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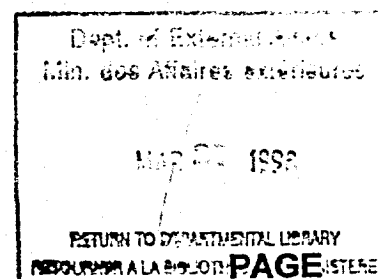
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# **MINING IN BOLIVIA**

## **SECTOR REPORT**

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## **EXECUTIVE SUMMARY**

### **Introduction:**

The government of President Sánchez de Lozada, in office until June 1997, has continued a trend initiated in 1985 by President Victor Paz Estenssoro, who introduced a liberal political and economic policy to a country that had grown used to many years of military dictatorship and state-led economy, plagued by inefficiency and corruption.

This new approach has created the conditions of political stability and open economy that has fostered the arrival of many foreign companies decided to join the local private businessmen who are now investing in new mining projects in Bolivia.

The development of new mining projects will bring new prosperity to Bolivia and offer an excellent market for the Canadian suppliers of mining equipment and services.

### **The Bolivian mining industry:**

The Andes mountains occupy more than a quarter of the country area and hide an enormous wealth of many different minerals.

After many years of being a leading producer of silver, Bolivia turned into an important producer of tin, until its private industry was nationalized in 1952, initiating a trend of technological obsolescence and lack of investment that led to depletion of the mineral reserves and the reduction of production and exports.

Starting in 1985, the Bolivian mining industry has started a process of modernization, replacing the traditional tin mining operations for more productive minerals like silver, lead, zinc, and lately gold.

A frenzy of mining exploration has discovered new, interesting prospects in non-traditional areas like Sud Lipez and the Pre-Cambrian, where many foreign companies (among them several Canadian ones) are now operating.

The production of minerals in Bolivia during 1995 was: 6,654 MT of Antimony; 14,733 MT of Tin; 428 MT of Silver; 20,451 MT of Lead; 826 MT of Tungsten; 146,130 MT of Zinc; 127 MT of Copper; 14.4 MT of Gold.

### **The mining business climate:**

Under the guidelines of the new economic policy, the Bolivian government has started to capitalize (an imaginative way of privatization that causes less political opposition) many of its public corporations.

**COMIBOL**, its mining enterprise, cannot be privatized because of constitutional reasons, so it is being gradually transformed into a holding company, whose former properties are being awarded to private investors who sign with it joint venture agreements.

Private investors, local and foreign alike, have now the same treatment. There are no restrictions for the free trading of capitals and profits, which may now be repatriated without any limitations.

In simple terms, the conditions existing now in Bolivia are as open and competitive as those prevalent in any other free economy.

Attracted by the favourable business climate, several private companies have signed joint venture agreements with COMIBOL. Among them: AUSPAC (Australia), Barrick Gold (Canada), Cía. Minera La Barca (U.S.A.), COMINESA (USA), COMSUR (Bolivia), Mineracao Taboca (Brazil), SAMEX (Canada), and Silver Standard (Canada).

Mining investors are now exploring in a new and promising area: the Pre-Cambrian. Among them: COMSUR/RTZ (Bolivia/U.K.), Orvana Minerals (Canada), and many more.

### **The New Mining Code:**

A draft of a New Mining Code has been recently submitted by the Secretary of Mining in order to update the existing legal instrument in force since 1991.

The idea is to create more favourable conditions for private investors and allow foreign firms to access to mining activities within 50 kilometers of the international borders, under certain conditions.

The new Code will include also other aspects like taxation stability, land claiming procedures and environmental control.

### **Environmental policy:**

After many years of neglect and total disregard for the environment, the Bolivian Government is beginning to take measures to control the environmental impact of mining operations. This is the result of greater public awareness regarding the environment and also the higher standards imposed by the foreign companies that are now operating in the country.

The New Mining Code that has been drafted will contain legislation devised to regulate the environmental matters related to existing mining operations and all new projects.

**The market for suppliers of mining equipment:**

There are no trade barriers to the importation of equipment, which does not require licenses or permits. The general customs duty is 10% on all imports.

Although this is a well-established and very competitive market, dominated in several areas by the Swedish giant Atlas Copco, but served also by suppliers from the U.S.A., Finland, Germany, Japan, Chile, Peru and Brazil, Canadian firms are also active and there is room for more.

Companies that provide equipment and services for mining exploration have the best possibilities, because there is a very ambitious plan of exploratory drilling (134,000 meters of diamond and reverse circulation drilling will be drilled this year. Suppliers of good reconditioned equipment have also a good potential.

It is calculated that purchasing of mining equipment during the present year will reach the figure of US\$ 47.0 million.

To succeed in this market, it is necessary to have a good local agent or distributor who can provide parts and be reliable after sales service.

## 1. INTRODUCTION

The mining sector has been and will continue to be for a long time one of the driving forces in the Bolivian economy.

After many years of a protectionist and state-led economy that conduced to the stagnation of its mining industry, the governments of Presidents Paz Estenssoro (1985), Paz Zamora (1989), and Sánchez de Lozada (1993) brought to the country the most needed political and economical stability and introduced the policy of free market and promotion of private investment.

As a result of the new conditions existing in the country, a large number of private firms, local and foreign, have begun a new trend of mass exploration and modernization of the mining industry.

The extraordinary mineral wealth hidden in the Bolivian Andes and in the new mining frontier in this country, the Pre-Cambrian, are witnessing the development of many new mining projects that are creating excellent opportunities for the participation of Canadian investors and suppliers.

## 2. BOLIVIA AT A GLANCE

**The country:** Bolivia is locate in the center of South America and is bordered by Peru, Chile, Argentina, Paraguay and Brazil. It lies between the 9°38' and 22°53' parallel south, and 57°25' and 69°38' west. It has a surface area of 424, 200 square miles, which makes it larger than any country in Europe.

The climate varies from the tropical plains in the east to the alpine climate of the high Andes in the west. The Andean Plateau occupies 20 percent of the country. It has two principal seasons, the dry and the wet, with the latter running from mid-December to early April.

**The people:** Bolivia has an estimated population of 6.5 million with the majority being of aboriginal descent. The official language is Spanish but, in certain sectors, Aymara and Quechua are spoken.

**Government:** Bolivia is a Democratic Republic with an executive branch, the Presidency, a legislative branch, the Congress, and a judicial branch, the Supreme Court. The present government is led by President Gonzalo Sánchez de Lozada. New elections will take place in June, 1997.

**Economy:** Mixed, private (majority) and public sector.

- 1995 GDP US\$7,130 million; US\$1,087 per capita; annual growth 3.72%.
- Agriculture 16.4% of GDP; manufacturing 13.8%; commerce 10.5%; services 12.9%; mining 5.6%; petroleum 4.3%.
- Exports in 1995 US\$1,150 million; 55% minerals, 27% hydrocarbons, 18% non-traditional (soya, wood, leather, coffee).
- Currency, freely convertible, is the Boliviano: Bs. 5.10 = US\$1.00 (August 15, 1996)

### **3. THE GEOGRAPHY OF MINING IN BOLIVIA**

Encompassing spectacular mountain ranges, high plains and tropical lowlands, Bolivia presents a highly diverse and interesting geology. Within a national territory of about 1.1 million square kilometers, six distinct geographic regions display different metallogenic qualities.

Andean geography occupies roughly the southwestern quarter of Bolivia. Three geographic and geological regions can be identified there. Stretching in a relatively narrow band along the southwestern frontier with Chile, the Cordillera Occidental or Western Range presents recent volcanic structures along with Tertiary dacites and andesites. This region is believed to offer considerable precious metals potential in epithermal deposits well-suited to bulk mining techniques. Large, high grade sulfur deposits also occur here.

Just to the east, the Altiplano stretches in a band some 700 kilometers long and about 130 kilometers wide. This intermontane basin, at an altitude of about 4,000 meters, runs from Lake Titicaca down to the border with Argentina. The Altiplano consists of Tertiary redbed sediments and volcanics. One volcanic complex near the city of Oruro has been developed as a massive open pit heap leach gold operation by Inti Raymi, a local company whose main shareholder is Battle Mountain Gold from the USA. Inti Raymis Kori Kollo mine represents Bolivia's most important gold development and is one of the most modern operations in the country. Southward beyond the town of Uyuni, another important bulk mining operation produces silver at Toldos.

One of the most interesting mineral deposits on the Altiplano is the Salar de Uyuni, a large salt lake containing the world's largest lithium deposit together with other elements in suspension. Other small salt and borate deposits are also found in the region.

The third Andean region, the Cordillera Real, forms the eastern rim of the Altiplano. Mountains of the Cordillera Real rise to 7,000 meters, including Illimani, which looms dramatically over the La Paz skyline. From the Peruvian border northwest of La Paz, this mountain range curves away south-southwestward to Argentina, gradually broadening to a width of some 100 kilometers. The geology of the mountain range is characterized by Tertiary intrusives and Devonian-Sulurian phyllites.

The Cordillera Real is the traditional mining region in Bolivia where, for centuries, rich lode deposits have been worked. In the 1500's, it was here that the Spaniards discovered the fabulous silver deposit of Cerro Rico de Potosí. Some three billion ounces of silver are believed to have been extracted from this deposit over the last 400 years, and it is now thought that a similar amount still remains within the mountain in disseminated form.

Other notable silver deposits have long been worked in Oruro, Colquechaca and Pulacayo.

Tin mines in the Cordillera Real became gradually more important after the end of the colonial era in 1825, and from the turn of the present century, tin became the leading export. From mid-century the state corporation COMIBOL dominated this resource. The most important tin deposits on the Cordillera Real are those of Catavi, Huanuni and Viloco.

It is only very recently that attention has shifted from narrow veins in sedimentary structures to the potential of disseminated metals in the Tertiary intrusives of the Cordillera Real.

The Sub-Andean zone is the fourth major geographic region exhibiting important geological potential. Here, in the eastern slopes of the Andes, Devonian shales host silver and base metals. Although hundreds of prospects have been identified, difficult terrain and lack of infrastructure have so far prevented development. Only one important mine has been established, working a zinc-silver deposit at Quioma.

Foothills north of La Paz and across the border in the Peruvian province of Madre de Dios are drained by a network of tributaries and rivers which run generally northward into the Amazon basin. This drainage area comprises a fifth geological region of Bolivia, important for extensive alluvial gold deposits. Nuggets have been extracted for many years from the Tipuani fields north of La Paz. So far, very little attention has been paid to the recovery of fine gold, as extraction has been dominated by technically primitive, labor-intensive cooperatives. Only one or two dredges have operated in this region of Bolivia; however, several dredges operate upstream in Peru on the Madre de Dios river and small suction dredges work on the Brazilian border to the north. It is estimated that there are 4 billion cubic meters of alluvial deposits with gold potential in this region. The Madre de Dios and Beni rivers are considered promising, but infrastructure is rudimentary and very little exploration has taken place.

The sixth geological region of Bolivia is the least explored and is currently generating some of the greatest interest. Extending in from the Brazilian border, the Bolivian Pre-Cambrian occupies about 250,000 square kilometers in the tropical eastern lowlands. Although narrow gold veins and stream beds have been prospected in a small way since colonial times, the Bolivian Pre-Cambrian did not attract serious attention until very recently.



From 1976 to 1986, the British Geological Service worked with its Bolivian counterpart, GEOBOL, to map the Pre-Cambrian region. This study established that the basic geological makeup of the region consists of proterozoic granitic gneisses and granulites, together with schist and mobile belts.

Among interesting occurrences found by the survey were gold bearing alluvials and greenstone belts extending over 380 kilometers. Intrusions bearing copper, nickel, chromium and platinum group metals were identified. Niobium, tantalum and precious metals were found in pegmatite fields. Tin-granites, iron and manganese formations and an alkaline carbonatite province were also encountered.

Several foreign and local companies are now exploring this region which presents an excellent potential.

#### **4. EVOLUTION OF THE BOLIVIAN MINING INDUSTRY**

**4.1 Background information:** Until the end of the nineteenth century, Bolivia was a major world exporter of silver; however, when the abandonment of precious metal coinage, together with the opening of large deposits elsewhere in the world led to declining prices, Bolivia was poorly equipped to compete. Attention shifted then to tin, in response to increasing prices and high world demand after the turn of the twentieth century. In fairly short order, tin became the dominant export and Bolivia joined the ranks of leading producers.

Ownership of tin production was quite concentrated: nearly 80 % of output was controlled by three groups: Patiño, Hochschild and Aramayo, the "tin barons". These groups came to control not only tin deposits but also other important metal deposits and prospects.

With the Revolution of 1952, the interests of the former controlling groups were nationalized by the government of Víctor Paz Estenssoro to form COMIBOL, Corporación Minera de Bolivia.

While COMIBOL maintained existing operations, it is instructive to note that the state corporation was unable to develop even one of its exploration prospects into a productive operation.

By the mid 1980's it was in complete disarray due to problems of corruption, inefficiency and unprofitability. The collapse of tin price in 1985, following the failure of the International Tin Agreement, merely constituted the coup de grace.

In 1985, Víctor Paz Estenssoro was elected to the Presidency. Ironically, he had been the principal architect of nationalization when he had ruled thirty years before. This time, his response to the chaos in which he found the country was the New Economic Policy (NPE) of 1985, which has been strictly followed by the governments of Presidents Paz Zamora and Sánchez de Lozada, who succeeded Paz Estenssoro.

The principal elements of the NPE were fiscal austerity and free play of the market forces. The budgetary deficit has been held near zero since 1986. Controls on prices of goods, services, wages and foreign exchange have been eliminated. US dollars are now sold under open auction by the Central Bank. The tax system was greatly simplified and efforts were made to cut bureaucracy. Inflation has been wrestled down from astronomical heights to levels that have been maintained in the 10 to 15 percent range.

COMIBOL was a special target for attention. The work force was slashed down from 30,000 to under 7,000 with several mines formed into cooperatives, including the tin operations at Catavi, Coquechaca, Morococala and Colavi. The new

government chose effectively to paralyze COMIBOL during a period of readjustment. Its losses were cut to US\$8.3 million in 1988.

Since Bolivian Constitution precludes the privatization of COMIBOL (minerals are the inalienable property of the state), the intention was to convert it into a holding corporation, operating a few profitable mines on its own account while seeking partners to explore, develop and operate other properties. Joint ventures arrangements were sought, rather than outright sale.

The stable economy and liberal policy of the Bolivian government permitted the overall output volume to recover to near 1,980 levels by the end of the decade. The process of recovery was complex and involved fundamental shifts in the output mix and in the distribution of control in the industry.

**4.2 Development of the mining industry:** The Bolivian government has explicitly recognized that private foreign and domestic investment would be indispensable for the recovery and expansion of the mining sector. It made, therefore, all the efforts to attract the private capitals required.

As a result of the favourable conditions, considerable private investment has been made in the Bolivian mining industry during the last years.

The main projects that have been developed are:

◆**The Kori Kollo mine:** located at the La Joya-Chuquiña mining district, 195 kilometers southwest of the city of La Paz, at an altitude of 3,750 meters above sea level, it is Bolivia's largest and most ambitious project. It produces around 245,000 ounces of gold and 1.06 million ounces of silver at the open pit mine. The total investment for its development has been in the order of US\$163.0 million. The owners of this important project are Battle Mountain Gold from the USA (85%), and the local group Zeland Mines (15%), whose owners are Empresa Minera Inti Raymi, EMUSA and other smaller investors.

◆**COMSUR:** It is the second largest private mining company in Bolivia, and it is owned by the Sánchez de Lozada family. In 1989 they signed a joint venture agreement with the British firm RTZ (Río Tinto Zinc), to carry out several exploration projects. Together they formed EMICRUZ, a mining company that has been conducting several exploration programs at the Altiplano and the San Ramón area at the Pre-Cambrian.

COMSUR invested, with its own resources, the sum of US\$17 million during the 1990-1992 period to expand its Porco mine to produce 350,000 MT of zinc-lead-silver mineral. The same group signed a joint venture contract with COMIBOL (April 1993) to work together the rich Bolívar mine (tin-silver-lead-zinc).

◆**EMUSA:** The Empresa Minera Unificada, owned by the Mercado family, has associated itself with Orvana Minerals, a Canadian company, and have formed the Cía. Minera El Altiplano S.A. which is working the Petersen gold deposit located at El Altiplano. This group has invested more than US\$12.0 million since 1991.

◆**ASARCO-EXPROMIN:** American Smelting and Refining Co., one of the largest US mining companies, signed in 1990 a joint venture contract with the local firm Expromin S.R.L., for an exploration program. They have already worked at the Rosario de Araca, el Quisca, Khoya Hallita and La Española.

◆**SAN MATIAS:** The Luxor Mining Company, a subsidiary of Plumbum Mineração Metallurgica (Luxma group), and Conami Nacional de Mineração, both from Brazil, have bought the San Matías mine, located at Toropalca (Potosí). The proven reserves of the lead-zinc mineral reach the 700, 000 MT level.

◆**MINING COOPERATIVES:** Several small companies and foreign investors have signed joint venture contracts with option to buy with gold mining cooperatives. The contracts exceed the US\$15 million, and their purpose is the exploitation of alluvials on the banks of the rivers, draining from the Cordillera Oriental. Other well-organized cooperatives that operate at the Tipuani, Teoponte and Guanay areas have also invested more than US\$12 million to purchase earth moving equipment and concentrators.

◆**COMIBOL:** According to its new policy, the Bolivian government proceeded to reduce the operations of the Corporación Minera de Bolivia (COMIBOL). Starting in 1992, the only investments made by the corporation have been in the joint venture contracts signed with several private investors. The most important contracts were:

ENTERPRISE	ORIGIN	DATE	INVESTMENT (Million US\$)	Mineral Deposit	Minerals
COMINESA	U.S.A.	Dec. '91	4.41	Tasna (Quechisa)	Bi, Au, Wo, Cu
Mineração Taboca	Brazil	June '92	10.0	Catavi (Tailings)	Pb
COMSUR	Bolivia	April '93	10.0	Bolivar	Pb
AUSPAC	Australia	July '93	3.65	Escala	Ag, Au
SAMEX	Canada	April '95	1.19	Goya I Bonete (Lipez)	Zn, Ag, Au
Cía. Minera La Barca	U.S.A.	June '95	0.410	Bonete (Lipez)	Pb, Ag, Zn, Au

ENTERPRISE	ORIGIN	DATE	INVESTMENT (Million US\$)	Mineral Deposit	Minerals
Barrick Gold	Canada	July '95	2.03	San Antonio de Lipez, Mestizo	Pb, Ag, Zn, Au
Silver Standard	Canada	Mar. '96	13.0	El Asiento	Pb, Ag, Zn, Au

Other contracts are going through the negotiation process at the moment.

**4.3 Mining Investment Opportunities:** Due to its rich mineral potential, Bolivia offers many excellent opportunities for investment. Following are only some of the better known:

◆Exploration targets in COMIBOL properties:

Type of Deposit	Property	Mineral
Volcanic dome-associated	Cerro Rico de Potosí Tatasi	Silver, tin Silver, zinc, lead, tin Silver, lead, zinc
	Choroma	
Porphyry system-associated	Tasna Choroloque	Gold, silver, copper Copper, gold, silver
Sediment-hosted	San Vicente Monserat	Silver, zinc Gold, silver, minor zinc, copper
	Mestizo	Gold
Carbonate-hosted	Ubina region	Gold-silver
	Colavi region	Silver, silver-zinc

#### ◆The Sud Lipez Region

This new mining frontier lies in south-western Bolivia, near the Argentine border.

Geologically, it is comprised of Tertiary-Quaternary volcanic complexes, ranging from pyroclastic flows to stratovolcanos, which overlay subhorizontally bedded Tertiary continental sedimentary rocks.

The Lipez region is relatively unexplored by modern methods. From the geologic point of view, this is a highly prospective area.

COMIBOL controls several mining properties in the Sud Lipez province of the Potosí Department. Most are ancient mines abandoned since the period of Spanish colonization.

There are several prospects of epithermal mineralization with intense hydrothermal alteration zones, associated with stratovolcanos, volcanic domes, calderas and possible diatremes, where it is reasonable to expect bulk-mineable or bonanza-vein-type economic mineralization.

The most significant mining concessions and prospects that could be explored successfully are:

\*San Antonio concession (41,600 Ha.): Three Ag-Zn prospects: Mesa de Plata, Nuevo Mundo and Machu Socavón, including the Sb-Au-Ag Mestizo prospect.

\*The Morocco concession (26,700 Ha.): Ag/Zn Mulato and Himalaya prospects and Sb/Au/Ag Buena Vista prospect.

\*Bonete concession (31,100 Ha.): Several Ag/Zn prospects, such as Mercedes, Barrahuayco, Lipeña, La Moza, Pucasale and Puka Orko.

#### ◆**Bolivian Pre-Cambrian**

Archaean and proterozoic rocks crop out in eastern Bolivia, which is the south western section of the Central Shield of South America.

The Pre-Cambrian terrains of eastern Bolivia are the least explored. They constitute a promising region for modern exploration efforts.

Pegmatite tin is known in the Ascención de Guarayos area; niobium and tantalum occur in the pegmatites of the Concepción and San Ignacio areas. The mafic-ultramafic Rincón del Tigre complex has potential for platinum group elements, chromium, copper and nickel.

The Velasco alkaline complex contains REE, uranium and phosphorus.

Non-metallic deposits include semi-precious stones (amethyst, beryl, citrine and garnet in various environments).

Gold occurs in both, primary and placer, deposits, and in granite greenstone belts. Gold-bearing quartz veins and gold-bearing banded iron formations constitute the main types of primary deposits.

The San Ramón greenstone belt has been explored for gold by the Bolivia/Great Britain Pre-Cambrian Project (COMSUR) and by undtcd/ GEOBOL.

At present, COMSUR, in association with RTZ, have identified the Puquio Norte deposit, which has an estimated 50 tons of gold.

Empresa Minera Paititi, a subsidiary of Orvana Minerals from Canada, is developing the Don Mario mine, rich in gold and copper. It has an estimated 40 tons of gold.

Other international mining companies which have taken concessions in the Pre-Cambrian area include: Barrick Gold in a joint venture with Jordex (both Canadian); Santa Helena, a Brazilian company which holds a 150,000 Ha. concession; Cominco, Eagle Crest, Golden Star, INMET, all from Canada, have also started exploration programs in this promising territory.

## **5. BOLIVIAN MINING PRODUCTION: THE MAIN MINERALS**

The Bolivian mining production grew in 1995 at the annual rate of 14.9%, thus reverting the recession of 1994 (-2.5%). In 1995, the declining tendency of traditional mining (tin) continued, but at a faster pace; while the drop in 1994 was -6.8%, in 1995 it descended in -9.1%. The new mining, on the contrary, grew 24.3% in 1995, more than compensating the fall of the traditional mining.

The dynamism of the new mining was due to the start up of the Bolivar mining complex, the greater production and efficiency in the operation of the Kori Kollo deposit, and some expansions in the polymetallic mining.

The declining tendency of traditional mining is the result of insufficient investment to replace reserves, increase production rates and renew technologies. If the existing tin operations do not receive, on an emergency basis, an important flow of investment, they will no longer be viable.

The aforementioned demonstrates that the growth of the national mining production depends strongly on the thrust of the new mining, which required the enormous investments made during the last ten years.

During the ten years of existence of the New Economic Policy (NPE), the total investment made in the Bolivian mining sector reached the sum of US\$ 569.4 million (public investment was US\$147.7 million and private investment was US\$421.6 million).

While the public investment during the 1985-1989 period reached a total of US\$76.0 million, more than doubling the investment made by the private sector (US\$37.7 million), the 1990-1995 period witnessed an increase in the private investment, which amounted to US\$384.0 million. During the same last period, the public investment reached only US\$71.7 million.

There has been also a qualitative difference in the structure of investment, since there has been a greater emphasis in exploration activities.

A byproduct of the modernization of the Bolivian mining industry has been the diversification and insertion in the international capitals markets. In 1980, the production of tin represented 60% of the national production, while in 1995 it was gold with 33% which represented the most important export, being followed by zinc with 28%, tin (17%) and silver (13%). These four minerals constituted the 91% of the national production. The presence of important international companies, making substantial risk investments in exploration and production, is another characteristic of Bolivian mining during the 90's. Companies like Altoro (Canada), Asarco (USA), Auspac (Australia), Barrick Gold (Canada), Battle Mountain Gold (USA), BHP (Australia), De Cappel (Canada), Eagle Crest and Essex Resources (Canada), Inmet Mining (Canada), Jordex (Canada), Orvana Minerals (Canada), Renison Goldfields (South Africa), RTZ (UK), Silver Standard



(Canada), Teck Corp. (Canada), among others, carry out an intense mining activity in Bolivia.

During 1995, the following minerals experienced increases in their production levels: copper (60%), zinc (45%), tungsten (42%), silver (21%), gold (12%) and lead (4%). Antimony (-14%) and tin (-10%) continued its declination.

The gold, silver and zinc production achieved in 1995 (14.4, 428 and 146,000 MT, respectively) constituted a historical record for Bolivia. The production of lead exceeded the 20,000 MT, while tin descended to 14,700 MT and antimony to 6,600 MT.

The following statistics show in more detail the variations experienced:

<b>BOLIVIA: VOLUME OF THE MINING PRODUCTION 1994-1995</b>				
<b>(in fine metric tons)</b>				
<b>MINERALS</b>	<b>1994</b>	<b>1995</b>	<b>DIFFERENCE</b>	
			<b>Absolute</b>	<b>Relative</b>
Antimony	7.762	6.654	-1.106	-14
Bismuth	28.5	---	-28.5	-100
Copper	79	127	+48	+61
Tin	16.329	14.733	-1.596	-10
Silver	354	428	+74	+21
Lead	19.718	20.451	+733	+4
Tungsten	583	826	+243	+42
Zinc	100.880	146.130	+45.250	+45
Gold	12.84	14.41	+1.57	+12
Other minerals	18.062	26.250	+8.188	+45

<b>BOLIVIA: VALUE OF THE MINING PRODUCTION 1994-1995</b> (in thousands of US\$)				
<b>MINERALS</b>	<b>1994</b>	<b>1995</b>	<b>DIFFERENCE</b>	
			<b>Absolute</b>	<b>Relative</b>
Antimony	14.033	18.664	+4.631	+33
Bismuth	179	—	-179	-100
Copper	168	373	+205	+122
Tin	89.136	91.601	+2.465	+3
Silver	60.212	71.576	+11.364	+19
Lead	10.775	12.882	+2.107	+20
Tungsten	2.113	4.910	+2.797	+132
Zinc	100.626	150.554	+49.928	+50
Gold	158.488	177.993	+19.505	+12
Other minerals	6.058	6.676	+618	+10
<b>Total</b>	<b>441.788</b>	<b>535.229</b>	<b>+93.441</b>	<b>+21</b>

More statistical information may be found at the end of this report.

## 6. THE MINING BUSINESS CLIMATE

The Bolivian mining industry evolves within a very favourable political and legal framework. Following are some of the issues that need to be known by the foreign companies interested in operating in this country.

**6.1 Mineral Policy and Legislation:** Bolivia's mineral sector relied almost exclusively on tin mining for decades. The collapse of the price of tin in the mid 1980's emphasized the need for diversification. As a result, the Bolivian mineral policy is today one of completely open doors.

Among the factors which should be attractive to foreign investors (in addition to highly interesting geology), are equal treatment of national and foreign capital, tax exemptions for reinvested profits, free currency convertibility and repatriation, and Bolivia's subscription to international investment guarantee agreements.

***The key features of the legislation are:***

\*Minerals belong to the state. Exploration and mining rights can be applied for and obtained through the Superintendent of Mines. For this, there is no differentiation between the national and the foreigner, with the exception of the 50 kilometers alongside the international borders, where a national must own the concession.

\*Bolivia recognizes that rapid development of the mining sector is the shortest term solution to its economic recovery. It further recognizes that this can best be accomplished through private enterprise.

\*The state-owned mining company, Corporación Minera de Bolivia (COMIBOL), has been restructured as part of a plan to convert it into an efficient holding company. As such, it seeks partners to join with in the exploration, development and operation of properties.

\*The development of efficient mineral sector institutions and the development of data base information, including maps, airphotos, geophysical data, etc.

\*An investment law has been enacted, not limited to the mining sector, which is based on equal treatment for all investors. This is a general law designed to provide a healthy climate for investment. Bolivia recognizes that having one of the most attractive geological environments for mineral discovery is not enough. It believes that the rules of the game must be clearly cut and supported by the law. The trust of all of the pending changes is to ensure that Bolivia maintains the "level playing field concept", whereby conditions for mining investment in Bolivia will have as favourable terms as any other country has to offer.

**6.2 Institutional Framework:** Since the mining industry has traditionally been one of the driving forces of the Bolivian economy, a strong institutional framework has been developed.

**The key government entities in the sector are:**

**\*The Secretaría Nacional de Minería** is responsible for the development of the country's mineral policy and the functional guidance of all state bodies in this sector. It includes the Superintendency of Mines, which grants exploration and exploitation concessions.

**\*The Servicio Nacional de Geología y Minería (SERGEOMIN)** is a new state body, recently created, that includes the functions of former institutions like GEOBOL, the Geological Service of Bolivia, and the Instituto de Investigaciones Minero-Metalúrgicas (IMM), dedicated to the functions of prospecting and exploring the mineral resources and the preparation of maps, and the research and improvement of mineral concentration processes, respectively.

**\*The Corporación Minera de Bolivia (COMIBOL)** is the state mining company. Its current thrust is to become profitable and to act as a holding company for joint ventures with private investors.

**The key private sector institutions are:**

**\*The Asociación de Mineros Medianos** (Association of Medium Miners) represents the interests of private companies with specified minimum production levels. Its members in 1995 were: Avicaya Ltda., BAREMSA, Barrosquira Ltda., Bernal Hnos., Cía. La Barca S.A., Cía. Minera "La Rosa", Cía. Minera "La Solución" Ltda., COMCO, COMISAL, COMSUR, EMUSA, Inti Raymi S.A.

**\*La Cámara Nacional de Minería** (The National Chamber of Mining) includes all of the private companies that do not qualify as medium-size miners.

**\*La Federación de Cooperativas Mineras** (The Federation of Mining Cooperatives) is the channel used by the cooperatives to deal with the government. It also provides technical assistance to its members using the services of a professional staff.

**\*La Federación Sindical de Trabajadores Mineros de Bolivia** (The Union of Bolivian Mine Workers) is the labor organization for all public and private sector mining workers in Bolivia.

**6.3 The New Mining Code:** The New Bolivian Mining Code became law in April 1991. Issued in the form of a series of amendments to the old 1965 Code, it was well received by the industry. While the former Code had generally been viewed

as an adequate framework for traditional vein mining, it was felt that several modifications were required.

The two most significant elements in the new Code concern taxation and access to previously restricted territories. The new system applies to all new mining ventures, while allowing established operations to use the former approach until 1999, if desired. A tax of 25% is levied on profits, as determined by standard accounting procedures. In addition, a 2.5 % "anticipo" (advance payment) is levied on the value of all onward sales of mineral product. The total of "anticipos" paid is applied against the tax owing on profits. If the balance of tax owing on profits minus the anticipos paid is positive, the difference must be paid to the revenue collecting authority. If it is negative, the difference may be brought forward as a fiscal credit in succeeding years.

In addition to the indicated taxes, a 13% V.A.T. applies to transactions involving mineral commodities. This tax is refundable in the form of a fiscal credit at the point of export. Under the new rules, reinvested profits are exempt from taxation as an incentive to productive expansion.

Formerly, foreign investors were not allowed to participate in mining activity within 50 kilometers of the international borders. The new code lifts this restriction (except in the case of investors from the neighboring states). Foreigners must, however, operate in partnership with Bolivian principals in these zones.

At the time of preparation of this report, the Secretary of Mines has submitted the draft of some amendments to the New Mining Code approved in 1991. The revised Code will include, if approved, important chapters on taxation stability, land claiming procedures and environmental aspects.

#### **6.4 Environmental aspects:**

The mining sector is Bolivia's largest foreign currency earner and, as such, plays a crucial role in the nation's well being. In the not so distant past, attention was focused on extracting ore from the ground as quickly as possible, with scant regard for human or environmental costs. Progress has been made in reducing the former, but only recently attention has been focused on the latter.

Because of the severe problems of contamination existing in most mining operations, with the extreme cases of Oruro and Potosí, and led by the greater environmental awareness arisen by the higher standards imposed by the major international firms starting to operate in Bolivia, the Secretary of Mines has included in the draft of the New Mining Code under consideration, a chapter entitled "Environmental Impact Assessment and Control of Environmental Quality".

Under the proposal set out in the draft document, control of environmental permitting will be affected by a three tier system, with regulatory authorities at

local, departmental and national levels. The ultimate responsibility for ensuring compliance with the requirements of the legislation lies with the Ministry of Sustainable Development and Environment (MDSMA).

The existing mining operations will be forced to undertake an environmental audit, then submit their plan of environmental adequacy in order to obtain their Environmental Permit (DAA).

The new projects of investment will require an initial environmental impact study (EIS), and a plan of action and control, in order to obtain their Environmental Permit (DIA).

To initiate environmental legal processes, the promoters of new projects must submit a "Ficha Ambiental" (FA) which is a technical document outlining the scope of the project, identifying key impacts and possible mitigation measures for adverse impacts.

The draft document is based on World Bank guidelines.

There are many companies registered in Bolivia in the mining environmental consulting sector, most of them local. The international firms operating in Bolivia are: A.D.I. Environmental Management Inc. (Canada); Dames & Moore (U.S.A.); Environ-Environmental Resources (U.K.); Golder Associates (Canada); International Mining Consultants Ltd. (U.K.); Knight Piesold & Partners (U.K.); and, Woodward-Clyde (Australia).

## **7. THE MARKET FOR SUPPLIERS OF MINING EQUIPMENT AND SERVICES**

Potential opportunities coming out of the recovery and expansion of mining in Bolivia may be considered in three fields: exploration; rehabilitation, refurbishment and maintenance of old or established mines; and large projects.

For forty years, Bolivia saw virtually no serious exploration effort, a situation which is now changing rapidly. This kind of neglect generates serious interest; precisely, due to years of inattention, it is likely that exploration efforts will generate considerable level of excitement in Bolivia. This country may, thus, offer a promising territory for suppliers of modern prospecting and exploration services and technology. It may safely be speculated that foreign companies active in Bolivia will meet much of the demand for such goods and services by using their own in-house resources; however, while multinationals will be seeking large targets, many of their local counterparts will be looking for smaller, more easily manageable potential projects, and they will be applying more modest resources to the search.

Only three companies offer diamond drilling and reverse circulation drilling services to the local exploration market. They are: the local La Barca (Battle Mountain), Layne, and American Mining Service (AMS). Since, approximately, 134,000 meters of reverse circulation and diamond drilling will be drilled in 1996, there is a good market for new companies that can offer good technology and competitive prices.

Investment in exploration and prospecting by the medium scale private mining companies of Bolivia totaled some US\$33.8 million in 1995. A sum of US\$39.2 million will be made during 1996 for the same risk activities.

The rehabilitation, maintenance and expansion of established mining operations generates demand for a range of equipment. Medium scale private firms will invest US\$47.0 million in mining equipment in 1996, including US\$26.0 million for installation, remodeling and expansion of concentrator plants.

The existing mining operations (with the exception of Inti Raymi and Comsur) present a somewhat small market for new mining equipment. There is some ongoing demand for hand-held drills and consumables, but most of the leading suppliers are represented locally and competition is tough.

There is a marked preference on the part of many operators for reconditioned equipment, since the price of new machinery often cannot be justified in smaller operations. Those suppliers who are willing to dedicate a reasonable amount of effort to the logistics of moving "special" orders for recycled equipment, can make sales. Demand for rebuilt gear runs all the gamut from mills and thickeners to large winches.

The market for mining equipment arising from the development of new projects is constituted at the moment by the Puquio Norte project, due to start its operations by

November 96. COMINESA will also start its bismuth processing plant at the end of 1996.

Bolivia represents an increasingly significant market for mining equipment and services. Competitive, competently represented foreign companies willing to invest the necessary commitment and creativity will certainly have a role to play. It has an open economy with low import duties (5% for equipment and 10% for consumables) and a convertible currency. These factors, plus a small and incipient local industry, mean that mining firms can freely import their equipment requirement.

The main foreign suppliers are from Sweden, U.S.A., Finland, Canada, Peru, Chile, Brazil, Germany, Japan and China.

The strongest competitor in the market of drilling equipment, air compressors, pumps and special mining vehicles is Atlas Copco from Sweden. This company has a manufacturing facility (Atlas Copco Boliviana), which was built during the late 70's and enjoyed a sort of monopoly for the Andean Group countries (Venezuela, Colombia, Ecuador, Peru and Bolivia) due to the possibility of exporting its products to all these countries at zero custom duties. That over protection disappeared when the free market concept was established in Bolivia. The NPE reduced the previous custom duties to one of 10%, "across the board" for all foreign imports, and that made the market open and competitive. The Swedish company is, however, a very important force in the Bolivian mining scenario.

A competent local agent or distributor is an indispensable factor in selling into the Bolivian market. The Mining Directory included in this report contains the references of several of the better known firms.

Since local mining companies have a strong preference for the distributors that have local service facilities and can supply spare parts and specialized labor in a short notice, it is important for the Canadian exporters interested in the Bolivian market to bear that factor in mind when choosing their local agent.



## **ANNEX 1: BOLIVIAN MINING DIRECTORY**

### **CANADIAN REPRESENTATION**

The Canadian Embassy in Peru is accredited also to the Government of Bolivia, and is, therefore, responsible for Canadian trade relations with this country.

#### **Canadian Embassy in Peru:**

Street address: Jirón Federico Gerdes (antes Libertad) 130,  
Miraflores, Lima 18  
Mailing address: Casilla Postal 18-1126  
Telephone/Fax: (51-1) 444-4015 / (51-1) 444-4347  
Ambassador: Mr. Anthony Vincent  
Head of the: Mrs. Danièle Ayotte,  
Commercial Division: First Secretary and Consul  
Commercial Officer: Mr. Oscar G. Vásquez (Responsible for Mining Sector)

The Canadian Government is represented in Bolivia by a Honourary Consul.

#### **Honorary Consulate in La Paz, Bolivia:**

Street address: 20 de Octubre 2475, Plaza Avaroa, Sopocachi, La Paz  
Telephone/Fax: (591-2) 431215 / (591-2) 432330  
Honourary Consul: Mr. Héctor Arduz  
Consular Assistant: Ms. María Bertha Issa

### **PUBLIC AND PRIVATE ENTITIES**

#### **MINISTERIO DE DESARROLLO ECONOMICO (MINISTRY OF ECONOMIC DEVELOPMENT)**

Address: Av. Mariscal Santa Cruz (Edificio Palacio de Comunicaciones Piso 20)  
Telephone/Fax: (591-2) 375000 365301 377236 / (591-2) 356711  
Minister: Mr. Jaime Villalobos

#### **SECRETARIA NACIONAL DE MINERIA (NATIONAL SECRETARY OF MINING)**

Address: Av. 16 de Julio 1769  
P.O. Box: 8686  
Telephone/Fax: (591-2) 379310 379312 / (591-2) 359998  
National Secretary: Mr. Teddy Cuentas

#### **CORPORACION MINERA DE BOLIVIA (COMIBOL) (BOLIVIA'S MINING CORPORATION)**

Address: Av. Camacho Esquina Loayza 396  
P.O. Box: 349 - 674 - 1414  
Telephone/Fax: (591-2) 367683 367686 / (591-2) 357979  
Executive President: Mr. Alberto Alandia

#### **DIRECTORIO CENTRAL DE INSTITUCIONES DE SERVICIO A LA MINERIA (CENTRAL DIRECTORY OF INSTITUTIONS SERVING MINING)**

Address: Calle Federico Zuazo 1673 (Edificio GEOBOL)  
Telephone / Fax: (591-2) 358877 / (591-2) 363988  
President: Mr. Alfonso Criales

#### **EMPRESA METALURGICA VINTO (VINTO METALLURGICAL ENTERPRISE-Former ENAF)**

Address: Av. Villazón 1966 / P.O. Box: 4301 La Paz / 612 Oruro  
Fax: (591-2) 363722  
Telephones: (591-2) 369546 to 48  
Telephone-Presidency: (591-2) 359270 (La Paz)  
Executive President: Mr. Fernando Freudenthal

**General Managing - Oruro**

Address: Kilómetro 8 - Carretera a Vinto  
P.O. Box: 612  
Fax: (591-5) 278024  
Telephone-Management: (591-5) 278091  
General Manager: Mr. René Candia

**INSTITUTO DE INVESTIGACIONES MINERO METALURGICAS  
(INSTITUTE OF MINING-METALLURGICAL RESEARCH)**

Address: Calle Junín (entre Petot y Camacho)  
P.O. Box: 600  
Fax: (591-5) 255548 (Oruro)  
Telephones: 51133 (Oruro) - 58877 (La Paz) -25085 (Potosí)  
Telephone - Direction: 52552 (Oruro)  
Executive Director: Mr. Zenobio Tapia

**SERVICIO GEOLOGICO DE BOLIVIA (GEOBOL) (BOLIVIAN GEOLOGICAL SERVICE)**

Address: Calle Reyes Ortiz esq. Federico Zuazo 1673  
P.O. Box: 2729  
Fax: (591-2) 391725 - 363474  
Telephones: (591-2) 377310 to 18  
Telephone -Direction: (591-2) 322022  
Executive Director: Mr. Franz Tavera

**SERVICIO NACIONAL DE CATASTRO MINERO (NATIONAL SERVICE OF MININ CADASTRE)**

Address: Calle Federico Zuazo 1673 (Edificio GEOBOL-Bloque I)  
P.O. Box: 1202  
Telefax: (591-2) 318295  
Telephone: (591-2) 317799  
Director: Mr. Hernán Claure

**SISTEMA DE INFORMACION MINERA (MINING INFORMATION SYSTEM)**

Address: Calle Federico Zuazo 1673 (Edificio GEOBOL)  
P.O. Box: 8686  
Fax: (591-2) 391431  
Telephone: (591-2) 371174 - 367200 - 370268  
Director: Mrs. Ana María Aranibar

**CAMARA NACIONAL DE MINERIA (NATIONAL MINING CHAMBER)**

Address: Pasaje Bernardo Trigo 429  
P.O. Box: 2022  
Fax: (591-2) 379651  
Telephone: (591-2) 379652  
Telephone - Presidency: (591-2) 350623  
President: Miss María René Rodríguez

**FEDERACION NACIONAL DE COOPERATIVAS MINERAS DE BOLIVIA  
(BOLIVIAN NATIONAL FEDERATION OF MINING COOPERATIVES)**

Address: Calle Pichincha 850 - La Paz  
P.O. Box: 10149  
Fax: (591-2) 327992  
Telephone: (591-2) 358422  
President: Mr. Crecencio Huanca

**ASOCIACION NACIONAL DE MINEROS MEDIANOS  
(NATIONAL ASSOCIATION OF MEDIUM MINERS)**

Address: Calle Pedro Salazar 600-Sopocachi/La Paz / P.O. Box: 6190  
Fax: (591-2) 354124  
Telephone: (591-2) 371112 - 352223  
President: Mr. Raúl España  
General Secretary: Mr. Rolando Jordán

**MAIN LOCAL AND FOREIGN MINING COMPANIES: LA PAZ**

**ARISUR INC. (CANADA)**

Address: Av. Villazón 1940  
P.O. Box: 7509  
Telephone / Fax: (591-2) 363699 - 366916 / (591-2) 366731  
General Manager: Mr. Luis Bottani  
Activity: Mining exploration and exploitation

**AUSPAC BOLIVIA S.R.L. (AUSTRALIA)**

Address: Av. 6 de Agosto 2036 - Piso 3  
Telephone / Fax: (591-2) 370560 / (591-2) 376682  
General Manager: Mr. Gabriel Rodríguez  
Activity: Mining exploration

**BAREX EMPRESA MINERA (BAREMSA) (BOLIVIA)**

Address: Av. Arce (Pasaje Pinilla 2557-A) / P.O. Box: 7518  
Telephone / Fax: (591-2) 351437 - 356146 / (591-2) 361712  
Mineral produced: Lead  
General Manager: Mr. Hans E. Tordoir  
Activity: Mining exploitation

**COMPAÑIA MINERA ALTORO (CANADA)**

Address: Pasaje Trigo 451  
Telephone / Fax: (591-2) 341990 - 323076 / (591-2) 323076  
President: Mr. Michael Schuler  
Activity: Mining exploration

**COMPAÑIA MINERA ANDACABA (BOLIVIA)**

Address: Calle 17 - 8083 / Calacoto / P.O. Box: 11061  
TeleFax: (591-2) 792330  
President: Mr. Kurt Gulsmet  
Activity: Mining exploration

**COMPAÑIA MINERA LA BARCA (U.S.A.)**

Address: Calle Cordero 30  
Telephone / Fax: (591-2) 433483 / (591-2) 432257  
President: Mr. Oscar Anzoleaga  
Activity: Mining exploration

**COMPAÑIA MINERA QUIOMA S.A. (BOLIVIA)**

Address: Av. 16 de Julio / Edificio Petrolero - Piso 10 / PO Box 4326  
Telephone / Fax: (591-2) 361018 / (591-2) 391016  
President: Mr. Jaime Urgel  
Activity: Mining exploration

**COMPAÑIA MINERA LA ROSA (CANADA/BOLIVIA)**

Address: Av. 20 de Octubre 1963 / Edificio EMUSA -Piso 2 / P.O. Box: 708  
Telephone / Fax: (591-2) 362704 - 327975 - 391292 / (591-2) 391707  
General Manager: Mr. Oscar Kemff  
Activity: Mining exploration

**COMPAÑIA MINERA TIWANACU LTDA. (BOLIVIA)**

Address: Av. 20 de Octubre 1971 / P.O. Box 3847  
Telephone / Fax: (591-2) 374751 / (591-2) 391360  
President: Mr. Alfredo Rojas  
Activity: Mining exploitation

**CORRIENTE RESOURCES CANADA (CANADA)**

Local Representative: MINTEC S.A.  
Address: Calle Romecin Campos 265  
Telephone / Fax: (591-2) 433800 / (591-2) 433737  
Activity: Mining exploration

**COMINESA (CANADA)**

Representative: MINTEC S.A. / Mr. Johnny Delgado  
Address: Calle Romecin Campos 265, Box 13790  
Telephone / Fax: (591-2) 433800 / (591-2) 433737  
Activity: Mining exploration

**DA CAPO RESOURCES LTDA. (CANADA)**

Address: Pasaje Trigo 451 / P.O. Box: 11314  
Telephone / Fax: (591-2) 341990 / (591-2) 323076  
Representative: Mr. David O'Connor

**DESERT SUN BOLIVIA (CANADA / BOLIVIA)**

Address: Av. Mariscal Santa Cruz N° 1295, Edificio Terrin - Piso 1  
Telephone / Fax: (591-2) 323340 / (591-2) 323340  
Representative: Mr. Edgar Guzmán  
Activity: Mining exploration

**EMPRESA MINERA ALTIPLANO S.A. (CANADA / BOLIVIA)**

Address: Av. 20 de Octubre 1963 / Edificio EMUSA - Piso 10 / PO Box: 291  
Telephone / Fax: (591-2) 353257 / (591-2) 358462  
General Manager: Mr. Luis Mercado  
Activity: Mining exploration

**EMPRESA MINERA AVICAYA LTDA. (BOLIVIA)**

Address: Av. 20 de Octubre 2001 - Piso 3 / P.O. Box 474  
Telephone / Fax: (591-2) 372235-372236-353591-358704 / (591-2) 372237  
Mineral produced: Tin  
President: Mr. Patricio Kyllman  
Activity: Mining exploitation

**EMPRESA MINERA BARROSQUIRA LTDA. (BOLIVIA)**

Address: Av. Mariscal Santa Cruz / Edificio Hansa - Piso 3 / P.O. Box: 1942  
Telephone / Fax: (591-2) 327410 - 322884 / (591-2) 370397  
General Manager: Mr. Fernando Kyllman  
Activity: Mining exploitation

**EMPRESA MINERA COMSUR S.A (BOLIVIA)**

Address: Av. 16 de Julio / Edificio Petrolero - Piso 10  
P.O. Box: 4326 - 703  
Telephone / Fax: (591-2) 361018 / (591-2) 391016  
Mineral produced: Silver, lead, zinc  
President: Mr. Jaime Urgel  
Activity: Mining exploitation

**EMPRESA MINERA EMUSA S.A. (BOLIVIA)**

Address: Av. 20 de Octubre/Edificio EMUSA - Piso 5 / P.O. Box 291  
Fax: (591-2) 358462  
Telephone: (591-2) 350806 - 350721 - 321098  
Mineral produced: Antimony  
President: Mr. Luis Mercado  
Activity: Mineral exploration and exploitation

**EMPRESA MINERA INTI RAYMI S.A. (U.S.A. / BOLIVIA)**

Address: Calle 12 N° 2550 - Calacoto  
P.O. Box: 9576  
Telephone / Fax: (591-2) 797676 / (591-2) 797273  
Mineral produced: Gold, silver  
General Manager: Mr. Alvaro Ugalde  
Activity: Mining Exploration and Exploitation

**EMPRESA MINERA SAN JOSE DE BERQUE LTDA. (BOLIVIA)**

Address: Calle Guatemala 1323 / P.O. Box 6336  
Telephone / Fax: (591-2) 343009 / (591-2) 365303  
General Manager: Mr. Davis Vargas A.  
Activity: Exploitation of tungsten and lead

**EXCALIBUR HOLDINGS (BOLIVIA) S.A. (CANADA / BOLIVIA)**

Address: Av. Arce 2342 - Piso 1 / P.O. Box: 2362  
Telephone / Fax: (591-2) 325457 / (591-2) 343153  
Representative: Mr. Jean Marc Teisseire  
Activity: Mining exploration and consulting

**EXPROMIN (U.S.A. / BOLIVIA)**

Address: Prebitero Medina esq. Pedro Salazar 2516, Box 5841  
Telephone / Fax: (591-2) 369800 / (591-2) 392075  
General Manager: Mr. Rubén Terrazas  
Activity: Mining exploration

**HYDROMETALLURGIC INTERNATIONAL CO. (U.S.A.)**

Address: Calle 2 N° 120 - La Barqueta / Achumani  
Telephone / Fax: (591-2) 710022 / (591-2) 710241  
President: Mr. Edgar Kann  
Activity: Mining exploration

**INMET MINING CORPORATION (CANADA)**

Address: Edificio Petrolero, Mezzanine - Of.11 / P.O. Box 270  
Telephone / Fax: (591-2) 326601 / (591-2) 391073  
Representative: Mr. Dieter Hauscherr  
Activity: Mining exploration

**MINERA BARRICK EXPLORACIONES S.A. (CANADA)**

Address: Prolongación Cordero 137  
Telephone / Fax: (591-2) 371257 / (591-2) 431454  
General Manager: Mr. Stuart Moller  
Activity: Mining exploration

**MINERA EL ALTO S.A. (CANADA / BOLIVIA)**

Address: Av. 20 de Octubre 1963 / Edificio EMUSA  
Telephone / Fax: (591-2) 350806 / (591-2) 358462  
President: Mr. Luis Mercado  
Activity: Mining exploration

**MINNOVA BOLIVIA (CANADA)**

Address: Edificio Petrolero , Mezzanine - Of.11  
P.O. Box: 270  
Telephone / Fax: (591-2) 326601 / (591-2) 391073  
Representative: Mr. Dieter Hauscherr  
Activity: Mining exploration

**ORVANA MINERALS CORP. / EMUSA JVC (CANADA / BOLIVIA)**

Address: Av. 20 de Octubre 1962  
Telephone / Fax: (591-2) 350672 / (591-2) 358462  
Representative: Mr. Enrique Arteaga  
Activity: Mining exploration

**PAN ANDEAN RESOURCES (CANADA)**

Address: Edificio Cámara Nacional de Comercio -Piso 9 / Of. 909  
Telephone / Fax: (591-2) 374728 / (591-2) 372639  
Representative: Mr. Marcelo Claure  
Activity: Mining exploration

**QUANTEC ARAUCO RESOURCES CORPORATION (U.S.A.)**

Address: Calle Federico Zuazo 1598, Edificio Park Inn - Piso 11  
Telefax: (591-2) 376380  
President: Mr. John Kieley  
Activity: Mining exploration

**RENISON GOLDFIELDS CONSOLIDATED LTD. (SOUTH AFRICA)**

Address: Pasaje Caracas 871 (6 de Agosto esq. Belisario Salinas)  
Telephone / Fax: (591-2) 323190 / (591-2) 317286  
Activity: Mining exploration

**RIO ALGOM/ RIO CHILEX (CANADA)**

Address: Av. Fuerza Naval 55 - Achumani  
Telephone / Fax: (591-2) 790635 / (591-2) 799416  
Representative: Mr. Marcial García  
Activity: Mining exploration

**RIO AMARILLO MINING LTD. (BOLIVIA) (CANADA)**

Address: Av. Fuerza Naval 55 - Achumani / P.O. Box: 9134  
Telephone / Fax: (591-2) 790635 / (591-2) 799416  
Representative: Mr. Marcial García  
Activity: Mineral exploration

**SAMEX S.A. (BOLIVIA) (CANADA)**

Address: Av. 20 de Octubre 2001, Box 474  
Telephone / Fax: (591-2) 790434 / (591-2) 790434  
Representative: Mr. Robert E. Kell  
Activity: Mining exploration

**SEREM BOLIVIA BRGM (FRANCE)**

Address: Pedro Salazar 429 - Piso 3 / Plaza Abaroa / P.O. Box 11573  
Telephone / Fax: (591-2) 374930 / (591-2) 392944  
Representative: Mr. Pierre Boutin  
Activity: Mining exploration

**SOCIEDAD MINERA DEL COBRE (BOLIVIA)**

Address: Av. 6 de Agosto 2730 - Edificio Concordia, Piso 2  
Telephone / Fax: (591-2) 430522 / (591-2) 391639  
Manager: Mr. Jorge Sfeir  
Activity: Mining exploration

**SOUTHERN STAR RESOURCES LTDA. (CANADA)**

Telephone / Fax: (591-2) 791978 / (591-2) 798747  
Representative: Mr. Jim Mc Namee  
Activity: Mining exploration

**SANTA CRUZ**

**BILLITON EXPLORATION AND MINING BOLIVIA BV (HOLLAND)**

Address: Teniente Vega 206  
Telephone / Fax: (591-3) 362940 / (591-3) 362941  
President: Mr. Jon Coates  
Activity: Mining exploration

**EAGLECREST EXPLORATIONS LTD. (CANADA)**

Address: Calle Los Paltos N°4, Abandi Cushing  
Telephone / Fax: (591-2) 427930 / (591-3) 427602  
Representative: Mr. Lionel Zupancich  
Activity: Mining exploration

**EMAR EMPRESA MINERA ARUMA LTDA. TANGANIK A.V.V. (SOUTH AFRICA)**

Address: Guarey Sud 245 - Barrio Urbari  
Telephone / Fax: (591-3) 524131 / (591-3) 524790  
Representative: Mr. Michael Biste  
Activity: Mining exploration

**EMICRUZ EXPLORACIONES MINERAS SANTA CRUZ (U.K. / BOLIVIA)**

Address: Av. Monseñor Rivero 376 - Edificio Navarro, Piso 2  
Telephone / Fax: (591-3) 329619 / (591-3) 334873  
President: Mr. Marc Ward  
Activity: Mining exploration

**EMPRESA MINERA PAITITI S.A (CANADA)**

Address: Calle Caigua N° 11, Barrio Urbari  
Telephone / Fax: (591-3) 539847 / (591-3) 524520  
General Manager: Mr. Reinaldo Bruzonc  
Activity: Mining exploration

**ESSEX RESOURCE CORPORATION (CANADA)**

Address: Calle Guarey N°245, Sud Urbari  
Telephone / Fax: (591-3) 524131 / (591-3) 524790  
Representative: Mr. Michael H. Biste  
Activity: Mining exploration

**JORDEX RESOURCES INC. (CANADA)**

Address: Calle 8 Este, Pasillo C.41 (Equipetrol)  
Telephone / Fax: (591-3) 425733 / (591-3) 425733  
President: Mr. Michael Bennett  
Activity: Mining exploration

**ODESSA MINING BOLIVIA (CANADA)**

Address: Calle Aiuma, Barrio Urbari  
P.O. Box: 1270  
Telephone / Fax: (591-3) 522244 / (591-3) 522667  
Representative: Mr. Marcelo Zambecchi  
Activity: Mining exploration

**LOCAL AGENTS, DISTRIBUTORS AND SUPPLIERS OF MINING EQUIPMENT AND SERVICES****ANDEAN INDUSTRIAL SUPPLIES**

Address: Av. Arce 2031 (Edificio Victoria, 2° Piso) / P.O. Box:4820  
Telephone / Fax: (591-2) 355701 / (591-2) 354622  
Manager: Mr. Mike Tondu  
Activity: Supply of mining equipment and consumables

**ATLAS COPCO BOLIVIANA S.A.**

Address: Av. Germán Busch 1759 - Miraflores / P.O. Box: 8742  
Telephone / Fax: (591-2) 379862 - 358455 / (591-2) 391035  
Managing Director: Mr. Olof Hossner  
Activity: Supply of drilling equipment, air compressors, etc.

**BALLIVIAN ASOCIADOS LTDA.**

Address: Calle Murillo 999 esq. Cochabamba / P.O. Box: 9747  
Telephone / Fax: (591-2) 341247 / (591-2) 327321  
General Manager: Mr. Carlos Ballivian  
Activity: Supply of equipment for mine safety

**CASA BERNARDO**

Address: Av. Camacho 1296 / P.O. Box: 685  
Telephone / Fax: (591-2) 354300 / (591-2) 328183  
General Manager: Mr. Eduardo Delgado  
Activity: Supply of measuring equipment and software for mining

**CIA. RICACRUZ LTDA.**

Address: Av. 20 de Octubre 1963 ( Edificio EMUSA, Piso 4), Box 7076  
Telephone / Fax: (591-2) 376085 - 355251 / (591-2) 353794  
Manager: Mr. Iván Monje  
Activity: Supply of explosives and equipment for measuring, mine safety.



**CIBO**

Address: Av. 20 de Octubre 2331 / P.O. Box: 954  
Telephone / Fax: (591-2) 430500 - 431913 / (591-2) 430600  
General Manager: Mr. Johnny Gelemter  
Activity: Supply of trucks, tractors, loaders, air compressors and mining equipment in general.

**ICOMBOL**

Address: Av. Mariscal Santa Cruz 384/Edificio "La Primera" P.B. / PO. Box 4984  
Telephone / Fax: (591-2) 365296 / (591-2) 391730  
Manager: Mr. Oscar Ramirez  
Activity: Supply of mining equipment

**INBUSTRADE LTDA.**

Address: Av. 20 de Octubre 2096 / Edificio Galaxia - Piso 1 / P.O. Box 10870  
Telephone / Fax: (591-2) 343616 - 370772 - 370120 / Fax: (591-2) 362449  
Manager: Mr. Julio C. Viscarra  
Activity: Supply of air compressors, jacklegs, stopers, drilling accessories, equipment for mine safety.

**INTER-MINING S.R.L.**

Address: Av. 16 de Julio / Edificio Alameda, P.14, Bloque A, Dpto.601  
Telephone / Fax: (591-2) 353277 / (591-2) 368023  
General Manager: Mr. Jorge Belmonte  
Activity: Supply of mining equipment and machinery: air compressors, electric generators, etc.

**IRECO INC. SUCURSAL BOLIVIA**

Address: Av. Mariscal Santa Cruz 1295 - Piso 1 / P.O. Box: 11231  
Telefax: (591-2) 370958  
Manager: Mr. Manuel Hemáiz  
Activity: Supply of explosives in general

**MATREQ**

Address: Av. Arce 2856 / P.O. Box: 9070  
Telephone / Fax: (591-2) 432185 / (591-2) 432058  
Manager: Mr. Carlos Taborga  
Activity: Supply of tractors, excavators, motorgraders and generators

**SOUTH AMERICAN CHEMICAL CORPORATION (SAMCO)**

Address: Av. España 1787 / P.O. Box: 209  
Telephone / Fax: (591-5) 260001-260002-260971 / Fax (591-5) 252677 (Oruro)  
Manager: Mr. Alberto Loayza  
Activity: Supply of chemical products

**TASSAROLI BOLIVIA LTDA.**

Address: Calle Batallón Colorados / Edificio El Cóndor - Piso 1 / P.O. Box: 7987  
Telefax: (591-2) 350855 - 366709  
Representative: Mr. Gustavo Gutiérrez  
Activity: Importation of equipment and supplies for mining.

## ANNEX 2: MINING STATISTICS

ANTIMONY (M.T.)								
	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	43	1	————	—	————	—	————	—
Medium mining	5.895	67	9.407	59	6.665	75	4.295	65
Small mining	2.745	31	4.560	28	2.144	24	1.597	24
Cooperatives	————	—	————	—	116	1	————	—
Other exporters	83	1	2.122	13	————	—	762	11
<b>Total</b>	<b>8.766</b>	<b>100</b>	<b>16.089</b>	<b>100</b>	<b>8.925</b>	<b>100</b>	<b>6.654</b>	<b>100</b>

BISMUTH (M.T.)								
	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	288	97	591	95	155	97	————	—
Medium mining	5	2	————	—	————	—	————	—
Small mining	4	1	12	2	4	3	————	—
Cooperatives	—	—	—	—	—	—	————	—
Other exporters	—	—	19	3	—	—	————	—
<b>Total</b>	<b>297</b>	<b>100</b>	<b>622</b>	<b>100</b>	<b>159</b>	<b>100</b>	<b>————</b>	<b>—</b>

TIN (M.T.)								
	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	13.893	57	20.272	63	9.859	61	3.967	27
Medium mining	3.919	16	6.899	22	4.085	25	515	4
Small mining	2.933	12	4.476	14	1.507	9	721	5
Cooperatives	————	—	————	—	819	5	2.124	14
Other exporters	3.465	15	305	1	————	—	7.406	50
<b>Total</b>	<b>24.210</b>	<b>100</b>	<b>31.952</b>	<b>100</b>	<b>16.270</b>	<b>100</b>	<b>14.733</b>	<b>100</b>

**COPPER (M.T.)**

	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	1.767	37	3.404	55	1.665	100	—	—
Medium mining	1.347	28	2.356	38	—	—	—	—
Small mining	595	13	122	2	—	—	—	—
Cooperatives	—	—	—	—	—	—	34	27
Other exporters	1.022	22	336	5	—	—	93	73
Total	4.731	100	6.218	100	1.665	100	127	100

**GOLD (M.T.)**

	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	0.01	—	0.01	—	0.01	—	0.01	—
Medium mining	1.05	36	0.68	41	0.16	28	10.53	73
Small mining	1.87	64	0.96	58	0.15	26	0.09	1
Cooperatives	—	—	—	—	0.24	45	3.79	26
Other exporters	—	—	—	—	—	—	—	—
Total	2.93	100	1.65	100	0.56	100	14.41	100

**SILVER (M.T.)**

	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	105	82	148	93	75	67	3	1
Medium mining	6	5	—	—	27	24	213	50
Small mining	15	11	7	4	4	4	109	25
Cooperatives	—	—	—	—	—	—	—	—
Other exporters	—	—	—	—	—	—	—	—
Total	128	100	160	100	112	100	428	100

LEAD (M.T.)								
	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	6.769	39	11.831	66	4.006	62	—	—
Medium mining	2.175	12	353	2	1.766	28	17.082	84
Small mining	7.564	43	3.834	21	547	9	2.754	13
Cooperatives	—	—	—	—	87	1	—	—
Other exporters	1.028	6	1.949	11	—	—	615	3
Total	17.536	100	17.967	100	6.406	100	20.451	100

TUNGSTEN (M.T.)								
	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	156	14	1.112	48	175	9	—	—
Medium mining	802	72	1.066	46	1.039	50	—	—
Small mining	154	14	33	1	109	5	628	76
Cooperatives	—	—	100	5	749	36	164	20
Other exporters	—	—	—	—	—	—	34	4
Total	1.112	100	2.311	100	2.072	100	826	100

ZINC (M.T.)								
	1965		1975		1985		1995	
	Volume	%	Volume	%	Volume	%	Volume	%
COMIBOL	4.083	30	31.656	65	13.672	36	8.267	6
Medium mining	2.432	18	12.563	26	22.852	60	100.871	69
Small mining	6.886	50	2.247	4	1.641	4	25.511	17
Cooperatives	—	—	—	—	40	—	—	—
Other exporters	287	2	2.308	5	—	—	11.481	8
Total	13.688	100	48.774	100	38.205	100	146.130	100

**PRODUCTION OF THE MEDIUM MINING COMPANIES IN 1995**  
 (In kilograms)

Company	Antimony	Tin	Gold (Grams)	Silver	Lead	Zinc
AVICAYA		121.827				
BARROQUIRA		327.282				
COMSUR		13.487		130.627	16.670.207	98.491.774
COMISAL	970.203					
EMUSA	2.696.620					
INTI RAYMI			10.529.310	40.758		
LA SOLUCION				1.483	347.441	2.379.089
<b>TOTAL</b>	<b>3.666.823</b>	<b>482.596</b>	<b>10.529.310</b>	<b>172.868</b>	<b>17.017.648</b>	<b>100.870.863</b>

**COMPOSITION OF BOLIVIAN MINING OUTPUT-1995**

PRODUCT	OUTPUT (M.T.)	VALUE (US\$'000)	% OF TOTAL
ZINC	146.130	150.554	28.35
TIN	14.733	91.601	17.25
GOLD	14.41	177.993	33.52
SILVER	428	71.576	13.48
LEAD	20.451	12.882	2.42
ANTIMONY	6.654	18.664	3.51
TUNGSTEN	826	4.910	0.92
BISMUTH	---	---	---
COPPER	127	373	---
OTHERS	18.776	2.445	0.46
<b>TOTAL</b>	<b>222.535</b>	<b>530.998</b>	<b>100</b>



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