MINERAL INVESTMENT CONDITIONS IN SELECTED COUNTRIES OF THE ASIA-PACIFIC REGION





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# MINERAL INVESTMENT CONDITIONS IN SELECTED COUNTRIES OF THE ASIA-PACIFIC REGION



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#### **TECHNICAL EDITOR'S NOTE**

In editing these proceedings, every effort was made to retain the original contents as presented by the authors. Editorial adjustments were sometimes made without seriously affecting the original form of the presentations. This publication has been issued without undergoing the formal United Nations editing process.

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# PREFACE

This study was prepared by the ESCAP/UNDP project Economic Restructuring and International Trade in the Mineral Commodities Sector (RAS/089/027) by a team from the Centre for Petroleum and Mineral Law and Policy of the University of Dundee, Scotland, United Kingdom, in collaboration with an international network of resource persons. Thomas Walde acted as global coordinator of the study; James Otto acted as project coordinator and had the principal responsibility for the chapter on investment criteria, the survey of mining companies and the individual country studies. The global network included Albert Chandler of Chandler and Thong-Ek, Bangkok, Thailand; B.K. Dhar, Central Mining Organisation, Dhanbad, India; James Dorian and Allen Clark, East-West Center, Hawaii, United States of America; and Julie Prud'homme, University of Montreal, Canada. Blank page

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# Introduction to the Mineral Investment Conditions in the Asia-Pacific Region

# 1. Background

The attitude toward mineral investment has changed drastically over the last decade. During the 1970s, foreign investment by private companies was viewed with suspicion by many developing countries. This attitude changed toward a much more inviting and promotional philosophy in the course of the 1980s, and this philosophy has accelerated in recent years with the collapse of the command-and-control system of managing national economies, and of inward-looking, state-oriented economic policies. Current thinking in many countries favours the promotion of foreign and private investment and the restructuring of state agencies into commercially oriented, corporately structured and ultimately fully or partially privatized companies.<sup>1</sup>

The mining industry, where national sensitivities over resource exploitation are particularly acute, presents a vivid illustration of this change. Metal mining, for most developing countries, means essentially the generation of badly wanted foreign exchange revenues; some opening up of remote areas, leading to a build-up of essential infrastructure; and heavy capital investment by foreign companies with a relatively modest level of employment. In Asia, the world's most populous and economically dynamic region, mining, however, carries with it two additional significant and often contradictory implications.

- \* First, there is a large and growing need for metals and minerals in the burgeoning economies of the Asian region.
- \* Second, population pressures and evolving environmental concerns sharpen the conflicts around land use where mining, with its visible, though generally quite localized impact, has to compete with agriculture, habitat, tourism and other natural and environmental protection objectives.<sup>2</sup>

From the investors'/companies' viewpoint, the Asian region raises the following issues: intensive exploration in the developed mining countries has identified and developed many high-grade ore deposits, but it is the developing world that promises to provide such promising mineral deposits in the future.

Industry in Developing Countries, *A*aterials Policy, 1992.

This paper was prepared for the ESCAP/UNDP Project Economic Restructuring and International Trade in the Mineral Commodities Sector by Thomas Walde and James Otto, Centre for Petroleum and Mineral Law and Policy, University of Dundee, United Kingdom. The views expressed in it are those of the authors and do not necessarily reflect those of the United Nations.

<sup>&</sup>lt;sup>1</sup> See T. Walde, Restructuring and Privatization of State Resource Companies, CPMLP Technical

The substantial growth of mineral exploration and development in some Asian countries indicates the willingness of mining companies to venture into the developing countries in Asia. There are, however, some drawbacks.

First, the restructuring of the socialist countries in Eastern Europe and Central Asia – the former Union of Soviet Socialist Republics being the world's top mineral producer – may divert the attention of investors from the Asian region and may attract investment resources that otherwise would have gone into the Asian region.<sup>3</sup> While there is, at the moment, considerable interest and curiosity, it is far from clear whether or not this vast mining province of the world will, within the next 10 years or so, really attract massive investment funds. The restructuring of these economies, their infrastructure and commercial, legal, financial, political and administrative systems, is likely to take much longer than originally envisaged. Also, there is a heritage of economic nationalism and a reluctance to hand over valued assets to foreign companies.

Second, the reorientation of overall national investment policies from restriction to promotion of foreign and private mineral investment is much easier to articulate on a general policy level than to actually implement in daily government practice over the years. There are considerable impediments to actually attracting foreign investment projects and making them work. Vested interests in local and regional politics, in established state companies with monopoly or de facto or de jure preference access to mining rights or private national companies having priority access rights, will not, in general, favourably view a competitor with the means to develop mining more effectively than they do. They will try to extract additional advantages from the foreign company in exchange for yielding access, and such additional benefits may work as an extra and consequently prohibitive tax. National administrative and business practices are, in general, not geared toward promoting and dealing smoothly with foreign inves-There is a tendency to be passive, to not nurture foreign investment tors. projects and to view access to foreign investment as a special privilege to be granted slowly, with long and protracted procedures. This clearly does not facilitate investment. There is rarely an institution absolutely focused on attracting foreign investment.

All this means that the task of reorienting mineral investment policies toward promotion is likely to be a long, tedious process requiring the gradual buildup of understanding of the industry, its practices and requirements, of legal, fiscal, environmental and administrative regulations and of institutional structures capable of attracting and dealing effectively with foreign and private investors.<sup>4</sup> The purpose of the present study is to help to prepare the groundwork for governments embarking on such a course; to support ongoing efforts in facilitating the understanding of what is required in actual practice to reorient mineral

<sup>&</sup>lt;sup>3</sup> See T. Walde, Current Developments in Mineral Licensing and Negotiations, CPMLP Technical Paper, published also as proceedings of the International Bar Association, Section on Energy and Natural Resources Law, Washington Conference, April 1992 and Proceedings of the United Kingdom Society of Petroleum Engineers (SPE), London Conference, 29 April 1992.

<sup>&</sup>lt;sup>4</sup> T. Walde, Methods of Mineral Investment Promotion, in: Foreign Investment Law Journal/ICSID Review, 1991, ..... published by the World Bank.

investment regimes; to restructure investment conditions; and to provide a yardstick of the success and level of effective investment promotion that countries have already achieved in the region or which they are on course to achieve over the coming decade.

The methodology of the study is based on the realization that it is not only the overall legal regime – important as it may be<sup>5</sup> – but the implementation of such rules in practice, the attitude and philosophies of government agencies, state and private national enterprises, in short the "real-life" investment conditions that are decisive for the success of a promotional investment policy.

The framework of the decision criteria used in the country studies is based on the experience of the study leaders, Thomas Walde and James Otto, in more than a decade of advisory services to governments for reorienting their investment policies.<sup>6</sup> Other studies in which Thomas Walde was involved – notably a study of mineral investment conditions in Africa now exclusively led by World Bank mining staff – provided valuable experiences upon which to found and further develop the methodology of the present effort.

Of particular importance is the attempt of the present study to gauge the attitudes of industry toward the Asian countries selected for review. It can be frequently observed that the self-estimate in a particular country concerning its investment climate is guite at variance with assessments made by the prospective or actual investors, the judgment of which will be ultimately decisive for the success of an investment promotion policy. The study therefore relied very heavily on the interface between an assessment of country conditions, with help from national resource persons and other internal sources on one hand, and the appraisal of that country's investment conditions from the outside, by mining companies. A detailed questionnaire - built upon and further developing previous efforts, notably by Charles Johnson<sup>7</sup> and the World Bank's mining staff was circulated and a surprisingly large response ratio was received using the study leaders' professional network in the industry. The survey and the individual country studies constitute both an assessment of the current situation -asnapshot, so to say - as well as describing the evolution, both in the countries and by the industry, of policies, practices and perceptions.

The study further relied on presentations of parts of the study and its major concepts at two regional meetings, a meeting of Asian mining agency representatives organized by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) in March 1992 in Bangkok and the March 1992 Third Asia-Pacific Mining Conference, Manila. These meetings allowed a dialogue based on the preliminary findings of the study to be incorporated in the country assessment reports.

<sup>&</sup>lt;sup>5</sup> See T. Walde, ICSID-Review, op. cit. supra.

<sup>&</sup>lt;sup>6</sup> For a conceptual discussion of these criteria see T. Walde, Methods of Mineral Investment Promotion, ICSID-Review, supra.

<sup>&</sup>lt;sup>7</sup> C. Johnson, "Ranking Countries for Minerals Exploration," Natural Resources Forum Vol. 14 No. 3, August 1990.

# 2. Criteria for Exploration and Mining Investment

The paper "Criteria for Assessing Mineral Investment Conditions" contains a description and list of the main decision criteria used by exploration and mining companies in making their investment decisions. The list was compiled to indicate the types of factors and issues that private-sector mineral companies may assess when deciding whether or not a given country is suitable for an exploration, mining or mineral processing project. The paper concludes that government mineral professionals, and policy and law makers, will be better positioned to manage mineral resource development if they have a basic understanding of the types of investment decision criteria that international mineral companies apply when assessing their country. The decision criteria list developed in the paper was used to provide a more or less uniform framework to analyse the mineral sector investment conditions in a cross-section of nations within the Asia-Pacific region.

# 3. Country Studies

A cross-section of developing countries within the ESCAP region was selected for study with the intention of profiling their respective mineral investment environments. The nine countries selected for analysis were chosen because they each represent a different approach to mineral sector development.

China was chosen because it is a socialist system with a high degree of centralized policy making. India has for many years followed a policy of mineral self-sufficiency and was not receptive to foreign mineral investment. Although this policy is now undergoing revision, the government policy still heavily emphasizes inward-looking mineral sector development. Indonesia leads the region in terms of foreign mineral sector investment. Its unique contract of work has been held out as an example that many countries may seek to emulate. Malaysia has one of the most complicated mineral sector regulatory systems. In Malaysia, both the states and the federal government have complementary regulatory roles to play, and each state has its own mining code. Myanmar was chosen because although it is widely believed to have good mineral potential, it has not chosen to develop that potential on the scale that the geology would seem to indicate might be possible. Mongolia illustrates the example of a landlocked country, which until recently was heavily dominated by the former Soviet Union. Its transition to a fully self-regulating state is now taking place. The Philippines was selected because it illustrates the problems that a country may face when foreign investors perceive the political regime to be potentially Thailand has one of the fastest growing economies in the world and unstable. relies heavily on external markets. As rapid industrialization takes place, the demand for minerals in Thailand will also increase. Finally, Viet Nam was selected to illustrate how foreign investors might appraise a country that is making the transition from a socialist approach to a more market-oriented economy.

It should be emphasized that the country studies are conceptual and address a very broad range of topics and issues. While a concerted effort was made to verify the accuracy of the information obtained and to collect the types of information necessary to thoroughly assess the mineral sector investment environment, it should be recognized that all "desk studies", including these country studies, have limitations. It was not possible within the scope of the study to visit all the countries to collect information. In most cases, designated local resource persons were identified to assist in locating and making available key information.

It is highly probable that some information reported in the studies is out of date and some may be inaccurate. However, the usefulness of the study effort relies not so much on knowing what this year's foreign exchange controls are in Mongolia but rather in knowing what types of foreign exchange controls will be acceptable to potential foreign investors interested in investing in Mongolia.

# 4. Global Survey

The list of decision criteria presented in the paper "Criteria for Assessing Mineral Investment Conditions" was used to formulate a questionnaire, which was sent to mineral industry companies worldwide. The inherent problem associated with the preparation of any study that addresses decision-making is that there is a danger that the personal bias of the author(s) will be reflected in the analysis and conclusions. To put these potential biases in perspective, the overall study effort included a worldwide survey of exploration and mining companies. The empirical data supplied by the survey should provide a good indication of how companies make their investment decisions and what criteria they use. In addition to revealing information on the company decision-making process, the questionnaires are useful in identifying whether or not the respective study countries meet certain investment criteria.

# 5. Bibliography

There is a vast and growing body of literature addressing the exploration and exploitation of minerals. For some nations within the ESCAP region, such as China, this literature dates back several thousand years. Every nation within the region has published (and has been the subject of publications), so a comprehensive review of the complete literature would not be practical and probably not very useful. However, a limited review of the literature and the complication of a bibliography of materials related to mineral sector investment is practical and can provide a valuable reference source.

Coincident with the drafting of this study, a search was made for relevant materials held by the World Bank, the United Nations and the Centre for Petroleum and Mineral Law and Policy at the University of Dundee, Scotland. The results of the search are given in the bibliography appearing as an appendix to this study. It should be noted that the appendix does not necessarily include all references appearing in the individual country studies.

# **Criteria for Assessing Mineral Investment Conditions**

# 1. Introduction

Worldwide, there is keen competition among countries to attract private sector capital for exploration and mining. While for some minerals there are only a few known countries where the mineral occurs, for most minerals a potential investor has a wide selection of nations to choose from in making its exploration programme/mining project investment. Thus, those nations that have both favourable geology and an attractive mineral sector investment environment tend to attract the majority of mineral sector investment.

The question then arises as to what constitutes a favourable mineral sector investment environment. There is no one correct answer to this question because different companies will have different strategic objectives and derive their related investment decision criteria accordingly. However, there are apt to be many similarities in the investment decision processes of companies. By understanding how companies decide where to invest, government officials are in a better position to evaluate their nation's mineral sector investment environment, its strengths, its weakness and areas where reform may be desirable.

# 2. Private-Sector Investment Objectives

For the private sector, the prevalent investment decision question – Will the investment make enough profit to justify the risks involved? – probably has not changed much over time. However, profit alone is not the only motive shaping the objectives of companies. The strategic objective (sometimes referred to as the corporate motive) provides the reason why the company wishes to invest and leads to both the development of specific company operational objectives and the selection and weighing of related decision criteria.

Some of the possible strategic objectives of companies who invest in the mineral industry are listed below.

- \* Maximize overall company profits
- \* Expand market share
- \* Guarantee raw materials for vital downstream enterprises
- \* Preempt competition
- \* Stabilize annual earnings
- \* Develop foreign markets

In order to achieve strategic objectives, companies will formally or informally strive to satisfy related operational objectives. Examples of operational objectives include the following.

This paper was prepared by James Otto, Assistant Director, Centre for Petroleum and Mineral Law and Policy, University of Dundee, United Kingdom. The views expressed in it are those of the author and do not necessarily reflect those of the United Nations.

- \* To locate, through exploration, a mineral deposit that the company can mine at a profit
- \* To locate an economically viable mineral deposit with reserves greater than a minimum cut-off
- \* To locate a mineral deposit that can be transferred (sold) to a mining company
- \* To obtain a deposit through acquisition that can be mined at a profit
- \* To locate and control a source of supply for a downstream project

Various investment criteria may be used to assess whether or not the proposed investment will meet the company's operational objectives. The specific investment criteria applied will thus depend largely on the nature of the investor's strategic and operational objective(s). To illustrate, assume a company's strategic objective is to increase market share. Two possible operational objectives to achieve increased market share would be to expand production by the acquisition of new deposits and to acquire known reserves to keep them out of reach of the competition.

As is indicated in Figure 1, for each operational objective the company will have certain criteria it will apply to determine whether the investment is warranted. The weight that will be placed on any one criterion will ultimately depend on the decision-making authority. While some companies may use a quantitative decision-making process, it is probably more prevalent for a management team or top officer to weigh the qualitative merits of the various criteria (some of which can be quantified, such as rate of return, and others which cannot, such as political risk) to arrive at the decision.



Figure 1. Illustration of the relationship between objectives and decision criteria

The company's investment objectives will act as a major determinant in the selection and weighing of decision criteria. In negotiations between an individual company and a host government, the better the government understands the particular motivation of the company, the better are its prospects for being able to lock in the investment on terms optimally beneficial to the government. In contrast, in assessing the mineral sector investment environment as a whole, the emphasis should be placed not on the objectives of individual companies but rather on the types of criteria exploration and mining firms commonly apply. The main emphasis of the present study is therefore not to identify investment objectives but rather to concentrate on delineating the types of criteria used by most companies in their investment decision-making.

# 3. Criteria for Assessing Investment Potential

The appendix lists a representative sampling of decision criteria topics that may play a role in a company's exploration or mining investment decision. The topic list focuses on the criteria used by the private sector to assess the mineral sector investment environment; it does not address the types of criteria that governments or government companies might apply. While there are certainly some similarities between the private sector and the public sector investment decision process, there may also be major differences. For instance, a government may be as interested in maximizing employment as it is in earning profits.

Companies that do exploration are not necessarily interested in mining and vice-versa. In addition, firms may not apply all the same criteria or give any one criterion equal weighting in the decision process. Thus, the comprehensive list given in the appendix should not be used as an indication of the criteria that any one exploration or mining company will apply but should instead be used as an indication of the types of factors firms may consider in the investment decision process. The criteria listed in the appendix have been organized into ten criteria groupings, namely, geological, political, marketing, regulatory, fiscal, monetary, environmental, operational, profit and others.

The criteria falling into each group are briefly discussed in the following sections.

# 3.1 Geological Criteria

Companies explore to locate minerals and mine to extract minerals. In either case, certain geological criteria will be considered by an investor when assessing the investment potential. Several examples of geological criteria are briefly introduced below.

# 3.1.1 General Mineral Abundance

Within the earth's crust minerals are not evenly distributed but tend to occur in certain types of geological environments. Geologists can often determine in advance of exploration the likelihood that an area or region will contain an abundance of minerals, based on very general information. Exploration companies will focus their attention on areas that their geologists advise have a good potential for anomalous mineral occurrences. Thus, one of the most important criteria used in assessing the investment environment is the perceived geological potential of the country relative to alternative exploration sites.

# 3.1.2 Geological Potential for Target Minerals

A country can be proven richly endowed with one mineral but be relatively barren with respect to another. Companies whose corporate strategy is to concentrate on a single mineral, such as gold for instance, will look for geology that is particularly indicative of good prospects for gold mineralization. Not all exploration companies concentrate on a single mineral, and these firms will have a much broader criterion for their selection of suitable areas for investment.

# 3.1.3 Availability of Geoscientific Information

To acquire geological information requires time and money. In most cases, it costs much less to acquire information from others who have already done such exploration rather than to begin anew. Topographic maps, geological maps, aerial photo coverage, airborne geophysics, geochemical data and geological reports may already be available to assist the company geologists in deciding what steps to take next. The availability of reliable geoscientific information (from a government organization such as a geological survey or from private sources) reduces the costs and risks of exploration. The availability of geoscientific information is important to large companies with sizeable exploration budgets and may be an essential criterion for small exploration firms who need to quickly pinpoint areas of prospective mineralization.

# 3.1.4 Historical Production

Exploration and recovery technologies have improved over time, and for some minerals (such as gold) previous discoveries and past production may be an important indicator for the discovery of new mining potential. Some companies specialize in the recovery of minerals from the waste and tailings dumps of old operations. Other firms with limited exploration budgets may, as an exploration strategy, only invest in areas where mineralization has been economic in the past. While historical production may be used by some companies as one criterion in the investment decision, many companies would find historical production a positive factor but would not base their investment decision on it.

# 3.1.5 Ability to Apply Geological Assessment Techniques

It is not always possible for technical and economic reasons to apply effective geological assessment techniques in a given area. Where this is the case, most companies will look to better suited areas to invest. For instance, a geophysical survey may locate a promising anomaly in an area of extremely rugged and steeply sloped mountains covered with snow fields, but to prove the deposit would require the extensive (and not economically justifiable) use of helicopters and blasting to set up drill sites. Heavy jungle coverage can inhibit the work of geologists on the ground, while climatological factors, such as monsoon rains, can reduce efficiency or curtail exploration efforts.

# 3.1.6 Rarity of Predicted Mineral Deposits

Companies may diminish the relative importance of other decision criteria if the deposit (or postulated deposit) contains a specific type of mineral (such as a strategic mineral or a truly rare mineral) or has an unusually high ore grade or large tonnage or will in some other way be more advantageous to develop than many other types of deposits.

# 3.2 Political Criteria

There are many risks associated with investing in an exploration or mining project. Some of these risks relate to inherent natural characteristics that the government has no control over (such as geology), but others may be influenced or induced by the political system. Examples of topics and decision criteria regarding political risk are presented in this section. The criteria discussed are by no means the only "political" criteria firms may apply, but the selected examples should give a good indication of the types of criteria that firms may use to assess the mineral sector investment environment.

# 3.2.1 Long-Term National Stability

Long-term national stability refers to the stability of a country's fundamental system of government. While regimes may come and go, the degree of stability demonstrated by the underlying political system will be a major factor taken into consideration by most potential investors. When a fundamental change in government structure is anticipated, many firms may decide not to invest or to delay making their decision. For example, at the time of preparation of this study, the existing frameworks of several governments were either undergoing or expected to undergo major structural changes, and the levels of private sector foreign investment in these countries have decreased or ceased entirely.

# 3.2.2 Regime Stability

Regime stability differs from national stability in that it refers to changes in government that are made within the framework of the fundamental system of government. Italy and Bolivia provide illustrative examples. Both have experienced many radical changes in leadership as one or another party or individual gained dominance, but the underlying institutions of government remained functional and companies could more or less get on with their affairs.

Questions related to regime stability that investment decision makers may ask include the following:

- \* When will there be a change in the regime?
- \* Will the change be likely to negatively affect the project?
- \* What steps, if any, can be taken to protect the company's interests?

Where exploration or mining rights were obtained through routine application and approval under a mining code, there is probably, in general, less direct risk of losing such rights after a change in regime than where the rights were obtained through a mineral agreement between the investor and the old regime. (Politically, it may be less difficult for a new regime to negate an agreement by a regime that has fallen from power and which can be blamed for entering into a "bad" agreement than it is to deprive a company of rights that were obtained under a law of general application.)

# 3.2.3 Consistency and Constance of Mineral Policies

Every nation has a mineral policy, although it may or may not take the form of a single document. In many cases, the policy must be determined by a careful analysis of the existing administrative and regulatory system, of papers and speeches made by the important politicians and technocrats and of industry practices and so forth. If the planned project is of a short duration, the decisionmaker will probably not be overly concerned with the evolution of the national mineral policy but instead will concentrate on the current policy and its ramifications for the project. However, if the project will be lengthy, as is the case with many mining projects, the company may try to analyse not only what the current policy is, but what it was and where it may be headed. Some companies may be wary of investing in a country that has frequently and radically changed its mineral policies or where there are inconsistencies in the policy.

# 3.2.4 Internal Security

Exploration teams working in the field and in mining projects, with their often long lines of supply, energy and delivery, are easy and frequent targets in nations where internal strife is exhibited in a violent way or where "banditry" is a problem. Many companies will set a strong criterion regarding worker safety and will not invest where such safety cannot be reasonably assured. Most exploration and mining companies will avoid major investment commitments in nations or in a region of a nation where there is a substantial potential for violent internal conflict or banditry.

## 3.2.5 Hostile Borders

Aside from the obvious situation where there is a likelihood that two countries may go to war, there is also the more frequently encountered possibility that the actions taken by a neighbouring country or group of countries may affect the ability of the company to conduct its business. This situation is particularly important where the supplies for a project or the means of marketing the product are vulnerable to certain external influences. An investor would probably carefully consider any situation where there is a possibility of a trade embargo or where a vital transportation link passes through an unfriendly neighbouring country.

# 3.2.6 Availability of Foreign Investment Insurance

In many developed nations, there are means to insure their citizen's investments in developing countries against certain political and other risks. In some cases, this insurance is offered through the government of the headquarters country of the investor (in the United States, such insurance is offered by the Oversees Private Investment Corporation) or by the private sector (such as that offered by Lloyds). Where an insurable political risk is deemed as unacceptably high by a foreign investor, the investor may be more willing to proceed if the risk can be insured against at an acceptable cost. Not all investments and not all country locations qualify for such insurance schemes, and this may influence the investment behaviour of some companies.

# 3.2.7 Form of Government

Some firms are sensitive to certain forms of government. Countries with systems of government that are authoritarian in nature or that do not in some other way fit a company's profile of acceptability may be rejected as potential locations for investment.

# 3.3 Marketing Criteria

World mineral markets are, by and large, highly competitive, and a company's perception as to its ability to sell the product from a proposed mine at a reasonable price may play a key role in the investment decision. The main exceptions to this general statement include minerals that are not demandrestrained (most precious metals, precious and semiprecious stones) and minerals destined for an integrated enterprise (such as coal for a captive power plant). There are many marketing criteria that a company can apply in making the investment decision, and several of these are described in this section.

# 3.3.1 Geographical Location

For some types of minerals, the investment decision will be based, in part, on the geographical location and how it affects the marketability of the product. This is particularly true for low-value, high-bulk commodities (such as clay, coal and limestone) where transportation costs may be a major factor in the project economics. For many minerals, the proximity to end markets is a fundamental decision criterion that must be met.

# 3.3.2 Presence of Internal Markets

The world markets for most minerals are highly competitive. In many instances, if an internal market exists within the country in which the mineral is produced, the producer may enjoy advantages within the internal market not available to external producers. These advantages may include lower transportation costs, import barriers and "buy home country" policies. However, the presence of internal markets can also be viewed negatively by foreign investors if restrictions are placed on a firm's ability to sell to the buyer offering the best terms, regardless of whether the product flows to the internal or external market. Thus, depending on how the supply to the internal market is regulated, potential investors may view the existence of an internal market either positively or negatively.

# 3.3.3 Transportation Infrastructure

For mining operations producing large volumes of material that must be moved for sale, the availability of a reliable bulk transportation system (roads, rails, deep-water ports) may be an important criterion in the investment decision. Except for the very largest mines, most operations will have only a limited capacity to install extensive transportation infrastructure. The existence of a transportation network alone is usually insufficient to meet a company's transportation criterion; it must also be accessible at an affordable cost. To illustrate, a joint-venture coal mine in one country sought and obtained rail access guarantees from the government to guarantee coal deliveries to the coast. The government has, at times, been unable to honour this arrangement, and since the time when this fact was publicized, there have been no other large foreign investments in coal mining in that country.

The extent to which transportation plays a role in the investment decision process will depend largely on the mineral to be produced and on the extent to which it is processed at the mine. Generally, for precious metals transportation infrastructure is not important, while for base metals and industrial minerals it may be a primary decision criterion.

# 3.3.4 Export Policies

Policies on exports of minerals are a key determinant in any decision to exploit a mineral for which there is only a limited internal market. Even where there is an adequate internal market to take up the production, it may not be in the best interests of the company to supply that market instead of looking abroad. Countries can restrict the ability of a company to market its product abroad using a number of different methods, with the most common being export quotas and duties. If these are too restrictive or costly, potential investors will look elsewhere.

A good example can be drawn from Malaysia where until 1991, an export duty of 10 per cent was levied on most mineral ores and concentrates. Almost no foreign exploration for minerals subject to the levy took place while the high duties were in effect because firms knew that even if the exploration was successful and the mine was developed, they would not be able to, after application of the duty, offer a competitive price to the international markets.

# 3.3.5 Regional and Bilateral Trade Agreements

In certain instances, the existence of a regional or bilateral trade agreement, either official or unofficial, can affect a company's investment decision. Such agreements can address many topics that would affect the economics of a mine, including lower tariffs, market protection, reduced energy and transportation costs, access to financing and so forth.

An example of a regional agreement, which is the key to a mine investment decision, is the pending agreement by most ASEAN governments to buy the production from a proposed potash mine to be built in southern Thailand.

# 3.3.6 Demand/Price Forecasting

Most mines rely on sales revenues to justify their continued operation. It follows that in the investment decision process companies will be interested in how potential changes in demand and related prices may affect those revenues. In some instances, a demand study may be carried out, but more commonly, a profit measures sensitivity analysis will be performed under a variety of pricing scenarios. The use of forecasting techniques can be useful in determining a range of pricing assumptions.

For many companies, an attempt will be made to insulate the project from severe price fluctuations through advance sales, long-term supply contracts, hedging and so forth. In many cases, access to financing for a large project may depend on proof of sales commitments by buyers.

Some of the key price-related questions that the decision-maker may ask are as follows.

- \* Can the company produce the product at a cost below the price it can sell the product for?
- \* What fluctuations in price can be expected to take place?
- \* Should and can the company take any protective marketing measures to insulate itself from price fluctuations?

# 3.4 Regulatory Criteria

There are many diverse approaches to mineral sector regulation that can provide attractive environments for private investment. Companies are usually more concerned with the "content" of the regulatory system than with its particular form. While approaches may differ, there are certain features of mineral sector regulation that companies examine closely. Examples of some of these are presented in this section.

# 3.4.1 Workable Mineral Legislation

A very important factor in the assessment of the mineral investment environment is the mining code. In most countries, it is this critical law that defines the basic framework under which exploration and mining will be regulated. The ability of companies to work within the code, rather than around it, quickly becomes public knowledge. The world mining community is not that large, and word spreads rapidly as to whether a particular country's approach to mineral sector regulation is workable or not. Key questions most firms will ask include the following.

- \* How does a company obtain rights?
- \* What rights can be obtained?
- \* What obligations will be imposed?
- \* How can a company lose specific rights?
- \* What means is there for the appeal of a right that has been lost?
- \* How flexible is the system?
- \* How complete is the system?

The legal requirements regulating the mineral process may be all-inclusive within the mining code or they may be found in a variety of laws dealing with such matters as environment, labour and machinery. Substantial transactional costs may be incurred by a company in a country where many different laws are applied to mineral projects.

#### 3.4.2 Stability of Exploration/Mining Terms

Exploration and mining are expensive, and companies must be able to justify the associated costs before investing. Such justification will depend to a large extent on the terms under which exploration and mining are allowed. If these terms are perceived as unstable, the investment may be placed at risk.

There are several ways companies reassure themselves concerning stability. One way is to examine the experience of other firms that have invested in the past. Another way is to clearly identify the extent to which the government and company agree to stabilize specific terms through the signing of a supplemental agreement or an agreement that supersedes the mining code. In some cases, the mining code itself will contain stability provisions. Mining codes that treat projects on a case-by-case basis are of particular concern to many mineral sector investors. The government may be more inclined to disturb terms that apply to a single mine than to change terms that apply generally to all mines.

## 3.4.3 Mineral Ownership

The ability to obtain the right to extract a mineral may depend, in part, on who owns the mineral. Examples of mineral ownership include the landowner, the state, the state in the name of the people, the ruler and the ruling council. Where there is confusion as to who owns the minerals, companies will be cautious in their investment decision. Problems may occur where private interests have conflicting claims or where local and national governments each claim ownership (a common occurrence in many offshore areas where minerals within a state, or other political subdivision, are vested in the state).

Another issue of concern to companies is at what point, if any, ownership will be vested in the company. The regulatory system should optimally identify at what point in the extraction/marketing process the ownership of the mineral becomes vested in the company.

# 3.4.4 Surface/Land Ownership (Access to Land)

Exploration is a means of determining land use. Mining is a land use. Both must be carried out in harmony with the rights of landholders, or serious problems may develop. The degree to which the regulatory and administration systems provide for the right of access to the land for exploration and mining is critical to exploration and mining decisions.

When exploration rights are granted, it is highly probable that there will be people living within the exploration area. The ability to undertake exploration will depend not only on the company's legal right but on practical considerations as well. In many cases, exploration rights will be granted by a central authority. The local population may have no input in the granting procedure and may deny access or hinder the exploration efforts. The degree to which the system provides practical access to the land is an important criterion for all exploration companies.

If a deposit is found where there is an existing land use, the regulatory system should provide the company with the means to obtain the right to access the land for mining. A company that is planning on expending millions on exploration will require adequate advance assurance that should a deposit be discovered, the presence of a banana plantation, rice field or small shrine will not preclude exploitation of the deposit. Clear procedures for the transfer of land rights (or access) and for determining landholder compensation are central to the resolution of the mineral investment question.

# 3.4.5 Security of Tenure

Security of tenure refers to the length of time for which the company will have a particular mineral right. In the mineral sequence, there are several key tenure questions that companies will consider.

With regard to exploration, the company will in most cases be granted exploration rights for a specific amount of time. The company will in most cases be very concerned about the ability to renew such rights and whether such renewal is automatic upon the fulfilment of certain obligations or is purely discretionary. Many mining codes allow for a short exploration period, while in practice, if likely prospects are found, the exploration period can be quite lengthy. A company will find reassurance in a regulatory system that provides for renewal upon the demonstration of a reasonable need for such renewal.

One of the most important decision criteria for exploration/mining companies is the regulatory linkage that provides for the transition between the exploration phase and the mining phase of mineral development. Companies will be very hesitant to invest in exploration unless the regulatory system provides a clear right for the company to mine should a viable deposit be discovered. Very few companies will undertake exploration unless the right to mine is also assured. However, the right to mine is not necessarily automatic. In almost all countries, the right is vested only after the company has met other government requirements such as the payment of fees; preparation of a survey plan, mine plan and environmental protection plan; and acquisition of the land rights.

With regard to the mining phase, investors will look to the regulatory system to determine under what conditions the right to mine may be cancelled and whether the right may be renewed.

# 3.4.6 Quality of the Mineral Title System

In many developing countries, one of the most daunting tasks faced by a minerals company is to determine what land is available for exploration and/or mining and who holds what rights over that land. It is not uncommon for a company to be awarded a large block, only to subsequently discover that the area actually available for exploration is only a fraction of the whole. The lack of an accurate and accessible land title system can be a severe impediment to almost all exploration companies and is especially disadvantageous to smaller firms who do not have the financial resources to spend months or years trying to sort the situation out.

Another situation that arises in some countries is that a foreign company will apply for an exploration area, then within a short time period scores of other applications will be filed for the same area by local companies, politicians and powerful individuals. This can delay the awarding of the exploration rights and will in many cases lead to protracted negotiations between the company and other applicants even before the rights are granted. Countries that can offer a clear picture of what lands are available for exploration, how a company applies for and is granted mineral rights, how overlapping requests for exploration areas are prioritized and how the right to mine matures in relation to existing land-use rights, are in a much superior position to attract a broad spectrum of potential investors than are countries without a well-developed and accessible mineral title system.

# 3.4.7 Right to Transfer Ownership

The last twenty years have seen the emergence of greater specialization in many industries, and the mineral industry is no exception. While many firms still pursue a course of exploration followed by mine development and mining, many smaller firms now specialize in only a single aspect of the mineral development sequence. In large part because of the creation of specialized share markets for raising mineral industry capital (in Australia, Canada and the United States), a new generation of mineral venture capital-raising companies has emerged that specializes in obtaining exploration and/or mining rights and then sells them to specialized exploration or exploration/mining companies. In addition, there has been a tremendous growth in companies that undertake exploration but who have no interest in mining. Because venture capital firms and exploration companies will not mine, they will place a high priority on the ability to legally transfer to the highest bidder their mining rights in a property. This is also true of large integrated minerals firms, who often will discover economically viable deposits that are too small to fit their corporate investment strategy. Mining codes and mineral agreements that clearly define the rules for transfer and which are not overly restrictive have broad appeal to today's international mining community.

# 3.4.8 Size of Exploration Blocks/Duration of Exploration Rights

Many exploration companies will not consider investing in an exploration area if the area granted is judged to be too small. What constitutes a viable minimum area for efficient and meaningful exploration will depend on the amount of geological information already available, the geological setting, the mineral sought and the type of exploration techniques to be used. Mining codes dating back to the time period when exploration was usually carried out by a single geologist using a rock hammer, pick and shovel often provided for the issuance of exploration rights for relatively small exploration areas. In today's world of satellite imaging, airborne geophysics and characteristic analysis, large land areas are often required before a company will invest in a costly exploration programme.

The implementation of a major exploration programme can be a lengthy affair, taking from a few years up to several decades. Mining codes that do not take into consideration the realities of today's exploration process and offer only a short time period will be less attractive than jurisdictions providing a reasonable time period for exploration.

# 3.4.9 Availability of a Mineral Agreement to Supplement or Stand in Place of the Mining Code

The use of a mineral agreement as an alternative or supplement to a mining code is widespread. The relative attractiveness of a mineral agreement to a mineral sector investor will depend largely on the mining code. If the mining code is complete, unambiguous and meets the requirements of most investors, a mineral agreement is probably not necessary. However, if the mining code is badly out of date, vague or silent on important matters, then an agreement will probably be requested by serious investors.

Countries that use a mineral agreement will generally be better positioned to attract smaller companies if they adopt a standardized mineral agreement. Smaller companies have limited management time and budget to spare on protracted negotiations. For large projects, companies probably prefer more flexibility, and a standardized agreement may not be adequate.

# 3.4.10 Dispute Resolution

Exploration and mining is often a lengthy business, and over the course of a project's life there is a good possibility that disputes between the government and the investor may arise. This is recognized by all experienced mining firms, who will closely consider the legal means provided for the resolution of such possible disputes. The main concern of an investor is that the dispute be settled in a fair, neutral and open manner. Where a strong independent judiciary is well established and familiar with hearing mining cases, recourse to the local court system (or national arbitration) may be deemed adequate by the investor. However, in many instances, especially where large sums are involved, the investor may prefer, and in some cases require, recourse to international arbitration.

#### 3.4.11 Procedural Efficiency and Clarity

Two of the most important criteria applied by experienced investors relate to procedural efficiency and clarity. The mining code or mining agreement will provide the basic framework for mineral sector regulation but will not usually address, in detail, procedural or administrative matters. Resolution of certain matters can be crucial for planning and cost estimation but can become mired in bureaucratic red tape and inefficiency. Within the ESCAP region, some countries are reportedly bypassed by potential investors because the criteria of procedural efficiency and clarity are not met.

The ability of a company to obtain timely government approval of applications and processing of key documents can be an extremely important criteria in decision-making. This is particularly true in countries where many approvals are required by different government offices. The ability of a country to efficiently process applications and other vital approvals within a reasonable time period is particularly important to smaller companies who may not have the fiscal or the management resources to outwait an inefficient bureaucratic system.

Most mining codes, including regulations and mineral agreements, are written in more or less general terms. Procedural details are often left for administrators to determine. This can result in a lack of clarity regarding implementation, which can lead both to frustration on the part of the mineral company and the government officers involved and to time delays. For example, the mining code may require that an environmental protection plan be submitted and approved by the government before mining may commence. Unless guidelines or detailed regulations are available to describe what should be included in such a plan, the company may not have a clear idea of what the government requires. In many cases, the company will not be able to obtain a clear explanation from government officers, who are unable or unwilling to provide clarification. If the company then submits a plan, government officers may delay in approving it because they are not sure what it should contain and will fear reprisals if they approve the plan and subsequent problems develop. Countries that provide unambiguous procedures and guidelines for the approval and processing of key documents quickly earn a reputation as countries in which business can be conducted on a reasonable basis.

# 3.5 Fiscal Criteria

# 3.5.1 Method and Level of Taxation

There are many methods that countries use to tax mineral sector companies. For most companies, the types of taxes levied (usually several tax methods will be used) are not as important as the net tax liability. Because taxes are a direct charge against revenues, potential investors will closely examine a country's tax structure when making their investment choices. While some companies may proceed under almost any tax scenario, hoping to change the scenario through later negotiations, most companies will avoid countries where the tax system is substantially more onerous than in other countries with similar geological potential. Taxes that are not profit-based (such as royalties, severance taxes, export taxes and import taxes) will be more harshly viewed than taxes that are profit-based.

# 3.5.2 Ability to Predetermine Tax Liability

Within the ESCAP region, some countries legislate and publish tax rates that are uniformly applied to all companies, while others rely on negotiations to set some or all tax rates on a project-by-project basis. Negotiated tax rates can be a particularly acute problem for some exploration companies, which may be unwilling to negotiate tax rates for a yet undiscovered deposit but will not undertake exploration until the rates that would apply to the development of a discovery are known. Companies that undertake comparative fiscal studies of possible countries to invest in (not all companies do) will encounter difficulties in nations where tax responsibility is vague or left to negotiations. Negotiated tax rates are less of a problem when a deposit is already known and the company can enter tax negotiations based on knowledge of the deposit's characteristics. While some companies prefer a uniform fiscal regime where the tax rates are published and known in advance, other firms may prefer the flexibility offered by negotiating some or all of the fiscal terms.

# 3.5.3 Availability of Tax Holiday

Almost all mining companies consider a tax holiday to be an added enticement to invest. However, the lack of a tax holiday will not always be viewed negatively. While the availability of a tax holiday may make a crucial difference in the decision to proceed with a marginally economic mine, in many cases, especially where the holiday period is fairly short, the holiday may have little effect on the overall project economics. Mines are capital intensive and deductions against income resulting from interest payments, amortization, depreciation and expensed capital costs will, in the early years of the project, already act to reduce the tax liability.

# 3.5.4 Availability of Accelerated Depreciation

One of the tax incentives most commonly made available to the mineral sector investor is accelerated depreciation. Under a system allowing accelerated depreciation, the total amount of depreciation allowable as a tax deduction does not change, but the company is allowed to make such deductions earlier in the project's life. The ability to deduct a large percentage of the depreciation allowance in the early years of the project can have a large effect on the measures of profitability (see subsequent subsections on measures of profitability) because of the effect of the "time value of money." Accelerated depreciation

would be viewed by almost all mining companies as a positive feature in an analysis of the investment environment.

# 3.5.5 Availability of Investment Tax Credits

Many nations allow some types of investments to be credited against the tax liability. Tax credits against tax liability are preferred by investors over deductions against taxable income (such as depreciation). This is because a credit of a given amount reduces the tax liability to a greater extent than would a taxable income deduction of that same amount. Like accelerated depreciation, most companies would consider tax credits a positive factor in favour of the decision to invest.

# 3.5.6 Availability of Reinvestment Credits

Depending on the nature of the project and the strategic objective of the company with regard to investment in the host country, the availability of reinvestment credits can be a major enticement to maintain and increase investment. For example, a company that wants to start out small and then expand an operation based on internally generated cashflow would find reinvestment credits very attractive. Similarly, a company that wishes to diversify its operations in a country would probably perceive such credits as an added inducement.

# 3.5.7 Deduction of Exploration Costs

Companies that undertake exploration with the objective of locating a deposit will be keenly interested in whether exploration expenses may be carried forward as deductions against future earnings from a mine. The ability to write off exploration expenses against future income is considered an attractive feature by almost all mineral companies.

# 3.5.8 Export-Import Credits

Investors headquartered in some nations may be able to obtain exportimport credits from their home government for investments in specified countries. Such credits can have a large impact on certain aspects of project economics and can therefore act as an inducement for companies to direct their investment toward countries where investment may be eligible for such credits.

# 3.5.9 Stability of the Fiscal System

Countries that exhibit (or which have a substantial potential for) fiscal system instability pose a greater investment risk than nations with a stable system of taxation. Taxes form an important part of a company's balance sheet, and investors will be wary of arrangements where the tax burden may unexpectedly increase.

# 3.5.10 Tax Treaty with the Home Country

In some instances, the existence of a tax treaty or similar arrangement between the country where the investing company is headquartered and the country where the revenues are earned may be an essential decision criteria. Double taxation, where the company would be taxed on income in both the home and host country, is a substantial deterrent to investment.

# 3.5.11 Expatriates Exempt from Income Tax

To attract a highly qualified individual who is willing to relocate, usually temporarily, to a developing country will often require that a high salary be paid to the individual. If the salary will be subject to income tax, the amount that must be paid to the expatriate employee will accordingly have to be increased. Exploration companies are particularly sensitive to this type of tax because the money that flows to the government during this period – when no revenues are coming in – will be charged against the exploration budget, thus effectively reducing the size of the exploration programme.

# 3.6 Monetary Criteria

The currencies of many countries are not freely convertible internationally, and this poses a variety of problems for an international mineral company. In making a choice between alternative investment projects, monetary criteria are likely to be taken into consideration.

# 3.6.1 Realistic Foreign Exchange Regulations and External Accounts

Countries whose currencies are not easily convertible in the world marketplace will see little mineral sector investment by foreign firms unless there are realistic foreign exchange regulations. In many developing countries, the internal mineral markets are small, and for many mines the majority of the production is sold abroad for hard currency. The interest of the country whose resources are being exploited, in seeing that this hard currency is brought into the country, must be balanced against the need of the company to repay loans, purchase equipment and supplies and pay other expenses that are denominated in hard currency.

# 3.6.2 Ability to Repatriate Profits

For most foreign mining companies, the ability to repatriate profits, or at least a goodly portion of profits, is essential to a positive investment decision. Countries that restrict the repatriation of profits or tax such remittances heavily will discourage potential mineral sector investors.

# 3.6.3 Ability to Raise External Financing

Several decades ago it was not uncommon for a mining company to fully fund new mine development in developing countries out of the company's internal funds. For a number of reasons (cost escalation, risk exposure) this practice is now the exception rather than the rule. In seeking financing for the project, local capital may be unavailable, not available in a sufficient amount or too costly; thus, the investor may need to turn to financing outside the country. In borrowing, many companies will seek to isolate the parent company from the borrowing risk to the extent possible and to tie the responsibility for repayment of the loan to the project rather than to the parent company (limited or nonrecourse loans). Thus, an important question that most international mining companies will consider is how potential lenders will perceive an investment opportunity in a given country. The perception of lenders regarding the investment environment in a given country may play a major role in determining whether limited or nonrecourse loans are wise and whether lending on any terms is advisable.

Another important source of external financing that will also be affected by perceptions of a country's investment environment are the share markets. The share markets are often used to raise venture capital for smaller exploration and mining projects. To raise money in a share market is not an easy task, and potential investors will shy away from offerings where the proposed investment is in a country perceived as having too risky an investment environment.

For many companies, an important part of the investment decision process is to assess whether external financing will be available to develop a project in the target country.

# 3.7 Environmental Criteria

# 3.7.1 Legal Requirements to Protect the Environment

International mining companies will be quite interested in assessing environmental requirements regarding their potential operation. Such requirements may come into force during the exploration stage (collection of baseline data), the mine application stage (environmental impact assessment), the mining stage (mitigation measures; buffer zones; compliance with air, soil and water standards) and after mining (final reclamation, disposal area maintenance). The company investment criteria that will be applied will relate primarily to practicality, reasonableness and, of course, cost. Countries that have established practical and reasonable environmental protection legislation (or equivalent provisions in a standard mineral agreement) are probably more attractive to many companies than are countries that have yet to take such action (see next section).

# 3.7.2 Ability to Predetermine Environment-Related Obligations

Many of the developing countries have not adopted environmental regulations and standards for the mining industry. In many countries, the only law on the subject is a vague mention in the mining code that the company must respect and, to a reasonable extent, minimize the damage to the environment. This is not very helpful to a company that needs to fully understand its environmental obligations to assess possible associated costs. There is a growing trend worldwide toward increased environmental protection regarding mining, and many companies would prefer to know in advance what their obligations are rather than to invest heavily and then be notified that new requirements will come into force. Nations that have not addressed the environmental obligation question are apt to be requested to define such obligations on a case-by-case basis through a written agreement or understanding. No company likes to increase its costs, and environmental protection is costly. However, most large international mining companies try to maintain a reputation as being good corporate citizens and will be willing to invest a reasonable amount to safeguard the environment. Regulatory systems that clearly define the extent to which environmental protection measures must be implemented or that indicate a clear means for determining such obligations will probably be more attractive to largescale investment than will systems that are silent on the subject. Smaller scale operations may not have this same concern regarding their status as "good corporate citizens" and may prefer to work in a system where environmental protection obligations are vague and associated costs can be avoided.

# 3.7.3 Antimining Groups

The presence of a strong antimining lobby will probably be of interest only to exploration and mining companies if such groups have been able to influence the governmental decision and mining administration system or are in a position to physically affect project implementation. Foreign mining companies with corporate headquarters in Australia, Europe and North America are familiar with working in environments with strong antimining groups, and their presence alone will probably not discourage exploration. However, when making a decision to invest in a mine or a processing facility, companies are beginning to more closely examine the extent to which the project will be acceptable to the local people. Problems encountered at the Ok Tedi copper mine in Papua New Guinea, the destruction of a new processing plant in Phuket, Thailand, access problems in Indonesia and similar occurrences elsewhere have made the international companies more aware of the need to assess the opinion of the population in the mine area. For larger projects, a social impact study or similar study will commonly be undertaken by the company, usually with the assistance of the government, to more fully understand how the mine will affect and be received by neighbouring communities. Such a study may have a substantial influence on the investment decision.

# 3.7.4 Relative Sensitivity of the Environment

The costs associated with environmental protection will depend both on the legal requirements and on the nature of the environment in the affected area. Some ecological environments are very mine-tolerant, while others (tundra, watersheds) are extremely sensitive. Mining companies have been able to operate in almost any environmental situation but may hesitate to mine in sensitive ecologies if there is a requirement for costly environmental protection.

# 3.8 Operational Criteria

# 3.8.1 Majority Equity Ownership Held by the Company

Many companies will not invest in any project in which they do not hold majority equity ownership. Others, such as some major Japanese firms, prefer to take a minority share. Countries that have a policy or legal requirement for greater than 50 per cent local or government participation lower their investment potential for at least two reasons: companies that have a majority ownership decision criterion probably would not invest, and other firms may stay away, anticipating that the 50 per cent local ownership requirement is unrealistic because of limitations in the availability of local investment capital.

Minority equity ownership requirements are more acceptable to international mineral firms and many would probably find such participation not only acceptable but advisable. Local partners can often offer valuable assistance in spreading risk, accessing finance, understanding the bureaucracy, deciphering the local geology and so forth.

#### 3.8.2 The Company has Management Control

Management control is a pivotal decision criterion for many companies. This is particularly true during the exploration and mine construction phases, when most foreign firms will want to maintain direct control of operations. Regulatory requirements that lessen a company's ability to manage the day-to-day affairs of a project will discourage investment by many companies.

# 3.8.3 Established Infrastructure and Utilities

The costs associated with installing basic infrastructure (such as transportation, power generation and distribution, and communications) can be substantial, and the degree to which these are already available can have a significant impact on decision-making for many projects.

#### 3.8.4 Favourable Climate

Extreme climates can increase costs and often pose increased operating risks and technical problems. Areas of extreme heat, cold, snowfall or rainfall may be excluded from consideration by some companies. The extent to which companies can or are willing to work in climatological extremes may depend to a great extent on the *in situ* infrastructure already in place.

# 3.8.5 Physical Lay of the Land

The physical lay of the land can in some cases affect the decision to proceed with the development of a deposit. Most mines require areas for waste dumps and tailings retention areas, among others, and suitable sites may not be available. Most mines also require a water supply, which again may not be present. The positioning and shape of the deposit relative to the host rock and local terrain may be unsuitable for economic mining methods to be used.

# 3.8.6 Availability of Experienced Local Workforce

While expatriates can and probably will be brought in for most projects, the associated cost is substantial and their familiarity with the local geology and social and regulatory systems will be limited. Training local personnel, who usually can be paid less than expatriates, can be a time-consuming and costly proposition. Thus, the availability of experienced local personnel (geologists, mining engineers, miners, heavy equipment operators) would be viewed as a positive factor by almost all serious mineral sector investors.

# 3.8.7 Availability of Fabrication/Maintenance Services

The availability of locally available support services reduces the amount of capital needed to invest. For most investors, excluding those who provide similar services for a fee, the availability of such services will be viewed as a positive feature of the investment environment.

# 3.8.8 Availability of Local Geotechnical Services

During the exploration phase and mine planning phase, and to a lesser extent during the mining phase, the availability of local mineral analysis laboratories, geotechnical consultants and other geotechnical support services can reduce costs and save time. If samples have to be shipped to another country for analysis, usually after going through customs, the cost and time lost can be substantial. Most mineral sector firms would see a definite advantage in the presence of reliable local geotechnical services.

# 3.8.9 Common Spoken Language

While not usually a criterion applied by most companies, small companies may prefer to work in countries where they know the language.

# 3.8.10 Constraints on the Use of Expatriate Staff

Companies prefer complete flexibility in the selection of their employees, regardless of their nationality. In contrast, governments have an interest in local employment and in the training of their citizens. Requirements that hinder a company in bringing in expatriate staff may discourage investment. Flexible arrangements that provide a gradual and reasonable replacement of most expatriate staff are acceptable to most mining companies.

# 3.8.11 Strength of Labour Unions

Frequent labour stoppages within a country can severely disrupt the cash flow of a mining operation. Mines can be extremely vulnerable to concerted union action because in addition to the workforce at the mine, the mine may rely on power, railroads and ports, which are vulnerable to union action. Investment decision-makers will probably consider the labour factor carefully in those types of operations particularly vulnerable to labour disruptions.

# 3.8.12 Excessive Bureaucratic Interference

Excessive bureaucratic interference with the operation of mineral enterprises will be taken as a negative factor by almost all potential investors. Examples of such interference can be found in many countries within the ESCAP region. As an example, within one such country, each time blasting will take place, a police officer must be called to accompany the explosive from its bunker to the blast hole.

# 3.8.13 Restrictions on Hiring, Firing and Setting Wages

As a matter of policy, some nations place unreasonable restrictions, from the viewpoint of the potential investor, on the hiring and firing of workers and may restrict an employer's ability to set wages. Depending on the type and size of a potential operation, such restrictions may be viewed as a negative aspect of the investment environment.

# 3.8.14 Technology Required

In assessing the mineral investment environment, companies will be exceedingly wary of government requirements that would hinder the company's selection of the most appropriate technology. Some mining codes provide that the government must approve all exploration work programmes and mine plans. While companies will usually respect requests for reasonable changes (such as those related to safety), where the government requires unreasonable changes or attempts to impose an alternative approach, companies will react negatively. The world exploration and mining industry is not large; it does not take many such instances for a country to earn, from an investment viewpoint, a damaging reputation.

# 3.9 Profit Criteria

Profit criteria are not part of the "mineral sector investment environment" *per se* but instead are derived from an estimation of the revenues and costs associated with a specific project. However, many factors in the investment environment – such as tax rates – will affect the calculation of the profit criteria. For many firms, the satisfaction of profit criteria is essential in making the decision to proceed with an investment.

In the not-so-distant past, profit criteria were rarely considered or considered only indirectly in a company's decision to undertake exploration. During exploration, no or very little mineral product will be produced for sale, and revenues will be insubstantial. Thus, profits during exploration will be nil, as the net cash flow will be negative.

There is a distinct trend today for exploration firms to undertake a preliminary economic evaluation of the postulated mine, based on a model target deposit, before investing in an exploration programme. The assumption here is that if the exploration programme is successful in locating a deposit, then the company may decide to sell the resource development rights or to mine the deposit. Since the company probably has a number of exploration options to choose from, a comparative analysis based on a model deposit can be useful in ranking countries for the purpose of allocating a limited exploration budget. The analysis might show that the model deposit would be highly profitable if discovered in one country but subeconomic if found in another. Aside from such comparative studies, an exploration company may perform an economic evaluation on the types of deposits that might be discovered within a given country or area to determine if the exploration effort would lead to the discovery of economic or subeconomic deposits.

In the same way that exploration companies often evaluate model deposits, governments can use the same techniques for assessing the relative merits and shortcomings of various taxation options. A recent example can be drawn from Malaysia, where in 1990 a computer model was developed to examine the effect of various tax scenarios on three types of deposits known to exist within the country. Based on the results of the study, and on other factors, modifications were made in the fiscal regime in 1991.

#### 3.9.1 Measures of Profitability

Almost all private sector mining companies will undertake studies to calculate profitability measures to compare to the company's profit criteria before investing in mine development and/or mining. The most common measures calculated include internal rate of return, net present value and payback year.

In most instances, a potential investor will calculate some or all of these economic measures, as each has its own particular usefulness. Each of the above measures of profitability are calculated based on the annual net cash flow of the project. There is no one correct way to calculate each of the profit measures, but fairly standard methods and variations commonly used by firms are described in detail in texts on the subject. A brief description of how the criteria are met follows.

The calculated internal rate of return (IRR), which is defined as the discount rate at which the sum of the discounted annual net cash flow from a project equals zero, is compared to the company's minimum rate of return (MROR). If the calculated IRR equals or exceeds the MROR, the IRR investment criterion is deemed satisfied. The MROR used by a company often represents the opportunity cost of capital (the rate of return that could be earned from alternative projects). Some firms will adjust the MROR upward or downward to take into account risks involved in the project.

The net present value (NPV) is the sum of the annual net cash flow discounted to the present time at a discount factor selected by the investor. If the NPV is greater than zero, the NPV criterion is satisfied.

The payback point (PBP) or the break-even year is the year in which selected costs associated with the project are paid back by net earnings. The payback criterion is met if the payback year is less than the company's maximum payback year. Payback criteria are often applied to projects where political risks are high or where the investment conditions are unstable; thus, an indication of the time necessary to make a net profit is required.

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# 3.9.2 Competitive Cost Position

An indirect measure of profitability used by many mining companies as an investment criterion is the estimated competitive cost position of a project relative to other producers. The company will calculate the estimated operating cost per unit product and compare this to that reported by other producers. The company will set a criterion cost cut-off based on the minimum cost position among producers that it finds acceptable. For instance, a company's investment criterion may be that any project must indicate a cost position within the 50 per cent of producers with lowest reported operating costs per unit product. By choosing a conservative cost position cut-off, the company has a better assurance that the project will not be a marginal producer.

Like the profit measures discussed above – IRR, NPV and PBP – competitive cost position is only indirectly linked to the mineral sector investment environment. The nature of the deposit itself will play a large role in determining the project's operating cost. However, certain aspects of the operating cost, such as general labour costs, transportation costs, energy costs, supply costs and so forth, are an integral part of the mineral sector investment environment and can be influenced by government policies and actions.

#### 3.10 Other Criteria

# 3.10.1 Prior Company Experience in the Country

Many exploration and mining companies tend to be conservative and will often invest most heavily in countries where the company has worked before. For many small companies, the costs of learning how to do business in a new location may be prohibitively high. Actions by the government to lower entry costs, such as the centralization of information pertaining to exploration and mining, can attract smaller exploration and mining firms. Closely related to the topic of company experience is the next topic area, company employee experience.

# 3.10.2 Company Employee Experience

Exploration and mining are dependent on highly trained personnel (such as geologists and mining engineers), who are often directly involved in the investment decision-making process. An important part of the investment consideration is the technical experience of a company's employees. With regard to exploration, a company is most apt to undertake programmes in the types of geological settings in which its employees have past experience. The same is true for mining. Many companies will restrict their investment to the development of types of deposits that company personnel are already acquainted with, to minerals traditionally mined by the company or to deposits amenable to certain types of mining methods. This is particularly applicable to small and medium-sized firms, which do not have an extensive personnel pool to call on.

The mineral sector has a highly mobile technical workforce with a high staff turnover. In many instances, if a company has not worked in a given location before, it may have an employee who has. Where a company does not have employees who are familiar with a specific country where the company has taken an interest, it is not uncommon to find the company establishing a oneperson office for several years to gain experience before making a major investment commitment for exploration or mining. Regulatory systems that provide for small projects amenable to this "get acquainted" practice may benefit over the long run. There is a perception that is not uncommon among government officers that unless a company is willing to make a large commitment immediately, it is not seriously interested. This is a dangerous perception because given the often conservative nature of mineral sector companies, large investment may only be forthcoming after employees of the firm have gained experience in working within the country.

# 3.10.3 Specialized Company Experience

As in many other fields requiring a high degree of technical expertise, many exploration and mining companies have specialized and will only be interested in geological settings or deposit types where their specialization can be applied. Thus, the mineral sector environment may be quite attractive to one company but not at all attractive to another, depending on the respective specialization of the firm.

# 3.10.4 Experience of Other Firms

Many mineral industry firms are quite conservative and unless they have direct experience in a country will hesitate to invest unless other firms are also seen investing. The experience of preceding firms often forms an important part of a potential investor's investigation. If previous companies have encountered difficulties, particularly non-technical difficulties, potential investors may shy away.

In some of the study countries there are few if any recent "track records" for companies to examine. This puts these countries in a unique but vulnerable position. The treatment that the first foreign investors receive will probably be closely scrutinized by other companies. If the initial investors are able to implement their programmes and projects with only a reasonable number of problems, then more conservative companies are more apt to follow.

# 3.10.5 Attitudes and Practices of Government Officials

Potential investors may encounter some self-serving officials in every bureaucracy. The degree to which self-serving practices are seen as a detriment, or attraction, to a foreign investor will depend on the particular situation. Most experienced companies expect and have learned to live with a reasonable number of self-serving practices, but should these begin to impinge too heavily on a company, a move to other, more acceptable countries could always be made.
# 3.10.6 Helpfulness of Government Officers

The attitude of government officers regarding foreign investors is an important part of the mineral sector investment environment. Company perceptions about the degree to which the regulatory system works is often derived from their experience with officers in key departments such as the geological survey, department of mines and office in charge of land. A concerted effort to educate officers with respect to their role as "ambassadors" for investment would not be inappropriate. In some countries, the attitude of government officers can be quite negative regarding the exploitation of national resources by foreigners, and this perception is not difficult for such a firm to recognize. If the recognition is strong enough, the foreign firm may turn elsewhere. Although laws and regulations may appear attractive, or at least acceptable, it is how the law is actually administered that is of key concern to almost all companies.

## 4. Summary

The determination of whether a country's investment environment is acceptable to the international mining community is not a question for which there is a single correct answer. What will be considered acceptable by one company may be rejected by another. This paper has briefly described many of the criteria that companies commonly investigate, but the specific criteria to be used and the relative importance of each in making the investment decision will depend on the nature of the investment and the experience and objectives of the decision-maker.

# Appendix.

# List of criteria for private sector appraisal of mineral sector investment conditions

## Geological criteria:

- General mineral abundance
- Geographical distribution of mineral potential
- Geological potential for target minerals
- Availability of geoscientific information (topographic maps, geological maps, aerial photo coverage, airborne geophysics, geochemical data, geological reports)
- Historical production
- Ability to apply geological assessment techniques
- Rarity of predicted mineral deposits

## Political criteria:

- Long-term national stability
- Regime stability
- Consistency and constancy of mineral policies
- Internal security
- Hostile borders

- Availability of foreign investment insurance
- Form of government

## Marketing criteria:

- Geographical location
- Presence of internal markets
- Transportation infrastructure
- Export/import policies
- Regional trade agreements
- Demand/price forecasting

## **Regulatory criteria:**

- Workable mineral legislation
- Stability of exploration/mining terms
- Mineral ownership
- Surface/land ownership (access to land)
- Security of tenure
- Quality of mineral title system
- Right to transfer ownership
- Size of exploration block/duration of exploration rights
- Availability of a mineral agreement to supplement or stand in place of the mining code
- Dispute resolution
- Excessive bureaucratic intervention
- Procedural efficiency and clarity

## Fiscal criteria:

- Tax method and level of tax levies
- Ability to predetermine tax liability
- Availability of tax holiday
- Availability of accelerated depreciation
- Availability of investment tax credits
- Availability of reinvestment credits
- Deduction of exploration costs
- Export-import credits
- Stability of fiscal regime
- Tax treaty with home country
- Expatriates exempt from income tax

# Monetary criteria:

- Realistic foreign exchange regulations
- Permitted external accounts
- Ability to repatriate profits
- Ability to raise external financing

## Environmental criteria:

- Legal requirements for environmental protection
- Ability to predetermine environment-related obligations
- Antimining groups
- Relative sensitivity of environment

#### Operational criteria:

- Majority equity ownership held by company
- Company has management control
- Established infrastructure and utilities
- Favourable climate
- Physical lay of the land
- Availability of experienced local workforce
- Availability of fabrication/maintenance services
- Availability of local geotechnical services
- Common spoken language
- Constraints on the use of expatriate staff
- Restrictions on hiring, firing and negotiating wages
- Technology required
- Government corruption
- Strength of labour unions

## Profit criteria:

- Measures of profitability
- Competitive cost position

#### Other criteria:

- Prior company experience in the country
- Company employee prior experience
- Specialized company expertise
- Experience of other firms
- Helpfulness of government officers

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# Mineral Investment Conditions in China

#### 1. Summary

Mining in China has advanced considerably during the past four decades. Today, the Chinese mining industry ranks fourth worldwide in output value, producing a wide variety of metallic and nonmetallic mineral resources. China's production of rare earth metals and tungsten ranks first globally, while output of antimony, iron ore and tin ranks third. China's mineral resources have facilitated strong economic growth in the nation, accounting for about 5 per cent of the nation's total industrial output value. Mineral products are among China's most important export commodities, including tungsten, tin, antimony, rare earths and several nonmetallic minerals.

While China's mining industry ranks high according to world standards, it operates at well below its potential, and the country has a very low per capita production of metals and minerals. China's mining industry has progressed significantly in recent years, yet problems are numerous, including low efficiency in recovery, production and utilization; use of outdated technology and equipment; minimal safety standards; wasted resources; and poor economic results. To facilitate the renovation and expansion of its mining industry, the Chinese Government has since 1979 encouraged foreign investment and participation in domestic mining activities as part of the country's open-door policy. A joint venture law was adopted in 1979, and numerous foreign investment provisions were implemented throughout the 1980s. Among centrally planned economies, China has established one of the most comprehensive legal systems guiding foreign investment, though the laws remain untested and fragile.

In mining, opportunities for foreign investment are plentiful, yet overseas investors have been slow to commit serious funds. While China relies mainly on its own resources and technology to expand domestic mining activities, the nation imports advanced foreign technology and equipment to boost output and increase export quantities. China seeks foreign assistance in a range of activities, including geological exploration and drilling, the modernization and construction of metal smelters and refineries, environmental reclamation and management training. In the field of geological exploration, China has signed longterm agreements on scientific cooperation with Germany, the United States, Japan, France and Australia. If the Chinese mining industry expands its level of cooperation with and competition against foreign companies, the industry will become more closely in tune with international markets and thus affected to a greater degree by changing market conditions.

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## 2. Background Information

#### 2.1 National Profile

#### 2.1.1 Economy

As a consequence of the reforms initiated in December 1978, the economy of China became one of the most dynamic in the world (Table 1). During the 1980s, NGP grew at an average rate of 9.2 per cent, average per capita income doubled, the incidence of rural poverty declined by about 13 per cent and investment and savings were maintained at high levels (Asian Development Bank 1991). Economic conditions in China are today significantly better than they were a decade ago. The reforms were aimed at improving efficiency, stimulating productivity, decentralizing authority and promoting enterprise ownership.

By the end of the 1980s, China's economy was faced with serious inflation and general macroeconomic imbalances. An overheated economy, inflation, declining state control and a growing trade deficit led to an adjustment or slowing down of economic reform in 1988 with the introduction of an austerity programme. By the end of 1989, inflation had slowed considerably, but the national economy was nearly at a standstill. The challenge facing government officials was to rejuvenate the economy in 1990 while keeping inflation in check.

In 1990, the Chinese GNP rose by an impressive total of 5 per cent over 1989, with much of the increase occurring in the second half of the year. The economy accelerated in the fourth quarter as a result of a rapid recovery in

<b>P</b> (	Year				
Leconomic measure	1988	1989	1990	1991	1992
Gross national product <sup>a</sup> (per cent change)	10.8	4.0	5.0	5.7	6.0
Agriculture	3.9	3.1	6.9	3.8	4.0
Industry	20.8	8.5	7.6	8.6	9.0
Services					
Gross domestic investment (per cent of GNP)	38.4	37.5	37.9	36.3	36.1
Gross domestic savings	36.3	35.9	39.2	36.6	36.1
Resource gap (per cent of GNP)	-2.1	-1.5	1.2	0.3	0.0
Inflation rate (per cent change in RPI)	18.51	17.8	2.1	9.0	9.0
Merchandise exports (\$ billion)	41.1	43.2	51.0	54.6	58.4
(per cent change)	18.2	5.3	18.0	7.0	7.0
Merchandise imports (\$ billion)	46.4	48.8	43.5	50.9	55.9
(per cent change)	27.4	5,3	-11.0	17.0	10.0
Trade balance (\$ billion)	-5.3	-5.6	7.5	3.7	2.4
Current account balance (\$ billion)	-3.8	-4.3	8.4	4.6	3.4
(per cent change)	-0.9	-1.0	2.2	1.2	0.8
External debt (\$ billion)	42.4	44.9	48.0	55.5	62.0
Debt-service ratio (per cent)	8.6	9.8	9.2	8.6	8.4

 Table 1. Major economic indicators for China, 1988 to 1992

<sup>a</sup> GNP growth is computed based on the SNA concept, while sectoral growth relates to the gross value of output (NMP basis).

Source: Asian Development Bank, 1991, Asian Economic Outlook 1991, Manila, Philippines, 307 p.

industrial output. By year-end 1990, the rate of increase in gross value of industrial output was up to around 15 per cent, rebounding from negative growth in January and February. China's agriculture sector was the greatest impetus for economic prosperity during the year, with a tremendous growth of 6.9 per cent in value, with 6.7 per cent in foodgrain output alone. China's trade surplus reached nearly 9 billion dollars last year; the country's foreign exchange reserves are now at around 30 billion dollars.

In 1990 and 1991, China's leaders formulated the nation's eighth five-year plan (1991-1995) to guide the national economy through the first half of the 1990s. The plan contains three principal features:

- \* a target for average annual economic growth of 6 per cent, less than the average growth in the 1980s but sufficient for China to achieve its goal of quadrupling the 1980 gross national product by the year 2000;
- \* a continuation of its decade-old open-door policies and attempt to introduce market-oriented forces in an overall socialist economic framework; and
- \* a commitment to accelerate support to scientific and industrial development, education, agriculture, energy, transportation, telecommunications, raw materials production and other basic industries to lay the foundation for longer-term economic prosperity in the next century.

The emphasis of the plan is one continued readjustment of China's economic structure, renewed support for promoting existing enterprises rather than initiating new ones and furthering the integration of market regulations into the nation's planned economy. Key projects in energy, communications, raw materials and water conservation will enjoy investment priority.

## 2.1.2 Infrastructure

A fundamental component of China's transport system is its railroads, which account for two-thirds of total traffic. The railway network was designed originally to facilitate the development of heavy industry. Coal and timber account for more than 40 per cent of rail freight, while iron ore, cement and chemical fertilizers also account for significant shares. With the expansion of manufacturing and light industry in China during the 1980s, the nature of transport demand changed noticeably. Finished and semiprocessed goods and foodstuffs now compete for transport space, and passenger traffic has grown rapidly.

With long distances between many of China's mineral supplies and the industries that process or consume them, the growth of these sectors will require an efficient transportation network. The transportation of mineral and energy supplies places a heavy burden on an already overtaxed transport system. While China is well endowed in major metallic, nonmetallic and mineral fuel resources, many are located in remote regions, adding to exploration, development and transportation costs. The lack of railway facilities has periodically halted increases in output at mines, particularly coal mines. Indeed, many mines in China determine their output targets not on the basis of their productive capacity but on the basis of the transport facilities at their disposal.

Efforts to relieve transportation problems have included the use of smaller coal mines away from major mining centres, but these are typically not large enough to operate efficiently and have lower quality deposits. More fundamentally, processing facilities should be sited according to economic rather than bureaucratic and political criteria. For example, as geological exploration efforts expand in China, more mineral deposits are being discovered in western China. To avoid high transportation costs, processing facilities should be located in this region and near energy resources such as hydropower, petroleum or coal, to facilitate energy-intensive smelting and refining activities.

## 2.2 Past and Current State of the Minerals Industry

## 2.2.1 Historical Perspective

Growth in China's minerals output since 1949 was influenced largely by the nation's development stategies and objectives. Between 1952 and 1990, a dramatic rise in minerals production took place for nearly all minerals produced in China. During the first five-year plan (1953-1957), the government emphasized construction of new mine plants and the planning for several more in the future. Minerals output increased dramatically between 1952 and 1957, an indication early in China's modern history that economic planning has a significant bearing on minerals production in the nation.

Minerals output continued to climb during the late 1950s and early 1960s, but the Cultural Revolution slowed industrial and minerals production. It was not until the fourth five-year plan (1971-1975) that China's minerals industry began to recuperate and output rose. Indeed, since the early 1970s, the Chinese minerals economy has steadily advanced, as evidenced by rapid growth in output. Problems in efficiencies of production and utilization, safety and environmental control do persist, however, and remain largely unchecked.

Today, China is one of the world's wealthiest mineral-producing regions, with a resource base highly capable of supporting a large industrial economy. The Chinese mining industry is the fourth largest in the world in terms of output value (Dorian 1987). It is a well-developed and robust industry, producing a wide variety of mineral and energy commodities. By 1990 Chinese mining output reached approximately 1.9 billion tonnes of various commodities, or nearly 40 times that in the early 1950s. Although the range of commodities produced in China is extensive, there is a general lack of metal processing facilities, necessitating large imports of aluminium, copper, magnesium, special steel products, titanium and zinc, among other commodities.

China's recent minerals production statistics are summarized in Table 2. The figures are estimates only, as the Chinese Government does not release official production statistics for a majority of its mineral and energy commodities produced. The years covered in the table include 1981, the beginning of the

#### Table 2. Selected minerals production of China, 1981 to 1990<sup>a</sup>

(thousand tonnes, unless otherwise noted)

Commodity	1981	1988	1989	1990	Per cent change: 1990 over 1981	1990 world rank/per cent of Total
Metals						
Aluminium (metal, refined)	360	610	750	830	+130.6	6/4.1 <sup>b</sup>
Copper (metal, refined)	300	460	470	560	+86.7	5/4.3 <sup>b</sup>
Gold <sup>c</sup>	1,700	3,090	3,220	3,540	+108.2	6/5.2 <sup>b</sup>
Iron and steel:						
Iron ore <sup>d</sup>	70,100	105,000	145,000	168,300	+140.1	4/11.3
Steel, raw	35,600	59,000	61,200	66,038	+85.5	4/7.8
Tin (metal, refined)	16.0	24.0	28.3	33.0 <sup>e</sup>	+106.3	4/12.2 <sup>b</sup>
Tungsten (ores and concentrates)	13.5	21.0	25.0	23.0	+70.4	1/5.2
Nonmetals						
Cement (hydraulic)	82,900	224,000	228,000	232,000	+180.0	1/18.6
Fluorspar (acid and metallurgical grades)	408.0	1,400.0	1,700.0	1,700.0	+316.6	1/32.4
Gypsum	3,440	8,100	8,300	8,300	+141.3	4/8.2
Phosphate rock ( $P_2O_5$ content)	11,980	15,000	17,000	18,000	+50.0	4/10.8
Salt	18,320	21,970	27,950	28,540	+55.8	2/15.0

<sup>a</sup> Estimated.

b 1989 figure.

<sup>c</sup> Thousand troy ounces.

<sup>d</sup> In terms of 32.1 per cent Fe ore, sometimes referred to as "lean ore" in China.

<sup>e</sup> Projected.

Sources: (1) World Bureau of Metal Statistics, May 1991, World Metal Statistics Yearbook 1991, London, 72 p.; (2) Mining Journal, 1991, Mining Annual Review 1991, June, London, p. 83-87; (3) U.S. Bureau of Mines, 1991, Mineral Commodity Summaries 1991, Washington, D.C., 196 p.; and (4) author's files.

sixth five-year plan period (1981-1985), and 1988, 1989 and 1990. China's relative position of 1990 world minerals output is presented in the final column of the table.

China continues to emphasize the development and expansion of its mining industry to facilitate economic growth. As a result, output of most mineral commodities escalated during the past decade. As for major metals, output of aluminium, copper, gold, iron and steel, tin and tungsten rose substantially in the 1980s by at least a factor of one-third. China's largest metal-producing sectors are iron and steel, aluminium and gold. Chinese crude steel output ranks fourth worldwide, behind the Commonwealth of Independent States, Japan and the United States. As with aluminium, the current economic plan of China stresses the expansion and renovation of the domestic iron and steel industry.

Production of gold, iron ore, raw steel, tin and tungsten in China accounts for a substantial share of world output, or 5.2, 11.3, 7.8, 12.2 and 5.2 per cent, respectively, in 1990. Though China's crude steel output is large by world standards, per capita production (and consumption) of crude steel amounts to

45 to 50 kg, less than a third of the global average and only about 10 per cent of the level in developed nations (Odagawa 1988). The situation is similar for other metals like copper and aluminium, as well as for petrochemical products and many key industrial items.

China's tungsten output continues to dominate the world market, reaching an estimated 23,000 tonnes in 1990. However, its exports are primarily concentrates, not value-added products. The largest tungsten-producing province in China is Jiangxi, where the oldest operating mine, at Xihuashan, has an annual output of 2,500 tonnes of 65 per cent tungsten concentrate (U.S. Bureau of Mines, *Minerals Yearbook* 1988). Ten large tungsten mines were in operation in southern Jiangxi, which is considered the tungsten capital of China (U.S. Bureau of Mines, *Minerals Yearbook* 1989).

Gold production in China increased steadily up to 1990, when the estimated output was 3,540,000 troy ounces. Chinese sources place the growth rate at around 11 per cent per annum over the last decade, which is forecast to drop to an annual rate of 9 per cent during the eighth five-year plan (1991-1995). Output of the precious metal has increased steadily since 1978, when the decision to lift restrictions on collective and individual mining was implemented. At that time China changed its policy of allowing only state-owned enterprises to mine gold and instead adopted preferential policies to encourage individuals and production units to mine more gold.

China has about 300,000 licensed private gold miners today, but more people are mining the metal without permission. As a result of extensive smuggling of gold (estimated at 90 per cent of individually mined gold), wastage of ore and unsafe mining practices by individual miners in recent years, in November 1988 China banned individuals from mining gold, reversing the 1978 decision. The official price of gold was also raised at this time to the equivalent of 400 U.S. dollars per ounce. At present, there are 49 gold mines in China, with annual output of more than 500 kg (16,000 oz) each, and production from these enterprises represents nearly 50 per cent of the country's total output. China's principal gold production centres are in Shandong, Henan, Heilongjiang, Shaanxi, Gansu, Sichuan and Hebei provinces.

Like the metals, China's production of nonmetals in recent years has grown rapidly, particularly that of cement, gypsum and phosphate rock. Output of each of these commodities more than doubled since 1981. With China's ambitious industrialization programme receiving government priority throughout much of the 1980s, a dramatic boost in cement production was considered necessary. China's seventh five-year plan (1986-1990) called for an increase in output value of the building industry of more than 40 per cent, along with the construction of several large and medium-sized cement plants during the period. Remarkably, owing to substantial growth in rural and urban construction in China, cement production rose from 83 million tonnes in 1981, the first year of the sixth five-year plan, to 232 million tonnes in 1990, the last year of the seventh five-year plan. China's 1990 cement production accounted for 18.6 per cent of global output, ranking number one among cement-producing nations. The country's cement exports in 1990 reached 6.1 million tonnes, a record. Exports for 1991 were projected to be between 7.2 and 9 million tonnes (*Mining Engineering* October 1991).

## 2.2.2 Structure of the Industry

Production of metals, nonmetals and mineral fuels in China is controlled largely by government policies and objectives. Indeed, the Chinese Government has a major supervisory role over the many mineral-related industries and corporations in the nation.

The State Council of China is the executive body of the highest organ of state power, in addition to being the highest organ of state administration. It is responsible to the National People's Congress or the congress' permanent organ, the Standing Committee, when the congress is not in session. Major functions and powers exercised by the State Council include exercising leadership and guidance over ministries, commissions and local state bodies; drafting and implementing national economic plans and the state budget; and directing and governing all state administrative affairs.

As part of an overall reorganization of the Chinese Government in 1988, the State Council was formally restructured. The plan for restructuring was adopted during the spring first session of the Seventh National People's Congress and involved a cut in the number of State Council ministries and commissions from 45 to 41. Although the number of ministries was reduced by only four, the reform involved was much more complex. According to the plan, 12 ministries and commissions were abolished, while 9 new ones were established. The reform involved not just abolition, reduction and amalgamation of the ministries and commissions, but a general change in the functions of many government organs. China's government reorganization is aimed at establishing a more flexible, efficient and smoothly operating system of administration and management, and increasing the separation of government and enterprises.

With restructuring, 41 ministries and commissions now exist under the direction of the State Council, including the Ministries of Metallurgical Industry, Materials and Equipment, Geology, and Mineral Resources. Each ministry and commission has one minister and two to four vice-ministers. These ministers<sup>1</sup> have the overall responsibility for their organizations.

Below the State Council are two vitally important organizations – the State Planning Commission and the State Economic Commission. The State Planning Commission exerts greater power and influence than the State Economic Commission, since it is responsible for development of new projects, budgeting capital investments and project financing and approval. In general, any large project involving more than 10 million dollars investment must be approved and

<sup>&</sup>lt;sup>1</sup> The head of China's Ministry of Metallurgical Industry is Qi Yuanjing; Ministry of Materials and Equipment, Liu Suinian; and Ministry of Geology and Mineral Resources, Zhu Xun.

financed by the State Planning Commission (Dorian, forthcoming 1992). Smaller projects can be approved and financed by the State Economic Commission (which oversees production and expansion of existing state-controlled enterprises). Overall, the State Economic Commission is responsible for implementing annual economic plans, whereas the State Planning Commission revises such plans and coordinates the development of China's five-year plans.

The mining industry of China is extraordinarily large and complex, as exploration, development, processing, refining, distribution and trade of metals, nonmetals and mineral fuels involves a multitude of industries and organizations (see Dorian, forthcoming 1992). Mines in China are classified as either state-run State-run mines are supervised by the various ministries, and or non-state-run. non-state-run mines include private (individual or family), collective and provincial, district or county mines. Nearly 130,000 state and non-state mines exist in China, with more than 6,000 state-owned mines above the county level. The remaining mines are small ventures operated by collective groups and individuals, employing an estimated five million surplus rural labourers. Approximately one-sixth of the output value of China's mineral production comes from collective and individual mines. In 1985, for example, collective and individual (nonstate) mines produced 15 per cent of the country's iron ore, 20 per cent of the gold, 25 per cent of the coal, 30 per cent of the nonferrous metals, half of the manganese and sulphur-iron ores, 70 per cent of the building materials and a considerable amount of the nonmetallic mineral products (Summary of World Broadcasts 10 September 1986).

The Chinese mining industry has undergone a number of organizational changes in recent years as part of a continuing effort to streamline operations and increase efficiency. Since the early 1980s, the trend has been to replace larger conglomerate organizations with smaller speciality ones, particularly in the production and trading of mineral and energy commodities. This has caused much confusion both within China and among the international community about the extent of responsibilities of the various organizations. At the same time, overlapping responsibilities among many key bureaucracies have caused friction and enhanced competition.

In total, there are 15 ministerial-level (bu ji) administrative organizations today that are, to varying degrees, directly involved with China's mining industry (Dorian, forthcoming 1992). These organizations serve to plan, guide and implement all mineral-related activities in the nation. In terms of authoritative powers, state bureaus or national corporations ( $fu \ bu \ ji$ ), bureaus ( $ju \ ji$ ), divisions ( $si \ ji$ ) and sections and departments ( $chu \ ji$ ) lie below the ministerial-level organs.

Several organizations within China's mining structure are concerned with primary industries; that is, mineral or energy raw materials serve as input into the industries for eventual processing into finished products. These industries include the Ministries of Metallurgy, Energy, Chemicals and Materials, as well as the China National Nonferrous Metals Industry Corporation (CNNC), the China Petrochemical Corporation (SINOPEC) and the China National Chemical Import and Export Corporation (SINOCHEM). Because of their importance to China's nonfuel minerals industry, three of the aforementioned ministries and corporations are described below. Combined, these three organizations directly employ about 5 million workers in China. Since there are several other organizations in the Chinese Government hierarchy that are directly or indirectly involved in minerals-related work, the actual number of workers involved in some capacity with the minerals industry of China greatly exceeds 5 million.

## 1. Ministry of Metallurgical Industry

The Ministry of Metallurgical Industry is one of two primary organizations in China involved in the production of metals, the other being the newly formed CNNC. As of 1983, China's Ministry of Metallurgical Industry delegated its responsibilities relating to nonferrous minerals development to CNNC. Thus, despite its name, the Ministry of Metallurgical Industry is responsible only for iron and steel (and the ingredients for making steel), as well as gold. The separation of China's ferrous and nonferrous sectors was aimed at improving efficiency and quality control in the nation's iron and steel enterprises, which are considered critical to the overall modernization programme.

The Ministry of Metallurgical Industry primarily conducts exploration for and mines iron ore, and supervises the nation's iron and steel mills. As the Chinese Government relies on foreign funds to help boost steel production capacity, the Ministry of Metallurgical Industry set up the China International Iron and Steel Investment Corporation (CIISIC) in 1987 and empowered it to negotiate with foreign bankers, machine-builders and iron and steel producers. According to the ministry, the Chinese steel industry since 1978 has used 4.8 billion U.S. dollars in foreign exchange for the introduction of advanced technology and facilities, in some 560 cases (Odagawa 1988).

At present, the ministry's main responsibility is to oversee China's steel industry, which consists of 14 large iron and steel complexes, about 1,800 plants (of which 1,246 are actual iron and steel mills) and 3.2 million employees (of which 2.58 million are employees of these steel mills). For decades the leaders of the Chinese Government have considered the nation's steel industry to be the key link to industrial development. The Chinese steel industry has recorded very steady growth in both quantity and quality since the late 1970s, when reform of the economy and open-door policies were begun. In recent years, the ministry's main projects have involved the renovation and expansion of existing major plants in Anshan, Wuhan, Baotou, Beijing, Benxi and Maanshan. A major undertaking during the 1980s was the construction of the Baoshan integrated steel complex north of Shanghai. Baoshan is China's most advanced iron and steel complex, with a designed capacity of six million tonnes of steel per year. Analysts suggest that China's steel industry advanced about 20 years through construction of the technologically advanced Baoshan complex. Currently, the Baoshan Steel and Iron Complex must import iron ore from Australia, Brazil and India because at about 35 per cent iron content, Chinese ore is not concentrated enough for this plant. The successful operation of Baoshan has accelerated the development of China's metallurgical industry.

Besides exploration, mining and processing activities, the Ministry of Metallurgical Industry is engaged in trade through its arm CMIEC, or the China Metallurgical Import-Export Corporation. CMIEC was formed in 1980 and at that time was the first company to compete with the only other metals trading group, MINMETALS of the Ministry of Foreign Economic Relations and Trade. As the trading arm of the Ministry of Metallurgical Industry, CMIEC participates in the exportation and importation of iron ore, pig iron, steel and ferrous alloys, and refractory products, plus the rare earths products produced at Bayan Obo and other Ministry of Metallurgical Industry facilities. The trade of many of these commodities was once handled almost exclusively by MINMETALS.

In addition to overseeing China's steel industry and associated ferrous mines, the ministry supervises gold mining activities in China. Although statesponsored exploration for gold is carried out by the Ministry of Geology and Mineral Resources, primary gold mining activities are controlled by the central Gold Bureau under the Ministry of Metallurgical Industry. The Gold Bureau, an administrative entity within the ministry, formed a sister company to handle business affairs, the China National Gold Corporation. The main task of this corporation, which is also under the jurisdiction of the Ministry of Metallurgical Industry, is to work with foreign companies. Major gold mines at the provincial level periodically report to the Gold Bureau/China National Gold Corporation.

Some of the administrative duties and responsibilities related to gold development in China are shared by the recently established State Gold Administration of China. Formed in 1989, this administrative body reports to the Ministry of Metallurgical Industry and is responsible for the central administration of the nation's gold industry. The State Gold Administration will help the Ministry of Metallurgical Industry facilitate expanded output of gold in China, which will be used to help the country in the repayment of its foreign debt. China's foreign debt is expected to peak in the early 1990s, at which time gold production is scheduled to be nearly twice the level of 1986 (*Mining Journal* 28 July 1989).

## 2. China National Nonferrous Metals Industry Corporation (CNNC)

In April 1983, the China National Nonferrous Metals Industry Corporation (CNNC) was established under the State Council to oversee China's nonferrous metals industry. The formation of CNNC was deemed necessary as a result of the shortage of nonferrous metals (particularly copper and aluminium) in China and their increasing importance to the nation's industrialization plus a growing nonferrous metals import bill. Since 1983, China's total annual output of ten major nonferrous metals – copper, aluminium, lead, zinc, nickel, tin, antimony, mercury, magnesium and titanium – has ranked among the top six countries in the world. There has been significant growth in the variety of nonferrous metals produced, as well as in rare earth metals, precious metals and semiconductor materials.

CNNC operates 15 regional companies, which control production units directly or in conjunction with provincial authorities. The corporation has ap-

proximately 1.2 million employees, of which about 100,000 are professionals. CNNC supervises the activities of more than 900 nonferrous metals enterprises and institutions throughout China. Almost all provinces and autonomous regions in the country have constructed their own local nonferrous metals industries (Huang Jichun 1987).

Responsibilities of CNNC are multifold and include geological studies and surveys, mineral assessments, mining development, smelting and refining, manufacturing, research and education, and metals trading. Regarding the latter, in early 1984 the China National Nonferrous Metals Import and Export Corporation (CNIEC) was formed to serve as the trading arm of CNNC. CNIEC's principal responsibilities include the exportation of mineral ores, finished products, semimetal equipment and technology, as well as the importation of ores, metals and finished products, machinery and complete plants, instruments, spare parts and The range of minerals traded through CNIEC includes the nonfertechnology. rous metals and rare earths. In recent years CNIEC and MINMETALS have competed strongly against one another, although CNIEC has steadily grown in importance, now controlling many of China's large nonferrous mines and process-There remains stiff competition between CNIEC and MINMETALS ing facilities. at the provincial and local levels, where few regulations dictate which corporations handle specific metals and metal products.

Although the Ministry of Geology and Mineral Resources is China's principal organization involved in exploration activities, CNNC also conducts exploration for the same minerals at times, although the general focus is different. The ministry often explores in new or remote regions, whereas CNNC generally undertakes exploration in previously explored regions where known deposits exist.

## 3. Ministry of Geology and Mineral Resources

Like the other mineral-related ministries in China, the Ministry of Geology and Mineral Resources reports directly to the State Council. It is China's principal exploration-oriented state organization, searching for all mineral and energy resources throughout the country. The ministry employs approximately 420,000 workers, of which nearly one-fourth are geoscientists. In terms of organizational breakdown, the ministry is composed of several bureaus and departments, as well as research institutions and universities. The major Wuhan College of Geology (formerly the Beijing College of Geology) is under the supervision of the Ministry of Geology and Mineral Resources. It has more than 6,000 students alone and consists of 7 major geoscience and engineering departments.

Until 1984, the Ministry of Geology and Mineral Resources had no production facilities or operating mines; these functions were relegated to China's production-oriented organizations, including CNNC and the Ministry of Metallurgical Industry. However, with a relaxation of government regulations and a general decentralization mindset, in 1984 the ministry was given the right to own and operate some of its own mines and production facilities (U.S.-China Business Council 1988). Since then the ministry has operated a few production facilities, particularly those involving nonmetallic mineral resources. With these operations the ministry is able to reap some of the revenues resulting from its own exploration work – an added financial incentive to improve exploration strategies and techniques. Efforts are continuing within the ministry to broaden its involvement in development activities, as a special department is now being formed that will be responsible for seeking joint-venture mining projects in China. This department will be essentially self-ruling and act much like a mining corporation. The changing forms of economic cooperation and exchanges the Ministry of Geology and Mineral Resources has pursued with foreign partners over the past four decades have been closely linked to the changing policies of the government. Since 1949, the ministry has engaged in scientific exchange with 79 countries, signed 38 agreements with 20 countries, joined 28 academic institutions and maintained contact with 12 organizations under the auspices of the United Nations (*China Daily* 27 November 1989).

The fundamental responsibility of the Ministry of Geology and Mineral Resources is to survey and explore China's surface terrain, both onshore as well as offshore, for natural resource occurrences. Other ministerial functions include basic geological, geochemical and geophysical research, and short-term to long-term mineral resource planning. Exploration is commonly broken down into four stages – mineral resource estimation, prospecting (of geology, geophysics and geochemistry), geological exploration (drilling) and identification and characterization of mineral and energy reserves. Surveying is intended to facilitate the development of detailed geological, geophysical and geochemical maps needed to assist geologists in the discovery of ore deposits. Map coverage of China at 1:200,000 scale is a long-term objective of the ministry.

The Ministry of Geology and Mineral Resources unveiled in November 1989 a 12-year surveying programme aimed to extract enough resources to support the country's economic growth. For energy-related mineral resources, according to the plan, the priority will be on prospecting for oil and natural gas while continuing to search for additional coal and large high-grade uranium reserves. Proven oil reserves in the coming 12 years are hoped to equal the quantity discovered in the past 40. The target for natural gas is 5.8 times as much as in the last 4 decades.

## 2.2.3 Government Policy Relating to Minerals

As a provider of raw materials and foreign exchange earnings, China's minerals industry is crucial to the country's economic development. The industry has been undergoing enormous changes since the economic reform programmes began in 1978. The pre-1978 period was characterized by a policy of self-reliance for minerals and limited external trade, while post-1978 China looked to the minerals (and energy) industry as a driving force for the country's entry into the international economy. It actively sought foreign capital and entered into joint ventures to modernize and expand minerals production and exports.

Despite successes in many areas, Chinese leaders have found the expansion of minerals production and exports to be an especially difficult challenge. In the past decade, three important changes in the country's minerals outlook have affected Chinese policy (Clark et al. 1989). First, the Chinese have realized that despite China's rich resource endowments, growing domestic demand will absorb an increasing share of production and is causing China to become a major importer of some mineral products. Second, depressed demand and prices for many resources in world markets have made mineral exports less attractive as earners of foreign exchange. Third, China's ability to expand supplies encountered serious difficulties. Indeed, supply has lagged, forcing China to fill the gap through imports. By 1989, China had become a major importer of iron and steel, manufactured fertilizer and nonferrous metals. Despite an extensive minerals base, constraints on hard currency have increasingly meant that the Chinese Government must delay capital investments in mine and plant construction and expansion.

The development scenario for China's metals industry during the eighth five-year plan indicates that the output of ten common nonferrous commodities will increase by 5 per cent annually to reach 3 million tonnes by 1995 (*Beijing Review* 4-10 March 1991). Renovation of existing nonferrous metal enterprises will be accelerated, and a group of new nonferrous metal production bases will be constructed in order to continue to increase nonferrous metals production during the ninth five-year plan period (1996-2000). By the end of the decade, China's key nonferrous metal enterprises are scheduled to be upgraded to the world standards of the late 1970s and early 1980s. China will rely primarily on its own resources and technology to reach these goals, though at the same time it will continue to import advanced foreign technology and equipment.

As for China's nonmetallic industries, rapid development is foreseen during the next five years, while nonmetallic mineral products are expected to become more competitive on international markets. China is today openly inviting foreign enterprises to invest funds, provide advanced technology and exploit nonmetallic mineral resources with Chinese and foreign investment or exclusively foreign funds. China's nonmetallic mineral enterprises will be developed at state, local and township levels. The State Bureau of Building Materials Industry and the ministries for the metallurgical, chemical and light industries, geology and mineral resources, and foreign economic relations and trade, will all be involved in research and development. The primary challenge China must overcome is how to expand its nonmetallic mineral industries with limited capital funds and outdated technology.

## 2.2.4 Decentralization and Enterprise Control

China's state-controlled ministries and corporations have operating enterprises at all levels, or specifically central ministerial, provincial and local ranks. As for the country's mineral and energy industries, the distinction between central and provincial/local level enterprises became more pronounced with decentralization – a fundamental policy of the 1980s promoted as part of economic reform until the introduction of an austerity programme. As local level enterprises grew in size, responsibility and wealth, they became increasingly influential in production and trade activities that previously would have been decided and planned only at the ministry level in Beijing. The distinction between central and provincial/local level enterprises became vitally important to foreign companies hoping to invest in Chinese mineral projects. Because local level enterprises usually have different motives, objectives and skills than do their parent enterprises, problems arose as a result of decentralization, including mismanagement. Enhanced competition among provincial companies led to selling confrontations where individual provinces attempted to outsell other provinces by offering goods to the market at a lower price.

One of the outcomes of a more powerful provincial/local level enterprise system in China was the elimination of complete and total authority by central ministerial-level enterprises and corporations over their subsidiaries. In addition, with economic reform, non-state private and collective mining enterprises flourished in China and gained in their relative share of national output. Nonstate enterprises now have the flexibility of being semi-independent from the state in decision making. However, with the present fiscal austerity programme, non-state enterprises are suffering the greatest losses, as the state attempts to regain control and, in doing so, halt ten years of uninterrupted growth of private and collective enterprises.

The distinction between central ministerial-level enterprises and their provincial/local subsidiaries extends beyond production and trade practices and affects foreign investment in China's mining projects, as well as efforts to raise capital. Decentralization provided provincial/local mining enterprises with more ability to solicit funds abroad for development projects, whereas in the past, decisions to raise foreign capital were made primarily at the central government level. As economic reform proceeded through the 1980s, the Chinese Government reduced its allocation of funds to state-controlled enterprises and encouraged them to solicit loans from domestic banking institutions. However, with the current fiscal clampdown, the government has frozen most new bank loans. The reduced number of bank loans still available is essentially for state-run enterprises, not for private or collective operations.

As for foreign investment into China's mining projects, overseas companies participating in Chinese business ventures can presently deal with enterprises at the central ministerial, provincial or local levels. This division is particularly important for equity participation, in light of recent decisions by the Chinese Government regarding the autonomy of ministry-level enterprises. Owing to the severe shortage of hard currency in China, these enterprises have been discouraged from engaging in joint venture activities where a substantial amount of equity participation is involved. In the mining industry, for example, aside from projects involving iron and steel, only the Great Wall Aluminum Complex joint venture project is expected to move ahead with significant ministry equity participation. This situation will remain unchanged in the near future as constraints on hard currency will likely grow because China is entering a high debt repayment period. While central ministerial-level enterprises have been discouraged from participating in equity joint ventures, provincial and local enterprises have not been so discouraged as of yet. Consequently, foreign companies interested in joint ventures in China can negotiate with these enterprises. It is advisable, however, that foreign companies first notify state enterprise officials in Beijing, then proceed with negotiations with relevant provincial or local enterprise officials.

From the perspective of a foreign investor, investment into provincial and/or local mining activities has several distinct advantages, including (Dorian, forthcoming 1992) the fact that central government interference can be minimized by working at the provincial and/or country level; provincial and country governments often control the physical infrastructure for mines (including those of the state enterprises); the provincial and/or local governments have tended to put forward smaller and better quality ventures than the ministry-level enterprises, which traditionally propose marginal, highly capital-intensive ventures for the international investor; many provincial and/or country mining ventures do not have to satisfy an output quota; and provincial and/or local entities are generally less concerned with using state-of-the-art technology than with appropriate technology and more labour use, resulting in lower overall costs. In general, the timeframe for implementing a project, the constraints on imports and exports of required equipment or products, and the level of bureaucratic interference can all be reduced when entering into ventures with provincial and/or country entities. This is particularly true in many autonomous regions, special economic zones, open coastal cities and special planning provinces such as Guangdong and Hainan, which have special privileges in dealing with foreign investors.

There are, of course, some shortcomings and pitfalls in entering into joint venture or other business activities with provincial or local enterprises that must be recognized and weighed against the advantages. These include the usual lower level of technical and/or managerial experience in initiating, developing and carrying out a joint venture among the provincial and/or country entities (Dorian, forthcoming 1992). Therefore, a certain amount of additional care must be taken in implementing a project to ensure that misunderstandings do not arise. On balance, however, a small- to medium-sized foreign investor in the mining industry of China must at least consider investment in provincial and/or country projects. Such investors must, however, pay attention to changing rules and regulations regarding authority and centralized control as they unfold in the 1990s.

## 2.2.5 Summary of Current and Projected State of Affairs

Though the 1980s was a decade of substantial growth in mining and exciting opportunities for foreign investment and participation, the three-year economic austerity programme and other events have dimmed investors' interest in China for the short term. This was made particularly evident in the third round of international bidding for offshore oil exploration rights, which saw very Despite nearly 20,000 foreign-funded business ventures having been set up in China since 1979, relatively few of these have been within the minerals industry. Remarkably, between 1988 and 1989, less than 100,000 U.S. dollars worth of foreign capital was directed through loans or DFI to China's Ministry of Metallurgical Industry, while in comparison 1.04 billion dollars was invested into the Ministry of Energy (State Statistical Bureau 1990). Clearly, new policies and strategies are vitally needed to encourage foreign participation in China's minerals sector, in conjunction with an improved political and economic climate.

Many mining companies that had at one time considered investing in China reconsidered for reasons of frustration, limited profit potential, political risk and uncertainty. However, few are disinterested because of a lack of opportunities or potential. While there are many difficulties in conducting business in China, the country does provide tremendous avenues for firms interested in pursuing a long-term market position. The enormous size and growth potential of China as a producer and consumer of minerals and mineral products simply cannot be ignored by company strategists. Clearly, there is future for business in China perhaps somewhere between 10 and 20 years away — as it is the world's largest undeveloped market.

China's long-term mining industry will be shaped, in part, by reform measures being adopted today, including revisions to China's joint venture law and selected foreign investment provisions. The current economic reform, the increasing role of the marketplace and changes in managerial philosophy have created more favourable conditions for the industry to promote international China's manufacturers of mining and geological exchanges and cooperation. equipment are, for example, striving to develop new products to raise levels of efficiency by establishing cooperative relations with foreign enterprises for the joint design and production of key equipment and for the import of investment capital and technology. As a result, the quality of machinery and equipment is being raised. In the field of geological exploration, the Chinese Government has signed long-term agreements on scientific and technical cooperation with Germany, the United States, Japan, France and Australia. These agreements may play a critical role in the introduction of new geological exploration concepts to China.

Over the next decade, China's mining industry will be characterized by an increase in the value of imported nonfuel mineral commodities and a gradual shift away from being a predominantly raw material-exporting nation. China's state enterprises will likely adopt managerial and accounting practices more typical of Western corporations. Opportunities for direct investments in major mining projects in China will increase during the latter 1990s, as China's need for foreign involvement grows and the country gains experience in working with multinational corporations. China's present investments in mineral projects abroad (for example, the Portland Aluminum Smelter and Channar Iron Ore Mine in Australia) are providing a means for Chinese mineral specialists to learn about the various financial and managerial techniques used in the West. Such invest-

ments in mining projects outside of China will occur at a modest pace over the next decade in Australia, Japan, the United States and Canada. In September 1991, China's Anshan Iron and Steel Corporation, one of the country's biggest steel companies, announced plans to invest 700 million dollars to revive a historic iron ore mine in Malaysia and set up a steel mill there (*Mining Journal* 27 September 1991). A Malayan state government is expected to take up 51 per cent equity in the joint venture and China Anshan the balance. Nearly half of the mine's iron ore output will be exported to China.

Though the potential benefits from investing in China's mining industry are uncertain, companies are advised to first establish a presence in China and not expend huge amounts of capital early on. It is best to establish a limited position in China by initiating a small project while developing China expertise and pursuing larger projects. It is unrealistic to believe that a rapid or quick profit can be made in China today. Generally, a foreign company must invest sufficient time, money and patience to develop or penetrate a market.

## 3. Geological Potential

## 3.1.1 General Mineral Abundance

With its complex geology and huge land area, China is well-endowed in most major metallic, nonmetallic and mineral fuel resources. Despite the vast minerals and energy base, with a population of one billion and one hundred twenty million people in China, the minerals and energy position per capita is less than that of most other resource-rich countries. In addition, although the nation's endowment of most nonfuel minerals is large, many of the deposits are of poor quality<sup>2</sup> or in remote locations, making them very costly and sometimes difficult to exploit. According to China's Ministry of Geology and Mineral Resources, "big mines of high quality and grade like iron (ore) mines in Australia, Canada, the Soviet Union, and Brazil and copper mines in Chile, Zambia, and Zaire have not been found thus far in China'' (Bureau of Mineral Resource Development Supervision 1991).

It was not until the end of 1985 that the Chinese Government undertook the first detailed and comprehensive nationwide survey of mineral and energy resources and mines in the country. According to that survey and others since, geologists in China have discovered more than 160 types of mineral and energy resources and have verified reserves of most types. These include 5 types of ferrous minerals, 20 types of nonferrous and precious minerals, 76 types of

<sup>&</sup>lt;sup>2</sup> It is often reported in geologic literature that mineral deposits in China are, on average, of lower grade or quality than similar deposit types worldwide. However, this generalization is disputed by some geologists. Based on statistical averages and the knowledge that China's land area is extremely large, mineral deposits in China are most likely of the same average grade as those found elsewhere in the world. It is perhaps the manner in which Chinese geologists define their reserves that makes it appear as if average grades of deposits in China are lower in quality than similar deposits worldwide. In general, the marginal cutoff grade of deposits in China include<sup>\circ</sup> all technologically and economically recoverable ore, whereas in many Western countries, for example, the marginal cutoff grade is that portion of the ore body that is economically extractable.

nonmetallic and geothermal and groundwater minerals, and 6 types of mineral fuels (Gao Wanli and Zheng Rencheng 1990). Mineral ores in China are distributed in more than 200,000 locations (Wang Xionglin 1988), although the distribution is fairly uneven throughout the country due to the complicated and varied geological conditions. There are also different degrees of intensity of geological investigation in China.

Reserves<sup>3</sup> of many types of mineral and energy resources in China are the largest in the world, and several minerals, including rare earths and tungsten, occur in an abundance that not only satisfies domestic demand but also allows for significant exports. China leads the world in the reserves of industrially valuable rare earth metals. Rare earths are generally found in association with iron ore and other deposits in China. Among the rare earth elements, the main ones are light rare earth metals, which are found also in phosphorous-bearing structures. China's known rare earth elements are cerium, lanthanum, praseodymium, neodymium, samarium, europium and gadolinium.

The Bayan Obo Iron Mine in China's Inner Mongolia has been identified as the world's largest rare earth mine. Its proven reserves of rare earths are several times the total outside of China. The mine accounts for 95 per cent of China's proven reserves. The mine produces a full range of rare earth elements of a high quality, with the rare earth oxides contained in the ore averaging 5 per cent. China's refined rare earth metals have entered the world export market.

Reserves of tungsten ore in China are reportedly larger than those of all other countries combined. The main types of tungsten ore in China are wolframite and scheelite, and the deposits are of the hydrothermal and skarn types. China leads the world in tungsten reserves, production and export. The reserves are about 80 per cent and the production and export are about half of the world's total.

China's tungsten deposits extend mainly from Guangxi in the west through Hunan, Guangdong and Jiangxi to the southern part of Fujian. This region accounts for roughly 80 per cent of China's total reserves. The deposits are most concentrated in southern Jiangxi. In the past, relatively few tungsten deposits were discovered in the vast area north of the Changjiang River. In recent years, promising tungsten deposits have been found in the northwest, north, northeast and southwest.

<sup>&</sup>lt;sup>3</sup> Mineral reserves in China are classified according to the "Tentative Criteria for Mineral Reserves Classification (TCCR)" issued by the National Mineral Reserves Committee in 1959. According to the classification scheme, mineral reserves in China are categorized as industrial and nonindustrial or prospective. Industrial reserves are technologically recoverable or mineable, with little consideration of economics. In contrast, nonindustrial reserves are nontechnologically recoverable for industry.

The TCCR classification scheme divides reserves into four types and six grades: Type 1, reserves subject to mining, generally A1 grade; Type 2, reserves subject to designing, generally A2, B and C1 grades; Type 3, prospective reserves are of C2 and D grades; and Type 4, geological reserves are of D grade. Industrial reserves are of grades A, B, C1 and C2, whereas nonindustrial or prospective reserves are of grade D. According to the TCCR, reserve amounts of grades A1, B and C1 are subject to as much as +/-20 per cent, +/-30 per cent and +/-45 per cent, respectively.

China's tungsten mines in southern Jiangxi were discovered in 1908 and first exploited in 1914. Years of prospecting have confirmed the existence of hundreds of tungsten mines with proven reserves. They are distributed mainly in Dayu, Chongyi, Shangyou, Chuannan, Dingnan, Nankang, Ganxian, Yudu, Anyuan and Xingguo counties. Wolframite and scheelite are the principal tungsten-bearing ores in southern Jiangxi.

Some of the few minerals of which China's reserves can be considered relatively small include chromite, platinum group metals, titanium (rutile) and zirconium. China's few chromite deposits are located in the northwestern provinces of Gansu and Qinghai.

#### 3.1.2 Geographical Distribution of Mineral Supplies

The regional distribution of China's mineral and energy supplies is uneven and does not necessarily correlate with the localities of existing consuming centres. This imbalance places a severe strain on China's transportation network and influences the distribution of heavy industry.

The majority of nonfuel mineral deposits in China are concentrated in the east, although this is in part a function of exploration biases prevalent in the past. Nonferrous metal reserves are, in general, located near energy sources such as hydropower, petroleum or coal, making energy-intensive smelting activities convenient. As an example, two of China's largest metal deposits – Lanping (lead/zinc) and Pingguo (bauxite/alumina) – are located in Yunnan and Guangxi provinces, respectively, where rainfall and numerous rivers provide for abundant hydroelectric resources. However, as with many mineral deposits in China, their localities are in remote regions with difficult mining conditions and poor transportation, leading to rather slow exploitation.

According to a World Bank study (1985), the potential advantages of abundant energy close to mineral deposits have not been realized in China (with a few exceptions). The majority of processing facilities (smelters/refineries) in the nation are located in coastal provinces some distance from mineral reserves and energy sources. Nearly one-third of China's refined copper output, for instance, emanates from processing facilities in Shanghai and Liaoning, yet major copper deposits and mines are found in at least eight provinces/regions throughout the country.

As with metals, China's nonmetallic mineral resources are scattered mainly in eastern coastal areas and along the middle and lower reaches of the Changjiang River. Since 1986, many nonmetallic markets and service centres have been set up in Beijing, Tianjin, Shanghai, Wuhan and Guangzhou (*Beijing Review* 6-12 June 1988). The availability of skilled workers and convenient transport, combined with solid economic conditions in eastern coastal areas, has enabled the nonmetallic mining industry to become one of China's fastest growing sectors.

## 3.1.3 Summary

Thousands of geological exploration teams in China are distributed throughout the country, engaged in drilling activities, geochemistry, geophysics, rock mechanics, remote sensing, marine geology, mathematical geology and instrument and equipment manufacture. Although China has conducted numerous preliminary geological surveys, efforts have been concentrated in the east, while hardly begun in many regions of the west. Prospecting techniques are still outdated. As such, much of China's geologic potential can still be tapped as advancements are made in geological research and exploration and as new concepts for discovery are introduced from abroad.

## 4. Marketing Potential

## 4.1.1 Declining Resource Self-Sufficiency

During the past decade, China's reliance on imported supplies of minerals rose dramatically to satisfy pent-up demand and to meet the needs of an overheated economy. Imports include large amounts of phosphate fertilizers, which account for 19 per cent of the world's total phosphate fertilizer imports, making China the world's largest importer of chemical fertilizers (*Beijing Review* 6-12 June 1988). Moreover, iron ore, chromite, sylvite, aluminium and copper are also imported in large quantities. China's long-term policy on the utilization of mineral resources is to rely principally on domestic sources where possible but to import reasonable quantities of selected commodities from abroad.

Since the early 1980s, China's consumption of metals and nonmetallic mineral resources grew dramatically with the need for more raw materials in industry and the military. Rates of growth of metals consumption in China between 1981 and 1989 were between two and six times those of the world for cadmium, copper, magnesium, steel, tin and zinc. Consumption of steel, the nation's most costly imported product, rose at an average annual rate of 8.6 per cent during the 1980s. Consumption of crude steel is now more than 70 million tonnes a year, an amount comparable to Japan's. Steel accounted for greater than 90 per cent of total metals consumption by weight in 1990. Aluminium is the major nonferrous metal consumed.

Supply has lagged, forcing China to fill the gap through imports. By 1989, China had become a major importer of iron and steel, manufactured fertilizer and nonferrous metals. Despite an extensive minerals base, constraints on hard currency have increasingly meant that the Chinese Government must delay capital investments in mine and plant construction and expansion.

Even at a slower than projected GDP growth rate during the 1990s, it is expected that China's consumption of steel will rise by nearly 5 per cent annually, reaching as much as 148 million tonnes in 2000; output is projected to be around 90 million tonnes. The shortfall of more than 55 million tonnes could be met through imports but at a cost of at least 10 billion dollars.

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China's domestic supply of other valuable metal commodities, such as copper, nickel and aluminium, will continue to fall short of demand in the 1990s. Annual copper output is currently at around 560,000 tonnes, while demand is running at between 800,000 tonnes and 1 million tonnes and rising. Nickel production in 1989 reached 26,300 tonnes, significantly less than the 30,000 tonnes consumed. More than 60 per cent of the nickel is used to make alloy steel, but the shortages have limited production and alloy steel accounts for only 5 per cent of total rolled steel output, compared to 30 to 40 per cent in developed countries.

#### 4.1.2 Import Costs

Mineral shortages foreseen in China in the years ahead recently prompted the Ministry of Geology and Mineral Resources to request a substantial increase in its share of the national budget to boost surveying activities. Shortages of steel, aluminium and fertilizers will continue through the decade; meeting the predicted shortfall by imports could cost up to 20 billion dollars by the year 2000 (Fridley and Dorian 1990).

Imports of both energy and minerals could eventually total 40 to 50 billion dollars, nearly equivalent to China's total export revenues today (Fridley and Dorian 1990). With expected strong growth in the import of other commodities such as grain and capital equipment, China is unlikely to be able to sustain the level of imports required to satisfy growth in energy and minerals demand, but without sufficient external supplies of these commodities, China may face bottlenecks in the production of primary goods, the effects of which may ripple throughout the economy.

## 5. Mineral Law

#### 5.1 Evolving Legal Framework

From 1979, the year China began implementing its open-door policy, to 1990, the Chinese Government promulgated more than 150 laws and regulations concerning external economic relations, including foreign trade, joint venture enterprises, taxation, technology transfers and special economic zones and open cities. Several other laws and regulations are now being formulated as well, which may directly or indirectly affect minerals and energy exploration and development, including corporation and bankruptcy laws.

China's business laws can be broadly divided into five categories – laws related to joint ventures, laws and regulations related to taxation, laws and regulations guiding technology transfers, regulations concerning special economic zones and open cities, and laws related to external trade. Table 3 lists major laws and regulations pertaining to joint ventures and direct foreign investment in China. The Regulations on the Encouragement of Foreign Investment, promulgated on 11 October 1986, reflect the more recent efforts on the part of Chinese Government authorities to encourage foreign businesses to invest in China. Several laws were passed in 1990 to improve conditions, including,

# Table 3. Major laws and regulations pertaining to joint ventures and foreign investment in China<sup>a</sup>

Law/Regulation Date Promu		
*	Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment	1 July 1979
*	Provisional Regulations for Providing Loans to Joint Ventures Using Chinese and Foreign Investment by the Bank of China	13 March 1981
*	Procedures for the Registration, Examination and Approval of Joint Ventures Using Chinese and Foreign Investment	24 April 1981
*	Regulations of the People's Republic of China on the Exploitation of Offshore Petroleum Resources in Cooperation with Foreign Enterprises	30 January 1982
*	Regulation for the Implementation of the Joint Venture Law	20 September 1983
*	Procedures for the Implementation of the Provisions for Labour Management in Joint Ventures Using Chinese and Foreign Investment	24 December 1983
*	Accounting Regulations of the People's Republic of China for Joint Ventures Using Chinese and Foreign Investment	4 March 1985
*	State Council Regulations on the Joint Ventures Balance Between Foreign Exchange Revenue and Expenditure	15 January 1986
*	Law of the People's Republic of China on Enterprises Operated Exclusively with Foreign Capital	12 April 1986
*	Law of the People's Republic of China Governing Wholly Foreign-Owned Enterprises	12 April 1986
*	Law of the People's Republic of China on Chinese-Foreign Cooperative Joint Ventures	13 April 1986
*	Provisional Regulations on Chinese-Foreign Cooperatively Designed Construction Projects	5 June 1986
*	Provisions of the State Council of the People's Republic of China for the Encouragement of Foreign Investment	11 October 1986
*	Implementation Measures of the Ministry of Finance for Putting into Effect the Preferential Terms on Taxation Provided in the "Provisions of the State Council for the Encouragement of Foreign Investment"	30 January 1987
*	Law of the People's Republic of China on Chinese-Foreign Contractual Joint Ventures	13 April 1988
*	Regulations on the Payment of Royalty for Exploitation of Offshore Petroleum Resources	5 December 1988
*	Amendments to the 1979 Law of the People's Republic of China Regarding Sino- Foreign Equity Joint Ventures	4 April 1991
*	Income Tax Law of the People's Republic of China for Enterprises with Foreign Investment and Foreign Enterprises	1 July 1991

<sup>a</sup> Through July 1991 there were 18 major laws and regulations pertaining to joint ventures and foreign investment in China. In-depth discussion of each can be found in the sources listed below.

Sources: (1) Beljing Review, 24-30 June 1991; (2) Intertrade, May 1988; (3) Clark, Jennifer C., 1988; (4) Ministry of Foreign Economic Relations and Trade, 1987; (5) Ross, Lester and Mitchell A. Silk, 1987; and (6) China International Economic Consultants, Inc., 1986.

firstly, an amendment to the 1979 joint venture law, allowing non-PRC nationals to chair a joint ventures board of directors and providing flexibility on joint venture tenures and, secondly, provisional land development regulations enabling foreigners to develop tracts of land in the open cities and special economic zones. The 1979 joint venture law stated that projects must have a fixed term, and the rules provided a blanket 30-year limit (which was subsequently extended to 50 years). The 4 April 1990 amendments to the 1979 law lifted the 50-year cap on the term of most joint venture contracts, granting certain projects open-ended lifetimes. Though China's MOFERT officials have renewed their efforts to protect joint venture interests by drafting new or revised laws in 1990, there remains considerable room for improving the uncertainty surrounding the legal environment.

## 5.2 Laws and Agreements Pertaining to Exploration and Mining

#### 5.2.1 Exploration and Development Activities

The means by which the Chinese jointly develop their minerals base with foreign partners are governed by China's national legislation on natural resources and the environment, as well as by the country's development policies and objectives. The specific working relationships between the Chinese partners and foreign firms are governed in accordance with the joint venture law, foreign investment provisions, technology transfer legislation and other legislation specific to mineral resources development. Additional laws concerning all foreign investment also have an influencing effect on joint mineral projects, including taxation and labour laws, and trade regulations. While a growing body of laws and policies pertaining to foreign investment in China will likely affect the future of mining development in the country, the specificity of many laws to the mining industry remains unclear.

As a means of better coordinating future mining exploration and development activities in China, a law governing the exploitation of mineral and energy resources was formulated and adopted in 1986. On 19 March of that year, the "Mineral Resources Law of the People's Republic of China" was adopted at the 15th session of the Standing Committee of the Sixth National People's Congress, promulgated by Order Number 36 of the President of the People's Republic of China (Foreign Broadcast Information Service 25 March 1986). While adopted in March 1986, the law was not made effective until 1 October 1986. Implementation provisions of the mineral resources law, including "Provisional Methods on Registration Administration of Mineral Exploration", "Provisional Methods on Mining Registration Administration by State-Owned Mining Enterprises" and "Provisional Methods on Supervision and Management of Mineral Resources", were issued on 29 April 1986 by China's State Council. Additionally, each province, autonomous region and municipality issued specific "Administration Methods for Mining by Collective Enterprises and Individuals in Counties and Towns'' for their own regions.

Although the 1986 Mineral Resources Law does not directly address setting up mining ventures with foreign investment or through Chinese-foreign cooperation, it does lay down general principles that all mining activities in China must adhere to. Questions dealing with foreign-operated or Chinese-foreign cooperative mining ventures in China should be defined with the deepening of the structural reforms, and a separate law will likely be enacted eventually (*Foreign Broadcast Information Service* 12 March 1986).

According to its text (Table 4), the law was drawn up on the basis of the Constitution of the People's Republic of China for "the purpose of developing the mining industry, strengthening the work of prospecting for and exploring, exploiting, and protecting mineral resources, and ensuring the fulfillment of the immediate and long-range needs of the socialist modernization programme." The law is aimed at encouraging while regulating mining by state-owned, collective and private enterprises. The law stipulates that no mining can take place without a state license, which could be revoked if the law were violated, and it also requires mining ventures to pay financial compensation and other fees to the state for extracting mineral resources. The environment is protected in the law by a special clause that requires mining enterprises to reclaim land that has been destroyed during mining.

Seven chapters and fifty articles are contained in the law, including chapters on general provisions, registration for mineral exploration, mineral exploration and exploitation, collective mining enterprises of villages and towns and mining by individuals, legal liability and supplementary provisions. According to its provisions, the state owns, controls and supervises all mineral resources in China, and any firm desiring to explore for mineral deposits must register in accordance to the law with the State Council or a designated department. Development rights must also be obtained, which cannot be sold, leased or pledged.

Article four stipulates that the state-operated mining enterprises of China shall be the principal force in the exploitation of the country's mineral resources. Collective mining enterprises of townships and cities are nonetheless encouraged to develop mineral resources within areas designated by the state, while individuals are permitted to exploit scattered and dispersed mineral deposits, as well as building materials.

Article five indicates that any firm that develops mineral resources in China will pay a resources tax in accordance with relevant state provisions. No further definition of a resource exploitation tax is contained in the law, however.

Before a mining enterprise is established in China, a government approval authority will review its application for a design or mining plan, production techniques and planned safety and environmental protection measures. Approval is granted if an enterprise meets standards established by the mineral resources law or relevant state provisions. The government will monitor all development activities to ensure that recovery rates in mining and processing are conducive to existing technologies. Article 28 states that byproduct mineral ores with commercial value must be efficiently exploited and utilized as part of an overall development strategy, so as to avoid waste.

#### Characteristics

- 1. Adopted 19 March 1986; implemented 1 October 1986.
- 2. Consists of seven chapters,<sup>a</sup> 158 articles and one appendix.

#### Major Provisions-Chapter I: General Provisions

- 1. Purpose of the law is to develop the mining industry, strengthen the work of prospecting for and exploring, exploiting, and protecting mineral resources, and ensure fulfillment of the immediate and long-range needs of the socialist modernization programme.
- 2. Mineral resources belong to the state. State-operated mining enterprises are the principal bodies to exploit mineral resources. The state encourages, guides and helps the development of collective mining enterprises of villages and towns.

#### Major Provisions-Chapter II: Registration of Mineral Resources: Prospecting; Examination and Approval of Mining Applications

- 1. The state carries out a system of centralized registration of mineral resources prospecting. The scope of registration of mineral resources prospecting and measures for such registration shall be worked out by the State Council.
- 2. Applications for running state-operated mining enterprises should be separately examined and approved by the State Council, the State Council's departments concerned and the provincial, autonomous regional and municipal people's governments.
- 3. Mining should be conducted in areas under state plans, in areas which are of importance to the national economy and in areas where the state permits only protective mining of certain local special minerals.

#### Major Provisions-Chapter III: Prospecting for Mineral Resources

- 1. In conducting general surveys of mineral resources, the major mineral species should be surveyed, after which a preliminary and comprehensive evaluation should be made of geological conditions concerning the formation of paragenetic and associated minerals, as well as of the industrial prospects of mineral deposits in the area.
- 2. In prospecting for mineral deposits, a comprehensive evaluation should be made of paragenetic and associated minerals that have industrial value in the mining area, and their reserves should be assessed accordingly. Prospecting reports that fail to include a comprehensive evaluation will not be approved.

#### Major Provisions-Chapter IV: Mining of Mineral Resources

- 1. In exploiting mineral resources, it is imperative to follow a reasonable order of extraction and appropriate methods of mining and ore dressing. Mining enterprises' rates of extraction and recovery, ore dilution and dressed ore retrieval should meet the designed requirements.
- 2. In mining major minerals, unified plans and comprehensive efforts should be made to exploit and utilize paragenetic and associated minerals having industrial value in order to prevent waste.
- 3. In exploiting mineral resources, it is imperative to observe the laws on environmental protection and to prevent environmental pollution. In extracting mineral resources, it is necessary to make economic use of land. In case arable land, grassland or forests are damaged as a result of mining operations, the mining enterprise should adopt locally suitable measures to reclaim the land for use, plant trees or grass or take other measures to make the damaged land usable. If exploitation of mineral resources results in losses to other people in terms of production and livelihood, compensation should be made and remedial actions taken accordingly.

#### Major Provisions-Chapter V: Collective Mining Enterprises in Townships and Individual Mining

- 1. In dealing with collective township mining enterprises and individual miners, the state implements the principle of giving them active support, making rational planning, providing correct guidance and strengthening their management.
- 2. Collective township mining enterprises and individual miners should raise their technical standards and increase the rate of recovery of mineral resources. It is forbidden to excavate ores indiscriminately and undermine mineral resources.

#### Major Provisions-Chapter VI: Legal Liabilities

1. Those who carry out mining without proper authorization and mining permits, enter the mining area defined by the state or mining areas that are of great value to the national economy or other people's mining areas to carry out mining without authorization or tap special mining resources that the state has designated for protective mining should be instructed to suspend operation and pay for the losses. Mineral products and illegal profits should be confiscated and fines be imposed.

<sup>a</sup> Six of seven chapters covered in this table.

Source: Foreign Broadcast Information Service, 25 March 1986.

Chapter VI of the Mineral Resources Law describes the many legal liabilities and conditions related to mining in China. Mining rights can be terminated for many reasons, including operating without a license, entering without authority into mining areas designated for the state, exploiting special varieties of minerals that the state had ordered under protective supervision and causing unnecessary damage to the natural environment. Violations to these conditions can be investigated for criminal responsibility in accordance with the provisions of Article 156 of China's Criminal Law. Smuggling or illegal selling of mineral resources is strictly prohibited and subject to severe criminal punishment.

## 5.3 Foreign Participation

## 5.3.1 Joint-Venture Opportunities

China's eighth five-year plan (1991-1995) calls for an average annual growth rate in GNP of 6 per cent, with industrial output value in 1995 rising to more than 37 per cent of the 1990 level (*Beijing Review* 13-19 May 1991). The *China Daily* reported recently that the nonferrous metals industry will grow at an average annual rate of 5 per cent in the 1991 to 1995 period, in line with national economic development. Clearly, China's ambitious economic targets imply continued reliance on the expansion of the minerals sector. This, in turn, suggests greater need for foreign financial and technical assistance in the years ahead.

Though China's mining industry is today one of the world's largest, it is plagued by numerous problems that may threaten future expansion, including low efficiencies in recovery, production and utilization; outdated mining equipment and technology; and severe transportation bottlenecks. Billions of dollars of investment will be required to facilitate the industry during the 1990s. The availability of capital in priority investment areas will be critical in order to ensure expansion of the industry into the twenty-first century. Priority will be given to the development of mines with large volumes and high-grade deposits, low production costs and economically viable operations. Stress will be placed on comprehensive prospecting, mining, recovery and utilization, and the intensive processing of manufactures for the purpose of absorbing foreign investment. The primary investment areas in China's mining industry include the following.

- \* Metal smelters and refineries (principally for copper, tin, tungsten, aluminium, lead/zinc, rare earths and nickel)
- \* Specialized mining and processing software and excavation techniques
- \* Geological exploration technology
- \* Modernizing iron and steel plants
- \* New and used mining and drilling machinery
- \* Pollution monitoring and control devices
- \* Development of mineral sands for export
- \* Engineering, computer and consultancy services
- \* Physical infrastructure, transportation and telecommunications

Using imported technology and equipment to renovate existing enterprises is a Chinese strategy to tap enterprise potential and promote production, economic growth and technical development. During the 1990s and the early part of the next century, technology transfers could play a pivotal role in promoting domestic economic growth, as well as cooperation with foreign nations. Though economic restructuring is underway in China, technological advancement of industry is needed to facilitate economic growth in the long term. It has been estimated that as much as 75 per cent of all equipment used in Chinese industry must be renovated or replaced to improve efficiencies in operation (Dorian 1987). Such an accomplishment would require massive capital investments, as well as technology transfer.

Potential growth areas for imports of technology and equipment are in priority development projects, which include minerals and energy extraction, processing, mining and safety, and in pollution abatement equipment. China intends to expand its minerals and metals production in order to manufacture value-added goods to meet consumer needs. Production of minerals, metals and their products will also depend on solving ecological problems.

## 5.3.2 Company Agreements and Strategies

In China, production of mineral commodities is regarded as a means of facilitating industrial expansion and an avenue for promoting economic development in sparsely populated areas, such as the Xinjiang Autonomous Region. Selected minerals are used for export to earn hard currency and to fulfill barter trade arrangements. Historically, Chinese policies concerning minerals were based largely on self-sufficiency motives. With the advent of the open-door policies, however, the Chinese Government recast its national mineral policy to coincide with economic and political restructuring. China has fully realized that expansion of its minerals industry cannot take place without a substantial influx

of technology, science and foreign capital from abroad, which is likely to occur through the fostering of joint ventures.

Foreign investment is one of the major financial resources available to the Chinese mining industry, which is in desperate need of investment, owing to limited domestic financing, an increasing reliance on imports and a growing demand for metals. Though the Chinese Government is actively seeking overseas partners in mining-related joint ventures, foreign mining companies have adopted a cautious approach in entering the Chinese market, as in other fields. Major mining companies that had sought investments in the 1980s in the minerals field were generally disappointed with the deposits offered to foreign investors, a lack of reliable geologic and economic data, and Chinese bureaucratic Moreover, investments in the minerals sector suffer from the complications. same general problems as other foreign investment in China, notably difficulties in obtaining foreign exchange to repatriate profits, rising cost of materials and wages, shortages and limited access to needed materials, inadequate infrastructure, a largely untested and fragile legal system, and uncertainty about consistency in government policies and procedures. Through 1990, only a handful of joint ventures in the minerals field were registered with the Chinese Government, though additional projects were under negotiation.

During the 1980s, most foreign involvement – either in the form of investment, joint-venture activities or technology transfers – was used to boost production of aluminium, copper, lead and zinc. Foreign companies will continue being encouraged to participate in the development of China's domestic metals industry through sales of mining and plant equipment, engineering services and computers and controls, and through technology transfer.

The principal geographic area for attracting foreign capital in China's nonferrous metals industry is southeastern China and, to a lesser extent, the northwest. Because of geological conditions, these regions have abundant metal resources and large concentrations of high-grade lead, zinc and bauxite, as well as promising hydroelectric power potential. They offer relatively attractive environments for joint venture activities, with prospects of low investment and relatively rapid financial returns. Cooperation with foreign enterprises on nonferrous metals production in China's many coastal cities is also encouraged.

Table 5 lists the major projects involving foreign companies in China's metals industry between 1989 and 1991. The profiles are based on media reports of business contracts and negotiations. The table is not necessarily complete, though it does provide an accurate representation of the types of projects involving foreign firms, the range of commodities attracting interest and the countries represented in the deals. Where available, investment figures are included in the profiles.

As shown, a majority of Sino-foreign projects are in aluminium, copper, iron and steel. Other commodities attracting overseas investment include coal (Japan, Germany), gemstones (Australia), gold (Canada), rare earths (Canada),

# Table 5. A profile of major investment projects in China's metals and minerals industry,1989-1991<sup>a</sup>

Commodity	Project description

#### Aluminium

Alcan Aluminum Ltd. (Canada) and Japanese Light Metal Corp. (Japan)/China National Nonferrous
 Metals Industry Corp., Southwest Aluminum Processing Factory and Guizhou Aluminum Factory
 Huajia Aluminum Materials Co. Ltd. joint venture in Shezhen began production of aluminium
 products. \$23.2 million (Canada and Japan-45 per cent, China-55 per cent). August 1990.

ABC Co. (U.S.)/Nanjing Aluminum Products Factory

Established Nanjing-ABC Aluminum Products Co. Ltd. to produce aluminium and stainless products. \$200,000. (United States-25 per cent, China-75 per cent). October 1989.

NA (United Kingdom)/Fenghua Machinery Co. and Chemical Reagent Plant, Heilongjiang

#### Mino (Italy)

Negotiating for construction of aluminium plant. \$115 million (IL 150 billion). January 1989.

#### Coal

- Nissho Iwai Corp. (Japan) and JGC Corp. (Japan)/Yanzhou Coal Mine Administration, Shandong Established joint venture to produce coal and water mixture. \$24.9 million (J Yen 3.8 billion). (Japan-49 per cent, China-51 per cent). Registered capital: \$8.3 million (J Yen 1.27 billion). January 1990.
- Corub Kopes Co. (FRG)/Anshan Coking and Refractory Material Engineering Co. Will establish Sino-German Engineering Co. for coking. March 1989.

#### **Construction stone**

Top Winner Co., Ltd./Four Chinese companies.

Opened the Jinxin Granite and Marble Co., Ltd. in Tianjin. \$3.68 million (Yen 13.7 million). May 1989.

#### Copper

Philipp and Lion Ltd. (London)/CNNC Shanghai Smelter and Cable Wire Group of Shanghai (CGS) Signed letter of intent for a joint venture to construct a modern, economically efficient pollutionfree copper smelter in Wusong Industrial Area, Shanghai. (United Kingdom-50 per cent, China-50 per cent). March 1991.

United Trading Co. Ltd. (Canada)/Cangzhou, Hebei

Established Cangyi Welding Wire Co. 10-year joint venture to produce copper plating welding wire. \$1.8 million (Canada-60 per cent, China-40 per cent). October 1989.

#### Wrought Copper Ltd. (Chile)/No. 1 Copper Tube Plant, Beijing Started operation of the Jingsheng Copper Tube Co. Ltd. joint venture to produce red copper tube. \$10.64 million (50 per cent-50 per cent). May 1989.

#### NA (United States)

Established Jinhui Reprocessed Metals Co. Ltd. to process copper and aluminium ingots. \$570,000. April 1989.

#### Gemstones

Argyle Diamonds Corp. (Australia)/Government of China, Beijing<sup>b</sup>

Argyle has opened a diamond cutting and polishing factory about 30 km from Beijing. The factory will provide training for Chinese in the crafts of cutting and polishing diamonds. September 1991.

Commodity	<b>Project description</b>
And an an an analysis of the second	

Pacific Gem Co. Ltd. (Australia)/Changle County, Shandong

Signed agreement to jointly process sapphires. \$1 million. June 1989

#### Gold

Galactic Resources Ltd. (Canada) Assisting in gold mining project. December 1988.

#### **Iron and Steel**

Fried. Krupp GmbH (Germany)/Taiyuan Iron and Steel Co. and CITIC

Established joint venture in Taiyuan, Shanxi Province to produce steel. \$400 million (Germany-30 per cent, China-70 per cent). September 1990.

#### Australia

Established the China-Australia Iron and Steel Industry Training Center at the Wuhan Institute of Iron and Steel Engineering to train management personnel and engineers over a five-year period. \$10.26 million. (Australia-67 per cent, China 33 per cent). September 1990.

Nittetsu Shoji Co., subsidiary of Nippon Steel Corp. (Japan) and Mitsui and Co. (Japan)/Shum Yip Trading Co. and Nanhai Oil Shenzhen Development and Service Corp.

Began operation of joint venture steel-cutting plant in Shenzhen SEZ. \$8 million (Japan-65 per cent, China-35 per cent). March 1990.

Mitsubishi Heavy Industries Ltd. (Japan) and Sumitomo Metal Industries Ltd. (Japan)/Ministry of Metallurgical Industry.

Will establish joint venture to design and engineer continuous steel-casting machinery. January 1990.

Mesta Engineering Co. (US-70 per cent owned by Capital Iron and Steel Corp.)/Capital Iron and Steel Corp., Beijing.

Opened Beijing Mesta Engineering Co. Ltd. joint venture to upgrade steel production process and explore foreign markets. September 1989.

#### NA (United States)

Established Yichang Steel Strip Co. Ltd. 15-year joint venture to produce thin steel and tin-plated strips. \$30 million. September 1989.

International Iron and Steel Far East Service Co. (US)

Will set up plant at Wuhan Iron and Steel Works to process steel slag and recover scrap steel. \$7.5 million. July 1989.

Always King Ltd./Shanxi Energy Corp. and Yuanping Iron and Steel Works

Signed agreement to build 150 m<sup>3</sup> puddling furnace and 24 m<sup>3</sup> sintering machine. May 1989.

NA (Japan)/Baoshan Steel Works, Shanghai

Established Baohua Trading Corp. to deal in steel, nonferrous metals, mechanical equipment, etc. Registered capital: \$340,000. (50 per cent-50 per cent). January 1989.

#### Scandiaconsult (Sweden)

Preparing feasibility study for iron mine and iron ore dressing plant. January 1989.

#### Mestek Inc. (United States)/Shoudu Iron and Steel

Sold 19 per cent of Mesta Engineering Co. to Shoudu, the majority partner in Mesta. (United States-30 per cent, China-70 per cent). January 1989.

#### Commodity

## Metallurgy

#### NA/Tianjin

Established Huasheng Co. to process metal waste. Registered capital: \$400,000. November 1988.

#### **Rare** earths

NA (Canada)/Jiangxi

Established Gongjia Rare Earth Co. Ltd. joint venture to process 200 tpy rare earths. September 1989.

NA/Yongfu County, Guangxi

Established Guiyong Magnetic Material Plant to mine and process nafeb alloy, a rare earth magnetic material. February 1989.

NA/Shanghai Rare Metals Refinery and Machinery Installation Co., affiliate of China No. 1 Metallurgical Construction Corp.

Established Shenli Rare Metals Co. Ltd. joint venture to recycle and refine rare metals. July 1989.

#### Talc

Ilshin Industrial (Republic of Korea) and Cyprus (United States). Will develop talc mines. March 1989.

#### Tin

Malaysia Mining Corp./CNIEC. Will form joint venture to mine tin. January 1989.

#### Titanium

Marubeni Corp. (Japan) and Malaysia Mining Corp. (Malaysia)/Hainan Provincial Metallurgical Nonferrous Metal Industry Corp.

Established joint venture in Hainan Province to mine titanium oxide-bearing mineral ilmenite for export to Japan. The funds involved are estimated to be 100 million yen. July 1990.

General Minerals Co. (Malaysia)/Yunnan Geological and Mineral Resources Bureau Signed letter of intent to exploit titanium-containing ores. January 1989.

NA:	Not Available.
CITIC:	China International Trust and Investment Corp.
CNIEC:	China National Nonferrous Import and Export Corp.
CNNC:	China National Nonferrous Metals Industry Corp.
CGS:	Cable and Wire Group of Shanghai.
<sup>a</sup> Based or	press reports of business contracts and negotiations. Not necessarily a complete list or independently
verified.	Contracts denominated in foreign currencies were converted into US dollars at the most recent monthly
average r	ate quoted in International Financial Statistics (IMF).

<sup>b</sup> Set up as a joint project between the Governments of Australia and China under the technical cooperation agreement established in 1991 for bilateral aid.

(1) U.S.-China Business Council, 1989-1991, China Business Review, (various issues); (2) Mining Sources: Journal, 1989-1991 (various issues); and (3) author's files.

talc (Republic of Korea, United States), tin (Malaysia) and titanium (Japan, Malaysia). Eleven projects involving iron and steel production and processing were under negotiation or finalized during the 1989 to 1991 period, involving Germany, Australia, Japan, the United States and Sweden, among others. Altogether, thirteen countries are represented in the investment projects listed in Table 5.

## 6. The Fiscal Regime

## 6.1 A New Income Tax System

Before 1978, the entire Chinese economy was publicly owned and managed. All enterprises turned the majority of their profits over to the state treasury, and then were taxed on the remaining share. China's national revenues and expenditures were thus totally controlled by the central government. The role of taxation as an economic lever was virtually nonexistent.

With the introduction of the open-door policy and reform in 1979, however, a completely new system of economic entities emerged in China, including jointventures, individually owned enterprises, wholly owned foreign enterprises and private businesses. Each of these has its own operating and accounting procedures, including even independently managed, state-owned enterprises with an exclusive responsibility for their own profits and losses.

From 1979 to 1982, China experimented on a limited basis with a system of replacing the collection of profits with taxation. All after-tax profits were retained by enterprises partaking in the experiment. After repeated success, the government decided in 1984 to put into practice a new tax system on a national basis. The principal features of the system are listed below (*Beijing Review* 7-13 August 1989).

- \* A reorganization of old industrial and commercial taxes into product tax, value-added tax, business tax and salt tax, each with its own readjusted tax rate
- \* The levying of a resource tax on crude oil, natural gas and coal extraction
- \* The establishment of a new tax for city maintenance and construction and the revival of taxes for real estate, land use, motor vehicles and ships
- \* The levying of an income and regulatory tax on profit-making state enterprises
- \* The creation of 15 specialized taxes covering personal and business income, banquets, wages and construction

Combined, these tax items make up a tax system dominated by turnover tax and income tax, in coordination with other tax items. China's new tax system is in addition to a series of tax laws promulgated since 1980 in a bid to attract
foreign investment, including income tax laws for Sino-foreign joint ventures, foreign-owned enterprises and personal income, plus a number of provisions giving preferential treatment to foreign investors in the special economic zones and open coastal cities. China has also signed agreements to avoid double taxation with a number of countries, including the United States, Japan, England, France and Germany.

With the establishment of the new tax system in 1984, taxation became the primary source of revenue for the state. Taxes now account for more than 90 per cent of China's state revenues, compared with only 6 per cent in 1978. In 1989, taxes accounted for 273 billion yuan out of a total government revenue of 292 billion yuan (State Statistical Bureau 1990). While the introduction of preferential tax measures for overseas investors has facilitated a growth in the absorption of foreign capital, foreign enterprises commonly complain about China's relatively heavy tax burden. Aware of this, some local regions in China compete with each other over who can offer the greatest number of preferential measures to overseas investors. By 1988, China had a total of 29 tax items, in comparison to more than 50 in Japan, more than 60 in Hungary, around 30 in Mexico and 25 in India.

#### 6.2 1991 Income Tax Law

At the fourth session of the Seventh National Congress in April 1991, the Chinese Government adopted the "Income Tax Law of the People's Republic of China for Enterprises with Foreign Investment and Foreign Enterprises." The law, promulgated by Order Number 45 of the President of the People's Republic of China, was made effective as of 1 July 1991.

While under consideration for several years by Chinese tax authorities, the State Tax Bureau solicited comments and opinions on the draft tax law by foreign business enterprises and accounting and law firms. This unusual move was aimed to alleviate the concerns of the many overseas enterprises that had major financial commitments in China. The 1991 law unifies two income tax laws applicable to foreign investors, namely the Law of Taxation on the Revenues of Sino-Foreign Joint Ventures (September 1980) and the Law of Taxation on the Revenues of Foreign-Owned Enterprises (December 1981).

According to Article 1 of the 1991 income tax law, income tax shall be paid by enterprises with foreign investment within China and foreign enterprises on their income derived from production, business operations and other sources. "Enterprises with foreign investment" refers to Chinese-foreign equity joint ventures, Chinese-foreign contractual joint ventures and foreign-capital enterprises that are established in China. "Foreign enterprises" refers to foreign companies, enterprises and other economic organizations that have establishments or sites in China and engage in production or business operations, or those which, although without establishments or sites in China, derive income from sources within China. Overseas companies involved in the exploration and production of mineral resources in China are considered foreign enterprises according to the new tax law.

Article 5 provides for a 30 per cent rate of income tax and a 3 per cent local income tax. Preferential tax rates (15 per cent) are offered to enterprises with foreign investment,

foreign enterprises in special economic zones or firms with foreign investment of a production nature in economic and technological development zones. Reduced taxes (24 per cent down to 15 per cent) are also offered to enterprises with foreign investment of a production nature in coastal economic open zones or in the old urban districts of cities where special economic zones or economic and technological development zones are located. Income tax exemptions may be authorized by the State Council for development projects encouraged by the state in such areas as energy, communications and port construction.

Income tax payable according to the new law is to be computed in terms of China's currency, the renminbi (yuan). Article 21 stipulates that income in foreign currency will be converted into renminbi according to the existing exchange rate quoted by the state exchange control authorities for purposes of tax payment.

China's new income tax law unifies key provisions from two previous tax laws put into effect nearly a decade ago, and is part of an overall strategy of the Beijing government to maintain order in an economy often plagued by speculation, profiteering and tax evasion among the country's more than 15 million privately owned enterprises.

## 6.3 Nonenergy Minerals Taxation

In China, mining is perceived as part of the social welfare system, and maximization of welfare payments, rather than profits, is encouraged under present revenue distribution schemes. The Chinese system of minerals taxation is unlike that of most non-socialist countries, reflecting the unique character of China's economic, political and social framework.

The distribution of income from China's nonfuel mineral projects was examined in a recent study (Otto 1990), which presented a comparison between the Chinese taxation procedure for natural resource projects and the newly adopted contractual responsibility system. On the national level, two systems of revenue distribution are now in practice in China: a contractual responsibility system and an income-based taxation scheme based on a national income tax and a series of provincial and local taxes. The systems evaluated by Otto (1990) did not apply to joint ventures with foreign enterprises, although the distribution of income from domestic as well as Sino-foreign projects can, similarly, be decided by negotiation rather than legislation. Provisions in the 1991 income tax law of China are relevant to mineral joint ventures involving at least one foreign participant. As with domestically operated resource projects, special provisions are generally made for foreign investments in remote and economically poor areas, projects involving strategic minerals or projects deemed necessary for national economic security.

By 1984, the new tax system put into place in China was applicable to all mining ventures in the country; however, the tremendous size and complexity of China's mining industry made the implementation of the system both difficult and confusing. It was therefore temporarily suspended for many enterprises in 1987/88, at which time the contractual responsibility system was introduced (Otto 1990). Under the contract obligation system, each entity enters into a contract with the next higher level of management to produce or provide product or revenues equal to the amount produced or provided in 1987, with various economic incentives rewarding any increase over 1987 levels (Otto 1990). Such a system of

incentives was geared to boost the efficiency of the Chinese mining industry, which suffers from low efficiency levels.

The revenue distribution system for major mineral projects in China not subject to the contract obligation system uses thirteen primary distribution mechanisms (Otto 1990): loan repayment, products tax (pre-1989), value-added tax (1989-present), city construction surtax, education surtax, mine maintenance charge and subsidy, depreciation allowance, operating costs, cost adjustment, capital repair charge, income tax, excess profits tax and profit retention. This distribution scheme was applied to almost all large projects prior to 1987. Projects subject to income-based taxation have a priority to repay outstanding loans to the central government, beginning in the first year of commercial production, if funds are available. During the 1980s, Chinese Government officials were considering imposing a resources tax on domestic nonfuel mining operations, to be used to replace the income tax. With the adoption of the 1991 income tax law, however, it is not clear whether such a tax will be introduced soon.

As China continues to move toward a more market-based economy, efforts will expand to convert from a quota and price-controlled system to a more profit and cost-minimization framework. Economic reforms will continue to influence the distribution of revenues from mineral projects. Since many such mining projects in China are not profitable, the central government will encounter serious difficulties in reducing or eliminating financial subsidies altogether. Many mining enterprises at the provincial and local levels exercise significant power and will likely see little incentive to adopt a uniform taxation system. The untested nature and lack of uniformity of China's taxation system has tended to discourage foreign companies from participating in the nation's mining activities.

#### 6.4 Creditworthiness

Along with other nations, China's creditworthiness is defined twice yearly by *Institutional Investor*, based on the viewpoints of the international banking community. Though subjective in nature, the opinions of the bankers polled provide some insight into the thoughts and concerns of financial experts about investing and lending to individual countries. In terms of a numerical country ranking, China is 31st worldwide, ahead of all Eastern European nations, India, South Africa, the Commonwealth of Independent States and Brazil. The country's investor credit rating is 53.1 compared to the global average of 37.9 (*Institutional Investor*, October 1991). During the twelve-month period from September 1990 to September 1991, China's rating rose by 1.7 points, making it one of the fastest rising rankings among the 110 countries listed.

China's apparent willingness to adhere to its open-door policies is important to the country's overall credit rating. Though minor, recent amendments to the 1979 joint venture law were considered a meaningful step in China's effort to improve the investment climate. In the short term, investor attitudes will be affected by restrictive policies on direct foreign investment. Joint ventures in China are not found across the entire spectrum of economic activity, are isolated geographically and are, in many cases, cut off from the domestic economy. If further reforms are introduced in China with a recognition that direct foreign investment (DFI), subject to reasonable policy regulations, leads to a beneficial arrangement for both the investing and host country, an increasing flow of DFI to China may be observed.

## 7. Monetary Controls and Access to Capital

## 7.1 Foreign Capital

The use of foreign capital is a critical component of China's long-term strategic policy for socialist economic development. Although the Chinese Government has actively encouraged foreign investment since 1979, China remains committed to the fundamental principles of a planned, socialist economy. As such, the initiation and approval of foreign investment projects is linked closely to China's state planning mechanism. Foreign investors are not, for instance, allowed to control China's economic lifelines or certain key industries and commodities.

## 7.2 Access and Use

China employs two methods to bring foreign capital into the country: borrowing money from foreign countries or attracting DFI.<sup>4</sup> Attracting DFI includes the creation of joint ventures, cooperative business operations, cooperative development, enterprises owned exclusively by foreign capital, compensation trade, the processing of materials supplied by clients and the assembling of parts and components supplied by them. In the statistical reporting on DFI, Chinese Government authorities categorize investment as one of four types: equity joint ventures, contractual joint ventures, wholly foreign-owned ventures and joint oil development projects. An equity joint venture is a limited liability company jointly managed by the investors in proportion to their respective shares of investment. Equity joint ventures are preferred over other types of DFI by the Chinese Government and now represent the predominant vehicle for DFI in the country.

Over the past decade, China's use of foreign capital increased yearly. Since 1979, the number of enterprises with foreign capital has amounted to about 20,000, of which 1,410 are fully owned by foreign capital (*Renmin Ribao* 27 February 1990). By 1990, foreign loans totaling 45.6 billion dollars had been used in China. Direct foreign investments between 1979 and 1989 amounted to 22.3 billion dollars. Foreign sources have grown more diverse, however, and the Chinese Government continues to encourage foreign investment to fund development projects. At the fourth session of its 13th Central Committee, the CPC reiterated that the absorption of foreign investment would remain critical to China's continued economic prosperity.

Foreign investment in China enjoyed a two and one-half year boom, beginning in late 1986. From January 1987 through June 1989, the number of signed contracts increased by 400 per cent, and contract value grew by 67 per cent over the totals accumulated from 1979 to 1986. (Brecker 1990)

In 1990, foreign investment in China set new records (Table 6). Official figures reveal that 7,274 ventures were approved, with a total of nearly 6.6 billion dollars of investment

<sup>&</sup>lt;sup>4</sup> Direct foreign investment is more broadly defined in Chinese than in Western usage. Under Chinese practice, DFI includes investment in equity joint ventures and wholly-owned ventures (as the term is generally understood outside of China), as well as cooperative arrangements with the participation of foreign capital, counter-trade and the like. See U.S. Department of Commerce, International Trade Administration, *International Direct Investment: Global Trends and the U.S. Role*, U.S. Government Printing Office, Washington, D.C., November 1988, p. 64.

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Equity Joint Ventures												
Ventures approved Foreign investment pledged <sup>1</sup> Actual foreign investment <sup>1</sup>	6 \$8m	20 \$63m	28 \$28m	29 \$29m \$100m <sup>2</sup>	107 \$188m \$74m	741 \$1,060m \$255m	1,412 \$2,030m \$580m	892 \$1,375m \$804m	1,399 \$1,920m \$1,480m	3,909 \$3,134m \$1,975m	3,659 \$2,659m \$2,037m	4,091 \$2,704m \$1,836m
<b>Cooperative Ventures</b>												
Ventures approved Foreign investment pledged <sup>1</sup> Actual foreign investment <sup>1</sup>	na	320 \$500m	70 \$1,300m	402 \$926m \$531m <sup>2</sup>	331 \$504m \$227m	1,089 \$1,480m \$460m	1,500 \$2,189m \$580m	582 \$1,358m \$790m	786 \$1,286m \$620m	1,621 \$1,624m \$780m	1,179 \$1,083m \$752m	1,317 \$1,254m \$674m
Wholly Foreign-Owned Ventures												
Ventures approved Foreign investment pledged <sup>1</sup> Actual foreign investment <sup>1</sup>	None None	4 \$14m	14 \$262m	12 \$55m \$40m <sup>2</sup>	18 \$44m \$43m	26 \$79m \$15m	46 \$32m \$13m	18 \$20m \$16m	45 \$470m \$25m	410 \$481m \$226m	931 \$1,654m \$371m	1,861 \$2,444m \$683m
Joint Oil Development Projects												
Ventures approved Foreign investment pledged <sup>1</sup> Actual foreign investment <sup>1</sup>	8 \$110m	4 \$1,112m	None None	1 \$170m \$497m <sup>2</sup>	18 \$1,031m \$292m	None None \$520m	4 \$360m \$480m	6 \$80m \$260m	3 \$4m \$180m	5 \$59m \$212m	10 \$204m \$232m	5 \$194m \$244m
Total												
Ventures approved Foreign investment pledged <sup>1</sup> Actual foreign investment <sup>1</sup>		348 \$1,689m	112 \$1,590m	444 \$1,180m \$1,168m <sup>2</sup>	474 \$1,767m \$636m	1,856 \$2,619m \$1,250m	2,962 \$4,611m \$1,653m	1,498 \$2,833m \$1,870m	2,233 \$3,680m \$2,305m	5,945 \$5,298m \$3,193m	5,779 \$5,600m \$3,392m	7,274 \$6,596m \$3,437m

## Table 6. Direct foreign investment in China, 1979 to 1990

<sup>1</sup> In U.S. dollars. <sup>2</sup> Total for 1978-82.

Sources: 1979-87, Pomfret (1989, 1991), based on China Investment Guide, China Business Review (May 1988, p. 57), Almanac of China's Foreign Economic Relations and Trade (1986, p. 1212-5, and 1987, p. 1385), Far Eastern Economic Review (2 March 1989, p. 59-60), Business China (30 January 1989, p. 12). The last three columns are from Beijing Review (6 March 1989, p. 17-18; 25 June 1990, p. 43; 4 February 1991) and Business China (25 June 1990, p. 92, and 27 May 1991, p. 76), reporting MOFERT data.

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pledged. The increase in pledged investment suggested that investors continue to have a relatively favourable view of overall investment conditions in China, despite the three-year economic austerity programme. Actual foreign investment in 1990 (3.4 billion dollars) slightly outpaced the 1989 level. The biggest increase in investment was in the wholly foreign-owned ventures category, where the number of projects approved doubled from 1989, and actual foreign investment rose by more than 45 per cent. Figure 1 graphically illustrates actual and pledged foreign investment in China during the past decade.

Though China's investment boom was temporarily broken in 1989, foreign investment continues to reach the country today in record levels. China is seeking a target of a cumulative total of 40 billion dollars in DFI by the end of this century by attracting about 25 billion dollars during the 1990s (Renmin Ribao, 2 April 1990). Although the growth of DFI in China has been tremendous in many ways, neither the amount of investment nor the transfer of advanced technology has met the original objectives. Investors still do not enjoy complete access to China's local market, and they continue to struggle with preoccupied bureaucracy complications, foreign exchange and finance difficulties, supply problems, high fees and charges and local interference. To alleviate some of these problems, in April 1990 the Chinese Government approved the Amendment to the Law on Joint Ventures Using Chinese and Foreign Investment. The change allowed foreign partners to exercise a more important role in management and protected equity joint ventures against expropriation by the state. China has also begun leasing land on a long-term basis for up to 70 years in special economic zones and open cities. Given a gradual improvement in relations with many industrialized countries and continued robust economic growth, a rise in DFI in the years ahead can be expected.

## 8. Environment

#### 8.1 Legal Requirements for Environmental Protection

In addition to minerals legislation, environmental laws that directly affect foreign investment in mining enterprises have also been promulgated in China. Under the reforms initiated by Deng Xiaoping in the late 1970s, the nation's first draft environmental protection law was passed in September 1979.<sup>5</sup> This law is based on the 1978 Chinese Constitution, Article 11,<sup>6</sup> which articulates that "the state protects the environment and natural resources and prevents and eliminates pollution and other hazards to the public." The environmental law encompasses mineral resources and resulting byproducts and consequences of mining ventures.<sup>7</sup> Specific provisions of the environmental law prohibit indiscriminate mining practices and prohibit dumping of mining waste into rivers, lakes or the sea. It remains unclear as to what environmental protections and controls actually will be required of foreign

<sup>&</sup>lt;sup>5</sup> Beijing Review, No. 45, 9 November 1979, p. 24.

<sup>&</sup>lt;sup>6</sup> Constitution of the People's Republic of China, Article 11 (1978), as translated in IV Constitutions of the Countries of the World (1982).

<sup>&</sup>lt;sup>7</sup> As with many of the substantive laws promulgated in China, the country's environmental law remains untested for the most part. While it is beyond the scope of this paper to discuss the laws in detail, China's environmental laws are critical to any foreign investor that wishes to develop mineral resources in the nation because of the almost certain environmental effects. See generally "China's First Environmental Protection Law," *Beijing Review*, No. 45, 9 November 1979, p. 24; and Culliton, "China Adopts New Law for Environmental Protection," *Science*, Vol. 206, No, 429, 1979.

# Direct Foreign Investment in China Foreign Investment Pledged



Direct Foreign Investment in China Actual Foreign Investment



Produced by IEDP, East-West Center

Figure 1

mining enterprises, though the law stipulates that all foreign nationals must observe the law as well as other regulations and rules for environmental protection.

China's environmental protection law contains seven chapters and thirty-three articles. The term environment, as used in the law, encompasses air, water, land, mineral resources, forests, grasslands, wild plants and animals, aquatic life, places of historical interest, scenic spots, hot springs, resorts and natural areas under special protection. The law specifies that the State Council, its subordinate departments, as well as local people's governments at all levels, have an obligation to effectively protect the environment. In accordance with the law, environmental protection bureaus are to be established in all provinces, autonomous regions and municipalities directly under the central government.

The specificity of China's environmental protection law to mining is vague in some cases, although Articles 12, 13, 16 and 17 directly or indirectly consider mining. Article 12 states that in the exploration for mineral resources, comprehensive prospecting, evaluation and utilization must be carried out in a manner benign to the environment. In addition, Article 12 strictly prohibits indiscriminate mining and damage to natural resources, and calls for tailings and slag to be properly disposed of. Article 18 specifies that new technology and methods of processing that will eliminate or reduce pollution should be actively tested and adopted. China's recovery rate of mineral resources has been 50 per cent in recent years, due in part to the use of outdated technology and disorderly mining activities.

China has also promulgated specific laws and regulations regarding water pollution<sup>8</sup> and marine resources;<sup>9</sup> the preservation of land;<sup>10</sup> grasslands<sup>11</sup> and fisheries;<sup>12</sup> water and soil conservation;<sup>13</sup> and wildlife protection.<sup>14</sup> The legal base has been accompanied by an

<sup>10</sup> The State Council promulgated the Regulations Governing the Requisition of Land for State Construction on 14 May 1982. Note also the Interim Provisions of the Shenzhen Special Economic Zone for Land Management and similar local regulations.

<sup>11</sup> The Grasslands Law was adopted by the Eleventh Session of the Sixth National People's Congress Standing Committee on 18 June 1985. The text is in *Renmin Ribao* (People's Daily), 19 June 1985, p. 2.

<sup>12</sup> The Fisheries Law was passed by the Fourteenth Session of the Sixth National People's Congress Standing Committee on 20 January 1986. The text is in *Zhongguo Fazhi Bao* (China Legal System Newspaper), 22 January 1986, p. 2.

<sup>13</sup> The State Council promulgated the Regulations on Soil Conservation Work on 30 June 1982. The text is in *Guojia Huanjing Baohu Fagui Wenjian Huibian* (Compendium on Laws, Regulations and Documents on Environmental Protection), Ministry of Urban and Rural Construction, 6 July 1982, pp. 101-109.

<sup>14</sup> The PRC has issued a number of regulations on wildlife protection. See, for example, State Council Circular on the Stringent Protection of Endangered Wildlife, in *Guojia Huanjing Baohu Fagui Wenjian Huibian* (Compendium on Laws, Regulations and Documents on Environmental Protection), Ministry of Urban and Rural Construction, 13 April 1983, p. 214-216.

<sup>&</sup>lt;sup>8</sup> The Water Pollution Prevention and Control Law. The Chinese text is in *Renmin Ribao* (People's Daily), 13 May 1984, p. 3; Xinhua Yuebao (Wenxiam Ban), No. 5 (1984), p. 63; GGB, No. 10 (1984), p. 307.

<sup>&</sup>lt;sup>9</sup> The 24th Session of the Standing Committee of the Fifth National People's Congress promulgated the Marine Environmental Protection Law (MEPL) on 23 August 1982. MEPL came into effect on 1 March 1983. The Chinese text is in *Renmin Ribao* (People's Daily), 25 August 1982, p. 3, reprinted in Falu, No. 8 (1982), p. 68.

expanding role of the central government in environmental protection and a redirection of policy. In the early 1980s, a new ministry was set up under the State Council to oversee environmental protection. In a move to boost productivity among China's industries, government officials have relied on regulatory controls (for example, requiring construction and expansion projects to include an environmental evaluation, and imposing more comprehensive and stringent emission standards) and economic instruments (Ross and Silk 1987). Large industries such as metallurgy and energy have been obligated to pay heed to environmental control, yet a tremendous amount of effort remains.

In choosing a model of economic development in the early 1950s, the Chinese Government sought an overall strategy for large-scale industrialization. Heavy industry, particularly steel, was emphasized, with little regard given to environmental conditions when deciding where to locate industrial facilities. By the mid-1970s, industrial pollution became so serious in China that some efforts were made to arrest it, leading to the drafting of the nation's first environmental laws. In a survey conducted in China between 1985 and 1987, a majority of China's factories were found to have annual total discharges of 8.9 million tonnes of organic pollutants and 3,790 tonnes of heavy metals like mercury, cadmium, chromium and lead (*China Daily*, 19 April 1988), as much as 90 per cent of which is dumped into rivers and seas.

#### 8.2 Environmental Trends

In recent years, numerous mineral and metal mines have been developed and brought into production in China. These mining activities have inevitably created environmental effects. Once a mine is opened, the existing soil layer and rock strata are disturbed, breaking up the land surface and exposing a greater surface to erosion. Major environmental damage is evident at most large- and medium-scale mines in China, as well as at small-scale mining operations worked by private and peasant miners. More than 120,000 small mines operated by farmers exist in China, accounting for one-third of the nation's total metals output. Unfortunately, farmers' mining in many areas has done serious damage to local mineral resources and ecosystems, as well as to the farmers' own safety. Some farmers have caused astonishing destruction and waste of the total natural environment by ignoring relevant laws and normal mining practices.

According to the *China Legal Journal*, rampant mining by peasants often threatens the health and safety of neighbouring residents because of randomly discharged wastewater, gases and residues (*China Daily* 29 June 1987). Peasants invest virtually nothing in environmental protection. Normal production at state-run mines is often affected by indiscriminant mining, and surrounding areas are commonly polluted. Indiscriminate gold panning in major rivers in Gansu Province, for example, has caused serious soil erosion and pollution (*China Daily* 9 July 1987). The gold mines, operated by more than an astounding 40,000 people, have also damaged vegetation, posing a direct threat to agriculture and human life.

Although peasants are often blamed for causing severe environmental damage in China, much of the nation's minerals industry, including state-run mines, is guilty of excessively damaging the environment. For example, a survey in Yunnan, Guizhou and Sichuan provinces in 1985 showed that the refining of sulfur was causing serious ecological damage,

leaving areas of barren hillsides. The industry's total output value was only 50 million yuan, but the damage has been valued at 100 million yuan (*China Daily* 26 October 1985).

A major question regarding environmental pollution and China's mining industry is whether or not problems resulting from pollution will seriously impede increased mining development in the future, particularly beyound the year 2000. Without a doubt, China has enormous environmental problems that threaten its ambitious modernization programme. A recent health study revealed that cancer and respiratory illnesses are among the leading causes of death in China. Since coal is the major fuel used in most places in China, it is the leading contributor to the growing sulfur dioxide levels in the atmosphere. Efforts are now underway by the Chinese Government to develop adequate environmental protection strategies to tackle the deteriorating Chinese environment. The focus of a just-completed government research study was the effects of long-term, low-level exposure to pollutants on humans, especially on their possible links with the incidence of cancer and heart diseases (*China Daily* 16 October 1986).

## 9. Conclusions and Recommendations

China today allows various kinds of investment forms, but prefers equity joint ventures, especially export-oriented ones. The three-year fiscal austerity programme added to uncertainty and confusion about China's Government and overall political stability, yet investment levels remain high. In 1990 and again in 1991, the Chinese Government emphasized that it would remain committed to open-door policies. In this regard, China devalued the renminbi on 17 November 1990 by 9.57 per cent against most major foreign currencies. This came just under one year after the 21.2 per cent devaluation in December 1989. Reportedly, the Chinese authorities had weighed the potential benefits that devaluation could provide in boosting exports and dampening imports against the risk that it would hamper their efforts to reduce the rate of inflation (Lee *et al.* February 1991). Since China eventually proceeded to devalue its currency without waiting for inflation to ease, the move was viewed by many analysts as a signal that the current leadership considers it critical to maintain an open economy. Amendments in 1990 to the 1979 joint-venture law further suggest that the Chinese Government still adheres to an open-door philosophy.

To further develop China's mining industry, the Chinese Government has encouraged foreign investment and participation in domestic mineral projects. The industry has, however, had a particularly difficult time stimulating foreign investor interest, despite strong efforts. This has occurred because of many factors. Initially, there is a general uncertainty about the nature of the mineral deposits in China. Much of the literature in the Western press claims that mineral deposits in the nation are, in general, of lower grade and smaller than similar types of deposits elsewhere in the world. Some geologists dispute this perception as being based on definitional differences between mineral reserves in China (industrial and prospective) and reserves in the West (conomic and inferred). Secondly, foreign investors are generally disappointed at the lack of adequate and reliable information provided by Chinese authorities on tonnages and grades of prospective mineral deposits. The information that is made available is often confusing because the methods by which the figures are computed are not defined. When describing mineral (or energy) reserves, Chinese literature needs to define the ways in which such reserves were computed (that is, sectional reserve computation versus krieging) and what in fact a reserve in China is,

Several other perceptions about China's mining industry also concern investors interested in mineral projects. One such perception is that minerals development has been and will continue to be limited to the east (which in this case is defined as those areas of China east of a line running between Lanzhou, Gansu and Kunming, Yunnan). It is estimated that as much as 90 per cent of the minerals and energy output of China comes from the more populated, more industrialized east. As a result, foreign investors tend to feel that it may not be worthwhile to invest in mining projects in western China because of the lack of infrastructure and general lack of encouragement by the Chinese Government to invest in the region. Indeed, by way of financial incentives and numerous investment laws, the Chinese Government facilitates investment into the special economic zones and open coastal cities but restricts investment into remote regions of the country where sufficient mineral deposits occur.

Despite the uncertainties surrounding China's political and legal environments, mining companies interested in establishing a long-term market position in China should pursue investment today. China's enormous geological potential will eventually offer substantial opportunities for joint-venture investment, particularly in the production of advanced technology and modern equipment for nonferrous metal excavation; the conservation of energy and technical innovation in aluminium technology and equipment; the recovery and comprehensive utilization of copper, aluminium and other base metals; processing of nonferrous metal products; smelting of heavy metals rich in oxygen; the application of microcomputers in production and management; and new techniques in mining, such as block caving and cemented cut-and-fill. Company strategists cannot ignore the large size and growth potential of China as a producer and consumer of mineral commodities. Firms are therefore advised to establish a limited presence in China, the world's largest market, while developing China expertise and gaining experience in the way business is done in China.

As China strives to increase its foreign investment base in the 1990s, the principal investment partners will continue to be Asian. Companies interested in pursuing business opportunities in China's mining industry will need to remain flexible and patient and must attempt to understand not only the industry but the often confusing bureaucratic system. The planned expansion and modernization of China's minerals sector will require a tremendous influx of foreign technology and financing. Firms that are able to establish a successful track record today in China may be able to reap more substantial rewards in the long term.

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## Appendix A., Table A1. Special economic zones and open cities in China

	Year			
Economic indicator	1985	1988	1985-88 annual change	
China GNP (billion yuan)	856.8	1,385.3	17.4%	
GNP index	187.8	251.0	10.2%	
Gross industrial production <sup>a</sup> (100 million yuan)				
4 SEZs	96.96	259.73	38.9%	
14 open cities	2,015.85	2,924.87	13.2%	
China foreign investment (100 million US \$)	16.61	31.93	24.3%	
4 SEZs	3.2	4.29	10.3%	
14 open cities	3.02	6.81	31.1%	
Exports (100 million yuan) Export procurement (100 million yuan)	808.9	1,767.6	29.8%	
4 SEZs	8.48	34.1	59.0%	
14 open cities	190.73	402.77	28.3%	
4 SEZs export procurement/China export	1.0%	1.9%	22.5%	
14 cities export procurement/China export	23.6%	22.8%	-1.1%	
4 SEZs DFI/total DFI	19.3%	13.4%	-11.3%	
14 cities DFI/total DFI	18.2%	21.3%	5.5%	

#### <sup>a</sup> 1980 price.

Note: Foreign trade figures are based on China's customs statistics.

Source: State Statistical Bureau, 1985-1989, Statistical Yearbook of China, various issues (Chinese and English versions).

## India: A Summary of Mineral Investment Conditions

## 1. Background Information

## 1.1 Economy

Pandit Jawaharlal Nehru, founder (Prime Minister) of modern India, had a vision of national growth through a continuous increase in industrial and agricultural production. An industrial policy was introduced in 1948. The policy was comprehensively revised and adopted in 1956. This policy was modified further in 1973, 1977, 1985, 1986 and 1991 to suit the objectives of the then current governments. The overall attitude of the government has been aimed at minimizing the economic and social disparity among the people. In a bid to do justice to this socio-economic goal, the government took certain socialist steps to alleviate poverty, but in no way can the Indian economy be defined as a purely socialist one. However, corporate planning and management of the core-sector industries are dictated by the Government of India. These industries serve many socio-economic purposes of the government, and although competition is encouraged among all such public sector companies, their objectives are wider than profit alone. At present, the gross national product of India is in the region of US \$350.00 per capita.

In the current year (1991/92), partial privatization is being considered by the present government in order to elevate productivity. In addition, a new, free and liberal industrial policy has been established to attract world investment in many sectors. However, there are eight industry categories, as follows, that are reserved for the public sector (to be run by the central federal or state governments; Government of India 1991).

- \* Arms and ammunition and allied items of defence equipment, defence aircraft and warships
- \* Atomic energy
- \* Coal and lignite
- \* Mineral oils
- \* Mining of iron ore, manganese ore, chrome ore, gypsum, sulphur, gold and diamonds
- \* Mining of copper, lead, zinc, tin, molybdenum and wolfram
- \* Minerals specified in the schedule of atomic energy (control of production and use order, 1953)
- \* Railway transport

The production of minerals requires compulsory industrial licensing.

The mining of mineral resources belongs to the core sector, and core sector industries are always given high priority as a policy matter of the government. Strategywise, in order

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to build up the backbone of the nation, mineral industrialists are given due importance because they belong to the core sector.

The basic framework of modern India was built in the pre-independence era, when the governing language was English, which was made the official language for business affairs. After independence, the government undertook to popularize Hindi in business affairs, but in reality English is still likely to remain the major language of business.

The Indian industrial policy, introduced in 1948, has been modified from time to time. However, the most significant modification is of 24 July 1991, when the policy became more liberal with regard to foreign investment, imports and exports.

Every government has aimed at minimizing the financial disparity among the different classes of people. To further this objective, there are eight types of industries reserved for the public sector, including most of the major mineral industries. An industrial license is mandatory for producing 18 different commodities, with coal and lignite, petroleum and other crude oils topping the list. Identified as a core sector, mining of mineral resources receives special importance.

#### 1.2 Infrastructure

In India, all modes of transport (roadways, railways, airways and waterways) are used. The Indian road network is one of the largest in the world but is comparatively expensive to use. The total road length in India at the end of 1984/85 was 1,772,000 kilometres (Malual Manorma 1990). From an economic viewpoint, rail transport is resorted to whenever possible. Over short distances, aerial ropeways are preferred to conveyor belts. The latter are most popular over short stretches of uneven terrain, especially where continuously uninterrupted supply is desired. For mineral transportation, waterways are hardly in use within the country, but sea freight is the only mode of conveyance for importing and exporting minerals and coal.

The Indian railway system has grown into Asia's largest and the world's fourth largest. In 1986/87, it possessed routes extending 61,810 kilometres. The Indian railways run about 11,300 trains every day, connecting 7,093 stations. During 1986/87, they carried 3,580 million passengers and 307.3 million tonnes of freight traffic (Malual Manorma 1990). Indian railways operate on three gauges: broad gauge, metre gauge and narrow gauge.

India's development is planned in the form of successive 5-year plans. In each of 7 such plans so far completed, a considerable budget was allocated to upgrade and widen the railways. Each annual budget of the government gives special priority to maintaining economy class fares and keeping freight costs to a minimum level.

## 1.3 Past and Current State of the Mineral Industry

#### 1.3.1 Historical Perspective

From 1800-1900 A.D., discoveries of several mineral resources were made and industries reliant on coal, mica, manganese, limestone and minerals were developed in India. Since independence, many other mineral deposits have been discovered in India, with the potential to produce, among others, rock phosphate, uranium and titanium. Mineral-related industries such as cement, steel, aluminium, ferro-alloy, chemicals, ceramics, refractories, fertilizer, rubber, mica and thermal power have been established and are an important part of the overall industrial development of India. (This is neither a comprehensive nor a complete list of mineral-related industrial activities.)

Mining activity for various mineral resources is spread over more than 8,000 square kilometres, with a total area of 3.276 million square kilometres, though the mineral deposits are found in a much larger area. The present and possible future production levels of major Indian minerals are as follows (CMPDIL 1984).

	1985	2000		
	(million	tonnes)		
Coal	131.00	400.00		
Iron ore	43.00	70.00		
Bauxite	2.03	9.00		
Lead and zinc	1.30	2.08		

The prominent mineral resources have vast reserves and are expected to last for many years. Their lifespan, based on the 1982 rate of production, is as follows (CMPDIL 1984).

Years of reserves		Years of reserves		
Asbestos	30	Gypsum	1,306	
Bauxite	1,274	Iron ore	439	
Chromite	324	Lead and zinc (concentrate)	4,795	
Coal	1,016	Lignite	504	
Copper	212	Limestone	2,288	
Diamonds	39	Rock phosphate	236	
Dolomite	2,450	Sillimanite	1,000	
Gold	26		-	

#### 1.3.2 Structure of the Industry

The Indian mining industry can be classified into two primary categories: coal mining, including peat, lignite, bituminous and anthracite; and metal mining, to cover all the rest of the mineral resources.

As regards coal mining, until 1971 it was completely under the control of private enterprise except for the National Coal Development Corporation (NCDC), which was a public sector undertaking. Coking coal mines were taken over by the state in 1971. In the infrastructure sector, the private entrepreneur's involvement was no more tenable, and in 1973, with the efforts of the then secretary of the Department of Coal, Ministry of Energy and of the then Prime Minister of India, almost all coal mines were nationalized under the banner of Coal India Limited, a public sector undertaking (*Economic Times* 18 December 1991). Only a few private collieries were allowed to continue in operation; i.e., captive mines exclusively supplying specific industries (*Economic Times*, 18 December 1991).

In the realm of metal mining, there are a number of public sector and private enterprises. Only a few of them deal in the minor minerals such as limestone, diamond, monazite and mica. Presently, gold, lead-zinc and copper are exclusively mined by state enterprises.

#### 1.3.3 Government Policies Relating to Minerals

The development of the country is undertaken on the basis of five-year plans that reflect the policies of the government. There has been a clear division of responsibilities regarding the mining industry. The strategies are taken up by different ministries of the central (federal) government, such as the Ministry of Steel and Mines, the Ministry of Energy, the Ministry of Environment and Forests and the Ministry of Industry. In 1991, the government created the Ministry of Coal and the Ministry of Mines, each with their own respective ministers, and these two ministries have been given a great deal of independence, except where there is obvious overlap with another ministry (for example, iron ore is a responsibility of the Ministry of Steel).

It is the responsibility of the state government to promote mining projects with the aid of public sector and/or private entrepreneurs. The public sector or government enterprises are given priority in the national interest. It is imperative to obtain a license from the Department of Geology and Mining of the concerned state government for prospecting, after which a feasibility report is prepared for approval by the government The nodal agencies of the Indian Government for this purpose are the Indian Bureau of Mines (IBM), Nagpur, Maharastra and the Directorate General of Mines Safety (DGMS), Dhanbad, Bihar. There are many other authorized bodies, such as the Central Mining Research Station, Dhanbad and the National Laboratory for Mining Research and Development, and some educational institutions and private consulting firms that can help prepare the requisite plans and other reports. After obtaining approval from the said departments of the central (federal) government, the concerned state government allows the mining operation to be carried out.

A commonly encountered problem is land acquisition. India has set a high priority on agriculture to achieve national growth. For mining purposes, if any cultivation is hampered, compensation should be ensured in terms of both money and suitable employment for the affected families, depending on the land area occupied. This policy, however, is not uniformly applied in the states within the Indian union.

While mining, constant vigilance over the operation is handled by the Indian Bureau of Mines (IBM) and the Directorate General of Mine Safety (DGMS), as per the Mines Act, 1952 (Act No. 35 of 1952), the Coal Mining Regulation, 1957 and the Metal Mining Regulation, 1968. Mine owners, whether they be private, public or government enterprises, are accountable to DGMS for everything related to safety and to IBM for mineral conservation and policy matters. Any complaint by the mining firm is supposed to be lodged with the local court or tribunal.

In recent years, the Ministry of Environment and Forests has framed more stringent stipulations, and post-mining rehabilitation is gaining importance. In addition to the stipulated requirements, some of the mines run by Neyveli Lignite Corporation and Coal India Limited have begun afforestation programmes. The Central Mining Research Station (CMRS) renders its services to aid the industry to maintain or to upgrade the mining environment.

Other environmental consultants are also available to the industry. All mineral investment projects are by law required to be environmentally acceptable. Before a project may proceed, a clearance must first be obtained from the Department of Environment and Forests of the central government or from IBM depending, on its size and the scale of the potential environmental impact.

The development and conservation of any mineral resource is the responsibility of the central government. However, any state government may develop mining operations on its own (such as the Gujrat Mineral Development Corporation) or with the assistance of any public or private enterprise. Certain strategic minerals like uranium and monazite sands are entirely at the disposal of the central government. In contrast, other minerals such as limestone and granite are developed and exploited mainly by private entrepreneurs. Mineral oil and natural gas are completely in the public sector, but foreign private parties are now welcome to participate on a contract basis. The production of coal is given a high priority but is defined as an essential service to the nation. The present government has shown a positive attitude toward the privatization of collieries if they are run as captive mines of a distinct industry. Foreign investors may be able to avail themselves of these opportunities. In summary, this is the existing policy but it may change in the future.

In the 1991 modification of the industrial policy, the government announced that it will now allow direct foreign investment of up to 51 per cent foreign-held equity in high priority industries. The government stated that there would be no bottlenecks of any kind in the investment process and that clearances would be available if foreign equity covers the foreign exchange requirement for any imported capital goods. Consequential amendments to the Foreign Exchange Regulation Act (1973) have been carried out.

Priority industries, at present, do not include all of the mineral industry but do include earth moving machinery and other industries relating to minerals. However, similar advantages may be available to all aspects of the mineral industry with the prior approval of the Government.

While the import of components, raw materials and intermediate goods and the payment of royalties will be governed by the general policy applicable to other domestic industries, the payment of dividends will be monitored by the Reserve Bank of India so as to ensure that the outflows for dividend payments are balanced by export earnings over a suitable period of time.

Other foreign equity proposals, including proposals involving 51 per cent foreign equity, that do not meet the criteria of the said priority industries, will continue to need prior clearance. A foreign equity proposal does not necessarily have to be accompanied by a foreign technology agreement.

To provide access to international markets, majority foreign equity holdings of up to 51 per cent will be allowed for trading companies primarily engaged in export activities. While emphasis will be on export activities, such trading houses shall be at par with domestic trading and export houses as per the import and export policy.

A specially empowered board will be constituted both to negotiate with a number of large international firms and to approve direct foreign investment in the selected areas. This

is part of a special programme designed to attract substantial investment that provides access to high technology found in the world markets. The investment programmes of such firms would be considered in totality, free from predetermined parameters or procedures.

Automatic permission will be given for foreign technology agreements in specified high priority industries up to a total sum of 10,000,000 rupees. Applicable taxes are to include a five per cent royalty for domestic sales and eight per cent royalty for export sales, subject to total payment of eight per cent of sales over a decade from the date of agreement or seven years from commencement of production. The prescribed royalty rates are net of taxes and will be calculated as per standard procedures. In respect of a project net qualifying as a high priority industry, automatic permission will be given subject to the same guidelines if no free foreign exchange payments are required.

The Monopoly and Restricted Trade Practices (MRTP) Act is to be amended to remove the threshold limits of assets in respect of MRTP companies (CMPDIL 1984).

## 1.3.4 Summary of the Current and Projected State of Affairs

In 1971, India's coking coal mines were nationalized, and in 1973 most other collieries, except a very few captive collieries, met the same fate. As the production targets for the core sector are more or less met, the purpose of nationalization is served. However, the loss incurred by Coal India Limited has steadily increased year by year (*Economic Times*, 24 November 1991). India has found itself unable to continue with the scale of the subsidies required by the public sector. Recently, India has had to accept aid from the International Monetary Fund and World Bank for temporary relief and looks forward to economic reform. The Minister of Energy is of the opinion that the management teams in charge of these state companies are responsible for the losses, and thus the government has given serious thought to privatizing at least part of the industry (Mukherjee 1978).

Tata Iron and Steel Company has shown some interest in taking a long-term lease on the property controlled by Bharat Coking Coal Ltd. (Coal India Limited) and hopes to make a profit from the operation (Mukherjee 1978). However, mineral industries are mostly reserved for the public sector, which emphasizes a "no profit, no loss" objective in a bid to render socio-economic services to the nation. Small-scale entrepreneurs are encouraged, at least to some extent, in order to alleviate unemployment.

## 2. Geological Potential

### 2.1 Description of the Geology

#### 2.1.1 General Mineral Abundance

A metallogenic province corresponds to a region where a particular mineral resource has been formed as the result of mineralization during one or more metallogenic epochs. In India, the following six metallogenic provinces have been identified (Sachedev 1991).

- \* Iron ore of Singhbhumi, Keonjhar, Mayurbhanj
- \* Gonditic manganese ore of Madhya Pradesh
- \* Koduritic manganese ore of Andhara Pradesh

- \* Lateritic manganese of Singhbhumi and Keonjhar
- \* Copper ore of Singhbhumi
- \* Gold ore of Karnataka

#### 2.1.2 Geographical Distribution of Mineral Potential

Asbestos: High grade chrysotile asbestos occurs in Cuddapah district, A.P. Lowgrade amphibolite asbestos occurs in association with tremolite-actinolite and arthophyllite in the Holenerisapur schist belt of Hassan (Karnataka), Maharashtra, Bihar and Orissa.

*Bauxite:* Bauxite ore occurs along the flat-topped hilly regions of Maharashtra, Tamil Nadu, M.P., Bihar and Karnataka and is well situated for development. The deposits are located in a warm humid climate with well-distributed, sufficient rainfall during the whole year. Most deposits allow for proper drainage. Bauxite deposits of good quality and quantity occur near Katni, Jabalpur, Surguja, Jashpur, Bilaspur, Mandle, Kolhapur, Belgaum and Ranchi.

*Chromite:* Chromite ore occurs along ultrabasic intrusives distributed in Sukhinda of Keonjhar district (Orissa), Joda of Singhbhumi (Bihar), the Sitampundi complex in Salem (Tamil Nadu) and serpentenized ultrabasic (Karnataka). It occurs in lenticular veins of shallow depth.

*Coal:* The major coal fields are confined to certain river valleys such as the Sone, Damodar, Wardha, Godavari and Pench-Kanhan along Upper Gondwana strata. Coking coal is confined to deposits in Jharia and Raniganj in the states of Bihar and West Bengal, respectively. Noncoking coal deposits with good blending characteristics are widely distributed in various coalfields controlled by Coal India Limited, Tata Iron and Steel Company, Indian Iron and Steel Company, Damodar Valley (Power) Corporation, Singareni Collieries Company Ltd. and Neyveli Lignite Corporation Ltd. Some 80 to 90 per cent of India's coal is produced by Coal India Ltd., which has eight subsidiary companies throughout the country that plan and operate coal mines.

*Copper:* The major copper fields are located in Mosabani of Singhbhumi district in Bihar; Khetri, Babi and Singhra districts of Rajasthan; and Malanjhakhand in Madhya Pradesh state. In Sikkim along the Rangpo Valley, valuable copper ore bodies occur in association with metamorphic rock belonging to the Daling series. In M.P. near Jabalpur, it occurs in the form of low grade veins in dolomitic limestone. All the copper fields are associated with ancient metamorphic rock, and copper ore occurs in the form of veins or stringers or is disseminated within the country rock.

*Diamond:* The major diamond fields are confined to kimberlitic pipes along Manjhgawa in Rewa district of Madhya Pradesh and in the Wajrakarur area of Anantpur district of Andhra Pradesh. Workable diamond deposits are located in the Manjhgawa area and its adjoining Panna district in M.P. Kimberlitic pipes have also been discovered in the jungles of Mirzapur in Uttar Pradesh.

Gold: The Kolar gold field of Karnataka is confined to Precambrian quartzite, where the gold deposits occur along veins. Gold-producing mines include the Champion Reef, the Oorgaon, the Nundydroog and the Hatti. Minor quantities of gold are also reported in placer deposits along Archean country rock in Madhya Pradesh, Chhota Nagpur in Bihar, Assam, Uttar Pradesh and Jammu and Kashmir. After South Africa, the Kolar mines are the deepest gold mines in the world.

*Gypsum:* About 90 per cent of India's gypsum is found in Rajasthan and was formed during the Permotriassic metallogenic epoch. The remaining gypsum deposits are scattered in Gujrat and Tamil Nadu.

Lead and zinc: Rajasthan State has almost a monopoly in the production of lead-zinc ore. Principal minerals such as galena and sphalerite occur as disseminated and replacement bodies in dolomitic limestone of the Aravalli period. The ore-producing centres are distributed at Zawar and Rampur Agucha in Rajasthan and at Salideepura and Agnigundala in Andhra Pradesh.

*Limestone:* Extensive deposits of limestone are confined to Vindhyan strata exposed in some valleys in Uttar Pradesh, Madhya Pradesh and Bihar; the Bhima Valley (Karnataka, Maharashtra); and the Shillong Plateau (Meghalaya). Limestone also occurs in other states such as Rajasthan and Haryana.

*Rock phosphate:* About 70 per cent of India's rock phosphate is produced from the Jhamarkotra area of Udaipur district (Rajasthan), where it is associated with a Precambrian marine environment and enriched by stramotolite in dolomitic limestone strata. Other rock phosphate is produced at Mussoriee and Lalitpur, U.P. and Jhabua, M.P.

*Talc and soapstone:* Talc and soapstone occur in the form of bands, lensoid veins and small patches in low-grade metamorphic rock and ultrabasic intrusives. High-quality talc and soapstone are mined in Jaipur, Udaipur (Rajasthan), Koderma (Bihar) and Jabalpur (Madhya Pradesh) and from small pockets found in Orissa and Karnataka.

## 2.1.3 Gelogical Potential for Target Minerals

*Bauxite:* India has total bauxite reserves of 250 million tonnes. In 1985, it produced 2.03 million tonnes of bauxite. The bauxite is the product of rock decomposition by the hot and humid climate.

*Beach sand:* Beach sand contains ilmentite (lithium) and rutile. India has one of the largest deposits in the world, with a total reserve of 350 million tonnes. Occurrences are mainly confined to Quilon district of Kerala and Kanyakumari district of Tamil Nadu, but some small patches also occur in Ratnagiri district of Maharashtra and Ganjam district of Orissa.

*Coal:* India has identified reserves of coal pertaining to Gondwana and tertiary formations. Reserves are indicated by depth. Some 31,386 million tonnes have been identified, as of 1 January 1991, at depths of less than 300 metres, and 192 billion tonnes at depths of less than 1,200 metres (Sachedev 1991). The following data reflect coal production by Coal India Limited.

	Productio	n (m. tonnes	3)	Productivity (tonnes)			
Year	Underground	<b>Open-Cast</b>	Total	Underground	<b>Open-Cast</b>	Total	
1989/90	59	120	179	0.55	3.08	1.21	

This production was to increase to 187 million tonnes in 1990/91.

*Dolomite:* India has vast reserves of dolomite, distributed in Rajasthan, Orissa, Madhya Pradesh and Maharashtra.

*Iron ore:* It is estimated that 25 per cent of global iron reserves occur in India. The identified reserves, including the combined Noamandi and Goa ore complex, total about 21,000 million tonnes. Most iron ore is confined to hematite in association with banded ferruginous quartzite and magnetite. Other important areas with iron ore are Kundermukh (Karnataka), Bailadila and Rajaharra (Madhya Pradesh) and Sundergarh and Mayurbhanj (Orissa).

## 2.1.4 Minerals of Exceptional Interest

*Manganese ore:* India is the world's second to third largest producer of manganese ore. The total estimated reserve is 101.6 million tonnes, containing a mixture of psilomelane and pyrolusite minerals. Three modes of mineralization are found, namely, gondites, kodurite and lateritic, and deposits are widely distributed at Bhandara, Balaghat, Chinddwara and Nagpur (Maharastra); Singhbhumi (Bihar); and Keonjhar, Bonai, Bolangiri and Mayurbhanj (Orissa).

*Mica:* India is fortunate to have the world's largest and best grade of mica, in the form of muscovite. Muscovite occurs as the primary constituent in quartz mica pegmatite, along with metamorphic schistose rock with a lenticular shape. Mica occurs in three major belts, namely, Bihar, Rajasthan and Andhra Pradesh. Phlogopite mica occurs in Kerala and Tamil Nadu.

*Silica sand:* Silica sand of 100 per cent purity occurs at and near Shankargarh in the district of Allahabad (Uttar Pradesh).

*Sillimanite:* India possesses one of the largest deposits of sillimanite in the world, with reserves of 35,100 tonnes, occurring at a depth of less than 10 metres. At the current rate of production, reserves will last for the next 1,000 years. Occurrences are confined to the Khasi Hills of Meghalaya and in Pipra of Madhya Pradesh, and the mineral is associated with corundum. The Meghalaya sillimanite is unique and does not require any beneficiation.

*Kyanite:* India possesses extensive reserves of kyanite and mines one of the largest deposits in the world. Occurrences are mostly confined to Lapsa-Buru and its surroundings in Bihar.

## 2.2 Ability to Apply Geological Assessment Techniques

The Geological Survey of India and Mineral Exploration Corporation Limited are the two national organizations exclusively devoted to the discovery of new deposits and their quantification. State departments also play an important role. India has the ability to apply the following geological assessment techniques in order to better understand its mineral resources: airborne surveys, geophysical surveys, geochemical surveys, remote sensing and drilling and field surveys. The role of the private sector in exploration has been small since the nationalization of most mines in the early 1970s.

## 2.3 Availability of Geoscientific Information

The following types of geoscientific information are readily available from the indicated source.

1.	Topographic maps	Survey of India, Dehra Dun, (U.P.)
2.	Geological maps	Geological Survey of India, Calcutta (West Bengal)
3.	Aerial photo coverage	Air Wing Survey of India, New Delhi; Na- tional Remote Sensing Agency, Hyderabad; and Air Survey Dum-Dum, Calcutta
4.	Airborne geophysical information	Airborne mineral survey wing of GSI, Bangalore; Atomic Mineral Division, Hyderabad
5.	Geophysical information	National Geophysical Research Institute, Hyderabad
6.	Geochemical information	GSI regional offices; Centre of Earth Science Study, Trivendrum
7.	Geological reports	Journal of Geological Society of India, Bangalore; Centre for Advanced Study at Sauger University; Jadavpur University; IBM reports; annual reports of various government undertakings engaged in the mineral industry
8.	Information on mineral resources on the seabed	National Institute of Oceanography, Goa

#### 2.4 Government Institutions

Exploration for mineral resources lies almost exclusively in the hands of the following institutions.

Geological Survey of India, Calcutta Indian Bureau of Mines, Nagpur Mineral Exploration Corporation Ltd., Nagpur National Mineral Development Corporation, Hyderabad Central Mines Planning and Design Institute Ltd., Ranchi National Institute of Oceanography, Goa National Geophysical Research Institute, Hyderabad National Natural Resource Management System, Indian Space Research Organisation, Bangalore In addition, exploration of strategic minerals is entrusted to the public sector companies responsible for their exploitation.

## 2.5 Summary

India is almost self-sufficient in mineral resources. Deposits are distributed throughout the country. With time, more and more difficult mineable reserves will need to be developed to maintain self-sufficiency. There are a number of major minerals with extensive reserves, including bauxite, asbestos, limestone, rock phosphate, talc, soapstone, dolomite, mica, sillimanite and kyanite, that enjoy large markets but which are not reserved for the public sector under the current industrial policy. In fact, most mining of minerals, like mica and others, is already being done by the private sector at least on a limited basis.

In India, all standard techniques for geological assessment are now being used. Some mineral-related companies, like Computer Maintenance Corporation, have endeavoured to create geostatistic modelling packages and other allied services. Geological data are centralized and available from several government agencies. The Geological Survey of India and Mineral Exploration Corporation Limited are the main agencies responsible for this information, but state government departments and others also play an important supporting role.

## 3. Marketing Considerations

## 3.1 Geographical Location in Relation to External Markets

India is relatively distant from world markets in Europe, North America and the Pacific Rim. However, shipping lines connect Indian ports with ports worldwide.

## 3.2 Market Review

A very brief review has been made for 11 minerals that are mined in India. In addition to the world market, India itself provides a ready internal market for many minerals.

*Bauxite:* India has extensive bauxite deposits, which can be developed to support the aluminium industry. Sri Lanka, Bahrain and Kuwait are among the main buyers of Indian aluminium.

*Beach sand:* Ilmentite, which occurs in beach sand, is a major mineral export commodity and an important source of foreign exchange. Indian beach sand is exported to the United Kingdom, the United States of America and Japan. It is used primarily in the paint and welding industries.

Coal: Indian coal is exported to Pakistan, Nepal, Myanmar and Sri Lanka.

Gypsum: India uses its gypsum production for its general requirements, principally in the fertilizer and cement industries.

*Kyanite:* India is the largest producer of kyanite in the world. It is exported to the United Kingdom, Italy, France and the United States of America. It is mainly used for the manufacture of industrial refractories.

Lead and zinc: India is self-sufficient in lead and zinc.

*Limestone:* India has vast reserves of limestone, which is useful in the cement and steel industries. India consumes limestone in the form of calcium carbonate soda-ash and caustic soda, as bleaching powder and in forms used by the chemical industries.

*Manganese ore:* India is ranked third in the world regarding the production of manganese ore. Indian manganese ore is exported to the United Kingdom, Germany, the Netherlands, Belgium, France, Japan and the United States of America. Manganese is used in the ferromanganese industry.

*Mica:* India is the largest high grade mica producer in the world. Most mica produced in India is exported to the United States of America, the United Kingdom, France, Germany, Italy and Japan. The export quality mica has various grades such as superfine, clean, fair stained, good stained, poor stained, mica spillting and waste. Mica is used by the steel, refractory and electrical industries.

*Sillimanite:* India has the largest deposit of sillimanite in the world. It is exported to Germany, Italy, Thailand and Belgium. It is used by the alumina refinery industry, the cement industry and the glass industry. In addition, it is consumed by the oil refining, steel making, tar, metal treatment and chemical industries.

*Soapstone and talc:* India exports soapstone to Australia, Germany and the Netherlands. It is used in the manufacture of paint, cosmetics and rubber.

#### 4. Mining Law

#### 4.1 Laws and Agreements Pertaining to Exploration and Mining

The main national laws and policies under which mineral exploration and exploitation are carried out are listed below.

- 1. Mines Act, 1952
- 2. Mines Rules, 1955
- 3. Mines and Metals (Regulation and Development Act), 1957
- 4. Coal Mines Regulation, 1957
- 5. Minerals Conservation and Development Rules, 1958
- 6. Land Acquisition (Mines) Act, 1885
- 7. Petroleum Concession Rules, 1949
- 8. Payment of Wages (Mines) Rules, 1956
- 9. Mineral Concession Rules, 1960
- 10. Metalliferous Mines Regulations, 1968

Besides the requirements embodied within the above laws, large-scale mineral development must be cleared by the Department of Environment and Forests. In the case of small mines, the Indian Bureau of Mines must first consent before mining begins. The pollution rules and acts must be complied with.

Only the major laws are listed above. The year in which each came into force is given, but most have been amended to keep them up to date.

#### 4.2 Major Features of the Existing Legislation/Agreements

All minerals are state owned and are leased out to parties for exploration and exploitation. Once the lease period is over, the land, which must be rehabilitated, belongs to the government. Normally, these pieces of legislation are not applicable to the minor minerals such as building stone, gravel, ordinary clay and ordinary sand. In the case of strategic minerals, a prospecting license and mining lease are not granted to anyone by the local state government without the prior approval of the federal government.

### 4.2.1 Ownership of Minerals

The complete ownership of any mineral resource vests in the central government; however, the minor minerals lie in the jurisdiction of the local state government.

The central government many ask any concerned state government to refrain from issuing a prospecting license and/or mining lease to any party. The affected party cannot resort to any legal court with a complaint of interference from the central government. Development and conservation of minerals are the duties of the central government, which may frame any rule, as and when required.

#### 4.2.2 Exploration

Geological maps are available from the Geological Survey of India. In consultation with the concerned state geology and mineral development department, an area is selected for exploration.

A certificate of approval in the prescribed form from the concerned state government and a recent income tax clearance certificate are required before exploration may commence. As per the Company Act, 1956 the public company must show that Indian directors hold 51 per cent of the share capital and fulfil the citizenship requirement in the Mines and Metals (Regulation and Development) Act, 1957. However, the Industrial Policy of 24 August 1991 has indicated a great deal of flexibility for foreign investors.

In considering an application for a prospecting license, the government assesses the financial ability, technical strength and past experience of the applicant.

An entrepreneur may undertake prospecting on 25 square kilometres under one or more licenses. The prospecting license remains valid for a period of one year for mica and two years for other minerals.

#### 4.2.3 Security of Tenure

The allotment of a mining lease is not a function of the prospecting done by any entrepreneur, but the latter reserves the preference to others or else the lease is granted on a first come, first served basis, provided other criteria permit.

While prospecting, prospectors usually sort out the problem of land acquisition with the concerned state government as per the Land Acquisition Act, 1885.

When the feasibility report is completed, a gestation period begins, which is concluded with the attainment of the target production for the first phase of mining. This period is commonly around two years for open-cast mining and eight years for underground mines using conventional boards and pillars.

Either the central (federal) government or the state government, in prior consultation with each other, is empowered to prematurely terminate any mining lease.

## 4.2.4 Mining

As regards ownership of minerals and eligibility of entrepreneurs, the same is applicable to mining as was true for exploration (see 4.2.2).

The maximum area of a mining lease is 25 square kilometres, unless the central government specifically grants an exception for the benefit of mineral development.

The duration of a mining lease for coal, iron ore or bauxite is up to 30 years, and the lease can be renewed for a like period. The duration of mining leases for other minerals is 20 years, and a lease may be renewed for a like period.

In the case of strategic minerals, prior consent by the central government is required before a lease can be renewed.

Minor minerals vary in occurrence and importance from state to state, and hence they are handled by the local state government.

Laws are firm and are strictly followed, but no company suffers from their enforcement.

## 4.2.5 Ownership and Control

The industrial policy of the present government allows 51 per cent foreign investorheld equity shares in specific high priority industries, such as the earth moving machineries industry, without prior government approval. Majority foreign ownership in other industries is also possible but only with the prior permission of the government (Government of India 1991).

In the present scenario, foreign investors can maintain a reasonable amount of management control.

### 4.3 Administrative Efficiency

Under the new policy, the investment climate has completely changed and India is now advancing toward an open market system of doing business. Government and bureaucratic delays have been significantly cut under the new (1991) rules for investment. By and large, government officers are very helpful and cooperative, and there is hardly any political interference.

## 5. The Fiscal Regime

#### 5.1 Description of Major Taxes

Like other governments, India levies a variety of taxes on mining projects. At the present time, the fiscal system is in a state of transition. Under the new (1991) industrial

policy, many fiscal incentives may be granted to foreign enterprises investing in India. However, the details regarding these fiscal incentives are not yet available. The feeling, in general, is that the tax policy is going to be pro-investment.

A mineral royalty tax is levied by the state governments, based on the structure laid down by the federal government. The holder of a mining lease has to pay periodic royalty taxes to the government at the rate given in the relevant schedule or pay a dead rent, whichever is higher. The state government is not entitled to increase the rate of royalty for any mineral more frequently than once in four years.

## 5.2 Ability to Predetermine Tax Liability, Stability of Fiscal Regime and Tax Treaties with Other Nations

Given the policy changes now taking place in India, it can be expected that the mineral sector fiscal system will undergo change in the near future. By and large, there is a sound fiscal system in India and information about it is generally available. The government is now introducing liberal policies to attract foreign investment in most of the industrial sectors.

## 6. Monetary Control and Access to Capital

## 6.1 Foreign Exchange

The introduction of the new (1991) industrial policy has opened the door to foreign investment and partially addressed prior problems relating to foreign exchange controls. The details of the new policy on foreign exchange controls are now in the process of being developed by the government.

#### 6.2 Access to Capital

There is free access to capital, both internally and externally. By and large India now has a completely changed industrial climate, with both free market and liberal investment policies. Foreign investment is now welcomed, and tax concessions will become available.

## 7. Environment

## 7.1 Legal Requirements for Environmental Protection

The preceding two decades have witnessed the enactment of a number of pieces of legislation related to the environment. Important among these are the Water (Prevention and Control of Pollution) Act, 1974; the Water (Protection and Control of Pollution) Cess Act, 1977; the Air (Prevention and Control of Pollution) Act, 1981; the Environment (Prevention) Act, 1986; the Forest Conservation Act, 1980; the Wildlife Protection Act, 1980 (Malhotra Bros. 1990); the Public Liability Insurance Act, 1991; Directorate General of Mines Safety circulars on noise, respirable dust and miners' health; and the revised Mines and Metals (Regulation and Development) 1957, with amendments in 1987 covering environmental issues in mineral development.

The Ministry of Environment and Forests serves as a focal point for the planning, promotion and coordination of various environmental programmes. The main bodies implementing these acts are the central and state pollution control boards. All major projects require clearance from central and state pollution control boards.

#### 7.2 Environment Trends

Awareness about environmental issues is growing among the people living in and around the mining areas. However, there is no organized antimining group in India. Central and state pollution control boards take care to protect the environment.

An environmental management plan (EMP) is required to be formulated on the basis of a rapid and exhaustive environmental impact assessment, which must address all the major environmental attributes, including the collection of baseline data.

There is no reclamation act existing at this time. Environmental clearance for major mines is granted by the Ministry of Environment and Forests through its Environment Assessment Committee on mining projects. Environmental clearance for small mining projects is done by the Indian Bureau of Mines.

There is growing expertise regarding the ability to predetermine environment-related obligations, and environment management cells are being created in each of the mining organizations for this purpose.

Regional centres of the Ministry of Environment and Forests are being built up to check that projects are in compliance with legal requirements that further a healthy environment.

#### 8. Local Services and Labour Market

#### 8.1 Availability of Local Services

With the growth of the mineral industry in India, a number of small and medium-scale mineral industries developed to provide good local support for fabrication and maintenance. For mineral analysis, government-assisted laboratories are suitably located.

## 8.2 Labour Market

The local workforce is plentiful, especially to fill unskilled and semiskilled jobs. The cost of local labour is reasonable. After obtaining a work permit from the government, expatriate staff can work without problems.

Labour unions are rather strong in India. In certain areas the unions can be very strong and are duly recognized by the government. The Ministry of Labour, the Ministry of Welfare and the Ministry of Health and Family Welfare have formulae and guidelines for labour welfare. On the whole, the unions are quite cooperative.

## 9. Conclusions and Recommendations

Since independence, India has defined its objectives clearly, but every new government tries to achieve these objectives in some novel way and hence the strategies alter. This study is based on the current policies. The present government has taken over only recently, and the financial situation of the nation demands its constant attention. Emphasis is now being placed on major economic reforms and restructuring, which will be reflected in the annual budgets and the eighth five-year plan (now in preparation). It may be necessary for the government to revise the conditions for mineral investment in India periodically, say every 5 years. Rules on the minor minerals are framed by the state and hence vary from state to state. Information on strategic minerals is not generally available in publications.

From a foreign investment viewpoint, the present Indian situation is more favourable than ever before since independence. However, with respect to the mineral industry, it is difficult at this time to say whether the country will be offering terms and conditions generally attractive to the world mining community. What is clear is that the door to foreign investment has been opened. The details still need to be fully developed.

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## Indonesia: The Effects of a Transparent Regulatory System on Foreign Mineral Investment

## 1. Introduction

Indonesia has been successful in attracting the interest and capital of the international mining industry. Of the developing nations in the Asia-Pacific region there is probably no other nation that has been as successful in this regard as has Indonesia. This is fairly remarkable considering that Indonesia nationalized foreign-held mining in the late 1950s and still does not allow direct foreign ownership of mineral deposits.

The government has developed a contractual system whereby foreign investors can participate in all stages of the mineral development and exploitation process. The contract of work and its sister agreement for coal development are increasingly used as models by other mineral-rich developing nations.

The government regulatory system has evolved over time and this has been reflected in a succession of different "generations" of agreements. The appraisal of the contractual system that follows is not based specifically on any one generation of contract, although many examples are drawn from the fourth-generation agreement, but rather reflects an analysis of the government's approach to certain issues that are key to the investment decision-making process.

The Indonesian approach to mineral sector regulation is complex, and a full development of its many facets is beyond the scope of this study. For those desiring a more complete description, a short bibliography of key papers and laws has been included.

In making a decision to invest in a given nation, a mineral sector investor will consider many factors. This paper identifies and discusses some of the more important factors that potential investors may look at in their appraisal of Indonesia.

## 2. Background Information

## 2.1 National Profile

#### 2.1.1 Political Environment

The Indonesian political system has been remarkably stable for the past twenty-five years. With the exception of a few easily identifiable areas, local insurgency is not a problem. Indonesia is on fairly good terms with its neighbours and is not subject to any economic sanctions that would negatively affect the minerals industry. On the whole, most mineral companies probably view the political situation as favourable for mineral investment.

This paper was prepared by James Otto, Assistant Director, Centre for Petroleum and Mineral Law and Policy, University of Dundee, United Kingdom. The views expressed in it are those of the author and do not necessarily reflect those of the United Nations.

## 2.1.2 Geography and Demography

Indonesia is made up of a complex grouping of 13,677 equatorial islands. Some 6,000 of the islands are inhabited. An estimated 179 million people populated Indonesia in 1989. The bulk of the population (108 million) lives on the island of Java. Exploration and mine development in highly populated areas can lead to local opposition, demands for participation in decision making and complex negotiations. A lack of access, infrastructure, resources and a trained local labour force can present problems in sparsely populated areas.

Bahasa Indonesian is the official language although Dutch is commonly spoken. In most areas, Bahasa Indonesian is spoken, but mineral companies working in remote areas having indigenous dialects will probably have to hire local translators. While many senior government officers can converse in English, most mineral companies will find it necessary to acquire staff fluent in Bahasa Indonesian.

Indonesia has a very complex geography and demography. Mineral companies must be prepared to operate in a multicultural, multilanguage situation. Given the complex geography, advance planning may be more involved for first entry firms than that required in many other nations in the region.

#### 2.1.3 Economy

The currency in use is the rupiah. The currency is valued in thousands per US dollar (1,823 rupiah per US \$1 in June 1990). The inflation rate in Indonesia for 1990 was 9.6 per cent. The Bank of Indonesia is the central bank.

Indonesia has a dynamic and predominantly development-oriented economy that has dealt reasonably well with the vagaries of the world economy. Oil, in the early 1980s, accounted for 80 per cent of Indonesia's export earnings. The economy during this period was highly sensitive to oil price fluctuations. In addition, debt servicing became quite costly, in part, due to vacillating international exchange rates. In order to reduce overall dependence on oil revenues, the government policy has been to encourage diversification of the economy, with special emphasis on the development of export-oriented and labour-intensive industries. By 1988/89, non-oil/gas exports had fully offset Indonesia's reduced oil and gas exports, assuming 61 per cent of Indonesia's export earnings. Its main export partner is Japan (67 per cent in 1989; ITN 1990, UNCTAD 1991).

Although Indonesia is resource rich, the gross national product per capita was only US \$555 in 1991 (*Asiaweek* 1991). The low per capita figure reflects, in part, the large population base, which is growing at around 1.8 per cent per year. (*Asiaweek* 1991). Indonesia's natural resources are concentrated in four provinces (Riau, Aceh, East Kalimantan and Irian Jaya). The agriculture sector's share accounted for more than half of the gross domestic product in 13 provinces in the 1970s, but by the mid-1980s agriculture accounted for that share in only four isolated provinces (Bengkulu, Southeast Sulawesi, and East and West Nusa Tenggara; Hill 1989).

Foreign project investment soared from US \$1,076 million in 1984 to US \$8,700 million in 1990 (UNCTAD 1991, Whitaker 1991). Java and Sumatra remain the centre of

economic activity in Indonesia, producing 50 per cent and 32 per cent, respectively, of the gross domestic product in the mid-1980s (Hill 1989).

The mining industry plays only a small role in the Indonesian economy. Mining of non-oil/gas minerals edged up to account for 1.2 per cent of the gross domestic product in 1988, versus 0.8 per cent in 1981. The mineral industry was subjected to negative pressures during the early to mid-1980s. Indonesia's tin, copper, nickel and bauxite markets were affected by the worldwide recession, falling prices and lowered demand. During this time period, one of Indonesia's three large tin producers (PT. Riau Tin) closed down operations, and both BHP and INCO scaled back their Indonesian operations. In 1989, non-oil and gas minerals accounted for 6.6 per cent (US \$1,447 million) of total exports. This level may be difficult to maintain since copper, aluminium and nickel (three of Indonesia's four top non-fuel mineral exports) enjoyed high prices at that time. If Indonesia's resources of coal, gold and copper can be exploited as planned, this would bolster the annual non-oil and gas mineral contribution to the economy by up to an additional US \$450,000,000 (Simatupang 1988, *Statesman* 1991, UNCTAD 1991, Whitaker 1991).

The current economic stability is a result of proactive policies that have been successful in developing a more export-led and labour-oriented economy. Most mineral companies would probably find the Indonesian economy to be a favourable factor in an investment decision. The relatively low inflation rate and the government's ability to implement a longterm, transparent economic policy are particularly commendable.

#### 2.1.4 Infrastructure

There have been enormous improvements in Indonesia's road, air, and sea transportation networks during the last 20 years. In many isolated provinces of eastern Indonesia, a good quality all-year road network barely existed even around major urban centres 30 years ago, and road construction has been given a high priority in central and provincial government development expenditures. The construction of the Trans-Sumatra Highway has had a dramatic effect on population mobility and commerce, especially among the southern provinces, integrating them into the economy of Java as never before. (The well-known fact that any provincial capital can now be reached in a day's travel from Jakarta has obvious implications for commercial – not to mention political – integration.) [Hill 1989]

Countrywide, there are approximately 50,000 miles of roads (Whitaker 1991).

Domestic air transportation is provided by Bouraq Indonesia and Merpati Nusantara. The international services are provided primarily by Garuda Indonesia, but some foreign carriers are allowed limited access. International airports are located near Jakarta, Medan, Denpasar, Surabaya, Manado and Ujaung Pandang (ITN 1990).

Islands such as Sumatra, Kalimantan (Borneo) and Irian Jaya (New Guinea) have extensive inland waterways. There are maritime ports on many of the islands (ITN 1990), but it should be noted that Indonesia has a relatively expensive domestic shipping system (Hill 1989). A modern deep-water coal terminal has recently been built to facilitate coal shipments out of Kalimantan.

Freight rail service is available on Java and to a limited extent on Sumatra.

Domestic telephone service has not yet reached Western standards, but international service, where available, is of a dependable and high quality.

About one-third of the villages in Java and Sumatra are supplied with electricity (*Statesman* 1991). The availability of electricity on the smaller islands is limited, often being restricted to the principal town. While small and medium-sized mines might be able to rely on existing power supplies in some areas, in most instances a mine would need to make provision to install its own generating capacity.

A foreign mining company that builds roads, harbours, airstrips or the like is required to allow use of those improvements by the government and the public in accord with the contract of work signed between itself and the government (UNCTAD 1991). Contracts of work will be discussed in many of the following sections of this paper.

The degree to which existing infrastructure is available is, in many cases, highly dependent on population density. In areas with low population densities such as Kalimantan and Irian Jaya, mineral companies will probably have to install most mine-related infrastructure, while in more populated islands existing power and transport may be adequate, at least for small and medium-sized operations.

## 2.2 Past and Current State of the Mineral Industry

#### 2.2.1 Historical Perspective

In 1899, the Mining Law was passed and licensing procedures implemented. Under this law, foreign investment in mining was restricted to citizens of the Netherlands and to companies established in the Netherlands or the Netherlands East Indies, while small-scale mining by indigenous peoples was controlled by the governor-general. The Japanese occupation of Indonesia during World War II and the fight for independence in the following years resulted in the destruction of some mines, but new mines were also opened (Simatupang 1988).

Following independence, the mines formerly run by the East Indies Government were put under the administration of the new government. In 1957, President Sukarno proclaimed the nationalization of all Dutch-owned property in Indonesia, and these mines were placed under the control of the Bureau for State Mining Companies Affairs (BUPTAN). In 1959, Law No. 10 terminated the existing mining act, and in 1960 the first national mining code (Mining Law No. 37) was promulgated. In 1961, BUPTAN was abolished and three stateowned mining companies were set up to run the industry; foreign participation was discouraged.

In 1967, Law No. 11 on the Basic Provision of Mining and Law No. 1 on Foreign Capital Investment were promulgated, establishing a more private sector-based orientation
toward mining, based on a contract of work (COW) approach (Simatupang 1988). In 1967, Freeport Indonesia signed the first contract of work, ushering in the system of regulation that has, on the whole, resulted in one of the most successful foreign investment-oriented mining policies in the developing world.

Foreign investment began to flow into the non-oil mineral sector even against a backdrop of declining world metal prices in the 1980s. Foreign companies were granted largescale exploration areas. Flexibility was incorporated into the process by setting the terms of business within the contract of work rather than through rigid regulations. Since the COW is passed by parliament, it has the weight of law once signed and supersedes other government regulations for its duration. The government periodically alters the COW to meet current conditions. There have now been five revisions of the standard terms of the contract of work. Within this framework, Indonesia has been able to increase production of minerals such as coal, nickel, tin, copper and precious metals. (Gandataruna 1990, UNCTAD 1991).

Changes in the fifth-generation COW (1987 to 1989) were not attractive to investors. It eliminated the investment allowance and changed the system for determining depreciation, increased the dividend tax rate, changed the debt/equity ratio used for determining taxes and doubled the dead-rent. No new COWs were signed between 1987 and 1990, even for target minerals experiencing buoyant prices (Gandataruna 1990, Simatupang 1988). Table 1 shows a breakdown of COWS by generation.

Generation		Contract of work					
	Period	Number	Exploration/ construction	Production	Terminated		
I	1967	1	_	1	_		
II	1968-1975	15	-	4	11		
III	1976-1984	14	5	1	8		
IV	1985-1987	94	67	3	24		
IV+V	1987-1989	none	-	_	_		
(frontier)	1990-present	17*	3				

#### Table 1. Number of COWS by generation

\* 3 approved, 14 now being processed

Note: Depending on what government source is referred to, there is some confusion as to the IV, IV+ and V designations. The table adopts the labelling system given in the source document below.

Source: "A Brief Outline of the Indonesian Mining Law and Foreign Investment Policy on Hard Minerals," Government of Indonesia, Expert Group Meeting on Rationalization and Modernization of Mining Codes and Regulations, Bangkok, 16 to 18 March 1992.

The government's recent innovation has been the addition of a special contract for "frontier area" projects. This contract has very favourable terms for companies that undertake mining projects whose location, complexity of ore or other adverse conditions require such incentives (Gandataruna 1990). Industrial minerals and sea-bed minerals at depths of more than 50 metres are included in the frontier COW. Areas currently classified as frontier areas are Irian Jaya, Sumba Island (part of East Nusa Tenggara) and Timor Island (including East Timor Province). By the end of 1991, 17 frontier area projects were being negotiated and three were signed, including a copper contract with Freeport Indonesia

in Irian Jaya, a gold contract with Nabire Bakti Mining in Irian Jaya and a kaolin contract with Engelhand Indonesia in North Sulawesi (Expert 1992).

According to Hill and Weidemann, "no province outside Java has received more than 2 per cent of foreign investment, apart from the special cases of North Sumatra (Asahan [alumina plant and hydroelectric]) and Irian Jaya (Freeport Copper and other mining projects)." Development of mineral resources in some of the small, outer islands has had mixed effects. Southeast Sulawesi, for example, benefitted greatly from the development of its nickel resources in the early 1960s. Transportation infrastructure and the government sector grew substantially. After 1981, the production of nickel dropped abruptly following nickel's sharp international price decline. The level of government expenditures to maintain Southeast Sulawesi grew steadily after the downturn in nickel production. The recent turnaround in nickel prices has sent the provincial economy roller-coastering (Hill 1989).

Nickel matte, copper concentrates, unwrought aluminium and unwrought tin were Indonesia's top-dollar mineral exports in 1989. The vast majority of Indonesia's mineral exports are destined for the Asia-Pacific region, with Japan receiving two-thirds and Singapore's share being 15 per cent overall. Western Europe's share shrunk considerably between 1980 and 1989 (30.9 per cent to 6.4 per cent). Japan received 100 per cent of the exported nickel matte, 74.7 per cent of the exported copper concentrate and 96.6 per cent of the exported unwrought aluminium in 1989. Singapore imported 83.4 per cent of Indonesia's unwrought tin the same year. Export arrangements are predominantly through long-term contracts. In the case of aluminium, the recipient is the foreign partner in a joint venture (UNCTAD 1991). Coal, gold, silver, nickel and copper concentrate production had noteworthy increases in the latter half of the 1980s, as can be seen from Table 2.

Indonesia has, over the past 40 years, gone through a transition from a colonial powerdominated mining industry to a state-dominated industry to, more recently, a foreign investor-led expansion of state and private mining. The country has established a track record of successful mineral operations and has been successful for the last decade in attracting foreign

Mineral (unit)	1981	1985	1986	1987	1988	1989
Tin	35.4	20.9	22.2	24.3	28.4	29.9
Copper concentrate	188.5	233.4	251.2	258.8	293.7	**324.6
Nickel in matte	19.9	24.9	28.0	26.2	28.5	**29.5
Nickel in ferro-nickel	4.7	4.8	4.5	3.1	4.9	5.0
Nickel ore	1,543.2	955.6	1,533.1	1,807.7	1,732.9	2,020.9
Bauxite	1,203.4	830.5	649.9	635.3	517.9	826.3
Gold‡ (kg)	1,687	2,649	3,292	3,634	4,738	6,075
Silver (kg)	25,824	38,355	55,277	63,156	61,833	72,471
Iron sand concentrate	86.6	130.9	153.3	194.0	202.7	142.7
Manganese	2.6	33.3	8.0	1.2	3.4	9.4
Coal	398.8	2,009.7	2,664.1	3,087.7	4,507.8	8,611.6

# Table 2. Indonesia's major minerals production (excluding oil and gas) in thousand metric tons, unless stated otherwise

\* Not including production of unregistered/informal miners.

\*\* Estimated.

Source: Kosim Gandataruna, Indonesian Mining Industry Review, Department of Mines and Energy, Jakarta, 1990.

investment. Toward the end of the 1980s, the government revised the COW, resulting in a decline of investor interest, but recent changes have seen a number of new COWs being signed.

# 2.2.2 Structure of the Industry

Indonesia's mineral industry can be broken up into six main sectors: state enterprises, government contracts (COWs and coal production-sharing cooperation contracts), private mining (indigenous and foreign joint ventures), people's mines, nonstructured mines and illegal mining.

The state enterprises and the government contractors are involved in large-scale, highinvestment mining, while the people's mines, nonstructured mines and illegal mining tend to be small-scale, low-investment mining.

State enterprises. There are more than 200 state corporations, which are known as Bada Usaha Milik Negara or BUMN, of which 7 come under the supervision of the Department of Mines and Energy. They function both independently and through collaboration with an assortment of private companies, both national and foreign. There are three somewhat distinct types of state corporations, as listed below.

- *Perum:* a type of public utility company that is wholly state financed but which may make a profit (example: the state coal company, Perum Tambang Batubara)
- *Perjan:* a type of public service agency capitalized as part of the state budget (example: the state railway, PJKA)
- *Persero:* a public limited liability company with all or part of the shares held by the government (examples: Pt. Aneka Tambang, Pt. Timah)

Key examples of public limited state mining enterprises include the following.

- \* *Pt. Tambang Timah* (which is involved primarily in tin and can participate in joint ventures with private and foreign companies with the approval of the government, which is a shareholder)
- \* *Pt. Aneka Tambang* (which is concerned with exploration and mining for various minerals such as gold, silver, nickel, bauxite and iron sand and which has entered into numerous joint venture COW agreements with foreign companies)
- \* *Pt. Tambang Batubara Bukit Asam* (which mines coal in Sumatra, manages coal development and can participate in joint ventures with foreign coal companies)
- \* Pt. Angkutan Pertambangan (which is involved in coal transport)

An example of the perum-type state mining enterprise is Perum Tambang Batubara (which mines coal and is responsible for negotiation and implementation of coal cooperation contracts and for the management of foreign and domestic coal contractors; Simatupang 1988).

**Government contractors.** Foreign companies can function as contractors working for the government. Generally, contracts of work or a coal cooperation contract (CCC) require contractors to totally finance and see through the mineral operation from prospecting to marketing, unless the contract is a joint venture agreement with a state enterprise.

**Private mining.** A small but growing part of the mineral industry is the private mining sector, which comprises Indonesian private mining companies, who may operate on their own or cooperate with a foreign partner. Such cooperation is usually in the form of a joint venture management contract. In this type of arrangement, the indigenous company holds a mining authorization (KP) and the foreign company supplies the expertise and contributes capital. KPs can only be held by individuals having Indonesian citizenship and residing in Indonesia. This part of the industry may hold special importance for the future, as it provides the base for a private, domestic mining industry (Simatupang 1988).

**People's mines.** People's mines consist of small areas that are assigned by the government to local individual or village cooperatives. These are legal operations sanctioned by the government.

Nonstructured mines. These mines are of two types: mines that operate under government-issued permits and which are linked to small industries (producing commodities such as clay and lime), and traditional unregistered mining by local people for local use (for example, producing river sand and gravel; Simatupang 1988).

**Illegal mining.** "Illegal mines may have some similarity to the nonstructured mines, the difference being that nonstructured mining is carried out with the tacit approval of the government, or done by local people with the non-written approval of some Government Agency, while illegal mining is against the law and its existence is in many cases due to the absence of effective government supervision in the region, or to a lag in law enforcement" (Simatupang 1988).

For almost 25 years, the mineral sector has increasingly been an intermingling of indigenous and foreign ventures. A current rough estimate of the percentage of exploration carried out by foreign companies is 60 per cent. The type of mineral involved has determined the amount of participation foreign individuals or companies are allowed (more on this in the following section). The eventual lessening of foreign involvement, through technology transfer and training, has been emphasized in government policy statements. This desire is being exercised through the manipulation of terms in the contract of work. Since 1988, less advantageous terms were offered in standard foreign contracts. This is not to say that there will not continue to be a sizable amount of foreign involvement in the mineral sector. In 1987, more than 60 per cent of the state income from taxes and royalties came from the private sector, the large majority of which comprises foreign companies (Gandataruna 1990, UNCTAD 1991).

The distribution of mineral sector development has been geographically uneven. Most development has been attracted by Java and Sumatra. Other regions of the country cannot compare in infrastructure, previous fieldwork or detailed mapping. The government has taken the position, both through policy and through the terms of contracts of work, that future foreign ventures should benefit the less developed regions or frontier areas (Gandataruna 1990).

Contracts and permits for "strategic" and "vital" minerals (discussed in section 5.1, Laws and agreements pertaining to exploration and mining), until recently, have been for medium and large-scale projects. Industrial minerals traditionally have been the domain of small-scale operators. Due to problems involving gold prospecting on a small scale by local illegal or "nonformal" miners, the government has decided to co-opt these entrepreneurs into a recognized system. It is not yet known how the integration of small-scale operators will affect larger operators (Gandataruna 1990).

# 2.2.3 Government Policies Relating to Minerals

The government has never published a national mineral policy, although there have been many speeches and writings that may be used to establish the nature of the policy. Excellent reviews concerning the evolution of mineral policies and practices are readily available (see Simatupang 1988, Sigit 1990, UNCTAD 1991).

The evolution of mineral policy since independence has been guided by the basic tenets stated in Article 33 of the Constitution, which states:

- "i. Branches of production of importance to the State which vitally affect the life of the people shall be controlled by the state" and
- "ii. Land and water and natural resources contained therein shall be controlled by the State and used for the maximum prosperity of the people."

The National Development Guidelines promulgated in 1988 set the following objectives for mineral development.

- \* To intensify mineral exploration in order to increase national resources
- \* To fulfil the demand for raw materials for domestic industries
- \* To increase export earnings
- \* To support regional development and national economic integration
- \* To promote mineral conservation and environmental protection
- \* To extend national investment in mining
- \* To create and expand employment and work opportunities

In line with this policy, foreign investors may be asked to develop a programme to transfer technical and managerial functions to local personnel. The government also encourages the consumption of domestic industrial products by the mining industry. Although the Indonesian Government has strongly encouraged downstream mineral use in order to gain greater revenue and to create employment, no restriction has been applied by the government against exporting raw materials (Expert 1990).

Another government policy is to make large increases in coal production in order to reduce the domestic demand for oil. This policy has been successful, and Indonesia is now focusing on ASEAN, Japan, Taiwan Province of China and the Republic of Korea as export markets for their coal surplus (Gandataruna 1990).

"Traditional" minerals such as copper, tin, nickel and gold are the government's first priority for exploration of nonfuel minerals. This is followed by nonmetallic minerals and ultimately by rare earths (UNCTAD 1991).

# 2.2.4 Summary of the Current and Projected State of Affairs

Indonesia has established a successful track record of mineral sector foreign investment. A pro-investment policy in the early 1980s led to the signing of a substantial number of COWs, but toward the latter part of the decade, the government shifted its policy, rewrote the terms of the COW and investment slowed considerably. With the advent of the 1990s, another generation of COW has come into use, which, although not as attractive as some previous COWs, is attracting foreign investor interest.

Investors and potential investors in the mineral industry of Indonesia benefit from the availability of clear mineral policies. While these policies vary from time to time and at a rate more frequent than most investors would probably prefer, the ability of investors to determine the policy at the time of investment has been key to the success of the development of the Indonesian mineral sector. The track record of the government in honouring a signed COW irrespective of whether its terms are in accord with current policy has bolstered foreign investor confidence in the regulatory system.

### 3. Geological Potential

### 3.1 Geographical Distribution of Mineral Potential

Asbestos. Asbestos deposits have been located in eastern Indonesia, and Aneka Tambung has defined about 4 million tons grading 3.77 per cent asbestos at Bukit Tangalo, Halmahera (Simatupang 1988).

**Barite.** Barite deposits have been located in Sulawesi, Kalimantan, the eastern Indonesian islands, Sumatra and Java. A small mine and processing plant is currently operating on the island of Flores (Simatupang 1988).

**Bauxite**. Bauxite is mined in the Riau Islands and on and around Bintan Island. All smelting takes place at a site in northern Sumatra, but a new plant is planned due to power disruption secondary to insufficient rainfall (Simatupang 1988, UNCTAD 1991).

**Bentonite.** A number of small mines are currently extracting bentonite on Java and Sumatra. Large deposits are known to exist but may be subeconomic.

Chromite. Deposits containing chromite are found in Sulawesi and Halmahera. AMAX has completed exploration work, which has led to the development of some small mines exploited by KP holders (Simatupang 1988).

**Coal.** Coal deposits of various qualities (lignite, subbituminous, bituminous anthracite) are found on Sumatra, Java, Sulawesi, Irian Jaya and Kalimantan. World-class deposits are now being developed to supply consumers in Indonesia and the Pacific Rim.

**Copper.** Copper mining with associated gold and silver recovery is taking place at the Freeport Indonesia mine in Irian Jaya and is essentially the only consequential copper

producer in Indonesia. An adjacent mine, the Grasberg deposit, has been operating since 1990. A large copper deposit has also been located in north Sulawesi. To date, there are no copper smelting facilities in Indonesia (Simatupang 1988, UNCTAD 1991).

**Diamonds.** A diamond mine is operating in southeast Kalimantan (Simatupang 1988, *Statesman* 1991, UNCTAD 1991).

Gold. In addition to the gold associated with the Irian Jaya copper production, gold is also found in Sumatra, Kalimantan, Wetar Island (north of Timor), southwest Java, Aceh, Riau and North Sulawesi. There is only one gold refinery in Indonesia. A mine located at Bengkulu in south Sumatra is the largest producer of gold in the country (UNCTAD 1991).

Iron. Iron sand is found in central and west Java. The government operates a combination direct reduction plant and steel plant. Small deposits of magnetite and hematite suitable for small-scale foundry pig iron production have been located in South Kalimantan (Simatupang 1988, UNCTAD 1991).

Kaolin. Large deposits of primary and secondary grade kaolin, some of paper grade, have been located in Bangka, Beitung, West Kalimantan and North Sulawesi.

Lead and zinc. Subeconomic deposits containing lead and zinc have been discovered in Sumatra, Java and Kalimantan.

Magnesite. Magnesite occurrences have been reported in Maluku, North Sumatra and Kalimantan.

Mica. Small, low-grade deposits that have proven to be subeconomic in the past occur in North Sumatra, Java and Central Sulawesi.

Manganese. Manganese is found in central and west Java. In addition, cobaltmanganese crusts are known to be found on many of the seamounts located in Indonesia.

Nickel. Large nickel reserves are found from central Sulawesi through Irian Jaya. On Gebe Island in the Moluccas, the state-owned enterprise P.T. Aneka Tambang extracts 75 per cent of its total nickel. The other major mine is at Pomalaa in South Sulawesi. With the recovery of nickel prices in 1988/89, the government is pushing for a two- to four-fold increase in the production of ferronickel (Simatupang 1988, UNCTAD 1991). Of possible interest to foreign investors is a large nickel deposit located on Gag Island.

Silica sand. Commercial grade silica sand deposits are found in Bangka, Belitung, East Java and East Kalimantan.

Sulphur. Volcanic sulphur deposits have been located in Java and in Sumatra. While most of these have proven subeconomic, Aneka Tambung is now investigating a pyrite deposit in South Kalimantan that is thought to contain at least 6.5 million tons, grading 10 per cent pyrite (Simatupang 1988).

Tin. The source of three-quarters of Indonesia's tin production is from governmentowned facilities located in Riau and on the islands of Bangka and Belitung. The additional production is chiefly through a joint venture between the state-owned enterprise and two Australian firms. There is only one tin smelter in Indonesia. For the first time, in 1990, state-owned tin production resulted in negative earnings (Simatupang 1988, UNCTAD 1991).

Mineral deposits have been discovered throughout Indonesia. The above locations are not complete for the specified minerals but are given to provide both an indication of the diversity of minerals in Indonesia and the extent to which they are located throughout the country.

### 3.2 Minerals of Exceptional Interest

The majority of exploration carried out by foreign companies is aimed at discovering gold and coal deposits. Coal has only recently been open to foreign investment (other than through World Bank funding). Gold and coal are expected to continue their previously high production growth rates in the future (Simatupang 1988, UNCTAD 1991).

Indonesia was one of the top producers of tin during the 1970s and early 1980s and accounted for 55 to 70 per cent of Indonesia's nonfuel exports. Certain factors, which included falling tin prices resulting from the disintegration of the International Tin Agreement (1985) and the emergence of other major exporters, have reduced to approximately 20 per cent Indonesia's export earnings from tin (UNCTAD 1991).

Many deposits of various minerals are known and well documented. Some of these deposits have been thoroughly investigated up through the feasibility stage; others were mined but later abandoned as subeconomic. Details about these deposits are easily obtainable from the government.

# 3.3 Ability to Apply Geological Assessment Techniques

The weather is generally typical of a tropical monsoon climate, characterized by a dry season from June to September, a wet season from October to April and hot temperatures year round. The subclimatic conditions of these islands vary, based on latitude, elevation, wind direction and agriculture, as well as other factors (*Statesman* 1991). Productive exploration and mining are likely to be affected by these weather patterns.

Some parts of the country are difficult to gain access to, both logistically and because of government preference. Heavy vegetation can make ground work difficult in many areas.

# 3.4 Availability of Geoscientific Information

The Indonesian Government attempts to widely disseminate basic geological and geophysical information. Open files are maintained, containing both exploration reports of relinquished lands and results of geological mapping by the private sector, which are handed over to the government when licenses expire and no follow-up activities are foreseen. The government uses this information for geological mapping. In 1990, the government published a book containing detailed information on nonmetallic minerals. A volume on metallic minerals is now being written (Simatupang 1988, UNCTAD 1991). Basic geological mapping of Java has been achieved on 1:100, 000 scale, while 75 per cent of the "outer" islands have been mapped on 1:250,000 scale. These maps are available to interested individuals, although some restrictions do apply. It is estimated that mapping of the remaining 25 per cent at this scale will be completed in 25 years. Airborne geophysical work has been progressing for some time, and the Asian Development Bank recently made a loan to Indonesia in order to carry out airborne geophysical surveys of Kalimantan and Sulawesi. Satellite imagery is also now being used as an aid to geological mapping (Simatupang 1988, UNCTAD 1991).

In 1988, only rudimentary computerized data processing and retrieval were available, and "high technology instrumentation" was essentially unavailable in Indonesia (Simatupang 1988, UNCTAD 1991). However, recently, the government established a publicly accessible geographic information system, which includes "basic geological maps, geothermal locations, geophysical survey data, tectonics, geochemistry and environmental baseline information" (UNCTAD 1991).

### 3.5 Government Institutions

The Department of Mines and Energy has authority over the mining sector. Structurally, the department is arranged with four directorate-generals under the Minister of Mines and Energy. The divisions include the Directorate-General of Mines, the Directorate-General of Geology and Mineral Resources, the Directorate-General of Oil and Gas and the Directorate-General of Electricity and Renewable Energy. The Directorate-General of Mines and the Directorate-General of Geology and Mineral Resources have the responsibility for nonfuel minerals (Simatupang 1988, UNCTAD 1991).

The Directorate-General of Mines supervises strategic (group A) and vital (group B) mineral projects (discussed in section 5.1 of this paper). "The Directorate-General of Mines handles negotiations with foreign investors, mine supervision, relations with state-owned mining companies, technological services to the mining industry and coal mining development." These main functions are delegated to four subdivisions. They are the Directorate of Promotion and Supervision of Mining Enterprises, the Directorate of Mine Licensing and Safety, the Directorate of Coal and the Mineral Technology Development Centre (Simatupang 1988, UNCTAD 1991).

The Directorate of Promotion and Supervision of Mining Enterprises executes COWs, rules on applications, negotiates on the government's behalf and oversees mining projects. This branch of the Department of Mining and Energy is most likely the first with which a foreign firm would have contact (Simatupang 1988).

The Directorate of Mine Licensing and Safety conducts mine inspections and is involved in assessing some aspects of the environmental impact studies. Primarily, foreign mining companies are involved with this directorate because the issuing of mining permits (KPs) and permit oversight fall under its jurisdiction (Simatupang 1988).

The Mineral Technology Development Centre in Bandung is a mineral research and laboratory facility. Mineral-related information and training programmes are provided by the centre (Simatupang 1988).

The planning, development, administration and implementation of coal projects that use foreign aid are the primary concerns of the Directorate of Coal (Simatupang 1988).

The Directorate-General of Geology and Mineral Resources performs classic geological survey functions. The unit of direct interest to foreign mining companies is the Directorate of Environmental Geology, which, among other responsibilities, issues licenses for water drilling (Simatupang 1988).

The Department of Mines and Energy confers with the Ministry of Industry in matters pertaining to the downstream processing of mineral products. The department does do some detailed exploration work but government policy favours such work being primarily the responsibility of the state-owned enterprises (UNCTAD 1991).

There is an abundance of financial institutions in Indonesia. Bank Dagang Negara provides services to the mining industry (*Statesman* 1991, Simatupang 1988).

# 3.6 Summary

Indonesia has favourable geology for a wide range of minerals, and current and historical mineral production is widely disbursed throughout the country. Past geological assessment work is well advanced in some areas, but other areas are almost untouched. The nation has a well-established geological survey, which supports an extensive open-file reference capability. Most mineral companies would find the geology, the amount of information and the capabilities of government geoscience institutions all favourable factors in their consideration of Indonesia as a site for exploration and mining investment.

# 4. Marketing Considerations

# 4.1 External Markets

Indonesia is well positioned geographically to supply the Pacific basin. A new deepwater coal terminal in Kalimantan should further assist in marketing Indonesian coal. Table 3 indicates the primary export markets for selected Indonesian minerals in 1989.

# 4.2 Internal Markets

With a population of 180 million, Indonesia is developing as a major mineral-consuming nation. If consumption grows along with economic development, the internal market could provide an important future market for many minerals. Table 4 indicates the import volume and value of selected minerals in 1989.

Indonesia would probably, on the whole and depending on the commodity, be considered by most mineral companies to be favourably situated with regard to marketing potential.

# 4.3 Legal Entitlement and Requirements under a COW

The government has implemented a policy that promotes the establishment of industries that add value to mineral production. However, the policy is implemented on a practical and economic basis and to date has not led to substantial friction between most mineral

### Table 3. Indonesia's mineral exports, 1989

(in thousand metric tons and million US \$)

Product	Volume	Value	Main destinations; per cent of value		
Nickel matte	38.2	314.4	Japan	100.0	
Copper concentrates	321.7	305.8	Japan Republic of Korea Germany	74.7 9.3 6.8	
Unwrought aluminium	142.9	290.9	Japan Malaysia Republic of Korea	96.6 1.9 0.6	
Nickel concentrates	1,081.5	62.8	Japan Australia	94.9 4.1	
Ferronickel	25.2	59.5	Japan Netherlands India	48.9 45.7 5.5	
Unwrought tin	29.7	248.7	Singapore Netherlands Germany	83.4 11.0 2.6	
Copper semifabricates	23.8	72.8	Thailand Republic of Korea	66.5 13.9	
Aluminium semifabricates	32.5	57.9	Japan Singapore	64.2 16.8	
Others		35.6	-		
Total		1,448.8	Japan Singapore Thailand	66.3 15.3 3.4	

Source: UNCTAD secretariat (extracted from UNCTAD 1991).

#### Table 4. Indonesia's mineral imports, 1989

(in thousand tons gross weight and million US \$)

Product	Volume	Value	Product	Volume	Value
Primary iron and steel	364.1	194.7	Ferroalloys	34.5	24.8
Refined copper	39.6	118.2	Copper semifabricates	6.6	22.0
Iron/steel waste and scrap	703.4	113.0	Unwrought aluminium	7.3	21.5
Iron ore	1,765.8	85.4	Direct reduced iron	104.9	15.8
Unwrought zinc	45.3	79.7	Unwrought lead	14.3	15.2
Aluminium semifabricates	11.9	52.5	Other products	_	20.3
Pig iron	176.6	27.5	Total	_	790.6

Source: UNCTAD secretariat (extracted from UNCTAD 1991).

companies operating under a COW. In addition, a contractor is expected to service local demand for its products. A COW typically states the following.

The company shall have the right to export its products obtained from the operations under this agreement. Without in any way prejudicing the company's basic right to export its products, such export will be subject to the provisions of

the export laws and regulations of Indonesia. The company will endeavour at all times to fulfil the requirements of the domestic market for its products, provided that to do so will not jeopardize the company in its ability to observe the provisions of committed sales agreements for its products.

The government maintains some oversight and control on exports, and any contract for sale of a contractor's products with a term exceeding three years must have the prior approval of the government. The internal market is protected by the COW to such an extent that Indonesians are entitled to purchase a contractor's products at the best terms offered to foreign buyers. Affiliates may not be given preferred terms.

# 5. Mining Law

# 5.1 Laws and Agreements Pertaining to Exploration and Mining

The regulation and administration of the mineral sector are addressed by mining laws, government regulations, presidential decrees and ministerial decrees. On the ground, practice must also take into account, in some areas, the will of the local population. In some cases, even though a company was granted an exclusive exploration right or mining right by law, the local population has interfered with or preempted that right. In such cases, legal remedies may be limited for political reasons.

The key legislation (and agreements) that regulate the mineral industry comprise the following.

- \* Article 5, paragraph (1) and Article 33 of the 1945 Constitution
- \* Decree of the People's Consultative Assembly No. XXI/MPRS/1966
- \* Decree of the People's Consultative Assembly No. XXIII/MPRS/1966
- \* Decree of the People's Consultative Assembly No. XXXIII/MPRS/1966
- \* Decision of the President of the Republic of Indonesia No. 163 of 1966
- \* Decision of the President of Indonesia No. 171 of 1967
- \* Law No. 11 of 1967 On Basic Provisions of Mining
- \* Law No. 1 of 1967 Concerning Foreign Capital Investment
- \* Government Decree (PP) No. 27 of 1980
- \* Financial Arrangements for Mining Companies Regulations of May 1985
- \* Contract of Work
- \* Cooperation Contract

The above list of legislation and agreements is by no means complete but does form the core of the mineral regulatory system.

Mineral sector investment by foreign concerns can be accomplished in three ways by way of contract.

- \* Contract of work. The foreign company acts as a contractor to the government or forms a joint venture company with one or more national partners. Contractor and joint venture companies must apply for a contract of work from the Minister of Mines and Energy.
- \* **Cooperation contract.** The foreign company cooperates with a state enterprise such as the state coal mining company, Perum Tambang Batubara.

\* **Private contract.** The foreign company enters into a contract with a private Indonesian company that holds a mining authorization (KP).

Mining authorizations, foreign investment, royalties and maximum areas to be granted by the government are based on the type of mineral involved. Act Number 11 of 1967 codifies minerals into categories A (strategic minerals), B (vital minerals) and C (other minerals). The strategic minerals consist of oil and gas, tin, nickel, radioactive minerals, cobalt and coal. Vital minerals include gold, silver, lead, zinc, iron, manganese, molybdenum, chromite, tungsten, copper, platinum, diamonds, fluorspar, bauxite, sulphur and various other metallic minerals. Category C is composed of industrial minerals such as clay and building materials (Simatupang 1988, Experts 1990, UNCTAD 1991).

The development of category A (strategic) minerals is not permitted except through the state-owned mining companies or the government agencies especially assigned by the Minister of Mines and Energy. However, the government can contract foreign companies to develop category A deposits. The other two categories of minerals may be handled by the private sector and cooperatives. Foreign enterprises can take part in the development of category B minerals as contractors to the government or as minority shareholders in a local company. Mining of group C minerals is reserved for Indonesian cooperatives, enterprises or citizens (Experts 1990, UNCTAD 1991).

### 5.2 Major Features of the Legislation/Agreement

The three types of contractual arrangements that can be used by a foreign company to participate in the Indonesian mining sector were described in the previous section. While technically any of the three can be used, in practice the COW is the preferred means of investment for all minerals except coal; the cooperative contract is used almost exclusively for coal, and the private contract is quite rare. A complete analysis of the three regulatory systems is beyond the scope of this study. However, some of the major features of the COW will be described to indicate the general nature of the legal environment for mineral sector investment.

In practice, a foreign company establishes a joint venture with an Indonesian partner and the joint venture then applies through the Minister of Mines and Energy for a COW. The COW is approved by the Parliament, giving the COW the status of law. Thus, provisions in the COW can supersede provisions in other legislation. This flexibility is somewhat restrained in practice, as the government tends to work from a model contract that is in harmony with existing laws. The government has shown a propensity to approve COWs in batches, with each batch, or generation, reflecting great commonality. The terms in the COWs are partially negotiated, but some matters such as fiscal terms are not, in general, negotiable. Because a COW is law, it remains fairly unaffected by subsequent legislation, unless such legislation specifically amends or repeals the specific COW. This stability of terms is attractive to almost all mineral companies.

The COW is a lengthy legal document that substitutes for regulations and requirements in many instances. For example, its reporting requirements are more detailed than those found in Indonesia's mining law. The discussions that follow on provisions, the fiscal regime, monetary controls and environmental protection will largely reflect the terms of the fourth generation COW, unless stated otherwise. In general, the COW spells out that the contractor has the right to "search and explore for minerals in the contract area, to develop and mine any mineral deposit found in the mining area, to process, refine, store, transport, market, sell or dispose of all the product inside and outside Indonesia" (Simatupang 1988). A COW may only be transferred or assigned with the prior consent of the government.

# 5.2.1 Ownership of Minerals

Article 33 of the Constitution of Indonesia states that all natural resources are "controlled by the State and (are to be) utilized for the greatest welfare of the people." Other laws, such as the Law on the Basic Provisions of Mining (Act Number 11, Article 1, December 1967), state that all minerals in Indonesia "are national wealth of the Indonesian people and shall therefore be controlled and utilized by the State for the maximum welfare of the people." The preamble to a typical COW restates these principles as follows.

All mineral resources contained in the territories of the Republic of Indonesia, including offshore areas, are the national wealth of the Indonesian people.

The COW gives the company the right to sell and export its product, but it must attempt to satisfy the domestic market. The contract specifies that purchase by an affiliate must be based on a competitive rate (Simatupang 1988).

## 5.2.2 Exploration

The terms of the COW provide for a general survey period of one year from commencement of exploration, and a subsequent exploration period lasting three years. While the combined four-year survey and exploration phase might be acceptable to some companies, for many types of minerals the duration is not sufficient for a thorough and systematic investigation. During the general survey period, the company must expend a minimum of US \$45 per square kilometre, and during the exploration period the requirement rises to US \$450 per square kilometre. The company is required to deliver a bank guarantee or bond, which is forfeit if the company does not fulfil its contractual obligations.

An exploration area is defined within an annex to the COW; agreements signed after 1987 have restricted the exploration area to a maximum of 250,000 hectares. The contract area excludes any area applied for, or already held under, a mining authorization or which is subject to "people's mining activities." Such areas are included in the contract area at such time as the mining authorization expires or the people's mining activities are no longer authorized. Specific area relinquishment requirements are detailed on a scheduled percentage-of-area basis.

If no potential mineral deposit is found during exploration, data and maps must be turned in to the government and the company may withdraw without penalty for terminating activities (Simatupang 1988). Written progress reports are due quarterly, and before a year has lapsed from the termination of the exploration period, a 1:250,000-scale geological map of the exploration area with associated reports must be submitted to the government (Simatupang 1988).

# 5.2.3 Security of Tenure

### **Designation of the Mining Area**

If the contractor locates a mineral deposit, it may then apply to the government to begin a feasibility studies period lasting one year but extendable at the government's discretion for an additional year. During this period the contractor must designate a mining area and prepare various feasibility studies. The contractor-designated area shall become the mining area unless the minister objects "on grounds of national security or that the conduct of mining in the proposed mining area will disproportionately and unreasonably damage the surrounding environment or limit its further development potential or significantly disrupt the sociopolitical stability in the region..." Should the minister so object, provision is made for a period of mutual consultation to resolve the matter; should that fail, the matter may be taken to international arbitration.

### Application to Proceed for Construction of a Mine

During the feasibility period, the contractor may submit an application to the minister to proceed with the construction of a mine. The application is deemed approved if the minister does not object within three months from submission of the application. Should the minister so object, provision is made for a period of mutual consultation to resolve the matter; should that fail, the matter may be taken to international arbitration. The contractor is given three years from the time that the specified plans are approved to substantially complete construction (construction period).

### 5.2.4 Mining

The operation period following the construction period is for 30 years, but at the discretion of the minister this may be initially granted for a longer duration. The COW clearly states the obligations and the rights of the contractor during the operating period.

In line with the promotion of national interest, the COW calls for ores to be processed in Indonesia if such processing is technically possible, practical and economically justifiable. The signer of a COW is required to work with the government in establishing associated downstream processing if such operations would be economically sound and practical. Any downstream processing facility that is developed in Indonesia is entitled to purchase the contractor's minerals at a price not less favourable than the terms offered by the contractor to any other customer. The contractor also has an obligation to try to use Indonesian services, materials and products whenever practical.

A report containing details that the government may need to determine the contractor's compliance with the contract is due at the beginning of each calendar year (Simatupang 1988). Company reports are normally considered confidential, except for noncommercial information and previously published data (UNCTAD 1991).

The COW may be terminated by the government should the company default in any of its obligations under the agreement and fail to remedy such default after notification by the government. In a situation where there is controversy as to whether the company is in default, there is provision for the matter to be referred to international arbitration. The contractor has a right to terminate a COW, subject to certain reasonable restrictions regarding satisfaction of pre-existing obligations.

# 5.2.5 Ownership and Control

In the standard COW, the foreign investor must offer at least 51 per cent of its shares to the Indonesian Government or to Indonesian citizens by the end of the tenth year of operation, but in the frontier COW, at least 51 per cent of the company ownership must be offered to the Indonesian Government or Indonesian citizens by the end of the company's fifteenth year of operation (Expert 1992, Simatupang 1988). The government may extend the timetable under which shares in the company are to be offered. The government is given the opportunity to purchase the investor's shares; if the government declines, other Indonesian parties may acquire the shares. In at least one case this requirement had to be waived, since market conditions led to a lack of interest (UNCTAD 1991). Detailed provisions are stated in a COW, describing the means by which share prices are to be computed.

There is a mandatory requirement in a typical COW for participation by Indonesians in the management of the company.

The company shall seek to provide direct Indonesian participation in the enterprise through the inclusion of Indonesian nationals in the management of the company and among the members of its board of directors. To this end, at least one seat on the board of directors will continuously be occupied by an Indonesian national from the date of incorporation of the company. The company will also train Indonesian nationals to occupy other responsible positions.

The COW leaves most operational details to the investor.

The company shall have full and effective control and management of all matters relating to the operation of the enterprise, including the production and marketing of its products in accordance with sound, long-term policies....

However, the contractor must first obtain the government's consent before it may undertake any of the following activities.

- \* Amend the articles of incorporation of the company
- \* Change the basic nature of the business of the company
- \* Voluntarily liquidate or wind up the company
- \* Merge or consolidate the company with any other company
- \* Guarantee or otherwise pledge the minerals in the contract area

The government maintains the right to access to the contract area (Simatupang 1988).

# 5.3 Administrative Efficiency

The investment approval process was simplified in the mid-1980s. The Investment Coordinating Board (BKPM) is able to issue most major licenses, including the investment license. Partly as an effect of recent government budget cuts, "the time needed to obtain authorizations has increased, reporting requirements are enforced less rigorously than in the past, and the frequency of mine inspection visits has decreased." Action has been taken to streamline the process by computerizing the system of mining rights registrations (UNCTAD 1991).

Most government approvals required by law or by agreement for mineral operations are worded in such a way that if a designated government officer fails to act within a stipulated timeframe, typically three months, the matter is deemed to have been approved.

# 5.4 Summary

Indonesia has a transparent system of regulation. It is not a simple system, but the level of detail provided in the two principal contracts, the COW and the cooperative contract, are sufficient to inform potential investors about the government's current policy regarding most key issues. The contracts define in detail the rights and obligations of the contractor. Because the contracts are approved by Parliament, they become law and are not prone to later unilateral change. The contract of work offered by the government in the late 1980s was not well received by the international mining community, but a new revised contract is apparently faring well. In summary, the Indonesian Government has used successive generations of standard contracts to explore the issue of what it takes to attract the international mining community while preserving the interests of the nation. Once an investor has entered into such a contract, the terms remain substantially fixed, irrespective of the adoption of later government policies or contractual preferences. On the whole, the government has been very successful in attracting foreign investors.

# 6. The Fiscal Regime

# 6.1 Description of Major Taxes

The emphasis in this section is on the fiscal system imposed under a typical COW. In such a contract, each and every tax and fee that a company will be subject to is listed and described. The list is comprehensive and includes the following.

- \* Dead-rent in respect of the contract area or mining area
- \* Royalties in respect of the company's production of minerals
- \* Additional royalties in respect of minerals exported
- \* Income taxes in respect of all kinds of profits received or accrued by the company
- \* Personal income tax
- \* Withholding taxes on interest, dividends and/or royalties
- \* Value-added tax on purchases and sales of taxable goods
- \* Stamp duty on legal documents
- \* Import duty on goods imported into Indonesia
- \* Land and building tax in respect of the contract area or the mining area, and the use of land area and space in which the company constructs facilities for its mining operations
- \* Levies, taxes, charges and duties imposed by the regional government in Indonesia that have been approved by the central government
- \* General administrative fees and charges for facilities or services rendered and

special rights granted by the government to the extent that such fees and charges have been approved by the central government

\* Tax on the transfer of ownership of motorized vehicles and ships in Indonesia

# 6.1.1 Income Tax

The income tax and its method of computation are defined within the COW. Income tax is graduated, based on the level of profits, from 15 per cent up to 35 per cent of profits. Expenses and losses incurred prior to production can be carried forward. Interest on debt, depending on the debt/equity ratio, may be deductible (UNCTAD 1991). Depreciation is determined on a declining balance system rather than on the straight-line basis used in early generation COWs (Simatupang 1988). Corporate and personal income tax are levied by both the standard COW and the frontier area COW (Simatupang 1988, UNCTAD 1991).

# 6.1.2 Import Taxes

According to the standard and the frontier COW, import duty on goods is charged. However, there is no import tax on capital goods, equipment and supplies needed for exploration or mining that are not produced in Indonesia for equivalent cost, for the first 10 years of operation. The same 10-year exclusion applies to value-added taxes (Expert 1992, Simatupang 1988).

# 6.1.3 Royalty Taxes

Royalties on minerals are kept low, usually below two per cent of the product value (UNCTAD 1991). Both the standard COW and the frontier COW impose royalties on mineral production, based on mineral content, and additional royalties on unprocessed minerals exported (Expert 1992, Simatupang 1988). Gold, silver and platinum are exempt from the export royalty. Export royalty taxes on minerals are relatively low and may be waived if the mineral is processed prior to shipping (UNCTAD 1991). The calculation method, along with calculation examples for some minerals, and the rates of royalty to which the contractor is liable are clearly defined in the COW.

# 6.1.4 Fees and Land "Rent"

Contractors are subject to dead-rent on the contract area. It is paid twice a year and is based on the amount of area held at each stage of development. As the operation moves through its various stages – general survey through to mining – the amount levied per unit area increases.

Contractors are also liable for a land and building tax. During the general survey, exploration, feasibility and construction periods, it is an amount equal to the dead-rent. During the operating period, the land and building tax is equal to an amount equal to the amount of dead-rent plus an additional surtax equal to an amount of 0.5 per cent times 20 per cent of the gross revenue from the mining operations.

According to the land code (Act Number 5 of 1960), land is either state land or land granted to individuals or corporations. There are 18 different types of land rights delineated in the land code. The holder of a mining right has preeminence over a landowner or holder.

The holder of the mining right must, however, compensate the landowner or holder. Payment during exploration is limited to surface damage done. If the mining right covers state land, no compensation is paid.

# 6.1.5 Miscellaneous

Companies under standard and frontier COWs are also charged the following.

- \* A withholding tax on interest, dividends, royalties paid to third parties and compensation paid for technical assistance or management services (15 to 20 per cent)
- \* A 10 per cent value-added tax on purchases and sales of taxable items and up to 20 per cent on "luxury items"
- \* Stamp duty on legal documents as provided in Law No. 13 of 1985
- \* Levies, taxes, charges and duties imposed by the regional government in Indonesia that have been approved by the central government at rates calculated in a manner no more onerous than in accordance with the laws and regulations prevailing as at the date of the signing of the COW
- \* General administrative fees and charges for facilities or services rendered and special rights granted by the government to the extent that such fees and charges have been approved by the central government
- \* Tax on the transfer of ownership of motor vehicles or ships

# 6.2 Ability to Predetermine Tax Liability

All tax types to be paid and their methods of computation are specified in the COW. The taxes established in the COW are thereafter guaranteed for the life of the project. Companies operating under a COW or cooperative contract have the ability to predetermine their liability to pay taxes, fees and charges to the government.

# 6.3 Stability of Fiscal Regime

To provide assurance against future changes, the standard COW contains the following provision.

The company shall not be subject to any other taxes, duties, levies, contributions, charges or fees now or hereafter levied or imposed or approved by the government other than those provided for in this article and elsewhere in this agreement.

# 6.4 Summary

In general, the tax policies are geared to promoting foreign investment in the mining sector. The taxes are clearly laid out in both the COW and cooperative contract and are no more onerous than those in many other mineral-producing nations. The levels of the various taxes change from one generation of contract to the next, reflecting, in part, the government's experimentation in determining "what the market can bear." Taxes are stable, being set upon the signing of the COW or cooperative agreement.

# 7. Monetary Controls and Access to Capital

# 7.1 Foreign Exchange

All state banks are authorized to deal in foreign exchange (*Statesman* 1991). Specific rules for the use of foreign exchange are not clearly stated in any one document but rather refer to "the prevailing rules and regulations in Indonesia" (Expert 1992). Basically, Indonesia allows capital to move freely from the country.

The standard COW sets certain terms and conditions pertaining to "currency exchange." It states that the company shall be granted the right to transfer abroad, in any currency it may desire, funds in respect of the following items, provided that such transfers are effected in accordance with the prevailing laws and regulations and at prevailing rates of exchange generally applicable to commercial transactions.

- \* Net operating profits in proportion to the share holding of the foreign investor
- \* Repayment of loans and the interest thereof, as far as they are a part of the intended investment, which has been approved by the government
- \* Allowance for depreciation of capital assets according to the foreign investment scheme
- \* Proceeds from sales of shares owned by the foreign investment to the Indonesian participant or to Indonesian nationals
- \* Expenses for expatriate personnel and training of Indonesian personnel abroad
- \* Compensation in case of nationalization of the company

With regard to external accounts, the standard COW allows the contractor "to pay abroad, in any currency it may desire, without conversion to rupiah, for the goods and services it may require and to defray abroad in any currency it may desire any other expense incurred for mining operations under this agreement."

# 7.2 Access to Capital

There are no explicit limitations on the debt-to-equity ratio in regard to financing a project under a COW. A typical COW contains the following provision:

The company may determine the extent to which the financing shall be accomplished through issuance of shares of the company or through borrowings of the company, provided that from the start of the construction period the company shall endeavour to maintain a ratio of shareholders' capital to third party borrowings so as to guarantee the continuing solvency of the company in order to protect the legitimate interests of the government, the lenders and the shareholders.

Indonesia has a rapidly developing capital market. Foreign companies may be able to raise substantial sums within the country. This is particularly true for investment capital sought during the construction phase.

### 8. Environmental Protection

# 8.1 Legal Requirements for Environmental Protection

Act Number 4 of 1982 deals with environmental protection; it defines the monitoring and procedures needed for environmental protection of an operating mine (Expert 1990). The regulatory mechanism used depends on the activity proposed. A presentation of environment information (PIL) is required for less extensive projects and is meant to explain the project design and its likely environmental consequences and to present plans to remedy any negative environmental impact. For a large or complex project, an environmental impact analysis (ANDAL) is required. The ANDAL is a document required to assist government decision makers by explaining the technical details of the project's plan to limit environmental harm, an analysis of unavoidable effects to the environment and delineated plans to handle anticipated damage. One or both, the PIL and/or the ANDAL, may be required of any proposal (Simatupang 1988).

A typical COW requires that the mandatory feasibility study include an environmental impact study into the effects of the operation of the mine on the environment. The COW states:

The company shall include in the feasibility study for each mining operation an environmental impact study to analyse the potential impact of its operations on land, water, air, biological resources and human settlements. The environmental study will also outline measures that the company intends to use to mitigate adverse impact.

In addition to preparing the environmental impact study, the contractor is required to respect and protect the environment. The COW states:

The company shall, in accordance with prevailing environmental and natural preservation laws and regulations of Indonesia, conduct its operations so as to control waste or loss of natural resources, to protect natural resources against unnecessary damage and to prevent pollution and contamination of the environment, and in general to maintain the health and safety of its employees and the local community. The company shall also be responsible for reasonable preservation of the natural environment within which the company operates and especially for taking no actions that may unnecessarily and unreasonably block or limit the further development of the resources of the area.

According to the terms of a typical COW, the company must operate:

In such a manner as to minimize harm to the environment and shall use recognized modern mining industry practices to protect natural resources against unnecessary damage, to minimize pollution and harmful emissions into the environment in its operations and to dispose of waste materials in a manner consistent with good waste disposal practices.

Under the terms of a typical COW, the minister may take exception to the contractor's plans and designs and withhold approval if their implementation would "disproportionately and unreasonably damage the surrounding environment or limit its further development

potential or significantly disrupt the sociopolitical stability in the area." The COW provides that the minister shall not unreasonably withhold such approval. An arbitration clause of general application is a part of most COWs and could be invoked should the contractor and minister not be able to resolve their differences.

### 8.2 Environmental Protection Trends

Early environmental statutes such as Article 30 of the 1967 Basic Provisions of Mining were principally concerned with the control of disease. It states "after completion of the mining for minerals in a certain mine, the holder of the relevant Mining Authorization is obliged to restore the land in such condition as not to evoke any danger of disease or any danger to the people living in the environment of the mine" (UNCTAD 1991).

The overall social consciousness about environmental protection has grown since that article was promulgated (Experts 1990). Clauses such as the one mentioned above in section 8.1 of this paper reflect the broader understanding and concern for the interaction between mining and the environment. Unfortunately, lack of trained government personnel has hindered the monitoring of project implementation and conformity with regulations in regard to environmental protection (UNCTAD 1991).

# 9. Local Services and Labour Market

# 9.1 Availability of Local Services

A wide range of mineral support services is available in Indonesia. The *Indonesian Mineral Development Digest* (Simatupang 1988) provides a fairly comprehensive list of government and private companies offering services to the mining industry. With regard to local services, most mining companies would find the Indonesian situation better than that in most other developing countries in the region.

# 9.2 Labour Market

Although the foreign firm may employ expatriate staff when necessary, Indonesian personnel must be employed when feasible. The foreign firm must undertake the training of Indonesian staff (Simatupang 1988, UNCTAD 1991).

According to the Indonesian Mining Association, Indonesia has a sufficient quantity of surface mining geologists, mining engineers, earth moving operators, civil construction people, general mechanics and electricians. However, they identify trained labour shortages among underground miners, high technology mill experts, primary and hard rock geologists and geophysicists, project engineers and project managers (Simatupang 1988).

The amount of available labour is dependent on the location of the mine. In the large mines on Sulawesi, staffing using local inhabitants is not unusually problematic, yet in the case of Irian Jaya, due to poor levels of education, lack of business experience and the government's transmigration programme, essentially all the administrative and skilled employees come from outside Irian Jaya, despite a company training programme (Hill 1989, UNCTAD 1991). A similar situation exists in East Kalimantan due to "spontaneous in-migration." On the other hand, an outflow of skilled, educated workers has resulted in areas

where the government has attempted to offer skill training and to raise educational standards (Hill 1989).

Recent fiscal restraint has caused reduced field staff for the Ministry of Mines, affecting activities such as mine inspection and geological fieldwork. Only 400,000 people (about 0.7 percent of the workforce) are currently employed in fuel and nonfuel mining and quarrying (UNCTAD 1991).

# 10. Conclusions

The major conclusions of this study can be summarized as follows.

- \* Overall, the country has been politically stable for twenty-five years.
- \* Insurgency is not a problem in most of the country.
- \* The willingness of local government officials to protect mineral rights granted by the central government to foreign companies from illegal mining has been a major problem for some companies.
- \* Indonesia is on fairly good terms with its neighbours and is not subject to any economic sanctions that would negatively affect the mineral industry.
- \* Mineral companies must be prepared to operate in a multicultural, multilanguage situation; most mineral companies will find it necessary to acquire staff fluent in Bahasa Indonesian and possibly other local languages.
- \* Given the complex geography, advance planning may be more involved for first entry firms than that required in many other nations in the region.
- \* Indonesia has a dynamic and predominantly development-oriented economy in which the non-oil/gas mineral sector plays only a very small role.
- \* Most mineral companies would probably find the Indonesian economy to be a favourable factor in an investment decision; the relatively low inflation rate and the government's ability to implement a long-term, transparent economic policy are particularly commendable.
- \* Improvements to basic infrastructure are progressing well on some islands, but in most locations a mining company would have to make a sizeable investment in infrastructure.
- \* Indonesia has established a successful track record of mineral sector foreign investment.
- \* Foreign investors have three legal options for participating in the Indonesian mineral industry: under a COW, a cooperation contract or through a private joint venture.
- \* A pro-investment policy in the early 1980s led to the signing of a substantial number of COWs, but toward the latter part of the decade, the government shifted its policy, rewrote the terms of the COW and investment slowed considerably.

- \* With the advent of the 1990s, another generation of COW has come into use, which, although not as attractive as some previous COWs, is attracting foreign investor interest.
- \* Investors and potential investors in the mineral industry of Indonesia benefit from the availability of clear mineral policies.
- \* The track record of the government in honouring a signed COW irrespective of whether its terms are in accord with current policy has bolstered foreign investor confidence in the regulatory system.
- \* Indonesia has favourable geology for a wide range of minerals, and current and historical mineral production is widely disbursed throughout the country.
- \* Most mineral companies would find the geology, the amount of information and the capabilities of government geoscience institutions all favourable factors in their consideration of Indonesia as a site for exploration and mining investment.
- \* Indonesia is well situated geographically to supply the Pacific Rim markets and has a growing internal market.
- \* Policies to promote downstream processing and national self-sufficiency have thus far been implemented on a practical level, where companies are given the right to sell their products at open market value.
- \* The combined four-year survey and exploration phase might be acceptable to some companies, but for many types of minerals the duration is not sufficient for a thorough and systematic investigation.
- \* The size of exploration blocks would meet the requirements of most exploration companies.
- \* The COW provides substantial security of tenure between the exploration and mining stages of mineral development.
- \* The requirement for a phased transfer of ownership (up to 51 per cent) would be considered as a disincentive by most mineral companies.
- \* Administrative efficiency is promoted by a policy where if a required government decision is not forthcoming in a specified time period, the matter is, by law, deemed approved.
- \* In general, the tax policies are geared to promoting foreign investment in the mining sector.
- \* Taxes are clearly laid out in both the COW and the cooperative contract and are no more onerous than those in many other mineral producing nations; taxes are stable, being set upon the signing of the COW or cooperative agreement.
- \* Foreign exchange regulations are reasonable, and external accounts may be used for some purposes.
- \* Environmental protection measures are required, but the government lacks the institutional depth to fully monitor and enforce environmental protection requirements.

\* The government has a reasonable policy on expatriate labour but requires participation and training of nationals; many types of trained mineral professionals are available in Indonesia.

In summary, the mineral investment environment in Indonesia would be considered as quite favourable by most foreign mining companies. Excellent prospects for many types of minerals, combined with a clear and time-tested regulatory and fiscal system, have proven to be attractive to the foreign mining community, as can be attested to by the number of companies now operating in the country. The government's periodic experimentation with the terms of the principal investment contract, the COW, resulted in a recent three-year period of little foreign investment, but a new-generation COW is once again drawing the attention of the international mineral industry to Indonesia.

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# Malaysia: The Effects of a Joint State and Federal Regulatory System on Foreign Mineral Investment

# 1. Introduction

Although Malaysia has long been one of the world's largest producers of tin, produced mainly by exploitation of alluvial deposits, alluvial and hardrock mining activities are undergoing a decline. The lack of adequate private sector exploration activity to identify new mineral deposits is the primary reason for this decline. Malaysia does offer some favourable geology, but this alone is not sufficient to attract and hold investor interest (Prast 1990). There is considerable competition for exploration investment around the world. The current mineral sector regulatory and fiscal system in Malaysia is not well suited to regulate today's mineral industry and does not offer competitive terms to attract investors.

The underlying causes of the lack of investor interest can be primarily attributed to current government policies, laws and administration. Unless fundamental changes are forthcoming, there is no reason to believe that exploration activities will increase significantly. The federal and state governments are now considering the adoption of a new national mineral policy and related federal and state legislation, which reportedly would address many of the perceived shortcomings in the current regulatory and fiscal systems (Otto 1990a).

# 2. Background Information

### 2.1 National Profile

### 2.1.1 Political Environment

Malaysia is a constitutional monarchy. The constitution provides for a federal system of government and defines the respective roles of both the federal and state governments. Under the constitution, both land and mineral rights are a state responsibility. A cabinet of ministers, appointed by the prime minister, sets and implements the major policies of the government. The minister of primary industries plays the lead federal role with regard to the development of the mineral sector. Members of the bicameral parliament (senate and house of representatives) are elected every five years. There is a federal judiciary. In most states, the authority to grant mineral rights lies with an executive council, which consists of political appointees.

After the 1990 election, the prime minister revealed a new long-term national development policy for the nation that focuses on the eradication of poverty and the encouragement of foreign investment (*Financial Times* 1991).

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Malaysia is considered to have one of the most stable governments in Asia. It is expected that the current system of dispute resolution through political means will continue. Malaysia would probably be considered by most foreign investors to have a very acceptable level of political risk.

### 2.1.2 Geography and Demography

Malaysia has a land area of 330,434 square kilometres and is physically divided into Peninsular Malaysia (eleven states and one federal territory) and the two states and one federal territory – Sabah, Sarawak and Labuan – located in the northern portion of the island of Borneo. The country is strategically located at the shipping crossroads linking the South China Sea and the Indian Ocean and is thus well positioned with regard to Asian markets.

The population of 17 million comprises many ethnic peoples, but the largest ethnic groups are the Malays, Chinese and Indians. The main languages are Malay, Chinese, English and Tamil. Most international business is conducted in English, and it is rare to find a businessman who is only bilingual. The population is well educated, by developing world standards. The vast majority of the population is found in the southern half of Peninsular Malaysia. In areas of higher population density, land use is becoming a major concern, and mineral companies may expect to encounter stiff competition from competing uses in some areas.

In Sarawak and to a lesser extent in Sabah, diverse ethnic groups have seen their customary rights receive substantial protection under the respective state land laws. Mineral companies operating in lands subject to customary land claims may encounter administrative delays at the mine application stage, reflecting the often complicated process of determination of such rights and assessment of adequate compensation.

Depending somewhat on the targeted mineral, most investors would find the geographical location of Malaysia acceptable. The presence of a relatively well-educated work force that is generally conversant in English and local languages has been an attraction for many foreign investors.

### 2.1.3 Economy

At the time of independence in 1957, the Malaysian economy was highly dependent on the export of raw materials such as rubber, timber, pepper and tin. During the 1970s, oil and gas were discovered, which added significantly to export earnings. Today, the Malaysian economy is still export driven but has diversified its export mix substantially. While Malaysia is one of the world's largest exporters of rubber, palm oil, timber, pepper and tin, the largest contributor to export value is now manufacturing, which in 1990 accounted for more than 30 per cent of the total export value.

Like all export-driven economies, Malaysia is vulnerable to worldwide economic downturns. However, the wide range of exported commodities has helped to insulate the economy from severe disruptions. The economy has seen fairly steady growth for the past 20 years and is considered one of the strongest among the developing nations. Inflation is low (less than 4 per cent in 1990), the balance-of-payments position has remained strong (positive or near positive) and the external debt is quite manageable (US \$15.5 billion in 1990). The balance of payments went slightly negative in 1991, but this is mainly attributed to imports of capital goods, which should, in the long run, benefit the economy.

### **Economic indicators**

	1989	1990
Real GDP growth rate	8.8 per cent	10.0 per cent
GDP US \$ billion	37.5	42.5
US \$ GDP/capita	2,154.0	2,388.0
Inflation	2.8 per cent	3.9 per cent
Current accounts balance, US \$ million	-0.2	-1.7

The economy is basically free-market-oriented, but many consumer commodities are price controlled. The government is in the process of privatizing many enterprises, and welcomes and openly encourages foreign investment.

After independence, there was a period of strong national sentiment, which was reflected in an effort to reduce the foreign presence in the business community. Strict rules were implemented, which required foreign-controlled companies to divest substantial interests to Malaysians (in many cases a national company) at a fair market price. Over time, this sentiment has softened and the government is much less interested in taking a direct ownership role.

A one-stop office has been established to facilitate investment by foreign manufacturing companies, and many firms from around the world have established production facilities. They have apparently been attracted by the reasonable fiscal system, the low cost of educated labour and the stability and predictability of the political system. There is no equivalent office for mineral sector investors either at the federal or the state level.

The mineral industry has historically played a central role in the development of the nation. However, for the past 20 years the importance of the sector has diminished substantially, reflecting both the successful diversification of the economy and a decrease in mineral production. In 1970, the non-energy mineral share of total export value was more than 20 per cent but had declined in 1990 to approximately 2 per cent. In 1989, mineral exports, excluding oil and gas, accounted for approximately M \$1,496 million (tin: M \$1,161 million, copper: M \$130 million, gold: M \$64 million, bauxite: M \$12 million).

There has been a steady and continued decrease in mine employment over the past 20 years. In 1970, mine employment was approximately 50,000 but had by 1990 dropped to just under 12,000.

In summary, Malaysia has successfully diversified its economy away from the production and export of raw materials. The economy is based on free-market principles, subject to a certain amount of government control. Over the last 20 years the economy has seen steady growth and is considered a model by many developing nations. Substantial foreign investment in manufacturing has been the result of successful marketing of Malaysia as a location offering economic and political stability, a steady economy, low wages, an educated workforce and a reasonable fiscal system.

### 2.1.4 Infrastructure

Basic infrastructure in Peninsular Malaysia is extensive by developing country standards but lags in the states of Sabah and Sarawak.

In the peninsula, rail routes link the capital and the well-developed main port, Port Klang, to Thailand in the north and Singapore in the south. Malaysia has constructed an extensive road system, which is considered as one of the best in Asia. The national power grid extends to most of the countryside, and a widespread natural gas distribution system is now being constructed. Communications systems are modern in most urban areas.

The infrastructure in Sabah and Sarawak is less well developed and is primarily centred around urban areas. The interior is not easily accessible in many places, but a growing system of dirt roads built by logging companies has made access for exploration both possible and practical in many areas that were recently considered inaccessible. Depending on the scope and nature of the operation, a mine operating in Peninsular Malaysia could benefit substantially by the costs saved in not having to emplace infrastructure. However, in most locations in Sabah and Sarawak, a company would need to budget for most of its infrastructure requirements.

### 2.2 Past and Current State of the Mineral Industry

### 2.2.1 Historical Perspective

The Malaysian mineral industry has been and continues to be dominated by tin. The Malaysian tin industry exploits mainly alluvial deposits by dredging and gravel pump mining; through a progression of technological improvements, it can now be considered at the forefront in the recovery of alluvial tin and gold.

The production in Malaysia of many minerals has declined since the early 1970s. This long-term decline is attributable to a lack of exploration and the depletion of known reserves. In addition, the demise of the International Tin Council and the sharp price decreases that resulted therefrom forced the closure of many smaller tin mines during the 1980s. In 1970, there were approximately 1,100 mines (1,083 of which were tin mines) in operation, but by 1990 the number had fallen to just more than 200 (141 tin mines). The following major mineral commodities experienced a production decline between 1970 and 1990.

Tin	(1970: 74,000 tonnes;	1990:	29,000 tonnes)
Iron ore	(1970: 4,491,000 tonnes;	1990:	293,000 tonnes)
Bauxite	(1970: 1,139,000 tonnes;	1990:	360,000 tonnes)

While production of most base metals has declined, some minerals are experiencing production growth. The following minerals experienced a production increase from 1970 to 1990.

Gold	(1970:	161 kg;	1990:	2,595 kg)
(primaril	y as a byp	roduct in copper conce	entrates	)
Copper	(1970:	0 tonnes;	1990:	102,000 tonnes)
Coal	(1970:	0 tonnes;	1990:	99,000 tonnes)
Ilmenite	(1970:	223,000 tonnes;	1990:	530,000 tonnes)

Barite	(1970:	0 tonnes;	1990:	21,000 tonnes)
Illite	(1970:	0 tonnes;	1990:	3,000 tonnes)
Silica sand	(1970:	0 tonnes;	1990:	641,000 tonnes)
Kaolin	(1970:	3,000 tonnes;	1990:	153,000 tonnes)

Copper concentrate production, which began in the mid-seventies with the opening of the Mamut copper-gold-silver mine, may cease in 1997, when mineable reserves are exhausted. When the Mamut mine closes, copper and silver production may cease in Malay-sia, and gold production may fall by 50 per cent.

There are currently two mineral projects of particular interest. Malaysia Mining Corporation has constructed a pilot processing plant as a precursor to a possible investment of up to US \$250 million to develop the Mengapur polymetallic (copper) deposit. In Sabah, BHP is in the early stages of delineating what appears to be a world-class coal discovery in the environmentally sensitive Meliau Basin.

To summarize, the Malaysian minerals industry is at a crossroads. Easily discovered and mineable reserves of tin and other minerals are now being depleted, but the level of private sector exploration has been inadequate to locate new deposits. With the exception of tin, the Malaysian mineral sector is not significant by world standards.

### 2.2.2 Structure of the Industry

The Malaysian mining industry is dominated by tin. In April 1991, the Department of Mines reported that 124 mines (23 dredges: 1,043,124 kg; 70 gravel pump operations: 794,734 kg; 17 open-cast mines: 196,768 kg; 13 underground mines: 7,682 kg) produced 2,042,308 kilograms of tin.

Other minerals produced include copper, gold, silver, iron ore, bauxite, coal, barite, illite, ilmenite, kaolin, silica sand and various byproducts.

With the exception of the Mamut Copper Mine and several of the tin dredging and gravel pump operations, the mines are small by world-class standards.

The mining industry is in a state of transition. Most tin mining companies, with a few notable exceptions, have little expertise or interest in hardrock exploration. When tin prices collapsed following the demise of the International Tin Council, many companies, particularly higher cost gravel pump operations, closed their mines and diverted their capital assets, if any, into the booming manufacturing industry and property markets. Exploration to discover and develop hardrock minerals was probably never even considered.

The famous alluvial tin deposits of Malaysia have been worked and reworked for years, and the grade remaining in accessible land is generally quite low. Many operations work materials that is lower in grade than the tailings discarded in other tin-producing countries such as Brazil. Even the always optimistic Malaysian Chamber of Mines admits that the potential for the long-term recovery of the tin industry is limited. Although production has been declining, tin will remain the mainstay of the Malaysian mineral industry for the foreseeable future.

The Geological Survey and the Department of Mines have clearly indicated their belief that the future of the mineral sector will depend on the development of hardrock minerals and coal. Those companies that currently do hardrock mining (such as Malaysia Mining Corporation, which has interests in hardrock mines operating outside Malaysia, the Bukit Young gold mine in Sarawak and the Mamut mine in Sabah) have ongoing exploration programmes in the country. However, their exploration activities and those of other local companies are small in comparison with the magnitude of the task at hand. Substantial foreign investment and expertise are needed if the Malaysian mineral sector is to see much growth in the near term. There has been substantial interest by foreign exploration companies, but few have actually acquired exploration rights and some of those that did have not proceeded.

In early 1990, there were approximately 684 valid permits and licenses in effect for exploration. The majority, more than 600, were in Peninsular Malaysia and covered very small alluvial tin and gold prospects. Foreign firms that are believed to be actively pursuing exploration programmes include BRGM, ASARCO, Eualba Mining Ltd., Montague Gold N.L., Avocet Inc, Leadstar, Pacific Arc, BHP, Renison Goldfields and Global Minerals Exploration Corp. A summary of annual exploration activities is available from the Geological Survey of Malaysia. To put the low level of activity into perspective, the most active country having exploration companies working in the region is Australia. The *Australian Mining Journal* reported in 1990 the following number of exploration licenses held in the indicated countries by Australian firms in 1988: Indonesia, 130 to 180; New Zealand, 130 to 150; Fiji, 50 to 70; Solomon Islands, 40 to 60; Vanuatu, 20 to 40; Philippines, 20 to 40; and Malaysia, 5.

Compared to many other Asia-Pacific nations, the mineral industry of Malaysia is quite orderly. To a large extent, small-scale mining by individuals is well managed and does not interfere with larger operations.

Individual mining using simple implements is not encouraged in Sabah and Sarawak, and there is no recent tradition or toleration of such activities. In Peninsular Malaysia, the tradition of panning for tin with a *dulong* (wooden pan) is well established, and such activities are administered by the state mining officer(s) through a tried and time-tested licensing system. Many tin mine operators allow the holders of dulong licenses to work within the mine area with the permission of the mine operator. Migration has not been a problem with regard to tin for the following reasons: the rewards are usually small; the number of licenses that an officer will issue is few for a given area; and local pressure will be brought to bear if licenses are issued to "outsiders."

A few years ago alluvial gold was discovered on land not currently subject to any exploration or mining rights in Lubok Mandi. This example is useful for examining how a gold rush is managed in Malaysia. The individual miners were issued licenses (at the peak 10,000 were issued in one month), which allowed the holder to work within the designated area subject to certain conditions such as a curfew and depth limits. Enforcement of license conditions by Department of Mines officers was sporadic, except to keep the panners within a designated area. The lack of strict enforcement was attributable to fears of personal safety by the enforcement officers and a lack of support to impose more than a minimum amount of control over the local "miners." Periodically, usually following a death resulting from a pit

or trench collapsing, the whole area would be closed, new rules written and then the area reopened. The state realized little if any fiscal benefit from the mining, but the political goodwill gained was probably substantial. After the main alluvial reserves were mostly worked out, the state undertook exploration with the intent to develop the gold associated with hardrock underlying the alluvium. A mining lease has been issued for at least a portion of the area, but at this stage, the company is moving cautiously.

A company holding a valid exploration right or mining right will probably not encounter any serious problems with small-scale miners for the following reasons: (1) the exploration or mining right is issued by the local state authority and not a distant national authority; (2) there is a tradition and well-established system of administration of small-scale mining; (3) laws regarding land rights are usually respected; (4) the state has a fiscal interest in seeing a mine rather than individual operations develop; and (5) there are few, if any, recent precedents of small-scale miners taking over an already established exploration or mining area. The main problem encountered is that if a company is given a large exploration block, there may have been panning licenses already issued within the block. The licenses authorize panning only within a very small area listed on the license. It is not clear in most states whether an exploration right takes precedence over a panning license.

In summary, the Malaysian mineral industry is dominated by tin, but the industry is declining. Most operations are quite small by world standards. Traditional mining companies are moving their capital into other sectors of the economy. There is not much foreign exploration at present (around ten companies). There is an extensive amount of panning activity for tin and gold, but it is generally well regulated and has not posed a problem for holders of mining leases.

### 2.2.3 Government Policies Relating to Minerals

It is not very useful to talk about government policies on minerals at the present time. As is discussed in more detail in a subsequent section of this study, the federal government and state governments each have their respective roles in the regulation of the mineral industry. The federal government and the state governments have not published a policy, and any *ad hoc* policies that might be in effect in one state would differ in another. Within some states, policies have been inconsistent from year to year and from investor to investor. (Sabah and Sarawak have been fairly consistent with regard to being open to foreign mineral investment.)

A joint federal-state committee has been working since 1989 with the assistance of the United Nations to establish a national mineral policy, which would clarify the federal and state positions on many key matters of concern to investors. The draft was completed in mid-1991 and will probably be considered for adoption before the end of 1993.

### 2.2.4 Summary of the Current and Projected State of Affairs

With the exception of some minor minerals (silica sand, barite, illite and kaolin) and possibly coal, it is not unreasonable to assume that unless a new direction and emphasis is given to encourage exploration activities, the mineral industry will see little growth in the near term. In 1989, the government, with the assistance of the United Nations, began a systematic review of mineral sector policies, legislation and the fiscal system. In this effort, a draft national mineral policy, draft federal mineral development act, draft model state mineral codes, a proposed mineral title management system and other related studies were completed in July 1991. The various approving bodies are now reviewing the package of recommended regulatory and fiscal reforms. Some of the recommendations have already been adopted into law or practice, and while there are early indications of support for most of the recommendations, it will probably be several years before the full extent of the regulatory reforms can be known with certainty.

# 3. Geological Potential

# 3.1 Description of the Geology

A detailed description of the diverse geology of the various regions within Malaysia is beyond the limited scope of this study. General and detailed descriptions are available in annual yearbooks of the Geological Survey of Malaysia. It is widely acknowledged by the world mining industry that Malaysia, in general, has favourable but not truly outstanding geological potential. The emphasis in this section is to indicate those "investment" jurisdictions with particularly favourable geological potential for specific minerals.

# 3.1.1 Geographical Distribution of Mineral Potential

The Geological Survey has identified more than 24 mineral types that may occur in significant quantities in Malaysia. The following partial list of mineral commodities indicates the states in which the mineral indicated is known or thought to exist in commercially prospective deposits.

Barite:	Kelantan, Pahang
Bauxite:	Johor, Melaka, Pahang, Terengganu, Perak, Selangor, Sabah, Sarawak
Coal:	Sabah, Sarawak
Copper:	Pahang, Sabah
Gold:	Johor, Kelantan, Pahang, Sabah, Sarawak, Terengannu
Illite:	Perak
Ilmenite:	Terengganu
Iron:	Johor, Kedah, Pahang, Perak, Terengganu
Kaolin:	Johor, Perak, Pulau Pinang, Selangor, Sarawak
Lead/zinc:	Pahang, Sabah
Silica:	Johor, Kelantan, Perak, Pahang, Selangor, Sabah, Sarawak, Terengganu
Silver:	Pahang, Sabah, Sarawak
Tin:	Johor, Kedah, Kelantan, Melaka, Negri Sembilan, Pahang, Perak, Perlis,
	Selangor, Terengganu

In general, foreign exploration companies are encountering serious difficulty in obtaining exploration rights in most states in Peninsular Malaysia. In contrast, the states of Sabah and Sarawak have established a reputation as locations where mineral companies can conduct business on a reasonable basis. A compilation by the Geological Survey indicated the following numbers of exploration-related permits and licenses in force in 1989.

u)

Note: fewer than 10 permits and licenses are held by foreign companies.

### 3.1.2 Minerals of Exceptional Interest

In the past decade, major coal resources have been identified in the states of Sabah and Sarawak. The Sabah Meliau basin coal may be of particular interest to foreign investors. It is an extremely clean (low sulphur, low ash) coal with a high heating value.

### 3.2 Ability to Apply Geological Assessment Techniques

Małaysia poses no exceptional problems in the application of geological assessment techniques aside from those normally associated with a tropical climate. During the monsoon, most companies cease field operations in the northern part of Peninsular Malaysia and in the states of Sabah and Sarawak. Airborne-based studies must be timed to avoid both cloud cover and, in some areas, haze resulting from seasonal agricultural burning. Road access is relatively good, by developing country standards, in Peninsular Malaysia but is less well established in Sabah and Sarawak. Extensive logging roads have been cut in many jungle areas. The use of planes and helicopters for mapping and survey work is carefully controlled for security reasons, and permission for such work can easily take more than a year to be granted.

#### 3.3 Availability of Geoscientific Information

Malaysia has a well-established and administered geological survey, which acts as the government's main repository for geological information, including exploration results summarized in the survey's extensive open-file geological reports. In addition, the Department of Mines maintains records and other information regarding historical and present-day mining operations. Both departments maintain libraries, and the Geological Survey has a full-time information officer available to assist visiting researchers. Both departments are readily accessible to potential foreign investors, and appointments with specialist officers are easy to arrange.

Geological maps at a scale of 1:250,000 have been completed for the entire country. At a more useful scale (1:50,000 or similar scale), maps have been completed for about 50 per cent of the country (about 78 per cent of Peninsular Malaysia, 19 per cent of Sarawak and 12 per cent of Sabah). Geological maps at 1:50,000 are considered sensitive and may neither be sold to nor possessed by foreign companies without special permission, which is not usually granted. However, established Malaysian companies can acquire 1:50,000-scale

maps without much difficulty. Little mapping has been done in offshore areas aside from that done by the petroleum sector, and this information is not readily available for public distribution.

Geophysical mapping has progressed slowly. Maps are now available for some parts of Peninsular Malaysia but not yet for Sabah or Sarawak. Limited airborne geophysical surveys are now underway in these two states, and maps will probably start becoming available in 1992. Raw data obtained by airborne survey for the generation of geophysical maps are considered sensitive by the government and are not available for public sale or distribution. Gravity and geochemical mapping has been ongoing for many years but is far from complete. The government maintains a remote sensing centre, but, to date, it has not been fully used for mineral assessment work.

In summary, the amount of geoscientific information available for Peninsular Malaysia compares quite favourably with that available in most developing countries. However, the amount of information available for the geologically important states of Sabah and Sarawak greatly lags behind that available for the peninsular states. The lack of information in these two states is somewhat offset by the fact that the Geological Survey maintains an office in each state staffed by competent geologists specializing in the local geology.

### 3.4 Government Institutions

The Geological Survey of Malaysia (GSM) is charged by law (the Geological Survey Act) with the sole responsibility and is given the authority to undertake the geological survey for the nation. It maintains a headquarters in the capital city of Kuala Lumpur and three main regional offices, which are located in Ipoh, Kuching and Kota Kinabalu. The office in Ipoh contains the main laboratories, archives and collections (including drill core storage). The GSM has at least one geologist based in each state to advise the state government and the private sector and also to manage the duties of the survey with respect to that state. The director general of the GSM reports to the minister of primary industries. The main directive for immediate work to be undertaken by the GSM is summarized and budgeted in each national five-year plan. The GSM also cooperates in bilateral research and institutional strengthening programmes with institutions such as the British Geological Survey (publications), the United States Bureau of Mines (mineral economics), the German Government (coal resource assessment) and JICA of Japan (exploration).

### 3.5 Summary

Based on the information known at this time, Malaysia has favourable but not outstanding geology, indicating the potential for the occurrence of a broad spectrum of minerals. The GSM is the lead government institution involved with mineral resource assessment and by world standards is well organized and helpful to the private sector. There are no major physical impediments to exploration aside from the monsoon and the lack of road systems in some areas. Restrictive policies regarding the distribution of sensitive information – aerial photographs, topographic maps, raw geophysical data – apply to most foreign companies. Permission for any type of aerial-based work may be denied or a substantial waiting period may be encountered.
# 4. Marketing Considerations

Malaysia is geographically well situated to supply the markets of the Asia-Pacific region. Rail linkages exist to Thailand and Singapore, and major sea routes touch at well-developed port facilities in Peninsular Malaysia. Internal transportation systems in Malaysia are well developed (among the best in Asia), except in the states of Sabah and Sarawak.

With a population of approximately 16 million, Malaysia does not offer large internal markets. However, Malaysia is a net importer of many minerals, metals and metal semimanufactures. The government encourages the development of local industries and downstream processing that would lessen the nation's import dependence. This support can take the form of various incentive measures, including subsidized energy costs, import tariffs and investment credits, which might allow an internal producer certain cost or price advantages over foreign competitors.

Commodity group	(M\$,000)	Commodity group	(M\$,000)
Aluminium	434,119	Kaolin	4,177
Barium	439	Rare earths	745
Clays	32,395	Silica	650
Coal	186,051	Silver	6,692
Copper	739,008	Tin	48,932
Gold	2,394,974	Titanium	108,095
Iron	648,366	Zirconium	8,276

#### Table 1. Value of imports of minerals, metals and metal semimanufactures in 1989

Source : Malaysian Minerals Yearbook 1989, Geological Survey of Malaysia.

*Note:* The list of commodity groups in the table represents minerals that are currently commercially produced from Malaysian deposits but for which the current domestic supply cannot meet demand. With only minor exceptions, all other minerals for which there is an internal market are imported.

# 5. Mining Law

#### 5.1 Laws and Agreements Pertaining to Exploration and Mining

The ninth schedule of the Federal Constitution provides a framework for the respective roles of the federal and state governments. Some federal roles are currently filled by the state governments, especially where state legislation predates the constitution and federal law has not been written to supersede the state law. The following selected examples illustrate the respective primary regulatory authority in practice.

Federal: Development of mineral resources Foreign exchange Labour and safety in mines (also state) Purchase, sale, import and export of minerals and mineral ores Registration of businesses Regulation of foreign corporations Scientific surveys Research taxation Work permits Visas State: Permits and licenses for exploration Mining leases Mining agreements Compulsory acquisition of land Land tenure and transfer Rehabilitation of mining land

There are several legislative regimes applicable to mining in Malaysian states. Most state mining enactments date to the turn of century (Sabah and Sarawak have more modern mining codes), and although they have been amended from time to time, they are not considered attractive by most foreign mineral companies. States on the east coast of the peninsula have their own unique mining codes, as do Sabah and Sarawak. The western states on the peninsula follow a similar law (Chapter 147). The lack of uniformity between state laws increases the difficulties foreign firms have when trying to analyse the investment environment. The situation can leave a company in a quandary, having to adjust to a different set of rules in each state.

This difficulty is compounded by the recent trend to supplement the mineral code with mineral agreements. In some cases, foreign companies have found that the mining codes do not provide an adequate level of definition and have requested agreements, and in other cases, the state has granted mineral rights to a state-owned enterprise, which then signed a mineral agreement with the foreign company. There is no consistency between the agreements signed, and the negotiations leading to signature have often been quite protracted.

Companies making a first visit to Malaysia or attempting to analyse the mining law from abroad will have a very difficult, if not impossible, task. Just obtaining physical copies of the laws and their amendments is a massive job. Companies having a good idea of which state they want to operate in will find the plethora of laws less of a burden but will probably be faced with a law that is badly aligned with the expectations of today's industry.

# 5.2 Major Features of the Legislation/Agreements

## 5.2.1 Ownership of Minerals

All minerals occurring within the federal territories of Labuan and Kuala Lumpur belong to the federal government. All minerals within a state belong to the state authority, which is defined for each state in its respective mining code. Ownership of minerals in the continental shelf beyond state boundaries and minerals within the exclusive economic zone of Malaysia is vested in the federal government. However, the states of Sabah and Sarawak may also claim ownership of minerals in certain offshore areas under laws predating independence. The applicable federal law and most state mining codes are silent about the point in the mining sequence at which the mineral becomes the property of the holder of the mining right.

### 5.2.2 Exploration

One of the most daunting tasks faced by an exploration company is to determine what areas are open for exploration. In some states this is fairly straightforward, but in others, it can require a major effort. Once a company determines what area it wants to apply for, the

procedures differ from state to state. In some states applications must be registered with district offices, while in others, the application is registered at a central location. In most states, priority is not reserved to the first company making an application. In one state, a foreign firm recently applied for an area and within the course of a few months more than 30 other applications were filed by local firms and individuals for the same area. Needless to say, the approving authority was reluctant to proceed. Administrative problems are more likely to be encountered in peninsular states; Sabah and Sarawak have established more streamlined procedures. Most states do not have any limitations on the size of areas that may be granted to a single company. In some states, the exploration company must specify the target mineral, but in others, a general mineral license is allowed. In practice, foreign firms have been entering into agreements wherein a work programme is described and the obligations and rights laid out in detail. In almost all states the approving authority for an exploration right is the state authority (usually a committee comprising politically appointed members). In most states, a prospecting license is not transferable. To summarize, a foreign firm wanting to obtain an exploration right in most Peninsular Malaysia states will find that a substantial amount of time and effort will be required.

### 5.2.3 Security of Tenure

If the holder of an exploration right discovers a deposit, then under the existing provisions in the state mining codes, the holder is not adequately, by a competitive world standard, guaranteed a right to obtain mining rights. In most states, if an application for such rights is denied, there is no provision for an appeal procedure to a higher or alternative authority.

In practice, most states would probably award the mining right to the foreign holder of the exploration right, but there is little historical evidence upon which to support this hypothesis. Any analogy to the tin industry would be misleading. Historically, most prospecting rights for tin were granted over an area that was already known to contain tin, and the awarding of mining rights depended not so much on a "discovery" as on who was applying.

#### 5.2.4 Mining

Most states issue mining leases for up to 21 years and in some cases supplement the conditions of the lease with a mineral agreement. A mining lease can only be issued on state land; if the land is not state land, it must first be converted. All states have some form of compulsory land acquisition law. Most state codes provide for a renewal of the license, but such renewal is completely discretionary. In some states, there is a history of short license periods, even when the deposit warranted a longer production life. This is related to the fiscal system. In many states, when a new lease is issued or renewed, a fee called a premium must be paid. The state authority must approve all transfers, and such approval is discretionary. Cancellation of a lease is done by the state authority, and there is no provision for arbitration either at the national or international levels. Cancellation would, however, be grounds for an appeal to the high court.

In general, the observations made above apply in most states, but there are exceptions. On the whole, the state mining codes do not provide the type of terms and protection that most international mining companies require. In most cases involving a foreign company, an agreement is signed to more clearly define the rights and obligations of the company.

# 5.2.5 Ownership and Control

There is currently no way of predetermining what the government's expectations are regarding limitations on ownership and control. Policies of the federal government are in a period of transition, and it has never been clear, to the foreign mining company at least, whether policies under the past new economic plan for manufacturing also applied to mining. The new national development plan is silent on the ownership issue, but new guidelines are reportedly now being formulated.

The Malaysian Industrial Development Authority has indicated that majority foreign equity ownership of up to 100 per cent is allowable under some circumstances (MIDA 1991, Goh 1990). There is, however, some question as to whether MIDA has the legal authority to make policy on mineral matters.

In practice, states appear to believe that it is within their purview to set ownership and control requirements. Most, but not all, foreign companies now doing exploration have a local partner. There have not been enough cases of mining with foreign participation to draw any guidance from historical precedence with regard to ownership and control.

### 5.3 Administrative Efficiency

The processing of applications for exploration or mining can become bogged down in the approval process. An application is usually routed to a number of state level departments before going to the approving authority, and it is not uncommon for the process to come inexplicably to a halt. In some states, applications for exploration rights have been pending for more than five years. In many states, a wait of a year or more is not uncommon. However, in some states processing is much quicker, particulary where a central committee composed of all the relevant departments reviews the application before vetting it to the state authority.

Once an exploration right or mining right has been approved, most matters are routinely handled without unreasonable delays.

On the whole, the existing regulatory structure has functioned well in the management of alluvial mining operations but is detrimental to attracting investment for the exploration and development of nonalluvial minerals (Garnett 1989).

# 6. The Fiscal Regime

#### 6.1 Description of Major Taxes

Many companies would find the fiscal system, as it appears in law, to be favourable for investment. The federal and state taxes are reasonable and provide a competitive approach to taxation (Otto 1990c). With only one exception (the state of Sabah), direct state taxes are defined by law and not subject to negotiation. However, some states, during the 1980s and up to the present, have levied or have attempted to levy indirect taxes that most mineral companies would find prohibitive.

# 6.1.1 Income Tax (a Federal Tax)

The corporate income tax is currently 35 per cent. There is also a development tax of five per cent (effective income tax of 40 per cent) that is being phased out over a five-year period, beginning in 1990. For mining, no tax holidays or investment tax credits are currently available. Accelerated depreciation is not available, but loss carry-forward is allowed. Exploration expenses may be deducted for computing taxable income in the year they are incurred, but if a mine is put into operation, the deducted exploration expenses are "clawed" back and counted as income in the first year of production. The exploration expenses may then be depreciated.

### 6.1.2 Export and Import Tax (a Federal Tax)

Export duties on almost all ores and concentrates were abolished in 1991. Some metals are subject to export duties of up to 10 per cent. Import duty on mining equipment can be quite high (generally 50 per cent). An exemption can be granted for any individual piece of equipment, but currently a blanket exemption for a mining project is not available. The official policy is that if the equipment is not manufactured in Malaysia and there are no current plans for such manufacture, then the equipment should qualify for the exemption. However, in practice, the exemption policy is not always followed. Most mining companies would probably view the current import tax on equipment as a disincentive.

# 6.1.3 Royalty Tax (a State Tax)

Most state mining codes contain a schedule of royalty rates. In many of the codes, rates are specified for only a handful of minerals that have seen historical production within the state. In most cases, the royalty rates are reasonable and comparable with those in other nations that are considered fiscally attractive by mining companies.

### 6.1.4 Fees and Land "Rent" (a State Tax)

In most states, application fees and other fees for exploration rights and mining rights are nominal. Area "rental" fees vary from state to state and by world standards are quite reasonable. At the time a mining lease is acquired, a land "premium" must be paid in most states. The amount of the premium varies from state to state but is, for most states, quite reasonable and not considered a deterrent by most serious investors.

#### 6.1.5 Indirect Taxes in Some States

Most states do not have the power to set their own royalty tax rates; in these states, the federal minister for primary industries sets the rates under the authority of the state mining code. State royalties have not been set by the minister for most minerals. The majority of states receive very little direct fiscal benefit from mining and have reacted by either being reluctant to tie up land with nonrevenue-producing mines or by using a variety of indirect tax methods to extract rents. The most common indirect methods are dividends paid to free equity shares issued by the mining company to a state-owned company and tribute. With tribute, the mining right is given to a state-owned corporation, which then signs a mining agreement with a mining company. The mining company pays a percentage royalty to the state-owned company. Being a contractual arrangement between "private" parties, the indirect tax avoids legal restrictions on a state with regard to its power of taxation. Not all states, including mineral-rich Sabah and Sarawak, use indirect taxation methods.

# 6.1.6 Miscellaneous

Investors from some developed countries can qualify for some types of capital investments in Malaysia for export credits from their home country.

Expatriates are not exempt from paying the federal income tax.

# 6.2 Ability to Predetermine Tax Liability

Direct taxes levied by the state and federal governments are not subject to negotiation (except in one or two states) and can be easily determined for planning purposes. Unfortunately, indirect taxes levied by some states are impossible to predetermine (Otto 1990b).

# 6.3 Stability of Fiscal Regime

The fiscal system is relatively stable, with most of the changes that have been made over the past 10 years benefitting investors. State royalties have remained exceptionally stable. The effective federal income tax is being decreased from 40 per cent to 35 per cent over a five-year period, and in 1991, almost all export duties on ores and concentrates were reduced to zero.

The federal and state governments are now reportedly considering a revised system of mineral taxes proposed by the United Nations, which is designed to encourage increased investment in the mineral sector (Otto 1990b).

# 6.4 Tax Treaties with other Nations

As of the end of 1991, Malaysia had signed comprehensive bilateral double tax agreements with Australia, Bangladesh, Belgium, Canada, China, the Commonwealth of Independent States, Denmark, Finland, France, Germany, Hungary, India, Italy, Japan, the Netherlands, New Zealand, Norway, Pakistan, the Philippines, Poland, the Republic of Korea, Rumania, Singapore, Sri Lanka, Sweden, Switzerland, Thailand and the United Kingdom. Other countries having some form of taxation agreement include Brazil, Egypt, Indonesia, Kuwait, Malta, Turkey and Yugoslavia. The current listing of such treaties and their provisions relevant to dual taxation and other topics is readily available from the Malaysian Industrial Development Authority (MIDA 1991).

In addition, Malaysia has entered into agreements with Australia, Austria, Belgium, Canada, Finland, France, Germany, Italy, Japan, Kuwait, the Netherlands, Norway, Rumania, Singapore, Sri Lanka, Sweden, Switzerland, the United Kingdom and the United States to guarantee such countries against some noncommercial risks such as expropriation (MIDA 1991, *Financial Times* 1991).

# 7. Monetary Controls and Access to Capital

# 7.1 Foreign Exchange

The Malaysian ringgit is readily convertible in the international community at reasonable rates of exchange. There is no currency black-market within Malaysia. Companies are allowed to repatriate profits and to set up external accounts.

# 7.2 Access to Capital

Raising local capital for exploration is difficult. The Malaysian economy has, on the whole, been growing very quickly and many, but not all, companies that began as mining companies have redirected their capital to more profitable and less risky forms of business. Local banks will not lend to support exploration, and a restrictive share market precludes raising capital through the issuance of stock offerings.

Raising local capital for small and medium-sized mines is less of a problem, but for large mines, external borrowing would almost certainly be necessary. Residents can borrow in foreign currency from Malaysian banks. Nonresident companies may borrow up to M \$10 million from all sources within Malaysia without permission from the central bank. The central bank must give approval for foreign borrowing exceeding M \$1 million and can restrict the debt-to-equity ratio. The bank has a reputation as being quite flexible with regard to foreign borrowing by the private sector.

# 8. Environmental Protection

#### 8.1 Legal Requirements for Environmental Protection

The federal constitution provides that the federal government has primary responsibility for the regulation of measures to protect the environment but also provides savings clauses for preindependence state laws, some of which address water pollution. Under current law, it is not possible to predetermine what environmental protection measures the government will require.

#### 8.1.2 Federal Requirements

The federal Environmental Quality Act of 1974 applies to all activities that are prescribed under the law. Exploration activities are not prescribed, but mining operations that will extend over an area greater than a few hundred acres must comply with the provisions of the act. Before development may commence, an environmental impact plan must be submitted and approved by the federal Department of Environment (part of the Ministry of Science, Technology and Environment).

The act gives the minister the power to set various effluent standards for the mining industry, but as yet no standards have been promulgated. Although a booklet on the preparation of an environmental impact plan is available from the department, it is best suited for a manufacturing project and does not stipulate which specific consequences of mining should be addressed in the plan. Without prescribed standards and guidelines, the government approving officer must use his subjective discretion in approving a plan. The department does not currently employ any staff with either an academic or practical background in mining. Government officers with a background in minerals (located in the Department of Mines and Geological Survey) report to another minister, and it is not clear to what extent they can be, or are, consulted in the approval process.

The department has set an internal EIA approval deadline of three months from the time the plan is submitted. In 1990, the first two mining companies submitted environmental impact plans for approval. The department took a cautious approach and both plan approv-

als were delayed, pending the receipt of additional information and modifications. Until such time as unambiguous preparation guidelines and standards are available, companies will have difficulty preparing their plans, and the department's officers will move cautiously to approve them to avoid later criticism. The administrative system, although slow, does appear to work. However, the basic problem remains: there is no clear guidance as to what environmental protection measures a company must provide to obtain federal government approval.

# 8.1.3 State Requirements

State laws regulating mining do not contain comprehensive provisions relating to environmental protection. However, most of the state mining codes prohibit the discharge of water containing excessive sediments or hazardous contaminants into watercourses. In most cases, the law does not specify effluent standards, and the enforcement officer must apply his or her discretion to determine whether a "safe" level is being exceeded.

# 8.2 Environmental Protection Trends

Expressions of public support for increased environmental protection have been growing. In some areas (such as the state of Sabah), vocal environmental groups have emerged, which have been able to bring pressure to bear on state officers who approve mining leases.

The Economic Planning Unit of the Prime Minister's Department is reportedly now considering a joint proposal by two federal ministries to develop both detailed guidelines for the preparation of mine environmental protection plans and environmental standards for mines.

# 9. Local Services and Labour Market

# 9.1 Availability of Local Services

Geotechnical and contract mining services to support alluvial, primarily tin, mining are well established. Fabrication and maintenance services are readily available, except in remote locations. In contrast, private-sector mineral laboratory analysis is limited. The Geological Survey laboratories are well equipped and, for a fee, will do work for the private sector subject to the availability of time. Many exploration companies send their samples abroad for analysis.

# 9.2 Labour Market

Malaysia currently has a surplus of trained mineral professionals. University-qualified geologists and mining engineers (local and foreign trained) are generally not difficult to recruit, reflecting the closure of much of the tin industry. With regard to the recovery of minerals from alluvial deposits, local engineers and labourers are among the best in the world. However, local professionals and miners are not well acquainted with other forms of mining.

Labour costs, even for professional staff, are very much lower than in the developed countries and compare favourably with other developing nations. There is no minimum

wage law. As an indication, the per capita income for the nation in 1990 was less than US \$2,400.

The federal government controls the issuance of work permits to expatriates, and the number of expatriates employed by a company is carefully monitored and controlled. The government has officially imposed a quota system mandating that a minimum percentage of a company's employees be *bumiputras* (of the Malay race) but has taken a flexible position in enforcement. Companies are generally able to freely negotiate wages. Government policies regarding employment have not been a problem at the country's largest mine, Mamut, but have posed difficulties for some exploration companies.

With the exception of the agricultural sector, labour unions rarely cause problems for any sector of the Malaysian economy. The mineral sector has not recently suffered significant work stoppages or transportation or energy bottlenecks as a result of actions by organized labour.

# 10. Conclusions

The key findings of this study with regard to the mineral sector investment environment are listed below.

Factors favourable to investment

- \* The level of political risk is relatively low.
- \* The geographic location is central to most Asian markets.
- \* The stability of the economy is attractive to most investors.
- \* Foreign exchange regulations are reasonable.
- \* The availability of established infrastructure can lower costs.
- \* The geological potential is favourable but not exceptional.
- \* Exceptional problems are not posed by small-scale miners.
- \* The amount of geotechnical information available compares favourably with that available in most developing nations.
- \* Labour is relatively inexpensive, and there is currently a surplus of universityeducated mineral professionals.
- \* The government is now reviewing a draft national mineral policy and supporting state and federal legislation that addresses many regulatory topics that now discourage investment.

Factors that discourage investment

- \* Mineral sector policies are unclear and inconsistent.
- \* There is a lack of uniformity among state mining codes, many of which need to be updated.

- \* State governments have almost no economic incentive to grant exploration and mining rights.
- \* The single largest impediment to investment is the uncertain and slow process of achieving access to land for exploration.
- \* There is no certainty that successful exploration will lead to mining rights for the economic life of the ore body.
- \* Transfers of mineral tenements require discretionary approval.
- \* Uncertainty regarding the fiscal system makes the economic assessment of projects difficult if not impossible.
- \* Certain fiscal elements, such as state tribute payments and free equity, are unreasonable, by world standards, and unacceptable to most companies.
- \* Import duties on equipment may discourage companies.
- \* The regulatory framework is not readily apparent, is fragmented and is not well suited for the regulation of today's exploration and mining industry.
- \* Local venture capital for exploration is very limited.
- \* Limitations on expatriate experts are not realistic for large-scale exploration projects executed by international companies.
- \* Federal policies and requirements regarding environmental protection are unclear.
- \* The government's policy on equity ownership and control is not clear.

Malaysia has had a tremendous influx of foreign investment into its manufacturing sector. That sector enjoys modern legislation, unambiguous policies and streamlined administration. This would appear to indicate that in terms of investor wariness, the problem does not lie with Malaysia as a whole but with the mineral sector regulatory system itself. In examining the list of negative investment factors listed above, all relate to policy, law or administration. Under the current system, few mineral sector investors have been able or have been willing to invest in exploration or mining. If new policy, laws and streamlined administrative procedures can be provided for the regulation of the mineral sector, there is every indication that the levels of investment by the world mineral industry would increase substantially.

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# **Mineral Investment Conditions in Mongolia**

#### 1. Summary

In the past two years, Mongolia has embraced both democracy and a free-market system, losing the aid and markets it had depended on during the past 70 years. The impact on the economy has been devastating. Gasoline and meat rationing, power outages and unemployment have become part of daily life in Ulaanbaator, the capital.

Mongolia is a huge, landlocked nation (about half the size of India), with a population of only 2.1 million people, more than half of whom are nomadic herdsmen. The main industries have traditionally been the processing of animal products, food and beverages, and mining. In recent years, the mining sector has grown in importance and accounts for 20 per cent of gross national product and produces 40 per cent of total exports, estimated at US \$290 million in 1991 (Damdinsuren 1991). The government hopes than Mongolia's vast mineral resources and the foreign investment they attract will lead it out of its current economic crisis. Both the potential and obstacles are, however, tremendous.

Currently, there are about 200 mines or deposits being worked in Mongolia. The largest mines are copper/molybdenum, fluorspar, lignite, coal, gold, tin and tungsten ore. Mongolia is a major exporter of copper, molybdenum and fluorspar. Many of the most promising deposits yet to be developed in Mongolia are in remote regions lacking roads and railways. Few roads are paved and many are impassable in winter. Horses are the most common form of private transport.

Mongolia needs to improve its long-term minerals export potential by developing metal processing facilities, upgrading the quality of existing mines and complexes and attracting foreign direct investment (FDI). Mongolia plans to develop several deposits with foreign assistance, including the lead/zinc/silver deposits at Ulaan Tsav, the Boro gold deposit, the copper/molybdenum deposit at Tsagaan Suvraga and the zinc deposit at Tumurtiin Ovoo.

Mongolia's enormous geological potential will eventually offer substantial opportunities for joint-venture investment. In a move to attract FDI in May 1990, Mongolia enacted a new foreign investment law providing favourable conditions for investing in the country and subsequently issued Regulation 207 - On the Implementation of the Foreign Investment Law. Numerous other laws and regulations are being developed to establish a complete and operable legal regime. Mongolia's government has started the process of privatization and is planning to privatize up to 70 per cent of assets, which were previously state owned.

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# 2. Background Information

# 2.1 National Profile

### 2.1.1 Political Environment

Mongolia's government is today pursuing economic and trade reform, political democratization and military downsizing.

By the end of the 1980s, Mongolia's economy had deteriorated and the country was facing rising unemployment, a trade imbalance and rapidly growing foreign debt. Economic reform measures were adopted in 1989 to stimulate the national economy, pave the way for political reorientation and allow for the introduction of democratic principles. The traditional Marxist government of Mongolia disintegrated in 1990, when Mongolia's ruling Communist party replaced its senior leadership with noted reformers, who vowed to transform the nation into a multiparty democracy. As a result of free, democratic elections in June 1990, a new political system has emerged in Mongolia, which includes a president, a parliament and a coalition government. Several political parties now exist, including the Mongolian People's Revolutionary Party, the Party of National Progress, the Democratic Party, the Party of Free Labour and the Green Party.

In 1991, Mongolia's newly elected government implemented a comprehensive economic reform programme aimed at moving the country toward a market economy and alleviating the impact of an imminent aid withdrawal. Before its dissolution, the former Soviet Union supplied an estimated US \$600 million annually in aid to Mongolia and accounted for more than 90 per cent of Mongolia's yearly foreign trade revenues. Annual trade between the two countries had been near US \$2.4 billion, with minerals comprising the major share. Virtually all of Mongolia's infrastructure and mining facilities are Soviet-built. The sharp reduction in financial aid and trade has slowed Mongolia's economic development considerably.

A primary objective of Mongolia's reform programme has been the creation of laws and regulations to encourage foreign investment and limit the role of state enterprises. Dozens of new laws have been introduced by the young Mongolian Government. Table 1 lists the major laws enacted and pending by the Mongolian Government. Among the most significant laws recently enacted are the Customs Law, the Bankruptcy Law, the Banking Law and the Privatization Law. Mongolian officials are continuing to revise their investment and taxation codes to attract overseas investment, particularly in the mining sector.

In early 1992 Mongolia adopted a constitution allowing private ownership of land and promoting human rights. The new constitution provides a legal foundation for moving the country from a centrally planned economy to a market economy. Effective 12 February 1992, the new charter converted Mongolia to a democratic parliamentary state with an autonomous judiciary and guarantees of basic human rights. The nation's name was changed to State of Mongolia from the Mongolian People's Republic, and the yellow star was removed from the flag.

#### Table 1. Recently enacted and pending legislation in Mongolia

The following laws have been adopted.	* Trade Unions Law 1991		
<ul> <li>Law on Underground Natural Resources 1989</li> </ul>	* Social Insurance Law 1991		
<ul> <li>Law on Cooperatives 1990</li> </ul>	* Labour Law 1991		
* Air Protection Law 1990	* Banking Law 1991		
<ul> <li>Foreign Investment Law 1990</li> </ul>	* Social Security Law 1991		
* Law on Political Parties 1990	* Business Law 1991		
* Law on the Structure of the Government 1990	<ul> <li>Privatization Law 1991</li> </ul>		
* Tax Law 1990	* Constitution Law 1991		
<ul> <li>Law on Government's Authority 1991</li> </ul>			
* Law Defining the Role of President 1991	The drafts of the following laws are before the Parliament.		
* Law Defining the Role of Baga Khural 1991	* Land Law		
* Law Defining the Role of Government 1991	<ul> <li>* Statistical Office Law</li> </ul>		
* Law on Membership of (Mongolia) in the	* Consumers' Law		
International Monetary Fund, International Bank for	* Antimonopoly Law		
Financial Corporation International Development	* Bankruptcy Law		
Association 1991	<ul> <li>Copyright Law</li> </ul>		
* Customs Law 1991	* Patents Law		
* Petroleum Law 1991	* Law on Gold		

Post-constitution government elections in Mongolia are scheduled for the summer of 1992, at which time a presidential runoff may take place. The newly adopted constitution has paved the way for a 76-member assembly to replace the existing Mongolian parliament. Members will serve four-year terms.

#### 2.1.2 Geography and Demography

Mongolia is a landlocked country on the central Asian plateau, nestled between the Commonwealth of Independent States and China. The land area is approximately 1.6 million square kilometres, which is slightly larger than Alaska or about one-half the size of India. The eastern portion of Mongolia is quite mountainous, averaging more than 2,000 metres and exceeding 4,000 metres in the Altai Mountains. The Gobi Desert region is located in the southernmost part of Mongolia. The country is divided into three principal topographic zones: mountains, with the three largest ranges located in the north and west; the intermountain basins; and the steppe (which includes the desert areas of the Gobi). Precipitation is quite low due to Mongolia's distance from large bodies of water. Winters are cold and summers hot, but with low humidity making it quite bearable.

The population of Mongolia is approximately 2.15 million, of which more than 500,000 reside in the capital, Ulaanbaator. Mongolia has a very high population growth rate by Asian standards, and the population has more than doubled in the past thirty years. Population density is low, however, at about 1.3 persons per square kilometre. Some 90 per cent of the population is Mongol, while the primary language is Mongolian. Most of the professional and technical people were educated in Moscow, and a significant portion of the population speaks Russian. Tibetan Buddhism is the primary religion.

# 2.1.3 Economy

The Mongolian economy has been shifting slowly to an industrial-agrarian-based economy. Since the mid-1970s, the Mongolian industrial sector, dominated by mining and electricity generation, expanded relative to other sectors of the economy. Primary industries in Mongolia include animal parts processing, building materials, food and beverages, and mining. In recent years, the Mongolians expanded coal, copper and molybdenum mining, grain and fodder production, consumer goods and construction material production, fishing and development of a food-processing industry. Mongolia's eighth five-year national economic and social development plan (1986 to 1990) aimed to strengthen the industrial base of the nation and continue Mongolia's transformation into an industrial-agrarian society. Instead, however, the country's transformation was slowed by falling industrial output, declining national income and a skyrocketing budget deficit (Table 2).

Economic restructuring in Mongolia was initiated in December 1988, when the president indicated that change and greater openness in political and social affairs were needed to rejuvenate the Mongolian economy. A series of events that facilitated change followed. These events included the following (Dorian 1991).

- \* Central Committee reforms in 1989, which included government restructuring and the establishment of government commissions to revise the party agenda, draft rule amendments, rewrite the constitution and rehabilitate the victims of Stalin and former Mongolian leader Choybalsan.
- \* Beginning in December 1989, a series of public rallies staged by the Mongolian Democratic Union, the Mongolian Social Democratic Union and the Mongolian Union of National Progress calling for accelerated reform and the removal of certain politburo members.
- \* The announcement on 12 March 1990 of the end to the Mongolian ruling party's 69-year monopoly on power and the proposal that party congress elections be held to select a new Central Committee.
- \* The replacement of the president in April 1990 by the leader of the reformist wing of the party.
- \* The first-ever multiparty elections in July 1990, in which the Communist party was victorious, but the opposition did well enough to be invited to join the cabinet.
- \* The introduction of a national privatization programme and new land law in 1991, allowing for privatization of agriculture and state-owned assets.
- \* The adoption of a new constitution in January 1992 paving the way for private ownership and guaranteeing human rights.

Mongolia's present economic outlook is bleak, as 70 years of mismanagement, waste and inefficient state operations are evident throughout the country. From 1980 to 1989, gross industrial production increased by 99 per cent in Mongolia (based on current tugrik value), while gross agricultural output increased by 82 per cent (Mongo-

#### Table 2. Basic economic indicators of Mongolia, 1990 and 1991

(millions of tugriks)

Indicator	1990	Year 1991	Change
Industrial output	7,427.0	6,560.0	-12%
Construction by Mongolia firms	2,521.0	1,744.0	-31%
Government budget		,	
Income	6,712.0	5,840.0	-13%
Expenditures	6,874.0	8,912.0	+29%
Deficit	162.0	3.072.0	+1.800%
Unemployment (,000)	36.5	54.1	+48%
Consumer price index	_		+53%

<sup>a</sup> Similar to GDP.

Source: State Statistical Committee, January 1992, Ulaanbaator, Mongolia.

lian Government 1991). The sectoral breakdown of net material production in 1989 was industry 34 per cent, agriculture 20 per cent and distribution and warehousing 27 per cent.

In 1990 and again in 1991, Mongolia's economy deteriorated noticeably from 1989. Mongolia's principal trading partners have undergone dramatic political and economic transformations, leading to disruptions in imports to Mongolia. As a consequence, Mongolia's industries are facing a severe shortage of spare parts. Mongolia's external debt rose from 8.58 to 9.82 billion transferable rubles between 1988 and 1989. The debt continued to escalate through 1990.

For 1991, preliminary estimates are that Mongolia's economy contracted by nearly 16 per cent. The decline in real incomes was even larger, and living standards plummeted. Liberalized prices led to an official inflation rate of 46 per cent in 1991, but unofficial rates were many times that. Trade between Mongolia and the CIS dropped by more than 60 per cent in 1991, though it still accounted for a majority of Mongolian foreign trade turnover. Most of the CIS trade was handled through barter exchanges of Mongolian copper concentrates for CIS oil products. Mongolia's foreign trade turnover reached US \$656.7 million in 1991, with US \$297.4 million worth of exports and US \$359.3 million worth of imports (Permanent Mission 1992). Industrial output dropped by 12 per cent to 6,560 million tugriks.

The worsening economic crisis in Mongolia has prompted Japan, the United States and international agencies to pour in money to keep Mongolia going through the winter of 1991/92. It will soon receive \$155 million in emergency aid for food, medicine, spare parts, petroleum products and other essentials.

Mongolia has also joined and requested assistance from the International Monetary Fund, the World Bank and the Asian Development Bank. It has also sought to improve its relations with China, Japan, the Republic of Korea and the United States. Mongolian President Punsalmaagiyn Orchirbat visited the United States in January 1991, and U.S Secretary of State James Baker went to Ulaanbaator in July of the same year. The United States granted Mongolia most favoured nation (MFN) status in 1991, though the economic impact will not be noticed for some time in Mongolia. Relations with China were normalized last year. In August 1991, Yang Shankun, the Chinese president, visited Mongolia and signed an agreement allowing Mongolia access to the Chinese port of Tianjin. Japan granted Mongolia MFN status in 1990, and the prime minister visited there in August of the same year. Mongolia enjoys a trade surplus with Japan, though trade is modest. In October 1991, President Orchirbat visited the Republic of Korea in another effort to boost economic ties.

### 2.1.4 Infrastructure

Mongolia has access to two seaports via rail, through China to Tientsin, south of Beijing, and through the CIS at Nakhodka, near Vladivostok (Damdinsuren 1991). The distances are 840 miles and 1,280 miles, respectively. The Mongolian rail system is in the process of expanding, driven largely by an emphasis on expanding the mining industry. There is an existing road network of more than 50,000 miles, the vast majority of which are simple dirt roads for which plans for improvements are being made.

Transportation plays a vital role in Mongolia, owing to the country's vast territory and low population density. Road transport carries more than 70 per cent of all freight and nine-tenths of all passengers (Academy of Sciences MPR 1990). A new highway is presently being constructed, running west from the capital, Ulaanbaator, and will serve as the major artery of the country. In 1988, 17.8 million tonnes of freight were moved on Mongolia's limited rail system, nearly double the volume at the beginning of the decade. A broad (1.524 m) railway links Mongolia with the CIS to the north of Ulaanbaator and with China to the south. Branch railway lines between key mining centres and industrial regions also exist.

# 2.2 Past and Current State of the Mineral Industry

Mining in Mongolia accounts for nearly 20 per cent of the country's national income and 40 per cent of its export revenues (Table 3). In the 1980s, Mongolia's mining industry was targeted for expansion. Today, nearly 200 deposits of coal, ferrous and nonferrous metals, rare earths and precious stones are being mined throughout the nation. Mining is dominated by large-scale development of coal, copper, fluorspar and molybdenum, whereas mining of gold, tin and tungsten is primarily small scale. Mongolia is one of the leading world producers of fluorspar, and a major producer and exporter of copper and molybdenum among the former centrally planned economies. All mining is state controlled or supervised by joint venture enterprises. Large-scale production of copper and molybdenum occurs at Erdenet, fluorspar at Berh and Borondor (Hentiy), limestone and cement at Hotol and coal at Baga-Nuur. Tungsten is mined at one locality, Isagaan Davaa, while precious metals and tin are extracted at various sites throughout the country.

The Erdenet copper and molybdenum complex, which was established in October 1978, consists of processing facilities, a thermal power station, buildings and ware-houses, and a branch line to the Trans-Mongolian Railway. The complex is reported to

#### Table 3. Mongolian minerals production, 1990

(thousand metric tons unless otherwise noted)

Commodity	Quantity	Average metal content	Value (million tugriks)
Cement	440.8	NA	176.3
Coal	7.153.2	NA	265.7
Anthracite	600.4	NA	22.4
Lignite	6.552.8	NA	243.3
Copper	354.1	NA	644.0
Concentrate	354.1	35%	644.0
Fluorspar	631.0	NA	255.8
Ore	512.1	30 to 92%	110.2
Concentrate	118.9	NA	145.6
Gold (metal)	NA	NA	NA
Gypsum	NA	NA	NA
Limestone	103.0	NA	36.2
Molybdenum (concentrate)	4.2	47%	116.6
Tin (concentrate)	317.4	50%	6.5
Tungsten (concentrate)	10.6	20%	0.1

NA = not available or not applicable.

have produced one million tonnes of copper concentrate by the end of 1989 (*Mining Journal* 1990). Erdenet's reserves are estimated at 300 million tonnes, grading 0.85 per cent copper and 0.012 per cent molybdenum (U.S. Bureau of Mines 1988). At present, concentrate production is 125,000 tonnes per year (t/y) of copper and 1,350 t/y of molybdenum, with most of the output shipped to the CIS. Some is also reportedly transported to Czechoslovakia, Finland, Germany, Hungary and Japan. Erdenet currently accounts for nearly 16 per cent of Mongolia's total industry output and 40 per cent of its total export earnings.

Mongolia's minerals endowment is relatively unexplored and undeveloped, though major deposits are being mined today. The copper and molybdenum deposit at Erdenetiynovoo was initially surveyed by Mongolian and Czechoslovakian scientists in the mid-1960s and subsequently investigated by Soviet and Mongolian geologists (Sanders 1973). Joint Soviet-Mongolian development of the deposit proceeded through the 1970s, and in December 1978 the Erdenet mine complex began operations. Several stages of expansion have taken place at Erdenet, with stage five construction beginning in 1987. During this period of enlargement, production capacity was scheduled to increase from 16 to 20 million t/y (U.S. Bureau of Mines 1989). Erdenet's operations became profitable in 1981 with the completion of stage four construction, which boosted concentrate production capacity to 16 million t/y. Erdenet officials are today seeking advanced recovery technologies for the copper-molybdenum complex, in addition to financial assistance for a metal smelter facility.

Fluorspar deposits being mined in east-central and southeast Mongolia include those at Berh and Bor-ondor (Hentiy), Harayrag (Dornogov'), Urgen (Dornogov') and Ulaanhajuu (Dornogov'). Essentially all of Mongolia's fluorspar output was traditionally exported to the former Soviet Union for use in its metallurgical industry.

Lignite is now being mined at Baga-Nuur and Nalayh near Ulaanbaator, as well as at other sites in northern (Sharyn Gol) and eastern (Aduunchuluun) Mongolia. Nearly

three-quarters of Mongolia's coal production comes from the Baga-Nuur, Nalayh and Sharyn Gol mines. Baga-Nuur lignite supplies a thermal power station at the mine site and meets much of the energy requirements of the mining and industrial centres in Borondor, Darhan, Erdenet and Ulaanbaator in northern Mongolia. Mongolia's eighth fiveyear plan proposed an increase in national coal output of about 25 per cent during the period, with much of the increase in output intended for electricity generation.

Given Mongolia's varied geological environment, the long-term prospects for mining in the country are considered favourable. Several mineral deposits are considered suitable for development in the near future, given appropriate market conditions and prices.

# 2.2.1 Historical Perspective

Minerals output in Mongolia accounts for a significant share of national income, and coal, copper, fluorspar and molybdenum are the most important commodities produced. In 1988, Mongolia produced an estimated 789,000 tonnes of fluorspar (metallurgical grade) or 15.3 per cent of world production. Mining output rose substantially during the ten-year period beginning in 1978, largely due to the financial and technical assistance of the former Soviet Union and other countries. Mining industry activities constitute the largest share of Mongolia's industrial sector.

Mining in Mongolia advanced considerably during the ten-year period ending in 1988. In the late 1970s, nearly all of the capital invested for industrial expansion in Mongolia was for the copper and molybdenum development at Erdenet in Bulgan *aimag* (province or administrative district) and for the construction of the fluorite mine at Borondor in southeastern Mongolia. Several other mines were developed or expanded during the 1980s with external assistance, including the coal deposit at Baga-Nuur, the fluorspar mines at Berh, Dzun-tsagaan Del and Bor-ondor and the cement and lime complex at Hotol.

Assistance has also been given for geological surveying activities in Mongolia through the years. Soviet geoscientists were involved in the operations of the Mongolneft' and Sovmongolmetal joint exploration enterprises until the USSR turned over its role in these organizations to Mongolia in 1957. Since that time, joint Soviet-Mongolian surveying activities have been conducted throughout Mongolia, with efforts in the 1970s focused on gold, tin, phosphorites, tungsten, copper, molybdenum and coal, and activities in the 1980s directed to industrial minerals, including fluorspar, molybdenum, lead, gold, tungsten, phosphorites and coal.

#### 2.2.2 Structure of the Industry

Three primary organizations govern the minerals industry of Mongolia: the State Geological Center, the Natural Resources Fund and the State Bureau of Mines. All three report directly to Mongolia's deputy prime minister.

The State Geological Center is responsible for general geological mapping and exploration in Mongolia. Seventeen regional geological departments exist within the centre, which has a staff of between 4,500 and 5,000 persons. More than one-fifth of

the employees have been trained in the former Soviet Union or other formerly socialist countries.

Planned geological research activities of the State Geological Center during the 1990s include the computerization of an extensive geological database; the processing and interpretation of remotely sensed data; the processing and interpretation of areal geophysical surveying data; and the training of mineral economists in Mongolia. Given the transformation of Mongolia to a market economy, the State Geological Center has begun to evaluate world market conditions for selected minerals and is also seeking closer ties with foreign countries and donor agencies. In the past, most centre specialists were trained in the former Soviet Union, in Czechoslovakia and in Rumania.

Once the State Geological Center identifies a mineral deposit, it transfers the geological information to the Nature Resources Fund, which then has the responsibility of evaluating and classifying the reserves. The Natural Resources Fund then provides all of the necessary data to the State Mining Bureau, which supervises all mining activities in Mongolia after the exploration and reserve evaluation phases.

The State Mining Bureau (formerly part of the Mongolian Ministry of Mining before it was debanded) is responsible for developing and exploiting the minerals and metals in Mongolia. It is also responsible for devising and implementing Mongolia's minerals policy.

The State Mining Bureau supervises all large mining projects in Mongolia, including the Mongol Erdene Association, which is a national corporation, and Mongolia's largest mining agency, Mongolsovzvetment, a joint-venture association that produces fluorspar, and the massive Erdenet joint venture. If the Ulan-Isav deposits are to be developed, Mongol Erdene is the probable mining association to handle development activities.

Other key organizations included in Mongolia's mining industry are the Mongolian Geological and Geophysical Exploration Company, Ltd. (MGGE) and the Mineral Processing Technological Center (MPTC). MGGE is a quasistate organization composed of a staff of around 500. MGGE functions as an integrated mineral exploration company and offers a wide range of exploration services. The Academy of Sciences of Mongolia's Mineral Processing Technological Center conducts studies on mineral processing techniques used in the country's mining industry. MPTC, which has a staff of approximately 40, was a major partner in a recent Mongolian-Czechoslovakian tin/ tungsten joint venture.

#### 2.2.3 Government Policy Relating to Minerals

Mongolia is now embarking on a new strategy to attract foreign investors. With abundant mineral and energy resources and livestock, the country hopes to rapidly improve its external economic ties. The Mongolian mining sector will begin marketing its resources globally to acquire much-needed hard currency. Several international energy firms are already pursuing investment opportunities in Mongolia, including the British Petroleum Company and Western Gcophysical Corporation. These two companies are surveying the country's northern, eastern and southeastern regions for prospective oil deposits. The Amoco and Chevron corporations have indicated that they will likely pursue exploration in Mongolia once the government establishes an appropriate legal system to guide such activities. Western company officials have estimated oil reserves in place at Mongolia's two known fields at 50 million barrels, of which between 10 to 30 per cent can be recovered.

Mongolia has a wide variety of mineral resources available for development. Though the nation's minerals industry will continue to be dominated by production of coal, copper, fluorspar and molybdenum, other commodities will also be subject to new or expanded development, including gold, limestone, nickel, phosphate, rare earth metals, silver, tin, tungsten, zeolites, lead and zinc. Mongolia will require continued financial and technical assistance from external sources to further develop its minerals base. Recent reports from the Mongolian news agency have indicated that the country will give priority during the next five years to the production of copper concentrates and the manufacture of finished products from copper. In addition, deposits of coking coal at Tavan-Tolgoi near Ulaanbaator will be developed as a matter of necessity.

Japan, anxiously awaiting the opening up of the Mongolian economy, has already indicated that it may disburse grants to Mongolia for telecommunications and infrastructure improvements, including building a railway or road to a Chinese port, thereby providing access to Japan. In August 1990, the Metal Mining Agency of Japan visited Mongolia to investigate development of the nation's copper and lead resource base and to identify possible business opportunities for Japanese firms and government agencies. Representatives from private Japanese companies also took part in the mission.

The substantial decline in CIS financial assistance to Mongolia will ultimately lead to greater opportunities for multinational lending to the country and increased commodity trade flows. The Mongolians will have to solicit hundreds of millions of dollars of aid from other sources. Mongolian trade with non-socialist countries, though relatively small, was expected to double in 1990, with most of the trade involving mineral raw materials. In 1988, two-way trade with market economies surged 46 per cent to US \$55 million, of which Japan and Switzerland accounted for 43 per cent and 19 per cent, respectively (U.S. Bureau of Mines 1990).

Mongolian officials are today evaluating ways to promote and guide joint venture developments in mining and other economic activities. Old regulations have already been abandoned or revised, paving the way for newer, more favourable legislation.

Efforts to attract foreign investors to Mongolia's mining activities in the months ahead will be influenced by several factors, including the extent and overall impact of the CIS withdrawal; the favourability of rules and regulations governing joint minerals development; Mongolia's ability to expend hard currency; and the political, economic and social stability in the country. Other factors that will have an impact on decisions to invest will include infrastructural and energy constraints, climate conditions and division of management control to joint ventures.

# 2.2.4 Summary of the Current and Projected State of Affairs

Mining is central to the economy of Mongolia, accounting for nearly one-fifth of the country's GDP and a significant percentage of export earnings. Over the past two decades, mining expanded considerably in the country, resulting largely from the development of the major Erdenet copper and molybdenum complex. Erdenet is reported to have produced one million tonnes of copper concentrate by the end of 1989. Mongolia's other large mines produce coal and fluorspar, while a host of small-scale mines extract gold, silver, tungsten, tin and precious stones. Mongolia is rich in gold resources, with several operational placer mines in northern Mongolia.

Faced with the CIS economic withdrawal, Mongolia intends to use its huge minerals base to attract overseas investment. How Mongolia will fare in the absence of CIS support remains to be seen. For decades, the majority of external assistance was directed to the Mongolian mining industry, which now faces a difficult task of attracting foreign investment. However, the country's mining potential is great, and in the years ahead ample opportunities for developing the resource-rich land will unfold.

# 3. Geological Potential

#### 3.1 Description of the Geology

The geology of Mongolia is complex, partially mapped and poorly evaluated in terms of overall minerals potential.

# 3.1.1 General Mineral Abundance

Because of its long and complex geological history, diversity of rock types and regional geological setting, Mongolia, in terms of volume and variety of mineral resources, ranks among the world's richest countries, having deposits of ferrous, nonferrous, rare earth, precious and light metals. Additionally, Mongolia has numerous deposits of nonmetallic minerals, including fluorite, zeolite, phosphate, silica, coal, peat, oil and gas. At present, the minerals of major economic value are copper, molybdenum, gold, fluorite and coal. Given the low level of exploration, particularly in the western two-thirds of the nation, additional deposits will undoubtedly be discovered of both known and presently unknown mineral resources.

#### 3.1.2 Geographical Distribution of Mineral Potential

The known occurrences of minerals are concentrated primarily in eastern Mongolia and in particular in the area of Ulaanbaator, northward in the area of Erdenet and eastward in the area of previous uranium mining by the former Soviet Union. The Ulan, Tsav and Salchit deposits are presently awaiting development. To a large extent, the areas of northwest, west, central and southern Mongolia, comprising more than twothirds of the nation, have not been adequately explored; as a result, the knowledge of mineral distribution in these areas is very limited. Nevertheless, an evaluation of available geology in conjunction with an extension of known metallogenic zones in the CIS and China indicates that these areas are highly prospective.

#### 3.1.3 Geological Potential for Target Minerals

The areas of highest mineral development potential, based on exploration and development to date, are the following.

The Erdenet-Zaamar Mining District. This district is centred on the Erdenet copper-molybdenum deposit and is the largest operating mine in Mongolia. However, within the immediate area of the Erdenet mine several additional mineralized porphyry systems are known but have yet to be adequately explored. Approximately 30 km southeast of the Erdenet mine is the Zaanam gold area, consisting of a zone of more than 300 gold-quartz veins, of which 150 contain gold and 20 are considered commercially viable. The Bumbat No. 118 vein is a typical example of the commercial veins of the area, being approximately 800 metres in length, extending at least 300 metres in depth and averaging 1 to 6 metres in width. Ore from the vein averages 20 g/t, and total reserves in the Bumbat No. 118 vein are 10 metric tonnes (mt) of gold.

The Bor Undur Mining District. The Bor Undur Mining District encompasses an area of 100 square miles and is centred on the Bor Undur fluorite mine jointly managed by Mongolia and the CIS through a joint venture enterprise, Mongolsovetmet. Within the Bor Undur Mining District, a total of 4 mines operate and produce 130 million tonnes per year of fluorite concentrate. An additional 12 prospects occur within the area.

The Darkhan Mining District. The district produces a variety of mineral products, including coal, oil and gold, the latter primarily from placer operations, although lode gold occurrences are known in the area. Additionally, the Dorkhan Mining District has two known occurrences of iron ore, occurring primarily as magnetite skarn deposits in association with granitic intrusives.

The Ulaan Tsav Mining District. As previously noted, the Ulaan Tsav Mining District is presently awaiting foreign investment in order to begin operation. The Ulan deposit has proven reserves of 37 million mt containing 5.47 per cent combined lead and zinc, plus 34 to 116 gm/mt of silver. The Tsav deposit, although smaller, with reserves of 7 million mt, averaging 6 per cent lead, 5 per cent zinc, 0.14 per cent Cu and 220 gm/mt silver, may be the most promising because of its higher grade overall and with respect to silver content. Three additional unexplored areas near Tsav (Bayan Uul, lead, zinc, gold-silver; Altantolgoi, lead-zinc-silver; and Salkit, lead-zinc-silver) may be developed in conjunction with the Tsav deposit. In addition to the lead-zinc deposits with substantial silver, the mining district also contains known fluorite deposits. During the late 1980s and early 1990s, it was the site of a major uranium mine (Mordot), which recently closed.

In addition to the above mining districts, there are several additional areas that are of considerable interest in terms of future mineral development in Mongolia, as described below.

The Delgerkhan District. Subsequent to the discovery and development of the Erdenet deposit, regional reconnaissance studies identified porphyry copper-molybde-

num mineralization around the Bajan Ula occurrence. The Bajan Ula occurrence and similar zones nearby constitute an anomalous area in excess of 40 km<sup>2</sup> with mineralization consisting of stockworks; weak veinlet-disseminated chalcophyrite, and molybdenite with Au occurring in quartz-albite rocks; and quartz tourmaline veins with Cu, Zn, Pb, Mo and Au. Known mineralization extends 500 m vertically. Numerous other similar zones occur throughout the district, but little exploration work has been done to date.

The Tsagaan-Suvraga Area. Located in southeast Mongolia's Gobi Desert, the Tsagaan Suvraga copper-molybdenum mine is a major greenfields project awaiting foreign funding for development. Exploration drilling has defined two ore bodies with total reserves of 240 mt of ore, grading 0.46 per cent Cu and 0.01 per cent molybdenum, with significant gold and silver levels as byproducts. Approximately 80 per cent of the total reserves are in orebody A. An additional 75 mt of noncommercial ore, averaging 0.25 per cent copper and 0.009 per cent molybdenum, have also been identified.

The Boroo Gold Area. Approximately 140 km north of Ulaanbaator is the Boroo gold mine, previously operated as a joint venture with the former German Democratic Republic. It has proven reserves of approximately 300,000 mt of ore, averaging 3 to 5 gm/mt. The deposit consists of a vein system, suitable for open pit mining to a depth of 100 metres, occurring in a zone 2.5 km in length and approximately 800 m in width. The richest veins in the deposit contain up to 10 grams/mt; however, such veins are small.

Gold placer occurrences in adjacent valleys also constitute viable gold exploration and development targets. Within 30 km of Boroo, for example, is the Sujegtei prospect, consisting of gold-quartz veins averaging 22 gm/mt and with reserves of 5 mt of Au, as well as the Navantolgoi prospect with three vein systems averaging 10 gm/mt.

The Undor Tsagaan Area. Located 100 km east of Ulaanbaator is the Undor Tsagaan tungsten-molybdenum deposit, which has been jointly explored by Mongolia and the former CMEA International Geological Expedition. The deposit is a ribbonlike zone approximately 1,800 m in length, 600 to 800 m wide and 6 to 800 m in depth, with reserves estimated at approximately 200 million mt. The average ore grade is 0.124 per cent tungsten and 0.019 per cent molybdenum. Additionally, the deposit has associated bismuth mineralization. Nearby is a smaller deposit (13 million mt) containing 1.2 per cent lead, 0.5 to 1 per cent zinc and 100 gm/mt of silver.

The Luu Gol Area. Rare earth metal concentrations are known in several areas in Mongolia; however, the Luu Gol deposit in south-central Mongolia is of particular significance because of its location immediately north of the world-famous Bayan Obo rare earth mine in Nei Mongol, China and its similar form of mineralization to that of Bayan Obo. Available data indicate a deposit of approximately 1 million mt with an average grade of approximately 4 per cent REO. The grade of the REO in the ore minerals is lanthanum (26.5 per cent), cesium (48.5 per cent), neodymium (13.0 per cent), samarium (2.0 per cent), europium (0.38 per cnet), gadolinium (0.95 per cent), dysprosium (1.0 per cent) and illtebium (1.0 per cent). The remainder of the oxides are

terbium (0.4 per cent) and holmium (0.10 per cent). Thorium (0.02 per cent) also occurs with the deposit.

# 3.1.4 Minerals of Exceptional Interest

Minerals of exceptional interest in Mongolia are a small subset of the total minerals endowment of the nation. For purposes of the discussion below, the minerals of exceptional interest are defined using the following criteria.

- \* They must occur in deposits or deposit types that have the potential, in terms of tonnage and grade, to warrant interest by foreign investors.
- \* They must be located near infrastructure or be capable of sustaining the cost of infrastructure development.
- \* They must be minerals for which there is an existing demand and market and for which future demand and markets are expected to increase.

Given these criteria the minerals of exceptional interest in Mongolia, in decreasing order of priority, are as follows.

Priority 1. Gold. Gold is Mongolia's best and most immediate prospect for development, with major gold areas already being exploited and numerous others awaiting development. The high grades (many vein systems having >10 gm/mt Au and medium to large tonnage, 40 mt, of Au in surface exposures amenable to open-pit mining) make gold deposits a number one priority for development.

**Priority 2.** Porphyry copper. Mongolia has a high potential for the discovery and/or development of several porphyry copper occurrences similar to that presently being mined at Erdenet. Mongolia's porphyry copper deposits are of interest because of their world class size (tonnage), the high initial grades of ore associated with secondary ore (chalcocite blankets) and their high-value byproducts. (Erdenet copper concentrates contain selenium, 50 to 60 gm/mt; silver, 50 to 70 gm/mt; tellurium, 8 to 9 gm/mt; and gold, 0.3 to 0.5 mg/mt.) Additional deposits are known in the Erdenet, Bayan Ula and Tsagaan Suvrage areas.

**Priority 3.** Fluorite. As the world's second largest producer of fluorite, and with numerous unexploited deposits in the Bor Undor and Ulaan Tsav areas, Mongolia's development potential in fluorite is excellent.

**Priority 4.** Rare earths. Rare earth mineralization occurs throughout Mongolia, normally associated both spatially and genetically with magmatic rock. Three basic associations are recognized: tantalum and niobium associated with lithium-fluorine granites; rare earth elements (REE) zirconium and niobium associated with alkaline granites; and REE in magnetite-apatite and apatite-fluorite rocks associated with carbonatite.

**Priority 5.** Tungsten-molybdenum. Numerous tungsten-molybdenum deposits occur throughout eastern and central Mongolia. The Undor Tsagaan (Zagan Davace) deposit east of Ulaanbaator, with approximately 200 Mmt of reserves, averaging 0.124 per cent W and 0.019 per cent molybdenum, is a typical example of such occurrences.

**Priority 6.** Lead-zinc-silver. Large deposits and numerous small occurrences of lead-zinc-silver occur throughout Mongolia, with the Ulaan Tsav area having a major potential for development, with reserves of 37 Mmt (averaging 5.47 per cent combined lead and zinc plus 34 to 116 gm/mt of silver) at Ulan and resources of 7 million mt, averaging 6 per cent lead, 59 per cent zinc, 0.14 per cent copper and 220 gm/mt of silver.

#### 3.2 Ability to Apply Geological Assessment Methodologies

Approximately 25 per cent of Mongolia's geologists, geophysicists, geochemists and mining engineers have been trained in the Commonwealth of Independent States and a significant number have been trained in other nations of eastern Europe. Therefore, although their capacity to apply geological assessment methodologies is technically quite good, its scope is limited by methodologies used primarily in the above countries. As a result, many of the geological assessments are conducted within a framework of partially outdated geological concepts and without the benefit of many Western assessment methodologies. In particular, geological assessments in Mongolia tend to rely heavily upon detailed geologic mapping and drilling/sampling of surface outcrops. Modern geochemical and geophysical exploration and evaluation methods are limited in their use, largely due to a lack of equipment and analytical facilities within Mongolia. This substantially reduces the effectiveness of geological assessments and limits most assessments to surface exposures.

Although improving steadily, the use of computer-based analyses and assessment methodologies in Mongolia is still not common, again due in large part to the lack of computing facilities and trained personnel. This lack of data processing capability is perhaps the greatest constraint on the assessment activities of the Mongolian geological community.

Finally, it should be noted that although the staffs of the geological organizations in Mongolia are large by Western standards, few of the geologists have been trained or exposed to geological assessment methodologies or programmes; rather, they have been trained for other specific areas of expertise.

#### 3.3 Availability of Geoscientific Information

Mongolia is completely covered by both aerial photos and satellite imagery, which are available from government and private agencies within Mongolia and from private industry internationally. Mongolia is presently undertaking the development of a satellite remote sensing centre in Ulaanbaator, with the assistance of the French Government, using SPOT imagery.

Mongolia has been the object of substantial geological study by Mongolia and by the CIS and the former eastern European countries, and these studies have produced a large quantity of geological information. The entire country has been mapped at a scale of 1:1,500,000 and approximately 80 per cent at a scale of 1:200,000. For most mining districts, geological maps at a scale of 1:50,000 and larger have been completed. Airborne geophysics information in Mongolia is limited, as are geochemical data, to the areas including and adjacent to the main mining districts. More than 4,000 geological reports have been prepared on Mongolia's geology and mineral deposits, primarily in the Russian language. At present, only about 10 per cent of the available literature has been translated and is available within Mongolia.

Overall, the information base on Mongolia is adequate but access is limited because of language and accessibility limitations and the lack of a centralized clearinghouse for data.

# **3.4 Government Institutions**

As with much of Mongolia's government structure, the minerals sector is undergoing considerable change and reorganization, the exact nature of which is still to be determined. For the present, however, four agencies previously discussed and summarized have the responsibility for overseeing and assisting the mineral development of Mongolia: the State Geological Center, the Natural Resources Fund, the State Bureau of Mines and the Mineral Processing Technology Center. All of these organizations are under Mongolia's deputy prime minister.

Mongolia's State Geological Center is responsible for general geological mapping, aerial geophysical surveying, geological remote sensing activities and mineral exploration. The Natural Resources Fund has the responsibility for deposit evaluation, reserve calculation and assessing the development potential of individual deposits. The State Mining Bureau is responsible for the development and exploitation of minerals and metals in Mongolia, while the Mineral Processing Technology Center functions under the Academy of Sciences of Mongolia and provides support to the State Mining Bureau in mineral processing and metallurgical studies.

### 3.5 Summary

The geological potential of Mongolia for the occurrence of world-class mineral deposits is among the highest in north Asia, based on the geology of Mongolia, the nature and distribution of known deposits and the diversity and geographic distribution of mineral occurrences throughout the nation. Within Mongolia, eight major districts/ areas can be defined, having the highest mineral development potential.

- Erdenet-Zaamar District. Porphyry copper-molybdenum deposits, gold-quartz vein lode deposits and placer gold.
- Darkhan District. Iron skarn deposits, placer gold and gold-quartz vein lode deposits.
- Ulaan Tsav District. Polymetallic (Pb, Zn, Ag) sulphide deposits, vein fluorite deposits and uranium.
- Delgerkhan District. Porphyry copper-molybdenum, quartz-tourmaline veins with Cu, Pb, Zn, Mo and Au.

Tsagaan-Suuvaga Area. Porphyry copper-molybdenum.

Boroo Gold Area. Gold-quartz vein lode deposits and placer gold deposits.

Undor Tsagaan Area. Tungsten-molybdenum vein and disseminated deposits and Pb-Zn-Ag vein deposits.

Luu Gol Area. Rare earth deposits, similar to Bayan Obo in China, and disseminated deposits with associated fluorite and magnetite.

Although Mongolia has numerous deposits in both known and partially explored areas, a number of external factors directly affect, and in most cases dictate, which areas, commodities and deposits will be developed, both in the near term and in the future. Among the most significant are access to infrastructure, availability of foreign markets, availability of foreign capital and the long-term development goals of Mongolia. Given these factors, the priorities for mineral development in Mongolia are assessed to be as follows.

Priority 1.	Gold
Priority 2.	Porphyry copper-molybdenum
Priority 3.	Fluorite
Priority 4.	Rare earths
Priority 5.	Tungsten-molybdenum
Priority 6.	Lead-zinc-silver

The immediate or near-term development of priority 1, 2 and 3 resources is most likely, as development would build upon existing mines. Priorities 4, 5 and 6 represent longer term prospects because of the need for infrastructure and foreign capital investment.

Although rich in minerals, with high potential for development, the Mongolian Government's capacity to effectively promote and facilitate development is limited because of five decades of reliance on central planning and the eastern bloc training of professionals. As a result, the indigenous capacity, although rapidly improving, is inadequate to effectively assist foreign investment. Major constraints include the lack of modern geological assessment capabilities, equipment, analytical support, computers and trained personnel.

# 4. Marketing Potential

#### 4.1 Geographical Location in Relation to External Markets

Mongolia is uniquely situated to take advantage of minerals trade, both with its two neighbouring nations, the Commonwealth of Independent States and China, and also with the rapidly developing and industrialized nations of the Asia-Pacific region. Located between the CIS and China, both large mineral-consuming and -producing nations, Mongolia has been and will continue to be a major supplier of minerals to these two large economies, albeit under differing arrangements.

Mongolia's access to eastern European markets and those of the Asia-Pacific region is also quite favourable. An obvious difficulty is the necessity to transship ores/ concentrates/metals to these markets either through the CIS to eastern Europe or through China to the Asia-Pacific region; however, neither route presents an insurmountable barrier. Considering that Mongolia has been a supplier of ores/concentrates to the CIS and eastern Europe in the past, it has a proven means of access and known markets in that area. Continued and expanded trade with those areas is highly likely. Recently,

Mongolia reached an agreement with China on the transshipment of goods, including ores/concentrates from Mongolia through China to the port facilities of Tianjin for forwarding to the Asia-Pacific region. In recent months, Mongolia has used this route for the shipping of 10 mt of copper concentrate from the Erdenet mine to Japan. An alternate route through the CIS to the port of Nakhodka is also available and already being used by Mongolia for shipping of goods to the Asia-Pacific region.

In the immediate future, Mongolia's new major external markets will be within the Asia-Pacific region, specifically Japan, the Republic of Korea and the United States. This excludes long-term contractual arrangements with the CIS. Subsequently, markets within ASEAN and Indochina may present opportunities for Mongolian mineral commodity trade. Reopening and expansion of markets with the CIS and eastern Europe will be dependent on the economic performance and political stability in these areas.

A major factor in determining the nature and extent of the minerals trade from Mongolia will be the development of a proposed copper smelter to refine copper ore produced at Erdenet. The Japanese company C. Itoh, heading a consortium of Japanese firms, is presently undertaking a feasibility study for a US \$380,000,000 smelter. The proposed smelter would produce up to 60,000 tonnes of copper ingots per year. Although the economic feasibility of the smelter is yet to be confirmed, the development of a smelter now or in the future would materially facilitate Mongolia's trade in copper by increasing the value added to the Erdenet ore, which is now exported as a concentrate, would reduce transportation volumes and costs and would produce a more desirable product for most of the world market. This, however, would not necessarily be true with respect to Mongolia's emerging trade with China, which, because of excess smelting capacity in China, prefers copper concentrate to refined copper. A secondary benefit of on-site smelting of Erdenet ore would be the recovery of byproduct molybdenum, silver, gold and other metals for sale on the world market.

#### 4.2 Internal Minerals Market

Mongolia's internal minerals market is very small and is primarily for iron and steel. To date, this demand has been met primarily by imports from the CIS and other European nations. At present, construction is underway for the development of an iron and steel facility at Darkhan, using scrap metal, which would be primarily for domestic supply. Additionally, an iron and steel facility is being discussed with Japan to exploit the iron ore reserves of Tumurtiin Droo. Although primarily designed for domestic supply, the project may be expanded for the production of iron and steel for export.

Overall, internal mineral markets are not expected to increase in the near term, and Mongolia will depend on the import of fabricated metal for the majority of its demand.

# 4.3 Implications of Transportation Infrastructure on Marketing

In evaluating the potential minerals trade of Mongolia, considerable emphasis must be placed on Mongolian transportation infrastructure and, in particular, its railways. Mongolia's rail system began in the 1930s with the construction of the 238-kmlong broad-gauge railway linking Chalbattan with the former Soviet Union in the east, thus providing rail access to the sea through Nakhodka, near Vladivostok. A 400-kmlong railway, linking Ulaanbaator with the former Soviet Union, via Navshkel, was completed in 1949, and subsequently extended southward an additional 700 km to the Chinese border. This 1,400-km stretch of railway today provides the major link for Mongolia with the CIS, China and the rest of the world. Since the completion of the Trans-Mongolia Railway in 1956, spur routes have been constructed to support minerals development, including an 80-km line constructed to link with the Sharyn Gol coal mine, a 140-km line to link with Erdenet and a 96-km line to link with Bor Undor.

Although the transportation infrastructure of Mongolia is poorly developed overall, which is a major constraint on new minerals development and trade, the converse is true for existing mining areas. The major producing districts of Erdenet, Bor Undur and Zaggan and the proposed Ulaan Tsav development area are all adjacent, or connected, to existing rail systems into the CIS and China. In all cases, however, transport through the CIS and China is dependent on the availability of transport capacity in those countries, reasonable transport costs and available rolling stock.

Of particular significance to the metals trade infrastructure issue is the trade protocol between China and Mongolia signed in August 1991. In addition to granting US \$10,000,000 in interest-free credits, China agreed to allow the transportation of Mongolian freight on the rail line from the Mongolia-China border through China to the port of Tianjin, providing Mongolia with direct access to the sea. Such a transfer of materials still cannot be accomplished without considerable time and effort, however, as the railroad tracks of Mongolia are the CIS standard 1.524 metres, whereas China's railroads are constructed to the international standard of 1.435 metres. Therefore, all goods must be transferred at the border.

#### 4.4 Export and Import Policies

All import and export activities of Mongolia are carried out under the general provisions of the Customs Law. Provisions applying directly or indirectly to the mineral industry are the following.

- Article 5.1. All goods and means of transport that cross the territory of (Mongolia) shall be subject to customs supervision and control.
- Article 8.6. The Customs General Administration shall formulate jointly with respective departments, regulations concerning customs control over goods and means of transport.
- Article 15 of the Customs Law provides specifically for goods and materials exempted from customs duties, as follows.
- Article 15.1. Goods to be brought into the registered capital or to be required for the production of enterprises set up in the territory of (Mongolia) and financed by foreign capital.
- Article 15.2. Goods to enter customs special zones and bonded warehouses.
- Article 15.3. Input of materials for foreign-owned manufacturers or exported raw materials for processing or manufacturing overseas.

Under Article 8.6, the Customs General Administration, in coordination with the Foreign Trade Corporation, is responsible for import/export activities specific to the minerals industry. Three specific organizations, Mongolexport, Mongolimpex and Materialimpex, handle issues of import and export of minerals and building materials.

Mongolexport handles the export of all domestic commodities and includes three firms that deal with mineral commodities. There are branch offices in the major mineral-producing areas of Darhan and Erdenet. The Aj Uildver firm exports copper, molybdenum, tin and tungsten concentrates; fluorspar; precious metals; scrap iron; aluminium; and copper secondary raw materials (*Information Mongolia* 1990). A second firm, Hil Hudaldaa, coordinates the activities of all firms involved in border trade, including minerals.

The Mongolimpex organization is responsible for all import and export transactions that take place in convertible currencies. The export group Mongolimpex sells copper, molybdenum and fluorspar primarily, in addition to a wide range of agricultural products. Most recently, Mongolimpex became the principal contractor with Japan in the evaluation of the metallurgical plant in Darkhan.

The Materialimpex organization is indirectly involved in the mineral industry in that its responsibility is to coordinate and facilitate the import and export of building materials through two specialized firms: Metall and Material. Metall is responsible primarily for the import of metallic building materials, whereas Material focuses on the import of construction materials, mainly cement.

Legislation presently under consideration in Mongolia may streamline customs regulations regarding import and export tariffs, as it is proposed to abolish all export taxes and impose a uniform fifteen per cent tariff on all non-excluded items.

#### 4.5 Specific Minerals that May be Marketable

Mongolia presently produces for export the following commodities: copper concentrate, molybdenum concentrate, tin concentrate, fluorspar, lead, zeolite, magnesite and silica sand.

Although Mongolia exports a diversity of commodities, the volume for export of most commodities is quite small, with the exceptions being copper and molybdenum concentrate and fluorspar. Because of prior contractual commitments and joint venture agreements (primarily with the CIS), most of Mongolia's production of these commodities is committed to CIS markets. During 1990, the Erdenet contract with the CIS was renegotiated, with the Mongolian Government retaining approximately 30 per cent (40 k mt) of the concentrate for sale abroad and the establishment of a Mongolia-CIS joint venture (51-49) agreement for the future operation of the mine. Under this agreement, it is anticipated that in the future, mined copper and molybdenum concentrate (appreciated 51 per cent or 65 k mt) will be available for sale abroad.

# 5. Mineral Law

# 5.1 Laws and Agreements Pertaining to Exploration and Mining

Legislation specific to the minerals industry in Mongolia is incorporated either directly or indirectly in the following.

- \* The Law on Underground Natural Resources of 1989
- \* Foreign Investment Law
- \* Regulation on the Implementation of the Foreign Investment Law
- \* Tax Law of the (former) Mongolian People's Republic
- \* Government Resolution 226. General Environment Law
- \* The Draft Land Law of 1991
- \* The Air Protection Law of 1989
- \* The Water Law of 1974
- \* Customs Law of (Mongolia)
- \* Constitution of 1992

As with the majority of legislation in Mongolia, the above legislation is broad based and general in its formulation and provides few of the specifics that the minerals industry desires. In particular, it should be noted that the Law on Underground Natural Resources of 1989, although specific to the minerals industry, was not promulgated by the new government that was formed after the first democratic elections. As such, it is largely based on socialist concepts and is *de facto* nonoperable at present. As a result, activities of the minerals industry are undertaken under the guidelines put forth in the Constitution of 1992, the Foreign Investment Law and the Draft of the Land Law.

# 5.2 Major Features of the Legislation/Agreements

# 5.2.1 Ownership of Minerals

Under the Constitution of 1992 (Article 6) "The land, its subsoil, waters, forests, fauna and flora and other natural resources belong exclusively to the People of Mongolia and shall be under the State Protection." Furthermore, the Constitution of 1992 provides (Article 6.2) that "...the lands except those given to the citizens for private ownership, as well as the subsoils with their resources, water, forests and fauna shall be the property of the state."

# 5.2.2 Exploration

The Law on Underground Natural Resources of 1989 provides only a general framework for exploration and development of natural resources in Mongolia. Its main provisions are as follows.

- \* Underground natural resources are the property of the state.
- \* The local administrations of people's *khurals* are responsible for the implementation of this law within their territories.
- \* That underground natural resources will be used for the following purposes: geological exploration, mining operations and underground construction.

- \* Fees will be charged for the use of underground natural resources according to their economic value.
- \* After exploration activities and mining operations, reclamation of land must be carried out.
- \* Improvement of technology for the extraction and processing of the mineral resources is required.

At present, the law is not used, except for the above broad principles, and, *de facto*, there is no mining law for Mongolia.

In the absence of a functioning mining law, it is necessary for a potential foreign investor to negotiate virtually all contractual terms under the general guidelines of the Foreign Investment Law and Resolution 207 On the Implementation of the Foreign Investment Law, although neither of the two documents is specific with respect to exploration, development and exploitation activities. Discussions with senior level management personnel in the mineral agencies in Mongolia indicate that all contractual negotiations will initially be undertaken with the State Geological Center and its respective divisions, with final approval being granted by the Ministry of Trade and Industry on behalf of the Mongolian Government.

# 5.2.3 Security to Tenure

As with exploration, the security of tenure for a mining enterprise would be the subject of point-by-point negotiation. Contracts presently being negotiated include the right to mine as a continuation activity from the exploratory phase; however, such contracts are with respect to known deposits, with exploration being specific to adjoining areas. Additionally, the primary purposes of the present contracts are feasibility studies and subsequent mining if the deposit is economic, and as a result can best be viewed as mining contracts from the onset of negotiation.

# 5.2.4 Mining

All existing mining operations are either joint ventures with former socialist nations (Erdenet and Bor Undor, for example) or are sole operations of Mongolian entities. All future mining activities would be carried out under the Foreign Investment Law or Regulation 207 On the Implementation of the Foreign Investment Law. Under this legislation, foreign investment in the minerals sector is open to all foreign investors, with the consent of the government. Foreign investment is banned in gold and silver mines where these precious metals are the primary products; however, as stated previously, such activities can take place with the approval of the government. Gold and silver production as byproducts would be allowed. Additionally, foreign investment in the mineral sector is restricted to no more than 49 per cent of the total capital.

As with exploration, only the most basic principles are put forward for mining, and all other factors would need to be the subject of point-by-point negotiations and would need to be clearly stated in the foundation documents of the foreign capital company.

# 5.3 Administrative Efficiency

Mongolia is presently in the process of major governmental reorganization, moving forward with privatization of government agencies and implementing a broad range of needed legislation and policy. As a result, the government is plagued with administrative in efficiency with respect to dealing with individual mining proposals and/or ventures. This is not to infer that responsible and prompt action cannot be taken with respect to mineral development activities but rather that such activities normally require a great deal of on-the-ground effort to ensure that they move forward.

Particularly cumbersome in the present circumstances is that in the absence of a national minerals policy and legislative framework, it is necessary to negotiate most contracts on a point-by-point basis. Further adding to the delays in this system is the limited number of trained multilingual personnel available within Mongolia to undertake the negotiations.

Although the present system is inefficient and time consuming, negotiations are conducted in an open and fair manner.

# 6. Fiscal System

#### 6.1 Description of Major Taxes

Major taxes in Mongolia applicable to the minerals sector are defined in the Foreign Investment Law of (Mongolia), On the Implementation of the Foreign Investment Law and the Tax Law of (Mongolia).

The principal tax on mineral enterprises in Mongolia is the profit tax, assessed against taxable income, which cannot exceed 40 per cent of enterprise profit. For purposes of computation, taxable income is defined (Article 11, Section 1, Tax Law) as

"....the amount remaining from gross income after the costs of materials (raw materials, semiprocessed goods, steamwater, energy, fuel, packing, spare parts), transport expenses, social security, payments for use of land and natural resources have been deducted."

(In assessing the tax, however, the rates of revenue and payments for use of land and natural resources will be set by the government.)

Article 13, Section 1 of the Tax Law provides that taxable income shall be reduced, with the approval of the Ministry of Finance and the executive administration of the local people's khural, by

- \* Up to 60 per cent of the amount of own-compiled and long-term bank credit invested during respective years in the production of highly efficient products, innovation and the introduction of progressive techniques and technologies and training of specialists;
- \* The amount spent on protecting the environment.

The profit tax shall be paid in the same currency as that of the profit.

Within the Tax Law, Foreign Investment Law and the Regulation on Implementation of the Foreign Investment Law, there are the following taxes and/or general descriptions pertaining to taxes of the fiscal regime.

- \* Foreign investors will be exempted from the profits tax in the first three years of their activities.
- \* Goods imported by a foreign investor, for its activities, shall be exempted from customs duties.
- \* Companies with foreign investment will pay fees for the use of land, forest, water and other natural resources.
- \* A foreign participant shall be exempted from any tax while transferring its share of profit abroad.
- \* Employees of companies with foreign capital may transfer abroad tax-free their salaries and other income.

From the above it will be noted that the tax structure of Mongolia is very general and has thus been appropriately criticized as being indefinite with respect to both taxation provisions and restrictions on investment in specific areas. In particular, the lack of consideration of accelerated depreciation, investment tax credits, reinvestment credits, export-import credits, loss carry-forward, deduction of exploration costs, user fees and additional fees is particularly noteworthy.

Although not clearly defined, the Tax Law provides for an "indirect" tax entitled a "turnover tax", which the authors were informed is an excess profits tax. Confusion with respect to this term has led to the government redefining and applying the tax as a sales tax, which has further confused the issue.

It should be noted that at present, there is no collection system presently operational for private enterprises and that the establishment of an efficient collection system is a high government priority for 1992.

# 7. Monetary Controls and Access to Capital

#### 7.1 Foreign Exchange

At the end of 1991, the economy of Mongolia was based on the tugrik, which had an official exchange rate against the U.S. dollar of 40 tugriks per US \$1.00. The Government of Mongolia has proposed, and is rapidly moving toward, a free float of the tugrik against all major international currencies. This process has been retarded due to low foreign currency reserves of the central bank; however, it is planned for implementation within the first quarter of 1992.

Repatriation of profits, "in proportion to their share in the company's capital", is guaranteed under the Foreign Investment Law of Mongolia, as is the right to maintain
external accounts. Although such capabilities are expressly granted in the Foreign Investment Law of Mongolia, it is done so without any elaboration and/or discussion of possible exceptions, specifically with respect to the mining sector.

### 7.2 Access to Capital

Capital formation within Mongolia is, at present, extremely limited and not feasible for large-scale projects such as a mining venture. Additionally, there is little possibility of raising investment capital through joint ventures with government agencies, further requiring that virtually all capital for mining activities will need to be generated outside Mongolia.

### 8. Environment

### 8.1 Legal Requirements for Environmental Problems

The adoption of the new, democratic constitution and the election of the new government in 1990 were accompanied by a comprehensive reexamination and reordering of priorities, goals and policies, as set out in the document *Basic Policy Guidelines* of the MPR Government. Policies set forth in the environmental section, which affect or may affect the mining sector are as follows.

- \* "The following areas are to be included in a network of state-protected regions: Lake Kubsugul: the source of the Onon, Kerulen and Tuula rivers; the Khan, Kentei and Uvs mountains, the western Mongolian steppes."
- \* "A programme for preservation of the Gobi region is to be implemented, including plantation of forests and vegetation of river sources."
- \* "The adverse environmental impacts of mining are to be reduced and controlled, and wastes and pollution from mining operations are to be kept to a reasonable level."

Provisions in other sections of the Basic Policy Guidelines of the MPR Government that have a bearing on environmental issues or are likely to affect environmental conditions with regard to mining include the following.

- \* An efficient economic system is to be developed, incorporating the development of a self-sustaining energy supply and the efficient use of natural resources.
- \* The utility value of natural resources will be determined, and all economic activities making use of natural resources will be charged accordingly.
- \* The authority of *somon* (local) governments is to be increased, including their authority to carry out supervision of natural resource use and to implement measures to protect the environment.

The basic policies of the government with regard to the environment, therefore, are wide ranging and ambitious and address the most critical environmental issues faced by the country. As may be expected, given that these policies were only recently adopted,

implementation of the measures and development of the programmes outlined in these basic policies are in the initial planning stages.

Current environmental legislation in Mongolia consists of a general environmental law (Government Resolution 226 of 1990) and five laws pertaining to individual environmental media or natural resources.

- \* The Draft Land Resources Law of 1991
- \* The Air Protection Law of 1989
- \* The Water Law of 1974
- \* The Forestry Law of 1974
- \* The Hunting Law of 1974
- \* The Mining and Minerals Law

Only the first two, Resolution 226 and the Draft Land Resources Law, were promulgated by the new government. The remaining laws were promulgated by the previous government and are therefore expected to be superseded by new laws in the near future. Under the above legislation, several effluent standards have been set and are presented in Table 4.

#### Table 4. Mongolia water, soil and air quality standards

Ambient water quality standards (mg/l)					
Hydrogenous indices	6.50 to 8.50	Phosphorus	0.10		
Suspended solids	6.50 to 8.50	MBAS	0.50		
Hardness	7.00	Iron	0.50		
Ammoniacal nitrogen	0.39	Copper	0.10		
Nitrite	0.02	Manganese	0.10		
Nitrate	10.00	Fluorine	1.50		
	Soil contamina (mg/kj	tion limits g)			
Nickel	4.0	Lead	200.0		
Chrome	0.5	Copper	3.0		
	Ambient air qual (mg/m	ity standards 3)			
	Individual	sampling	Daily mean/value		
Nitrogen dioxide	0.08	35	0.04		
Sulphur dioxide	0.50	00	0.05		
Carbon monoxide	5.00	00	3.00		
Dust	0.50	00	0.15		

Although effluent standards have been set and numerous policies articulated, the basic fact is that at present Mongolia lacks both technically trained personnel and analytical/monitoring capability to effectively implement its environmental policy. As the mining sector is at present without a mining law, there are no specific predetermined environmentally-related obligations applicable to either existing or proposed mining ventures.

### 8.2 Environmental Trends

Mongolia's government and people have a clear and strong concern for the environment, tempered with a pragmatic view of the trade-offs required between mineral development for national growth and the environment. Similarly, their view is strongly influenced by their knowledge of present environmental problems, which resulted from seven decades of central planning under which environmental issues were largely ignored, in particular in the energy and minerals sectors. As a result, the prospects for expanding environmentally sensitive sectors, such as mining, make the introduction of effective environmental assessment and monitoring procedures an overriding short-term priority for Mongolia. Even with this emphasis, however, the background paper for the Aid Donor Consultation Meeting, held in October 1992 in Ulaanbaator, notes that

"...While the government is determined to promote a clean environment, large investments in this sector cannot be a high priority in the short term...."

Nevertheless, the same report emphasizes "...strict limits will be placed on the environmental effects of mining activities..."

Overall, the environmental picture in Mongolia, as it applies to mining seems to be that of a rising awareness and concern with respect to the environmental impact of mining, a recognition that future mining activities will need to meet higher standards environmentally and the belief that there must be some short-term trade-offs in order to facilitate development. For the investor, however, the above can be inferred to mean that a strict adherence to present environmental guidelines and the development of environmentally sound projects should be a major priority, as environmental concerns and restrictions will increase in the future.

At present, there are no antimining groups within Mongolia opposing mining development; however, there is both a strong sensitivity with respect to the environment and a recognition, in many areas, of the negative environmental impact of past and existing operations. Therefore, it should be concluded that such groups could easily form in the future as environmental awareness increases.

### 9. Local Services and Labour Market

#### 9.1 Availability of Local Services

Local services to support minerals industry activities are presently not available within Mongolia. In addition, state-run facilities have only limited capacity and capability to assist in providing services.

### 9.2 Labour Market

An experienced local workforce does not exist in Mongolia for the minerals industry. As present, issues of wages, firing and use of expatriate staff are all the subject of negotiation within individual contracts. It should be noted that wage controls for the government sector will be maintained during 1992 and into 1993. There are no wage controls in effect or anticipated for private sector activities.

# 10. Conclusions and Recommendations

The present study is limited in its scope and ability to assess the short- to intermediate-term development of the minerals industry in Mongolia, primarily because the nation is only now emerging from 70 years of centrally planned development, which has kept the nation largely isolated from the international community. As a result, the nation has only recently (January 1992) approved a democratic constitution and is presently formulating the national policy and legislation needed to join the free market community of nations. At the present time, however, the nation is plagued by four major problems that further limit the study's ability to completely address the mineral investment climate of Mongolia at present and in the future. These problems are as follows.

- 1. With the withdrawal of CIS/socialist assistance, the nation's economy, already weak, has declined dramatically, with a resulting decrease in goods and services.
- 2. Although reorganized, the responsible government agencies for mineral development remain essentially the same. As a result, activities are a mix of controlled planning and free market concepts, which occasionally results in considerable confusion in terms of process and procedure. The problem is further compounded by the lack of trained personnel, particularly those with practical negotiation and planning skills.
- 3. Virtually all legislation, enacted and pending in the nation, is very general and does not provide the level of specificity required by investors. The lack of a mining law is a critical deficiency and requires that any mineral development proposed be negotiated on a time-consuming point-by-point basis.
- 4. Access to available data on geology, geophysics, geochemistry and mineral deposits within Mongolia is, for a variety of reasons, very difficult to acquire. As a result, insufficient data are available for formulating a base exploration programme, selecting from alternative prospects or identifying favourable investment/development options.

All of the above shows that for the potential investor in Mongolia, there are a number of structural problems within the present government that require time, effort and perseverence to overcome. Nevertheless, Mongolia has a high potential for the discovery and/or development of a wide range of mineral commodities.

Although the above constraints exist, the Mongolian Government is working diligently to put in place a market economy with all of the structure, policy and legislation that is needed to attract foreign investment. This trend is expected to continue. In the interim, the government has demonstrated a desire to facilitate mineral development in the country by focusing on a foreign investment law under which projects can be negotiated and undertaken. It guarantees repatriation of profits, ensures against expropriation and provides both a tax-free initial investment period and investment credits for specific action. There will be a 49 per cent level of foreign participation in mineral projects and an exclusion of gold and silver deposits from foreign investment. In terms of developing and implementing a modern mining law, there is still a great deal that must be done to inform the government in terms of modern mining contracts, to train personnel for contract negotiations and to remove the mining sector from the structural barriers of the previous socialist system.

Overall, the future for Mongolia's minerals industry is bright, as the nation is richly endowed with a variety of minerals, many occurring in large and high-grade deposits. There is a strong national commitment by the government to facilitate mineral development and trade. Most importantly, Mongolia has two great potential trading partners and access to both Europe and Asia for its mineral exports.

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# Myanmar: The Effects of a Nonvisible Regulatory System on Foreign Mineral Investment

### 1. Summary

Myanmar has been historically subjected to foreign interference on many occasions, leaving it particularly wary of foreign participation in its affairs. Myanmar has effectively kept the outside world at an arm's length since gaining independence.

Myanmar has recently embarked on a policy of officially encouraging foreign investment. However, a number of factors have acted to discourage such investment, including investment in the mineral sector. Most international mineral companies would probably view the mineral sector investment environment in Myanmar as much less attractive than in many other countries within the Asia-Pacific region.

Until certain fundamental changes take place in the political and regulatory system, there will be a less than optimum interest by the international mining industry in developing the mineral resources of Myanmar.

### 2. Background Information

#### 2.1 National Profile

#### 2.1.1 Political Environment

In 1989, the country known to most of the world as either Burma or the Union of Burma changed its name to the Union of Myanmar. Myanmar has followed a practice of isolation following independence from Great Britain and is not a member of the British Commonwealth or ASEAN. It does, however, have membership in the United Nations (Whitaker 1991).

Myanmar is functionally controlled by a military junta. The government comprises the State Law and Order Restoration Council, headed by a chairman, and a cabinet of ministers.

There are some portions of the country in which mining companies may not be able to function because of the inability of the government to impose its presence. The United States Embassy in Myanmar relates that there is a "continued presence of insurgents in many of the richest mineral areas" (American Embassy 1991). This is reinforced by Richard Vokes, who states that "the continuing civil war and insecurity along wide tracts of the country's border also deprive the government of access to much of the country's forest and mineral reserves and disrupt moves to expand official crossborder trade" (Mya Than 1990). However, in 1991, of the nine petroleum companies

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currently working in Myanmar, only one was unable to work because of insurgency troubles.

The traditional five-year development plans may be a thing of the past for Myanmar. As of 1990, the government has chosen to determine policy and goals through annual plans. All prior long-term plans have been annulled. Generally, most mineral sector foreign investments are long-term, yet the government's strategic policy for long-term development and support for the sector is now unclear (Mya Than 1990).

The Government of Myanmar has made a major switch from "comparative isolation" to an "open-door policy" and from a socialist philosophy to a more marketoriented approach. The 1965 Law for the Establishment of a Socialist Economic System was repealed, and in 1988, the open-door policy took the form of the Union of Myanmar's second Foreign Investment Law (the first, the Union of Burma Investment Act, was introduced in 1958; Mya Than 1990).

After World War II, both foreign and domestic businesses were nationalized. State economic enterprises (SEEs) were set up in all sectors of the economy. By the 1970s, all major economic enterprises except for agriculture, small-scale trading and minor services had been nationalized. All significant industrial activity is concentrated in state-owned enterprises. Out of almost 40,000 private establishments there are only 13 employing more then 50 workers. There were about 50 SEEs operating in 1988. They ranged from banking and insurance to hotels and tourism (Mya Than 1990). The mining sector currently has six state economic enterprises, which are discussed under the section of this paper titled "government institutions."

In the case of petroleum companies, the government has provided the protection necessary for most of them to carry out their work. From a security standpoint, mining companies may be able to operate in some areas but not in others.

#### 2.1.2 Geography and Demography

Myanmar has a land area of 261,218 square miles (676,552 square kilometres). It is located between the Malay Peninsula and the Tibetan Plateau and shares borders with Bangladesh, China, India, the Lao PDR and Thailand. The Bay of Bengal and the Andaman Sea are to its south and west.

The Myanmar Government estimates that for 1989/90, 0.5 per cent of the employed workforce (78,000/15,022,000) was engaged in the mining sector (Ministry of Planning and Finance 1990).

#### 2.1.3 Economy

The currency in use in Myanmar is the kyat. The kyat is not negotiable abroad. Its value is pegged to the IMF's special drawing rights and is widely believed to be overvalued (Mya Than 1991).

Myanmar was given least developed country status by the United Nations in 1986. Its level of per capita income makes it one of the poorest in Southeast Asia (Mya Than 1990). Principally, Myanmar's economy is centrally planned and regulated. It is one of the most heavily agriculture-based economies in the world. Unlike many other least developed countries, agriculture actually increased its gross domestic product share by three per cent between 1961/62 and 1981/82 (Mya Than 1990). In 1989/90, agriculture accounted for 40.6 per cent of the gross domestic product, whereas the mining sector accounted for less than one per cent (UMFIC 1990).

Myanmar's economy is considered unhealthy by international standards. "A major problem affecting Burma ... is that it currently lacks the necessary external aid to fund the complete structural adjustment necessary" (Mya Than 1990). In 1987/88, Myanmar received about \$46 million dollars annually in bilateral and multilateral aid (OECD figures). The Myanmar Government has seen a dramatic fall in foreign aid since 1988. Its donors are now confined to the United Nations Development Programme and to temporary assistance, mainly from Japan and also from Germany and Australia. The United States has levied trade restrictions against Myanmar (notably suspending Myanmar's tariff preference under the General System of Preferences). The European Community has also suspended economic ties with the Myanmar Government and held back development aid (*Times* 1991b and c). Japan recognized the new regime in early 1989, but its aid payments are being limited to existing projects (Mya Than 1990).

Defence expenditures reportedly account for 40 per cent of the national budget. Since 1983, when export income began to drop as a result of the decrease in rice purchasing and the falling world price of rice, the economy has displayed signs of deterioration. Government revenues (tax and non-tax) have fallen from 17 per cent of GDP in 1981/82 to 10 per cent in 1987/88, rising significantly only in 1989/90. The contribution of state economic enterprises fell steadily from 1981/82 through 1988/89. The country's industrial production is very low, and therefore Myanmar has not been able to tap export markets in order to generate foreign exchange nor, for that matter, to meet the domestic demands of its growing population (Mya Than 1990).

There was an estimated ten per cent level of inflation (consumer price index) during 1991. The October 1991 economic indicators, as reported by *Asiaweek*, listed the gross national product per capita as US \$278 and listed a gross domestic product growth rate of 5.1 per cent (*Asiaweek* 1991).

The overall balance of trade in Myanmar has been in deficit since at least 1977. Japan is the key country from which it receives imports (Ministry of Planning and Finance 1990). The current account deficit stood at \$400 million in October 1991 and the foreign debt at US \$4.5 billion (*Asiaweek* 1991). Exports in the mid-sixties accounted for approximately 16 per cent of the gross domestic product but sank to 2.2 per cent in 1987 and 1988. It is felt that factors such as a shortage of foreign exchange to replace worn-out machinery and to purchase spare parts have severely limited Myanmar's ability to exploit its mineral resources (American Embassy 1991). The shortage of fuel oil has further hindered Myanmar's ability to profit from its natural resources (Mya Than 1990).

Currently, the development of Myanmar's mining sector is almost exclusively dependent on state investment. The 1989/90 annual plan allocated 544.9 million kyats

or 11 per cent of the state investment budget toward mining sector development. The net amount of investment by the state into the mining sector has fluctuated from 1986 through 1990, both in terms of sheer number of kyats and in terms of the percentage of total expenditures by the state, as shown in the Tables 1 and 2 (Ministry of Planning and Finance 1990).

According to the Foreign Exchange Commission, total exports added 3,552 million kyats to the economy. There is a disparity, however, between the Ministry of Planning and Finances' 1989/90 figures and the Foreign Investment Commission's figures for the kyat value of minerals and gems exported from Myanmar that year. The former states the value at approximately 180.2 million kyats, while the latter cites 287 million kyats (equivalent to eight per cent of the total foreign export). The two organizations were in agreement for the 1988/89 figures for both total exports and for minerals and gems contributions to that total, which for 1988/89 did, apparently, equal eight per cent. Exports of minerals and gems were also reported by the Ministry of Planning and Finance for the years 1986/87 (283.9 million kyats), 1987/88 (225.0 million kyats) and 1988/89 (172.7 million kyats; Ministry of Planning and Finance 1990). It was not, however, stated if these values were given in real or current terms, what exchange rate was used in making the calculations and what hard currency was received.

#### Table 1. Change in current state expenditures in the mining sector

Year	Amount (in million kyats)	Percentage of total current expenditure
1986/87	2,151	8.8
1987/88	1,102	4.9
1988/89 provisional/actual	2,624	10.5
1989/90 provisional	3,007	7.7
1990/91 annual plan projection	3.296	8.6

(through the state administrative organizations, the state economic enterprises and the town and city development committees)

Note: Excluding payment of interest, subsidies and contributions of state economic enterprises to the state.

Source: Extracted from Review of the Financial, Economic and Social Conditions, Ministry of Planning and Finance, Yangon, Myanmar 1990.

#### Table 2. Changes in state capital expenditure in the mining sector

(through the state administrative organizations, the state economic enterprises and the town and city development committees)

Year	Amount (in million kysts)	Percentage of total capital expenditure	
1986/87	239	3.8	
1987/88	394	6.4	
1988/89 provisional/actual	546	12.5	
1989/90 provisional	571	7.4	
1990/91 annual plan projection	410	5.6	

Source: Extracted from Review of the Financial, Economic and Social Conditions, Ministry of Planning and Finance, Yangon, Myanmar 1990.

In conclusion, the economy of Myanmar is in a state of transition. A new emphasis on private ownership and foreign investment has been publicized, but its implementation and effectiveness are yet to be demonstrated. The mineral sector has the potential to play a major developmental role, but under current conditions, the required foreign capital has not been forthcoming.

### 2.1.4 Infrastructure

Almost all travel by foreigners throughout the country must be approved by the government. Travel within Myanmar is possible by road, rail, air or river. Of the almost 15,000 miles of roadway, approximately 2,500 miles are surfaced (UMFIC 1990). Petrol stations, as such, are not found. Most distribution of petrol is by the state. Access to petrol is uncertain and may lead to operational difficulties for mining operations.

Major urban hubs are connected by train and airplane. The train route between Yangon and Pagan is well maintained (at least during the dry/cool season). The government-run airline, Myanmar Airways, is the sole domestic carrier, with almost 40 airfields scattered around the country.

Travel by water includes river and coastal shipping. Of the major rivers, only the Ayeyarwady (Irrawady) is navigable for long distances. The state-owned shipping line operates to various ports along Myanmar's coastline (UMFIC 1990). Firsthand experience found that for some types of transportation, the overall demand exceeds the supply and that some scheduled services may not be operating. This may be partly attributable to a lack of fuel.

Electricity is produced by a state-run enterprise and is provided almost exclusively to the southern and central parts of Myanmar (UMFIC 1990). The power supply is less than reliable. The American Embassy reports that serious electricity shortfalls constrain production of minerals (American Embassy 1991); therefore, the need for uninterrupted service may also lead to some operational difficulties.

Government postal services are readily available. There is explicit censorship of materials entering the country.

Personal telephones are not common items in the average Myanmar home, with only 65,419 in the entire country of 40 million, including business and government phones (UMFIC 1990). *Asiaweek* puts the number of telephones at approximately one per five hundred people (*Asiaweek* 1991). Even though there is a desire by many local people to have a telephone, the cost of having one installed is prohibitively high. Mining companies may find that access to some forms of modern communication may be difficult.

### 2.2 Past and Current State of the Mineral Industry

### 2.2.1 Historical Perspective

Historical records indicate that lead, zinc, silver, tin, tungsten and gems were being mined in Myanmar since at least the fifteenth century. After achieving independence, the government established three primary mineral sector regulatory bodies: the Burma Geological Department, responsible for geological mapping; the Mines and Explosives Department, responsible for the establishment of mining laws and taxation; and the Mineral Resources Development Corporation, responsible for the development of the country's mineral resources. Joint venture companies were established between the Myanmar Government and United Kingdom companies to develop or reopen the mines at Namtu, Bawdwin, Mawchi, Heinda and Mogok (U Mya Soe 1992).

During the 1960s, the corporations were reorganized under a scheme of expropriation and nationalization. Separate corporations were formed to deal with specific groups of minerals (see description under the section on government institutions).

Today, Myanmar lacks experience in dealing with foreign investors and has had very little contact with the international mining industry. Recent statistical data for the Myanmar mineral industry are shown in Tables 3 through 6.

In real terms, there was an increase of 14.5 per cent of the net output value of Myanmar's mining sector between 1988/89 and 1989/90, according to government statistics. (See Table 6.) Even correcting for the inclusion of petroleum and gas, there was an increase from the previous year in the output value of metal products such as tin concentrates; tungsten concentrates; tin, tungsten and scheelite mixed concentrates; refined silver; gold; zinc concentrates; and copper concentrates (Ministry of Planning and Finance). Increases reported by some government departments do not necessarily agree with statistics reported by others.

Year	Value of mining production (in million kyats at current producers' prices)	Value of net output of mining sector (in million kyats at current producers' prices)	Value of net output of mining sector (in million kyats at constant producers' prices)
1961/62	93.6	54.7	
1969/70	192.3	110.8	
1973/74	354.0	153.5	
1977/78	483.4	282.7	
1981/82	803.4	429.8	
1982/83	845.5	501.2	
1983/84	850.3	504.0	
1984/85	959.5	545.1	
1985/86	908.1	533.5	533.5
1986/87	823.5	483.4	498.4
1987/88	810.5	478.2	429.6
1988/89	843.6*	497.7*	434.3
1989/90	1,337.9*	789.4*	393.0*
1990/91		970.2**	542.6**

#### Table 3. Myanmar's mining statistics

\* Provisional data.

\*\* Annual plan projections.

Source: Extracted from Review of the Financial, Economic and Social Conditions, Ministry of Planning and Finance, Yangon, Myanmar 1990.

Particulars	A/U	1986/87	1987/88	1988/89 (provisional/ actual)	1989/90 (provisional)
Tin concentrates (65 per cent)*	Metric tons	638.0	321.0	180.0	681.0
Tungsten concentrates (65 per cent)**	Metric tons	132.0	46.0	26.0	200.0
Tin and tungsten mixed concentrates (65 per cent)***	Metric tons	798.0	502.0	333.0	659.0
Tin, tungsten and scheelite mixed concentrates	Metric tons	1,522.0	1,351.0	938.0	1,530.0
Tin concentrates (74 per cent)	Metric tons	420.0	254.0	176.0	887.0
Tungsten concentrates (67 per cent)	Metric tons	326.0	175.0	167.0	513.0
Refined tin metal (99.9 per cent)	Metric tons	649.0	309.0	110.0	500.0
Gold	Troy ounces	-	1,258.0	994.0	4,000.0
Refined gold	Fine ounces	66.0	51.0	_	50.0
Lead sulphide ore****	Lakh metric tons	3.1	2.4	1.7	3.1
Refined silver	Lakh fine ounces	4.3	3.0	2.2	2.7
Refined lead	Metric tons	5,948.0	4,093.0	3,198.0	3,000.0
Zinc concentrates	Metric tons	7,393.0	5,089.0	4,975.0	5,000.0
Copper matte	Metric tons	79.0	77.0	224.0	200.0
Nickel speiss	Metric tons	47.0	50.0	101.0	80.0
Tin concentrates (65 per cent)*	Metric tons	638.0	321.0	180.0	681.0
Antimonial lead	Metric tons	141.0	247.0	160.0	300.0
Copper ore	Million metric tons	1.4	1.4	0.7	1.8
Copper concentrates	Metric tons	40,227.0	42,575.0	18,846.0	20,000.0
Pig iron	Metric tons	2,669.0	624.0	688.0	3,500.0

#### **Table 4. Production of metallic minerals**

\* Tin concentrate (65 per cent) is the primary product; from that, upgraded tin concentrates (74 per cent) and refined tin metal are subsequently produced.

\*\* Tungsten concentrate (65 per cent) is the primary product; from that, upgraded tungsten concentrates (67 per cent) are subsequently produced.

\*\*\* Tin and tungsten mixed concentrates (65 per cent) are the primary products; from these, upgraded tin concentrates (74 per cent) and upgraded tungsten concentrates (67 per cent) are subsequently produced.

\*\*\*\* Lead sulphide ore is the primary product; from that, refined gold, refined silver and antimonial lead are subsequently produced.

Source: Review of the Financial, Economic and Social Conditions, Ministry of Planning and Finance, Yangon, Myanmar 1990.

#### Table 5. Production of nonmetallic minerals

Particulars	A/U	1986/87	1987/88	1988/89 (provisional/ actual)	1989/90 (provisional)
Jade	Kilos	60.333.0	98.623.0	131.777.0	54,266.0
Dolomite	Long tons	2.360.0	4.539.0	923.0	1,900.0
Manganese dioxide	Long tons	94.0	131.0	68.0	100.0
Calcium carbonate	Long tons	2,310.0	2,850.0	2,141.0	1,600.0
(Monywa)					
Coal	Long tons	37,498.0	38,713.0	29,780.0	37,000.0
Stone quarrying	Lakh sudrum	5.4	5.3	5.2	5.1
Barites	Long tons	11,395.0	16,970.0	12,478.0	9,000.0
Gypsum	Long tons	25,450.0	22,533.0	31,215.0	31,036.0
Limestone	Million long tons	0.8	1.3	1.1	1.2
Feldspar	Long tons	3,028.0	5,531.0	4,860.0	4,190.0
Fire clay	Long tons	2,162.0	2,022.0	3,330.0	2,750.0
Fire clay powder	Long tons	289.0	136.0	88.0	350.0
Ball clay	Long tons	130.0	215.0	243.0	200.0
Bentonite	Long tons	840.0	292.0	411.0	700.0
River shingle	Lakh sudrum	1.6	1.7	1.4	1.4

Source: Review of the Financial, Economic and Social Conditions, Ministry of Planning and Finance, Yangon, Myanmar 1990.

Table 6. I	ndices of	mineral	production	by	type	(quantum	index	1985/86	= 100)
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Particulars	1987/88	1988/89 (provisional)	1989/90 (provisional)	
Lead, zinc, silver and allied products	65.5	54.2	56.8	
Tin, tungsten and scheelite mixed concentrates	62.8	43.7	74.8	
Jade and gems	170.4	222.9	101.2	
Industrial minerals	92.0	83.8	89.4	
Others	116.1	76.3	98.9	

Source: Review of the Financial, Economic and Social Conditions, Ministry of Planning and Finance, Yangon, Myanmar 1990.

According to the 1989/90 provisional data, the production of important minerals comprised tin concentrates, 681 metric tons; tungsten concentrates, 200 metric tons; tin, tungsten and scheelite mixed concentrates, 1,530 metric tons; refined tin metal, 500 metric tons; gold, 4,000 troy ounces; refined gold, 50 fine ounces; refined silver, 270,000 fine ounces; refined lead, 3,000 metric tons; zinc concentrates, 5,000 metric tons; copper matte, 200 metric tons; nickel speiss, 80 metric tons; and antimonial lead, 300 metric tons, respectively. Compared with 1988/89, the production of all minerals increased, except for refined lead, copper matte and nickel speiss (Ministry of Planning and Finance 1990). See Table 4.

In 1989/90, the production of refined copper concentrates was 20,000 metric tons; steel billets, 18,000 metric tons; other important industrial minerals such as barites, 9,000 long tons; gypsum 31,036 long tons; fire clay, 2,750 long tons; fire clay powder, 350 long tons; ball clay, 200 long tons; and calcium carbonate, 1,600 long tons. Compared with 1988/89, the production of refined copper concentrates, steel billets and fire clay powder increased. However, some industrial minerals were produced in ac-

cordance with the demand of the industries (Ministry of Planning and Finance 1990). See Table 5.

The official reported value of mine production is shown in Table 3.

Recent levels of minerals produced in Myanmar are given in Tables 4, 5 and 6.

### 2.2.2 Structure of the Industry

Although Myanmar may have exceptional mineral resources, the economy is primarily agrarian. The scope of the mining industry has actually decreased since the 1940s, when there were as many as 900 mines of all sizes in Myanmar. Currently, there are only 19 notable mines, of which only three are good-sized: the copper mine at Monya, the lead-zinc-silver mine at Namtu and the gold mine being commissioned at Kyaukpahto (Guy-Bray 1991).

One substantial agreement produced as a result of Myanmar's 1989 law allowing joint ventures is a 49/51 joint venture between the No. 3 Mining Enterprise and ECI Minerals Pte. Ltd. of Singapore to produce barite powder (for use in drilling for oil). The government is providing the barite from three sites: Kyaukse, Heho and Anisakan. ECI is providing the hardware for a 100,000-ton capacity plant at Thazi. Production is planned to commence at the beginning of 1992, with an annual output of 30,000 tons. Mining of some other of Myanmar's plentiful industrial minerals such as feldspar, talc and manganese is being planned by ECI (American Embassy 1991, U Mya Soe 1992).

On the whole, foreign investment in mining has been inconsequential and confined to investors from neighbouring countries. Coal is being mined at Maw Taung, Taninthayi township, Taninthayi Division (near the Thai border) by the Burapa Coal Company Ltd. of Thailand under a 1990 purchase contract with the No. 3 Mining Enterprise. Coal is being mined at Motai near China's Yunnan Province through a 1989 production-sharing agreement with the Wuzhou Company. Lead is being mined in the Mongkyat area in the Southern Shan State, near the Thai border, by the Thai company Saha Pongsiri Co. Ltd. through a production-sharing contract with the No. 1 Mining Enterprise (American Embassy 1991). Due to the decrease in tin prices, recent offshore tin mining contracts with Thai companies have apparently been revoked or held in abeyance. These 1990 and 1991 agreements, between the No. 2 Mining Enterprise and Sea Exploration and Mining Co. and Soong Thai Construction and Trading Co. Ltd, respectively, were originally to have been on a production-sharing basis.

The Kyaukpahto Special Metal (2) Gold Project in Kawlin township of the Sagaing Division was financed with a loan from Yugoslavia. Construction was started in 1987/88 and 90 per cent of the project was completed by 1989/90. Arrangements were made for the installation of power transmission lines to the project site in 1989/90 (Ministry of Planning and Finance 1990).

Several joint ventures were under negotiation in early 1992, including the following.

\* A joint venture for production of medium- and high-quality jewellery between Myanmar Gems Enterprise and a Thai jewellery manufacturer.

- \* A joint venture production-sharing contract for processing smelter slag at Namtu between the No. 1 Mining Enterprise and an Austrian company.
- \* A joint venture production-sharing contract for granite dimension stone between the No. 3 Mining Enterprise and a Japanese company.
- \* A joint-venture production-sharing contract for mining zinc silicate near the Thai border by the No. 1 Mining Enterprise and a foreign firm (U Mya Soe 1992).

As stated earlier, "the officially reported production of jade and gemstones has increased considerably over the past two years. Similarly, joint ventures between the Ministry of Mines and private companies have been formed for the production of tin, tungsten, scheelite and mixed ore" (American Embassy 1991). The government has encouraged joint-venture businesses on a production-sharing basis between government mining enterprises and Myanmar entrepreneurs. Areas are offered by the government on a bidding basis, with mining permits being awarded accordingly by the Ministry of Mines. The permits typically cover one acre and are valid for two years. Production is shared between the respective government mining enterprise and the local owner (U Mya Soe 1992).

An excerpt from the American Embassy in Yangon's Mineral Outlook Report, Burma states that

Legalization of private exploitation of gemstones was intended to stop their diversion to the black market. Beginning in 1990, mining blocks have been auctioned off to interested parties (Burmese nationals only). The proceeds (including, in theory, foreign exchange) from the mining operation are split between the Myanma Gems Enterprise (under the Ministry of Mines) and the private operator. Minimum bidding price is kyat 100,000 per mine with a maximum limit of three mines. In the latest round, May 1991, 189 blocks were awarded. While it is impossible to ascertain if this policy has led to any decrease in smuggling, the officially reported production of jade and gemstones has increased considerably over the past two years. Similarly, joint ventures between the Ministry of Mines and private companies have been formed for the production of tin, tungsten, scheelite and mixed ore (American Embassy 1991).

It is a well-known fact that small-scale illegal mining occurs in many areas throughout the country. Jade, gemstones and gold all find ready markets in neighbouring countries. Border towns flourish on this trade. It is not possible to accurately determine the full extent of this illegal production.

### 2.2.3 Government Policies Relating to Minerals

In 1988, Myanmar law changed to permit foreign ventures in which 100 per cent of the shares could be controlled by foreign companies or individuals. The list of economic activities allowed for foreign investment under the heading of mining, allows for "exploration, exploitation, production and marketing of non-metallic industrial minerals, such as coal, limestone, gypsum, etc.; marble quarrying and production and marketing of marble blocks and slabs; carrying out other quarrying industries and marketing of products thereof" (Union of Myanmar 1989).

Unfortunately, exploration, extraction and export of metals, jade and precious stones are not directly covered by the law. In the case of these commodities, production and trade must be either by the government enterprises or through approved methods (Mya Than 1990). However, the government has also stated that "if proposals for economic activities not specified in the above-mentioned list are submitted, they will be considered individually by the Union of Myanmar Foreign Investment Commission" (Union of Myanmar 1990). The application for such an activity would be submitted under Section 3 of the State-Owned Economic Enterprises Law. (The application process is described in a following section.) Thus, although foreign-controlled exploration and mining for metals, jade and precious stones are not specifically allowed under the foreign investment law, a foreign mining company might be able to obtain such rights by submission of such an application. In discussions with key government officials, the author ascertained that the government is keenly interested in proposals that would include participation by one of the established government mining enter-The preferred mechanisms for foreigners to engage in mining in Myanmar prises. include equity-sharing, joint ventures, purchase contracts or production sharing (UMFIC 1989).

Rumours of further liberalization by the government include a reduction or even elimination of high royalty fees being paid on most minerals except gemstones. Similar conditions to those offered to petroleum companies may soon be offered to nonpetroleum mineral companies, such as spending requirements, production split and the length of lease (American Embassy 1991).

### 2.2.4 Summary of the Current and Projected State of Affairs

The mining industry of Myanmar consists of around 20 small to medium-sized mines, on a world scale, and production by individual miners. A substantial but not quantifiable amount of jade, precious stones and gold is produced by operations beyond the regulation of the government. State mineral enterprises receive government funds but are faced with a capital shortfall and a lack of hard-currency purchasing power and must cope with less than adequate infrastructure. The government has taken the first steps to open the industry to foreign investment, but it is clear that further developments must occur before the international mining community would make a major commitment to exploration and mining.

# 3. Geological Potential

### **3.1 Description of the Geology**

### 3.1.1 Geographical Distribution of Mineral Potential

Besides its active mines, Myanmar is endowed with known deposits that warrant further evaluation and development. Discoveries of additional mineral wealth are likely to be made as modern technology is applied and as various areas of the country become stabilized.

The principal mineral finds in Myanmar are widely distributed across the country and can be found in the Sagaing Division, the Mandalay Division, the Tanintharyi Division, the Kayah State, the Shan State and the Kachin State. In the Sagaing Division, copper, coal, gold, tin, tungsten and scheelite are found. In the Mandalay Division, rubies, sapphires, other gemstones, gold, iron and barite are known to exist. Diamonds, tin, tungsten and scheelite are found in the Tanintharyi Division. Tin is found in the state of Kayah. In the Shan State, known deposits containing rubies, sapphires, lead, zinc, silver, gold, coal and barite have been identified. In the Kachin State, jade and coal are found (Ministry of Mines 1990).

Lead, zinc, silver and some gold are produced in the Shan State at the Bawdwin, Bawsaing and Yadanatheingi mines. Lead concentrates are transported by rail to Namtu Township in the Northern Shan State for smelting (Ministry of Mines 1990).

Copper is mined in Salingya township, while coal is mined in Salingyi township and Kalewa township, Sagaing Division in the central plains and is also found in the Northern Shan State. Lately, coal for export is being mined by China in Lweje, Momauk township, Kachin State (Ministry of Mines 1990).

Tin, tungsten and scheelite are found principally in the Tanintharyi Division. The largest tin-producing mine is the Mawchi Mine in the Kayah State; however, several promising areas have been found offshore in the Gulf of Mottama. Other areas with known tin deposits are found along the Thailand-Myanmar and China-Myanmar borders. One of the more recent discoveries containing tin, tungsten, scheelite and gold was found near Kyaukpahtoe, in the Sagaing Division. All high-grade tin is refined and smelted at a plant near Yangon. The low-grade tin and mixed concentrate are sent to a plant near Dawei in Tanintharyi Division for upgrading (Ministry of Mines 1990).

Gold is being extracted near Mandalay, Pyinmana, Nyaunglebin and Kyaukpahtoe (Ministry of Mines 1990).

Gems, such as high-quality rubies and sapphires, are currently produced in the hills northeast of Mandalay (Mogok area) and in Namtu township in the Northern Shan State. The Mogok area also produces spinel, garnet, periodot, tourmaline, aquamarine, amethyst, citrine, zircon, moonstone, iolite and danburite. Jadeite is mined in the Kachin State (Ministry of Mines 1990).

Other minerals of interest include alluvial diamonds, manganese oxide, iron, barite, gypsum and limestone. Alluvial diamonds are found in the Tanintharyi Division at the Theindaw Mine and at Mohjauk (Ministry of Mines 1990). A high-grade manganese oxide deposit has been identified near Keng Tung (Guy-Bray 1991). Iron is found in Mandalay (Ministry of Mines 1990). Barite is located in the Western Shan Plateau (north of Pyinoolwin in Mandalay Division, to the south of Heho in the Southern Shan State; Ministry of Mines 1990). A gypsum mine is located in the Northern Shan State. Limestone quarries are found in the Mandalay Division.

Companies seeking detailed geological information may encounter difficulties. Official government reports are not comprehensive and may not be available in English. Knowledgeable geologists once found in the university system are becoming scarce, as many have found reason to leave the country. The geology of Myanmar undoubtedly is highly prospective for many types of minerals, as is clearly indicated by the breadth and distribution of known deposits, but systematic geological investigation is not as well advanced as it is in most other countries in the region.

### 3.1.2 Minerals of Exceptional Interest

According to the Myanmar Government, "there are many possibilities to work under foreign investment in various fields of mining." They assert that Myanmar has "probable deposits of gems, jade, copper, lead, gold, zinc, tin, tungsten, iron, antimony, nonmetallic industrial raw minerals and oil shale for further exploration and exploitation" (UMFIC 1990).

"A number of experts consider that Myanmar has the potential for deposits whose economic value, in terms of size and grade, would be capable of attracting [development of] rare earths, silver, tin, tungsten, zinc, and gemstones (as well as gas and oil). The highest rating is awarded to commodities of high unit value and relatively simple technology, i.e., precious metals and gemstones" (Guy-Bray 1991).

The Myanmar Government is promoting the following undeveloped discoveries to foreign investors.

- Copper The Letpadaung deposit, seven miles from the Monywa Mine, reportedly contains 180 million tons of copper ore of 0.66 per cent purity. The Ministry of Mines claims that Australian, Malaysian, Republic of Korea and United Kingdom companies have expressed an interest in developing the deposit.
- Nickel An earlier United Nations study judged a deposit in Mwetaung, Chin State near the Indian border, to be of no significance. Subsequently, attracted by the soil colour, a German firm took a second look and concluded that the deposit had reserves of ten million tons, of more than 1.19 per cent nickel content. The site is still under study.
- Coal Although current coal production is minimal, geologists note that old geological records show the presence of significant coal deposits throughout the country. However, transportation difficulties hinder the development of many deposits. If the Mwetaung nickel deposits were developed, the nearby Kalewa subbituminous underground mine, currently producing 15,000 to 20,000 tons per year, could be expanded to produce fuel for use in the mining and smelting of ferro-nickel. Ministry officials claim that the site contains 100 million tons of coal.
- Platinum The Survey and Exploration Department of the Ministry of Mines is currently studying platinum deposits in the Indawgyi area of Kachin State (northeastern Burma).
- Diamonds In addition to the potential for diamond mining near the Mogok gem mines, alluvial diamonds have been found in the Tanintharyi [Tenasserim]

Peninsula in tin-bearing areas. Myanmar geologists are puzzled by this uncommon occurrence and are unaware of its origins.

- Tin The traditional tin-producing region of Myanmar is the Tanintharyi [Tenasserim] Peninsula, but two to three years ago, tin was discovered in the northeast on the border with China.
- Zinc In 1988, a number of foreign companies, including the Thai-Belgian Padaeng Co., looked into the considerable zinc deposits at Longchain in the Southern Shan State near the Thai border. (Myanmar operated a mine at that site until the late 1950s.) Currently there is no active interest in development of the deposit (American Embassy 1991).

Also of possible interest is the three million tons of slag at the Namtu smelter, which contains approximately 20 per cent zinc oxide and 13 grams per ton of silver. Some 1.2 million tons at the Mile 32 "old mill site" contain approximately 3.08 per cent lead, 2.91 per cent zinc, 0.73 per cent copper and three ounces per ton of silver, which could be extracted using modern technology (Ministry of Mines 1990).

Gold, which is located in secure, accessible areas, may eventually have good mining potential in Myanmar (American Embassy 1991). It should be noted at this point that the exploitation of gold is not included in the list of economic activities allowed for foreign investment (Union of Myanmar 1990).

### 3.2 Ability to Apply Geological Assessment Techniques

Myanmar has a primarily tropical climate. It has three seasons: the hot season from mid-February to mid-May, the rainy season from mid-May to mid-October and the cool season from mid-October to mid-February. "Annual rainfalls vary from 500 cm in the coastal regions to 75 cm and less in the central dry zone. Mean temperature ranges from 32 degrees C in the coastal and delta areas and 21 degrees C in the northern lowlands. During the hot season, temperatures could be considerably higher in the central dry zone" (UMFIC 1990). Fieldwork may be hindered by climatic conditions during various times of the year, depending on where the work is being carried out.

The willingness of the government to allow airborne geotechnical assessment methods to be implemented by foreign companies has yet to be determined.

### 3.3 Availability of Geoscientific Information

According to a recent United Nations report, no systematic mineral resource assessment programme has been undertaken for Myanmar nor have any nationwide airborne geophysical or geochemical surveys been conducted. The true mineral potential is thus poorly known. Key sources of information include the Ministry of Mines and the departments of geology in the major universities.

### 3.4 Government Institutions

Myanmar's mining industry is organized under the Ministry of Mines, which includes two departments and six state-owned mining enterprises. The two departments

in the Ministry of Mines are the Department of Geological Survey and Mineral Exploration and the Department of Planning and Inspection. The state-owned mining enterprises are the Myanma Gems Enterprise, the Myanma Pearl Enterprise, the Myanma Salt and Marine Chemical Enterprise, the No. 1 Mining Enterprise, the No. 2 Mining Enterprise and the No. 3 Mining Enterprise (Ministry of Mines 1990).

The Department of Geological Survey and Mineral Exploration is a typical geological survey organization comprising 18 divisions and sections. It addresses the primary geoscience areas and provides the support services found in many developing country geological survey organizations. A central research laboratory was established in 1981 in Yangon with Japanese assistance. It currently employs some 1,200 personnel. The primary functions of the survey are geological surveys, mineral exploration, providing feasibility reports and drawing geological maps (including tectonic, metallogenic province, mineral occurrence, hydrogeological and engineering geological maps; Ministry of Mines 1990).

The Planning and Inspection Department (PID) is responsible for mineral conservation, mine safety and health, and environmental protection. The main function of this department is to administer the provisions of the Mines Act, the Explosives Act, the Petroleum Act and the Gas Cylinder Rules.

Applications to carry out any economic enterprise allowable under the Foreign Investment Law are to be made to the state enterprise concerned. At present, the main mineral-producing operations are handled by the state-owned mining enterprises. The permit to carry out work, however, is issued by the Union of Myanmar Foreign Investment Commission, which has extensive discretionary powers (UMFIC 1990). The function of this commission will be described later in this section.

The mining enterprises are divided into groups based on the minerals for which they are responsible. The No. 1 Mining Enterprise has oversight for nonferrous metals such as lead, zinc, copper and silver and byproducts such as antimonial lead, copper matte and nickel speiss. It also deals with the export of minerals produced by the No. 3 Mining Enterprise (Ministry of Mines 1990).

Production and export of tin concentrates as well as refined tin, wolfram concentrates, tin-wolfram-scheelite and tin-wolfram mixed concentrates, gold and other byproducts associated with tin and tungsten minerals is the responsibility of the No. 2 Mining Enterprise. This enterprise is also involved with the actual exploration and production of tin-tungsten and gold. It also imports machinery and equipment for the above-mentioned activities (Ministry of Mines 1990).

The No. 3 Mining Enterprise is responsible for the production of industrial minerals such as barite, gypsum, limestone, fire clay, talc powder, graphite, manganese dioxide, bentonite, calcium carbonate and red and yellow ochres, as well as iron ore, sponge iron, pig iron, steel billets and coal. The importation of coal and coke also falls under the auspices of the No. 3 Mining Enterprise (Ministry of Mines 1990).

Myanma Gems Enterprise's main activity is the mining of gems and jade. It is also involved with the processing and manufacturing of finished gems, jade, pearls, silver and gold merchandise, and it vends many of these products (Ministry of Mines 1990).

The Myanma Pearl Enterprise, as its name implies, has the responsibility for the production, repair and sorting of cultured pearls (Ministry of Mines 1990).

The Myanma Salt and Marine Chemical Enterprise is assigned the research, production, distribution and marketing of solar salt and associated marine chemicals (Ministry of Mines 1990).

The Union of Myanmar Foreign Investment Commission wields great power. It accepts or rejects proposals for foreign investment. If a proposal is accepted, the commission issues a permit to the applicant. Extending or amending the terms of the original permit also falls within the jurisdiction of the commission. The commission's decisions are pivotal in determining how bright the prospects are for running a profit-able venture in broad ways, such as determining the terms of the contract and permit or by granting tax relief or exemptions, and in more subtle ways, such as evaluating the foreign capital brought in terms of its kyat value (Union of Myanmar 1990). It decides on the employment of foreign personnel and may "at any time, require the investor to furnish such evidence of facts as the Commission deems necessary" (Mya Than 1990).

The chairman of the commission is the minister of planning and finance. Its members are the ministers of mines, trade, industry 1 and 2, energy, agriculture and forests, transport and communication, construction, livestock breeding and fisheries, and cooperatives (Union of Myanmar 1988).

The banking system is wholly government owned and comprises the Union of Myanmar Bank, the Economic Bank, the Agriculture Bank, the Foreign Exchange Bank and the newly opened Investment and Commercial Bank. The Union of Myanmar Bank is the country's central bank. The Economic Bank serves the SEEs. The Agriculture Bank lends to agriculture, and the Foreign Trade Bank serves as an international bank.

"To facilitate business operations by enterprises operating under the Foreign Investment Law and to enable other business enterprises engaged in external trade and services, the Myanmar Investment and Commercial Bank was established in 1989/90" (Ministry of Planning and Finance 1990). This bank is a unit of the Economic Bank. It provides domestic and international banking as well as investment banking services to local and foreign investors, joint venture companies, local and foreign business enterprises and the Chamber of Commerce (UMFIC 1990).

The other bank of special interest to mineral investors is the Myanma Foreign Trade Bank. The mandate of this bank is to develop foreign trade. The exchange of foreign currency is overseen by the Exchange Control Board under the guidance of the managing director of the Foreign Trade Bank. Contracts relating to the payment and receipt of foreign exchange are often executed by the Foreign Trade Bank (UMFIC 1990). Foreign firms and their foreign employees are required to open foreign currency and local currency accounts in this state-designated bank (Union of Myanmar 1988).

# 3.5 Summary

Based on the limited amount of information available, Myanmar is widely considered as having excellent geological prospects for a wide range of minerals. The quantity and quality of basic geological information is limited, and that which does exist may be difficult to obtain. A lack of basic transportation infrastructure in rural areas would pose an impediment to exploration and mining, particularly during the rainy season. Some regions of the country are officially or practically off limits due to security problems. Deposits of some minerals have been identified and may be of commercial interest to risk-taking companies.

# 4. Marketing Considerations

Aside from industrial building materials, there is only a limited internal market for minerals in an economy that is agriculture-led. Positioned above the Malacca Straits, Myanmar has fairly quick access to markets in the Pacific and Indian Ocean basins.

# 5. Mining Law

# 5.1 Laws and Agreements Pertaining to Exploration and Mining

The mining sector is subject to regulation under the following acts.

\* Mines Acts

The Land Acquisition (Mines) Act (Indian Act of 1885) Union Mineral Resources (Grant of Right of Exploration) (Enabling) Act (Act No. 47 of 1949) The Burma Metalliferous Mines Manual, 1937 (Indian Act of 1923) Mineral Concession Rules, 1957 (Indian Regulation of 1913) Union of Burma Mines and Minerals Act, 1961 Mineral Resources Development Corporation Act, 1965

\* Explosives Acts

The Explosives Act, 1884 (Indian Act) The Explosive Substance Act, 1908 (Indian Act)

Jade and Gem Acts
 The Upper Burma Ruby Regulation, 1887
 The Jade Mines Regulations, 1940 (U Mya Soe 1992)

U Mya Soe has summarized the content of the acts (U Mya Soe 1992), as follows.

Basically the existing mining legislation is composed of two main documents: the Burma Metalliferous Mines Manual, 1937, corrected up to 1st May, 1941; and the Mineral Concession Rules, 1913 of an Indian regulation subsequently amended and adopted in Yangon on 18th November, 1957. The Burma Metalliferous Mines Manual, 1937 laid down the legal framework for the regulation of mines and development of all kinds of minerals, and it also includes provisions as to the safety and health of miners and their labour and employment conditions. The Mineral Concession Rules, 1957 involves for regulating grant of prospecting licences, mining leases and collecting royalties in respect of all kinds of minerals.

In July 1991 the government formed the Central Law Review Board, which has the responsibility to review and amend existing laws and regulations. In support of the board, the Ministry of Mines has formed the Mining Laws and Regulations Reviewing Central Committee (consisting of representatives from the various mining enterprises and mining departments). The functions of the ministerial committee are to list the existing mining laws, rules and regulations; review the list of mining laws and discuss whether to abolish or revise or draw up new laws; and draft the revised and new mining laws and regulations (U Mya Soe 1992).

As of March 1992, the ministerial committee had completed its revision of the Explosives Act and the Myanma Jade and Gems Act, drafted the new Myanma Pearl Act and the Myanma Salt Act and started the review of the Burma Metalliferous Mines Manual, 1937, Mineral Concession Rules, 1957 and Union of Burma Mines and Mineral Act, 1961. When the committee has completed its work, the revised and new laws and regulations will be forwarded to the Central Law Review Board, which shall make such changes as it deems appropriate before submitting the final legislation to the government for adoption (U Mya Soe 1992).

A 1991 review of Myanmar's mining laws by the United Nations found that "Myanmar lacks an enunciated mineral development policy. Its mining legislation and regulations are unresponsive to modern needs" (Guy-Bray 1991). U Mya Soe is in agreement: "Most of the mining legislations were inherited from the old colonial regime and some mine acts and regulations were amended after the independence in 1948... Since the existing mining laws and regulators are not being in harmony with the present trends of the economic policy, the Government is now reviewing the existing legislations and revising mining laws which are suitable and adaptable to the present circumstances" (U Mya Soe 1992).

The Burma Mines Act of 1961, amended in 1969, was not available to the author in an English version. Personal visits by the author to the official government bookstores in 1991 found that the law was out of print and not available from other key government institutions or from the major embassy libraries in Yangon. Clearly, if exploration and mining companies are to invest in the country, the government will need to better publicize the laws under which such investment will be regulated.

From discussions with senior government officials, the author has concluded that in practice, with regard to foreign investors, the current mining legislation would probably not apply or would apply only in part. Apparently, a state-company mineral agreement would take precedence over the provisions of the law. Such an agreement would be formulated under provisions found in the foreign investment legislation.

The Foreign Investment Law of 1988 is ambiguous in many instances. Terms are used but never defined. "Powers granted are usually modified if it is deemed in the best interest of the State and investors will be held to other laws of the State, without the specific ones being specified" (Mya Than 1990).

### 5.2 Major Features of the Legislation/Agreement

Appendix 2 of the official *Guide to Foreign Investment in Myanmar* lists the economic activities allowed for foreign investment. In relation to the mineral industry, these activities include the following.

Exploration, exploitation, production and marketing of nonmetallic industrial minerals, such as coal, limestone and gypsum.

Marble quarrying and production and marketing of marble blocks and slabs.

Carrying out other quarrying industries and marketing of the products thereof.

Manufacturing and marketing of bricks, tiles, floor tiles and wall tiles, refractory bricks and similar products.

Manufacturing and marketing of cement of all kinds, cement products, lime, plaster and related manufactures.

Manufacturing and marketing of iron and steel products, basic iron and steel products, basic nonferrous metal products using metal purchased from stateowned economic organizations or from abroad.

Manufacturing and marketing of all kinds of mining machinery and equipment.

Economic activities mentioned in Section 3 of the State-Owned Economic Enterprises Law, provided permission has been obtained under Section 4 of the said law [the economic activities include "exploration and extraction of pearls, jade and precious stones and export of the same; exploration and extraction of metals and export of the same"].

If proposals for economic activities not specified in the above-mentioned list are submitted, they will be considered individually by the Union of Myanmar Foreign Investment Commission.

There are twelve economic activities defined in Section 3 of the State-Owned Economic Enterprises Law that may be carried out solely by the state-owned economic enterprises, including "exploration and extraction of pearls, jade and precious stones and export of the same; exploration and extraction of metals and export of the same." The procedures to apply for an exception to Section 3 are as follows.

The government may, in the interests of the state, permit any enterprise that is prescribed under Section 3 of the State-Owned Economic Enterprises Law to be carried out solely by the government, in any of the following forms: joint venture between the organization and a citizen or a foreigner; joint venture between the organization, a citizen and a foreigner; joint venture between a citizen and a foreigner; enterprise by a citizen or a foreigner (this apparently implies that 100 per cent foreign ownership may be legally possible).

When any citizen or foreigner applies to carry out any economic enterprise that is prescribed under Section 3 of the said law, the following procedures are required.

- (a) Application shall be made on the attached Form (A) to the state economic organization concerned.
- (b) The organization shall submit the proposal to its ministry, together with its comments.
- (c) If the ministry concerned considers that the proposed enterprise submitted by the organization is not covered by the Union of Myanmar Foreign Investment Law and is also in the interests of the state, the ministry concerned shall submit the following particulars, together with explanations and its comments, to the government:
  - \* Type of business carried out,
  - \* Type of organization to be formed,
  - \* Estimated amount of capital to be invested,
  - \* Financial arrangement,
  - \* Duration to be carried out,
  - \* Estimated income and expenses,
  - \* Economic and social justification for the state and
  - \* Conditions to be prescribed.
- (d) If the proposal submitted by the organization is covered by the Union of Myanmar Foreign Investment Law, the ministry concerned shall obtain the approval of the government.
- (e) If the proposal submitted under subparagraphs (c) and (d) is considered to be in the interests of the state, the government or the ministry authorized for this purpose may, by notification, permit it to be carried out, with appropriate conditions.
- (f) If the ministry concerned considers the proposal submitted by the organization to be not in the interests of the state or if the government does not permit, the proposal may be rejected. Such rejection shall be communicated to the applicant.

Under the Foreign Investment Law (Article 22, Chapter XI), the Myanmar Government guarantees that business ventures undertaken will not be nationalized during the term of the contract (Union of Myanmar 1990).

The Draft Contract Regarding One Hundred Percent Foreign Investment To Be Made In the Union Of Myanmar has been published in the *Guide to Foreign Investment in Myanmar*. The agreement is quite short and not specific to mining.

### 5.3 Administrative Efficiency

Oil company executives operating in Myanmar interviewed by the author indicated that they found few faults with the government administration. This was in large part due to the streamlined nature of top level decision-making and the ability of the decision-makers to ensure that the implementation of approved operations proceeded with a minimum of administrative delay.

# 6. The Fiscal Regime

### 6.1 Description of Major Taxes

The tax structure of Myanmar falls into four major and fifteen minor categories. There are seven different government agencies that administer one or more of these taxes. The tax of specific interest to the foreign mineral investor will likely be the tax on extraction of minerals administered by the General Administration Department (UMFIC 1990).

The first category of taxes is taxes levied on utilities of state-owned properties. This category encompasses taxes on land, water tax, embankment tax and tax on extraction of minerals administered by the General Administration Department; tax on fisheries administered by the Fishery Department; and tax levied on rubber administered by the Forest Department (UMFIC 1990).

The second category of taxes is those levied on domestic production and public consumption. This category includes excise tax, which is administered by the General Administration Department, license fees on imported goods administered by the Customs Department, tax on transport administered by the Department of Road Transport Administration, commercial tax and sale proceeds of stamps administered by the Internal Revenue Department (UMFIC 1990).

The third category of taxes is those levied on income and ownership. This category consists of income tax and profit tax, both of which are administered by the Internal Revenue Department (UMFIC 1990).

The final category of taxes is customs duties, which are administered by the Customs Department (UMFIC 1990).

The Foreign Investment Commission grants exemptions or relief from taxes and determines the rates of depreciation on capital goods (Union of Myanmar 1988). The areas mentioned for tax relief or exemption include the following.

- \* Exemption from income tax (detailed under section 6.1.1)
- \* Exemption or relief from tax on profits held in reserve and reinvested into the business within one year
- \* Accelerated depreciation of capital assets
- \* Relief from income tax up to 50 per cent on the profits arising from export of goods produced by the enterprise concerned
- \* Allowance for research and development expenditures that cannot be conducted by any department or organization of the state
- \* Carry-forward of loss sustained within two years following the tax holiday period for setting off against profits in the following three consecutive years
- \* Exemption or relief from customs duties and/or other taxes on machinery, equipment, components, spare parts, instruments and other materials imported during the period of the enterprise

- \* Exemptions or relief on raw materials imported in the first three years' commercial production following the completion of construction
- \* Exemption from commercial tax (UMFIC 1990)

Although this list is extensive, tax and duty exemptions such as these are felt to be minor considerations compared to the overall business environment that faces a prospective investor (Myint 1971).

### 6.1.1 Income Tax

"The Income Tax Law and Profit Tax Law was amended to support economic development, and to enable expansion of economic enterprises in the country. According to the amendment, tax rates have been reduced, and tax exemptions and relief have been allowed in accordance with the Foreign Investment Law. Moreover, with the aim of providing opportunities for private entrepreneurs to expand investment, tax relief had been accorded to income on unspecified business voluntarily declared" (Ministry of Planning and Finance 1990).

Income tax is applied to income accrued or gained from all sources within Myanmar by businesses operating under the Foreign Investment Law. The tax year for income tax in Myanmar is from 1 April through 31 March. Tax is paid in advance on a monthly or quarterly basis based on projected income for the whole year. Tax return applications are filed with the Internal Revenue Department on or before 30 June or within one month of discontinuing business. Likewise, within a month of disposing of capital assets, tax forms claiming capital gains must be submitted (UMFIC 1990).

A consecutive three-year tax holiday is available to all enterprises operating under the Foreign Investment Law, commencing with start up of production. Application for extension of this tax holiday may be granted if the Foreign Investment Commission deems it in the interest of the state. "A flat tax rate" of 30 per cent applies to all businesses that operate under the Foreign Investment Law and under the Myanmar Companies Act (UMFIC 1990).

"Expenses incurred in earning the income, and the depreciation allowance in respect of capital assets are deductible from the gross income but it does not include expenses which are of capital, personal or domestic nature, and which are not commensurate with the volume of business. The payments made by a firm or an association of persons to its partners by way of salaries, wages, bonuses, commissions are also not allowed" (UMFIC 1990). Expatriates are required to pay the same income tax as Myanmar citizens (Mya Than 1990).

#### 6.1.2 Export and Import Taxes

In Myanmar, imported goods are subject to both customs duties and import license fees. A license fee of five per cent is assessed for imports (UMFIC 1990).

All imported goods must be declared to the Customs Department. Customs duties are applied to almost all imported goods. The charge on the import of machinery, spare parts and supplies ranges from five to thirty per cent (UMFIC 1990).

No license fee is assessed for exports. No export duty is levied against mineral products at present (UMFIC 1990).

Additional sales taxes may be imposed on imported goods that are then sold. The Commercial Tax Law, which came into effect in 1990, calls for a tax on the "goods and services produced or rendered within the State and the imported goods from abroad" with the exception of "essential and basic commodities." This tax is based on the "landed cost" of the import and on the price obtained from the sale of goods produced within Myanmar. The rate charged is based upon a predetermined set of schedules. For example, jade and gems are listed under Schedule V, which calls for a tax of at least sixty per cent (UMFIC 1990).

### 6.1.3 Royalty Taxes

The author was unable to determine if the government levies a royalty tax on minerals. There is a tax levied on the extraction of minerals mined by state enterprises but the method and rate of application are not known to the author.

### 6.1.4 Fees and Land "Rent"

"It is possible for a foreign investor to acquire land for operations under the Foreign Investment Law on long term lease of 10 to 30 years. Rents will be changed depending upon the locality and type of land" (UMFIC 1990).

### 6.2 Ability to Predetermine Tax Liability

One of the key elements in almost any company's investment decision is the extent to which its revenues will be tapped by the state. The availability of key tax information is less than adequate in Myanmar. This may be an indication that foreign investors may be able to determine some tax levels through a mineral agreement or simply that the government is not truly interested in such investment. While the author was unable to uncover key tax information in this desk study (supplemented by one brief visit to Yangon), persevering companies may be able to resolve the matter.

### 6.3 Stability of the Fiscal Regime

The government has attempted to control the value of its currency by removing a large number of currency notes from circulation. This technique was tried in 1964, 1985 and 1987. The removal in 1987 actually reduced the currency in circulation from 17.7 billion kyats in June 1987 to 8.1 billion kyats 4 months later (Mya Than 1990).

There has been very little foreign investment in mining. Without a precedent of such activity, it is not possible to determine whether the tax regime will remain stable after such investment takes place.

### 7. Monetary Controls and Access to Capital

### 7.1 Foreign Exchange

Exportation and importation of kyats are prohibited and the kyat is not negotiable outside Myanmar. All external payments are subject to prior government authorization.

All export proceeds and invisible receipts must be declared to the Myanma Foreign Trade Bank (UMFIC 1990).

In Chapter XI, Articles 24 and 25 pf the Foreign Investment Law, it is stated that "the [Foreign Investment] Commission shall evaluate the foreign capital in terms of kyat in the manner prescribed, and register it in the name of the investor. In so registering, the types of foreign capital and the type of the foreign currency evaluated shall be stated. In the event of termination of business, the person who has brought in foreign capital may withdraw foreign capital which he is entitled to withdraw as prescribed by the [Foreign Investment] Commission within the time stipulated" (Union of Myanmar 1990).

Contracts relating to the payment and receipt of foreign exchange are often executed by the Foreign Trade Bank (UMFIC 1990).

Under Article 23 of Chapter XI of the Foreign Investment Law, it is not clear what rights an investor has for repatriation of capital. It states "on the expiry of the term of the contract, the Government guarantees an investor of foreign capital, the rights he is entitled to, in the foreign currency in which such investment was made" (Union of Myanmar 1990).

In a document entitled *Procedures Relating to the Foreign Investment Law*, it is stated in Chapter XII, Article 27 that "in determining the net profits transferable abroad, the following funds shall be deducted: employee's bonus fund; contributions made by the employer to the employee's provident fund; employees' social and welfare fund; enterprise development fund; such other funds as are required to be reserved according to commercial practice'' (Union of Myanmar 1988).

Rather than clarifying the situation, the above section seems to further cloud the situation. The first application for such a transfer was reportedly made in early 1991 and was still under government consideration in the latter part of the year.

### 7.2 Access to Capital

A foreign firm looking to invest in Myanmar would need to look outside the country for investment capital.

#### 8. Environmental Protection

### 8.1 Legal Requirements for Environmental Protection

The draft contract for 100 per cent foreign investment in joint venture agreements provided by the Union of Myanmar Foreign Investment Commission loosely calls for the foreign company/firm or individual to "take all reasonable measures for the protection of the environment and shall refrain from wasteful utilization of her natural resources" (UMFIC 1990).

#### 8.2 Environmental Protection Trends

It is doubtful that should the central authorities approve a mining venture that any significant antimining environmental group would have an impact on the project.

### 9. Local Services and Labour Market

#### 9.1 Availability of Local Services

The geotechnical services available in Myanmar at the present time are limited, and most companies would have to depend on their own resources for carrying out analytical work.

### 9.2 Labour Market

The Foreign Investment Commission states in its rules that "in appointing personnel in an economic organization formed under a permit, preference shall be given to citizens, provided that the commission may, if necessary, allow the appointment of experts and technicians from abroad" (Union of Myanmar 1990). The commission will prescribe the type, number and term of required foreign experts and technicians (Union of Myanmar 1988).

Businesses are required to submit a list of workers needed and to select from candidates sent by the Labour Office. "Required qualified manpower is available through the township labour offices" (UMFIC 1990). The provision of training is the responsibility of the employer, "to ensure its local personnel proficiency in their work and promotion to higher ranks of service" (Union of Myanmar 1990).

The worker enjoys certain legislated entitlements. Vacation, sick leave, holidays, maternity benefits, medical care and working hours are among worker benefits. Workers' compensation and settlement of trade disputes are also addressed by law. The Department of Labour will assure that employment contracts are in conformity with Myanmar's Labour Law.

There is no fixed pay scale; rather, wages are negotiated between employee and employer. The employer has the right to terminate the employment of any individual (Union of Myanmar 1990).

In 1991, the literacy rate of Myanmar was 78.5 per cent (Asiaweek 1991) and the per capita income in 1987 was US \$190 (Mya Than 1990).

### 10. Conclusions

Myanmar has kept the outside world at an arm's length since it threw off the yoke of colonialism. Faced with a lack of economic progress and recurrent political unrest, it has recently embarked on a policy of encouraging foreign investment. However, a number of factors have acted to discourage such investment, including investment in the minerals sector. Most international mineral companies would probably view the mineral sector investment environment in Myanmar as much less attractive than in many other countries within the Asia-Pacific region. Specific findings and conclusions reached in this analysis include the following.

- \* The nation's prior history of expropriation and socialism may make mineral companies wary of the new open-door investment policy.
- \* The lack of government control in some highly prospective areas of the country is viewed as a negative factor by most mining companies.
- \* The general weakness of the economic system and the low level of foreign investment in all economic sectors increases the apprehension of mineral sector investors.
- \* Prospects for internal mineral markets are slight, but the country is geographically positioned to access the Indian Ocean basin and the Asia-Pacific region.
- \* There is a possibility that sanctions by governments and international bodies, in light of political, human rights and drug trafficking issues, could affect the ability of producers operating in Myanmar to access external markets and capital.
- \* The mineral sector has been stagnant for some time.
- \* The nation has enticing geology, attractive to most exploration and mining companies.
- \* There is a general lack of geoscientific information.
- \* Infrastructure is generally poor, but in some areas river and rail transport is good.
- \* The current mining laws are difficult to obtain, and it is no longer clear whether they or an agreement under the foreign investment law would be applied to foreign investors.
- \* All mining laws are now under review and thus little serious foreign investment is likely to occur until the nature of the new or amended laws is known.
- \* While industrial minerals are open to foreign investment, metallic and precious mineral production is reserved for state enterprises, except in exceptional cases.
- \* Foreign oil companies have found the level of administrative efficiency to be very acceptable, given the centralized nature of the government authority.
- \* The tax situation is not clear for minerals, and a lack of historical precedent with regard to foreign investment makes it difficult to predict the stability of the tax system.
- \* The foreign exchange situation would probably be viewed as a disincentive to investment by most mineral companies.
- \* Environmental requirements cannot be discerned from the current legislation.
- \* Restrictive requirements on hiring labour may be viewed as an impediment by some investors.

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# The Philippines: The Effects of an Interim Regulatory System on Foreign Mineral Investment

### 1. Introduction

The Philippines has a long history of mining and possesses the types of geological features prospective for a wide range of minerals. However, at the present time, political, legal, administrative and economic problems and uncertainties tend to limit the amount of foreign investment in the mineral sector.

The Philippines mineral sector regulatory system is now in a state of transition. The traditional leasehold system is in the process of being replaced by a system of mineral resources administration centring on coproduction, joint ventures and production-sharing agreements. Although the transition process has been started, it is not yet completed. Executive and administrative orders intended for interim use provide a temporary means of bringing the regulatory system into compliance with constitutional changes made in the 1980s. A new comprehensive mining law has been drafted and is now being considered for adoption by the national legislative bodies. A separate small-scale mining law was passed in July 1990 and is intended to complement and supplement the draft primary mining law.

In making a decision to invest in a country such as the Philippines, a mineral sector investor will consider many factors aside from the regulatory system. This paper identifies and discusses some of the more important factors that potential investors may look at in their appraisal of the Philippines.

### 2. Background Information

### 2.1 National Profile

### 2.1.1 Political Environment

The Philippines has membership in the United Nations and the Association of South East Asian Nations.

A recent government publication describes the Philippine system of government as follows.

The Philippines is a democratic and republican state. Its government consists of three independent co-equal branches – executive, legislative and judicial. Executive power is vested in the president; legislative power in the bicameral Congress; and judicial power in the Supreme Court and in other courts established by law. The president is elected by direct vote of the

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people for a single term of six years. The members of Congress are also elected by direct vote of the people – the senators for a term of six years and the representatives for three years.

The members of the Supreme Court and of the lower courts are appointed by the President without congressional confirmation.

For purposes of administration, the Philippines is divided into 14 regions each consisting of several of the country's 73 provinces and 60 cities. Provinces are further subdivided into municipalities. A province is headed by a governor; a municipality and a city by a mayor. All local officials are elected by popular vote every three years (Chamber of Mines 1991).

The Philippine political system is viewed by most foreign investors as less stable than that in many other nations in the region. Insurgency problems must be taken into consideration in some locations, but most areas would be safe for mineral operations. The Philippines is on good terms with its neighbours and is not subject to any international economic sanctions that would negatively affect the mineral industry. On the whole, most mineral companies probably view the current political situation as a disincentive to investment.

### 2.1.2 Geography and Demography

Made up of a far-flung grouping of some 7,100 tropical islands, the Philippines borders the South China Sea, the Sulu Sea, the Celebes Sea and the Pacific Ocean, mainly between latitudes 5° to 20° north and between longitudes 115° to 130° east. Its land area totals some 300,000 square kilometres. The main islands feature mountainous volcanic topography and are blanketed in lush equatorial vegetation. Volcanic activity is pronounced, with frequent eruptions on some islands. Earthquakes are common on many islands and this must be taken into account in mine planning. Many of the smaller islands are the summits of sea mounts. Deep ocean trenches are also found within the exclusive economic zone.

Typhoons and heavy rains can frequently lead to power disruptions, flooding, landslides or disruption of work. In 1989/90, six of the seven copper producers saw production setbacks occasioned by a combination of factors, including the weather (Bureau of Mines and Geosciences 1990).

Around 1,000 of the islands are inhabited. An estimated 63 million people populated the Philippines in 1990 (*Asiaweek* 1991). The bulk of the population lives on the island of Luzon. Manila, situated on Luzon, has a population of more than 10.5 million. While some 60 per cent of the population lives in rural areas, there is a growing migration to urban centres (Chamber of Mines). In 1990, the population growth rate was estimated to be 2.3 per cent. As in most countries, exploration and mine development in highly populated areas can lead to local opposition.

To an extent perhaps more pronounced than in most nations in the Asia-Pacific region (with the exception of Australia and New Zealand), the Philippines has adopted a

Western outlook. Foreign investors are apt to find the people to be generally outgoing and receptive to outsiders.

Filipino is the official language, but English is commonly used in business, government, education and telecommunications. Foreign companies operating in the Philippines should be able to conduct almost all business matters in English, but in some localities, knowledge of Filipino or a local dialect may prove useful to field parties or during operations.

Most potential investors would find the widespread use of English and the nature of the local culture amenable to doing business. The island geography will benefit operations that seek to supply the export market. Deep waters are found adjacent to most of the islands.

#### 2.1.3. Economy

The economy began to improve slightly in the latter part of the 1980s; 1986 saw the economy grow by about 2 per cent, and from 1987 to 1989, growth rates were consistently above 5 per cent. A substantial decline in the economy occurred in 1990, and the GDP growth rate slid to around 3 per cent as a result of a variety of factors, including increased oil prices, high inflation, foreign exchange shortages, volcanic eruptions, earthquakes and typhoons. The gross national product per capita in 1991 was about US \$690.

Expressed in constant dollars, the gross domestic product (GDP) has been decreasing for more than a decade, which clearly indicates the weakness of the economy. Table 1 gives the annual value of GDP from 1972 to 1990.

The currency in use is the peso. In early 1992 the peso was valued at around 40 pesos per US \$1. The inflation rate (consumer price index) in the Philippines for 1990 was 19 per cent. The Central Bank has the responsibility for implementing foreign exchange policies.

(in billion US dollars, constant 1972 prices)

Year	GDP	Year	GDP
1971	NA	1981	12.14
1972	4.36	1982	11.55
1973	4.56	1983	8.92
1974	4.76	1984	5.68
1975	4.70	1985	4.95
1976	8.04	1986	4.45
1977	8.52	1987	4.64
1978	11.21	1988	4.82
1979	11.70	1989	4.92
1980	12.23	1990	4.49

#### Table 1. Gross domestic product: 1972 to 1990

Source: Muyco, Joel. An overview of the Philippine mining industry. Proceedings of the Third Asia-Pacific Mining Conference, March 1992, Manila. p. 67.

The 1991 foreign debt was estimated to be around US \$28.8 billion. The current account deficit amounted to US \$2,695 million in 1990. Hard currency shortages have led to the rescheduling of some debt payments. The closure of the United States military bases Clark and Subic Bay will put an additional burden on the government's ability to service its debt.

One of the effects of the sustained recession has been an exodus of skilled and unskilled labour seeking work abroad. The lack of jobs in the Philippines has acted to keep wage rates low, which would be considered a positive investment incentive by some mining companies.

The mining industry plays a significant role in the Philippine economy. While the overall contribution to gross domestic product is small (less than 2 per cent), minerals are an important source of export-derived hard currency (Table 2). In 1990, the formal mineral sector employed about 140,000 people out of a total estimated workforce of around 22 million. If small miners are included, the number employed in the mineral sector would increase by about 300,000.

Year	Employment (1000)	Percentage share of:		
	Employment (000)	GDP	Total export value	
1970	51	NA	20.8	
1975	54	2.3	17.3	
1980	130	2.5	21.3	
1985	129	1.8	12.0	
1990	139	1.3	8.8	

#### Table 2. Mineral sector contribution to the economy\*

\*Note: Employment figures do not include small-scale miners. It is estimated that up to 300,000 people participate in small-scale mining activities.

Sources: Mineral News Service No. 85, Mines and Geosciences Bureau, Department of Environment and Natural Resources, Quezon City, 1990. p. 1 and Muyco 1992.

In summary, the country is faced with a large foreign debt, a widening budget deficit, high inflation and a shortage of foreign exchange. Investors probably view the economy with mixed reactions. The high level of debt and double-digit inflation would be viewed negatively. However, the need for the government to improve the situation through an infusion of foreign capital acts to provide incentives that would probably not be available if the economy was more robust.

### 2.1.4 Infrastructure

Countrywide, there are approximately 162,000 kilometres of roads but only about 12,000 kilometres of these can be considered to be of an all-weather standard. All-weather roads tend to be narrow, and congestion in some areas can be a problem. Although the road system is not as well developed as that in some neighbouring nations, it gives good access to most areas on the major islands.
In terms of air transport, the Philippines is well endowed with 87 national airports. International airports are located in Manila and in Cebu. The national carrier, Philippine Airlines, serves 43 cities within the country and 34 cities around the world. Unlike many nations in the region, the Philippines allows fairly open access to foreign carriers, and in 1991, 28 international airlines were offering service to Manila or Cebu. There is an extensive air charter industry offering a wide range of fixed-wing and rotary aircraft. Most large mining companies tend to operate their own aircraft. Exploration programmes in rugged areas rely extensively on helicopters to provide access.

Reflecting the fact that the country consists of many islands, there is a wellestablished and extensive interisland marine transport system. The Philippine coastlines tend to be very irregular, creating some 60 natural harbours. Manila Bay has a perimeter of almost 200 kilometres and is one of the largest anchorages in the world. There are more than 600 public ports, supplemented by 300 private facilities. However, many of these ports are not set up to handle bulk commodity shipments or large equipment transfers. Some private ports have been constructed to handle bulk minerals, and many mining operations operate their own port facilities. Major ports built to an international standard are found at Cagayan de Oro, Cebu, Davao, General Santos, Iloilo, Manila, Subic, Polillo and Zambales.

There is not much potential to move equipment or bulk minerals by rail. The main railway is limited to south and central Luzon. A rail extension plan, scheduled for completion in 1992, is now being implemented and will add approximately 700 kilometres to the Luzon line.

Domestic telephone service has not yet reached Western standards, but international service, where available, is of a dependable and high quality. International direct dialing is now available. The urban telephone system is quite extensive by developing country standards, and it is estimated that the ratio of phones to the population is around 1 to 60. However, in remote areas many mining companies rely on their own radio networks.

The Philippines has not fully developed its national power grid. In some areas mining companies can take advantage of installed capacity, but in many areas a company would need to install its own generating capability. In areas where electricity is available from the National Power Corporation or local operating company, mining companies will probably find it advantageous to install standby capacity to run essential services during periods of power disruptions resulting both from natural causes and routine maintenance. The National Power Corporation had an installed capacity of around 6,000 megawatts in 1991. The country relies heavily on oil for its energy needs (43 per cent), followed by hydropower (35 per cent), geothermal power (15 per cent) and natural gas (7 per cent). The cost of power in the NPC electric grid as of December 1989 was PO. 9,380/KWH (national average) and PO. 6,669/KWH in the Mindanao area.

In remote areas and on most of the smaller islands, mineral companies would have to install most mine-related infrastructure, while in more populated islands near urban centres, existing power and transport may be adequate, at least for small and mediumsized operations.

# 2.2 Past and Current State of the Mineral Industry

### 2.2.1 Historical Perspective

After independence in 1946, mineral resource exploration and development came under the jurisdiction of the Philippine Republic. During the latter part of the 1940s, efforts were concentrated on the rehabilitation of gold mines in Benguet, Surigao and Camarines Norte. Extensive exploration for copper was emphasized during the 1950s by the Philippine Bureau of Mines (established in 1937) with the assistance of the International Cooperation Agency of the United States. This exploration was successful, and during the 1950s and 1960s more than 50 copper porphyry deposits were located. By 1974, 18 porphyry mines were producing copper and its byproducts. In 1984, the copper industry reached its greatest capacity, producing 300,000 tons, but this was not sustained and today production has fallen to less than 200,000 tons per year. The only nickel refinery in the country, Nonoc Mining and Industrial Corporation, was foreclosed and operations were suspended in 1986. It is now undergoing rehabilitation. Ten major mining companies were closed or taken over by the government between 1980 and 1986, and of these only one is now in operation (Maricalum Mining Corporation). While copper tended to lead the industry during the 1970s and 1980s, gold is expected to displace copper as the more valuable mineral in the 1990s for the following reasons.

- \* Copper mines with coproduct gold will attract more investment than those without such gold.
- \* The government has implemented gold exploration and development programmes since 1983.
- \* The private sector has emphasized gold exploration throughout the 1980s.
- \* There has been a tremendous growth of small-scale gold mining activity, which is not going to abate.
- \* The recognition of the existence of new types of gold deposits (epithermal gold) will encourage gold mining (Bureau of Mines and Geosciences 1986).

Today, some 30 different metallic and nonmetallic minerals are produced in the Philippines on a commercial basis. Reserve estimates are available for 13 metallic and 29 nonmetallic minerals. As of 1989, reserves of the four most commercially important minerals now being exploited were estimated as follows.

Gold: 109 million metric tonnes (mt) of 2.7 grams Au per mt Copper: 4,100 million mt of 0.44 per cent Cu Chrome: 27.5 million mt of 33.3 per cent  $Cr_2O_3$ Nickel: 1,600 million mt of 1.16 per cent Ni

Table 3 indicates production levels from 1980 to 1990 for these four important mineral commodities.

On a world scale, the Philippines is a significant producer of four commodities (Table 4).

Year	Gold	Copper	Chromite	Nickel
	(t)	(1,000 t)	(1,000 t)	(1,000 t)
1980	20	305	496	25
1981	23	301	443	24
1982	26	292	332	11
1983	26	271	267	14
1984	26	233	257	14
1985	33	222	272	28
1986	35	217	174	13
1987	33	214	188	9
1988	31	216	182	10
1989	30	192	248	15
1990	29	182	235	16

Table 3. Philippines major minerals production, 1980 to 1990

Source: The Philippines: A Prospectus for the International Mining Industry, Mining Journal Research Services, London, 1992. p. 101.

	World	ranking	Percentage of world productio		
Commodity	1971 to 1980	1981 to 1990	1971 to 1980	1981 to 1990	
Copper	9	14	3.4	2.4	
Gold	8	9	1.5	2.0	
Chromite	4	10	5.9	1.4	
Nickel	5	15	4.6	1.2	

Table 4. World position of Philippine mineral production

Source: Muyco 1992.

The Philippines has arguably the best-established hardrock mining industry in Southeast Asia. The industry is well established by developing nation standards and quite diverse, producing a wide range of minerals from many scales of operations. Most investors would probably view the historical presence of mining as beneficial because it indicates that the role of the mining industry is better understood and appreciated than might be the case in nations that have not historically experienced substantial levels of mining.

### 2.2.2 Structure of the industry

The Philippines mineral industry comprises exploration, production and processing companies and a very active and sizeable number of small-scale miners. In addition to activities undertaken by Philippine private and state-owned companies and individuals, a number of foreign companies have invested in the industry. Table 5 indicates the number of major metallic mineral producers by commodity, and Table 6 lists the major metallic mineral exploration, mining and processing companies.

	Number of producers					
Year 	Copper	Gold/silver	Chromite	Nickel		
1970	14	14	2	1		
1975	16	19	5	2		
1980	20	27	20	2		
1985	10	18	12	3		
1990	8	18	6	3		

#### Table 5. Number of major producers by commodity\*

\* Not including small-scale operations.

Source: Muyco 1992.

Some of the larger operations, such as PASAR (42 per cent owned by the government, 32 per cent by a consortium of Japanese companies, 1 per cent by local copper producers and 5 per cent by the International Finance Corporation) and the state-owned Semirara Coal Corporation, are in financial difficulty resulting, in part, from a devaluation of the peso leading to debt-servicing problems of loans denominated in yen and other foreign currencies (SAML 1991).

A partial listing of foreign companies with investments or exploration projects in the Philippine mining industry includes CRA Ltd., Cultus Gold, Galactic Resources Ltd., C. Ithoh & Co., Irish Junior, Kawasaki Steel Co. Inc., Kenmare Resources, Marubeni Corp., Paragon Resources N.L., Placer Development Ltd., Renison Goldfields Consolidated Ltd., Shinichi Kobira, Sumitomo Corp., Voest Alpine, Western Mining and Yoshiro Ejima. Constitutional barriers that have tended to keep foreign investment out of the mineral sector are discussed in Section 5.2.1.

Many of the richest deposits now being worked were discovered by small-scale miners. The small-scale sector has had a troubled time, as large and politically influential individuals and companies have acted to acquire legal rights over "illegal" workings by the small-scale miners. In some instances, the sheer number of such miners has kept organized companies at bay, but in many cases the company has been successful, often causing substantial resentment on the part of the populace. As one author has put it, "Indigenous miners battle it out with a corporate body which has historically been backed by foreign capital and protected by some of the richest families in the Philippines" (Yocogan 1992). Beginning in the mid-1980s, an attempt was made to recognize and accommodate the interests of small-scale miners; this effort culminated in the passage of the People's Small-Scale Mining Act of 1991. How well this act will fare remains to be seen. The act does provide legal rights for small-scale miners, but such rights are dependent on certain conditions that may not be practical for many areas currently under dispute. For example, if a company holds an "active mining area" (this definition includes areas under exploration), small-scale miners cannot exercise their mining rights in the area. This requirement sounds quite reasonable (an exclusive development right is a fundamental part of almost all mining laws) until one realizes that very large tracts of ground in traditionally small-mining worked areas are held under old licenses by large companies. The government is given the discretion to

#### **Company** name

#### **Exploration companies**

- 1. Alpha Resources Dev. Corp.
- 2. Camarines Minerals, Inc.
- 3. Dizon Copper-Silver Mines
- 4. Global Mining Resources
- 5. Gold Fields Asia Ltd.
- 6. Kenmare Resources PLC
- 7. Lodestar Mining Corp.
- 8. Samar Mining Co.
- 9. Vulcan Industrial and Mining Corp.

#### **Mining companies**

- 1. Acoje Mining Co.
- 2. Apex Mining Co., Inc.
- 3. Atlas Consol. Mining and Dev.
- 4. Atok Big-Wedge Mining Co.
- 5. Banahaw Mining and Dev. Co.
- 6. Benguet Corp.
- 7. Benguet Corp./Consol. Mines
- 8. Dizon Copper Project
- 9. Goldfields Phil. Corp.
- 10. Hinatuan Mining Corp.
- 11. Integrated Chrome Corp.
- 12. Itogon-Suyoc Mines Inc.
- 13. Krominco Inc.
- 14. Lepanto Consol. Mining Co.
- 15. Manila Mining Corp.
- 16. Marcopper Mining Corp.
- 17. Maricalum Mining Corp.
- 18. Masbate Gold Operation
- 19. Nonoc Mining and Ind. Corp.
- 20. North Davio Mining Corp.
- 21. Paracale Gold Operation
- 22. Philex Mining Corp.
- 23. Philippine Pyrite Corp.
- 24. Rio Tuba Nickel Mining Co.
- 25. Surigao Cons. Mining Inc.
- 26. United Paragon Mining Corp.

#### **Processing companies**

<ul> <li>8. Phil. Minerals and Alloy Corp.</li> <li>9. Phil. Associated Smelting and Refining Corp.</li> <li>10. Philippine Sinter Corp.</li> <li>10. Philippine Sinter Corp.</li> </ul>	6. Metro Alloys Corp.Ferro-chro7. Mindanao Ferro-AlloysFerro-mar	me Corp. Ferro-chrome Ferro-silicon	<ol> <li>Alamag Processing Corp.</li> <li>Ferro-Chemicals Inc.</li> <li>Ferro Chrome Phil. Inc.</li> <li>Integrated Chrome Corp.</li> <li>MCCI Corp.</li> <li>Metro Alloys Corp.</li> <li>Mindanao Ferro-Alloys</li> <li>Phil. Minerals and Alloy Corp.</li> <li>Phil. Associated Smelting and Refining Corp.</li> <li>Philippine Sinter Corp.</li> </ol>	Chrome concentrate Ferro-alloys, ferro-chrome, ferro-manganese, silico-manganese Ferro-chrome Ferro-chrome Ferro-silicon Ferro-chrome, ferro-silicon Ferro-manganese Silico-chrome, silico-manganese, ferro-chrome Copper cathodes Sintered iron
4. Integrated Chrome Corp.       Ferro-chrome         5. MCCI Corp.       Ferro-silicon         6. Metro Alloys Corp.       Ferro-chrome, ferro-silicon         7. Mindanao Ferro-Alloys       Ferro-manganese	4. Integrated Chrome Corp.     Ferro-chrome       5. MCCI Corp.     Ferro-silic		3. Ferro Chrome Phil. Inc.	silico-manganese Ferro-chrome
silico-manganese3. Ferro Chrome Phil. Inc.Ferro-chrome4. Integrated Chrome Corp.Ferro-chrome5. MCCI Corp.Ferro-silicon6. Metro Alloys Corp.Ferro-chrome, ferro-silicon7. Mindanao Ferro-AlloysFerro-manganese	3. Ferro Chrome Phil. Inc.       silico-mar         4. Integrated Chrome Corp.       Ferro-chrome Ferro-chrome Corp.         5. MCCI Corp.       Ferro-silicon	Silico-manganese Phil. Inc. Ferro-chrome	<ol> <li>Alamag Processing Corp.</li> <li>Ferro-Chemicals Inc.</li> </ol>	Chrome concentrate Ferro-alloys, ferro-chrome, ferro-manganese,

Source: Chamber of Mines of the Philippines 1991.

### Product sought or produced

Gold, silver Chromite Copper, gold, silver Nickel, iron, chrome Gold, silver Gold, silver, chromite Gold, silver, chromite, nickel Gold, silver Gold, silver, silica, granite

Chrome concentrate and ore Gold, silver Copper, gold, silver Gold, silver Gold, silver Gold, silver Refractory chrome concentrate Copper, gold, silver Gold, silver Nickel Metallic chrome concentrate Gold, silver Metallurgical chrome Copper, gold, silver Gold, silver Copper, gold, silver Copper, gold, silver Gold, silver Nickel Copper, gold, silver Gold, silver Copper, gold, silver Pyrite Nickel, chrome Gold, silver Gold, silver

resolve the rights disputes, but how this will work out in practice remains to be seen. It has been estimated that about 7 to 8 tons of gold were produced in 1991 by small-scale miners (Walker 1992).

### 2.2.3 Government Policies Relating to Minerals

The Philippines Government has never published a national mineral policy, although certain aspects of government policy may be discerned from government publications, the regulatory system and practices of the industry.

The government actively encourages foreign investment and aggressively pursues it. In a recent United Nations-assisted effort to promote foreign investment, the government produced and widely circulated information to the international mining community about investment opportunities in the Philippines. The government's overall philosophy on foreign investment in the mineral sector of the economy can be stated as follows.

...the Government of the Philippines invites investors, especially foreign investors, to participate in the development and realization of the country's mineral wealth, to the mutual benefit of both the industry and the Philippine nation.

While the government seeks foreign investment in the mineral sector, it must do so within the regulatory framework. At present, this framework is not conducive to attracting such investment. The regulatory framework is discussed further in Section 5.

Investors and potential investors in the mineral industry of the Philippines do not benefit from the availability of a clear mineral policy. On one hand, the government appears to openly encourage mineral sector foreign investment, but on the other hand, it has failed to develop a regulatory framework that would be attractive to the world mining community. It is not clear whether the indigenous mining community is anxious to fully open the door to competition from the world community and draft legislation that would clarify the government's position.

The main elements of the Philippine mineral policy are derived from Article XII of the Philippine Constitution. (See Section 7 of this paper for further information.) The main policy framework includes the following elements.

- \* Foreign ownership is only allowed up to 40 per cent of equity.
- \* The exploration, development and utilization of mineral resources shall be under the full control and supervision of the state.
- \* Exploration, development and utilization of mineral resources shall be done under the authority granted in a coproduction, joint venture, productionsharing agreement or technical and financial assistance agreement.
- \* Congress may allow small-scale utilization of mineral resources.

With regard to small-scale mining, the government has formally codified the following policy statement. Section 2. Declaration of Policy – It is hereby declared the policy of the State to promote, develop, protect and rationalize viable small-scale mining activities in order to generate more employment opportunities and provide an equitable sharing of the nation's wealth and natural resources, giving due regard to existing rights as herein provided (People's Small-Scale Mining Act of 1991).

Additional elements of the national policy are given in DENR Administrative Order 57, Series of 1989, which states

- 1.2 Policies and Objectives. The policies and the objectives of the Government on Mineral Resources shall be:
- (a) To promote equitable access to, economically efficient development of, and fair sharing of benefits and costs derived from the exploration, development and utilization of minerals;
- (b) To enhance the contribution of mineral resources to economic recovery and sustain national development particularly in developing host rural communities as well as local science and technology resources;
- (c) To promote the rational development and conservation of mineral resources under the full control and supervision of the State; and
- (d) To enable the Government to recover full economic rent and/or its equitable share in the production and utilization of minerals.

The government has also implemented a policy to promote the use of Philippine nationals in all aspects of exploration and mining operations. The employment of foreign staff is strictly controlled and work permits are required. Work permits are valid for one year and are extendable for additional one year periods.

# 2.2.4 Summary of the Current and Projected State of Affairs

The Philippines has a long history of mining dating back almost a thousand years. Even though the country has extensive proven reserves of many minerals and an experienced local industry, the sector has been contracting, with the exception of gold and some minor minerals, for the past decade. An infusion of foreign capital and expertise will probably be required to revitalize the sector, but unclear government policies and the lack of a conducive regulatory system retard such investment.

### 3. Geological Potential

### 3.1 Description of the Geology

A concise description of the geology of the Philippines has been included in a recent Chamber of Mines (1991) summary of the country's mineral sector potential, which states the following.

The Philippines islands are generally composed of Cenozoic rocks, mostly volcanic and sedimentary strata with some plutons of quartz dioritic character and of generally limited size. All of the major islands, however, include a "basement," much of which seems to be Cretaceous but which includes rocks ranging in age at least from the Permian up to the Eocene. Ophiolitic bodies (ultramafic and related rocks of the oceanic crust) of various dimensions and ages are widespread, indicating a complex structural history.

In tectonic terms, a fundamental two-fold division of the archipelago is evident. An elongate, NNW-SSE trending mobile (seismic) zone or belt in the east abuts a stable (aseismic) zone in the SW, centred in the Sulu Sea. The mobile belt is margined, both to the east and west by opposed, inward dipping subduction zones, various segments of which have been intermittently active through much of Cenozoic time.

The oldest rocks (Carboniferous to Jurassic) in the country seem to be restricted to the stable zone.

Permian limestone has been proven in place in Palawan and in Carabao Island, Romblon. Fossiliferous Carboniferous argillite occurs as float in Mindoro and ancient schists underlie the Permian outcrops. Similar metamorphic rocks occur also in the Zamboanga peninsula of western Mindanao.

Much of the Philippine's metamorphic rocks occurs in the same area, together with all of the country's granitic intrusions believed to be pre-Palaeogene. Some ophiolitic bodies are also found and part of the area is underlain by clastic sedimentary rocks and limestone of stable shelf facies, with minor volcanic components.

The mobile belt also includes ophiolitic sequences, some of regional extent, but is largely formed by island-arc-related volcanic, volcaniclastic and sedimentary strata of Cretaceous to Quaternary age. Within these successions are diorite, quartz diorite, and andesite porphyry bodies up to batholithic dimensions, and generally thought to be of Palaeogene to Miocene date. Miocene to recent volcanic edifices are found in various states of preservation. Between sub-parallel magmatic arcs lie a number of long-lived Cenozoic sedimentary basins, sometimes evidently fault-defined (grabens and half-grabens) and generally with thick sedimentary sequences (up to 12,000 meters in the Agusan-Davao trough of eastern Mindanao).

Unconformities in the succession at various levels and different localities often point to extensive tectonic activity, which seems to have reached one culmination at least in the Middle Miocene.

Subduction and related processes around the Philippines have brought into contiguity a series of crustal platelets. For this reason, the archipelago has been described as a "collage of geologic terranes" or an "arc aggregate." Oblique collision with the archipelago of a terrane from the southeast is the probable cause of the well-known Philippine fault system, which forms a prominent feature approximately co-axial with the mobile belt. The fault system includes numerous branches and, in northern Luzon, fans out into a number of splays. This feature has evidently been active from the Cretaceous.

These geological processes are still in progress, as evidenced by historic and current volcanic and seismic activity related both to the subduction zone and to the fault planes.

Accounts providing more information on the geology of the Philippines are readily available. Of particular note are publications by the *Mining Journal* (1992) and the Bureau of Mines and Geosciences (1986). It is the view of many geologists that the Philippines offers some of the most highly prospective geology in the world.

#### 3.1.1 Geographical Distribution of Mineral Potential

Many minerals are found in the Philippines and occur at many locations. Thus, a list of specific geographic sites will not be given here. A description of the geology and location of known mineral deposits is included in a 1986 study available from the Bureau of Mines and Geosciences (1986). A partial list of Philippine minerals with commercial potential includes asbestos, barite, bauxite, bentonite, chromite, coal, co-balt, copper, dimension stone, dolomite, gold, gypsum, iron, kaolin, lead and zinc, limestone, marble, magnesite, mercury, mica, manganese, molybdenum, nickel, perlite, platinum group, phosphate, salt, silica sand, silver, sulphur and talc.

### 3.1.2 Minerals of Exceptional Interest

The minerals of main interest in the Philippines include gold, copper, nickel and chromite.

Many deposits of various minerals are known and well documented. Some of these deposits have been thoroughly investigated up through the feasibility stage; others were mined but later abandoned as subeconomic. Details about these deposits are easily obtainable from the government.

### 3.2 Ability to Apply Geological Assessment Techniques

The weather is generally typical of a tropical monsoon climate, characterized by a dry season from June to September, a wet season from October to April and hot temperatures all year. The subclimatic conditions of these islands vary, based on latitude, elevation, wind direction and agriculture, as well as other factors. Productive exploration and mining are likely to be affected by these weather patterns.

Some parts of the country are difficult to gain access to both logistically and because of government preference. Heavy vegetative growth can make groundwork difficult in many areas.

### 3.3 Availability of Geoscientific Information

The Philippine Government attempts to widely disseminate basic geological and geophysical information. Open files are maintained containing exploration reports. However, the amount of historical mining and geological information available from the

government is not what one might expect from a country with such a long-established mining industry. A series of natural calamities and several fires have destroyed many irreplaceable records.

In 1986, the government published the book *Geology and Mineral Resources of* the *Philippines*, containing comprehensive and detailed geological information and a plate series.

In the mid- to late 1980s, the Bureau of Mines and Geosciences, with the assistance of the Japan International Cooperation Agency and the Metal Mining Agency of Japan, completed a regional exploration programme in six areas chosen on the basis of a previous lack of systematic exploration. The total area studied encompassed some 130,000 square kilometres (about one-third of the land area of the Philippines). The work involved geological and geochemical surveying and resulted in the collection of nearly 43,500 sediment samples, which were analysed for up to 14 metals.

During the 1980s, the Office of Energy Affairs commissioned detailed onshore and offshore aeromagnetic surveys of much of the Philippines.

At the current time, only rudimentary computerized data processing and retrieval are available within government offices. However, a new mineral title system is now being developed. Presently, the Bureau of Mines and Geosciences uses a manual recording system, which has proved difficult to use to resolve questions about claim ownership, status and location. The Australian International Development Assistance Bureau has made available P22.4 million to a programme to provide training and technical support for computerized title management. The grant aims to provide a fully functional information system in each of the regions by sometime in late 1992 or early 1993 (SAML).

### 3.4 Government Institutions

The Department of Environment and Natural Resources (DENR) plays the lead government role in the regulation of the mineral sector. It is responsible for the development of mineral policy and development programmes, promulgates rules and regulations implementing the laws on mining, and considers and approves contracts for exploration and mining rights. Under the direction of DENR there are five mineralrelated regulatory bodies: the Bureau of Mines and Geosciences, the Environmental Management Bureau, the National Mapping and Resource Information Authority, the Natural Resources Development Corporation and the DENR regional and field offices.

The Bureau of Mines and Geosciences recommends policies, legislation and programmes on mineral resource assessment and development, and processes and recommends action on applications for exploration and mining rights. This bureau has suffered from a loss of trained personnel to the private sector in recent years but still has a trained and helpful core of geologists, mining engineers, mineral economists and other mineral professionals. Investors find that access to these professionals is easy, and the staff can often assist in directing the investor regarding the regulatory system as well as in providing technical information. Of particular importance to mineral inves-

tors is the bureau's pivotal responsibility for the negotiation of production-sharing agreements.

The Environmental Management Bureau formulates and implements policies and programmes for environmental management and pollution control approved by DENR. The Philippines has comprehensive environmental protection legislation (see Section 8 on environment), but the implementation of the legislative mandate is often slow, in part because of acute understaffing problems.

The National Mapping and Resources Information Authority is the primary government body responsible for maps, photogrammetry, satellite imagery and other cartographic materials.

The Natural Resources Development Corporation plays a role in the corporate activities of DENR relating to production, marketing ventures and financing of mineral projects.

The DENR regional and field offices enforce the mining law in their jurisdictional area and implement the policies, plans, programmes and projects issued by the DENR secretary.

The Office of Energy Affairs has taken the lead role in commissioning detailed onshore and offshore aeromagnetic surveys of much of the Philippines. It is also responsible for coal mining.

The Commission on Volcanology, the Philippine Atmospheric, Geophysical and Astronomical Services Administration, the National Power Corporation and the Department of Public Works and Highways all hold data that may be of value to companies interested in exploration or mining. The National Institute of Geological Sciences at the University of the Philippines has a good reference library of maps, geological reports, aerial photographs and satellite imagery and is equipped with modern scientific and analytical equipment.

The Board of Investments is the key government agency providing information on current incentives and legal requirements concerning exploration and mining. Companies are required to be registered with the board before commencing operations.

### 3.5 Summary

The Philippines has very favourable geology for a wide range of minerals, and current and historical mineral production is widely disbursed throughout the country. Past geological assessment work is well advanced in some areas, but other areas are almost untouched. The nation has a well-established geological survey, which supports an open-file reference capability, but many historical records were destroyed by natural calamities and fires. Most mineral companies would find the geology and the capabilities of government geoscience institutions all favourable factors in their consideration of the Philippines as a site for exploration and mining investment.

### 4. Marketing Considerations

### 4.1 External Markets

The Philippines is well positioned geographically to supply the Pacific basin. Table 7 indicates the primary export markets for selected Philippine minerals in 1989.

Product	Volume	Value (million US \$)	Main destinations, per cent of value	
Gold (kg)	6,900	85	Japan Republic of Korea United Kingdom	97.7 0.9 0.8
Silver (kg)	21,656	4	Japan United Kingdom Belgium	78.9 13.1 5.7
Copper concentrates (DMT)	397,200	226	Japan Republic of Korea Taiwan Province of China	96.5 2.2 1.3
Copper cathodes (MT)	115,958	333	Japan Taiwan Province of China Republic of Korea	45.3 26.7 14.7
Zinc (MT)	3,625	1	Japan	100
Dolomite (MT)	244,852	1	Japan	100
Metallurgical chromite concentrate (DMT)	31,002	3	China	34.3
Metallurgical chromite ore (DMT)	7,197	1	China	11.4
Chemical chromite ore (DMT)	15,749	1	Germany	100
Nickel ore (DMT)	638,647	45	Japan	100
Refractory chromite ore (DMT)	113,328	11	Canada Brazil Japan	21.7 16.8 14.9

Table 7. Mineral exports of the Philippines, 19
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Source: Bureau of Mines and Geosciences.

The Philippines probably is, on the whole and depending on the commodity, considered by most mineral companies to be favourably situated with regard to marketing potential.

### 4.2 Internal Markets

The Philippines has a population of 63 million people but does not represent a major market for most nonagricultural (fertilizer) minerals.

# 5. Mining Law

# 5.1 Laws and Agreements Pertaining to Exploration and Mining

The regulation of the mineral sector is addressed by laws, government regulations, presidential orders and ministerial orders. In practice, operations must also take into account, in some areas, the will of the local population. In some cases, even though a company was granted an exclusive exploration right or mining right by law, the local population interfered with or preempted that right. In such cases, legal remedies may be limited for political reasons.

The key pieces of legislation and agreements that regulate the mineral industry are briefly described below.

Presidential Decree No. 463 of 17 May 1974. Mining activities are governed on an interim basis by this presidential decree, pending the enactment by Congress of a comprehensive mining code. The decree was the first attempt in the Philippines to standardize and modernize mineral sector legislation. The decree did introduce many important features to the regulatory framework but also led to many problems that only a comprehensive mining code could hope to avoid. The subsequent adoption of a new constitution required that some portions of the decree be changed through legislation. Key provisions in Presidential Decree 463 include the following.

- \* Standardization of mining claims to a size of 81 hectares.
- \* Claims to be awarded on a meridianal block system.
- \* Prior claims to be converted to the new system within two years or face cancellation.
- \* Individual claimants must be Filipino, while corporate and partnership claimants must have at least 60 per cent Filipino ownership.
- \* Within 30 days of a mineral discovery, the location must be registered with the Mines Regional Recorder; once recorded, the claim owner has the right to occupy, explore, develop and transfer the claim.
- \* An application for a mining lease to develop a claim must be submitted within two years of registration.
- \* A mining lease is valid for 25 years and is renewable for a maximum of a further 25 years.
- \* The lease grants the holder the right to extract, process and remove all minerals within the lease area.
- \* The lease holder is exempt from import taxes on specified types of equipment.
- \* Failure to pay royalties, taxes, rentals and occupation fees are grounds for lease cancellation.
- \* A lease can be sublet or transferred with the permission of the Bureau of Mines and Geosciences.

Much of the decree has now been rendered ineffective by Executive Orders 211 and 279 (below). Currently, it mainly applies to perfected claims.

Constitution (Article XII), 1987. (See description in Section 2.2.3.)

Executive Order 211, prescribing the interim procedures in the processing and approval of applications for the exploration, development and utilization of minerals (of 10 July 1987). The purpose of this order was to reconcile Presidential Decree 463, as amended, with Article XII of the 1987 Constitution. The main effect was to give continuing validity to the presidential decree after the change in government, thus giving recognition to the validity of existing perfected mining claims and leases.

Executive Order 279, authorizing the Secretary of Environment and Natural Resources to negotiate and conclude joint venture, coproduction, or productionsharing agreements for the exploration, development and utilization of mineral resources, and prescribing the guidelines for such agreements and those agreements involving technical or financial assistance by foreign-owned corporations for large-scale exploration, development, and utilization of minerals (of 23 July 1987). Pending enactment of the Mining Code, this order, which supplements and, in part, supersedes Presidential Decree 463, empowers the Secretary of Environment and Natural Resources to negotiate and conclude joint venture, coproduction, production-sharing and financial or technical assistance agreements as provided for by the 1987 Constitution. Such agreements require a minimum expenditure of US \$50 million and require final approval by the President. The minimum terms and conditions that must be included in such agreements are stated in the order as follows.

- \* All the necessary management, technology and financial services are to be furnished by the contractor.
- \* The use of local goods and services to the maximum extent practicable must be given preference.
- \* A condition that the contractor shall not acquire title to the contract area.
- \* The stipulated share in revenue and manner of payment thereof.
- \* A period of exploration not exceeding two years from the date of agreement, extendable for another two years.
- \* A period of use, including development, that shall not exceed 25 years, subject to renewal for another period not exceeding 25 years under the same terms and conditions.
- \* Obligatory relinquishment of portions of the contract area after the exploration period that are not needed for use and development.
- \* Work programme and minimum expenditure commitment for the exploration period.
- \* Provision on consultation and arbitration with respect to interpretation and implementation of the agreement.
- \* Employment and training of Filipino personnel.
- \* Industrial safety and antipollution measures.
- \* Restoration and/or protection of the environment.
- \* Transfer of technology to the government or local mining company.
- \* A stipulation that all data gathered by the contractor shall be furnished to the Bureau of Mines and Geosciences and that all books of account and records shall be open to inspection.
- \* Commitment to community development.
- \* Such other terms and conditions not inconsistent with the Constitution and existing laws, as the secretary may deem to be in the best interest of the government.

Executive Order 279 also states that all provisions of Presidential Decree 473 that are not inconsistent with the order "shall continue in force and effect."

DENR Administrative Order No. 57, guidelines on mineral production-sharing agreement under Executive Order No. 279 (series of 1989). This important order develops the mineral production-sharing agreement guidelines given in Executive order 279 in the form of rules and regulations and in addition introduces key policy statements (previously described in Section 2.2.3.) Mineral companies interested in working in the Philippines should obtain a copy of this key order because it clearly lays out the basic framework and extent to which the government may negotiate specific provisions of the dominant form of foreign investment: the production-sharing agreement.

DENR Circular Order No. 06, clarificatory guidelines on certain sections of DENR Administrative Order No. 57, series of 1989 and insertion of new provisions thereof (series of 1989). The purpose of this order was to provide additional information and amendments to improve clarity of the detailed production-sharing guidelines given in DENR Administrative Order 57.

**DENR Administrative Order No. 32, Series of 20 November 1990.** This order modified DENR Administrative Order No. 57. Of particular interest is a modification made to Section 5.1 that allows the government to negotiate the major taxes (basic share in production or gross revenue plus a share in net revenue) rather than be restricted to a predetermined tax formulation. The provision states the following.

Government Share in the Production – The share of the government shall be composed of a basic share in production or gross revenue plus a share in net revenue determinable through negotiations, taking into account the following considerations: (a) capital investment; (b) risks involved; (c) contributions to the economy; (d) and such other factors as will help in determining a sharing that is fair and equitable to both parties. The basic share shall be expressed as per cent of production or gross revenue.

Some companies will probably find this flexibility attractive but others may see it as a potential bureaucratic quagmire.

DENR Administrative Order No. 82, Series of 1990, and DENR Administrative Order No. 82-A, Series of 1990. These orders set the implementing and procedural application guidelines for a mineral production-sharing agreement. In addition, they state that a declaration of location under Presidential Decree 463 shall no longer be accepted. The orders include guidelines covering the following topics: minimum financial requirements for individual and corporate applicants; application requirements for a two-year exploration work programme; requirements for an applicant to commit to undertake an environmental impact assessment; a survey of the area; publication of application details; and DENR verification of the claim area.

In addition, there is provision for the issuing of interim mine permits authorizing a company to continue operations where an application has been filed for an existing mining venture.

**Omnibus Investment Code of 1987.** Highlights of the Omnibus Investment Code include, for qualifying investment, a tax holiday of 4 to 6 years and extendable under certain conditions to 8 years; additional deductions for labour expenses from taxable income for up to 5 years; tax credits on domestic capital equipment; liberalized employment of foreign nationals for supervisory, technical or advisory positions; exemption from wharfage duties; exemption from value-added tax for export-oriented projects; tax deduction for labour training expenses; tax and duty-free importation of capital equipment until 12 August 1992; and exemption from contractor's tax.

Local Tax Code (Section 5). Section 5 of this code declares that local governments may not tax mining projects (see Section 7).

Model Production-Sharing Agreement and other agreements. In compliance with the above-mentioned executive and administrative orders, a number of model agreements have been drawn up by the government. The Constitution calls for four types of agreements: joint venture, coproduction, production-sharing and technical/financial assistance agreements. Currently, the main form of agreement being used by the government is the production-sharing agreement, and a model agreement has been prepared by the government that can be used as the basis for negotiations.

### **Future Mining Code**

A draft mining code has been prepared and is now being considered for adoption by Congress. Because the draft law does not constitute law at the present time, it will not be analysed here. The draft code addresses the topics now being regulated by the above-described orders in a comprehensive manner. General descriptions of the proposed code are available from many sources (see *Australia Journal of Mining* 1992, *Mining Journal* and Chamber of Mines).

#### 5.2 Major Features of the Legislation/Agreement

At present, a foreign investor interested in a minerals project in the Philippines would most likely seek regulatory approval through a production-sharing agreement. Because there currently is no mining code, the agreement would be framed, negotiated and issued within the regulatory system brought into existence through the various executive and administrative orders described in the preceding section. Some of the major features of the existing system are described in the following subsections.

### 5.2.1 Ownership of Minerals

Article XII Section 2 of the 1987 Constitution states that

All lands of the public domain, waters, minerals, coal, petroleum and other mineral oils, all sources of potential energy, fisheries, forests or timber, wildlife, flora and fauna, and other natural resources are owned by the State. With the exception of agricultural lands, all other natural resources shall not be alienated. The exploration, development and utilisation of natural resources shall be under the full control and supervision of the State. The State may directly undertake such activities, or it may enter into coproduction, joint venture, or production sharing agreements with Filipino citizens; or corporations or associations, at least 60 per cent of whose capital is owned by such citizens. Such agreements may be for a period not exceeding 25 years, and under such terms and conditions as may be provided by law.

In line with the Constitution, Executive Order 279 states that in a productionsharing agreement there shall be a condition that the contractor shall not acquire title to the contract area. Thus, the contractor is given the right to explore and exploit minerals but not to obtain title to the area.

# 5.2.2 Exploration

Executive Order 279 indicates that an exploration right under a production-sharing agreement shall not exceed an initial two-year period from the date of agreement and may be extended for another two years. While the combined four-year initial and possible extension period might be acceptable to some companies, for many types of minerals the duration is not sufficient for a thorough and systematic investigation.

DENR Administrative Order No. 57 states that a production-sharing agreement shall include the following.

The requirements during this period [exploration period] are:

- (a) As basis for negotiation, the prospective Contractor must submit to the appropriate panel or subcommittee for examination, evaluation and approval, a sufficiently detailed Exploration Work Programme which indicates clearly the schedule of activities including the objectives, specific targets and outputs expected, and the budget. Such Exploration Work Programme shall cover the entire duration of the exploration period, excluding extension. Any request for extension must be accompanied by a separate Exploration Work Programme.
- (b) The Contractor shall submit Annual Reports which shall include information on the technical aspects of the operations as well as financial expenditures on various items of activities to serve as the basis for evaluation of performance and compliance by the contractor.
- (c) The Contractor shall submit a final report at the end of the Exploration Period which shall be in the form and substance comparable to published professional reports of respected international institutions and shall incorporate all the findings in the Contract Area, including locations of samples, assays, chemical analysis, and assessment of the mineral potential. Such report shall also include complete, detailed expenditures incurred during the Exploration Period.
- (d) The Contractor must spend the amount necessary to accomplish the annual Work Programme.

The maximum size of an exploration area allowed under the order in any one province is 500 hectares to an individual or 5,000 hectares to a partnership or corpora-

tion. This maximum size is fairly small and will probably be viewed as a disincentive by most exploration companies. The minimum size of the exploration area and the amount that must be expended on the work area are negotiable; this is probably an inducement to invest because it allows the company to prepare a proposal based on the geology, terrain and amount of information already known. However, this approach requires that the government spend time in reviewing the application, and if this leads to a general situation of long approval delays, companies may negatively view this approach.

# 5.2.3 Security of Tenure

DENR Administrative Order No. 57 does not directly address security of tenure. However, it can be implied from the order that the right to mine is automatic, subject to the submission of an acceptable feasibility study and development work programme. Arbitration is to be provided in cases where the government and company cannot reach agreement. Under the current system of regulatory orders and production agreements, most companies would probably not feel comfortable with the way in which the security of tenure between the exploration and mining phases is addressed. While it can be inferred from the orders and the model agreement that such security of tenure does exist and is automatic, most companies would probably prefer to see this important right clearly stated.

# 5.2.4 Mining

In satisfaction of Article XII of the Constitution, which requires that the exploration, development and utilization of mineral resources shall be under the full control and supervision of the state, DENR Administrative Order No. 57 provides that a production-sharing agreement must include a provision requiring that workplans be submitted to the government every three years. This level of repeated government oversight would probably be viewed negatively by most mining companies. Failure to abide by the requirement to submit a workplan, substantial deviation from an approved workplan or other defaults or breaches of the agreement are grounds for terminating the agreement. Arbitration is available.

# 5.2.5 Ownership and Control

This paper has stated in several sections (for example, see Sections 2.2.3 and 5.2.1) that the Constitution requires that 60 per cent of the equity in a mineral project be held by a Filipino or a Philippine corporation. In addition, the constitution directs that the government shall exert close control and supervision over mining operations. Many foreign mining companies would find these requirements unacceptable.

# 5.3 Administrative Efficiency

Some government offices, including the Bureau of Mines and Geosciences, which negotiates agreements, suffer from underfunding and a lack of sufficient personnel. This can lead to delays in processing applications. A tendency to decentralize certain functions to regional offices has probably made the regulatory system more efficient, but substantial delays can occur. Many mineral operation approvals required by law or by agreement are worded in such a way that where a designated government officer fails to act within a stipulated timeframe, the matter is deemed to have been approved.

### 5.4 Summary

The Philippines mineral sector regulatory system is now in a state of transition. The traditional leasehold system is in the process of being replaced by a system of mineral resources administration centring on coproduction, joint venture and production-sharing agreements. Although the transition process has been started, it is not yet completed. Executive and administrative orders intended for interim use provide a temporary means to bring the regulatory system into compliance with constitutional changes made in 1987. A new comprehensive mining law has been drafted and is now being considered for adoption by the national legislative bodies. A separate small-scale mining law was passed into law in July 1990 and is intended to complement and supplement the draft primary mining law. While the transition legislation does provide for a means by which foreign investors may participate in exploration and mining activities, most foreign firms would probably prefer to make major commitments under a more comprehensive and permanent mining law. Such a law has been drafted and is now being considered by the Philippine lawmaking bodies.

### 6. The Fiscal Regime

### 6.1 Description of Major Taxes

The major taxes that may apply to a mining operation in the Philippines are as follows: corporate income tax, excise tax, value-added tax, import tax, interest and money market income tax, tax on interest paid on foreign loans, occupation fees, real property tax, mine wastes and tailings fees, documentary stamp taxes and taxes specific to an agreement.

It should be noted that some of the above taxes may not apply in a situation wherein a company has entered into one of the four allowed forms of agreement with the government. In these cases, some of the above taxes do not apply; instead, a tax specific to the agreement is assessed.

Under Section 5 of the Local Tax Code, local governments are prohibited from taxing mining claims, mineral products and mining operations. These principles are restated in the proposed mining code. However, autonomous regions created by law are vested with the power to tax businesses in their jurisdictional area. Under the proposed mining code, any tax imposed by an autonomous region administration shall come from the share of the government under a production-sharing agreement or similar agreement.

For investments qualifying under the Omnibus Investment Code of 1987, a variety of tax incentives may be available, including a tax holiday of 4 to 6 years and extendable under certain conditions to 8 years; additional deductions for labour expenses from taxable income for up to 5 years; tax credits on domestic capital equipment; and exemption from contractor's tax.

Investors can obtain a summary of the current tax provisions relating to the mineral sector by contacting the Philippine Board of Investment. The following summaries describing various tax types and rates were extracted from information obtained from the Board of Investment, unless otherwise noted, and were presumably accurate for August 1991.

# 6.1.1 Income Tax

Resident foreign corporations are taxed at a flat rate of 35 per cent on taxable income from Philippine sources, and domestic corporations are taxed at 35 per cent on taxable income from worldwide sources.

# 6.1.2 Import and Export Taxes

Export sales are zero rated, but tariffs are assessed on imports. Import duty rates vary, depending on the type of mineral or equipment being imported. The range is generally 10 to 50 per cent of value, with most large mine equipment being assessed at 10 to 30 per cent. These high levels of duty put potential investors at a substantial capital cost disadvantage compared to many other countries in the region that waive import duties for mining equipment. The government may waive the duty under a production-sharing agreement.

# 6.1.3 Royalty Taxes

An excise tax is payable quarterly. The rate is 5 per cent of the gross output value after deducting smelting, refining and other charges incurred in the process of converting the mineral concentrates into refined metals. In the case of nonmetallic or quarry resources, the excise tax is 3 per cent of the actual market value of the gross output thereof at the time of removal. Most international mining companies would probably consider the level of the tax as somewhat on the high side compared to royalty rates in other countries. However, the rates are not so high as to discourage most companies. Under the terms of a production-sharing agreement, the government may waive the excise tax.

# 6.1.4 Fees and Land "Rent"

An occupational fee/lease rental is payable upon registration and annually thereafter in the amount of P10.000 per hectare.

# 6.1.5 Miscellaneous

Mining companies will also be assessed the following taxes and fees.

- \* A real property tax is assessed at 0.25 to 0.5 per cent of the assessed value of property outside a city or 0.5 to 2.0 per cent of the value of property situated in a city.
- \* An annual corporate residence tax is payable in the amount of P50, plus up to P6,000 annually, depending on the assessed value of the property and gross receipts of the corporation, excluding dividends received from another corporation.

- \* A value-added tax is applied at 10 per cent of the selling price if the mineral products are sold within the Philippines, but no value-added tax is assessed on exported minerals.
- \* Interest and money market income are subject to a 20 per cent tax on the yield of the investment.
- \* Interest paid on foreign loans is taxed at 20 per cent.
- \* A substantial mine wastes and tailings fee may also be assessed (DENR Administrative Order No. 85, Series 1990, implementing Presidential Decree No. 1251, provides that "a semi-annual fee…shall be imposed by the Secretary on all operating mining companies, upon the recommendation of the Evaluation committee." The order sets the fees at 5 centavos per metric ton of mine waste and 10 centavos per metric ton of tailings for companies discharging into tailings impoundments or into the sea. If the waste disposal meets one of five criteria described in the order, the mine may be exempted, at the discretion of the government, from paying the fee.)
- \* Taxes specific to a production-sharing agreement (see Section 5.1).

# 6.2 Ability to Predetermine Tax Liability

Under the current fiscal regime, it is not possible to predetermine a mining company's tax liability because the tax liability may be negotiated within the terms of an agreement. However, a model agreement may be available from the government and can be used as one means of determining the upper tax limit. Fiscal systems that do not clearly identify every tax may be unattractive to small and medium-sized international mining companies, which may not have the resources to undertake lengthy negotiations to resolve a fiscal system under an agreement.

# 6.3 Stability of the Fiscal Regime

The Philippines regulatory system is currently based on an interim set of executive and administrative orders. Until such time as a comprehensive mining law comes into force, the stability of the fiscal regime must be questioned. However, those taxes that are set in a production-sharing agreement or other form of agreement are approved by the President and reported to the Congress. The elements of the fiscal regime set in such an agreement would probably thus be less vulnerable to later unilateral modification.

# 6.4 Summary

In summary, the fiscal system in place at the current time must be viewed as an interim system. The existing regulatory framework of executive and administrative orders now regulating the industry may soon be replaced by a comprehensive mining act. Production-sharing agreements tend to exempt the contractor from some standard taxes and arguably provide a fair degree of fiscal stability. However, it not possible to determine the level of taxes under such agreements because the tax level is subject to negotiation on an *ad hoc* basis. Most foreign investors would probably view the current fiscal system as confusing and susceptible to instability.

# 7. Monetary Controls and Access to Capital

# 7.1 Foreign Exchange

To stem capital flight, the government instituted strict controls over foreign remittances, the types of controls that most mining companies would find detrimental to doing business. However, in January 1991 the Central Bank significantly liberalized exchange regulations. Today, the remittance of profits, dividends and recovered investments is administered by the Central Bank under a system that most companies would find acceptable but somewhat tedious and bureaucratic. The following activities are strictly monitored and subject to government policy: foreign exchange inflow; foreign borrowings and investments; remittance of profits, dividends and recovered investment; remittance of royalties; foreign currency deposits; and securities transactions.

The Philippine peso is fully convertible.

# 7.2 Access to Capital

Meeting the 60 per cent local ownership requirement may prove to be difficult, especially for investors in larger projects who are unable to locate a local partner with capital resources. Project equity can be raised through stock issues on either the Manila or Makati stock exchanges.

The country is faced with a large foreign debt, a widening budget deficit, high inflation and a shortage of foreign exchange. There is discussion in the government from time to time about the possibility of halting payments toward the national debt. These economic conditions are not conducive to lender confidence, and companies seeking to borrow money in the international markets may either find banks reluctant to lend or willing to lend but at a higher interest rate that takes into account the perceived risk of lending into a weak economy. There is a 20 per cent tax on interest paid on foreign loans.

# 8. Environmental Protection

# 8.1 Legal Requirements for Environmental Protection

A mineral operation in the Philippines would be subject to a variety of pieces of environmental protection legislation. The key pieces of environmental legislation of the Philippines that relate to mining include the following.

- \* Commonwealth Act No. 33 (An act to punish the dumping into any river of refuse waste matter or a substance of any kind whatsoever that may bring about the rise or filling in of riverbeds or cause artificial alluvial formations)
- Republic Act No. 3931 (An act creating the National Water and Air Pollution Control Commission)
- \* Presidential Decree No. 600 (Prevention and control of marine pollution)
- \* Presidential Decree No. 984 (Providing for the revision of Presidential Decree No. 600, governing marine pollution)

- \* Presidential Decree No. 984 (Providing for the revision of Republic Act 3941, commonly known as the Pollution Control Law)
- \* Presidential Decree No. 1121 (Act creating the National Environmental Protection Council)
- \* Presidential Decree No. 1151 (Philippine environmental policy)
- \* Presidential Decree No. 1152 (Philippine environmental code)
- \* Presidential Decree No. 1160 (Vesting authority in *barangy* captains to enforce pollution and environmental control laws)
- \* Presidential Decree No. 1198 (Requiring all individuals, partnerships or corporations engaged in the exploration or exploitation of natural resources or in the construction of infrastructure projects to restore or rehabilitate areas subject thereof or affected thereby to their original conditions)
- \* Presidential Decree No. 1251 (Imposing a fee on operating mining companies, to be known as mine wastes and tailings fees, to compensate for damages to private landowners and for other purposes)
- \* Presidential Decree No. 1281 (Revising Commonwealth Act No. 136, creating the Bureau of Mines)
- \* Presidential Decree No. 1396 (Act creating the Department of Human Settlements)
- \* Presidential Decree No. 1586 (Establishing an environmental impact statement system, including other environmental management-related measures)
- \* Rules and regulations implementing the intent and provisions of Presidential Decree 1586, establishing the environmental impact statement system in relation to Presidential Decree 1151, promulgating the Philippine Environmental Policy)
- \* Presidential Decree No. 1720 (Amending Presidential Decree No. 1720)
- \* Presidential Decree No. 1899 (Establishing small-scale mining as a new dimension in mineral development)
- \* Presidential Decree No. 2146 (Proclaiming certain areas and types of projects as environmentally critical and within the scope of the environmental impact statement system established under Presidential Decree 1586)
- \* Letter of Instruction No. 549 (Re: establishment of an administrative system for the evaluation of the environmental impact of projects being undertaken)
- \* Letter of Instruction No. 1179 (Re: issuance of environmental compliance certificates)
- \* Mines Administrative Order No. MRD-16 (Rules and regulations governing the issuance of permits for the taking and removal of ordinary earth, sand and stone)

- \* Mines Administrative Order No. 20, Series of 1977 (Amendment to Consolidated Mines Administrative Order of 1975)
- \* Executive Order No. 192 (Providing for the reorganization of the Department of Environment, Energy and Natural Resources and renaming it as the Department of Environment and Natural Resources)
- DENR Administrative Order No. 85, Series of 1990 (Revised rules and regulations implementing Presidential Decree No. 1251, as amended, imposing fees on operating mining companies, to be known as mine waste and tailings fees, to compensate for damages to private landowners and for other purposes)

In addition to these pieces of legislation, the proposed mining code also contains provisions directed at the preservation of the environment.

As in many other countries with a long history of mining, the Philippines has developed a regulatory system to manage and prevent environmental degradation. One of the weaknesses in the system is a severe understaffing problem in the key government approving and enforcement offices. One of the problems caused by this institutional weakness is that environmental impact assessment (EIA) approval can be a lengthy process. A recent article summed up the problems of the system as follows (Brillantes 1992).

The Philippines EIA system was established in 1978. In the more than a decade of its implementation, it has contributed very modestly to arresting environmental degradation caused by development projects....A closer study of the system shows institutional and procedural problems that greatly affect its utility. While remedial measures have been initiated by government, most of these were stop-gap measures which can still be considerably improved on. An honest assessment of the system and its implementation shows the need for major amendments and modifications if the system is expected to be more efficient and effective.

The regulatory system requires the completion of an environmental impact assessment before an application for mining can be approved. In addition, specified plans and proposals must be prepared indicating the measures that will be taken to mitigate damages and what measures will be taken upon mine closure to restore the mine area.

The Philippine environmental protection system is fairly comprehensive compared to similar regulatory systems in most other neighbouring countries. Most investors would probably find the completeness of the system attractive in that it clearly identifies what the investor must submit and even provides guidelines on the expected content of such submissions. The requirements are somewhat more stringent than in many other developing nations but are quite reasonable by international standards.

# 8.2 Environmental Protection Trends

The Philippines has gained an international reputation as a country besieged with environmental problems. Some of these are natural such as volcanic eruptions and earthquakes; however, many are manmade. The international press has focused on issues such as extensive deforestation and blasting of reefs and, in the mining sector, downstream pollution caused by small-scale mining (tailings and mercury contamination). The commercial mining sector has fared better in the press, and some rehabilitated mining areas provide examples that even developed countries would be hard pressed to emulate.

The Philippine people are by and large highly educated and are environmentally conscious to a greater extent than are people in most countries in the region. "People power" is a fact, and mining operations should keep this in mind. Mines should be planned to mitigate unreasonable environmental degradation. The Philippines culture has close associations with the land, and needless or excessive pollution will not go unheeded in a nation now comfortable with a free press and frequent local elections.

# 9. Local Services and Labour Market

#### 9.1 Availability of Local Services

A wide range of mineral support services are available in the Philippines. There are many private, trade and employment organizations that can assist in identifying companies and individuals to assist in various aspects of the mineral industry.

Plane and helicopter charter and rental services are available for interisland passenger and freight movement.

The Philippines offers modern banking facilities.

The Geology Department of the University of the Philippines has been transformed with aid assistance from the German Government into the National Institute of Geological Sciences. The institute has a reference library of maps, geological reports, aerial photographs and satellite imagery. It is equipped with modern scientific and analytical equipment.

With regard to local services, most mining companies would find the Philippine situation better than that in most other developing countries. The Philippine mine services sector provides services throughout the Asia-Pacific region.

### 9.2 Labour Market

The Philippines has a well-established educational system and one of the highest literacy rates in the Asian region: 89.8 per cent in 1991. There are around 40 universities and 350 private colleges, and many of these offer training in geology, mining or others fields relating to the mineral industry. The University of the Philippines in Manila is regarded by many as the premier institution offering mineral-related degree programmes, and Adamson University and the Papua Institute of Technology also offer postgraduate degrees in geology, mining and metallurgy.

In addition to trained mineral professionals, the country has a relatively highquality educated and skilled workforce commanding moderate wages. The workforce has been prone to strikes. With the economy encountering a high rate of inflation, pressure may come to bear on companies to maintain the real earning power of their employees or, alternatively, face strike action.

# 10. Conclusions

The major conclusions of this study can be summarized as follows.

- \* The Philippine political system is probably viewed by most foreign investors as less stable than that in many other nations in the region.
- \* National stability and regime stability are closely linked, and repeated coup attempts bring into question the durability of the overall system of government.
- \* Demands for land reform may lead to future changes in how land-use planning is implemented.
- \* Insurgency is not a problem in most of the country, but such activities must be taken into consideration in some locations.
- \* The Philippines is on good terms with its neighbours and is not subject to any international economic sanctions that would negatively affect the mineral industry.
- \* Most potential investors would find the widespread use of English and the nature of the local culture amenable to doing business.
- \* Most investors would probably view the historical presence of mining in the Philippines as beneficial because it indicates that the role of the mining industry is better understood and appreciated than might be the case in nations that have not historically experienced substantial levels of mining.
- \* Investors probably view the poor shape of the economy with mixed reactions; the high level of debt and double digit inflation would be viewed negatively, but the need for the government to improve the situation through an infusion of foreign capital acts to provide incentives that would probably not be available if the economy was more robust.
- \* In remote areas and on most of the smaller islands, mineral companies would have to install most mine-related infrastructure, while in more populated islands near urban centres, existing power and transport may be adequate, at least for small and medium-sized operations.
- \* The Philippines has arguably the best-established hardrock mining industry in Southeast Asia.
- \* Foreign investors have four options to invest in large mineral projects: through a joint venture agreement, coproduction agreement, production-sharing agreement or technical/financial assistance agreement.
- \* The number of agreements signed with foreign investors has been small.

- \* Mineral policies in the Philippines are probably not clear to most investors and potential investors.
- \* The country does not yet have an established track record to determine whether its preferred investment agreement, the production-sharing agreement, will provide long-term stability of terms and conditions to an investor.
- \* The Philippines has favourable geology for a wide range of minerals, and current and historical mineral production is widely disbursed throughout the country.
- \* Most mineral companies would find the geology, the amount of information and the capabilities of government geoscience institutions all favourable factors in their consideration of the Philippines as a site for exploration and mining investment.
- \* The Philippines is well situated geographically to supply the Pacific Rim markets.
- \* The combined two-year exploration period and two-year discretionary extension might be acceptable to some companies, but for many types of minerals the duration is not sufficient for a thorough and systematic investigation.
- \* The size of exploration blocks may be smaller than preferred by many international mineral companies.
- \* The current regulatory system implies but does not explicitly grant substantial security of tenure between the exploration and mining stages of mineral development.
- \* The requirement for 60 per cent local ownership would be considered a major disincentive by most mineral companies.
- \* The administrative bodies are understaffed, but administrative efficiency is promoted by a policy in which if a required government decision is not forthcoming in a specified time period, the matter is, by law, deemed approved.
- \* The fiscal system in place at the current time must be viewed as an interim system.
- \* Production-sharing agreements tend to exempt the contractor from some standard taxes and arguably provide a fair degree of fiscal stability; however, it is not possible to predetermine the level of taxes under such agreements because the tax level is subject to negotiation on an *ad hoc* basis.
- \* Most foreign investors would probably view the current fiscal system as confusing and susceptible to instability.
- \* Foreign exchange regulations are cumbersome but workable.
- \* Environmental protection measures are required, but most investors would probably find the completeness of the regulatory system attractive in that it

clearly identifies what the investor must submit and even provides guidelines on the expected content.

\* Many types of trained mineral professionals are available in the Philippines.

In summary, the mineral investment environment in the Philippines would be looked on with mixed feelings by most foreign mining companies. Excellent geology prospective for many types of minerals would clearly be an inducement for mineral investors. However, the unsettled political system, economic worries and transitory regulatory and fiscal systems would probably be viewed as negative factors by most companies. The adoption of the proposed comprehensive mining code would assist in bolstering the international mining community's understanding and confidence in the Philippines regulatory system.

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# Thailand: Mineral Investment in an Export-Led Economy

### 1. Introduction

Thailand's mining industry is experiencing a transition from its traditional exportoriented focus in a bid to meet rising domestic demand.<sup>1</sup> This transition has been the subject of numerous papers and news reports in 1991 and the Department of Mineral Resources' seminar in October 1991 in Phuket titled "The Mineral Resources Crisis in Thailand."

Thailand's progress toward becoming an industrialized country has increased its need for raw materials. Production of industrial minerals such as feldspar, ball clay and glass sand is falling behind demand. Part of the increase in demand has resulted from the boom in the construction and ceramics industries. Some of the problems the industry has been facing have accentuated the transformation the mining industry is going through. For example, "national forest policy" on the granting of mineral exploration rights, high taxes and royalties on minerals, illegal mining activity and increased public awareness of the environmental ramifications of mining, combined with a lack of security of mine tenure, have all affected the industry.<sup>2</sup>

This paper seeks to present an analysis of the legal, economic and political structures in Thailand that affect the mining industry. Key attractive conditions, important problems and recommendations for improvement are highlighted in the conclusion.

### 2. Background Information

### 2.1 National Profile

### 2.1.1 Political Environment

### National and Regime Stability

Even though Thailand has had numerous changes in government and 15 constitutions since 1932, these constant changes seem to be a normal phenomenon and have not affected greatly the country's stability nor its growing economy. Several factors contribute to this stability: the common Thai language, the Buddhist religion, the growing private business sector and the three pillars of government, comprising the monarchy, the military and the civil service. All of these have contributed to political stability in

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<sup>&</sup>lt;sup>1</sup> "Mining Industry in Midst of Transformation", Bangkok Post, 25 October 1991.

<sup>&</sup>lt;sup>2</sup> "Breaking New Ground: Mining Industry in Transition", Business in Thailand, May 1991, p. 39.

Thailand and investor confidence, even when the political situation may appear very unsettled.<sup>3</sup>

### Relationships with Neighbouring Countries

Thailand's foreign policy has been "to promote peace and peaceful coexistence among all countries on the principles of respect for each other's independence, sovereignty and territorial integrity; non-aggression and non-interference in each other's internal affairs."<sup>4</sup> The last two decades have witnessed political turbulence in the region. However, with a peace settlement negotiated in Cambodia, and Cambodia, the Lao PDR and Viet Nam opening their doors to foreign investors, Thailand has initiated cooperative ventures in fisheries, oil and gas, minerals and other economic projects in both Myanmar and Indochina. For example, talks are underway between the Thai and Vietnamese governments to build a pipeline to deliver natural gas from offshore Viet Nam to the Thai domestic downstream industries.<sup>5</sup>

#### 2.1.2 Geography and Demography

Thailand has a land area of approximately 513,115 square kilometres. Located in Southeast Asia, Thailand's neighbours are Myanmar to the west, the Lao PDR to the north, Cambodia to the east and Malaysia to the south. The Gulf of Thailand leading to the South China Sea and the Pacific Ocean, and the Andaman Sea of the Indian Ocean provide water routes to and from Thailand. Since Thailand is situated in the Tropic of Cancer, the climate is tropical and humid. There are three seasons in general (although differing according to region): it is hot from March to May, rainy from June to October and cool from November to February. During the hot season, it is often dusty, and temperatures can reach 104 degrees Fahrenheit.

During the rainy season, humidity is often 90 to 100 per cent, and rains can cause flooding, particularly in September and October. During the cool season, humidity is lower than at other times of the year and temperatures, as well as the weather, are very pleasant, with average temperatures of from 62 to 96 degrees Fahrenheit.<sup>6</sup> The country has 4 main regions: the northern region, which is mountainous, cool in the winter and home to numerous hilltribes; the northeast region, which is an arid plateau bordered to the east by the Mekong River; the central region, which is the fertile rice growing region around Bangkok; and the southern region, which offers lush vegetation.

### 2.1.3 The Economy

Thailand's economic growth rates in recent years have been high, increasing from 3.5 per cent in 1985 to 10.5 per cent in 1989, 10.0 per cent in 1990 and 9 per cent in

<sup>&</sup>lt;sup>3</sup> Anita Louis Hummel and Pises Sethsathira, *Starting and Operating in Thailand*, (McGraw Hill Publications: Singapore), 1991, p. 8.

<sup>&</sup>lt;sup>4</sup> The Best in Thailand, (BLC Publishing Co., Ltd.: Bangkok), 1989, p. 17.

<sup>&</sup>lt;sup>5</sup> Articles reported periodically in *The Nation* and *Bangkok Post* newspapers, 1991.

<sup>&</sup>lt;sup>6</sup> Standard Chartered Bank and Tilleke and Gibbins, R.O.P., *Thailand Business Basic*, (Bangkok) 1991, Chapter 1, p. 7.

1991, according to NESDB and TDRI (see Appendix A for economic growth from 1970 to 1992). The economy is expected to remain healthy into the 1990s, with growth projections of more than 7 per cent in the next three years. While there are certain economic issues that will have to be addressed in the upcoming years in order for Thailand to outperform its competitors, such as rising inflation rates and skilled labour shortages, the Thai economy appears to be stable, resilient and dynamic.<sup>7</sup>

Real GDP growth in 1991 averaged around 9.8 per cent, with real growth in the manufacturing sector averaging 12.4 per cent.<sup>8</sup> Economic indicators such as inflation rate, trade deficit, fiscal surplus and exchange rate also demonstrate the stability of the Thai economy. The inflation rate is estimated at 6.5 per cent for 1991 and poses a worry to the government. However, the government has resolved to keep inflation below 7.5 per cent. The fiscal surplus has grown steadily from US \$1.2 billion in 1988 to US \$2.3 billion in 1989 and US \$4.0 billion in 1990. The export sector has been the engine of growth for the Thai economy, mainly through the contribution of the manufacturing industry, whose share of total exports doubled from 30 per cent in 1980 to 70 per cent in 1990. However, due to higher growth rates in imports, the account deficit increased from US \$1.6 billion in 1988 to more than US \$6 billion in 1990. The problem in the balance of payments is recognized by the government, and it has undertaken a number of measures to promote exports, to develop capital goods and supporting industries in Thailand, to reduce dependence on imports and to facilitate both foreign direct and portfolio investment in the securities market, as Thailand goes through changes from an import-substitution to an export-oriented economy.<sup>9</sup>

The mineral industry contributed only 3.6 per cent to the GDP in the first half of 1991.<sup>10</sup> Mining production also grew at a decelerated rate of 8.5 per cent. Depressed ore prices and higher production costs discouraged producers and led to the closure of many mines. On the other hand, quarrying for construction remained buoyant to catch up with the demand from construction activity. Output of fuel minerals, particularly natural gas and condensate natural gas, rose by 20 per cent last year due to the opening of new oil fields and higher production capacity.<sup>11</sup>

Thailand has developed policies to assist in the growth of the country. It is committed to the following: an open market economy based on free, private enterprise; a minimum of government intervention; close cooperation and identification of economic goals between the public and private sectors; modernization of essential public services and physical infrastructure; sound and prudent financial, monetary and fiscal management; and economic interdependence of nations and the integration of Thailand into the world economic order.<sup>12</sup>

- <sup>10</sup> Bank of Thailand Quarterly Reports, Vol. 31, No. 2, June 1991, p. 88.
- <sup>11</sup> Bank of Thailand Quarterly Reports, p. 10.

<sup>&</sup>lt;sup>7</sup> Ibid., Chapter 2, p. 4.

<sup>&</sup>lt;sup>8</sup> Office of the Board of Investment and Office of the Prime Minister, *The Investment Environment in Thailand* (Bangkok ACME Printing Co. Ltd.), 1991, p. 7-16

<sup>&</sup>lt;sup>9</sup> Q. Leepowpanth, "Thailand", Mining Annual Review, 1991, p. 95.

<sup>&</sup>lt;sup>12</sup> Standard Chartered and Tilleke and Gibbins, Chapter 2, p. 6.

### 2.1.4 Infrastructure

#### Land: Road and Rail

The length of the entire road network of Thailand is 167,450 km, of which 46,550 km are national highways, 107,300 km are rural highways and 13,600 km streets in municipal areas.<sup>13</sup> Presently, most roads from north to south lead through the heart of Bangkok. The government is trying to alleviate the burden that this causes by building road networks that will circumvent the Bangkok metropolitan area. To help alleviate the traffic congestion in Bangkok, the government has initiated key infrastructure projects as follows.

- \* A second-stage expressway (1990 to 1995), which will include a tollway to the airport, overpasses and new road construction
- \* A first-stage mass transit system comprising the Hopewell road/rail project, the Lavalin Skytrain project and the Bangkok Metropolitan Administration's elevated railway network<sup>14</sup>

Thailand has a 4,000-km rail network, which stretches north to Chiangmai and Nong Khai and as far south as the Malaysian border. A new rail link between Bangkok and the Eastern Seaboard is now in place and will greatly facilitate the transportation of cargo in containers.

### Ports: Air and Sea

Bangkok's Don Muang International Airport is served by some 57 airlines and is becoming a major hub, with frequent daily flights to North America, Europe, Japan and other parts of the world. It can handle 16 million passengers and 400,000 tons of goods per year. There are plans underway to build a new international airport near Bangkok, since the present airport is already fully utilized. Besides Bangkok, there are smaller international airports at Chiang Mai, Phuket, Hat Yai and Uthapao. Domestic flights are connected through an additional 27 commercial airports. The aviation system has enabled Thailand to competently handle significant volumes of air cargo from other parts of Asia and Europe.

Thailand is also becoming a major shipping port in the region. Ports are presently managed by the Port Authority of Thailand at Klong Toey, Phuket, Songkhla, Sattahip and Laem Chabang. Klong Toey, one of the oldest ports in Thailand, is considered a high-volume port. It is located on the banks of the Chao Phraya River, and it has 17 berths, of which 7 handle container ships and 10 handle break-bulk. Phuket, located in the south, has a port with 2 berths. The Songkhla port has 3 berths. Sattahip is an old military port, located outside of Bangkok. The port has 4 berths in operation, but since it is owned by the Royal Thai Navy, there is a chance this port might be taken over for naval operations. The newest port is the Laem Chabang Deep Sea Port, located in the Eastern Seaboard area. This port is by far the most aggressive seaport construction

<sup>&</sup>lt;sup>13</sup> Office of the Board of Investment and Office of the Prime Minister, *The Investment Environment in Thailand: The Export Base of Asia* (Bangkok), 1990, p. 34.

<sup>&</sup>lt;sup>14</sup> Office of BOI, Investment Environment in Thailand, 1991, p. 5.

ever undertaken by the Thai Government. The port will be able to handle vessels that are presently not able to berth at Klong Toey Port due to limited channel access. When completely finished, the Laem Chabang Deep Sea Port will consist of two container cargo berths, two general cargo berths, one bulk cargo berth for sugar or molasses and one pier for exporting agricultural products. The port will have modern facilities to support ship repair and other port-related industries.

Besides the above-mentioned ports, the government has another port project, the Map Ta Phut Deep Sea Port. This is also part of the Eastern Seaboard Development Plan and is expected to be completed in 1992.

#### **Telecommunications**

Presently, Thailand has about 1,500,000 telephone lines. The state agencies responsible for telecommunications, TOT and CAT, are actively working to modernize the telecommunications network of the country in order to service the sophisticated needs of modern business. In August 1991, the government awarded a contract to TelecomAsia to install an additional 2 million telephone lines in Bangkok. In addition to the conventional telephone network, there are some 100,000 mobile telephone lines in Thailand. CAT and TOT currently operate 3 systems: the Nordic Mobile Telephone Systems (NMTS) 470, NMTS 900 and Advanced Mobile Phone System (AMPS) 800.

Future projects include the installation of a complete integrated service digital network (ISDN) system, along with teleport, to link the Map Ta Phut Industrial Estate with Silom and Suriwongse roads in Bangkok; the establishment of a data processing zone (DPZ) to provide a range of modern internal and international telecommunication services; and an increased number of private sector satellite projects.<sup>15</sup>

### Electricity, Water and Energy Sources

The demand for electricity has grown rapidly in recent years. EGAT currently has a combined generation capacity of 8,653 megawatts (MW). Current projects under construction will add another 4,219 MW of capacity. EGAT plans to expand its generating capacity to 14,500 MW by the year 1996 and to 25,000 MW by 2006. To accelerate expansion, the Thai Government has initiated a proposal to allow private participation in EGAT, whereby EGAT has received authorization to embark upon a 3-year privatization plan under which the private sector would be granted the right to own 49 per cent equity.

Water supply within the Bangkok metropolitan area is under the responsibility of the Metropolitan Water Works Authority (MWA), with the Provincial Waterworks Authority (PWA) covering other areas. At present, the MWA supplies about 2.9 million cubic metres of water per day (MCMPD). By 1993 the supply will be 3.78 MCMPD. The PWA supplies 1.14 MCMPD. This capacity is expected to meet demand in every region until 1998, except for the Eastern Seaboard and other industrial areas, where the PWA plans to double the current water supply within 1992.

<sup>&</sup>lt;sup>15</sup> Office of BOI, Investment Environment in Thailand, 1991, p. 3.

Thailand's main source of energy is petroleum. Imports met about 70 per cent of national petroleum demand in 1991. Other energy sources include lignite and hydropower. Most of the oil supplies are imported from the Middle East and from other Southeast Asian countries. Since the enactment of the Petroleum Act and Petroleum Income Tax Act in 1971, the government has granted concessions to oil companies for the exploration of petroleum. Two of these concessionaires have developed major petroleum reserves.

- \* The discovery and development of natural gas in the Gulf of Thailand by UNOCAL contributed significantly to the country's economy. UNOCAL is presently producing offshore about 500 MMcfd.
- \* Shell discovered crude oil onshore in 1979 and started production in 1981, now producing approximately 23,000 b/d.
- \* Esso started production of natural gas onshore in 1991 from the Nam Phong field in the northeast and is presently producing about 65 MMcfd.

The Electricity Generating Authority of Thailand has invested 100,000 million baht for electrification projects from 1988 to 1991. These projects have increased from 25 to 32 in the current sixth national and social development plan (1987 to 1991). Of the 32, 5 will be hydropower plants, 15 will be thermal plants, 5 will be lignite mining and 7 will be high voltage transmission systems.

# 2.2 Past and Current State of the Mineral Industry

# 2.2.1 Historical Perspective

NESDB is the government organization responsible for the planning and implementation of policies for the economic and social development of Thailand. It drafts the national development plans. The following table summarizes the features of the first six plans and the major mining legislation and industry activity during the periods covered by each plan.

Attached in Appendix B is a list of current mining legislation.

# Seventh Plan (1992-1996)

The Seventh Plan emphasizes the improvement of the natural resources administration system. In order to conserve natural resources as basic factors for living of rural people, national heritage and sustainable development, several guidelines were set up, as follows.

- \* Persuade the public to participate with the government in formulating any projects concerning natural resources conservation, as the public should be able to join in administration, supervision, control and evaluation of the projects.
- \* Administer and control implementation through natural resources administration projects, with emphasis on budget allocation and personnel to be sufficiently provided for operations to promote public awareness in natural re-

Summary	of	National	Economic	and	Social	Develop	pment	Plans
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Government Policy	Key Mining Legislation Enacted	Industry Development Highlights
First Plan (1962-1966)		
<ul> <li>Promotion of exploration and exploitation through geological mapping and economic geology study by DMR</li> <li>Detailed exploration and development of mineral resources through the private sector</li> <li>Mineral production mainly for export</li> </ul>	> Mineral Royalty Rates Act (1966)	<ul> <li>&gt; Expansion of the mining industry</li> <li>&gt; Mineral exploration by government with special United Nations fund</li> <li>&gt; Proposal to establish a mining technical school</li> <li>&gt; 1965 – the establishment of the Thailand Smelting and Refining Co. for tin smelting</li> </ul>
Second Plan (1967-1971)		
<ul> <li>&gt; Increase in production, royalties, foreign exchange earnings and local employment</li> <li>&gt; Promotion of exploration and exploitation through surveys: <ul> <li>a) geological survey in the North</li> <li>b) special surveys</li> <li>1) tin and iron ore in the East and Northeast</li> <li>2) natural fuel, base metals and ceramic minerals in the North</li> <li>3) manganese in the North and South</li> <li>&gt; Provision of technical assistance to private mine operators</li> <li>&gt; Optimum utilization of domestic minerals</li> </ul> </li> </ul>	<ul> <li>Minerals Act (1967), which superseded all previous mining laws</li> <li>Tin Control Act (1971)</li> <li>Minerals Act (No. 2) 1973</li> <li>Royal Decree Establishing Offshore Mining Organizations (1975)</li> </ul>	<ul> <li>&gt; 22 newly discovered minerals targeted</li> <li>&gt; Industrial minerals tried as raw materials for local use</li> <li>&gt; Proposal to set up mineral resource centres in the North, South and Northeast</li> <li>&gt; 1968 - TEMCO and EMCO - two dredging companies were granted offshore concessions</li> <li>&gt; 1973 - popular agitation over offshore concessions granted to foreigners. 300 suction dredges invaded concessions areas of TEMCO and EMCO. Government then revoked the concessions.</li> <li>&gt; 1975 - tin rush. Illegal tin miners in Phuket escaped paying royalties by smuggling ore to Penang and Singapore for smelting.</li> </ul>
Fourth Plan (1977-1981)		
<ul> <li>Encouragement for small and medium-scale mining</li> <li>Formulation of a land-use plan for mining industry</li> <li>Establishment of a financial institution to develop mineral resources</li> <li>Promotion of mining, processing and smelting operations</li> </ul>	<ul> <li>&gt; Mineral Royalty Rates Act (No. 2) 1977</li> <li>&gt; Minerals Act (No. 3) 1979</li> <li>&gt; Mineral Royalty Rates Act (No. 3) 1979</li> </ul>	<ul> <li>&gt; Worldwide commodity price boom influenced Thai mineral prices; prices reached highest levels ever and spurred production of export-oriented minerals</li> <li>&gt; Discovery of tin deposits of Phangnga; tungsten in Nakhon Si Tammarat, Chiang Rai and Phrae; antimony in Chonburi</li> </ul>

(Continued)

Government Policy	Key Mining Legislation Enacted	Industry Development Highlights
		<ul> <li>&gt; Illegal mining in Phangnga and Khao Soon</li> <li>&gt; 1980 - tantalum boom. Prices for tantalum were high, and set off frenzied search for tin slag in Phuket</li> </ul>
Fifth Plan (1982-1986)		
<ul> <li>Stressed high growth and diversified production structure, especially zinc and lead</li> <li>Local consumption of minerals emphasized</li> </ul>	> Mining Council Act (1983)	<ul> <li>&gt; Prices declined and remained depressed for export minerals, especially tin</li> <li>&gt; Production of tin, barite, and tungsten fell</li> <li>&gt; 1985 - collapse of the International Tin Council</li> <li>&gt; 1986 - TTIC tantalum plant scheduled to open was burned down by Phuket residents over environmental and tourism issues</li> </ul>
Sixth Plan (1987-1991)		
<ul> <li>Increase efficiency in human resources, science and technology, natural resources utilization, and operation of government and state enterprises</li> <li>Improve production and marketing through diversified production and improved infrastructure</li> <li>Improved income distribution between rural and urban areas</li> </ul>	> Minerals Act (No. 4) 1991	<ul> <li>&gt; Domestic demand for industrial minerals increased</li> <li>&gt; 1989 - logging ban imposed nationwide; pending reclassification of forest reserves affected mining</li> <li>&gt; Salt farming by local people was banned in the Northeast by Cabinet Resolution (1989)</li> <li>&gt; Lignite production increased 15 per cent from 1989 to 1990. EGAT banned lignite exploration off Saba Yoi because of villagers' protests</li> <li>&gt; 1989 - ASEAN potash project proposed and equity established in 1989</li> <li>&gt; Production of tin dropped further</li> <li>&gt; Environmental impact issues addressed</li> <li>&gt; 1988 - ATPC (Association of Tin Producing Countries) issued third export quota because of depressed tin prices and tin stockpiles</li> <li>&gt; 1991 - 5th export quota by ATPC reduced export of tin for member countries by 6 per cent</li> </ul>

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sources conservation. Public relations, moreover, must be conducted via the press and conservation schemes must be improved.

- \* Reduce conflicts in future utilization of natural resources by urging land-use planning in each area.
- \* Impose monetary and fiscal measures to facilitate natural resources administration to create social justice so that the public can receive equal benefits from natural resources utilization. Taxes on land, in addition, must be improved in order to eliminate land speculation.
- \* Establish natural resources systems to be used in the planning process in this regard so as to properly demarcate conserved forest areas, and formulate land-use plans in coastal areas that will be undertaken simultaneously with mangrove forest and coral conservation.
- \* Issue an act to ensure the consistency between natural resources conservation and changing situations. The Community Forest Act, for instance, should be enforced to provide the people and private development organizations with an opportunity to legally join in forest conservation.

According to one DMR survey, there are approximately 400 potential mineral deposit sites throughout the country, most of which are located in reserved forests. Investors going into reserved forest areas that contain mineral deposits will be governed by a detailed master plan, consisting of a national management plan aimed at avoiding conflict between the industry and sound natural resource utilization, central to which is a policy for land rehabilitation. Regulations will be revised to make mining more promotable to the private sector.

Mineral royalty collection currently suffers from inconsistent methods and the lack of a standard base. In the seventh plan, it is forecast that the base will decrease for 3 to 5 years. The current system of bidding for mining leases will be revised to provide more incentives and to decrease the risk to the investor. Future DMR promotion programmes will focus on increasing the areas open for exploration and decreasing the investor risk by guaranteeing that mining lease rights will be granted immediately following a prospecting license.<sup>16</sup>

# 2.2.2 Recent Structural Changes

# **Declining Importance of Mining**

One major problem confronting the mining industry is its declining importance in the national economy. Having played a critical role in Thailand's industrialization, mining in general, and tin mining in particular, have lost the spotlight to the manufacturing and service sectors. This inevitable outcome of any successful development affects all primary sectors, including agriculture, fisheries and forestry. The newly developed, highly productive and profitable manufacturing industries are the primary recipients of competing capital investment and skilled labour. While minerals are basic material for much manufacturing, the development of the basic metal industry has not slowed the

<sup>&</sup>lt;sup>16</sup> This section on the seventh plan is excerpted and modified from *Breaking New Ground*, p. 40.

decline in the relative share of mining any more than agro-processing has slowed down the decline in the share of agriculture.

# Impact of World Prices

Another source of difficulty for the mining sector arises from the decline in the prices of most minerals, driven by the discovery of new resources, substitution and the development of new mining technologies. Of the minerals mined in Thailand, tin has been most affected by these changes. The International Tin Council (ITC), whose purpose was to stabilize tin prices, collapsed in 1985, and the Thai tin-mining industry has been operating below capacity ever since. The relatively high production costs of Thai tin mines, due to low-grade and low-accessibility ore deposits, have further eroded the competitiveness of the Thai tin-mining industry in world markets.

The mining industry, with assistance from the DMR, has made relatively successful efforts to diversify its mining activities to minerals such as zinc and lead. However, the deposits of most of these secondary minerals are limited and of relatively low grade, although large areas of the country have yet to be explored. On the positive side, the domestic demand for mineral raw materials is expected to continue increasing, especially in the cement, glass, ceramics, zinc and tin industries, as well as in the area of power generation.

#### Increasing Domestic Consumption

As a result of the rapid growth of domestic downstream industries, the development of mineral resources has been directed toward more internal consumption. The growth of mineral exports has thus declined, and the growth of exported manufactured products and processed minerals has increased. One issue is whether to support calls for an export restriction policy on certain domestic minerals in order to prolong the domestic reserves and to avoid the need to import minerals and raw materials.<sup>17</sup>

The future development of Thailand's mineral industries will be influenced by the future state of the world economy. Substitution may cut into the markets for some of these materials, but at the same time, Thailand's own industries are beginning to consume increased volumes of raw material, whether they are producing for domestic consumption or for export. The value of domestic consumption of minerals grew by 12 per cent between 1983 and 1984 and by 104 per cent between 1984 and 1985. Most of these materials were used in the ceramic, glass, rubber, paint and paper product industries. Attached in Appendix C is a table of active mines by kind of minerals.

## 2.2.3 Structure of the Industry

The role of foreign exploration and mining companies has been limited due to the restrictions on alien ownership of mineral rights and land. See Appendix D for a summary of these restrictions. Under the Mining Council Act (1983), it is a condition

<sup>&</sup>lt;sup>17</sup> This section on structural changes is excerpted from D. Intarapavich, Q. Leepowpanth and T. Panayotou, *Mining, Environment, and Sustainable Land-Use: Meeting the Challenge*, Research Report No. 2 in the project "Industrializing Thailand and its Impact on the Environment", (Thailand Development Research Institute: Bangkok), 1990, p. 1-2.

of eligibility for exploration and mining rights that the holder be a member of the Mining Council. The present membership in the Council is as follows.

		Number of members
Ordinary members	(mining operations)	403
Associate members	(buyers of minerals)	336
Temporary members		4,087
Total		4,826

Major Thai mining operating companies are listed below.

Padaeng Industry Co., L	Ltd.
Major shareholder:	Ministry of Finance, 20 per cent
Operating business:	manufacturing of zinc ingots and zinc alloy
Kanjanaburi Exploration	n and Mining Co., Ltd. (Kemco)
Major shareholders:	Metallgesellschaft AG (FRG), 46 per cent
	Dr. Bhol Klipbua, 17 per cent
Operating business:	Exporting and manufacturing of lead and zinc concen-
	trates
Aokam Thai Limited	
Major shareholders:	Malaysia Mining Corporation BHD, 30 per cent
	The Crown Property Bureau, 15 per cent
	Siam Commercial Bank, 10 per cent
Operating business:	Manufacturing of tin ore products
Ban Pu Coal Co., Ltd.	
Major shareholders:	Vongkusolkit family
Operating business:	Manufacturing of nonferrous ore mining

The industry has responded to the increasing domestic demand from the domestic downstream industries. The growth in the construction sector demands large volumes of flat glass and cement, and the beverage and food industries' growth has generated an increasing demand for container glass.<sup>18</sup> Over the last few years, the ceramic and glass industry has created a higher demand for the related mineral raw materials, and the consumption of feldspar, kaolin, ball clay and glass sand have greatly increased.<sup>19</sup> Glass and ceramics are very important to the national economy. Most of the basic raw materials, such as glass sand, soda ash, gypsum, ball clay, kaolin, limestone, feldspar and quartz, used in both industries, are inexpensive and come from domestic sources.<sup>20</sup>

The cement industry is rapidly increasing due to expansion in the construction industry. At least five new cement plants will be entering the industry and will add to

<sup>&</sup>lt;sup>18</sup> Mineral Resource Development, p. 23.

<sup>19</sup> Ibid.

<sup>&</sup>lt;sup>20</sup> Breaking New Ground, p. 37.

the current capacity, while the existing major cement manufacturers were permitted to increase their capacity. The increase in cement production will of course increase the demand for limestone and gypsum.<sup>21</sup> The importance of limestone has increased proportionally and has been consumed entirely domestically.

Zinc is an integral material in the finished or semi-finished products of many industries, and domestic consumption of the metal has increased over time. Prior to 1985, Thailand had to import the zinc it required for domestic consumption, but when full production was begun by Padaeng Industry Co – the only Thai zinc producer – the quantity of imported zinc was substantially reduced. The zinc refinery at Tak was set up in 1984 and uses low-grade silicate/carbonate ores as feed material. Zinc produced in Thailand is provided first for the domestic market, then, after the country's industrial needs are met, the surplus will be exported. Zinc enjoyed an increase in production because of higher domestic consumption and the highly escalated price of zinc metal in the world market. Domestic zinc ore is processed to produce zinc metal and ingot for domestic consumption and export, while lead ore is totally exported to be refined abroad and shipped back as lead metal for domestic consumption. A portion of lead metal is available from scrap recycling, and recently, the new lead smelting plant treating lead carbonate in Kanchanaburi Province has been producing 12,000 metric tons per annum.<sup>22</sup>

Padaeng also has plans for a copper smelter, the final feasibility study for which will be completed in June 1991.<sup>23</sup> Padaeng also has plans for a second zinc smelter in cooperation with Metallgesellschaft AG and Lurgi GmbH of Germany.<sup>24</sup> The country's first and largest tin smelter was set up in 1965 in Phuket so that Thai miners could sell tin ore directly to the local smelter instead of shipping it to smelters abroad. Beneficiation plants were established around 1973 at several localities to upgrade fluorite ores, including a heavy media separation plant in Lampoon and flotation plants in Petchaburi and Krabi. A relatively large, modern underground mine was commenced by a Thai-German joint venture in 1979 to mine and beneficiate lead ore by flotation in Kanchanaburi.<sup>25</sup>

## 2.2.4 Government Policies in Relation to Minerals

Under the seventh plan, the government is planning to set the target areas for conserved forest of about 25 per cent of the total forest areas of the country, accelerate the distribution of land ownership by urging land reform in 30 million *rai* within 7 years, expedite the granting of land ownership documents by accelerating the issuance of land title deeds nationwide within 20 years and conserve coral reefs in all coastal national parks.

<sup>24</sup> Ibid., p. 37.

<sup>&</sup>lt;sup>21</sup> Leepowpanth, "Thailand", p. 95.

<sup>&</sup>lt;sup>22</sup> Mineral Resource Development, p. 23.

<sup>&</sup>lt;sup>23</sup> Breaking New Ground, p. 38.

<sup>&</sup>lt;sup>25</sup> Arbhabhirama, p. 129.

# 3. Geological Potential

Estimates of Thailand's reserves of minerals may be made on the basis of past production records and present knowledge.<sup>26</sup>

## 3.1 Description of the Geology

Mineral resources are found in most regions of the country, but the distribution of specific minerals varies greatly. In the southern provinces along the west coast, tin ore is found, usually in the form of alluvial deposits, which can be worked with simple extraction methods such as gravel pumping. Associated minerals, including tantalum and monazite, are also found in these areas. More complex types of tin ore are found in areas of the southeastern coast. Tin ore also occurs in lode deposits, necessitating the use of more advanced mining practices. A number of minerals, including tin and tungsten, are found in the west-central and northern regions, occurring in a variety of forms. The northeast region is rich in salt and potash, which have not yet been commercially exploited on a large scale.<sup>27</sup>

Metallic minerals	Total reserves (million metric tons)	Metallic minerals	Total reserves (million metric tons)
Copper	78.000	Tin	0.136
Iron	34.800	Tungsten	0.002
Lead	1.510	Zinc	3.777
Nonmetallic minerals		Nonmetallic minerals	
Barite	14.352	Glass sand	19.194
Coal	2,068.000	Gypsum	42.307
Diatomite	249.760	Kaolin	58.675
Dolomite	100.000	Limestone	5,474.000
Emery	0.020	Phosphate	0.234
Feldspar	43.010	Potash	407,000.000
Fluorite	5.299	Rock salt	18,000,000.000

## Known mineral reserves<sup>28</sup>

Source: Economic Geology Division, Department of Mineral Resources.

#### 3.2 Ability to Apply Geological Assessment Techniques

Thailand has a tropical monsoon climate, and fieldwork must be timed, at least in some areas, to avoid heavy rains. Some border areas can represent possible security problems for personnel.

<sup>28</sup> Mineral Resource Development, p. 31, the source of which was the Economic Geology Division, Department of Mineral Resources.

<sup>&</sup>lt;sup>26</sup> Ibid., p. 123.

<sup>&</sup>lt;sup>27</sup> Ibid., p. 126.

#### 3.3 Availability of Geoscientific Information

In Thailand, various branches of the government collect and maintain spatial information. While some private universities or companies occasionally carry out *ad hoc* surveys, most systematic spatial data collection is carried out under the auspices of one government agency or another.

#### Royal Thai Survey Department

By far, the military is the largest source of spatial information in the kingdom. The Royal Thai Survey Department is the section of the Royal Thai Army charged with creating base maps of the kingdom and thus is the producer of spatial information. The department's functions include ground and air surveys for map production, staff education, geodesy and geophysical research. It will also carry out *ad hoc* mapping projects at the request of other government agencies. Since its products are ordinarily used in the military, data security is a main concern for the department, especially in border areas. Consequently, its map products are not widely distributed. In terms of data updating, the department will normally update about 50 base maps a year, with emphasis given to sensitive areas or special projects. The department's main product is a map used as a basis for other maps: a base map. The entire kingdom is covered by base maps at a scale of 1:50,000.

## Department of Land Development (DLD)

The next largest holders of spatial information are those government agencies charged with managing the kingdom's natural resources: its soil, water, minerals and forests. In terms of data volume, the largest is the Department of Land Development within the Ministry of Agriculture and Cooperatives. By law, DLD is responsible for mapping soils, present land use and geomorphology, as well as formulating agricultural land-use plans for the entire kingdom. Another primary responsibility includes soil and water conservation. DLD also produces geomorphology maps at scales ranging from 1:1,000,000 on an *ad hoc* basis.

DLD has completed an inventory of soil over all of the kingdom at a scale of 1:50,000. It also has a large, comprehensive database with detailed information concerning the physical and chemical characteristics of each of the soils found in Thailand. The maps produced by DLD are fundamental to the formulation of provincial land-use plans. DLD's maps are available for purchase at a nominal cost. The DLD is presently improving its information by automating its soil map database and introducing image analysis facilities to accelerate its land-use mapping.

## The Department of Mineral Resources (DMR)

DMR is charged with mapping and evaluating all of Thailand's mineral resources. It acts as a geoscience technical centre, on a national and regional basis, to disseminate the information it has compiled to the public. DMR's 1:50,000-scale series of geological maps covers about 50 per cent of the country, with the remainder being mapped at a rapidly accelerating pace. The whole kingdom is covered by 1:250,000-scale maps. Hydrogeologic (groundwater) maps cover a portion of the country, usually where groundwater use is critical or where groundwater resources are plentiful. This informa-

tion has been developed into a comprehensive database made available to the general public. DMR has recently completed a nationwide magnetic survey with the aid of the Canadian Government; this is being made available at a scale of 1:50,000 as an aid to mineral exploration and evaluation.

In general, DMR normally limits distribution of its geological maps to other government agencies but will occasionally furnish maps to mineral exploration or mining companies cooperating with it.

#### The Royal Forestry Department (RFD)

RFD is responsible for information concerning the country's forests, forest reserves and national parks. It collects information through ground surveys and satellite image interpretation and is perhaps the foremost institute in the country in terms of production remote sensing work. RFD's forest reserve maps are an important source of information for land ownership, at least as far as private versus public land is concerned. While these are normally stored in log books or in the form of 1:250,000-scale maps, they can be transferred to the more widely available scale of 1:50,000. RFD will usually provide maps of forest reserve and forested land on official request.

## The Royal Irrigation Department

This department has data (climatic, daily rainfall, water flow, river levels and so on) in digital form, which is available to requesting agencies.

## National Research Council of Thailand (NRCT)

NRCT is the government agency responsible for remote sensing.<sup>29</sup> NRCT receives Landsat<sup>30</sup>, SPOT<sup>31</sup> and MOS-1 satellite images that are relevant to natural resources and environmental management. Within Thailand, Landsat Thematic Mapper (TM) and SPOT are widely used for land-use mapping, especially forested land, and as an aid in the assessment of natural disasters such as the landslide in southern Thailand in 1988.

#### Department of Land (DOL)

DOL is legally responsible for gathering cadastral information and recording it on large-scale maps (ranging from 1:1,000 to 1:10,000). DOL is responsible for maintaining the cadastre for all public and private nonforest reserve land in the kingdom.

<sup>&</sup>lt;sup>29</sup> Remote sensing is a technique of collecting information from a distance, in this case a satellite in orbit around the earth. Remotely sensed data, although spatial data when properly geocoded, are raw data and need to be interpreted.

<sup>&</sup>lt;sup>30</sup> Landsat-1 was the first non-military satellite launched by NASA and was designed to provide systematic global coverage of the earth's resources. A Thematic Mapper sensor was launched aboard Landsat-5 in 1984 and produces images that cover a swath 85 km wide, corresponding to scales of 1:50,000 on produced maps.

<sup>&</sup>lt;sup>31</sup> SPOT is a satellite programme begun by France in 1978; SPOT-1 was launched in February 1986. SPOT also produces images that usually cover a swath 60 km wide. The images produced are equivalent to 1:50,000-scale maps.

Specifically, its responsibilities include public land surveying, protecting public land, utilizing public land to benefit the government, land allocation, land parcel adjustment, issuance of land titles and land registrations, control of real estate business, as well as land and property evaluation. Thus, DOL is the country's primary land management agency, except for land defined as forest reserve.<sup>32</sup>

A comprehensive mineral resource inventory assessment programme has been in progress since June 1984. Largely funded by the Asian Development Bank and the Canadian International Development Agency, the project includes an airborne geophysical survey, which would cover the entire country by aerial survey to help in the preparation of aeromagnetic, radiometric and electromagnetic maps. An integrated database would then be available for both private and public sector uses. Unfortunately, the project never reached conclusion and is presently suspended.<sup>33</sup>

#### 3.4 Government Institutions

#### Ministry of Industry

The Ministry of Industry (MOI) is charged with formulating the country's industrial policy, measures and projects; promoting and developing industries; supervising and preventing industries from creating problems to the public as a whole; exploring and exploiting natural resources; and formulating industrial product standards.

#### Office of the National Environment Board

As a result of increasing public concern and a wish to create an organization that can effectively protect precious environmental resources, the Thai Government in 1975 promulgated the Improvement and Conservation of National Environmental Quality Act (A.D. 1975). This act, among other things, created the National Environment Board (NEB) and the Office of the National Environment Board (ONEB), an executive secretariat and the operational arm of the board.

#### Office of the National Economic and Social Development Board

According to the National Economic and Social Development Act of 1978, the main responsibilities of NESDB are to analyse and study the economic situation for presentation to the National Economic and Social Development Committee (NESDC) and to recommend economic development and stabilization policies.

#### **Royal Forest Department**

The Royal Forest Department was established in 1896 to be in charge of the teak forests previously owned by the feudal lords or princes of the North. The modernized form of administration was first introduced in 1940 and since 1942 has developed into

<sup>&</sup>lt;sup>32</sup> This section on availability of geoscientific information is excerpted and summarized from Paul Hastings and Chatchawan Boonraksa, *Integrated Information for Natural Resources Management*, Supplementary Report in the project "Industrializing Thailand and its Impact on the Environment", (Thailand Development Research Institute: Bangkok), 1990, p. 9-22.

<sup>&</sup>lt;sup>33</sup> Arbhabhirama, p. 125-126.

the present system. The organization of the Royal Forest Department now consists of central administration and provincial administration. Central administration is under the direct control of the director general and other respective controlling staffs. The provincial administration is directly responsible administratively to the provincial governors and answerable to the divisional forest officers in technical matters.

# Ministry of Agriculture and Cooperatives

The Office of the Permanent Secretary coordinates the activities of the various departments of the Ministry of Agriculture and Cooperatives. The rules and regulations of the ministry are enforced by this office, which includes the Aviation Service, the Royal Rainmaking Service, Agricultural Research, Agricultural Project Planning and Agricultural Information. It cooperates with agricultural organizations inside and outside the country and performs jobs that do not belong to any department.

The most important industry association concerned with mineral development is the Mining Industry Council (MIC), established by law in 1983. All holders of mining leases and mineral dealers are required by law to be members of the council. MIC's main duty is to perform functions for the benefit of members and the mining industry in general. It is responsible for resolving issues and problems impeding the industry's development with the government agencies on behalf of the operators. It also serves as a minerals advisor to the government.

The Offshore Mining Organization (OMO) was established in July 1975 to take over ownership of the offshore concession held by the former TEMCO company in areas off Phuket and Phangnga provinces. Presently, OMO operates its own tin dredge and at the same time hires private contractors to mine tin ore on its behalf.

EGAT conducts mining operations for lignite at its deposits at Mae Moh and Krabi. Because large quantities of lignite are required for fuel, especially at Mae Moh, EGAT employs modern equipment. The mine is regarded as one of the largest and most advanced operations in Asia.

The Phangnga Provincial Organization has played an important role since 1975 upon revocation of the TEMCO offshore tin concessions by the government. It has the authority to take tin ore from suction boats from certain designated areas within Phangnga. It also supervises and controls offshore tin dredging operations and sees to it that untoward activities do not occur.<sup>34</sup>

# 4. Marketing Potential

## 4.1 Export/Import Policies

Export policies have concentrated on generating foreign exchange and avoiding imbalances in the balance of trade. A number of government agencies are involved in export promotion.

<sup>&</sup>lt;sup>34</sup> Ibid., p. 141.

#### The Board of Investment (BOI)

BOI offers incentives of exemptions from income tax, import duties and business taxes. Further details on this subject are found in the section on investment promotion law in Appendix E.

#### Ministry of Finance (MOF)

MOF operates 2 main schemes to help exporters: tax drawbacks from the Customs Department, whereby exporters first pay the full amount of taxes or duties (customs, business, municipal and excise taxes inclusive) and obtain a refund from the Bank of Thailand or use a bank guarantee during importation; and tax rebates from the Fiscal Policy Office, whereby exporters pay taxes on input used in exported products by means of tax credit certificates.

## **Bonded Warehouse Facilities**

Producers engaged exclusively in manufacturing for export may set up bonded warehouses and import duty-free input for their export production.

#### Export Processing Zones (EPZ)

Location in an EPZ qualifies a producer for exemption from import duty and business taxes on factory construction materials, machinery, equipment, input needed for the manufacture of exports, export duties and value-added tax.

#### **Department of Export Promotion**

DEP provides information on potential buyers and markets and also provides relevant training.

#### 4.2 Regional Trade Agreements

#### Association of Southeast Asian Nations

As a member of the Association of South East Asian Nations (ASEAN), Thailand is committed to support cooperation with and give assistance in trade and economics to the other member nations and to maintain political stability in the region.

The six ASEAN members (Brunei, Indonesia, Malaysia, the Philippines, Singapore and Thailand) have formed a joint venture to mine and produce potash in Thailand at Bamnet Narong. The project will invest US \$289 million for a capacity of 1 million tons per year. It is expected to go onstream in 1996.<sup>35</sup>

The member nations of ASEAN have agreed to give one another trading preferences, both tariff and nontariff. The tariff preferences allow the reduction of duties paid on certain products. The nontariff preferences include long-term contracts, import barrier reductions and other advantages that will enhance regional trade.<sup>36</sup>

<sup>&</sup>lt;sup>35</sup> Leepowpanth, "Thailand", p. 96. "Baht 71 Million Raised for ASEAN Potash Project", *The Bangkok Post*, 14 February 1991.

<sup>&</sup>lt;sup>36</sup> Ibid.

In January 1992, the heads of the ASEAN governments met in Singapore to consider steps to adapt ASEAN to the current world situation, to be outlined in the Singapore Declaration. Implementation of these steps will increase the importance of ASEAN as a regional trading block.

In 1991, Thailand initiated steps to establish the ASEAN Free Trade Area, with the purpose to phase out within 15 years the import tariffs on products traded within ASEAN by applying the tariff reduction scheme known as the Common Effective Preferential Tariff (CEPT).

#### Asia-Pacific Economic Cooperation (APEC)

Recently, the Asia-Pacific Economic Cooperation was established to provide a mechanism for regional cooperation and promotion of multilateral trade liberalization to help less developed nations build economic strength. The formulation of an Asian-Pacific economic bloc should assist in dealing with the united European Common Market and the North American free trade agreements. The 6 ASEAN nations, as well as Australia, Canada, Japan, New Zealand, the Republic of Korea and the United States of America, formed APEC.<sup>37</sup>

## 5. Mineral Law

#### 5.1 Laws and Agreements Pertaining to Exploration and Mining

See Appendix F for a short description of business laws in Thailand and restrictions on aliens engaged in exploration and mining. See Appendix B for a listing of current mining legislation.

The government's goal is to promote and expand the development of mineral resources for the country's economic well-being. The principal law is the Minerals Act (1967), last amended in 1991 by Minerals Act No. 4. The act governs onshore and offshore exploration, mineral production, mineral trading, ore-dressing, transport and export of minerals. DMR is empowered to enforce all provisions of the Minerals Act and to issue and implement ministerial regulations. DMR also provides technical assistance in exploration, mining, mineral processing and metallurgical activities. It functions under the jurisdiction of the Ministry of Industry (MOI). Another law, the Mineral Royalty Rates (1966), prescribes the rates of royalties to be assessed for different kinds of minerals.

## 5.2 Major Features of Mineral Law

#### 5.2.1 Ownership of Minerals

A main concept behind the mining legislation of Thailand is that minerals are deemed to belong to the state and that no one can explore for minerals or undertake mining unless a prospecting license or mining lease is first obtained. Since minerals are nonrenewable natural resources, the country as a whole should benefit fully from their

<sup>&</sup>lt;sup>37</sup> Standard Chartered and Tilleke and Gibbins, Chapter 2, p. 23.

exploitation. The government is committed to the development of the mineral industry through the private sector.

#### 5.2.2 Exploration Rights

Before any prospecting can be undertaken, a prospecting license *(atchayabat)* must be obtained. There are three kinds of prospecting licenses that mining investors may apply for: the general prospecting license (GPL) the exclusive prospecting license (EPL) and the special prospecting license (SPL).

A GPL is a nonexclusive, nonrenewable license that is issued for one year by the Local Mineral Resources Office (LMRO). The license allows a mining company to conduct geophysical exploration of a specific area. There are also other provisions that govern the possession of minerals. No license holder may possess minerals of any type in excess of 2 kilograms without a license from DMR. Possession of a large quantity of minerals may be permitted for analysis purposes, but the quantity is not to exceed the stated limit in the GPL. Current practice is to allow 10 kilograms for each type of mineral.

An EPL contains basically the same conditions as a GPL, with the exception that an EPL gives an investor an exclusive right to explore for any kind of minerals in the area covered by the license. It is also nontransferable and valid for a period of one year but can be renewed for another like period. Investors must comply with the following: exploration must begin within 60 days after an EPL is issued; an exploration report must be filed with LMRO within 180 days after the receipt of the EPL; and the final exploration report must be filed 30 days before the expiration date of the EPL. In 1989, MOI stipulated that the maximum exploration area that may be granted is 1,250 rai (two grid blocks), and the area would be issued to one entity in one province. An investor must submit a workplan and a description of exploration methods, and both must be endorsed by a qualified geologist or mining engineer recognized by DMR. The maximum area that may be granted for offshore exploration under MOI's new policy is 20,000 rai. For an area larger than 20,000 rai, it is possible to submit an SPL application, but the applicant must offer special benefits to the government.

An SPL has a lifespan of three years and is renewable for another two years. The exploration area that may be granted under an SPL may not exceed 10,000 rai. An application for an SPL must include a workplan and an estimate of expenses for each year for the whole project, as well as an offer of special benefits to the government. The prospector must commence exploration within 90 days of the issuance of the SPL. A progress report to DMR must be submitted within 120 days of receiving a license. The SPL is suitable for large projects entailing high-value minerals or substantial investment capital, and also when the applicant requires more time or a larger area for exploration. The prospector may relinquish areas he no longer wishes to prospect.<sup>38</sup>

<sup>&</sup>lt;sup>38</sup> Sections 25-42 of the Minerals Act (1967) as amended by Minerals Act No. 2 and Minerals Act No. 3.

Each SPL applicant must describe a special benefit to the Thai Government in the application. The SPL holders can enjoy a large area to explore and a long duration period.

On 19 July 1988, DMR issued two regulations on procedures for EPL, GPL, SPL and ML application, renewal and transfer. These regulations are treated as guidelines and mandates for DMR officials and the applicants to comply with.

## Access to Land: Determining Land Open for Exploration

There are some categories of reserved areas that have been declared closed to exploration/mining activities by cabinet resolutions. These include wildlife reserve areas, national parks areas, first-class forest areas of the northern region and areas reserved for security purposes. The first three categories are administered by the Royal Forest Department, while the fourth comes under the control of the Ministry of Defense.<sup>39</sup>

Approximately 40 per cent of the total land area is forest reserve, of which 15 per cent is conservation forest and 25 per cent is economic forest. Any activities, including mining, in conservation forest areas are strictly prohibited, and several restrictions apply to mining activities in economic forest areas. Because the other areas in the country are classified as urban areas, water bodies and areas for settlement programmes, only small, site-specific areas are available for mining. The policy to reclassify the country's forest area, if approved by the government, will increase the total area of conservation forest to 20 per cent of the country's total area and reduce the total area of economic forest to 20 per cent of the total land area.<sup>40</sup>

Region	Number of concessions	Percentage concession area out of total area in the region
Total	2,206	0.10
Northern	530	0.08
Central	629	0.07
Eastern	78	0.07
Northeastern	38	0.02
Southern	931	0.30

Mining concession areas classified by region, 1989

The operating concession areas classified by type of minerals for the years 1981, 1983 and 1989 have not increased much during the last decade, and for some minerals such as gypsum and iron, the areas are even smaller. Tin mining accounts for most of the concession area (more than 50 per cent), while limestone and lignite occupy a much smaller but still substantial area of land.

<sup>&</sup>lt;sup>39</sup> Arbhabhirama, p. 140.

<sup>&</sup>lt;sup>40</sup> Mineral Resource Development, p. 52.

Mineral	1981	1983	1989
Total operating concession area	189,980 rai	231,920 rai	264,380 rai
	(Unit: percentage of total cor	ncession area)	
Tin	50.6	52.5	51.6
Limestone	2.8	5.5	6.1
Gypsum	2.0	1.6	1.1
Iron ore	1.7	0.4	0.6
Kaolin	1.5	0.9	2.7
Lignite	1.4	2.1	4.8
Feldspar	1.1	1.4	3.1
Shale	0.7	1.4	1.3
Glass sand	0.3	0.3	0.3
Ball clay	0.1	0.1	0.5
Zinc	0.0	0.0	0.1
Others	37.8	33.8	27.8

## Operating concession areas classified by type of minerals<sup>41</sup>

In an effort to preserve the country's forests, a government resolution for watershed classification in May 1985 prescribed that with no exception, all development activity would be prohibited in forest areas classified as category 1A; watershed category 1B was subject to government approval on a case-by-case basis; and mining was allowed to operate in reserved categories from 2 to 5.<sup>42</sup> Currently, it has become even more complicated and more difficult to obtain permission to operate a mine in any category of reserved forest because of the revocation of forest concessions countrywide in January 1989. The revocation of forest concessions resulted in a reclassification of the country's forests, which are now pending classification as national parks, wildlife reserves, economic forests and land reform zones. Because the process of land reclassification is ongoing, all mining applications are now pending. A total of 99 mining applications – both new applications and license renewals – are still pending in 27 provinces, and approximately 95 per cent of the areas of these pending cases are located in national forest reserves.<sup>43</sup> Despite this, the country's newspapers have reported that

<sup>41</sup> Ibid., p. 54-55.

43 Ibid.

<sup>&</sup>lt;sup>42</sup> Mineral Resource Development, p. 61. Watershed Class 1 refers to protected forest (conservation forest). Both Class 1A and 1B are areas of protected forest and headwater source areas, but the areas in Class 1A still remain under permanent forest cover, while for Class 1B, portions of the area have already been cleared for agricultural use or are occupied by villages.

Watershed Class 2 refers to commercial forests.

Watershed Class 3 refers to fruit tree plantations.

Watershed Class 4 refers to upland farming.

Watershed Class 5 refers to lowland farming.

8 companies and individuals have recently obtained exploration licenses for mineral resources in 6 national parks.<sup>44</sup>

#### Access to Land: Land Ownership

Ownership of land is governed by the Land Code (1954), the Civil and Commercial Code, the Land Reform for Agriculture Act (1975) and regulations as set forth by the Ministry of the Interior. Under Thai law, aliens may own land only if a treaty has been entered into between Thailand and their country or if permission is granted by the Ministry of the Interior. Presently, there are no such treaties between Thailand and any other country; the Treaty of Amity and Economic Relations between the United States and Thailand does not allow foreign ownership of land.

Generally speaking, the Ministry of Interior will give permission for aliens to own land on the following conditions: they have received permission from the Board of Investment to own land and carry out promoted activities; they have a factory within the approved government industrial estates; they are in the petroleum business; or they hold minority shares in a company that has a need to own land such as a hotel or resort.

Though ownership of land is difficult, foreigners can freely lease land and construct and own buildings on leased land. In the case where a majority Thai company is formed to carry on business and occupy a piece of land, the foreigner as the minority shareholder must make sure he is protected with minority shareholder protection clauses under the shareholders' agreement and the company's articles of association. In recent years, the increase in joint venture partners created in order to buy land has greatly concerned the Thai Government. Many of these companies were formed for the purpose of land speculation and therefore have tried to circumvent the provisions of land ownership under the Land Code by forming a joint venture with 49 per cent of the shares as foreign and 51 per cent held by nominee Thai nationals. However, under Section 74 of the Land Code, the Land Department has the power to investigate any land purchase that it feels is a scheme to evade Thai law.<sup>45</sup>

#### Acquiring Surface Rights to Land

Before applying for a mining lease, it is necessary for the applicant to acquire the surface rights to the land from the public or private owner, as the case may be. Negotiation with a private land owner is concluded by purchase or lease. A lease agreement may have a duration of up to 30 years and must be registered with the Land Department. In practice, it is often difficult to determine who owns or has possessory rights to the land. In case the land is owned by the government, a permit issued by the Forestry Department is required to be submitted along with the application for a mining

<sup>&</sup>lt;sup>44</sup> Apisak Dhanasettakorn, "Approval of Mining Certificate Raises Questions of Precedents," The Nation, 11 March 1991;

\_\_\_\_\_, "50 Mining Projects in Reserves Approved," The Nation, 28 March 1991; "Forest Mining Approved," The Nation, 7 March 1991; and "Cabinet Nod for Mining in Ore-Rich Forest Lands", Bangkok Post, 12 June 1991.

<sup>&</sup>lt;sup>45</sup> Hummel and Sethsathira, p. 134-135.

lease before a lease is granted. In the event the application is for an area in a forestry zone, a power of attorney shall be arranged by the applicant to authorize the officials of DMR to file for an application for entry to make use of or to inhabit the forestry zone, together with a bank guarantee as a security for payment of forestry fees, which must be deposited in accordance with the regulations of the Royal Forest Department.

## 5.2.3 Security of Tenure

One factor that is often cited as an impediment to the mining industry's development is the lack of "security of tenure." The existing legal system does not expressly guarantee that the holder of an exploration license will be granted a mining lease if he makes a commercial discovery. The government bureaucracy and the limited scope of the mining laws are not the sole causes of the inability to assure a right to mine over prospected land; the conflicts and restrictions from other authorities as well as subsequent land-use conflicts complicate the issuing of rights.<sup>46</sup>

# 5.2.4 Mining Rights

Upon discovery of a commercial mineral deposit, a prospector must apply for a mining lease (*prathanabat*) in order to mine. Although there is no guarantee of being granted a mining lease, the prospector holding an EPL or SPL has first priority. A mining lease may cover an area of not more than 300 rai onshore and 50,000 rai offshore. An applicant may apply for more than one mining lease in an onshore area. A mining lease has a duration of not more than 25 years and may not be transferred or subleased without the approval of MOI. Pending the approval of the mining lease, a prospector may apply for a nontransferable temporary mining lease that is valid for one year.<sup>47</sup>

An applicant for a mining lease must provide:<sup>48</sup> a map showing the area to be mined, evidence of financial capital, a workplan, evidence showing acquisition of surface land rights, evidence of technological ability (tools, equipment, machinery) and an environmental impact assessment (EIA).

DMR has published guidelines for determining the minimum amount of capital required. Presently, evidence of financial capital may be shown by a letter of confirmation issued by a bank.

An applicant who declares that he has his own machinery and equipment necessary for use in mining may produce the evidence of ownership and value thereof for deduction from the amount of money evidence of which the mining lease applicant is required to show as financial capital, provided the deduction does not exceed 50 per cent of the amount designated.<sup>49</sup>

<sup>&</sup>lt;sup>46</sup> Mineral Resource Development, p. 16.

<sup>&</sup>lt;sup>47</sup> Minerals Act (1967), Sections 43 to 88.

<sup>&</sup>lt;sup>48</sup> Ministerial Requirement No. 19, amended by Ministerial Regulation No. 69, issued under the Minerals Act (1967).

<sup>&</sup>lt;sup>49</sup> Regulations of DMR on Procedures for Mining Lease, Renewal or Transfer (1988).

## Special Rules for Offshore Mining

In August 1978, the cabinet passed two resolutions concerning offshore mining of minerals at depths not exceeding 200 feet. The resolutions can be summarized as follows.

\* Known Deposits

After the expiration of the maximum mining lease period of 25 years, the foreign mining lease holder may apply for a new mining lease to work an old deposit, provided that it realigns its equity interests so that Thai nationals hold at least 60 per cent of the total equity interest in the venture.

\* Unknown Deposits

A company with foreign shareholders may apply for a mining lease to exploit a new deposit offshore, provided that Thai nationals hold at least 51 per cent of the equity interest initially, to be increased to 60 per cent within 2 years.

The above resolutions constitute administrative guidelines to be followed by DMR in its consideration of whether or not to grant or renew an offshore mining lease.<sup>50</sup>

#### Other Approvals Required

#### Land-Use Approval

In addition to the DMR requirements, approval must also be sought from the Ministry of Agriculture and Co-operatives for the right to explore for and mine minerals in forest areas, under the National Reserved Forest Act of 1964. Under a set of conditions and for certain fees, the Ministry of Agriculture and Co-operatives and the Royal Forest Department will consider granting the right to individuals or entities to conduct exploration and/or mining operations in reserved forest areas.<sup>51</sup>

#### Purchase of Minerals

Any person who wishes to purchase minerals in the course of business must obtain a license from DMR. A purchasing license is valid only until 31 December of the year the license was issued. The holder of a purchasing license may not purchase minerals at any place other than the place specified in the purchasing license. Purchasing minerals outside the specified place of purchase requires an external purchasing license, which will be valid for the same period as the purchasing license. A holder of a purchasing license must keep accounts of minerals bought and sold and minerals still on hand.<sup>52</sup>

## Transportation and Storage of Minerals

The transportation of a mineral is possible only if the mineral royalty is paid. For most minerals, an ore transport license must accompany the transporting vehicle to the

<sup>&</sup>lt;sup>50</sup> International Legal Counsellors of Thailand, *Thailand Business Legal Handbook*, 1987; Hummel and Sethsathira, p. 115.

<sup>&</sup>lt;sup>51</sup> Arbhabhirama, p. 140.

<sup>&</sup>lt;sup>52</sup> Section 92, Minerals Act (1967).

destination stated in the license. However, minerals such as fluorite, barite, gypsum, coal and gemstones require no ore transport license after the royalty is paid. Any person who wishes to store minerals outside the mining area or outside the place of purchase must also obtain a storage license. This license is valid until 31 December of the year of issuance.

## Ore Dressing

Except for the holder of a mining lease or of a temporary mining license, no one can undertake ore dressing operations without a license.

## **Export-Import Policies on Minerals**

The import of mineral and metal of any kind, with the exception of tin in excess of 2 kilograms, does not come under the provisions of the Minerals Act, regardless of quantity. The Minerals Act, however, governs export of the following minerals: tin ore in excess of 50 grams; gold ore, in any amount; copper ore, zinc ore and iron ore in excess of 2 kg each; and minerals with columbium, tantalum and thorium, or other radioactive contents, in any amount.<sup>53</sup>

## Alien Business License

DMR has a policy not to grant mineral rights to aliens (including companies in which ownership by aliens exceeds 49 per cent). However, it is possible that DMR would grant a mineral right to an alien company under a special agreement or an alien company promoted by the Board of Investment. In such case, an alien company would require an alien business license under category C 2(8) of the Alien Business Law (see Appendix E).

## Mining Council Membership

The Mining Council was established by the Mining Council Act (1983). The council comprises members who are mining operators, including those involved in exploration and trading. At present, any person wishing to apply for a mining right is required to be a member of the Mining Council first.<sup>54</sup>

## 5.2.5 Ownership and Control

See Appendix E for restrictions on aliens carrying on mining business.

## 5.3 Administrative Efficiency

One characteristic of the Thai bureaucracy that causes it to stand out from other bureaucracies is the divided nature of Thai administration. Government agencies in

<sup>&</sup>lt;sup>53</sup> Ministerial Regulation No. 24, issued under the Minerals Act (1967).

<sup>&</sup>lt;sup>54</sup> "The role of the Mining Council is mainly to act as a representative of the mining industry and a quasi-government regulated organization. As part of their role, the Council coordinates with the government to solve various problems concerning the industry. The Council also holds several seminars and conferences each year to promote and develop the industry." Hummel and Sethsathira, 116.

Thailand are divided into ministries, departments and bureaus, each of which are separate juristic entities having independent contracting powers. Thus, the Ministry of Industry is a separate legal entity from the Department of Mineral Resources, which answers to it administratively. Even though DMR is only one among many departments within MOI, it can enter into contracts with a private party independent of the ministry. For example, DMR can engage contractors to construct or repair buildings, purchase supplies and engage in consulting services. The director general, as the head of the department, is the signatory to contracts. The question of whether the department or the director general has the power to conclude contracts and the parameters within which this power can be exercised is governed by the law on public administration.

Each government agency is only concerned with administering its own law, even though that law may contradict other laws or may be inconsistent with national policy. This fact poses a major problem for the mineral industry in that DMR is not the agency that has the final say on whether or not an exploration or mining venture can be conducted. The ultimate decision may rest with the Environmental Agency or with the Forestry Department, if it happens to control the land on which the mining is to be conducted.

Foreign investors often believe that once having signed a contract with DMR and having paid the bonus, they may then proceed with the exploration and development work. In reality, the contract is only a grant of mineral rights, subject to negotiation with the other agencies concerned, and there is no guarantee that investors will be given all necessary approvals in the end. All acts of parliament have the same standing under the law. The Forestry Act and the Mineral Act are equal. Therefore, DMR and the Forest Department are of equal legal status, in the sense that neither can tell the other what to do. There is no "super-agency" to conciliate differences and impose its decision on conflicting agencies.

Policies issued by the heads of various ministries and departments are the real modus operandi for the government officials, and the failure of the officers to comply with the policies may result in disciplinary action. These policies are internal directives and are not known to the public. As one looks through the various statutes in Thailand, one finds many provisions giving wide discretionary powers to permanent officials responsible for administering the law.<sup>55</sup>

Anything categorized as a "special payment" should be scrutinized. Differentiating between valid payments and those that are not is a delicate issue. It is advisable to employ able personnel who can deal with such matters. They will know the system and can assist in the processing of forms and transactions. The personnel should have good communication skills and personal contacts, as well as an ability to communicate effectively in Thai.

<sup>&</sup>lt;sup>55</sup> Jayanadh Bunnag, "Thailand's Mineral Resources Crisis – A Legal Practitioner's Viewpoint," Bangkok Post, 5 November 1991.

# 6. The Fiscal Regime

# 6.1 Description of Major Taxes

The major taxes applicable to the mining business are company income tax, mineral royalties and value-added tax.

## Company Income Tax

A company earning revenues from the mining business is liable to pay company income tax under the Revenue Code. The present rate is 30 per cent. Dividend payments to overseas shareholders are generally subject to a withholding tax of 10 per cent. Expenses incurred for the sole purpose of carrying on the business may be deducted.

Depreciation of assets may be deducted as a business expense but must be done on an annual basis. Official prescribed rates of depreciation are 5 per cent for permanent buildings, 100 per cent for temporary buildings, 5 per cent for depletable natural resources, 10 per cent for lease rights with no fixed termination date and 20 per cent for other property.

Losses may be carried forward for five consecutive years.

# Mineral Royalties

Mining lease holders must pay royalties to the government according to the Mineral Royalty Rates Act (1966).

Royalties are paid based on the value of the minerals extracted, except in the case of gem mining, whereby the royalty is based on the size and the value of the land covered in the mining lease.

# Royalty Rates<sup>56</sup>

Royalty rates on tin, tungsten, lead and zinc are levied on sliding progressive scales. Tin royalty shall not exceed 30 per cent of the DMR posted price.

Tin ore price (baht over 60 kg)	Royalty rate (per cent)	Lead ore royalty (baht per metric ton)	Royalty rate (per cent)
0- 3,000	0	0 - 8,000	2
3,001- 6,000	20	8,001 - 12,000	5
6,001- 9,000	25	12,001 - 20,000	10
9,001 - 12,000	30	20,000 up	15
12,001-15,000	35		
15,001 up	40		

(Continued)

<sup>&</sup>lt;sup>56</sup> Ministerial Regulation No. 25, (1981) issued under the Mineral Royalty Rates Act (1966).

Tungsten ore price (baht)	Royalty rate (per cent)	Zinc royalty (baht per metric ton)	Royalty rate (per cent)
0 - 3,000	0.1	0-10,000	2
3,001 - 4,000	5.0	10,001 - 20,000	5
4,001 - 5,000	10.0	20,001 - 30,000	10
5,001 - 6,000	15.0	30,000 up <sup>57</sup>	
6,001 up	20.0		

Examples of royalty rates on other minerals are:

Antimony	
-ore	10 per cent
-crudum	10 per cent
Barite	-
-crudum	7 per cent
-ore	2 per cent
Feldspar	
-crudum	4 per cent
-ore	2 per cent
Fluorite	
-metallurgical grade	7 per cent
-acid grade	4 per cent
Gypsum	4 per cent
Most decorative stones	4 per cent

## Value-Added Tax

Effective 1 January 1992, the value-added tax (VAT) replaced the existing business tax system. Under VAT, there are three assessment rates. Mining companies or entities are deemed to be "traders", meaning all persons who sell goods, render services or import goods and services, and thus are subject to VAT at the usual rate of 7 per cent. However, a 0 per cent VAT rate applies to exports of minerals by mineral traders who are normally subject to VAT at 7 per cent. This is to bolster to export sector of the economy. VAT payable is calculated from the difference between input tax (VAT paid by the mining trader to persons who sell goods or services) and output tax (VAT collected by the mining trader from persons who purchase goods or services). Mineral traders have to register for VAT before they may issue tax invoices. Registered traders also must maintain an output tax report, an input tax report and a goods and raw materials report.<sup>58</sup>

#### Schedule of Fees under the Minerals Act<sup>59</sup>

The following are some of the fees fixed for the different mining licenses.

<sup>57</sup> Ministerial Regulation No. 23, issued under the Mineral Royalty Rates Act (1966).

<sup>&</sup>lt;sup>58</sup> Chandler and Thong-Ek, Value-Added Tax and Specific Business Tax, (Nithitham Publishing House: Bangkok), 1991.

<sup>&</sup>lt;sup>59</sup> Ministerial Regulations No. 45, (1980) issued under the Minerals Act (1967).

General Prospecting License	100
Exclusive Prospecting License	500
Special Prospecting License	1,000
Provisional Mining Lease	1,000
Mining Lease and Renewal Thereof (Rai Per Year)	1,000
Mineral Transport License	20
Mineral Purchasing License	1,000
and License to Purchase Elsewhere	1,000
Mineral Dressing and Renewal Thereof	1,000
Metalwork Operation License	1,000
Mineral Import License	500
Mineral Export License	500
Fees for Use of Land	
a) under EPL. SPL per rai per vear	5
b) mining lease or provisional mining lease	
i) tin mining per rai per vear	5
ii) other minerals per rai per vear	20
Joint Mining License	200
Mining Cessation License	200

Baht

There are other applicable fees to conduct analysis determining the content of the minerals or mineral ores.

## 6.2 Tax Treaties with Other Nations

Currently, Thailand has double tax treaties with 25 countries, as follows: Australia, Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, Hungary, India, Indonesia, Italy, Japan, Malaysia, the Netherlands, Norway, Pakistan, the Philippines, Poland, the Republic of Korea, Singapore, Sri Lanka, Sweden and the United Kingdom.<sup>60</sup>

# **BOI** Promotional Incentives

See Appendix E for a description of investment incentives available to the mining industry under the Investment Promotion Act.

# 7. Monetary Controls and Access to Capital

## 7.1 Monetary Controls

## Foreign Exchange

Exchange control transactions are governed by the Exchange Control Act (1942), by ministerial regulations and by notifications of the Bank of Thailand made thereunder.

Thailand is a member of the International Monetary Fund. In 1991, the government decided to allow free transfer and conversion of any holding of currency acquired by nonresidents through the process of world market free trade under Article 8 of IMF.

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<sup>&</sup>lt;sup>60</sup> Baker and Mackenzie, p. 145-148.

## Importation and Repatriation of Investment Funds

Importation: Importation of investment funds can be made freely in unlimited amounts; however, such foreign currency must, within 15 days of inward remittances, be either converted into Thai baht or deposited in a foreign currency account with commercial banks in Thailand, of which a maximum total balance of all such accounts per person per day shall not exceed US \$500,000 for a natural person or US \$5.0 million for a juristic person.

Repatriation: As a general rule, the approval of the Bank of Thailand is not required to purchase and remit foreign exchange for any purpose. Discretion to approve most transactions has been delegated to the commercial banks. Standardized procedures have been established for obtaining permission to repatriate or remit foreign currency. Evidence of the purpose of remittance is usually required, along with other relevant documentation. A recent change now allows remittances for repatriation of investment funds accompanied by documentary evidence to be freely sent or taken out of the country. Generally, commercial bank authorization for remittances can be given when the investor provides the appropriate documentation for the following: profits and dividends after all taxes and reserve requirements have been paid; proceeds from the sale of shares; repayment of offshore loan principal and/or interest; payment of a business; and capital surplus to the requirements of a business revenue.

#### Exchange Controls on Business Transactions

Imports: There are no longer any restrictions on the remittance of foreign exchange in payment for imported goods, regardless of the amount or method of payment. Opening letters of credit to pay for the cost of goods requires no permission, although authorized banks have to report opening any letters of credit to BOT. However, BOT must be informed about remittances for payments of imported goods for amounts exceeding US \$20,000, with formalities remaining unchanged. For payment of costs of imports, the importer may also ask to purchase or withdraw foreign currency from his deposit account to pay for the value of the imports. In selling foreign currency to pay for the cost of the imports, an authorized bank must require the importer to submit documentary evidence.

Exports: Export proceeds must be collected and brought into Thailand within 180 days of the date of the receipt of the proceeds. The foreign currency proceeds must be converted into Thai baht with an authorized agent or deposited into a foreign currency deposit account with a commercial bank in Thailand within 15 days of the date of receipt.<sup>61</sup>

#### 7.2 Access to Capital

It is not easy for mining companies to raise capital from the local capital market because there is no way to provide security to lenders. Rights under mining leases and to ore reserves may not be mortgaged.

<sup>&</sup>lt;sup>61</sup> Standard Chartered and Tilleke and Gibbins, Chapter 5, p. 12-14.

# 8. Environment

# 8.1 Legal requirements for environmental protection

# The Minerals Act

Specific ministerial regulations have been issued under the Minerals Act (1967) to govern the impact of mining activities on the environment. Some examples are given below.

- \* Ministerial Regulation No. 9 (1970) prescribes safety regulations to protect workers of a mining, ore-dressing or metallurgical operation. Within the safety regulations, specific requirements are provided regarding use of machinery, boilers, electricity, explosives, dredgers, excavators and underground mining.
- \* Ministerial Regulation No. 10 (1970) prescribes standards of water pollution that mining operations have to observe.
- \* Ministerial Regulation No. 25 provides for rules and processes of ore-dressing and metallurgy that may or must be made. Ore-dressing and metallurgical operators must conduct their operations according to the flow sheets and processes they have specified to the Local Mineral Resources Office.
- \* Ministerial Regulation No. 50 prescribes methods for providing protection to workers and safety to third persons.

# The NEB Act

The Improvement and Conservation of National Environment Quality Act (1975), as amended, is administered by the National Environment Board (NEB). Under the provisions of this act, mining operations of any type and size require prior approval by NEB, based on the submission of an environmental impact assessment (EIA). The EIA report must be prepared by an authorized entity approved by the NEB office. The EIA must include a description of the present environmental conditions; a description of the proposed project; assessment of possible environmental damage; a proposal for a mitigation programme; and a proposal for a monitoring programme to be conducted by the project proponent.

Before a mining lease is issued, the EIA must be approved by NEB. The environmental protection measures that the miner must observe are written into the lease agreement and become subject to the Minerals Act. The mining inspectors in local offices are responsible for ensuring that the miner complies with the provisions of the lease agreement. The Environmental Section of DMR's Mining Technology Division carries out periodic inspections and provides technical advice to local inspectors and miners, but it has no authority over mining investors or to enforce compliance. Generally, the mining inspectors do not effectively police environmental protection conditions, and the limited staff finds it difficult to adequately cover all mine sites. Another factor that makes enforcement difficult is the schedule of penalties set out in the Minerals Act for dealing with miners who ignore lease agreement requirements or contravene the Minerals Act. The penalties are out of date and, as a result, nominal. In a dispute, DMR still has the option of ordering a miner to cease all operations, but this is a measure that is rarely used in practice, and in any event, it is not effective in forcing reclamation if the miner has already completed mining operations.<sup>62</sup>

# The Forest Reserves Act

The Forest Reserves Act provides for regulations concerning the delineation of forest reserves in Thailand according to the categories described above in the section on land access. Refer also to the section on land-use approval.

## **Occupational Safety Laws**

The Ministry of Interior has issued several notifications that provide for safety measures to be adopted for construction sites, use of machinery, chemical handling, electricity and the work environment.<sup>63</sup>

For offshore mining at certain sites in Phuket, apart from the submission of an environmental impact assessment report, seawater standards have been set, covering turbidity, suspended solids, temperature, dissolved oxygen and so on, for recreation and coral preservation purposes.<sup>64</sup>

In 1981, the government announced a ministerial regulation to collect a special fee from tin miners that would be equal to 5 per cent of the royalty the miners paid to the Department of Mineral Resources. Of that 5 per cent, 50 per cent was awarded to the provinces where mining is located, 25 per cent was set aside for the suppression of mineral smuggling and the remaining 25 per cent was used for a rehabilitation programme aimed at the restoration of the environmental erosion caused by mining. The collection of the special fee was suspended in late 1985 in response to the collapse of the LME tin market, and it has not been resumed since.

The government projects that have been initiated concerning the environment are as follows (all projects are for damages from tin mining).

- \* From 1983 to 1985, the acquisition of mechanical services from DMR was initiated for the rehabilitation of mined-out areas.
- \* The rehabilitation of mined-out land at Bangrin village in Ranong Province was completed in 1988. The project demonstrated that the mined-out areas caused by gravel pumping could be restored for planting different kinds of trees with satisfactory results.
- \* The design and construction of a device to be attached to an offshore dredge. The purpose of the device was to control and prevent the dispersion of slime during mining operations by the Asian Institute of Technology research team.

<sup>&</sup>lt;sup>62</sup> World Bank Energy Sector/UNDP and National Economic and Social Development Board, *Thailand's Coal Development and Utilization Study*, 1989, p. 62 and 63.

<sup>&</sup>lt;sup>63</sup> Notifications of the MOI (1976), (1977) and (1981).

<sup>&</sup>lt;sup>64</sup> Arbhabhirama, p. 140.

The project was completed in 1988 and adopted for use on the dredge, as required by ONEB and DMR.

- \* The rehabilitation and utilization of mined-out land and the creation of a fast-growing plantation forest at Bang-Mang, Takuapa District in Phangnga Province was completed in 1988. The project was supervised by the forestry faculty from Kasetsart University.
- \* The rehabilitation of a large area of mined land to create a public park at Vichit village in Phuket Province was supervised and implemented by DMR and was also completed in 1988.
- \* A project designed to expand the use of fast-growing trees and soil cover revegetation to reclaim mined land in Tai-Muang District in Phangnga Province is currently underway under the supervision of the Land Development Department. The project was started in 1983.

In addition, the government has mandated that suction boat dredges (when suction pipes are bigger than 14 inches) must now be equipped with slime suppression pipes for offshore mining of tin or else they will not be allowed in a mining area. This measure is aimed at eliminating slime water dispersion, particularly on the surface of seawater.

A rehabilitation project carried out by the Electricity Generating Authority of Thailand is the lignite mine reclamation at both the Mae Moh Mine in Lampang Province and the Krabi Mine in Krabi Province. Experimental rehabilitation exercises to study soil conditions were performed as part of the reclamation programme. The project enables EGAT to understand, fairly well in advance, what kinds of trees and plants should be grown following mining in that area. A mine reclamation plan was prepared for both the Mae Moh and Krabi Mines, and a fund was collected for every ton of lignite product.

Apart from this EGAT project, the only other major rehabilitation project is being carried out by a private company dealing with environmental problems for a lignite mine in Li District of Lampoon Province. The Li project is converting a mined-out area into a terrace-type landscape to grow trees for various purposes. Elsewhere, the mining community pays less attention to environmental problems, even though the rehabilitation of mined-out areas has been mandated by law. In the mining scheme submitted for approval to DMR, the mine operator usually promises to prevent environmental degradation, to protect the environment as much as possible and to rehabilitate mined land so that it is as near the former condition as possible. However, because of insufficient law enforcement, in practice, little or no effort has been expended to implement these promised changes, and several pits or holes have been left untouched. Some mined areas, especially hydraulic mines, are so eroded that great efforts are needed to restore them to a useful condition.

Between 1972 and 1978, many mining concessions expired, and some parts of the remaining land areas were reserved. Most of these areas are publicly operated; the rest are divided between private and nontitled properties. As of the end of 1987, approximately 128,000 rai of expired mining lands were left to be rehabilitated, which will cost

the government approximately 3,600 million baht, based on the cost per rai of the Bangrin Project in Ranong Province, which is indicative of the minimum rehabilitation costs. In normal practice, the mined land must be rehabilitated for agriculture and other uses. However, some of the mined land area may have been converted to titled land through cooperation of the concerned parties, thereby depriving the government of the chance to distribute such land to needy farmers. Private land areas could be turned into orchards, plantations or even rice fields after mining, but there is little that the government could do to improve private land that still belongs to the owners. Thus, land rehabilitation efforts will become a major factor for inducing support from other agencies for the development of mineral resources in reserved or restricted areas of Thailand.<sup>65</sup>

#### 8.2 Environmental Trends

There is a growing awareness in Thailand of the detrimental effects of mining without adequate protection for the environment. Thailand's recent track record in environmental control for mining, specifically in the requirement for submission of an environmental impact assessment together with mitigation measures, is notable compared to other developing countries.<sup>66</sup> Nevertheless, there are problems of inadequate enforcement and bureaucracy that reduce the benefits of effective measures.

## 9. Labour Services and Labour Market

#### Major Labour Laws

The major governing laws are the Labour Relations Act (1975); National Executive Council Announcement No. 103, Civil and Commercial Code Sections 574-586 regarding the hire of service; and the Aliens Working Act (1978).

The Labour Relations Act (1975) sets out the procedures for presentation of demands, negotiations between the employer and employee, mediation by the Labour Department and arbitration by a labour relations committee.<sup>67</sup>

## Labour Costs

It is estimated that labour costs in Thailand are as follows.

Туре	Weighted Average Per Month (Baht)
Unskilled	3,000
Semiskilled	5,000
Technician	11,250
Management	25,00068

<sup>65</sup> This section on rehabilitation is excerpted from *Mineral Resource Development*, 49-51.

<sup>66</sup> "Thailand Joins Meet on Impact from Mining," *The Nation*, 10 August 1991. "Favourable Image Projected at Meet on Mining Damage," *Bangkok Post*, 13 August 1991.

<sup>67</sup> American Chamber of Commerce, The Human Resources Handbook, 1991, p. 6.

<sup>68</sup> Standard Chartered and Tilleke and Gibbins, Chapter 3, p. 7.

## Hiring, Firing and Negotiating Wages

The minimum wage in effect from 1 April 1991 is baht 100 per day for all employees (except certain agricultural workers and employees as the minister may prescribe) employed in the Bangkok metropolis and six other provinces, namely, Nonthaburi, Pathum Thani, Samut Prakan, Samut Sakorn, Nakhon Pathom and Phuket provinces. The minimum wage is baht 93 in Ranong and Phangnga; baht 88 in Chon Buri, Saraburi, Nakhon Ratchasima and Chiang Mai Provinces; and baht 82 everywhere else in the kingdom.<sup>69</sup>

Notice of termination must be given by at least one prior pay-period, so long as it does not exceed 3 months, unless a shorter period has been agreed upon. An employee may be dismissed immediately, if remuneration (including severance pay) is paid up to the expiration of the notice. Termination without cause may be considered as an unfair labour practice under the act establishing Labour Court procedures. The Labour Court has the power to order the employer to re-employ the terminated employee and to fix an amount of compensation to be paid to the terminated employee, in addition to the severance pay.

## Constraints on Use of Expatriate Staff

Aliens working in Thailand are subject to a number of laws, including the Immigration Act providing for various types of visas and the Aliens Working Act (1977) providing for work permits and banning certain occupations to aliens. If one's employer is a company promoted by BOI under the Investment Promotion Act or is in a position to obtain letters of support from a government department or agency, it is possible to speed up the process of visa and work permit applications.

Under the Immigration Act, an alien who comes into Thailand to work or do business must apply for a nonimmigrant visa. The Aliens Working Act requires that an alien who wants to work in Thailand must obtain a work permit. If the intended occupation of the alien is not among the occupations restricted exclusively to Thai nationals, an application for a work permit can be made personally or the employer can apply on the alien's behalf. A letter of employment, plus documents outlining staff (including number of Thais and aliens, capitalization, registration certificate) and other documents are required by the Labour Department.<sup>70</sup> Assuming an alien has academic qualifications and experience, and there is a reasonable need for his or her employment, a work permit will be issued in due course.

## Strength of Labour Unions

The Thai organized labour movement was fragmented and fractionalized even before legislation removed state enterprises from the Labour Relations Act and dissolved unions in the state enterprise sector in April 1991. Thailand has had one of the lowest levels of unionization in the region, with under 3 per cent of its industrial workforce unionized. In 1990, the number of registered union members grew by 7 per

<sup>69</sup> AMCHAM, p. 22-23.

<sup>&</sup>lt;sup>70</sup> Ibid., p. 33-34.

cent, while the number of registered unions grew from 562 to 732. Prior to the 1991 change of government, union strength was concentrated in the state enterprise sector, accounting for more than half of total union membership and most of the largest and strongest unions. Private sector organization progressed only marginally, due to a number of legal and cultural factors that discourage further organization in private firms, such as the traditionally paternalistic relationships between employers and employees.

The strongest single labour organization had been the State Enterprise Labour Relations Group, a loose coalition of unions. There are four other formal labour federations competing for leadership of the labour movement: the Labour Congress of Thailand, the Thai Trade Union Congress, the National Congress of Thai Labour and the National Free Labour League. In addition, there are 3 less well-established groups. They are the Thai Industries Union Congress, a union for metalworkers; the National State Enterprise Labour Congress (TOT); and another congress that applied for registration in March 1991.<sup>71</sup>

# Labour Trends

The Thai labour market has recently demonstrated imbalances that threaten to slow economic growth. These include a serious lack of qualified Thai engineers, technicians and middle managers. This shortage is likely to persist through the mid-1990s. Additionally, shortages of unskilled labour in the retail and manufacturing sectors have led some observers to foresee more serious labour shortages in sectors previously characterized by a labour surplus. Overcentralization of investment in the Bangkok area and the city's declining ability to absorb new migrants have aggravated the problem. Two types of labour shortage exist in Thailand.

- \* Engineers, scientists and researchers are simply not available, as the educational system in Thailand is not producing enough graduates in these professions to meet demand.
- \* Technicians and skilled labour are available but are not usually up to the standard required by employers. They need training and therefore are not immediately available.

Employers compete to attract and retain qualified employees. "Brain drain" has long existed in Thailand but has recently become widespread, with executive recruitment becoming a big problem for some companies. The reasons for the current labour shortage in these areas are as follows.

- \* The rapid expansion of manufacturing creates the need for labour. Workers, absorbed from the agricultural sector and moving to the manufacturing sector, take time to be taught and to adjust to the new work environment. Skilled technical labour takes additional time and investment to bring up to standard.
- \* National education remains inconsistent with changes in the labour market.

<sup>&</sup>lt;sup>71</sup> Ibid., p. 2.

In some fields, there are more professionals than needed, while in other areas, there is an insufficient supply of trained staff. The limitations of schools' personnel and their budgets are only partly to blame. Many employees are not working in jobs that reflect their educational backgrounds.

\* Many young people, seeing the benefits of education, choose to continue their education instead of entering the labour market.<sup>72</sup>

Following the military coup of 23 February 1991, the National Legislative Assembly voted to remove state enterprises from protection under the Labour Relations Act of 1975 and to dissolve unions in the state enterprise sector. Employees of state enterprises now have the right to form "associations" instead. The powers of these associations are more limited in scope than unions. A number of international labour organizations have condemned this action,<sup>73</sup> but it appears to have been accepted by those concerned in Thailand.

# 10. Conclusion

# 10.1 Attractive Minerals Investment Conditions<sup>74</sup>

- \* Thailand has a high degree of political and social stability. The frequent changes in government have little impact on the business environment or the power of the civil service. In the case of the mining industry, almost all decisions are made by the civil service. The only important exception is that the signature of the Minister of Industry is required for the issue of mining leases and EPLs.
- \* Thailand has a well-balanced economy. Thailand has abundant and diversified natural resources, from agriculture to petroleum and minerals. There has been exceptional growth since 1987, and indications are that the growth rate will continue to remain one of the highest in the Asian-Pacific region in this decade. A favourable currency alignment is another investment advantage. The country's conservative monetary and fiscal policies ensure financial stability, despite economic slowdowns in other parts of the world. The economy is resilient and has shown itself to be dynamic. Thailand's domestic industries and domestic markets are expanding.
- \* Thailand is a favourable location for export-oriented manufacturing and assembly businesses because of its inexpensive labour resources, abundant natural resources, government commitment to promote private business ventures, the current revamping of laws relating to the economy, BOI incentives and geographical location. Solutions are being implemented to correct infrastructure problems. The implementation of the seventh plan will also improve existing investment conditions and systematize procedures.

<sup>&</sup>lt;sup>72</sup> Ibid., p. 38

<sup>&</sup>lt;sup>73</sup> Ibid., p. 2.

<sup>&</sup>lt;sup>74</sup> This section on attractive conditions is adapted from Standard Chartered and Tilleke and Gibbins, p. 26-27.

- \* Thailand has favourable export performance in both goods and services. The transition from an import substitution economy to an export-dominated economy has led to an increase in the value of manufactured goods and also a diversity of export products.
- \* Thailand has a high quality, cost-competitive and reliable workforce. Unskilled labour is fairly abundant in the country at competitive costs.

# 10.2 Special Problems Faced by the Thai Mineral Industry

- \* There is a perception of inconsistency in enforcement and non-coordination in the granting of mining rights, especially on the part of foreigners who do not read the Thai language or who may fail to completely inform themselves about local law and procedures.
- \* The maze of approvals and applications to be submitted to various departments can be confusing and frustrating. "The byzantine world of mining concessions also entails various steps of verification and approval from several departments in a very time-consuming process."<sup>75</sup> In our opinion, sufficient legislation and guidelines are available to intelligently plan most mineral exploration and development projects. The uncertainties in the issuing of necessary approvals and permits are similar to those encountered in other developed or developing countries.
- \* The competing objectives of different government agencies and the absence of effective coordination mechanisms frustrate mineral exploration and development. "Wherever they are found, the discovery of mineral deposits can lead to potential conflicts with other important land uses, including agriculture, forestry, water resource development, fisheries, environmental protection and tourism. With different government objectives, some degree of friction is almost guaranteed, and the issue of whether minerals should be exploited in reserved areas – and if so, how – is likely to become more pressing."<sup>76</sup> We believe these comments are familiar to those in many other developing countries where society places value on land ownership and environmental values.
- \* In the past, during periods of high prices, there were instances of illegal mining and smuggling. Illegal mining of offshore tin in Phangnga, of wolf-ram ore at Khao Soon (in Nakhon Si Tammarat) or Doi Ngom (in Phrae), of scheelite ore at Doi Mok (in Chiang Mai) and of antimony ore at Chonburi have adversely affected rights of holders of mining rights. DMR does not have the budget and manpower to protect holders of mining rights in the face of certain community action, and it is often difficult to enlist the aid of police or other authorities.
- \* Fluctuating world prices and mineral substitutions pose the same problems for the Thai mining industry as in other countries.

<sup>75</sup> Breaking New Ground, p. 39.

<sup>&</sup>lt;sup>76</sup> Arbhabhirama, p. 141.

\* New environmental factors and land-use conflicts are an increasing problem.

The land-use conflicts between mineral resource users and other sectors have become a major source of difficulty for the mining industry. The government, under pressure from strong environmental advocates, the media and the general public, has resisted repeated requests from the mining industry to allow mining, at least in the economic forests and unclassified forest reserves. The mining industry has argued that minerals occur only in specific geological settings; the sites for mineral extraction cannot be freely chosen. Some 98 per cent of the pending mining applications are in national forest reserves, and the pending area of mining concession, while large for the industry, is less than 1 per cent of these national reserves and is negligibly small for the country. Environmental advocates argue, however, that while the area actually mined is small, the environmental impact extends to areas that are several times larger.<sup>77</sup>

In the case of mineral rights issued in forest areas, there is often a mismatch between the duration of forest department approvals (initially, only 5 years, subject to renewal) and mining rights (up to 25 years, in the case of a mining lease). Large areas of land in the kingdom are effectively off-limits for the mining industry. These include large military reserves, in addition to forest reserves and areas of private land ownership (unless rights to use the land can be privately negotiated).

- \* There is a complete absence of any form of exploration right for the large areas necessary to justify modern exploration programmes. The MOI policy of June 1989, the DMR policy of confining boundaries of EPLs to grid-blocks and the restrictive DMR policies on issue of SPLs, together constitute a serious disincentive to exploration.
- \* Inadequate infrastructure and a shortage of utilities (electricity, water) pose operational problems in some areas.
- \* Skilled labour shortage (as discussed in the labour section).

# 10.3 Recommendations for Improvements

- \* The arbitrary restrictions on issue of exploration rights should be immediately corrected. Specific reference is made to the MOI policy of June 1989 and the DMR policy limiting the boundaries of EPLs to grid-blocks.
- \* The maximum size of SPLs should be substantially increased, and the procedures for issue of SPLs should be simplified in order to encourage modern exploration techniques. In addition, the government should authorize the signing of mining agreements (similar to the Indonesian contract of work or the Thai potash agreements) as an alternative to SPLs.
- \* DMR should be encouraged to require its officers to comply with the time schedules prescribed in its internal regulations for processing applications for mineral rights.
- \* DMR should make the existing data and maps more easily available to the mining industry.

<sup>&</sup>lt;sup>77</sup> Mineral Resource Development, p. 3-4.

- \* In putting prospects up for tender, DMR should recognize the fact that it cannot, in most cases, deliver surface rights or ensure the approval of environmental authorities. The front-end payments required in recent tenders and negotiations have deterred investment by major international mining companies.
- \* A Thai miners' environmental fund might be established. Such a fund would be composed of a land reclamation bond and a forest protection bond. Both bonds would be refundable upon the miner's fulfilment of the terms and conditions of environmentally sound mining.
- \* The mining industry needs to conduct its operations in a way to better satisfy environmental concerns. A good public relations campaign (similar to those of the oil industry) might be an important step toward putting environmental problems in a better perspective.
- \* A number of authorities have the view that the government needs to formulate a clear minerals policy and a more systematic approach for the development of Thailand's mineral wealth. The mineral industry is too often unsystematic when carrying out exploration and production activities because its current structure places a considerable premium on producing profits as fast as possible. Given a more systematic approach, it is likely that mining operations would become more efficient, while any environmental impact could be identified at an early stage and properly managed. national minerals policy should be developed on the basis of an improved understanding of the available mineral reserves and should aim to maximize the ultimate national benefits to be had from the exploitation of the country's valuable, nonrenewable mineral resources. Coordination among the various agencies for licensing, a clear method of resolving land-use conflicts and the formulation of a government policy on whether to restrict exports in order to meet rising domestic consumption are needed.<sup>78</sup> We consider such a recommendation to be somewhat academic and not practical in the context of Thailand.
- \* A number of authorities argue that the system of granting exploration licenses needs to provide more assurance to miners that they will be granted mining rights in case of discoveries and that they will be free to extract and sell their mineral production. We do not have any specific suggestion how to provide such additional assurance.
- \* The government should encourage exploration by the private sector by sponsoring research and development of mining technology and skill training for labour.

# Limitations of this Study

This report is not complete in important respects. Much of the relevant material is in the Thai language and scattered among many government agencies. Certain government agencies do not respond to requests for information. Much of the existing literature on mining investment conditions is somewhat shallow or academic in content.

<sup>78</sup> Arbhabhirama, p. 143.



Appendix A. Economic growth: 1970-1992 (GDP at 1972 prices)

Sources: National Economic and Social Development Board and Thailand Development Research Institute.

# Appendix B. Current Thai Mineral Legislation

(excluding petroleum)

 MINERALS ACT, B.E. 2510 (Amended up to Minerals Act (No. 4) B.E. 2534 and Royal Proclamation (No. 2) B.E. 2528)

Ministerial Regulations (No. 70 is latest issued in November 1991). Details as per Appendix B (1).

Notifications, various (latest issued in April 1991)

Internal DMR Regulation re: procedures for ML application, renewal and transfer and Regulation re: procedures for application for atchayabat, dated 19 July 1988 and their amendments.

2. MINERAL ROYALTY RATES ACT, B.E. 2509 (Amended up to Mineral Royalty Rates Act (No. 3) B.E. 2522)

Ministerial Regulations (No. 44 is latest issued in August 1990). Details as per Appendix B (2).

3. TIN CONTROL, B.E. 2514

Royal Decrees (Amended up to November 1986)

Ministerial Regulations (No. 10 is latest issued in June 1985). Details as per Appendix B (3).

Notifications, various (latest issued in August 1987)

 ROYAL DECREE ESTABLISHING OFFSHORE MINING ORGANIZA-TION, B.E. 2518 (Amended up to Royal Decree (No. 2) B.E. 2527)

Regulations of Offshore Mining Organization (No. 23 is latest issued in 1984). Details as per Appendix B (4).

- 5. MINING COUNCIL ACT, B.E. 2526 and Regulation
- 6. REVENUE CODE The following are royal decrees, ministerial regulations and notifications issued under the Revenue Code and relating to minerals:

# Royal Decrees

- 1. No. 161 (8 November 1985) Re: Exemption of stamp duty to an engaged person to exploration of minerals under a contract with government agency.
- 2. No. 162 (8 November 1985) Re: Exemption of business tax to gross receipts from being engaged in exploration of minerals under a contract with government agency.

3. No. 177 (14 August 1986) Re: Exemption of income tax to the revenue received from the sale of tin to juristic companies or partnerships in certain cases.

#### Ministerial Regulation

1. No. 171 (19 September 1986) Re: Exemption of income tax to the revenue for the sale of tin as from 1 January 1988 and the dividends or shares of profit computed from the revenue received from the sale of tin.

#### Notifications

- 1. No. 42 (21 June 1991) Re: Reduction of rate of business tax on exported tin or ores for a period of one year from 4 June 1991.
- 2. No. 43 (10 November 1987) Re: Reduction of rate of business tax on exported lead or lead ores for a period of one year from 4 June 1991.
- 3. No. 44 (27 June 1991) Re: Reduction of rates of business tax on wolfram and celite or wolfram and celite exported.
| M.R. | B.E.        | Subject  |  |  |  |
|------|-------------|--|--|--|--|
| No.  |             | -<br>-   |  |  |  |
| 3    | 2511 (1968) | Identity card of the competent official  |  |  |  |
| 9    | 2513 (1970) | Safety regulations   |  |  |  |
| 10   | 2513 (1970) | Water pollution  |  |  |  |
| 11   | 2513 (1970) | Employment, register and working hours records   |  |  |  |
| 13   | 2513 (1970) | Kinds and quantities of other mineral admixtures by nature prohibited from removal by any mineral removal licens holders   |  |  |  |
| 19   | 2516 (1973) | Qualification of applicants for atchayabat, prathanabat and<br>licenses, and rules, procedures and conditions in submitting<br>applications for same                         |  |  |  |
| 20   | 2516 (1973) | Survey of prospecting license, exclusive prospecting license or prathanabat  |  |  |  |
| 21   | 2516 (1973) | List of decorative rocks, industrial rocks, industrial earths and industrial sand  |  |  |  |
| 23   | 2516 (1973) | Kinds of minerals, localities, method of individual mining<br>and the rules governing the issue, suspension and revocation<br>of individual mining licenses to be determined |  |  |  |
| 24   | 2516 (1973) | Kinds, conditions and quantities of minerals under import and export control   |  |  |  |
| 25   | 2517 (1974) | Rules and processes of ore-dressing and metallurgy   |  |  |  |
| 26   | 2517 (1974) | Control of metallurgical operations  |  |  |  |
| 27   | 2517 (1974) | Printed forms of atchayabat, provisional prathanabat, prathanabat and other licenses   |  |  |  |
| 28   | 2517 (1974) | Rules and methods relating to mineral prospecting under atchayabat, mineral conservation and mining  |  |  |  |
| 29   | 2517 (1974) | Rules and procedures to the purchase, sale, storing, possession and transport of minerals  |  |  |  |
| 31   | 2520 (1977) | Amended M.R. No. 21 - type of industrial rocks   |  |  |  |
| 37   | 2522 (1979) | Establishment of provincial mineral resource offices   |  |  |  |
| 38   | 2522 (1979) | Amended M.R. No. 23 - kinds of minerals and localities for which a license can be issued to individual mining concerns   |  |  |  |
| 39   | 2522 (1979) | Amended M.R. No. 24 - kinds of minerals, condition and quantity to be minerals under import control  |  |  |  |
| 40   | 2522 (1979) | Amended M.R. No. 27 - revised Form 5 (Mining Lease)  |  |  |  |
| 42   | 2522 (1979) | Procedure for sublease prathanabat and cancellation of submining lease   |  |  |  |
| 43   | 2522 (1979) | List of percentage per weight of minerals can be removed by<br>the mineral removal license holder  |  |  |  |
| 44   | 2523 (1980) | Amended M.R. No. 29 - rules and procedures to be complied with by the licensee to transport minerals   |  |  |  |

# Appendix B (1). Index to ministerial regulations (M.R.) issued under the Minerals Act, B.E. 2510 (effective)

M.R. No.	B.E.	Subject			
45	2523 (1980)	Schedule of fees			
46	2523 (1980)	Procedures and rates fixed for refundable royalty			
48	2524 (1981)	Amended M.R. No. 23 - localities where the tin panning license will be issued			
49	2524 (1981)	Conditions and rates of special subscription to be paid by the holders of provisional prathanabat or prathanabat			
50	2525 (1982)	Amended M.R. No. 9 - method of providing protection to workers and safety to third persons			
51	2525 (1982)	Amended M.R. No. 37 - establishment of provincial minera resources offices			
52	2526 (1983)	Amended M.R. No. 19 - qualification of applicant for license			
53	2526 (1983)	Obstacles because of which the holder of prathanabat ca apply for cessation of mining			
54	2526 (1983)	Procedures and methods for the holder of provisional prathanabat or prathanabat or the mineral purchase license to defer payment of mineral royalty			
55	2527 (1984)	Amended M.R. No. 27 - license for mineral sale an transport			
56	2527 (1984)	Amended M.R. No. 45 - fee for the application of mineration transport license			
57	2528 (1985)	Amended M.R. No. 45 - mining cessation fee			
58	2528 (1985)	Amended M.R. No. 21 - types of decorative stones			
59	2528 (1985)	Amended M.R. No. 49 - reduction of the rate of speci contributions and the area for allocation of the speci contributions			
60	2528 (1985)	Bases, procedures, conditions and rates of mineral royal refundable to the mineral consumer			
61	2528 (1985)	Amended M.R. No. 49 - mineral royalty tariff exempted f special contributions			
62	2529 (1986)	Methods of sale or distribution of property or goods			
63	2529 (1986)	Fee for use of land and mining cessation			
64	2530 (1987)	The qualifications of the applicants for special licen temporary mining lease and mining lease for gold			
65	2530 (1987)	Amended M.R. No. 21 - decorative stones			
66	2531 (1988)	Amended M.R. No. 21 - perlite shall be industrial rock			
67	2531 (1988)	Amended M.R. No. 37 - establishment of a provinc mineral office in Loei Province			
68	2532 (1989)	Amended M.R. No. 21 - phyllite shall be industrial rock			
69	2534 (1991)	Amended M.R. No. 19 - evidence for applying for exclus prospecting atchayabat			
70	2534 (1991)	Amended M.R. No. 28 - methods of mineral prospecting			

# Appendix B (1). (Continued)

# Appendix B (2). Index to effective ministerial regulations (M.R.) issued under the Mineral Royalty Rates Act, B.E. 2509

M.R. No.	B.E.	Subject
6	2514 (1971)	Method of fixing market prices for minerals, rate of foreign exchange and controlling the payment of mineral royalties
15	2520 (1977)	Amended M.R. No. 6 - method of fixing market price for tin ore
17	2521 (1978)	Amended M.R. No. 6 - method of fixing market price for gem minerals
19	2522 (1979)	Amended M.R. No. 6 - method of fixing the rate of foreign exchange for the purpose of determining the market prices of minerals
21	2522 (1979)	Method of assessment of gem minerals and royalty rates to be collected for gem minerals
22	2523 (1980)	Amended M.R. No. 6 - method of fixing market prices for ore containing tungstic oxide, silver ore, combination of tantalite and columbite ores, slag containing columbium pentoxide or tantalum pentoxide or a combination of both and method of controlling the payment of mineral royalties
23	2523 (1980)	Schedule of royalty rates for mineral ore, metal and slag
24	2523 (1980)	Amended M.R. No. 6 - method of fixing market price for slag containing columbium pentoxide or tantalum pentoxide or a combination of both
25	2524 (1981)	Amended M.R. No. 23 - schedule of royalty rates for tin ores
26	2526 (1983)	Amended M.R. No. 23 - royalty rates for feldspar
27	2526 (1983)	Amended M.R. No. 27 - royalty rates for tin
28	2526 (1983)	Amended M.R. No. 23 - royalty rates for garnet and lukocine
29	2528 (1985)	Amended M.R. No. 23 - royalty rates for feldspar, kaolin and other decorative stones
30	2528 (1985)	Amended M.R. No. 23 - royalty rates for tin
31	2528 (1985)	Amended M.R. No. 6 - method of fixing price for tin ore
32	2528 (1985)	Amended M.R. No. 6 - method of fixing price for ore with tungstic oxide content
33	2529 (1986)	Amended M.R. No. 23 - rate of royalty for ore with a tungstic oxide content
34	2529 (1986)	Amended M.R. No. 6 - the procedure for fixing the market price of tin
35	2529 (1986)	Amended M.R. No. 23 - the adjustment of royalty for lead or zinc
36	2529 (1986)	Amended M.R. No. 6 - the procedure to control the payment of royalty for lead and zinc
37	2530 (1987)	Amended M.R. No. 23 - royalty rate of limestone for the chemical industry

M.R. No.	B.E.	Subject				
38	2530 (1987)	Amended M.R. No. 23 - royalty rate of lead and zinc				
39	2530 (1987)	Amended M.R. No. 6 - market price of silver, zinc and lead				
40	2530 (1987)	Amended M.R. No. 23 - royalty for pulverized barite				
41	2530 (1987)	Amended M.R. No. 23 - royalty rate for slate, dickite, pacodite and soapstone				
42	2532 (1989)	Amended M.R. No. 23 - royalty rate for perlite				
43	2532 (1989)	Amended M.R. No. 23 - royalty rate for phyllite				
44	2533 (1990)	Amended M.R. No. 23 - royalty rate for bentonite				

# Appendix B (2). (Continued)

# Appendix B (3). Ministerial regulations issued under the Tin Control Act (effective)

No.	B.E.	Subject
2	2514 (1971)	Rates and bases for collection of money in lieu of minerals for remittance to the international buffer stock
3	2514 (1971)	Form of buffer stock document
4	2514 (1971)	Bases and procedures for transferring or pledging the rights of claim under the buffer stock document
5	2516 (1973)	Form of mineral certificate
6	2519 (1976)	Amended M.R. No. 2 - rate of tin ore and tin metal
7	2523 (1980)	Type of minerals that are not minerals under the Tin Control Act
8	2526 (1983)	Amended M.R. No. 2 - cash or bank guarantee for the amount that has to be remitted to the buffer stock
9	2526 (1983)	Amended M.R. No. 2 - rate for collection of money in lieu of minerals for remittance to the international buffer stock
10	2528 (1985)	Amended M.R. No. 2 - cash or bank guarantee for the amount that has to be remitted to the buffer stock

Note: The Ministerial Regulations not shown in this list have been repealed,

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Anthracite	1	1	1	1	1	1	1	1	1	1
Antimony	39	32	40	46	48	44	37	27	18	18
Ball clay	3	3	6	6	7	13	15	13	16	17
Barite	49	52	56	51	44	31	25	16	9	10
Bentonite	x	x	x	x	1	_	_	_	3	1
Calcite	2	2	2	3	4	1	_	_	1	2
Chromite	_	-	1	2	2	2	3	2	-	_
Diatomite	1	1	1	ĩ	2	2	2	วิ	3	3
Dolomite	1	5	6	6	7	7	7	8	8	10
Emery	r v	, v	v	v	,	1	1	1	-	-
Feldsnar	21	22	25	28	29	34	35	44	41	41
Fire clay	21	25	25	20	2)	24	1	1	1	1
Fluorite	66	63	61	64	61	62	48	43	34	22
Gemetones	32	22	28	26	32	13	21	20	28	29
Glass sand	8	14	20	18	18	22	21	20	16	15
Gold	v	17 Y	20 X	10 V	10 V	22 X	2.5 V	20 X	1	12
Granite	x	x	x	x	4	20	25	25	32	34
Graphite	1	1	1	1	_					
Gynsum	13	18	20	21	19	21	22	24	25	25
Iron	6	4	-5	7	8	10	10	8	7	7
Kaolin	29	27	38	42	44	55	54	53	47	44
Lead	11	10	13	13	14	11	11	10	8	8
Lignite	10	13	13	17	20	21	23	25	17	14
Limestone	11	17	23	25	26	29	33	32	27	27
Magnesite	х	1	1	1	1	1	_		_	_
Manganese	11	16	16	18	15	14	13	10	7	8
Marble	11	21	36	43	44	47	51	57	57	58
Marl	7	_		_	_	2	6	7	7	6
Molybdenum	х	x	1	1	]	1	_	_	-	_
Ornamental stone	х	х	x	х	х	х	х	3	5	5
Phosphate	9	11	12	16	16	14	11	11	7	6
Pyrophyllite	4	7	11	11	9	10	7	6	5	5
Quartz	1	3	3	4	7	8	8	9	7	8
Rock salt	1	3	1	1	1	2	2	3	2	2
Scheelite	6	5	5	4	6	6	4	3	2	2
Shale	5	5	5	5	5	6	5	5	5	5
Talc	5	7	8	8	6	6	6	5	4	4
Tin*	762	735	720	696	623	448	334	259	167	155
Wolfram	18	16	15	10	7	8	9	6	5	4
Zinc	_	1	1	1	1	1	1	1	1	1
Zircon	-	-	1	1	3	3	3	2	2	1
Total	1,149	1,152	1,199	1,201	1,139	979	857	782	626	611

# Appendix C. Number of active mines by kind of minerals

1991 (March).\* Including Tin-Tungsten Mines.Data from Department of Mineral Resources.

No.	Year	Subject		
6	1975	Method of payment		
8	1975	Method and procedure of procurement		
9	1975	Method and procedure of employment		
14	1976	Bases for opening a bank account and withdrawing money		
16	1976	Assigning an officer to perform specific affairs on behalf of the managing director of an offshore mining organization		

# Appendix D. Regulation of offshore mining organizations

*Note:* The regulations omitted from the list are regulations governing internal administrative affairs of an offshore mining organization and were not published in the government gazette.

# Appendix E. Doing Business in Thailand

#### (including restrictions on aliens in the mining business)

A foreign lawyer looking at a project or transaction in Thailand for the first time will find a legal framework and administrative practices that satisfactorily govern most business transactions. The role of the law, lawyers and the judiciary in Thailand has been long established. It is a system within which most foreign and local investors can operate comfortably with a high degree of confidence in consistent interpretation and enforcement of the law.

The modern Thai legal system is long established, dating from the reign of King Chulalongkorn in 1868. The Ministry of Justice was established in 1892. The Thai Bar Association was established in 1914. Its members presently number some 25,000, including judges, prosecutors, practicing lawyers, professors and others. There is an independent judiciary that provides a forum for fair settlement of disputes. A great deal of status is attached to being a judge, and the examinations to enter the judiciary are very difficult. The judiciary jealously guards its independence. Government agencies may be sued in the courts and cannot raise a defense of sovereign immunity or the like.

There is a Thai civil service that administers laws and regulations with a high degree of consistency and is largely free from political influences. Few if any decisions in a normal business transaction or investment project require going above the civil service for a political decision.

There are four basic codes: the Civil and Commercial Code, the Criminal Code, the Civil Procedure Code and the Criminal Procedure Code. In adopting these codes early in this century, Thailand selected features of the two Western legal systems (common law and civil law) and adapted to circumstances in Thailand provisions drawn from foreign systems. Decisions and rulings of the judiciary and civil service have considerable force as precedents. In addition, there are hundreds of special laws and regulations governing most activity, many of them drafted and implemented with the assistance of international legal advisors. The legal and accounting professions are regulated under professional licensing systems, which encourage high standards of service.

For the Western businessman, there are available reliable English translations of most laws and regulations. Competent translation services are readily available. Although Thai is the language of the courts, most contracts between private parties may be executed in English or other foreign languages and may be governed by foreign law.

#### General Laws Governing Doing Business

Investors may carry on business in Thailand as sole proprietorships, partnerships, private limited companies or public limited companies. In addition, joint ventures and branches of foreign corporations may be used in some cases. Foreign investors, like domestic investors, must comply with the general business laws of Thailand. The principal laws include the following.

#### Thai Companies Law

The most popular form of business organization for any major project is the private limited company. Thai companies law is found in sections 1096 to 1273 of the Thai Civil and Commercial Code. Formerly, there was no distinction made in the code between "private" and "public" companies, and companies registered under this law are still eligible to be listed on the Securities Exchange of Thailand.

A Thai limited company may be formed within approximately 30 days. After reserving the name and filing a memorandum of association, a statutory meeting is held at which articles of association are adopted, promoters' actions are ratified, shares are allotted and initial directors and auditors are appointed. Payment of a minimum of 25 per cent of registered capital must be made. Under Thai practice, all shares must be issued and each share must be at least 25 per cent paid up in cash or property. There is no equivalent of "authorized but unissued" shares or treasury stock. The registered capital of a Thai limited company may be increased by special resolution of the shareholders.

In 1978, the Public Companies Act was enacted. As a result of arbitrary and impractical share ownership restrictions and other provisions, very few public limited companies have been registered. A new Public Companies Act was enacted in early 1992.

#### Revenue Code

The Revenue Code prescribes the company income tax on net profits at a flat rate of 30 per cent. Usual business deductions and depreciation allowances at rates ranging from 5 to 20 per cent are allowed in calculating net profits. Accelerated depreciation methods are allowed. Returns are filed 150 days after the end of each fiscal year, together with audited financial statements and payment of tax due as calculated by the taxpayer. A six-month return, together with estimated tax, is required to be filed within two months after mid-year.

A major tax applicable in the past to companies carrying on business in Thailand was the business tax, which was a tax on gross receipts. It was replaced effective 1 January 1992 by a 7 per cent value-added tax.

A withholding tax at rates up to 15 per cent is payable on many forms of outward remittances such as dividends (10 per cent), royalties (15 per cent) and other forms of income paid to companies not doing business in Thailand. Interest paid to foreign banks or financial institutions is taxed at a flat 10 per cent, subject to some exceptions.

The Revenue Code also provides for a personal income tax at rates ranging from 5 to 37 per cent. Every person, resident or nonresident, who derives assessable income from employment or business carried on in Thailand is subject to personal income tax, whether his income is paid in or outside of Thailand. Standard deductions and personal exemptions are allowed.

Thailand has double tax treaties with 25 countries, and these treaties provide relief from double taxation on certain forms of income. There is no double tax treaty with the United States of America.

#### Labour Law

Thailand has a comprehensive set of labour regulations contained in numerous announcements and notifications issued under NEC Announcement 103 of 16 March 1972. The Labour Relations Act of 1975 governs labour relations problems. These notifications deal with such subjects as work hours, holidays, leaves of absence, female and child labour, wages and overtime, severance pay, workmen's compensation, compensation funds, welfare, work rules and other matters. There is a minimum legal wage in effect in most provinces of Thailand. A social security act was enacted in 1990.

#### Exchange Control

In the past, Thailand had comprehensive exchange control regulations administered by the Bank of Thailand. Although approvals to repatriate capital and profits were discretionary, in practice approvals were granted as a matter of routine, provided one had complied with applicable procedures. A relaxation of exchange controls was announced by the Bank of Thailand in June 1990, and ceilings on permitted remittances were substantially increased. Further relaxation was announced effective 1 April 1991.

#### Arbitration

In 1987, Thailand enacted the Arbitration Act, which recognizes arbitration awards made according to private agreements and allows enforcement through the courts. Thai law recognizes two forms of arbitration: arbitration in court and arbitration out of court. Thailand is a party to the Geneva Convention and the New York Convention.

In 1967, the Thai Board of Trade adopted the Thai Commercial Arbitration Rules, which are often specified in arbitration clauses. It is also common to find the Rules of Conciliation and Arbitration of the International Chamber of Commerce or the UNCITRAL Rules specified. A series of regulations under the Arbitration Act was issued by the Ministry of Justice in 1990, further defining the rules of arbitration in Thailand.

#### Restrictions on Aliens Doing Business in Thailand

There is no general licensing requirement for foreign investors in Thailand. The proper approach for a lawyer representing a foreign investor is to obtain a complete description of the proposed project, including accounting transactions, then identify all applicable policies, laws and regulations. In some areas, including most manufacturing, there are no restrictions on alien investment.

Restrictions on the percentage of alien ownership of commercial banks, finance companies, commercial fishing, aircraft, commercial transportation, commodity export, mining and other enterprises exist under various laws, cabinet policies and trade association regulations. In connection with seeking promotion by the Board of Investment, Thai participation requirements will generally be prescribed.

#### Minerals Act

There is a government policy based on a 1966 cabinet resolution prohibiting aliens from carrying on mining north of Chumphon (approximately 11 degrees north). This policy restricts companies with more than 49 per cent alien shareholders and Thai nationals whose fathers were not Thai. This policy is presently applied by DMR to mineral rights of all kinds throughout the kingdom.

Very few exceptions have been made to this policy. The only exceptions to our knowledge were made in a major potash exploration and development contract approved by the cabinet.

#### Alien Business Law

The most important law governing majority alien-owned businesses in Thailand is the Alien Business Law, which prescribes three categories of businesses that are controlled. Generally, categories A and B businesses are closed to aliens, and category C businesses are open to aliens, subject to conditions. There remain a number of businesses, including most manufacturing businesses, that do not fall within any of the three categories and are open for investments by aliens. The 1966 Treaty of Amity and Economic Relations between Thailand and the United States has been interpreted by the Ministry of Commerce to provide an exemption from the restrictions in the Alien Business Law for United States nationals and corporations. DMR does not recognize any exemption for mining. The following activities related to mining are restricted.

B 3(2) ore tradingC 2(7) rocksalt miningC 2(8) miningC 3(1) service business

An "alien" means a natural person or juristic person without Thai nationality, including a company with half or more than half of the capital belonging to aliens or a company with half or more than half of the number of the shareholders being aliens.

Alien businesses in categories B and C existing on the effective date of the law (November 1972) are subject to restrictions on opening new branches and increasing sales or production more than 30 per cent per year. In recent years, this 30 per cent ceiling on growth in sales or production has been waived.

#### Alien Occupation Law

The Alien Occupation Law requires that every alien working in Thailand obtain a work permit, with certain exceptions. At the present time, 39 occupations are closed to aliens, including architecture, civil engineering, accounting and law. Generally, aliens may start working only after a work permit is issued. In practice, little difficulty is experienced in obtaining work permits for qualified aliens for positions for which qualified Thai nationals are not available.

#### Immigration Law

In the past, immigration law and practices have posed substantial difficulties for aliens wishing to remain in Thailand to work, with the exception of aliens working for a promoted industry or on a government contract. Unless an alien was able to obtain long-term visa status, he experienced continuing and frustrating difficulties in renewing his visa.

Under the Immigration Law of 1979, additional visa categories were established to accommodate the needs of foreign investors. These include two forms of nonimmigrant visa, one of which (type B-A) is valid for one year and is renewable.

#### Land Code

Under the Land Code, aliens may own land in Thailand only pursuant to treaties enforced between Thailand and other countries. At present, there are no such treaty provisions in force, and consequently an alien may not purchase land. Aliens are allowed to own up to 40 per cent of units in a condominium. For purposes of the Land Code, a company is deemed to be alien if more than 49 per cent of its share capital is owned by aliens or if more than half of the shareholders are aliens. However, since April 1988 the Land Department has restricted transfers of land to companies with any significant alien minority ownership.

For industrial proposes, a company promoted by the Board of Investment may be granted the right to own land, as noted below. An alien company may lease immovable property, and a registered lease of up to 30 years' duration provides secure tenure.

#### Investment Law

The Board of Investment prescribes ceilings on alien ownership on a case-by-case basis for most projects awarded promotional privileges (see below).

#### **Investment Promotion Law**

The Investment Promotion Law of 1977 follows the same general form of the first investment promotion law enacted in 1963. Both foreign and local investors may apply for incentives under this law. (On the other hand, both foreign and local investors may initiate new projects in most industries without seeking approval under this law.) See *A Guide to Investing in Thailand*, published in January 1990 by the Board of Investment.

A list of projects eligible for promotion is maintained by the Board of Investment, which will consider additional activities if a promising proposal is received. conditions may be imposed on promoted projects, including minimum capital investment, minimum Thai share participation, requirements to use local raw materials, nationality and number of employees, training of labour, and distribution, designation and quality of products.

Projects eligible for promotion include the following.

\* Mineral ore prospecting: minimum registered capital, baht 1 million; minimum Thai ownership, 60 per cent.

- \* Mining or ore dressing: minimum registered capital, baht 10 million; minimum Thai ownership, 60 per cent; no ownership restriction if project has investment capital of baht 100 million or more.
- \* Smelting.
- \* Processing of metal.
- \* Ceramic products industry.

Promoted companies are given certain guarantees and privileges, summarized briefly as follows.

- \* The state may not nationalize the promoted business nor engage in a new project in competition with a promoted industry.
- \* The state may not monopolize the selling of products similar to those produced by the promoted industry nor control selling prices of products of promoted industries except under limited conditions.
- \* No government agency may import products similar to those produced by the promoted industry free of import duty and business tax.
- \* The board has the power to establish tariff walls against products similar to those being produced by promoted projects and in some circumstances can ban importation of similar products.

Subject to reduced benefits for projects in zone 1 (Bangkok and surrounding 5 provinces) and zone 2 (adjacent 10 provinces), promoted projects are granted the following incentives.

- \* The right to bring alien technicians and managers into Thailand.
- \* The right to own land to carry on the promoted business.
- \* An exemption from import duties and business tax on imported machinery and equipment.
- \* A reduction of import duties and business tax on raw materials used by the promoted project, for a one-year, renewable period.
- \* An exemption from payment of income taxes for a period of between three and eight years.
- \* Dividends derived from profits of promoted industries may be exempted from tax.
- \* Remittances of royalties and other license fees may be exempted from withholding tax for a period of five years.

If the project is located in an "investment promotion zone", it may qualify for further discretionary benefits, as follows.

\* A reduction of up to 90 per cent of business tax on products sold for a maximum of 5 years.

- \* A reduction of 50 per cent of the normal rate of income tax on net profits derived from the promoted project following expiry of the tax exempt period.
- \* Company income tax deductions of double the cost of transportation, electricity and water supplies, and up to 25 per cent of the capital investment in infrastructure.

All provinces (including Laem Chabang and Map Ta Phut industrial estates) are designated investment promotion zones, except those provinces in zones 1 (Bangkok and surrounding 5 provinces) and 2 (adjacent 10 provinces).

To encourage exports, the board may award the following additional incentives.

- \* Exemption from import duty and business tax on raw materials imported for use in manufacturing products for export.
- \* Exemption from import duty and business tax on components imported for re-export.
- \* Exemption from export duty and business tax on products produced for export.
- \* Deductions of amounts equal to 5 per cent of the increased income derived from exports over the prior year.

Even though a particular project is eligible for promotion, obtaining promotion usually is not a condition to proceeding with the project. In some instances, for example, foreign investors decide to proceed without promotion to avoid delays, costs or minimum Thai participation requirements involved in applying for promotion or because the incentives offered by the Board of Investment are not felt to be necessary.

The Board of Investment published the *Thailand Business Legal Handbook*, which is one of the best English summaries of Thai business laws available. The Board of Investment assists investors who have difficulties with the administrative procedures involved in obtaining numerous official documents from various government departments. There is no single coordinating authority in Thailand for investors to turn to for assistance.

# Viet Nam: Prospects for Foreign Mineral Investment in a Transitional Economy

#### 1. Summary

Since the end of the Viet Nam War in 1975, there has been very little foreign investment in Viet Nam's mining sector. This has been the result of government policy, the United States trade embargo and the reluctance of the international mining community to invest in an emerging socialist system. In 1988, a significant change in economic policy opened the door to foreign investment in an attempt to revitalize the economy. New laws and regulations concerning foreign investment were passed, and draft laws for a new mining code, mining regulations and a model agreement are now under consideration.

The extent of Viet Nam's mineral resources is not fully known, but there are indications that the country contains highly prospective ground for some minerals. Of particular interest are major coal fields, some of which are geographically well positioned, with good export potential.

Given the lack of a history of recent foreign investment in the mineral sector, an accurate analysis of the mineral sector investment environment is quite difficult. Thus, the approach summarized in this report focuses on the written content of the existing laws whereby mineral investment will be regulated. However, no attempt is made to analyse the early drafts of the new mining laws, regulations and mineral agreements that were prepared in 1991 with the assistance of the United Nations. These drafts will almost certainly undergo revision before possible adoption.

The major conclusions reached are as follows.

- \* Viet Nam contains some highly prospective areas for certain types of minerals.
- \* The mineral sector is now being opened to foreign investment, but the overall economic system remains fundamentally centrally planned.
- \* The regulatory and fiscal systems that will control foreign investment in the minerals sector are not yet fully formulated.
- \* The time is now right for risk-taking exploration companies to begin looking at Viet Nam in anticipation of the passage of the new mineral sector legislation.
- \* Most mining companies would be wary of major construction commitments at this point in time.

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\* Foreign investors will need to be patient and flexible in doing business in Viet Nam and should have a long-term perspective.

Foreign investor interest in Viet Nam, including exploration and mining, has been expanding rapidly since the new economic policies were announced in 1989. To put the general investment picture in perspective, in the third quarter of 1989 there were about 800 tours by foreign investor delegations and 33 applications for investment, as compared to some 2,000 missions and 80 applications during the year and a half prior to that quarter. In 1989 and 1990, more than 200 investment licenses were issued to foreign corporations, with a planned total capital value of approximately 1.7 billion U.S. dollars (Tran 1991). While reported levels of investment are substantial, some reported investments represent very preliminary commitments or indications of investment interest as established through nonbinding memoranda of understanding. It is not known what percentage of the reported "investment" is related to the mineral sector of the economy.

The primary impediments to foreign investment include both the United States trade embargo and the fact that the socialist system is not well suited to many investors. Some foreign businesses are now positioned in Viet Nam in the expectation that the removal of the United States ban is forthcoming. In addition, some multilateral financial institutions are projecting the establishment of major projects in Viet Nam (Tran 1991).

In spite of the new open-door policy and the encouraging responses from foreign investors, there are indications that Viet Nam's institutional framework is not yet ready for a major influx of new investment capital. The country lacks both a coherent body of commercial law and officials skilled in commercial regulation. The difference between regulation of economic activity and direct business operations is not clearly defined. Central and local authorities are accustomed to a direct role in the management and control of business enterprises and will need time to learn to play a cooperative regulatory role. One option that has potential at this time is for new and existing state enterprises to have full autonomy with regard to business decisions, subject to government financial accountability and sanctions in case of nonperformance. Within state enterprises, overstaffing is common; this, taken together with a lack of performance incentives, hinders development. Internationally accepted business accounting and project appraisal methods are not widely known and are infrequently used. In summary, the regulatory process will require substantial improvement before sustained foreign capital investment will occur.

Developments in the mineral industry have to be seen against the background of these general regulatory practices. Particular issues where substantial improvements need to be made to foster increased levels of mineral sector investment include the following needs.

- \* To set up a modern legal regime and design a practical fiscal regime for mining operations
- \* To improve project appraisal techniques (through training in the preparation of project feasibility studies)

- \* To build up expertise in negotiating contracts with foreign partners
- \* To understand the importance of efficient enterprise organization
- \* To redefine the government's regulatory role in relation to an exploration, mining or processing operation
- \* To depoliticize the operation of mining operations
- \* To give strong emphasis to business judgment and financial accountability

Foreign investors can choose from among hundreds of project opportunities in countries all over the world. At the present time, there are several known deposits that would attract investment if the Vietnamese Government can provide a more comprehensive and satisfactory investment environment. However, aside from these few known deposits, there is no particular reason why exploration companies would give much preference to Viet Nam. It is just now opening its doors and will need to establish a stable, specific and attractive legal framework for foreign investment before a sustained exploration effort will materialize. Other countries in the region also offer appealing geology and often something that Viet Nam will not be able to offer for many years: a track record of successful foreign investment.

#### 2. Background Information

#### 2.1 National Profile

#### 2.1.1 Political Environment

Viet Nam is a member of the United Nations, the Moscow-based International Investment Bank, the International Bank for Economic Cooperation, the Asian Development Bank, the World Bank and the International Monetary Fund.

#### **Political Structure**

A concise and practical description of the current political structure in Viet Nam is provided by West (*Insight Guide* 1991). Viet Nam has been a socialist republic since 1975, ruled by the Vietnamese Communist Party.

Systems of government with highly centralized decision-making, such as that of Viet Nam, may be attractive to exploration and mining companies if they have direct access to the decision-makers. Companies that are unable to penetrate to the actual decision-makers may find themselves mired in a bureaucratic quagmire where lesser officials fear to act.

The stability of any political system may be strained by the introduction of major economic reform measures. If the current Vietnamese reform trend persists, Viet Nam is apt to follow China's example of slow market system experimentation rather than attempt radical changes in the management of the economy that might undermine the political system. Viet Nam has just ended a very long period of foreign domination and will probably remain wary of any measures that impinge on issues of sovereignty, such as the control of natural resources. A major change in the political structure would not necessarily lessen Viet Nam's wariness of major foreign participation in the economy.

#### **Relations with Neighbouring Countries**

Currently, Viet Nam is attempting to normalize relations with its neighbours in a pragmatic attempt to re-enter the region, both politically and economically.

Hostilities between Viet Nam and China escalated in 1979 and had a notable impact on the Vietnamese mining industry. Mining enterprises near the border with China producing tin-wolfram, graphite and phosphate were heavily damaged in the fighting. The subsequent exodus of skilled ethnic Chinese miners has had a detrimental effect on the Vietnamese mining industry (Premoli 1989). Recently, Viet Nam and China have entered into a more amiable relationship. In 1991, work began on rebuilding war-damaged railways linking Viet Nam and China.

Viet Nam is also attempting to establish better relations with other neighbouring countries. In October 1991, Viet Nam signed a peace accord and began removing troops from Cambodia. This action was a crucial step toward gaining greater political flexibility in dealing with the Association of South-East Asian Nations (ASEAN), as well as the United States.

#### United States Trade Embargo

The normalization of relations with the United States is paramount to opening the door to foreign investment. At the conclusion of the Viet Nam War, the United States imposed a fairly effective economic embargo on trade with Viet Nam. The embargo prevents Viet Nam from securing access to aid from the United States, from many other industrialized countries (including Japan) and from some multilateral agencies. More importantly, under the terms of the embargo, United States companies are prohibited from directly investing in Viet Nam. Many non-United States international mining companies are wary of investing in Viet Nam as long as the embargo is in place.

The groundwork for improved relations was laid partially in 1989, when the government rewrote the preamble of its constitution to remove all specific accusations of aggression and imperialism by the United States, China, France and Japan (*New York Times* 1989). Viet Nam's recent withdrawal from Cambodia and its reduction in its armed forces have increased the likelihood of better relations with the United States.

During 1991, some progress was made in bettering relations between Viet Nam and the United States, and many articles began appearing in the ASEAN region newspapers predicting the lifting of the embargo in 1992.

#### Insurgency

Little open information exists about possible local insurgency problems interfering with mineral projects. It is probably safe to assume that the government would be able to provide assurances of adequate security for established mining operations.

#### 2.1.2 Geography and Demography

Viet Nam is situated in Southeast Asia and has a land area of 327,500 sq km. It is bordered to the east by the South China Sea, to the north by the People's Republic of

China (1,150-km border) and to the west by the Lao People's Democratic Republic (1,650-km border) and Cambodia (930-km border). Its exclusive economic zone (EEZ) extends from the Gulf of Tonkin to the Gulf of Thailand and includes a significant amount of area also claimed by other nations. It possesses a 2,500-km coastline, some of which may have commercial mining potential (heavy sands, silica sand). The country is less well situated regarding major shipping lanes than are some other ASEAN nations but is still well situated with regard to Asian markets.

The climate is humid during both the hot summer and the relatively cold winter. Monsoon rains occur in both seasons and are a definite factor to be considered for exploration planning and mine design and operation.

Viet Nam has an estimated population of 68.2 million (90 per cent Vietnamese and 10 per cent other ethnic minorities), increasing at an annual rate of 2.2 per cent. Approximately 70 per cent of its population is under 30 years old. The principal religion is Buddhism. There are also Daoist, Confucian, Hoa, Caodaist and Christian minorities.

The main language is Vietnamese, but French, English and Russian speakers are also to be found. Foreign exploration and mining companies visiting Viet Nam on preliminary assessment missions will probably encounter few major language difficulties in dealing with the government but should make provision for Vietnamese language capability at the negotiations and operations stage.

Viet Nam enjoys a high literacy rate (94 per cent in 1991). Although mining has been a part of the Vietnamese economy for hundreds of years, there is a shortage of miners skilled in modern production methods.

Depending on the target mineral, most foreign investors would find the geographical location of Viet Nam acceptable. The high literacy rate is a plus but this is offset somewhat by the limited number of the population that speaks a major commercial language.

#### 2.1.3 Economy

After achieving reunification in 1975, Viet Nam created a centrally planned economy with military overtones. The economy has declined with a steady deterioration of infrastructure. In 1991, the average income per capita was around US \$200/year, unemployment was high (5 per cent unemployment, 25 per cent underemployment) and the inflation rate was around 100 per cent (down from 700 per cent in January 1989; *Asiaweek* 4 October 1991).

According to official statistics, which are reputed to be less than 100 per cent accurate, Viet Nam's gross domestic product increased at an average annual rate of 4.8 per cent from 1986 to 1988, 2.7 per cent in 1989 and 2.4 per cent in 1990.

Rice cultivation accounts for about 45 per cent of the gross national product (GNP), with other major crops being bananas, coconut, coffee, cotton, manioc, rubber,

soybeans, tea and tobacco. Approximately 70 per cent of its fast-growing population (1991: 2.2 per cent growth rate) is engaged in agriculture. The industrial sector accounts for roughly 30 per cent of the country's GNP and 35 per cent of the total value of export earnings and employs 10 per cent of the working population. Major industrial products include electricity, steel, cement, cotton fabrics, fish, wood, paper and, more recently, oil. By and large, Viet Nam remains an agrarian economy. A general indication of the economy is shown in the following tabulation.

Date	Pop. (million)	Pop. growth	Literacy	GNP/ capita	GDP growth	Exports	Deficit current account	Foreign debt	Inflation (CPI)
10/04/91	68.2	2.2%	94%	\$200	2.4%	<b>\$2.1</b> b	\$500m	\$14.6b	100%
01/13/89	67.1		_	\$130	4.5%	\$0.7b	\$1,111m	\$7.6b	700%

Source: Asiaweek, 4 October 1991, p. 6, 11.

In 1986, the Vietnamese Government took note of the difficulties encountered in the management of the economy by embarking on an economic revitalization policy called Boi Doi. Since the end of the Viet Nam War in 1975, the economy had made little overall progress and many sectors had begun to decline. The government introduced reforms aimed at transforming Viet Nam from a centralized economy to a more market-oriented system. The major elements of the policy called for creating and modernizing infrastructure in many sectors, including communications, construction, energy, transportation, education and health. Starting in 1987, a series of liberal foreign investment laws were introduced to invite and encourage a more outward-looking economy, fuelled by an injection of foreign capital. The economic reform measures have begun to decentralize economic management, adopt more market-oriented prices and wages, encourage the growth of the private sector and require state enterprises to stress profitability and self-financing.

In 1989, in order to secure cooperation from the International Monetary Fund, Viet Nam introduced an economic stabilization programme. This programme included measures to more closely align its official international exchange rate with market rates, to restrain credit and money supply (control inflation) and to reduce state subsidies. Though Viet Nam's reform process is under way in most sectors of the economy, current efforts are concentrated in food and consumer goods production, export development and foreign investment.

The political and economic changes occurring in the former Union of Soviet Socialist Republics and in Eastern Europe have had an important impact on Viet Nam. Prior to its dissolution, the Soviet Union provided about US \$1 billion a year in aid, but this plummeted in 1989 by about 65 per cent. In 1989, Moscow began to price its contribution of goods at the world market value, demanded repayment in hard currency, cut its shipments of economically critical supplies such as oil, steel and fertilizers and cancelled many contracts to buy Vietnamese finished products. At the end of 1990, Viet Nam's debt to what was then the Soviet Union totalled approximately US \$18 billion, of which more than US \$10 billion is due for repayment before 1995.

During the late 1980s, the Vietnamese economy was partially dependent on remittances of hard currency from its citizens working abroad. The level of such remittances was reduced significantly by the return of many workers from the former Soviet Union, Eastern Europe and Iraq. When hard currency remittances fell, unemployment increased, putting a further strain on the economy.

The country's economy has also been hampered by the effects of the United States trade embargo, its inability to obtain credit (owning to its default on payments to the International Monetary Fund) and the lack of infrastructure development.

Revitalization of the economy after years of isolation will be a long and difficult task. The government is attempting through its Boi Doi policies to attract a major influx of foreign investment as an important step in rekindling the economy.

#### 2.1.4 Infrastructure

Basic infrastructure throughout most of Viet Nam is less adequate than that found in many nations within the ESCAP region. Most mining operations would probably incur substantial costs related to infrastructure development.

The transportation system is not well developed and has been deteriorating as a result of war and neglect. This is particularly true in rural areas and in northern Viet Nam.

Viet Nam's main trunk road, National Highway 1, cuts across the country from Ca Mau in the extreme south to Dong Dong at the Chinese border in the north. Apart from the major routes, roads are generally dirt tracks and may become unusable during the monsoon season (*Insight* 1990).

The railroad system in Viet Nam was established during colonial times. War, a lack of adequate maintenance and modernization have left room for substantial improvement. One route of 1,730 km links Ho Chi Minh City and Hanoi. A second line links Hanoi with Haiphong. Mining companies interested in using rail services for moving bulk commodities on a regular basis would probably need to make a sizeable investment in rolling stock and pay for other improvements to the system.

Viet Nam has many waterways, which have played a central role in internal and international trade. However, depending on the particular situation, major dredging and maintenance programmes would be necessary in order to accommodate major mine shipments of bulk commodities. The port at Ho Chi Minh City is operating at or above capacity. It does have some modern equipment, but further expansion would be difficult. The port of Haiphong is poorly laid out and somewhat antiquated. Mining companies seeking international markets for bulk minerals would probably need to budget for substantial port development costs.

Communications systems throughout most of Viet Nam are not well developed. Satellite links via Moscow and Australian Telecom are available in some major cities. Telex and international phone service is available in some hotels in major cities but may be totally absent in most rural areas. On the whole, communications difficulties are the norm rather than the exception. Under the provisions of Circular No. 02/Vp 1989, all postal and telecommunications needs have to go through the national postal and telecommunications network. Enterprises with foreign invested capital and foreign employees are not allowed to set up their own postal and communications lines without permission, but detailed provisions are laid out for obtaining such permission. Such enterprises are explicitly allowed to use telegraphic, telephone, telex and telefax services, as long as they comply with current regulations.

Viet Nam has a considerable energy potential, but this potential has yet to be fully developed and energy shortages are not uncommon. Currently, energy is derived mainly from coal, hydroelectric installations and petroleum. Since the end of the war, Viet Nam has been heavily dependent on the Commonwealth of Independent States for petroleum (1986 imports of refined petroleum products from the former Soviet Union were equivalent to 50 per cent of export earnings in convertible currencies). With the development of indigenous petroleum resources, this dependency has now slackened. Mining companies may encounter difficulties locally in acquiring reliable sources of energy for operational purposes.

# 2.2 Past and Current State of the Mineral Industry

#### 2.2.1 Historical Perspective

Copper, tin, zinc and gold have been mined in Viet Nam, particularly in northern Viet Nam, since the early Bronze Age. Extraction of iron, silver and nonmetallic minerals followed. With the development of the mining industry in China during the Ming Dynasty, many Chinese miners migrated to Viet Nam and developed mines extracting kaolin and other minerals. With the introduction of firearms to the region in the sixteenth century, sulphur, coal, natural nitrates and lead mines were developed. During the Nguyen Dynasty (around 1800), some 75 tax-paying mines, including gold and tin mines, were recorded. The availability of minerals in Indochina was partly responsible for French interest in the region, and the first geological map of Indochina was completed in 1882 (two years before the final capitulation of Indochina to the French). The coal resources of Hon Gai were of particular importance to the steam-driven French fleet. Under the guidance of the French, the mining industry began to expand, with most nonindustrial minerals destined for export. After the first world war, the mining industry experienced rapid expansion, and between 1923 and 1929 the number of mining titles increased from 496 to 17,685. World War II caused a severe disruption of the industry, as markets and transportation systems became inaccessible. The growth of mining activity after World War II has been slow, being hampered by independence movements, war and, more recently, a socialist system not conducive to high growth rates (adopted from Premoli 1990).

Since the end of the Viet Nam War, the former Soviet Union and some Eastern European countries have provided financial and technical assistance to Viet Nam for onshore and offshore exploration. A substantial part of Viet Nam's coal production has been a result of, or benefitted from, financial and technical aid from the former Soviet Union. The willingness and ability of these countries to continue to supply such aid at levels achieved during the late 1980s is doubtful.

#### 2.2.2 Structure of the Industry

#### Large and Small-Scale Operations

The Vietnamese mineral industry is characterized by two sectors: large, government-run and often nonprofitable enterprises organized on the socialist model, and small, undercapitalized industries whose production is largely unrecorded. There is a notable absence of medium-sized operations and export-oriented mines (Premoli 1989). Many of the large-scale projects are obsolete in matters of technology and organization (Waelde 1989).

Small-scale and individually run operations produce a host of different commodities and represent a robust but not quantifiable portion of the Vietnamese mining industry. They are not well capitalized and are typically ignorant of or cut off from foreign markets. They employ some of the most talented people available, and in the north are more artisan-oriented than in the south, where more sophisticated technology is in use by some operators.

#### **Illegal Mining**

The extent to which interference with mining operations might arise from "illegal" peasant miners, such as has plagued some operations in Brazil, the Philippines and Indonesia, cannot be fully ascertained at this time. However, 1991 ASEAN region newspaper accounts reported that massive illegal "peasant" mining was interfering with operations in some gemstone areas.

Under the Land Law of 1987, the holder of a right to explore or mine holds an exclusive right to the area allotted.

Only those organisations which are assigned by the State to conduct exploration and production of minerals may use land for the said purpose. Land for exploration and production of minerals, including stone-quarrying, shall be allotted for use only during the period of active exploration and production (Article 39).

Land users shall be entitled to the following rights and benefits: ... to enjoy State protection against infringement of their legal land-use rights (Article 49(6)).

This premise is further supported by Clause 6 of the Ordinance of Mineral Resources, which states: "Geological investigations and mining of mineral resources, using mineral resource in the earth's crust, are strictly prohibited if there is no permission of an authorised state's organ pursuant to this ordinance."

The extent to which the government is willing, or able, to control illegal mining activities that may encroach on exploration/mining operations with foreign interests cannot be ascertained until more foreign companies have established operational experience in Viet Nam.

#### 2.2.3 Government Policies Relating to Minerals

Viet Nam does not have a published national mineral policy at the present time. It

has, however, enacted a law on foreign investment, which clearly indicates the country's general willingness to allow foreign investment.

Article 1 of the Law on Foreign Investment in Viet Nam states that "the State of the Socialist Republic of Viet Nam welcomes and encourages investment by foreign organizations or persons of their capital and technology in Viet Nam on the principles of respect for the independence and sovereignty of Viet Nam, observance of Vietnamese laws, equality and mutual benefit. The State shall guarantee the ownership of invested capital and other rights of foreign organizations or persons and extend to the latter favourable conditions and easy formalities for their investment in Viet Nam."

Article 3 goes on to list five sectors of the economy where the state encourages foreign investment, but does not specifically name the mineral sector. The article states that "a detailed list of branches and sectors of the economy shall be published by the State organ responsible for the management of foreign investment." It is not known at this time whether such a list has ever been published. While Article 3 does not specifically identify the mineral sector as one where the state encourages foreign investment, Article 7(2) does provide some insight.

The capital contribution by the Vietnamese partner to a joint venture [with foreign participation] may be made in the form of the following assets ... natural resources ...

Thus, by implication it would seem that the intent of the Law on Foreign Investment is to include mineral activities. Other key laws (such as the Land Law and the Ordinance on Mineral Resources) reinforce this premise by specific reference to regulation of foreign investment in the mineral sector.

Recognizing a need to improve the stagnant or deteriorating status of the sector, under the Boi Doi renovation scheme several policy changes are now becoming apparent. These include local mines and mine managers being allowed a greater degree of autonomy; a new approach to salaries that is less dependent on subsidies and indiced to productivity; and a more tolerant view of small-scale mining outside the "official" economy (Premoli 1990).

#### 2.2.4 Summary of Current and Projected State of Affairs

Recent and historical geological investigations have identified considerable reserves of minerals in Viet Nam. What is lacking is the ability to develop out of these reserves commercially viable mining projects. Modern project appraisal methods, project planning, capital, technology and management capabilities are lacking but necessary. To develop this potential will require the translation of the general guidelines of the new Boi Doi economic policies into actions in the mining sector that encourage and stimulate investment, both by foreign investors and by national institutions. Adoption of a United Nations-assisted draft mining code, mining regulations and model agreement would be a positive step in this direction.

It is highly likely that the first generation of foreign investors who are able to identify viable mining projects will be given preferential status by Vietnamese authorities. To date, only a few firms, mostly from Australia, are believed to have committed capital for exploration and development, but many others have expressed interest. Nonpetroleum commodities of greatest interest include bauxite, coal, chromite, copper, gold, lead, mineral sands, nickel, precious stones, tin and zinc.

Today, Viet Nam's mineral production includes antimony, coal and lignite, phosphates, iron ore, chromite, gold, precious stones, tin, graphite, lead, zinc, antimony, pyrite, wolframite, manganese, kaolinite, quartz, limestone, marble, salt and a variety of nonmetallic minerals. Accurate tabulations of mineral production are not generally available. A 1988 estimate has been compiled by Premoli (1989a).

Coal	_	5,500,000 t	Kaolin	_	> 700 t
Cement		1,650,000 t	Graphite		600 t
Phosphate		> 300,000 t	Cassiterite (concs)	-	400-1,000 t
Iron ore	_	200,000 t	Gold	_	about 1,000 kg
Chromite	-	3,500 t			

Viet Nam has identified deposits of other minerals, including, but not limited to anatase, asbestos, barite, bauxite, bentonite, beryllium, bismuth, cadmium, copper, emery, fluorite, gallium, garnet, guano, hafnium, ilmenite, leucoxene, manganese, mercury, molybdenum, monazite, nickel, niobium, rare earths, rubies, rutile, sapphires, silver, strontium, tantalum, thorium, tungsten, uranium, vanadium and zircon.

Coal is the most significant mineral currently being produced. Viet Nam is endowed with several world-class coal fields, including the Quang Yen Basin, the Phan Me Basin and Tuyenn Quang. Descriptions of these fields are openly available to potential foreign investors. Viet Nam has some of the world's finest anthracite (the quality being such that it is often used by the handicraft sector for sculpture carving). Coal reserves have been estimated at 20,000 Mt, with 135 Mt of proven reserves. Uncertainty in Vietnamese reserve estimates is complicated by the fact that the former Soviet Union's system of estimation has been in use and it is not readily comparable to Western reserve estimation methods.

Coal is Viet Nam's principal source of energy and remains an important source of foreign exchange. (Exports, about 800,000 t/y, are delivered to Japan and some European nations.) The production is estimated at approximately 5.5 million tonnes per year of coal and 1.7 million tonnes per year of lignite. Some of the major coalfields are located close to the sea, and it is likely that in the near future some fields may undergo large-scale development by international mining companies interested in supplying the rapidly expanding energy needs of Asia. Current coal production for export is far from insignificant but is hampered by obsolete mines, inefficiency and low management and worker morale (Premoli 1989a).

Viet Nam exported approximately one million tonnes of coal in the first ten months of 1991, and future export growth is expected to continue. Export coal quality has been a problem, and corrective measures will require an infusion of new capital.

	Value of coal exports (US \$ million)	Total value of all exports (US \$ million)
1985	40	746
1981	34	785
1987	12	880
	Coal production (million tons)	Per capita output of clean coal (kg)
1976	5.7	1960 161
1981	6.0	1975 211
1987	6.8	1976 116
1989	5.5	1981 109
		1005 04

Estimates of coal production and exports are as follows for selected years.

Source: Vo Nhran Tri 1990.

BHP and CRA of Australia and BP Coal have all shown interest in Viet Nam's coal resources, and some preliminary feasibility studies are now underway. Bulk Materials Coal Handling Co. (Australia) has invested US \$10 million in recent years to upgrade several coal-washing and screening plants run by Cam Pha Co. (Quang Ninh mining area).

#### 3. Geological Potential

#### 3.1 Description of the Geology

#### .3.1.1 Geological Distribution of Mineral Potential

It is beyond the scope of this study to provide a detailed description of the geology of Viet Nam. General descriptions in English may be obtained by reference to the geologically-oriented references listed in the references/bibliography section. For example, a good overall description complete with maps is given in the *Atlas of Mineral Resources of the ESCAP Region – Viet Nam* (ESCAP 1990).

To summarize, historically, geologists have considered the north as substantially more prospective for most minerals than the south. However, depending on the type of mineral sought, the south may also contain highly prospective areas.

# 3.1.2 Minerals of Exceptional Interest

The most significant resource attracting the attention of international mining houses is coal (refer to the description in section 2.2.4). Viet Nam compares very favourably in terms of transportation costs with Australia, the region's major supplier.

While iron ore (55 per cent Fe content) is currently being produced, production could expand significantly if infrastructure was improved. Power shortages have created difficulties in existing operations.

Chromite has been mined in Viet Nam since at least 1930. Production peaked in 1963 (36,000 t of concentrates) but has now stagnated. An infusion of capital and modern mining practices could revitalize production.

At least five major occurrences of manganese have been identified in Viet Nam, and it is presently mined from a deposit at Yen Cu (reserves of 2.5 Mt of high-grade ore). These deposits could be subject to prefeasibility studies to determine their potential.

Gold has been mined historically in the country; current production is mainly by small unofficial operations. Production is at present very limited, mostly nonformal, and probably totals around 1,000 kg per annum. Alluvial panning and sluicing is a common sight along some rivers. More efficient equipment is being used by small groups. There is every indication that small-scale gold production will increase (Premoli 1989c). Viet Nam has as many as eight major goldfields in the north around Hanoi and two in the south. Covictory Investment Ltd. (Australia) is reported to have acquired a 100 per cent stake in the Bong Mieu Mine near Danang, an old mine exploited by the French until 1942. This mine is reported to have reserves of approximately 5 t of gold. Other Australian companies, such as CRA and Tuckanora, have also shown interest in historical gold mining areas.

Some Vietnamese rubies and sapphires are reportedly of high quality. Recent problems with illegal miners have been encountered in some gemstone areas. A joint venture was formed in 1989 between the Vietnamese Government and Thai interests for the commercialization and marketing of gemstones (Premoli 1989c).

There are considerable untapped alluvial reserves of tin. Most current production is on a small scale, with the main obstacle to development being access to capital and technology and the depressed price of tin. Discussions with Malaysian tin companies have been progressing, but it is not known whether any formal agreements have yet materialized.

Small, high-grade (10 to 15 per cent) copper and copper/nickel deposits were mined during colonial times, but recent production is not reported. Several deposits have been discovered north of Hanoi but remain undeveloped.

Promising bauxite reserves have been identified near the Chinese border, but no large-scale operation is yet planned.

Viet Nam has extensive reserves of phosphate, and the mine at Lao Cai (built using Soviet assistance) is presently extracting around 300,000 tons per year of phosphate ore. Phosphate fertilizer is one of the few mineral commodities to have reached planned production levels (Premoli 1989c). Other large phosphate deposits are known and have development potential.

Mineral sand (including ilmenite) reserves have been discovered and quantified and could be exploited. In 1990 and 1991, preliminary discussions took place between some Malaysian mining companies and the Vietnamese Government, but the results of these talks have not yet been publicized. A Republic of Korea firm, Doosan Industrial Co., has reportedly, with the state company MINEXCO, received a 50-year license to mine silica sands (AWSJ 1991).

Graphite, emery and garnets occur in ample reserves and represent possible development targets. Known deposits of ornamental stone such as marble and granite have also been identified.

After 50 years of relative neglect, Viet Nam's mineral sector now seems poised for growth, if an infusion of foreign investment can be mustered. Prospects have been identified, but the country lacks the skills, money and experience to bring them into production.

#### 3.2 Ability to Apply Geological Assessment Techniques

Many parts of the country are currently closed to foreigners (Article 108 of Decree No. 139/HDBT, 1988 specifically refers to certain areas that may be forbidden to foreigners). While it is probably safe to assume that if an exploration or mining right is granted, access would not be a problem, this has yet to be verified by actual practice.

The lack of all-weather roads in most rural areas will pose a serious handicap during the rainy season. Cloud cover during the rainy season will also hamper aerial reconnaissance. It is not known what restrictions and requirements the government may place on the use of aerial reconnaissance methods.

#### 3.3 Availability of Geoscientific Information

The Geological Survey of Indochina was set up in 1898 as a branch of the Directorate of Mines. A systematic investigation of the country's mineral potential was begun under the direction of French geologists. However, since 1950, scant technical information has been released on Viet Nam's most commercially interesting minerals, which occur mainly in the northern part of the country (Premoli 1989c). Some exploration took place under the direction of Soviet and Eastern European experts, but their methods for resource appraisal and qualification (particularly the meaning and qualification of "proved" reserves) were different from those familiar to most international exploration and mining companies (Premoli 1989a). A new assessment is badly needed. During the last 15 years, Vietnamese scientists carried out a large exploration programme, which generated a considerable body of new and useful information. Most exploration records are in Vietnamese or Russian and use methods developed and familiar to CIS and Eastern European geologists. The usefulness of these reports to Western mining companies remains to be seen but is probably limited.

However, a first compendium, Geology and Mineral Resources of Viet Nam (217 pages), was published in 1988 by the General Department of Mines and Geology. As of 1992, this volume remains one of the best sources of geological information on Viet Nam openly available to foreign investors. In addition, Volume 6 of the Atlas of Mineral Resources of the ESCAP Region – Viet Nam (ESCAP 1990) provides a valuable overview of Viet Nam's geology and major known deposits.

The extent to which geoscientific maps are made available to foreign mining companies by the government is not known. Apparently, over the past 30 years, small and medium-scale geological mapping programmes have been conducted for the entire country, and large-scale maps (1:500,000) have been completed for some areas (ESCAP 1990). The following maps are available in the international marketplace.

Geological Map of Viet Nam 1:1,500,000 Geological Map of Viet Nam 1:1,000,000 Geological Map of Northern Viet Nam (sheet 1) 1:1,000,000 Geological Map of Northern Viet Nam (sheet 2) 1:1,000,000 Metalliferous Map of Viet Nam 1:1,500,000 Nonmetallics Map of Viet Nam 1:1,500,000 Miteral Map of Viet Nam 1:1,500,000 Mineral Map of Viet Nam 1:3,000,000 Mineral Resources Map of Viet Nam 1:1,500,000 Metallogenic Map of Viet Nam: North 1:1,400,000 Metallogenic Map of Viet Nam: South 1:1,400,000 Metallogenic map of Northern Viet Nam (sheets 1-6) 1:500,000 (I.M.R. 1991)

On a world standard, there is a general lack of available geological information. This may be attributed to a number of factors, including war, the lack of English translations, a shortage of trained staff and equipment and a fear of foreign exploration. Current efforts are being made with the assistance of the United Nations Economic and Social Commission for Asia and the Pacific and other organizations to increase the availability of geological and mining data.

#### 3.4 Government Institutions

The Ordinance of Mineral Resources states that "the Council of Ministers manages the government in respect of mineral resources. The state organ of mineral resource management and the state organ of geological investigation management help the Council of Ministers in this field. Related Ministries concerned with exploiting, processing and using mineral resources shall be assigned responsibilities to manage and protect mineral resources as specified by the Council of Ministers (Clause 8). The decisions of assigning mining areas or permitting mineral resource mining are the jurisdiction of the Council of Ministers and the state organ of mineral resources management ... (Clause 17)."

The key government organization regulating foreign investment in Viet Nam is specified in Article 6 of the Regulations for the Implementation of the Law on Foreign Investment in Viet Nam.

The State organ for administration of foreign investment of the Government of the Socialist Republic of Viet Nam ... is the State Committee for Cooperation and Investment. The Ministry of External Economic relations shall act as the Government body responsible for receiving and processing investment projects submitted by foreign investors, recommending optional handling approaches and reporting to the State Committee of Cooperation and Investment for examination and decision.

The powers and duties of the state organ (State Committee for Cooperation and Investment) are described in Article 36 of the Law on Foreign Investment.

The State organ for administration of foreign investment of the Government of the Socialist Republic of Viet Nam is vested with the overall authority of solving matters related to the investment operations of foreign organizations and persons in Viet Nam.

The State organ for management of foreign investment shall have the following rights and responsibilities:

(1) To assist and guide the potential foreign and Vietnamese partners in the negotiation and conclusion of business cooperation and joint venture contracts; to assist and guide foreign organizations or persons in the establishment in Viet Nam of private enterprises with 100 per cent foreign invested capital and to act as a focal point for settlement of all matters at the request of foreign investing organizations or persons.

(2) To consider and approve business co-operation and joint venture contracts; authorise the establishment by foreign organizations or persons of private enterprises with 100 per cent foreign invested capital and approve the Charters of enterprises with foreign invested capital.

(3) To decide and grant preferences to an enterprise with foreign invested capital and the foreign partner to a business cooperation contract.

(4) To monitor and control the execution of business cooperation and joint venture contracts and the operation of the enterprises with 100 per cent foreign invested capital.

(5) To analyze the economic activities of the enterprise with foreign invested capital.

If implemented as written, the designated state organ acts as a one-stop approving authority. The ability to proceed with the approval of a central authority will be looked on favourably by most exploration and mining companies. How the state approving organ interacts with the General Department of Mines and Geology is not known to the authors.

The General Department of Mines and Geology is the lead technical-level department involved in exploration and mining. While not a ministry, it does act directly under the Council of Ministers and is headed by a director-general. Currently, the department is participating in the United Nations-assisted mineral legislative drafting exercise, which is described more fully elsewhere in this paper.

The Research Institute for Geology and Mining concentrates on functions typical of a geological survey. It is also involved in the development of mining technology.

The Ministry of Energy is responsible for coal development and mining.

In 1989, the government set up the Mineral Development Ltd. Company (MIDECO), a state company under the authority of the General Department of Mines and Geology. MIDECO is to function as a promoter, contact point and joint venture partner of foreign investors. It is anticipated that most larger-scale joint venture arrangements with foreign investors will probably include MIDECO. The operational structure of MIDECO is not clearly known at this time and will probably evolve as the company gains experience in working with foreign investors.

# 3.5 Summary

Viet Nam has been amassing geological data for many years. Much of this material is not available in English or other European languages. There are many deposits of various minerals already identified, but most have not been scrutinized using free-market style feasibility studies. Many of these may turn out to be subeconomic, but others probably have excellent development potential. If Viet Nam can assure foreign investors that it can offer an attractive investment environment, the geology will not act as a disincentive. On the contrary, the geology is highly prospective for many types of minerals.

# 4. Marketing Considerations

Reliable estimates of internal mineral consumption requirements were not available to the authors. Lacking such estimates, it was not possible to evaluate the potential for supplying internal mineral markets.

Viet Nam is in a reasonably central location, regarding Asian markets. Its coastline provides access to the rapidly developing ASEAN nations, as well as to the principal Asia-Pacific markets. Land linkages offer minimal immediate prospects for external trade.

As long as the United States economic embargo is in place, there may be substantial difficulties in persuading many international mining companies to consider large, export-oriented mining projects.

# 5. Mining Law

# 5.1 Laws and Agreements Pertaining to Exploration and Mining

A mineral resources ordinance was enacted in 1989, but the ordinance is stated in very general terms that do not provide a clear indication of the role of and the regulations regarding foreign investors. Currently, it has been proposed that two new laws be prepared, which will provide separately for the regulation of oil and gas and the regulation of all other minerals. The draft legislation for non-oil and gas minerals was prepared with the assistance of the United Nations Development Programme and ESCAP and includes a mining code (Fortin 1991a), model mineral agreement (Fortin 1991b) and detailed regulations (Garnett 1991). If adopted, the legislation will provide detailed and comprehensive provisions for the regulation of the mineral sector. As these drafts

are only now being considered by the government and will probably undergo substantial modifications, they are not described here. However, if adopted in their current form, they will provide the type of legislation that most international mining companies would feel comfortable with.

## 5.2 Major Features of the Existing Legislation/Agreements

A number of different laws apply to foreign investment in exploration and mining, with the key provisions found in the Ordinance of Mineral Resources, the Land Law and, most importantly, the Law on Foreign Investment. The desire of the government to attract foreign mineral sector investment is clearly indicated in Clause 3 of the Ordinance of Mineral Resources, which states that "the government encourages organisations, individuals, overseas organisations and Vietnamese settlers overseas to invest capital and technology in geological investigations, mining and mining materials in Viet Nam according to the Foreign Investment Law of Viet Nam and this ordinance."

#### 5.2.1 Ownership of Minerals

According to Article 19 of the constitution, "The lands,..., mines, natural resources in the ground, in the territorial seas, and on the continental shelf,..., and other property defined by law as belonging to the state are under the ownership of the entire people." This is further expanded in Clause 2 of the Ordinance of Mineral Resources: "All mineral resources in the earth, continental shelf, islands and ocean of the Socialist Republic of Viet Nam form a national united mineral resource, belong to all people, to be managed by the government."

#### 5.2.2 Exploration

Geological investigations can only be carried out after obtaining licenses or decisions of approval of objectives and projects from an authorized state organ stipulated by the Council of Ministers (Clause 10, Ordinance of Mineral Resources, 1989). The ordinance goes on to outline the obligations of organizations and individuals undertaking geological investigations; these obligations are typical of those found in many mining codes worldwide. Few exploration companies would find fault with the obligations imposed under the ordinance.

Junior exploration/mining companies would find Clause 4 of the Ordinance of Mineral Resources reassuring with regard to their ability to transfer or assign their rights.

The Government guarantees mining organisations and individuals all legal rights in assigned mining areas, including rights of joint-venture prospecting, exploitation, product consuming, inheriting mining rights, transferring and giving up and selling capital works in mining areas in accordance with legal regulations.

#### 5.2.3 Security of Tenure

Under the current Ordinance of Mineral Resources, most mining companies would find the legal linkage between the exploration and mining phase too weak to impart confidence that should a viable deposit be discovered, the company will have a right to mine it.

Individuals and organisations who obtain results in searching and prospecting for mineral resources will have priority for mining investments (Clause 4).

The right to mine is not guaranteed and is subject to a decision process based on the following criteria.

- \* Policies, projects of social-economic development, regulations and mining projects of the government.
- \* The results of geological investigations and mineral reserves of the mining areas.
- \* A feasibility study that guarantees that the mineral resources of the mines shall be fully exploited and properly used.
- \* The conditions of finance, economics, level of technical, geological and mining expertise and management capacity of organizations or individuals applying for, or who have signed, mining contracts.
- \* The requirements of environmental protection, historical vestiges, culture, beautiful landscapes, national defence and security.
- \* Regulations of the government regarding technical and safety aspects of mining and processing of mineral materials (Clause 16).

The interpretation and application of the criteria under Clause 16 remain to be seen. Many international mining companies would probably seek further government reassurance regarding their right to proceed to mine under a more closely worded agreement.

In addition to any special agreement that may be in force, a foreign firm would be expected to comply with the Land Law of 1987.

Foreign organisations and private persons, international organisations and Vietnamese-foreign joint ventures and business co-operation undertakings, as land recipients and users, shall abide by the provisions of this Law, unless otherwise provided for in the international treaties concluded between the Socialist Republic of Viet Nam and other countries or international organisations (Article 51).

Under the Land Law of 1987, the Council of Ministers has broad powers regarding the allocation of land. For the purposes of the Land Law, land for exploration and tapping of mineral resources is classified as "specialized land" (Article 36).

Article 50 of the Land Law makes specific reference to foreign land users, emphasizing that allotment of land to a foreign organization is a central rather than local concern. Allotment of land for use by foreign organisations and private persons, international organisations and Vietnamese-foreign joint ventures and business cooperation undertakings shall be decided upon by the Council of Ministers of the Socialist Republic of Viet Nam.

Article 14(5) of the Land Law of 1987 states that the state shall regain possession of the land if "the land used leaves the land idle for six consecutive months without authorization of the competent State authorities that have issued the decision on this land allotment."

Under the Law of Foreign Investment, a joint venture is to be allowed for a maximum period of 20 years but may be extended. This extension has been formalized in Decree No. 139, Article 43, which states that "the duration of a joint venture shall be agreed upon between the joint venture partners of a joint venture and shall not exceed twenty years. However, in respect of projects for exploitation of natural resources ... the joint venture partners are allowed to agree on a longer duration, which shall not exceed fifty years."

Article 56 of the regulations extends the provisions of Article 43 to enterprises with 100 per cent foreign capital.

If exploration or mining cease, the land user may lose its rights under Article 39 of the Land Law of 1987.

Land for exploration and production of minerals, including stone-quarrying, shall be allotted for use only during the period of active exploration and production.

Clause 24 of the Ordinance of Mineral Resources goes on to state that the mining area can be cancelled "after one or two years, depending on the scope of the exploitation, from the date of the decision assigning the mining area, if construction or the mining plant has not been realized or is undertaken without permission of authorized offices."

The government has a policy against the expropriation of foreign investment projects. This has been codified in Article 21 of the Law on Foreign Investment.

In the course of its investment in Viet Nam, the invested capital, property and assets of a foreign organization or person shall not be requisitioned or confiscated under administrative procedures. The enterprise with foreign invested capital shall not be nationalised.

#### 5.2.4 Mining

At the present time, the main law pertaining to mining operations is the Ordinance for Mineral Resources of 1989. It stipulates typical obligations of the mining company such as are commonly found in most mining codes (preparation of a feasibility study, approval of a mine plan, adherence to safety and environmental regulations, payment of taxes and so on), and under Clause 18, conformability with specified provisions of the Land Law.

Under the ordinance, the government clearly allows for organizations, individuals, overseas organizations and Vietnamese settlers overseas to invest in exploration and mining. It confirms that all mineral resources are the property of the state, and that the state may issue exploration licenses and mining rights. There is provision for dispute settlement, access to land and arbitration. While the mining law includes a broad framework, it does not provide the level of detail that most international mining companies would like to see.

Key rights and obligations are spelled out in very general terms. For example, the procedure for obtaining mining rights is vague, as are the qualifications and work obligations of the holder of a mining right. Regulation and operational control are not clearly separated.

One obligation may be particularly unacceptable to many mining companies as impractical or not cost-effective: "...rehabilitating the capacity to use the land properly after finishing mining" (Clause 21(5)). The extent to which the government expects rehabilitation is not known at the present time.

Other issues not addressed in adequate detail include the differentiation of largeand small-scale mining and the relationship between large-scale and small-scale minerals; how practical access to land is obtained; the procedures for obtaining mining rights; the supervision of work programmes and other obligations; the role, the authority, the scope and the procedure for negotiation of mineral investment agreements; the environmental protection criteria procedures; the regulatory and administrative relationship between the agency granting mining rights, the General Department of Mines and Geology and the local authorities; and how mining taxes are regulated.

Until such time as a more detailed mining code, regulations or model agreement is available, most mining companies would probably view the current mining code with some suspicion. While it contains few provisions that companies would object to, the general lack of clarity on important issues would discourage many mining companies. A more complete understanding of the government's expectations and regulatory role would be welcomed by almost any potential foreign investor.

#### 5.2.5 Ownership and Control

Three types of foreign investment are allowed under the Law on Foreign Investment: contractual business cooperation, joint ventures and private enterprise with 100 per cent foreign invested capital.

With regard to joint ventures, Article 12 of the law specifies certain requirements with regard to a board of management.

The leading body of the joint venture shall be its Board of Management. Each partner to the joint venture shall appoint their nominees to the Board of Management in proportion to their respective capital contributions to the venture [note: Vietnamese capital contribution is in the form of the resource itself, not cash], provided, however, that they shall each have at least two of their nominees on the Board. The Chairman of the Board shall be appointed by both partners by mutual agreement. The General Director and Deputy General Directors shall be nominated by the Board of Management to handle the daily business of the joint venture and shall be responsible to the Board of Management for the operation of the joint venture. The General Director or the first Deputy General Director of the Board of Management shall be a Vietnamese citizen.

The last requirement, that the head of day-to-day management be a Vietnamese citizen, will probably be viewed negatively by potential foreign mining sector investors. If Article 13 is not enough to deter potential investors, then Article 14 probably is.

The most important matters related to the organization and operation of the joint venture, including the orientation of its activity, business planning, and key personnel shall be decided by the Board of Management on the principle of unanimity.

The management of a private enterprise with 100 per cent foreign invested capital is left, to a great extent, in the hands of the foreign investor. Article 14 of the foreign investment law states that "foreign organizations or persons may establish in Viet Nam private enterprises with the invested capital wholly (100 per cent) owned by them, in which case they shall assume full management of the enterprise, be subject to control of the State organ for management of foreign investment, be entitled to enjoy the rights and liable to carry out all obligations stated in the investment licence."

The extent to which the government will allow exploration/mining by a 100 per cent foreign-owned company is not known at this time. In addition, it is not clear to what extent the "State organ for management of foreign investment" will actually exert control.

Article 63 of the Regulations for the Implementation of the Law on Foreign Investment in Viet Nam provides some further refinement.

The parties to a business co-operation contract and an enterprise with foreign invested capital are fully entitled to decide on their own production and business programmes and plans. The Vietnamese State authorities shall not design plan targets to such parties.

Should a dispute arise between a foreign investor and the government, Clause 33(5) of the Ordinance of Mineral Resources provides guidance.

Disputes concerning geological investigation rights and mining mineral resources in Viet Nam in which one or both parties are organisations or individuals from overseas will be resolved according to Vietnamese laws except where there is a signed agreement between Viet Nam and a foreign country or an international organisation specifying otherwise. Article 25 of the Law on Foreign Investment allows for arbitration where the form of business is a joint venture.

... If, however, the two parties to a dispute fail to reach an agreement, the dispute shall be referred to the Vietnamese economic arbitration body or any other arbitration or law-enforcement institution as may be mutually agreed upon.

This has been more fully developed under Article 53 of the Regulations to the Law on Foreign Investment (Decree No. 139/HDBT 1988).

Any dispute between the joint venture partners arising from the execution of a joint venture contract shall first be settled through negotiation and amicable arrangement between the partners. Failing an agreement between them, the disputing partners may refer the dispute to one of the following bodies:

- \* The Foreign Trade Arbitration Committee at the Chamber of Commerce and Industry of the Socialist Republic of Viet Nam or, an arbitration body in a third country or, still, to an international arbitration body, or
- \* An arbitration committee to be set up as may be agreed upon between the partners.

The joint venture partners shall state the agreed form of arbitration and arbitration body in the joint venture contract.

## 5.3 Administrative Efficiency

While the initial approval for exploration/mining appears on paper to be fairly streamlined, there is no precedent by which to judge how efficiently an exploration or mining project would be regulated. In many nations where lower level bureaucrats have been subject to periodic "re-education" or are implementing new procedures, substantial delays may be encountered. Whether this will be the case in Viet Nam remains to be seen. At the bureaucratic level, Viet Nam is not currently renowned for efficiency.

# 6. The Fiscal Regime

# 6.1 Description of Major Taxes

# 6.1.1 Income Tax

According to Article 26 of the Law on Foreign Investment the rate of income tax is set at 15 to 25 per cent of earned profits. The level will depend on an assessment of six criteria set out in Article 73(1) of the Regulations under the Law (Decree No. 139/ HDBT 1988). However, for oil and gas, and some other valuable resources (which are not specified), the income tax may be higher. Further details are provided in Article 73(5), which states, in part that "in respect of projects for exploitation of oil and gas and a number of other rare and precious natural resources, the State Committee for Cooperation and Investment shall, on a case-by-case basis, decide on any income tax rate
in excess of twenty-five per cent of actual profits in accordance with international practice and in consideration of the proposal of the foreign investor."

Legislation imposing special tax rates on minerals has been written and is under consideration.

A tax holiday is afforded to some joint ventures under Article 27 of the Law on Foreign Investment.

Depending on the branch or sector of its investment, the scale of its capital investment, the volume of its exports, its nature and duration, a joint venture may be exempted by the State organ for management of foreign investment from payment of income tax for a maximum period of two years counting from the first profit-making year and allowed a 50 per cent reduction of income tax for a maximum period of two succeeding years.

The same article goes on to allow loss carry-forward.

In the course of its operation, losses incurred by a joint venture in any tax year may be carried over to the next tax year and made up with the profits of the succeeding years but not exceeding five years.

Partial tax relief is available to some companies under Article 28.

In exceptional cases where encouragement of investment is needed, reduction of income tax may be granted by the State organ for management of foreign investment up to 10 per cent of the earned profits and the period of income tax exemption or reduction may be extended for a longer period than that provided for in Article 27 of the present Law.

A reinvestment allowance may be available to some firms under Article 32.

When any foreign organization or foreign person reinvests part of their share of the profits, they may receive a refund by the tax authorities of the income tax already paid on the reinvested profits. (Note: also Article 77, Decree No. 139/HDBT, 1988.)

### 6.1.2 Export and Import Taxes

Article 35 of the Law on Foreign Investment states that "export and import duties on export/import products of the enterprise with foreign invested capital as well as those of contractual business co-operation shall be levied according to the Law on Export/ Import Duties. The State organ for management of foreign investment may decide a tax exemption or reduction in each individual case where investment is exceptionally encouraged."

The level of duties on various classifications of imports and exports is found in the Appendix to the Import Export Law of 11 January 1988 and in the Tariff of Duties on

Export of Commercial Goods 1989. Export duties are based on sales value. Under the said appendix, sample values are coal, 1 per cent; ores and purified metallic ores, 5 per cent; non-ore, earth or stone minerals, 5 per cent; black metals, 10 per cent; second black metals, 30 per cent; colour metals, 10 per cent; second colour metals, 50 per cent. These values do not match those in the aforementioned Tariff of Duties. Sample export duties under the tariff are coal, standard 3 to 5 per cent, minimum 0 to 3 per cent; ores and metal ores, standard 3 to 5 per cent, minimum 0 to 2 per cent; ferrous metal disposals, standard 30 to 40 per cent, minimum 20 to 30 per cent; nonferrous metal disposals, 40 to 50 per cent, minimum 30 to 40 per cent.

Operations enjoying a favoured status under the Law of Foreign Investment are charged a lower rate than the universal rate on many commodities. Most machinery, equipment, raw materials and fuel are exempt from import tax (Vo 1990). Article 81 of Decree No. 139/HDBT, 1988 specifies the guidelines for import tax exemption.

Article 65 of the same decree allows for a blanket exemption from import duty.

Imports of equipment, machinery, spare parts, transport vehicles, raw and other materials, fuel, among others, to meet the needs of production under a business co-operation contract already approved by the State Committee for Co-operation and Investment shall be subject to either a single overall import quota or an annual import quota as may be proposed by the parties to the contract. Where necessary, additions or adjustments may be approved for an import quota in consideration of a fair proposal made by the enterprise to this effect.

Decree No. 8/HDBT specifically allows certain types of agreements to supersede the general laws and tariff rates for imports and exports. The language in Article 3 is, however, open to some interpretation problems.

With regard to export or import goods, which have the separate agreement in writing between the Vietnamese Government (the Council of Ministers or the State-run agencies delegated by the Council of Ministers) with foreign governments or organizations on the deduction or exemption of the import-export taxes, then the relevant export and import taxes shall be levied in accordance with this agreement. Export and import goods of enterprises with foreign invested capital and goods exported under contractual business co-operation then the import-export taxes are applied in accordance with the provisions of the Import/Export Tax Law.

### 6.1.3 Royalty Taxes

Article 29 of the Law on Foreign Investment states that "in case of exploitation of natural resources, they shall have to pay a royalty." Article 84 of the Regulations under the Law (Decree No. 139/HDBT, 1988) also discusses royalty. The actual royalty rates are set out in the Ordinance on Royalties 30 March 1990. Under Article 2(1) of the ordinance, "metal and non-metal mineral resources, including rock, sand,

pebble, and earth used as materials for industrial production, small industries and handicrafts" are all subject to royalty tax. The rates given in the ordinance are for metal minerals, 2 to 10 per cent; gold, 2 to 15 per cent; nonmetallic minerals, 1 to 12 per cent; and gemstones, 3 to 15 per cent. Based on the given rate range, the Council of Ministers stipulates the specific tax rate. For mineral resources exploited by foreign organizations, the rate is applied to a selling price stipulated by the Council of Ministers in conformity with international market prices.

### 6.1.4 Fees and Land Rent

Article 29 of the Law on Foreign Investment states that "the enterprise with foreign invested capital and the foreign partner to a business co-operation contract shall be liable to pay rents for the use of land, water surface or sea surface in Viet Nam."

Various rate schedules are prescribed in Article 2 of the Regulation on the Rents of Land, Water and Sea Surface to be Applied to Foreign Investment Firms in Viet Nam. Depending on the land type, the rate can vary from US \$0.50 to as high as US \$1,000 per hectare per year. The rate is stipulated for different types of land, within a set range, on a case-by-case basis.

It cannot be determined with certainty whether the rent referred to in the Law on Foreign Investment is the same land-use tax appearing in the Land Law.

### 6.1.5 Indirect Taxes

Article 7(2) of the Law on Foreign Investment in Viet Nam states that "the capital contribution by the Vietnamese partner to a joint venture may be made in the form of ... natural resources." Article 10 states that "the profits and risks of a joint venture shall be shared by the partners in proportion to their respective capital contributions." Most mineral companies would view the effect of these two provisions as an indirect tax (free equity). Free equity requirements may dramatically lessen investment interest by foreign mineral companies, except in "bonanza" situations. However, it should be noted that three types of foreign investment are allowed under the law: contractual business cooperation, joint ventures and private enterprises with 100 per cent foreign invested capital. The requirement for free equity would apparently only apply to the second organizational form – joint ventures.

### 6.1.6 Miscellaneous

There is a 10 per cent withholding tax on profits repatriated abroad; however, this can drop to 5 per cent in the case of foreign interests holding more than 50 per cent of the capital or where the investment is more than US \$10 million (see Article 76, Decree No. 139/HDBT, 1988). Withholding tax must be paid in the currency type being remitted.

Mining enterprises are subject to a turnover tax under the provisions of the Law on Turnover Tax. Details contained in the law alone are insufficient to give foreign firms an indication of the level of the tax and how it is to be calculated.

# 6.2 Ability to Predetermine Tax Liability

While some tax liabilities can be predetermined at the present time, other taxes, such as mineral royalty and land rent, cannot. The inability to predetermine basic tax rates will be viewed negatively by most exploration and mining companies. Special tax legislation is now under consideration, which may remove the current uncertainty.

### 6.3 Stability of Fiscal System

Foreign investment is now just beginning to re-enter Viet Nam. There is no precedent on which to rely in determining whether the current fiscal system will remain stable. It is highly likely that the current system will change as the government experiments with foreign investment. Foreign companies seeking projects will probably seek to clarify their tax liability and its stability through written agreements.

### 6.4 Tax Treaties with Other Nations

Article 40 of the Law on Foreign Investment states that "pursuant to the principles prescribed in the present Law, the Government of the Socialist Republic of Viet Nam may conclude with foreign governments agreements on co-operation and investment in accordance with the economic relations between Viet Nam and each foreign country."

It is not known to the authors the extent, if any, to which the government has acted with this authority to enter into tax treaties with other nations.

### 7. Monetary Controls and Access to Capital

### 7.1 Foreign Exchange

Article 17 of the Law on Foreign Investment states that "the enterprise with foreign invested capital shall open its accounts in Vietnamese currency and in foreign currencies with the Bank for Foreign Trade of Viet Nam or with branches of foreign banks established in Viet Nam as may be approved by the State Bank of Viet Nam."

The extent, if at all, to which the government will allow external accounts is not made absolutely clear in the law. However, some commentators have reported that all revenues and expenditures of enterprises are required to be effected through accounts opened pursuant to Article 17. Article 5 of Circular No. 26/NH-TT appears to support this view.

Article 22 of the law provides additional details regarding repatriating capital.

The foreign organizations or persons investing in Viet Nam shall have the right to repatriate or remit abroad:

- 1) Their share of the profits derived from business operation;
- 2) Any approved payments due to them for provision of technology or services;

- 3) The principal and interest due on any loan made in the course of business operation;
- 4) Their invested capital;
- 5) Other sums of money and assets in their legal ownership.

Article 23 extends the right of expatriate employees to repatriate or remit abroad their earnings after payment of the local income tax.

With regard to exchange rates, Article 25 of the Law on Foreign Investment states that "the conversion of Vietnamese currency into a foreign currency shall be effected at the official exchange rate to be made public by the State Bank of Viet Nam."

Additional details pertaining to foreign exchange regulation are provided in Chapter VII of Decree No. 139/HDBT, 1988 and Circular No. 26/NH-TT, 1989.

Most mining companies would find the exchange control system less than optimum. The apparent inability to maintain external accounts would be viewed by many as a major disincentive. The potential for a divergence in the real and official exchange rates between local and hard currencies would also tend to be viewed negatively.

### 7.2 Access to Capital

There is little substantial venture capital available in Viet Nam. Small-scale miners do not generally have the fiscal resources to meaningfully contribute to a joint venture arrangement. Larger state companies also have limited fiscal resources and would in most cases argue that their contribution to a project should be in the form of the resources rather than in cash.

Aid contributions from traditional sources are now decreasing, and there is little likelihood that any increase will be forthcoming.

Viet Nam cannot borrow additional funds from the IMF until it repays its standby credit. Obligations in this regard are estimated to be about US \$150 million (principal plus interest). The World Bank has lent some money to Viet Nam, but this has been done in the face of the objections of the United States. Sizeable injections for a mining project would not be easy to arrange until the United States embargo is raised.

In summary, foreign firms interested in developing exploration and mining projects in Viet Nam will have difficulty raising funds within Viet Nam.

### 8. Environmental Protection

# 8.1 Legal Requirements for Environmental Protection

Article 36 of the constitution states that "all state organs, factories, co-operatives, units of the people's armed forces, and citizens have the duty to implement the policy of protecting, transforming, and renewing natural resources, and of protecting and improving the environment." The extent to which this general requirement has been applied to mining operations is unknown to the authors. In addition to the broad requirement under the constitution, Article 34 of the Law on Foreign Investment states that "the enterprise with foreign invested capital shall be liable to take necessary steps for protection of the environment in the course of its operation." What these steps are or how they can be determined is not described within the law.

Article 46(4) of the Regulations for the Implementation of the Law on Foreign Investment (Decree No. 139/HDBT 1988) states that in respect of a joint venture "serious pollution of the environment caused by the activities of the joint venture, without any solution to control it in time" is grounds for terminating the joint venture.

Similarly, Article 62 of the regulations empowers the State Commission for Cooperation and Investment to issue a decision for temporary discontinuance of the operation of an enterprise with 100 per cent foreign capital or for its dissolution if there occurs serious pollution of the environment without any effective measure to control it.

Under the Land Law of 1987, mining is considered a "specialized" land use, and a general obligation is imposed on the land-user.

Users of specialised land shall have the following obligations: ... To take necessary measures aimed at achieving economical land-use, protecting the environment and avoiding any interference with the productive activity and ordinary life of the people in adjacent areas (Article 45).

... to conduct land protection, transformation and fertilization and to refrain from all acts harmful to the environment and to the legal interests of users of adjacent lands (Article 48).

Article 39 of the Land Law states with specific reference to mining land that "at the termination of its use, the land shall be returned in the State as described in the landallotment decision of the State authorities concerned."

In conclusion, many of the laws that would apply to a mineral project investment contain a very broadly worded requirement for environmental protection. Since there are no recent and sustained precedents of foreign investment in mining, the mineral investor has little guidance on the extent to which such broadly worded requirements require actual environmental protection and rehabilitation. While this lack of clear guidance may appeal to some mining companies, given the lack of precedents most companies would probably prefer to know early on the extent of their environmental obligation.

### 8.2 Environmental Protection Trends

Environmental protection groups are not well established in Viet Nam. It is doubtful that antimining groups would play any significant role, except in isolated instances where local communities may come to oppose a specific project threatening their livelihood.

# 9. Local Services and Labour Market

### 9.1 Availability of Local Services

In general, there is a general lack of local services to support exploration and mining operations. Laboratories tend to be outdated and lack even basic types of analytical equipment. Finding trained personnel is less of a problem.

The United Nations (UNDP/ESCAP) is assisting to upgrade some aspects of government geotechnical services and capabilities such as analytical laboratories, offices, transport and communications.

### 9.2 Labour Market

Article 68 of the Regulations for the Implementation of the Law on Foreign Investment in Viet Nam defines key matters regarding the employment of Vietnamese. Basically, most key labour issues, including wages, are regulated by a labour contract between the parties. Labour in an enterprise with foreign capital has the right to form its own trade union, which represents the workers in all outstanding issues between labour and the enterprise. Further requirements are presented in the Labour Regulations for Enterprise with Foreign Invested Capital, 1990.

The minimum wage allowed by the Minister of Labour for labour employed in enterprises with foreign invested capital is US \$50 per month (Decision of Minister of Labour, War Invalids and Social Affairs on Minimum Wage For Labour in Enterprise With Foreign Invested Capital, 29 August 1990).

At the present time, roughly 10,000 people are engaged in Vietnamese geological taskforces. About 10 per cent of these have university degrees and 30 per cent have received intermediate training (*Vietnam Business* 15 July 1991). International petroleum companies operating in Viet Nam have found many highly knowledgable Vietnamese geologists. In terms of mining, it is anticipated that for most projects expatriate staff would be required at the development and early operations stage.

### 10. Conclusions

The key findings of this study with regard to the mineral sector investment environment are listed below.

### Factors Favourable to Investment

- \* Favourable geology.
- \* Emergence of an "open-door" policy.
- \* A choice of investment modes, including both joint ventures and 100 per cent foreign-owned equity.
- \* Existence of known deposits and some operating mines that have economic potential for development or optimization.

- \* Most known taxes compare favourably with those of other nations in the region (15 to 25 per cent income tax; however, for some minerals the income tax could be higher; a provision for tax holiday and further exemptions is possible; there is a remittance tax of 5 to 10 per cent, which can drop to 5 per cent in the case of foreign interests holding more than 50 per cent of the capital or where the investment is more than \$10 million; and duty-free tax exemptions on imports of some raw materials or equipment related to the business).
- \* Arbitration (including non-national arbitration) is allowable.
- \* A guarantee against expatriation or nationalization.
- \* The right to repatriate capital and profits.

# Factors that Discourage Investment

- \* Lack of a national mineral policy, comprehensive mining code, regulations and model agreement.
- \* Lack of infrastructure.
- \* Cumbersome bureaucracy for companies that cannot start at the top of the political structure.
- \* Lack of government familiarity with mining industry financial analysis and decision making.
- \* Lack of government experience in dealing with international mining companies and the international trade of minerals.
- \* Lack of a modern service structure (analytical laboratories, suppliers, ...).
- \* Difficulties in obtaining geological and mining data.
- \* Lack of a governmental promotional capability whereby foreign investors can become better acquainted with known deposits and prospective mining areas.
- \* Some taxes are not possible to quantify, given the current legislation.
- \* External accounts are not allowed.

At the present time, mineral sector investment in Viet Nam is riskier than in many other nations offering similar geology. It can be expected that there will be an initial surge of investment by some mining companies looking to develop known deposits representing "bonanza" opportunities, but that sustained exploration investment will be slow to develop. Before substantial sums are spent in exploration or for mining, current laws (or a model agreement) will need to be more fully developed.

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# A Global Survey of Mineral Company Investment Preferences

#### 1. Introduction

Every company undertaking a study of the mineral sector in a region or country will select evaluation criteria that fit its particular needs and biases. To gain a better understanding of the reasons for companies making decisions to select one country over another for investment, a questionnaire was circulated to mining companies worldwide. As expected, the compilation of the responses indicated that some companies place a stronger emphasis on certain criteria than do other companies. However, certain patterns did show up in the compilation. Most of these, such as a pronounced attraction to prospective geology and high profit-potential mines, were predictable. Other trends were not as predictable.

Governments should find the results of the survey valuable when assessing their country's mineral investment environment. For example, an analysis of the results of this survey could be useful in devising an investment-oriented mineral development policy or in revising mineral regulatory systems.

Companies may also find the survey useful. It provides a fairly comprehensive list of various investment criteria and indicates the types of commonalities and differences among fellow companies. At the least, it can act as a yardstick to measure the company's approach against the rest of the industry.

As with almost all surveys, this survey was faced with limitations and difficulties. For example, some questions were not well devised and needed to be discarded, while others were too broadly worded and did not provide a truly useful level of detail. However, on the whole, comments received from the questionnaire respondents were quite positive. Almost all respondents indicated that they wanted a copy of the results.

The interpretation of the survey results is left to the reader. The results have been tabulated for ease in such analysis. Questions regarding the methodology used in the collection and compilation of the data may be referred to James Otto, Centre for Petroleum and Mineral Law and Policy, University of Dundee, Scotland, UK DD1 4HN. Information contained in individual questionnaires is considered confidential and will not be disclosed.

### 2. Survey Methodology

Confidential questionnaires were sent by mail to 100 mineral companies around the world. When it became apparent that the response to the initial mailing was inadequate, an extensive effort was made to contact non-responding companies through a second mailed request, by telefax and by phoning.

This paper was prepared by James Otto, Assistant Director, Centre for Petroleum and Mineral Law and Policy, University of Dundee, United Kingdom. The views expressed in it are those of the author and do not necessarily reflect those of the United Nations.

In selecting the 100 companies to be contacted, it was first determined whether a company had exploration or mining projects outside of its home country. Only companies with reported "international" experience were sent the questionnaire. Upon receipt of the completed questionnaires, some companies indicated they were no longer operating internationally. The responses from this small group were included in the tabulated results to gain a better appreciation of why some companies have retreated from their international position.

Because it is not accurately known how many exploration and mining companies exist that invest internationally in mineral projects, it was not possible to determine whether the sample group is truly representative of mineral companies worldwide. The reason for the practical approach was to try to gain a broad sample, including small and large companies, that have a direct role in exploration and mining. Thus, some types of organizations that are directly linked to the minerals industry, such as financial institutions and trading companies, were excluded from the sample.

No assurance can be given that the companies responding to the questionnaire comprise a valid statistical sample group representative of the world mining industry. The tabulated results derived from the questionnaire responses are intended to provide a qualitative indication of the criteria that the respondents use in making an investment decision. Any statistical extrapolation based on the results reported here is left to the reader.

#### 3. Description of the Companies Responding to the Survey

The questionnaire included several questions designed to provide a general profile of the responding companies, including their primary business focus and the scale of their operations and expenditures. The response to these questions indicated that the companies responding to the survey included a wide range of mineral sector investors. The breakdown of the number of companies contacted and responding to the questionnaire is summarized as follows.

- Companies contacted: 100
- Completed questionnaire: 39
- Declined to participate: 15
- Companies not responding: 45
- Companies responding too late: 1 100

The fifteen companies that were unwilling to answer the questionnaire gave the following reasons for not participating.

- Against company policy to answer (3 companies)
- Out of business, merged (5 companies)
- Redirecting away from minerals (2 companies)
- No interest in investing in Asia-Pacific (3 companies)
- Felt questionnaire did not apply to the company (2 companies)

The companies that returned completed or mainly completed questionnaires are listed by region in Table 1.

#### Table 1. List of companies completing the questionnaire

Africa:	North America:
<ul> <li>Anglo American Corp. of SA Ltd.</li> </ul>	<ul> <li>ALCAN International Ltd.</li> </ul>
<ul> <li>Anglovaal Ltd.</li> </ul>	<ul> <li>Amax Exploration, Inc.</li> </ul>
	- ARCO Coal Co.
Asia:	<ul> <li>Battle Mountain Gold Co.</li> </ul>
<ul> <li>Atlas Consolidated Mining &amp; Development</li> </ul>	<ul> <li>BHP-Utah International Inc.</li> </ul>
Corp.	<ul> <li>Consolidation Coal Co.</li> </ul>
<ul> <li>Padaeng Industry Company Ltd.</li> </ul>	<ul> <li>Falconbridge Ltd.</li> </ul>
- P.T. Adaro Indonesia	- FMC Gold Co.
	<ul> <li>Inco Exploration and Technical Services Inc.</li> </ul>
Australia:	<ul> <li>Massey Coal International, Inc.</li> </ul>
<ul> <li>Ashton Mining Ltd.</li> </ul>	<ul> <li>Noranda Minerals Inc.</li> </ul>
- Bridge Oil Ltd.	<ul> <li>Pegasus Gold Co.</li> </ul>
<ul> <li>CRA Exploration Pty. Ltd.</li> </ul>	- Placer Dome Inc.
- Delta Gold NL	<ul> <li>Teck Exploration Ltd.</li> </ul>
<ul> <li>Dominion Mining Ltd.</li> </ul>	
- MIM Holdings Ltd.	Western Europe:
- Newcrest Mining Ltd.	<ul> <li>Billiton International Metals BV</li> </ul>
- North Broken Hill Peko Ltd.	<ul> <li>Bisichi Mining PLC</li> </ul>
<ul> <li>Pancontinental Mining Ltd.</li> </ul>	– BRGM
<ul> <li>Paragon Resources NL</li> </ul>	<ul> <li>ECC International Ltd.</li> </ul>
- Renison Goldfields Consolidated Ltd.	<ul> <li>Greenwich Resources</li> </ul>
<ul> <li>Sons of Gwalia NL</li> </ul>	- Sibeka
<ul> <li>Western Mining Corp. Ltd.</li> </ul>	<ul> <li>RTZ Corp. PLC</li> </ul>
<ul> <li>North Broken Hill Peko Ltd.</li> <li>Pancontinental Mining Ltd.</li> <li>Paragon Resources NL</li> <li>Renison Goldfields Consolidated Ltd.</li> <li>Sons of Gwalia NL</li> <li>Western Mining Corp. Ltd.</li> </ul>	<ul> <li>Bisichi Mining PLC</li> <li>BRGM</li> <li>ECC International Ltd.</li> <li>Greenwich Resources</li> <li>Sibeka</li> <li>RTZ Corp. PLC</li> </ul>

There is a perception that today's worldwide mineral industry has become more specialized, with some firms engaging only in exploration and others only in mining. Firms engaged only in exploration might have different investment criteria than firms focusing only on mining. In order to identify the respondent's primary focus of activity, the respondent was asked to indicate the major activity undertaken by the company. Table 2 indicates that most companies responding to the questionnaire consider both exploration and mining as their primary business activities. Table 3 demonstrates that the companies responding cover a broad range of sizes, based on annual sales revenues, exploration expenditure and mine investment.

#### Table 2. Major mineral activity

Company's primary business activity	Number of companies
Exploration	1
Exploration and mining	25
Mining	7
Holding company	2
Primarily services	0
Others:	
Mineral processing	1
Mining investment	1
Exploration, mining, processing	1
Exploration, mining, holding company	1
Number of companies responding:	39

#### Table 3. Company revenues and expenditures

(All values in million US \$)

General combined data:

	Average	Total	Number of companies
Mineral sales revenues	\$1.098	\$34,025	31
Exploration expenditures	\$29	\$897	31
Mine capital expenditures (excluding exploration)	\$130	\$3,898	30

Size distribution based on annual mineral sales revenue:

	Mineral sales revenue				
	<\$100	\$100 to <\$250	\$250 to <\$1,000	\$1,000+	
Number of companies	6	6	8	11	

Size distribution based on annual exploration expenditure:

	Investment in exploration				
	<\$10	\$10 to <\$25	\$25 to <\$50	250+	
Number of companies	11	7	6	7	

Size distribution based on annual mine investment:

	Investment in mines				
	<\$50	\$50 to <\$100	\$100 to <\$250	250+	
Number of companies	10	7	7	6	

Note: Companies reported data for 1990 or the most recent year available.

#### 4. Exploration and Mining Philosophy

If a country does not have good prospects for the latest "hot market" mineral, are its prospects for mineral sector investment appreciably decreased? Answers to questions like this are related to the investment "philosophy" of individual companies. Tables 4 and 5 contain company responses related to company investment philosophy.

Twenty companies indicated that they preferred to operate in a regulatory environment that provided for the negotiation of project-related provisions within an established mining code. These companies were asked to identify the specific topics they preferred to negotiate. The results are shown in Table 6.

Number of companies	Focus of company investment policy for the next 5 years
14	Interested in a broad range of minerals within any favourable country or region
11	Interested in one or two minerals within any favourable country or region
8	Interested in one or two minerals within a specific region
2	Interested in a broad range of minerals within a specific country
2	Interested in a broad range of minerals within a specific region
1	Interested in one or two minerals within a specific country
38	Total number of companies responding

#### Table 4. Focus of company investment policy for the next five years

#### Table 5. Investment philosophy

Number of companies	Exploration investment philosophy
21	If the prospects are good, we are prepared to be one of the first foreign companies to undertake exploration in any particular country.
15	We prefer to see other companies exploring before we will become involved in any particular developing country.
3	Not applicable (company does not do exploration)
39	Total number of companies responding
	Mining investment philosophy
21	If the economics are good, we are prepared to be one of the first to undertake mining in any particular country.
16	We prefer to mine in countries with an established record of mining by foreign companies.
2	Not applicable (company does not build or operate mines)
39	Total number of companies responding
	Regulation philosophy for exploration and mining
8*	Prefer to work within an established mining code
7	Prefer to work within a negotiated agreement
20*	Prefer to work with project-related provisions negotiated within an established mining code
4	No preference
38	Total number of companies responding

\*Note: Includes one company that indicated the first choice for exploration and the second choice for mining.

No. of companies indicating that the provision should be negotiated	Provision(s)	No. of companies indicating that the provision should be negotiated	Provision(s)
9	Provisions related to taxa-	2	Offshore accounts
	tion	2	Security of tenure
5	Importation of equipment	1	Provision of social services
3	Government and/or local participation	1	Everything not addressed in the law
3	Free repatriation of pro-	1	Access to ground
	ducts, revenues, profits	1	Tax-free holidays
3	Expatriate labour	1	Management
3	Currency conversion	1	Marketing
2	Labour regulations	1	Cost of services

Table 6. Legal provisions that companies prefer to negotiate

There are few issues that receive more attention than the issue of taxation. In today's investment environment, taxes are usually either fixed by law or are, at least in part, negotiable. Table 7 indicates how the respondents to the survey viewed the alternative of fixed duty versus negotiable duty for a variety of commonly employed tax types.

Table 8 provides a summary of where, on a regional basis, the respondent companies actually carried out exploration and mining projects over the past ten years.

Table 7.	Investor	preferences	pertaining	to fixed o	or negotiable (	taxes
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	Fixed	Negotiable	No preference
Import duties	18	17	3
Royalties	16	19	3
Income tax	28	10	I
Tax holiday	13	21	4
Tax holiday	13	21	

Other comments: If rates are competitive, then fixed; otherwise negotiable - 3 companies.

39 companies responded but not necessarily to all items.

Table 8.	<b>Regions where</b>	companies have work	ed in the past te	n years

	N	umber of	companies worl	king in a region	within the	e past ten y	'ears
ай 1	Africa	Asia	Australia/ New Zealand	Papua New Guinea/ Pacific islands	Europe	North America	Central and South America
Exploration:	16	22	30	17	14	25	25
Mining:	14	9	26	8	7	20	12

Number of companies responding: 39

#### 5. Company Decision Criteria

When making an exploration or mining investment decision, different companies will use a variety of decision criteria. Not all companies use the same decision criteria nor do they place an equal weighting on any one criterion. Table 9 indicates how important the respondent companies thought each of a number of decision criteria were for their companies.

Companies were asked to indicate the three most important decision criteria that they used in making exploration and mining investment decisions. These criteria were not limited to those listed in Table 9. A tabulation of the combined key criteria is shown in Table 10.

To provide additional information about economic criteria, a question was formulated to determine what types of profitability and other economic measures companies use. Companies were asked to state whether or not they use specific types of economic criteria when assessing a prospective mining operation. Their responses are given in Table 11.

The companies were asked to identify how important different sources of information and experience were in identifying mineral opportunities in foreign countries. The ranking of information sources is shown in Table 12, which indicates that previous experience was given the highest level of importance, followed by information supplied by the national geological survey and department of mines.

There is a variety of factors whose presence may be viewed adversely by mineral sector investors. Companies were asked to indicate whether they considered certain specified factors to be investment disincentives and, if so, to what extent (Table 13).

#### 6. Investor Attitudes Regarding the Asia-Pacific Region

One of the first steps that almost any company investing in the Asia-Pacific region takes is to determine what information is already available. Companies were asked to evaluate the general availability of certain types of information in the developing countries of the Asia-Pacific region. Table 14 indicates that there is widespread agreement that information requirements could be better met.

The usefulness of appraising the mineral industry investment environment of the Asia-Pacific region as a whole is limited. To give a better indication of how companies perceive the countries within the region, 11 developing countries in the region were selected for detailed appraisal. The companies were requested to give their views on whether or not specific investment criteria were favourably satisfied in each of the selected countries. In addition, they were asked their overall perception of the favourability for exploration and mining investment. The results are given in Table 15.

As a follow-up question, the companies were asked whether they had, within the past ten years, undertaken certain types of work in the 11 selected countries. The results are tabulated in Table 16.

	Expl	oration progra	mmes	Mining projects							
	Very important	Important	Not very important	Very important	Important	Not very important					
Geological criteria											
General mineral abundance	15	18	4								
Geological potential for target minerals	34	5	0								
Availability of geoscientific information	7	27	4								
Historical production	4	16	16								
Ability to apply geological assessment techniques	22	13	3								
Rarity of predicted mineral deposits	2	7	23								
Political criteria											
Long-term national stability	22	17	0	23	11	0					
Regime stability	14	21	2	14	16	2					
Consistency and constancy of mineral policies	30	9	0	27	6	1					
Internal conflicts	20	16	1	18	14	0					
Hostile borders Others: democratic - 1; secur	16 rity of personn	17 el - 1	3	15	14	2					
Marketing criteria											
Geographic location	9	20	8	11	18	6					
Presence of internal markets	1	6	30	0	13	22					
Transportation infrastructure	11	17	9	14	18	3					
Export/import policies	22	9	6	24	9	2					
Regional trade agreements Demand/price forecasts	3 11	10 10	24 14	7 14	10 8	21 11					
Regulatory criteria											
Modern mineral legislation	19	14	5	20	11	4					
Stability of exploration/ mining terms	26	11	1	29	7	0					
Mineral ownership	27	7	4	26	6	3					
Surface/land ownership	18	13	7	16	15	4					
Security of tenure	32	6	0	34	2	0					
Established mineral titles system	22	14	2	22	12	2					
Right to transfer ownership	20	17	1	15	18	2					
Size of exploration blocks	11	15	10			-					
agreement to supplement or stand in place of the mining code	11	17	6	10	14	2					
International arbitration	9	16	11	9	15	6					
Fiscal criteria											
Method and level of tax levies	22	12	2	25	10	0					
Ability to predetermine tax liability	26	10	0	29	6	0					
Availability of tax holiday	6	16	13	9	17	9					
Availability of accelerated depreciation	8	17	10	9	22	4					
Availability of reinvestment credits	3	16	16	1	23	11					
Stability of fiscal regime	23	11	1	26	7	0					

### Table 9. Importance of specific decision criteria

### Table 9. (Continued)

	Expl	oration progra	mmes	Mining projects						
	Very important	Important	Not very important	Very important	Important	Not very important				
Tax treaty with home	7	17	11	10	16	9				
Expatriates exempt from income tax	4	7	25	3	6	26				
Monetary criteria										
Realistic foreign exchange regulations	26	11	0	28	8	0				
Permitted external accounts	20	12	5	25	10	1				
Ability to repatriate profits	31	4	2	34	2	0				
Ability to raise external financing	23	9	5	24	11	1				
Oulers. exchange rate stabilit	y - 1, no with	loiding tax - 1								
Environmental criteria										
Ebvironmental regulations	9	24	5	14	17	4				
Ability to predetermine environment-related obligations	23	14	ł	27	7	0				
Antimining groups	7	17	13	6	21	6				
Relative sensitivity of environment	10	20	7	14	16	2				
<b>Operational factors</b>										
Prior company experience in the country	2	13	23	3	18	14				
Majority equity ownership held by company	21	12	6	20	12	4				
Company has management control	27	9	2	27	7	2				
Established infrastructure and utilities	4	21	12	8	23	4				
Favourable climate	1	6	29	2	6	27				
Physical lay of the land	1	13	23	2	10	23				
Availability of experienced local workforce	3	18	15	5	25	4				
Availability of fabrication/	2	16	19	6	19	9				
Availability of local geotechnical services	1	14	22	1	13	22				
Common spoken language	2	13	21	2	13	20				
Availability of foreign investment insurance	8	8	21	6	11	17				
Others: importing exploration	n equipment -	l; no free carrie	d interest - 1							
Profit criteria										
Internal rate of return				30	7	0				
Net present value				25	9	3				
Break-even year				17	14	5				
Return on investment				27	8					
Others: accounting return - 1	; total revenue	e - 1		21	12	2				

Number of companies responding: 39

Note: Not all companies indicated a response for every criterion.

Number of companies	One of three key decision criteria	Number of companies	One of three key decision criteria
Exploration i	investment decision	Mining inves	tment decision
34	Geological potential	18	Profit potential
15	Political stability	15	Political stability
10	Security of tenure	11	Repatriation of profits
7	Mining law	9	Tax levels/tax stability
5	Mining law stability	8	Market
7	Tax stability/level of taxes	7	Cost
3	Logistics	7	Deposit characteristics
3	Management control	5	Mining law stability
2	Access to land	4	Mining law
2	Market	3	Location
2	Cost	3	Security of tenure
2	Location	3	Technical criteria
2	Repatriation of profits	2	Infrastructure availability
2	Safety of people and assets	2	Management control
2	Quality and financial involve-	1	Logistics
	ment of operator	1	Political risk insurance
1	Country of operation	1	Quality of operator
1	Environmental climate	1	Country of operation
1	Policy stability	1	Personal financial involvement
1	Availability of geotechnical services		of operator
1	Infrastructure availability	1	Control
1	Applicability of experience/	1	Repatriation of capital
	technology	1	Environmental criteria
1	Large blocks	1	Size of investment
1	Mineral ownership	1	Ability to export

#### Table 10. Key investment criteria

Number of companies responding: 39

Note: Not all companies specified three key criteria.

### Table 11. Types of economic measures used in assessing a prospective mining project

Yes	No
36	3
36	3
30	9
34	5
32	7
	Yes 36 36 30 34 32

Others: toal revenue - 1; revenue/operating cost greater than two - 1

Number of companies responding: 39

#### Table 12. Relative importance of information sources

		Degree of impor	tance
	Major	Some	Little or none
Direct company experience	22	13	2
Geological survey, mines department	19	14	5
Company employee's prior experience	11	22	5
Other companies	8	25	4
Consultants	4	22	12
Professional journals, magazines	2	24	2
Country's promotional efforts	2	18	18
United Nations or World Bank reports	0	19	17

Others: geological database - 1; extended visit to country - 1

Number of companies responding: 38

Note: Not all companies indicated a response for every data source.

#### Table 13. Factors that act as a disincentive to investment

	Prohibitive	Major disincentive	Minor disincentive	Not a disincentive
Equity participation				
Mandatory majority government participation	20	19	0	0
Mandatory majority participation by nationals	14	17	8	0
Mandatory minority government participation	0	10	17	12
Mandatory minority participation by nationals	0	4	16	17
Form of government				
Communist form of government	15	15	8	1
Government dominated by one person	4	12	15	7
Democratic form of government	0	0	0	39
Miscellaneous				
Government corruption	13	22	3	0
Restrictions on negotiating wages	4	16	17	1
Strong labour unions	3	14	7	4
Expatriate personnel limitations	2	18	16	2
Mandatory provision of social services (schools, health services,)	0	7	18	11
Mandatory training of nationals	0	1	8	30

Comments: One company commented that free carried interest was a major disincentive.

Number of companies responding: 39

Note: Not all companies indicated a response for every item.

	Adequate	Somewhat adequate	Generally inadequate	Do not know
Geology				
Topographic maps	3	19	9	4
Aerial photo coverage	2	7	23	3
Geological maps	1	16	14	4
Airborne geophysics	0	1	25	9
Geological reports	0	11	17	7
Geochemical data	0	3	25	7
Others: previous exploration data generally inad	lequate - 1			
Legislation				
Foreign investment code	3	14	12	5
Mining code	3	8	15	6

#### Table 14. Adequacy of information in the developing Asia-Pacific countries

Comments: Ability to deal with single government office a big advantage - 1; varies significantly, depending on the country - 3, question too general - 4, information is difficult to obtain - 1; information is low quality - 1.

Number of companies responding: 35

#### Table 15. Investor appraisal of general investment conditions in selected developing Asia-Pacific countries

										(F - favourable;						U - unfavourable; ? - do not know)								w)	
Country		eol gic:	lo- al	Po	litio risk	al	M	Market- ing		M	Mining laws		Investment and tax laws			Environ- ment			Opera- tional			0	Overall		
	F	U	?	F	U	?	F	U	?	F	U	?	F	U	?	F	U	?	F	U	?	F	U	?	
China	31	2	1	3	24	7	9	12	12	2	13	19	I	15	18	9	10	15	1	22	11	3	21	10	
India	15	5	13	11	12	8	8	10	13	0	10	22	2	13	17	6	11	15	4	18	9	3	21	10	
Indonesia	35	0	0	30	3	2	30	1	3	- 26	6	3	25	3	6	23	1	8	24	7	3	28	3	4	
Lao PDR	8	5	19	4	15	12	2	7	21	2	4	25	3	1	27	6	2	21	6	7	17	4	10	18	
Malaysia	24	3	6	25	1	5	22	1	7	13	8	10	17	6	8	17	3	10	19	5	7	19	3	11	
Mongolia	11	4	17	0	9	22	0	11	19	1	1	29	0	1	30	1	5	24	0	8	24	0	10	24	
Pakistan	6	4	22	0	17	14	4	7	19	1	2	28	1	3	28	2	6	21	3	7	21	0	13	20	
Papua New Guinea	27	1	4	15	13	4	21	2	7	21	2	6	22	4	7	15	8	7	13	15	4	18	8	7	
Philippines	29	3	1	8	22	2	25	1	4	17	8	5	13	12	6	20	3	7	24	4	4	16	11	6	
Thailand	23	3	7	24	2	6	26	0	5	5	11	16	16	6	10	20	1	10	20	2	9	18	5	10	
Viet Nam	21	3	9	7	15	9	8	7	15	3	6	22	4	5	21	6	5	19	7	8	16	8	9	16	

Number of companies responding: 35

Note: Not all companies responded to all items.

To provide an indication of whether the selected countries will be receiving the near-term attention of the responding companies, the companies were asked to indicate whether they plan, within the next five years, to undertake work in those countries. The relative favourability for investment by the responding companies in each selected country is shown in Table 17.

Table 16. Exploration and mining activities undertaken in selected Asia-Pacific countries in the past ten years

(Y	= yes,	Ν	= no)
•			

True of a stirite	Cl	China		India		Indonesia		Lao PDR		Malaysia		Mongolia		Pakistan		P.N.G		Philippines		iland	Viet Nam	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Desk study(ies)	21	14	9	27	28	8	6	30	21	14	6	30	7	29	21	15	25	11	22	14	18	18
Visit(s) by company personnel	18	17	7	29	30	6	6	30	20	16	3	33	3	33	19	17	24	12	19	17	10	26
Exploration programme	6	31	1	36	21	16	2	35	9	28	0	37	0	37	17	20	8	29	9	28	3	34
Mining	1	36	2	35	11	26	0	37	5	32	0	37	0	37	8	29	6	31	3	34	0	37
Contractual services	5	31	1	35	9	27	0	36	5	31	1	35	0	36	6	30	4	32	4	32	3	33

Number of companies completing the table: 37

Note: Not all companies responded to all items.

#### Table 17. Exploration and mining activities likely to be undertaken in selected Asia-Pacific countries in the next five years

(P = probably, U = unlikely)

Tumo of activity	Ch	China		India		Indonesia		Lao PDR		Malaysia		Mongolia		Pakistan		P.N.G		Philippines		Thailand		Viet Nam	
	Р	U	р	U	Р	U	Р	U	Р	U	Р	U	Р	U	Р	U	Р	U	Р	U	Р	U	
Desk study(ies)	16	18	7	26	25	7	12	20	19	14	7	26	5	27	19	14	19	12	22	12	20	14	
Visit(s) by company personnel	16	17	9	25	23	10	10	22	18	16	7	26	5	28	18	15	17	15	21	13	17	17	
Exploration programme	7	27	2	31	20	11	6	26	11	20	0	32	1	30	15	16	12	20	13	18	10	19	
Mining	4	27	2	29	13	17	1	28	3	25	0	31	1	28	9	21	10	20	3	27	3	26	
Contractual services	6	24	3	27	7	21	1	29	5	23	1	29	0	29	5	25	8	21	6	24	6	24	

Number of companies included in the table: 36

Note: Not all companies responding answered all items.

### Supplementary Bibliography

Note: This supplementary bibliography lists various sources of information useful in gaining a better appreciation of the mineral investment conditions in the ESCAP region. The documents (or other source materials) that appear in the bibliography were not necessarily used in the preparation of the preceding studies. Likewise, not all references and citations contained in the studies are duplicated here.

The intent behind the preparation of the bibliography was to provide a general listing of materials related to mineral sector country investment analysis that may be useful to government officers, planners and policy makers; industry; academia; and multilateral institutions.

It is beyond the scope of this modest effort to present a comprehensive bibliography for the ESCAP region or even for the selected study countries. The literature is immense; this bibliography represents only a sampling of the available information.

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