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THE MINING
INDUSTRY IN
MEXICO

THE MINING INDUSTRY IN MEXICO

(note: Tonnes used in this report and values are in U.S. dollars)

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THE MINING INDUSTRY IN MEXICO

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1. METALS AND MINERALS HISTORY

The early history of Mexico and the development of mining are synonymous. This early period saw the development of Mexico due primarily to the Spaniards desire for silver. The towns that grew into cities were generally the early silver mining centers that were discovered in the mid - 1500's, such as Zacatecas, Santa Barbara, Fresnillo, Taxco, Guanajuato and Pachuca, which continue to this day as major mining centers and important cities.

The production of silver during the period 1561-1580 was 32.3 million ounces or an average of more than 1.6 million ounces per year. This increased gradually to 9.7 million ounces average per year over the period 1761-1780 rising to 57.7 million ounces in 1900, and 73.7 in 1909. During the early 1900's Mexico produced approximately one-third of the world's silver. With the advent of high taxation and later mexicanization of the industry, the former British, American and French interests gradually withdrew and production dropped drastically and has averaged much less than 50 million ounces per year until the last few years.

Gold production was never of the importance of silver but they were found together and production of over 1,000,000 ounces of gold per year was obtained during years of high silver production.

Lead mining started in the 1890's and with direct smelting of ores or gravity concentrates, metal production reached 120,000 tons in 1912.

With the development of the selective flotation concentrating method in the early 1920's, Mexican lead production increased rapidly to over 240,000 tons per year. Since that time, however, production decreased to 160,000 tons in 1972 and further to 145,000 tons in 1980.

Copper mining in Mexico began also in the 1890's with the exploitation of the Cananea, Sonora deposit.

The Cananea mine produced copper, lead and zinc all of which were concentrated by gravity methods using vibrating tables which had a capacity of 2,500 tons per day with a ratio of concentration of 4 to 1. The concentrate was then smelted in a local smelter with a production as high as 2,700 tons per month of copper.

In the late 1890's, the El Boleo mine in Baja California under French management produced about 11,000 tons of copper per year from 250,000 to 300,000 tons of mineral. Some of this copper was sent by sailing ships around Cape Horn to Europe. In the early 1900's small copper smelters were operated in Concepción del Oro, Zacatecas and in the State of Aguascalientes. Towards 1910, Mexican annual production of copper reached 50,000 to 60,000 tons.

Copper production continued to vary from 10,000 tons per year, during the revolutionary times, to as high as 80,000 tons per year just before the 1930's depression. In 1935 the production of copper was about 40,000 tons but the production increased gradually, until the middle 1970's due essentially to increased production from Cananea. (El Boleo is still in production as a State enterprise but is presently producing

less than 800 tons of copper per year). Coproduct copper from lead and zinc mining, however, has always accounted for some of Mexico's production. In the 1970's additional copper began to be produced from the Inguaran mine in Michoacan and as a major coproduct at the San Martin mine in Zacatecas. Cananea remained by far the major copper producer until the La Caridad mine came into production in 1979 and this mine now out-produces Cananea.

During the 1960's and early 1970's three large copper porphyry deposits were discovered in Mexico but price and market conditions have not been favorable enough to justify putting these properties into operation.

The history of zinc mining in Mexico actually begins with the development of the selective flotation concentrating method, around 1924, and by 1930 production had reached 160,000 tons per year. However, the U.S. depression stifled demand and production went below 100,000 tons per year. In 1934 production began a general upward trend culminating in 1955 with a yearly production of 294,000 tons. Since that time production has fluctuated, reaching a low in 1981 of less than 212,000 tons.

Since the initiation of Mexico's fledgling steel manufacturing capability in the late 1800's, the country has been almost self-sufficient in the basic inputs of iron ore and coke. However, with major expansions in the domestic market for steel, Mexico has had to rely on increasing imports of coking coal and will need to import iron ore for projected increases in steel production by the SICARTSA complex on the Pacific Coast.

Mexico's pig iron production increased at an annual rate of 10% in the 1970-1982 period and during the same time her sponge iron production saw an average increase of some 13% annually, all of this just to keep up with domestic demand. The country has seen its steel industry develop from very meager beginnings to the present annual capacity of almost 12.5 million tons primarily from three government firms (SICARTSA, Altos Hornos de Mexico, and Fundidora Monterrey) and two major private firms (HYLSA and Tubos de Acero). Present capacity far exceeds production due to the major drop in domestic demand in the 1982-1985 recession. For this reason, no new projects to increase capacity are contemplated.

In addition to silver, lead, copper, zinc, iron and coal as discussed above, Mexico is a leading petroleum exporter and an exporter of sulphur, fluorite, bismuth, antimony, graphite, mercury, barite, gypsum and others.

Today the mining industry employs over 200,000 people and has a total value of production of approximately U.S.\$1.4 billion dollars.

The 1917 constitution declared subsoil wealth to be the property of the nation, and government policies since then have consistently promoted increased Mexican participation in mining activity.

Today some minerals are reserved exclusively for government exploitation, such as petroleum and uranium. Others such as sulphur, iron ore, coal, potassium require 66% Mexican equity interests.

Most mining ventures now require at least a 51% ownership by Mexican nationals or specific Mexican entities and concessions can only be held by Mexican nationals. This "Mexicanization" law was promulgated in 1961 and the industry today is considered fully "Mexicanized".

Mining has developed more slowly than other sectors of the economy and in 1983 provided 1.3% of Mexico's Gross National Product, as opposed to 30% in the early 1920's. Appendix III contains a table showing the total Gross National Product and the Gross Product Mining for Mexico for the years 1960-1983.

2. THE MEXICAN MINING INDUSTRY

a. Mexico's Mixed Economy

Mexico's economy is characterized by a unique blend of free enterprise and statism in which certain spheres of economic activity are reserved exclusively for the State, others have coparticipation between the State and the private sector, and there is a broad, largely undefined area that is regarded as the domain of private enterprise.

While the State owns and operates hotels, restaurants and supermarkets, its main participation is in infrastructure and key economic areas such as electric power, petroleum and basic petrochemicals, the telephone service, railroads, fertilizers and a large part of the steel industry to mention a few of the principal activities.

In mining, somewhere between 34 and 40 percent of production is by companies owned solely or partially by the State, and this percentage is increasing. The majority of the State share of mining production is owned in partnership with private industry.

b. Production

Production is, of course, based on price and markets. Although in general over the last 24 years the price of silver has increased more than 5% annually, in real terms the price in 1984 was well below that trend. The average prices of copper and lead, in constant dollars, are the lowest in 35 years and real zinc prices are the lowest in 24 years. That 1984 average lead and zinc prices exceeded those of 1983 does little to compensate for this.

The world markets for fluorite, manganese and sulphur, three very important Mexican mineral products, were weak in 1984 but much stronger than in 1982 and 1983 and increased production of these products was noted in 1984 even though prices remained low.

Included in Appendix I are the following production tables with tonnages in metric tons values in U.S. dollars:

Table I Total Annual Production - Mexico - 1954-1984 for silver, lead, zinc, and copper.

Table II Mexican Mineral Production by Volume 1983-1984.

Table III Mexican Mineral Production by Value 1983-1984.

Table IV Distribution of Mexican Mineral Production by value for selected years.

As seen in Table I, silver production stayed fairly constant during the period 1954-1976 but then increased dramatically with increased world prices of silver. These production figures are, however, well below those for the period 1900-1945. Lead production has decreased in recent years as has zinc while copper production has increased dramatically since 1972 with the inauguration of first the Inguaran mine (now mined out) and later the La Caridad mine.

Table II indicates large production increases for silver, lead, zinc, manganese and fluorite in 1984 over 1983 but also production decreases in copper and molybdenum.

Table IV shows that for Mexico the values of silver, copper, zinc, sulphur, lead and iron are the most important for the country. Mexico was, in 1983, the world's leading producer

of silver, fluorite and arsenic; second in celestite and sodium sulphate; third in antimony and bismuth; fourth in mercury and amorphous graphite and fifth in sulphur, lead, zinc and feldspar.

Projections of near term future production will, of course, depend on price and market conditions. With recent mine expansions the capacity to produce more silver, lead and zinc is available and Mexico should see increased production of these metals. The capacity of the two large copper producers is being expanded and, although the average mine grades are decreasing, the capacity to produce more copper is available but could be restrained by low prices and weak markets. The same condition holds for molybdenum as for copper. If the world recession continues to abate, there should be increased Mexican production of manganese, fluorite, sulphur and barite since the capacity exists. The iron and coke production capacity has not been fully utilized in the last few years and a modest increase in output could be expected.

In the last few years a few mines have been closed owing to exhaustion of reserves and others because of low prices. However, during this time a few mines have come into production and there have been a number of expansions. The start of 1985, however, found Mexico's mining industry with few new projects scheduled for construction in the near term. Any current construction activity is the termination of projects started previously.

c. Exports

Well after Petroleos Mexicanos, the second, third, and fourth largest Mexican exporters are mining companies.

The major mineral exports of Mexico are silver, copper, zinc, lead, manganese, fluorite, sulphur and sodium sulphate. Many other minerals or metals are exported but of less value than those mentioned above and include, molybdenum, cadmium, bismuth, barite, graphite, gypsum, mercury, arsenic, antimony, celestite and diatomaceous earth. Of course other mineral commodities are exported in a manufactured form such as steel, ceramics, automobiles etc.

Approximate figures for export of metals and minerals in 1983 of a few selected commodities were (in metric tons):

	1983	1984
Silver	1,350	1,620
Copper	121,600	146,700
Sulphur	900,000	
Zinc	166,000	188,000
Lead	80,000	91,000
Fluorite	338,600	
Manganese	120,000	metallurgical and battery grade
	188,000	manganese ferroalloys
Gypsum	1,900,000	
Sodium sulphate	178,000	
Salt	5,500,000	
Graphite	48,000	
Diatomite	65,000	

The above are in decreasing order of value of exports (1983).

While Mexico is a gross exporter of minerals, it imports aluminum, phosphate, asbestos, nickel, tin and industrial diamonds to name the major commodities in order of decreasing value (1983). For steel making, Mexico imports scrap as well as metallurgical coal and iron concentrates besides some necessary ferroalloys.

d. Investment

- (1) The value of mineral production in Mexico in 1983 was reported to be \$1.4 billion dollars (all figures U.S. dollars) which was approximately the same as in 1982. During 1983 the Chamber of Mines reported investments in the mining industry in Mexico of \$310 million dollars of which \$16 million dollars was spent on exploration, \$110 million dollars on new projects and \$160 million dollars on expansions. This investment total is small compared to investments during the last decade. Due to the economic problems in recent years in Mexico and the worldwide recession, new investment has been greatly curtailed and few mineral industry projects are being contemplated.
- (2) The legislation governing foreign investment is the Foreign Investment Law (FIL) which is governed by the National Foreign Investment commission (NFIC).

The FIL is intended to permit foreign investment provided it complements and does not displace Mexican investment and is in areas deemed to be of priority.

In order to accomplish the desired purposes of the FIL, the following legal requirements have been established for Mexicanized companies.

- a) Equity capital: The general rule relating to equity capital is usually stated as being that at least a majority (51%) must be held by Mexican investors. A transfer of equity to another foreign investor would normally require a special FIL permit.
- b) Management: As a general rule the majority of persons at management level of an enterprise must be Mexican. Under the criteria of the Mexican authorities a prior permit is required for the appointment of any foreigner to the board of directors of a Mexican entity. However, in practice such permits have been granted provided the majority of the board is Mexican.
- c) Control: The FIL contains a general provision to the effect that foreign investment may participate in Mexican enterprises provided it does not have, in any manner, the power to determine the management of the enterprise.

(3) Capital Costs

The capital costs for mineral producing projects in Mexico are as varied as the projects themselves. For example, one mine producing 10,000 tons per day (located near established roads, railroad, electric

line and water) had a capital cost of approximately U.S. \$17,000 per daily ton of design capacity in 1980 dollars for an operation including pre-mine stripping, mine, mill, townsite and all connecting services. A 2,000 tons per day mine and mill that came on-stream in mid-1983 had a capital cost of \$21,500 dollars per daily ton of design capacity in 1980 dollars. A mid-1983 cost study for a 500 tons per day underground vein mine came out to be between \$25,300 and \$33,500 dollars per daily ton of design capacity in 1983 dollars with the difference depending on the amount of infrastructure and production development needed. The cost of a 450 tons per day underground mine that came into production in 1982 was \$31,600 dollars per ton of daily production in 1981 dollars.

The capital cost of large operations such as smelters, and large mines is more expensive in Mexico than in Canada or the U.S., due primarily to the increased cost of imported equipment. The additional capital cost is estimated to be between 12 and 24 percent. Construction costs can, however, be lower in Mexico so that the total cost of expansion can be equal to that in Canada or the U.S.

e. Operating Costs

Operating costs for underground mines are among the lowest in the world due primarily to good labor at low cost. Most of the major underground mines in Mexico had total direct and indirect costs at the mines not including amortization or corporate costs) of less than US \$15 per ton in 1983. The smaller underground mines producing less than 700 tons per day

tended to have higher costs but these seldom exceeded US \$25 per ton.

Underground mine costs are more dependent on the type of deposit than any other factor except, in some cases, daily production. The highest costs are incurred in narrow vein mines. Costs are lower when wide veins are being exploited and the lowest costs are found where large chimneys or mantos are being mined.

Large open pit operations are more capital intensive than labor intensive underground mines. Therefore, generally Mexican open pit operating costs are slightly higher than comparable operations in Canada or the U.S. Although labor and fuel are less expensive in Mexico, costs of maintenance, spare and replacement parts, new equipment and electricity are higher.

f. Labor

In 1983 the labor statistics report 211,000 people employed directly in the mining industry in Mexico.

The mining labor situation in Mexico has been considered more favorable than in most countries and more favorable than in other industries within Mexico. There are two main reasons for this: 1) there have been very few strikes or labour slowdowns, and 2) labor is well trained and motivated, especially in underground mining.

The Mining and Metallurgical Workers Union that has long been associated with the mining industry is well respected by both its membership and the Mexican Government. The leaders of

the mine workers have given highest priority to the attainment of better conditions. Under Mexican labour laws, this union has been able to negotiate favourable contracts for its members who invariably abide by the conditions of their contracts once signed.

Well qualified, experienced professional personnel such as mining engineers, geologists, metallurgists, etc. may be harder to find than in Canada or the United States.

g. Smelters and Refineries

1) Smelters

There are two major lead smelters in Mexico.

a) Met-Mex Peñoles, a subsidiary of Industrias Peñoles operates a lead smelter in Torreón, Coahuila.

Capacity 180,000 tons of lead per year.

b) Industrial Minera México operates a lead smelter at Avalos, Chihuahua.

Capacity 110,000 tons of lead per year.

There are four zinc smelters or smelter-refineries in Mexico.

c) Met-Mex Peñoles operates an electrolytic zinc refinery located at Torreón, Coahuila.

Capacity 105,000 tons of refined zinc a yer.

d) Industrial Minera México put its new electrolytic zinc refinery on-stream in late 1983.

Capacity 113,000 tons of refined zinc per year.

Industrial Minera Mexico is shutting down its old scotch hearth zinc smelter in Rosita, Coahuila.

e) Zincamex, a government company, operates a hydrometallurgical zinc plant at Saltillo, Coahuila.

f) Zinc Nacional operates a small plant in Monterrey, Nuevo León.
Capacity 13,000 tons per year zinc oxide and 6,000 tons per year of zinc sulphate.

There are three copper smelters in Mexico and one under construction.

g) Compañía Minera de Cananea operates a copper smelter at Cananea, Sonora.

Capacity 60,000 tons of blister copper per year.

h) Industrial Minera México operates a copper smelter at San Luis Potosí, S.L.P.

Capacity 42,000 tons of blister copper per year.

i) Compañía Minera Santa Rosalía, a government company, operates a small smelter at Santa Rosalía, Baja California Sur.

j) Mexicana de Cobre is constructing a copper smelter near their La Caridad operation in Sonora. Smelter to be on-stream at the end of 1985.

Capacity 185,000 tons of blister copper per year.

(2) Refineries

There are three lead refineries in Mexico and the two largest of these refineries are operated by the two companies that also have the only two lead smelters in Mexico.

(a) Met-Mex Peñoles operates a silver-lead refinery at Torreon, Coahuila.

Capacity: this refinery has produced up to 34 million ounces of silver per year but was not operating at capacity. Gold, bismuth and antimonial lead are by-products of this refinery.

(b) Industrial Minera Mexico operates a silver-lead refinery at Monterrey, Nuevo Leon.

Capacity: has produced up to 20 million ounces of silver per year but could accept more feed.

(c) Compañia Real del Monte y Pachuca operates a silver refinery in Pachuca, Hidalgo.

Capacity: between 4 and 4.5 million ounces of silver per year.

There is one copper refinery in Mexico

(d) The Cobre de Mexico copper refinery is located at Mexico City.

Capacity 150,000 tons of electrolytic refined copper per year.

Included with this report as Appendix V are examples of two current smelter schedules. The lead smelter charges are among the lowest in the world while the zinc smelter charges are very high.

3. MEXICAN GOVERNMENT MINERAL POLICY

a. Ministry of Energy, Mining and Parastate Industries

The Secretaría de Energía, Minas e Industria Paraestatal (Ministry of Energy, Mining and Parastate Industries) is responsible for mining. This ministry sets policy, (in the National Mining Program), regulates the agencies that oversee mineral development and exploration by government and establishes the mining law and, with other ministries, establishes the mining taxes.

b. National Mining Program 1984-1988

On August 1984, President Lic. Miguel de la Madrid presented his government's National Mining Program for 1984-1988. The stated objects of the program were:

- 1) To maintain the productive capacity, mineral development and export competitiveness of the mining industry in the face of the economic problems facing the country.
- 2) Assure the capacity of the industry to compete in foreign markets, by increasing exports, supply sufficient mineral raw materials for the domestic market and maintain a healthy and stable growth.
- 3) Assure the domination of the Nation over its mineral resources, develop employment and earn foreign exchange and elevate the living standard of the people with the participation of both the public and private sectors.

To carry out these objectives, the government proposes the following program:

- a) Increase exploration within the country.
- b) Assist the industry in development and increased production
- c) Orient the industry along lines of greater priority.
- d) Assist, in particular, the small and medium sized mining operations, thereby broadening the industry base.
- e) Assist rural communities by technical and financial means, in developing their mineral resources.
- f) Assist the State Companies so that they may contribute to the mining sector.

c. Public Sector in Mining

The government views the mining industry as very important in supplying Mexico's raw material needs and as an important source of foreign exchange through exports. At the same time the mining sector is regarded as an important source of tax income.

Mexican mining provided 1.3% of the Gross national Product in 1984. In 1983 the government's contribution to the Gross Mining Product (GMP) was 38% through its operation of state enterprises, parastate enterprises and union operations, while the large private companies contributed 49% of the GMP.

The government controls the majority of the production of copper through its 100% control of Compañía Minera de Cananea, S.A. and 44% ownership of Mexicana de Cobre S.A.

To supplement private industry exploration, a government organization, the Consejo de Recursos Minerales (Mineral Resources Council), has been charged with direct exploration for minerals.

The government can place any part of the public domain in the National Reserve which prohibits private individuals from obtaining concessions in these reserves except in special cases and in joint venture with the government. The amount of ground held in National Reserve is steadily increasing. For example, between March 1983 and March 4, 1984, 517,400 hectares were incorporated into the National Reserve. During the same period no land was released.

d. Commission for Mining Development

The Comisión de Fomento Minero (Commission for Mining Development, CFM) is a centralized federal government agency which acquires direct interests in mining concerns and provides technical assistance and financing to mining companies and operations other than the large private companies.

At the end of 1984 the CFM had participation in 30 mining-metallurgical companies as follows:

- 1) Majority holding:
 - a) Real del Monte y Pachuca
 - b) Zincamex
 - c) Rofomex
 - d) Macocozac
 - e) Exportadora de Sal
 - f) Nine other companies
- 2) Minority holding:
 - a) Compañía Minera Autlán
 - b) Compañía Minera de Cananea
 - c) Mexicana de Cobre

- d) Minera Real de Angeles
- e) Twelve other companies.

As technical assistance to the mining industry, the CFM operates numerous beneficiating plants as custom mills as a service to medium and small scale operators in districts where there are no milling facilities. While there were 14 such plants operating in 1982 this was increased to 21 in 1983 and these beneficiated a total of 600,000 tons which was about 70% of installed capacity. As can be seen, the average plant is of small capacity. Recoveries are often low due to the diverse feed material and, in places, associated manganese oxides. The more important of these plants, with their design capacities, are as follows:

- 1) Guanacevi, Durango 6,000 tons per month, flotation.
- 2) El Bote, Zacatecas 17,000 tons per month, flotation.
- 3) La Parrilla, Durango 5,000 tons per month, flotation.
- 4) Patronato, Parral, Chihuahua 12,000 tons per month cyanidation.
- 5) Patronato, Zacatecas, 6,000 tons per month, flotation and 10,000 tons per month, cyanidation.

The CFM also operates three laboratories which are located at Tecamachalco, D.F., Hermosillo, Sonora and Oaxaca, Oaxaca.

The CFM is financed partially by dividends and royalties and part of the payments received from mining claims. However, the majority of their financing is directly from government.

In the first 9 months of 1984, the CFM reported that they granted credits of 3.7 billion pesos (approx US\$21 million dollars to small and medium size mine operators and as

subsidy to 21 CFM beneficiating plants.

e. Mineral Resources Council

The Consejo de Recursos Minerales (Mineral Resources Council, CRM) is the geological survey branch of the government and is charged with exploring and establishing an inventory of Mexico's mineral resources. To carry out its duties, the CRM is staffed by approximately 350 mineral specialists (geologists, geophysicists, geochemists, statisticians, mining engineers, etc.) The CRM has well equipped laboratories and maintains a number of regional offices throughout Mexico.

Although the CRM was founded as a geological survey of organization, they have, over the last 15 years, developed into an organization primarily interested in mineral exploration in direct competition with private industry. Any viable discoveries of the CRM are to be turned over to the CFM for operation or sale. The CRM also offers its services, primarily to small and medium sized operators, at a nominal cost.

f. Trust Fund for Mexican Non-Metallic Minerals

The Fideicomiso de Minerales No Metálicos Mexicanos (Trust Fund for Non-Metallic Minerals, FNM) is a government trust which provides credit and technical assistance to small and medium size mining enterprises as well as investing in exploration and operation activities of its own in support of the development of non-metallic minerals. Over the course of 1984, FNM made loans totalling approximately U.S.\$19 million while maintaining significant equity participation in six companies.

g. Mining Law

The basis of the Mexican mining law is the Mexican Constitution which states that the subsoil and any minerals found therein belong to the Nation. All forms of mining activity require a concession from the Federal Government.

The mining law of 1961 requires that to be granted concessions, the majority ownership of any operating entity must be in the hands of Mexican nationals or specified Mexican entities.

The mining law of 20 June 1976, with subsequent currently grants the following mining rights:

Exploration Concession - valid for 3 years renewable once for 3 years, if justified, with areas up to 50,000 Ha.

Exploitation Concession - valid for 25 years renewable if justified, over areas not exceeding 5,000 Ha.

Treatment Concessions - required for concentrators, smelters and refineries over 100 tons per day capacity. Valid for 25 years renewable, if justified. All plants must accept up to 15% of their feed from the public.

Concessions on National Reserve - concessions can be granted in National reserves to entities with 66 or more percent ownership by Mexican Nationals or specified Mexican entities.

All concessions are subject to the payment of taxes and holders must submit annual reports, work programs and budgets

for approval. Minimum expenditures are specified. Uranium, coal, iron ore, phosphates, potash and sulphur are reserved for the State. Uranium is exclusively reserved for the State while sulphur, potash and phosphates may be exploited by mixed companies in which the State holds a majority, and for coal and iron ore the State holding may be a minority.

The mining law also regulates the assignment and transfer of concessions, payment of royalties and surface indemnity.

h. Mining Taxation

A specific tax law for mining became effective in 1978. This superseded a more complicated system of production and export taxes that contained special negotiated allowances and agreed reductions for certain mines or commodities. The most recent specific tax law for mining became effective in 1981 and has the following major taxes:

Taxes

Right-to-produce Tax assessed on metal or mineral in concentrates or on mine production. This is a severance type tax. 7% of value on gold silver and sulphur 2% of value on coal, iron and manganese 5% of value on all other substances.

Concession Tax Exploration concession \$87 pesos/Ha. yearly. Exploitation concession metallics \$522 pesos/Ha. yearly. Non-metallics \$261 pesos/Ha. yearly.

Local taxes No State, district or municipal taxes levied.

Allowances

Import duties As levied - up to 75% reduction on import duties on machinery and parts.

Accelerated depreciation

For investments in fixed assets made and/or put into service in 1985, a 50% depreciation is allowed.

For investments in fixed assets made and/or put into service in 1986, a 25% depreciation is allowed.

i. Corporate and other taxes

In addition to the specific taxes levied on mining, income and other taxes must also be paid. The most important are those imposed by the Federal government. State and municipal governments have more limited tax powers but do receive a share of some Federal taxes collected within their borders.

The principal taxes and levies payable by commercial and corporate enterprises operating in Mexico are:

1. Taxes on income: Maximum 42% of net profits graduating downwards for lower profits.
2. Levy for worker profit sharing: 10% of net profits.
3. Value added tax: 15%. Taxes included in calculation of value added may be recovered.
4. Payroll taxes: Mainly Social Security and National Housing Fund.
5. Others including local taxes on proceeds of capital and real property and excise taxes.

Foreign individuals or companies offering personal services or contract services must pay a 21% tax on the services which is deductible by the corporation if the contracts have been duly registered.

A stockholder now pays a 55% tax on his dividend which is withheld at the source. In 1984 and 1985 the corporation was allowed to expense dividends paid. However, in 1986 the corporation will not be allowed to expense dividends but the stockholder will be able to claim deductions reducing his effective dividend tax rate to 21%.

B Amonium sulphate	Met-Mex smelter
C Asbestos	Pegaso
C Barite/silver/lead/zinc	La Minita
A Coal	Río Escondido
A Coal	Pasta de Conchos
A Coal	C.F.M.
A Copper	Cananea expansion
C Copper	Cananea smelter
A Copper	La Caridad expansion
A Copper	La Caridad smelter
C Copper	Mexicana de Cobre refinery
C Copper	El Arco
B Diatomite	Canadian-Mexican joint venture
A Gold	Barqueño
B Kaolin	Huayacocotla
C Lead/silver	IMMSA refinery
B Limestone	Pedregal
A Manganese	Tetzintla
B Phosphate rock	San Juan de la Costa
B Silica sand	Jiménez
A Silver/lead/zinc	Charcas expansion
A Silver/lead/zinc	Naica shaft
A Silver/lead/zinc	San Luis shaft
B Silver/lead/zinc	Cerro de Dolores
B Silver/lead/zinc	Veta Colorada
C Silver/lead/zinc/copper	Real de Asientos
A Silver/gold	Sultepec
C Silver/gold	San Antonio
C Silver/gold	Guanacevi
A Silver/gold	Durango refinery
B Silver/gold/lead/zinc	La Cienega
B Silver/gold/lead/zinc/copper	Tizapa
B Silver/gold/lead/zinc/copper	Rey de Plata
A Silver/gold/lead/zinc	Plomosas

B MINERAL Ammonium Sulphate

PROJECT NAME Met-Mex Peñoles Smelter Scrubber

DESCRIPTION A smelter gas scrubber system to recover clean high quantity SO₂ for an acid plant and to make ammonium sulphate for the fertilizer industry is to be installed at the Industrias Peñoles, Met-Mex lead smelter at Torreon, Coahuila. This will have four steps; gas cleaning, absorption, acidification and crystallization. Products will be sulphuric acid and ammonium sulphate for which markets have been secured.

FINANCE SOURCES

Estimated investment of \$11 million dollars.

IMPLEMENTING AGENCY/ADDRESS

Industrias Peñoles, S.A. de C.V.
Paseo de la Reforma 383
06500 Mexico, D.F.

Contact Director of Engineering and Development

CURRENT STATUS

Basic engineering design has been completed but equipment purchases and awarding of engineering contract are yet to be made (March 1985). Detailed engineering will be completed in 1985 with construction in 1986, terminating in late 1986. The lead smelter has a capacity of 180,000 tons per year of lead.

C MINERAL Asbestos

PROJECT NAME Minera Pegaso Asbestos Project

DESCRIPTION Industrias Peñoles asbestos project near Cuicatlan, Oaxaca. Asbestos in short fiber & slip fiber (size 5 and 6). Estimated 45,000 tons per year of fiber. Local infrastructure needed townsite, power, water and shipping facilities.

FINANCE SOURCES

IMPLEMENTING AGENCY/ADDRESS

Industrias Peñoles, S.A. de C.V.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 211-0054

Contact Director of Mines

CURRENT STATUS

The 2 ton per hour pilot plant producing less than 3 tons per day of fiber is operating. No present plans to construct plant of 45,000 ton per year of fiber, awaiting more favorable price and market for asbestos.

C MINERAL Barite / Silver / Lead / Zinc

PROJECT NAME La Minita - Expansion

DESCRIPTION Minera Capela, S.A. operation in the Coalcoman district of Michoacan. Barite mine with by-product silver, lead and zinc. Possible expansion and new mine.

FINANCE SOURCES

Company internal

IMPLEMENTING AGENCY/ADDRESS

Industrias Peñoles, S.A. de C.V.
Paseo fe la Reforma 383
06500 Mexico, D. F.
Tel 211-0054

Contact Director of Mines

CURRENT STATUS

Presently operating at 40,000 tons per month which is below design capacity of 60,000 tons per month. No present new construction but expansion possible if and when market conditions improve.

A MINERAL Coal (thermal)

PROJECT NAME Rio Escondido Coal Mines

DESCRIPTION Thermal coal mine system near Piedras Negras, Coahuila to supply thermoelectric plant being built by the Comision Federal de Electricidad.

FINANCE SOURCES

Loan from Inter-American Development Bank.
Comision Federal de Electricidad.

IMPLEMENTING AGENCY/ADDRESS

Minera Carbonifera Rio Escondido, S.A.

1) Mariano Escobedo 375
Mexico 5, D.F.
Tel. 254-2211 / 254-2622

2) Lopez Mateos y Tepic
Piedras Negras, Coahuila
Tel. 2-3243 / 2-3242

CURRENT STATUS

The open pit now producing 2,000 tons per day is designed for 6,000 tons per day. Construction completed, equipment has been purchased. The underground mines are now producing 2,000 tons per day from development work but are designed to produce 12,000 tons per day. These mines are under development and all equipment has been purchased. Bids have been requested for a coal preparation plant to prepare the 18,000 tons per day requirements for the power plant which is due to be operating by the end of 1985.

A MINERAL Copper

PROJECT NAME Cananea expansion

A MINERAL Coal (metallurgical)

PROJECT NAME Pasta de Conchos, Nueva Rosita, Coahuila

DESCRIPTION A new underground coal mine is being developed which will have a monthly production of 40,000 tons per month by the end of 1986. Inclined shafts have been completed and development work is underway. The extraction will be by one long-wall unit and two continuous miner machines. The bed thickness is 2.4 meters and the quality is better than most coal in this Sabinas basin.

FINANCE SOURCES

Estimated investment is \$6 million dollars not including equipment some of which will come from the abandoned Sabinas No. 7 mine. Present bank revolving funds are sufficient for financing.

IMPLEMENTING AGENCY/ADDRESS

Carbonifera de Nueva Rosita, S.A.
Baja California #200
Mexico 7, D.F.
Tel. 564-7066

Contact Director of Engineering and Construction

CURRENT STATUS

Shaft sinking and surface installations construction were begun in late 1982 and full production is expected by late 1986. Present development work produces 10,000 tons per month of coal.

C MINERAL Coal (metallurgical)

PROJECT NAME

DESCRIPTION

The Comision de Fomento Minero (CFM) operates various coal mines in the Sabinas Basin in the State of Coahuila. There are no major construction projects underway at present as projects have recently been completed on two mines. However, there is continuing need for new equipment at the CFM mines for replacement and for expansions.

FINANCE SOURCES

IMPLEMENTING AGENCY/ADDRESS

Comision de Fomento Minero
 Presidente Juarez No. 23
 Nueva Rosita, Coahuila
 Tel. (861) 43571, (861) 43785

Contact District Manager

CURRENT STATUS

A MINERAL Copper

PROJECT NAME Cananea expansion

DESCRIPTION Constructing a new crushing and grinding plant for 70,000 tons per day feed. Constructing a 50,000 tons per day flotation plant will utilize 20,000 tons per day from old plant to augment total beneficiating plant to 70,000 tons per day. Cia. Minera de Cananea is the second largest copper producer in Mexico and is controlled by the government. A small percentage of shares are held by the public but there is no foreign ownership.

FINANCE SOURCES Equipment purchase is being financed by credits from U.S. Eximbank and EDC

IMPLEMENTING AGENCY/ADDRESS
 Compania Minera de Cananea, S.A.
 Insurgentes Sur 1377 - 12 piso
 Mexico 20, D.F.
 Tel. 589-1400

Contact Director General or Purchasing Manager

CURRENT STATUS All equipment has been purchased and construction should be terminated by early 1986. Some new equipment and replacement equipment will be needed for the mine in late 1985 and 1986 (shovels, trucks, drills, etc.)

Copper

A MINERAL

Cananea expansion

PROJECT NAME

C MINERAL Copper

PROJECT NAME Cananea Smelter

DESCRIPTION An expansion of the present 60,000 tons per year copper smelter at Cananea is contemplated so as to be able to smelt the additional concentrates that will be produced from the present mine and plant expansion.

FINANCE SOURCES**IMPLEMENTING AGENCY/ADDRESS**

Compañía Minera de Cananea, S.A.
 Insurgentes Sur 1377 - 12^a Piso
 Mexico 20, D.F.
 Tel. 598-1400

Contact Director General or Purchasing Manager

CURRENT STATUS

Engineering for a new smelter has been contemplated but construction is not due to start until the copper price and market conditions improve. The present smelter will be maintained. If the new beneficiating plant is operating at capacity it will produce some 110,000 tons of copper per year in concentrates. The excess over the 60,000 tons per year smelter capacity will be sold as concentrates and some of this might be sold to Mexicana de Cobre for their, to be completed, 185,000 tons per year smelter.

A MINERAL

Copper

PROJECT NAME

La Caridad Expansion

DESCRIPTION

Construction is underway to expand the La Caridad mine and beneficiating plant from 72,000 tons per day to 90,000 tons per day. Construction is scheduled to be completed by late 1986.

FINANCE SOURCES

IMPLEMENTING AGENCY/ADDRESS

Mexicana de Cobre, S.A.
 Insurgentes Sur 432
 Mexico 7, D.F.
 Tel: 584-0122

Contact

Director General or Purchasing Manager

CURRENT STATUS

All the equipment for this expansion has been purchased, however, there is continuous need for mine replacement equipment. Bids have also been solicited for a sulphuric acid plant to be built in 1985.

A MINERAL Copper

PROJECT NAME La Caridad smelter

DESCRIPTION A new copper smelter is being constructed by Mexicana de Cobre to smelt their concentrates from the La Caridad mine. The design capacity of this smelter is 185,000 tons per year. Mexicana de Cobre, S.A. is owned 38% by Nacional Financiera, 6% by the Mining Development Council (CFM) and 56% by private shareholders. The major share holding is hold by a group headed by Sr. Jorge Larrea.

FINANCE SOURCES

IMPLEMENTING AGENCY/ADDRESS

Mexicana de Cobre, S.A.
Insurgentes Sur 432
Mexico 7, D.F.
Tel. 584-0122

Contact Director General or Purchasing Manager

CURRENT STATUS

Construction to be completed by fourth quarter 1985 with production planned for early 1986. All equipment has been purchased. Expenditures for 1985 on this smelter are budgeted for \$23.5 million U.S. dollars.

C MINERAL Copper

PROJECT NAME Mexicana de Cobre Copper Refinery

DESCRIPTION All engineering has been completed for an electrolytic copper refinery to be built at Empalme, Sonora by Mexicana de Cobre to refine their copper blister to be produced at their La Caridad Smelter.

FINANCE SOURCES

IMPLEMENTING AGENCY/ADDRESS

Mexicana de Cobre, S. A.
Insurgentes Sur 432
Mexico 7, D.F.
Tel. 584-0122

Contact Director General or Purchasing Manager

CURRENT STATUS

There are no plans at present to start construction of this refinery. There is presently an excess of copper refining capacity in Mexico and this project will be suspended until copper price and market conditions improve.

C MINERAL Copper

PROJECT NAME El Arco

DESCRIPTION: Industrial Minera Mexico has explored the El Arco porphyry copper deposit in Baja California Norte. Drilling has indicated 650 million tons of 0.67% copper with by-product gold values. Adequate water supplies have been developed, but otherwise there is no infrastructure which would be needed - townsite, power, roads, port development, etc.

FINANCE SOURCES

IMPLEMENTING AGENCY/ADDRESS

Industrial Minera Mexico, S.A.
Baja California 200
Mexico 7, D. F.
Tel. 564-7066

Contact Director of Mines

CURRENT STATUS

Preliminary engineering has been completed and pilot plant studies have been made. A construction decision will await more favorable price and market conditions.

B MINERAL Diatomite

PROJECT NAME Diatomite, Tuxpan, Michoacan

DESCRIPTION It is planned that in the first phase of the development of this diatomite property that a plant to produce 40,000 tons per year of diatomite for export will be constructed. All basic engineering, mineralogic studies and pilot plant tests have been completed with favorable results and a feasibility study was made. An open pit mine is required as is a plant for crushing, washing and classification. Reserves of 3.2 million tons are reported of very good quality material.

FINANCE SOURCES

Estimated investment is \$16 million Canadian dollars. Financing by Canadian and Mexican entities.

IMPLEMENTING AGENCY/ADDRESS

This project is a joint venture between a Canadian group LMBDS - SIDAM with 49%, Minerales No Metalicos Mexicanos 26% and private Mexican investment, 25%.

Contact LMBDS - SIDAM

CURRENT STATUS

Basic engineering, laboratory and pilot plant tests, market studies and feasibility studies have been completed. Detailed engineering and construction can begin four months after final contracts have been signed.

A MINERAL

Gold

PROJECT NAME Barqueno

DESCRIPTION

First exploration was by the Consejo de Recursos Minerales (CPM) in early April 1982 and the first production of gold was in April 1984. Early claims as to the size and grade of this deposit were somewhat overstated and it now appears that a few million tons of 2 gram per ton gold may represent this deposit. The gold occurs in veins in volcanics. The vein walls are broken and must be supported and open pit tonnage is limited.

FINANCE SOURCES

Mexican government

IMPLEMENTING AGENCY/ADDRESS

Consejo de Recursos Minerales
Ninos Heroes 139
Mexico, D.F.

Contact

Director General

CURRENT STATUS

A small open pit is being operated and a pilot plant with heap-leach pads for up to 20,000 tons has been constructed. Investigations are continuing to determine reserves and leach recovery figures. With incompetent walls and low grades only open-pit operations are probably feasible.

B MINERAL Kaolin

PROJECT NAME Huayacocotla Veracruz

DESCRIPTION Minerale No Metalicos Mexicanos has completed the basic engineering and feasibility studies and plans to build two kaolin processing plants. The first plant (1) to be built is planned to process 21,000 tons per year of kaolin to be used for paper filler and coating. The second plant (2) will have a capacity of 45,000 tons per year and will also be used for paper but also for fine ceramics. Large reserves of high quality are reported. The plant will include washing, classification, filtering and drying.

FINANCE SOURCES

Estimated investment plant (1) \$550 million pesos in fixed assets and \$250 million pesos in working capital. Estimated investment in plant (2) is \$1800 million pesos. Plant (1) will be financed 100% by Mexican government while plant (2) will have government and private investment.

IMPLEMENTING AGENCY/ADDRESS

Minerale No Metalicos Mexicanos
Av. Chapultepec 536
06700 Mexico, D.F.
Tel. 286-4788

Contact Coordinator of Industrial Planning and Development

CURRENT STATUS

The basic engineering has been completed. Laboratory testing has been done and a market study has been completed. A feasibility study has been completed. Construction is contemplated to begin in 1985. This material will all be consumed in Mexico substituting for imported kaolin.

C MINERAL Lead / Silver

C MINERAL PROJECT NAME Lead / Silver Refinery Chihuahua, Chihuahua

PROJECT NAME DESCRIPTION Lead-Silver Refinery Chihuahua, Chihuahua
 DESCRIPTION Industrial Minera Mexico, S.A. operates their lead-silver refinery in Monterrey, Nuevo Leon. Preliminary engineering has been done to construct a new refinery in Chihuahua and transfer all operations to this new location. This refinery is designed to be slightly larger than the Monterrey refinery with a capacity of 110,000 tons of lead and 25 million ounces of silver per year. The justification of relocating the refinery is for increased efficiency.

FINANCE SOURCES

Estimated investment is \$100 million dollars. No financing has yet been arranged.

Estimated investment is \$100 million dollars. No financing has yet been arranged.

IMPLEMENTING AGENCY/ADDRESS

Industrial Minera Mexico, S.A.
 IMPLEMENTING AGENCY/ADDRESS Baja California #200
 Mexico 7, D.F.
 tel. 564-7066
 Baja California #200

Contact Director of Plants
 tel. 564-7066

CONTACT STATUS Director of Plants

CURRENT STATUS Basic engineering has been completed as have numerous special studies. No decision has yet been made on when construction will start.
 basic engineering has been completed as have numerous special studies. No decision has yet been made on when construction will start.

B MINERAL Limestone

PROJECT NAME Pedregal, Quintana Roo

DESCRIPTION Industrias Peñoles plans to start construction of a 3 million ton per year limestone quarry and crushing and screening plant later to be expanded to 9 million tons per year. This plant will produce cement raw material and aggregate to the U.S. Gulf Coast area. Plant and quarry construction planned to begin late 1985 or early 1986. Quarry will have primary crusher with secondary and tertiary crushing and screening at the plant. A dock and ship loader will be built to load 60,000 ton dead weight bulk carriers.

FINANCE SOURCES

Estimated investment in first phase 3 million ton per year operation is \$33 million. Financing not established. Financing will be an important consideration for purchases of equipment and services.

IMPLEMENTING AGENCY/ADDRESS

Industrias Peñoles, S.A. de C.V.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 211-0054

Contact Director of Engineering and Development

CURRENT STATUS

The reef limestone deposit is located in the state of Quintana Roo on the mainland near Cozumel Island. Exploration has located a large deposit of limestone suitable for cement raw material and aggregate. Letters of intent have been obtained for initial production. Basic engineering design has been completed and detailed engineering will be done in 1985. No equipment has been purchased but equipment is being considered. Plant operation and shipping is scheduled to begin late 1986 or early 1987. Construction will include quarry, crushing and screening plant, dock with shiploader and infrastructure and support.

A MINERAL Manganese

PROJECT NAME Tetzintla Underground Mine, Molango, Hidalgo

DESCRIPTION The Tetzintla open pit mine of Cia. Minera Autlan is reaching the economic mining limit of their deposit and therefore mining must continue underground. A sub-level mining operation is being developed to produce up to 200,000 tons per year contained Mn. Besides the development work of tunnels, drifts ramps and sub-level drifts a conveyor belt haulage system is being built. Production began from this underground mine and is increasing as new development work is done.

FINANCE SOURCES

Estimated total investment in this project to completion is \$10 million dollars.

IMPLEMENTING AGENCY/ADDRESS

Cia. Minera Autlan, S.A. de C.V.
Mariano Escobedo No. 510 - 5ª
Mexico 5, D.F.
Tel. 250-1977

Contact Director of Mines

CURRENT STATUS

Development continuing with estimated termination in 1987 when the open pit mine will be exhausted and the underground mine will be at design capacity.

B MINERAL Phosphate Rock

PROJECT NAME San Juan de la Costa - Underground Mine

DESCRIPTION The San Juan de la Costa open pit mine is reaching its economic stripping limit and a project is being programmed to start mining underground. The new underground mine is planned to produce 2,000 tons per day by the room and pillar method and 4,000 tons per day by the long wall method operating two long wall units each of a capacity of 2,000 tons per day. Total projected production is 6,000 tons per day. Approximate bed height is two meters.

FINANCE SOURCES

Total financing including needed infrastructure is estimated at \$20 - \$24 million dollars.

IMPLEMENTING AGENCY/ADDRESS

Roca Fosforica Mexicana, S.A. de C.V.
 Linares 96 Col. Roma Sur
 06760 Mexico, D.F.
 Tel. 584-8926

Contact Director General

CURRENT STATUS

All the basic engineering has been finished. Detailed engineering for the long wall units is to be done by mid 1985 and the units are to be in operation by the end of 1985. The initial phase of the room and pillar operation was started in early 1985 to phase into the decrease in production from the open pit. The underground mine will use trackless equipment there will need to be minor changes and adjustments to the beneficiating plant to accept the raw underground plant feed.

B MINERAL Silica Sand

PROJECT NAME Silica Sand Jimenez, Chihuahua

DESCRIPTION A large sedimentary sand deposit exists southeast of Jimenez, Chih. with reported reserves of 4 million tons. A plant to produce 8,500 tons per year of high grade formation fracturing sand. All of this product will be used by Petroleos Mexicanos (PEMEX) although later expansion for export is envisaged. The plant will include crushing, washing, classification, vibrating tables and leaching. A mine is also included in the project.

FINANCE SOURCES

Estimated investment \$450 million pesos to be supplied by the government and private investment.

IMPLEMENTING AGENCY

Minerales No Metalicos Mexicanos
Ave. Chapultepec 536
06700 Mexico, D. F.
Tel. 286-4788

Contact Coordinator of Industrial Planning and Development

CURRENT STATUS

The basic engineering has been completed as have pilot plant tests and market studies. A feasibility study has been completed and detailed engineering and construction are estimated to start in 1985. This material will be substituted for frax sand presently being imported by PEMEX

A MINERAL Silver / Lead / Zinc

PROJECT NAME Charcas Charcas, San Luis Potosi

DESCRIPTION In January 1983 the decision was made to transfer the Inguaran flotation plant to Charcas from the depleted Inguaran, Michoacan mine. This 2,200 tons per day plant is being installed and will augment the already existing 1,250 tons per day plant. In addition, a new shaft is being sunk which should be finished by the fourth quarter of 1985. New mining equipment will be needed as well as a pumping system and a new electric substation.

FINANCE SOURCES Financed internally.

IMPLEMENTING AGENCY/ADDRESS

Industrial Minera Mexico, S.A.
Baja California #200
Mexico 7, D.F.
Tel. 564-7066

Contact Director of Engineering and Construction

CURRENT STATUS

Project should be completed by early 1986.

A MINERAL Silver / Lead / Zinc

PROJECT NAME Naica Shaft

DESCRIPTION The Naica Shaft is being sunk by Cia. Fresnillo, S.A. at their Naica unit at Naica, Chihuahua. This shaft will be used as the main hoisting and service shaft for the Naica mine which presently produces 3,000 tons per day.

FINANCE SOURCES

Internal - Total estimated cost of shaft is \$3.5 million dollars with an additional cost of new and improved pumping system of an additional 2.5 million dollars (present pumping 13,000 gal. per minute).

IMPLEMENTING AGENCY/ADDRESS

Cia. Fresnillo, S.A.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 533-4872

Contact Director of Mines or Purchasing Manager

CURRENT STATUS

This shaft was begun in 1982 and in April 1985 had been sunk to the 600 meter level and is planned to go down to the 850 meter level and could be finished in late 1986. Pumping from the Naica Shaft is to the 541 level which is connected across to the lowest pumping level of the Gibraltar Shaft. The Gibraltar Shaft will not be lowered but the pumping system to the surface will be maintained.

A MINERAL Silver / Lead / Zinc

PROJECT NAME San Luis Shaft

DESCRIPTION The San Luis Shaft is being sunk by Cia. Fresnillo, S.A. at their Fresnillo unit at Fresnillo, Zacatecas. This is a 3.4 by 4.4 meter shaft to connect the 695 level to the surface and to be used primarily as a service shaft but equipped for hoisting (primarily waste). Present Fresnillo Mine production is 2,200 tons per day.

FINANCE SOURCES

Internal - Total estimated cost \$3.7 million dollars which includes all costs of equipment, buildings, etc.

IMPLEMENTING AGENCY/ADDRESS

Cia. Fresnillo, S.A.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 533-4872

Contact Director of Mines or Purchasing Manager

CURRENT STATUS

Shaft begun in 1984 and carried out by slabbing of previously bored ventilation shaft. In April 1985 this shaft had been slabbed down to the 370 meter level, connected to the 270 level and stations prepared on the 165 and 215 levels. When connected to the 425 level it will be prepared to service this level from the surface while continuing to slab to the 695 level. This shaft should be completed by late 1985 or early 1986.

B MINERAL Silver / Lead / Zinc

PROJECT NAME Cerro de Dolores

DESCRIPTION Industrias Luismin has been exploring the Cerro Dolores project in Morelos State in joint venture with Cia. Minera Astumex for the last two years. Only a small section of a large structure has been explored by underground methods and 600,000 tons of reserves have been developed grading 230g Ag and 9% combined Pb-Zn. Exploration is continuing but preliminary planning and engineering for a 500 to 700 tons per day flotation plant has been completed. Present plans are to start construction of this plant in 1987. A fair amount of infrastructure will be necessary.

FINANCE SOURCES

Estimated investment \$13,750,000 dollars.

IMPLEMENTING AGENCY/ADDRESS

Industrias Luismin, S.A. de C.V.
Campos Eliseos 400, 8 piso
11000 Mexico, D.F.
Tel. 540-3293/540-5403

Contact Director of Mines

CURRENT STATUS

This is considered to be a project of high potential as continuing exploration is developing increased reserves in this vertical bedded deposit. Widths and grades are erratic but there is good potential for a large tonnage. To date only preliminary feasibility studies using basic engineering have been completed.

B MINERAL Silver / Lead / Zinc

PROJECT NAME Veta Colorada, Parral, Chihuahua

DESCRIPTION At present sulphide mineralization from the Veta Colorada mines (4) is being transported to the 1,400 tons per day Parral plant. With the development of the Sierra Plata mine with its oxide mineralization in the upper levels a new 1,200 tons per day flotation-cyanide plant will be constructed using some equipment from the Tecolote mill (750 tpd). Also a vertical shaft at the Sierra Plata mine was begun in October 1984 and will be finished in early 1986.

FINANCE SOURCES

Estimated investment including plant, townsite, pumping equipment, etc., is \$20 million dollars. Present bank revolving funds sufficient for financing.

IMPLEMENTING AGENCY

Zinc de Mexico, S.A.
Baja California #200
Mexico 7, D.F.
Tel. 564-7066

Contact Director of Engineering and Construction

CURRENT STATUS

All basic engineering has been completed and some of the detailed engineering and special studies have been made. The Tecolote plant is being dismantled. Construction is being delayed awaiting higher metal prices. Construction is estimated to take 24 months.

C MINERAL Silver / Lead / Zinc / Copper

PROJECT NAME Real de Asientos, Aguascalientes

DESCRIPTION Due to low metal prices these properties are presently not operating. Sufficient tonnage of reserves are available to feed the present 750 tons per day flotation mills (one 250 tons per day, one 500 tons per day) and exploration is indicating good potential to develop large reserves sufficient to expand the flotation plants to 2,000 tons per day. Little new infrastructure will be necessary in this developed district.

FINANCE SOURCES

Too early for financial negotiations.

IMPLEMENTING AGENCY/ADDRESS

Industrias Luismin, S.A. de C.V.
Campos Eliseos 400 8^a Piso
1000 Mexico, D.F.
Tel. 540-3293 / 540-5403

Contact Director of Mines

CURRENT STATUS

Only basic engineering has been completed on the expansion of the flotation plant to 2,000 tons per day. Present projections are to continue developing reserves and to operate the 750 tons per day plants for two to three years before starting the construction of the expansion.

A MINERAL Silver / Gold

PROJECT NAME Sultepec

DESCRIPTION Cia. Fresnillo project in the Sultepec mining district, Sultepec, Edo. de Mexico. Development of one main vein and other small structures with present known reserves of 1,065,000 tons grading 160 g silver and 0.7g gold. Of the total reserves 800,000 tons will be mined by open pit with the remainder mined by underground methods. The beneficiating plant will be a flotation plant with the tailings from this plant going to a cyanidation plant. Products will be lead and zinc concentrates and gold-silver precipitates.

FINANCE SOURCES

Total investment in project is estimated at \$13 million with approximately \$7 million for plant.

IMPLEMENTING AGENCY/ADDRESS

Cia. Fresnillo, S.A.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 533-4872

Contact Director of Mines or Purchasing Manager

CURRENT STATUS

The construction of a 200,000 ton per year flotation and cyanidation plant was started in October 1981 but work was suspended in April 1982 because of the low silver price at the time. Construction was started again in July 1984 and is expected to be completed in September 1985.

C MINERAL Silver / Gold

PROJECT NAME Guanacevi, Guanacevi, Durango

DESCRIPTION This project includes the repair and renovation of the deep inclined shaft. After the shaft is in good operating condition underground workings, primarily drifts and raises, will be run to block out reserves and for development. Included in this phase of the project will be some 2,000 to 4,000 meters of drilling. With known reserves of 620,000 tons grading 285g Ag and 0.6g Au a future plant construction of at least 300 tons per day is envisaged.

FINANCE SOURCES

IMPLEMENTING AGENCY

Industrias Peñoles, S.A. de C.V.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 211-0054

Contact Director, Division of Mines

CURRENT STATUS

Due to low metal prices, work on this project has been suspended. When metal prices increase sufficiently, or if a joint-venture partnership is formed, the project will go ahead as all planning and engineering has been done and the infrastructure is in place.

C MINERAL Silver / Gold

PROJECT NAME San Antonio, Durango

DESCRIPTION Industrias Luismin has been exploring the San Antonio mine for the last years. The present project of direct underground exploration is being carried out to increase proven reserves from the present over 500,000 tons grading 345g Ag and 7g Au to at least 900,000 tons to justify a 500 tons per day cyanide plant. The mine is near the present Toyoltita mine but some infrastructure will be needed. Only three of the 11 veins on the property have been partially explored. Mining will be by the cut and fill method.

FINANCE SOURCES

Estimated investment \$13 million

IMPLEMENTING AGENCY/ADDRESS

Industrias Luismin, S.A. de C.V.
Campos Eliseos 400 8^a Piso
11000 Mexico, D.F.
Tel. 540-3293 / 540-5403

Contact Director of Mines

CURRENT STATUS

Basic engineering for a 500 tons per day cyanide plant has been completed. Some infrastructure which has been necessary for the extensive underground exploration phase has been done. Present favorable exploration results indicate that plant construction might be able to be started by the beginning of 1986.

A MINERAL Silver - Gold Refinery

PROJECT NAME Durango Refinery - Durango, Durango

DESCRIPTION A project to construct a 5 million ounces of doré silver-gold refinery in Durango, Durango is presently in its initial stages. The feed for this refinery will be primarily from the mines of Industrias Luismin, S.A. de C.V. (largest producer is the Tayoltita Mine).

FINANCE SOURCES

Estimated investment in foreign equipment is \$1.65 million and peso investments, primarily construction, of approximately 900 million pesos (\$3.5 million). Financing will be internal and local.

IMPLEMENTING AGENCY/ADDRESS

Industrial Luismin, S.A. de C.V.
Campos Eliseos 400 8^a Piso
11000 Mexico, D.F.
Tel. 540-3293 / 540-5403

Contact Director of Mines

CURRENT STATUS

The plant site has been purchased and construction has begun on the office building and some major buildings and this construction should be finished by fourth quarter 1985. All basic and detailed engineering has been contemplated. Money appropriated for 1985 is \$240 million pesos (slightly under one million dollars).

B MINERAL Silver / Gold / Lead / Zinc

PROJECT NAME La Cienega, Durango

DESCRIPTION Project includes the construction of a 300 ton per day cyanide beneficiating plant, equipping an underground mine (trackless), townsite and infrastructure. The mine system will be cut and fill or sublevel stoping if ground conditions are favorable. Some of the mine development has been completed. Reserves reported to be 900,000 tons grading 340g Ag, 1.7g Au, 1.0% Pb and 0.7% Zn.

FINANCE SOURCES

Estimated costs \$11.5 million includes mine plant, infrastructure and townsite. Contemplated 50% equity and 50% borrowing.

IMPLEMENTING AGENCY/ADDRESS

Industrias Peñoles, S.A. de C.V.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 211-0054

Contact Director, Division of Mines

CURRENT STATUS

All basic engineering has been completed. The detailed engineering will be completed in mid 1985. Some initial townsite construction has been done. The start of construction has been suspended until precious metal prices increase. Some items of equipment will be moved from the Rio Colorado flotation mill, primarily mills and crushers.

B MINERAL Silver / Gold / Lead / Zinc / Copper

PROJECT NAME Tizapa, State of Mexico

DESCRIPTION A volcanogenic stratabound deposit was located by the Consejo de Recursos Minerales in 1982. This deposit was drilled and preliminary reserves were stated as being 2.8 million tons grading 260g Ag, 1g Au, 1.9% Pb, 7.4% Zn and 0.5% Cu. A joint venture is being formed to do further exploration which will lead to a feasibility study. Work contemplated - 1,200 meters of drifts and cross-cuts, 6,000 meters of diamond drilling, extensive rock mechanics studies, mining system studies. It is contemplated that the work will be done by contractors and consultants.

FINANCE SOURCES

Joint venture between Comision de Fomento Minero (CFM) 60%, the French government agency for geological and mining (Bureau de Recherches Geologiques et Minieres) 30%, private Mexican capital 10%. The International Finance Corporation has indicated interest.
Budget \$2.7 million

IMPLEMENTING AGENCY/ADDRESS

Contact Comision de Fomento Minero
Av. Puente de Tecamachalco #26
Mexico 10, D.F.

CURRENT STATUS
Contact Director General or General Manager

CURRENT STATUS

All planning has been completed for this exploration project. Details have been submitted to the International Finance Corporation. Studies that will be necessary before a final feasibility study can be made include rock mechanics, mining system, water and drainage and metallurgical tests.

B MINERAL Silver / Gold / Lead / Zinc / Copper

PROJECT NAME Rey de Plata, Morelos

DESCRIPTION The 300 meter shaft on this property has been completed to depth but still lacks timbering, guides, etc. to the bottom. The head frame and hoist are installed. The next phase project is to investigate, by underground workings, the mineral deposit, block out reserves, make rock mechanic studies and other tests to determine the mining system. With reserves of 1.6 million tons grading 275g Ag, 0.8g Au, 1.79% Pb, 7.8% Zn and 0.3% Cu, a flotation beneficiating plant of 600 to 800 tons per day is envisaged.

FINANCE SOURCES

The estimate of the cost of the exploration and development project is \$5 to \$7 million

IMPLEMENTING AGENCY/ADDRESS

Industrias Peñoles, S.A. de C.V.
Paseo de la Reforma 383
06500 Mexico, D.F.
Tel. 211-0054

Contact Director, Division of Mines

CURRENT STATUS

The exploration and development project is being held in abeyance until metal prices increase or a joint venture (up to 40%) partner is found.

A MINERAL Silver / Lead / Zinc / Gold

PROJECT NAME Plomosas, Rosario, Sinaloa

DESCRIPTION A 600 tons per day flotation plant is being constructed that will take feed from two different mines, the Plomosas mine with 1.3 million tons of reserves of 190g Ag and 5% combined lead and zinc and the San Juan mine with 300,000 tons reserves of 325g Ag, and 0.5g Au. Mining at Plomosas will be by open stoping and at San Juan by shrink stoping. Infrastructure includes building small townsite of 48 houses and 65 Km. of electric line. Mining equipment will also be needed.

FINANCE SOURCES

Estimated investment \$15 million total.
Present bank revolving funds sufficient for financing

IMPLEMENTING AGENCY/ADDRESS

V. Industrial Minera Mexico, S.A.
Baja California #200
Mexico 7, D.F.
Tel. 564-7066

Contact Director of Engineering and Construction

CURRENT STATUS

The project started in late 1982 but has not been under continuous construction. Estimated termination date is early 1986 at which time the plant and both mines will be operational. Mine development is underway.

5. SELLING MINING EQUIPMENT IN MEXICO

The economic difficulties experienced by Mexico over the past few years have resulted in a general dampening of investment activity and a substantial reduction in imports across all industrial sectors. The mining industry, while affected by this, has nonetheless continued to grow. The government attaches significant priority to this sector as it generates considerable employment and is a significant foreign exchange earner. As noted in chapter 4, several projects are in various stages of development and the opportunities for Canadian equipment sales are promising.

a. Local Buying Practices

The major factor influencing purchase of imported mining equipment in Mexico has been the proximity of the United States. Mexican mining companies have turned first to the American equipment suppliers because communications are easier, shipping costs lower and American equipment is well known. This latter aspect has several facets:

- (1) Before the Mexicanization of the mining industry, most of the large mining companies were American and these well established companies were using American equipment.
- (2) Many Mexican mining executives received their undergraduate or post-graduate degree in the United States or worked there for American mining corporations and thus became familiar with American equipment.
- (3) American mining equipment suppliers have had:
 - (a) Mexican subsidiaries fabricating and semi-fabricating equipment in Mexico for some time.
 - (b) Distributors and the representatives maintain their product lines before the industry.
 - (c) A hand in helping secure financing in the United States.

Because of these advantages of proximity, some foreign manufacturers have established manufacturing facilities in the United States which places them in favourable position to compete in the Mexican market.

At the same time, although the competition has been formidable, many Canadian firms have successfully sold a wide range of mining equipment and services to Mexico and experience proves that a well thought out marketing strategy will have positive results.

The Canadian manufacturer of mining equipment should realize that the Mexican buyer is generally not as familiar with Canadian mining equipment and usually seeks suppliers he knows.

b. Facts About Selling to Mexico

Two major points which Mexican mining industry executives stress are:

- (1) Canadian companies who want to sell in the Mexican market must be able to provide quick service. Price alone is not the overwhelming reason for purchase. Mexican mining companies can and do buy equipment in Europe, Japan and the United States. Canadian companies that offer competitive prices, good delivery and excellent service and spare parts replacement can expect to do a good business in Mexico.
- (2) A good agent or representative is necessary to do business with Mexican mining companies who like to know that there is a contact in Mexico whom they can call on for information and to help solve problems. In addition, a representative on-the-spot is in an excellent position to keep his principals up-to-date on the Mexican mining industry and ferret out new business opportunities.

c. Local Sales Office/Assembly Operations

Once established in Mexico with a local representative or agent, the Canadian company may wish to set up its own sales office in Mexico. This requires the incorporation of a Mexican company and the approval of the National Foreign Investment Commission where foreign investment is more than 49%. A Mexican partner holding at least 51% of the shares of the company would normally be the sales agent for the principals, although other investors could possibly be found. Should the Canadian company find that to defend its market share it has to change over to local assembly (partial or complete), these same foreign investment requirements would apply. The advantage of local assembly is that there is a considerable degree of protection from import competition.

d. Import Permits

In July 1985, new import regulations were introduced which exempted many items from permit requirements, but in a large number of cases, raised the tariffs very significantly (e.g. from 10 to 40%). For equipment not manufactured in Mexico, the new import control procedures will normally not constitute a major obstacle. The tariff and permit requirements change frequently, however, and prospective exporters should check with their agent, the Central American Trade Development Division of External Affairs, Ottawa, or the Embassy in Mexico for up to date information.

e. Local Manufacturing of Mining Equipment

The Mexican Government, as one of its economic objectives, is encouraging local manufacturing of industrial equipment to substitute imports. Mining equipment falls into this category and much basic equipment is already made in Mexico, e.g. drills, drill steel, drill bits, skips, cages, small crushing

and milling equipment, laboratory equipment and compressors. Some of the major measures used to encourage local manufacture are:

- (1) The requirement for import permits on some equipment. A Ministry of Commerce review of the permit application seeks to ensure that local manufacturing will not be damaged by the import of equipment.
- (2) High duties on imported mining equipment.

f. Equipment Likely to be Imported

In spite of a well developed program to encourage local manufacture, much large scale mining equipment is, and will continue to be imported. Mexican mines are converting to trackless underground equipment none of which is made in this country. Large crushing and milling equipment, hoists, off-highway trucks, open-pit shovels and loading equipment, large blast hole drills, underground jumbo-drills - all have a ready market.

g. Customs brokers

In the ordinary course of events, it is the purchaser who generally secures the Mexican import permit required. However, in those cases where the supplier will secure the permit, which must be requested by a Mexican company, it is advisable to retain a reputable Mexican customs broker. Normally, the local sales representative will retain the broker.

h. Financing

For a number of reasons, foreign banks have played and continue to play a major role in the expansion of the mining industry in Mexico. Canadian banks are quite active here and have made major loan agreements with such companies as

Industrias Peñoles, S.A. de C.V., Compañía Fresnillo, S.A., and Industrial Minera México, S.A.

Prominent among the Canadian banks are: Bank of Montreal, Canadian Imperial Bank of Commerce, Toronto Dominion Bank, Bank of Nova Scotia and Royal Bank of Canada all of whom have representative offices in Mexico City (see Appendix VI).

While Mexican mining companies use foreign financing for major projects and expansion programs, most purchases of equipment for these projects are made out of cash flow and on 30 day open account. Large purchases may require special individual financing packages.

The Export Development Corporation also provides loan facilities for the purchase of Canadian mining equipment and related services and has been active in financing Mexican imports, principally by the public sector.

i. Mexican Mining Congress and Equipment Exhibition

The Mexican Association of Mining Engineers holds a bi-annual convention which brings together over 2,000 Mexican mining executives including key equipment purchase decision makers. Companies find the associated equipment exhibition an excellent method of making their equipment known in Mexico and have many opportunities to talk to key customers. In 1985 this was held in Mazatlán. The Government of Canada, through the Department of External Affairs will offer advice and assistance to companies wishing to participate in the 1987 convention/exhibition.

j. Some Agents or Representatives for Mining Equipment in Mexico

<u>Company</u>	<u>Product Lines</u>
1. Distribuidora la Suiza, S.A. Mar Adriático No. 66 México, D.F. Tel: 527-1599/527-5510	General mining equipment
2. Interindustrias, S.A. Blvd. M.A. Camacho 370 Naucalpan, Edo. de México Tel: 576-2072/360-1540	General mining equipment

3. Maquinaria Lyu, S.A. Milling equipment
Calz. Vallejo 724
02630 Mexico, D.F.
Tel. 567-4943
4. Maquinaria Intercontinental Mining and construction
equipment
Av. Hangares de Aviacion #310
Mexico 9, D. F.
Tel. 571-8166
5. Maquinas de Proceso, S.A. de C.V. Process equipment
Rio San Joaquín 704 Desp. 201
México, D. F.
Tel. 395-1025/395-3713/395-3734
6. MSA de Mexico, S.A. de C.V. Underground and exploration
drilling equipment. Mine
Francisco I. Madero 84 safety equipment
Naucalpan, Edo. de Mexico
Tel. 576-6444/576-4066
7. Proveedora Minera Mexicana, S.A. Process equipment
Homero 1425-1005
11510 Mexico, D. F.
Tel. 395-5555/395-5750/395-5963
8. Ing. Reynaldo Phillippe Exploration drilling equipment
David Herrera No. 19
Col. Escandon
Mexico 19, D. F.
Tel. 516-6370

9. Procequipo, S. A. Process equipment
 Parral 78-Bis PH
 Mexico 11, D. F.
 Tel. 553-4063/553-5965/553-5958
10. Representaciones Hamilton, S.A. Drilling equipment.
 Degollado 202 Underground mining equipment
 Mexico 3, D. F.
 Tel. 529-2341/529-7357
11. Montes y Valdes, S.A. Mining and laboratory
 Manuel Carpio 127 equipment
 Del. Cuauhtemoc
 06400 Mexico, D. F.
 Tel. 541-3205
12. Pettibone de Mexico, S.A. de C.V. Crushing and plant equipment
 Km. 29.8 Via Jose Lopez Portillo
 Ecatepec de Morelos, Edo. de Mexico
 Tel. 787-2377
13. S-A Mexicana, S.A. de C.V. Process and materials
 Camino Real de Toluca No. 154 handling equipment
 Col. Bella Vista
 Deleg. Alvaro Obregon
 18810 Mexico, D. F.
 Tel. 516-4548
14. Outukumpu Mexicana, S.A. de C.V. Mining, processing and
 Homero No. 229 - 6^a Piso control equipment
 Col. Polanco Chapultepec
 Del. Miguel Hidalgo
 11560 Mexico, D. F.
 Tel. 254-4208

k. Manufacturing Companies With Their Own Distributors and Plants

Several companies manufacture part of their complete line or maintain representative offices in Mexico including the following:

- Atlas Copco Mexicana
- Chicago Pneumatic Tool de Mexico
- Door Oliver de Mexico
- Envirotech de Mexico
- Ingersoll Rand
- Jarvis Clark de Mexico
- Jeffrey Manufacturera Mexicana
- J.K. Smit
- Toledo Scale de Mexico
- Eriez Equipos Magneticos

6. THE MARKET FOR CONSULTING SERVICES

Canadian engineering and construction companies have in the past worked in Mexico and could continue to do so in the future. It should be noted, however, that while the basic and much of the detailed engineering can be done at the home office, a company cannot receive a contract for mining construction in Mexico as by law this must be carried out by a Mexican firm. A joint venture company, however, can be formed in which majority ownership is Mexican. In the past, a Canadian construction company was hired on a major mining development project by a Mexican mining company (with minority Canadian ownership) to oversee the project, evaluate bids, review progress and, in general, act as the mining company's construction contract manager.

Specialist consultants in such fields as rock mechanics, airborne geophysics, process control, etc. find little competition from Mexicans in their fields and are more readily employed than non-specialized geologists, mining engineers and geophysicists.

Consulting and engineering fees paid are generally lower than are paid in Canada which tends to dampen enthusiasm as does the 21% tax which is withheld from fees and payments.

Any foreigner working in Mexico must obtain working papers which requires permission and a fee.

Although the market is thin, there are possibilities for Canadian companies and individuals to work in Mexico in the mining industry although long term individual contracts are very difficult to obtain.

7. WORLD BANK SECOND SMALL AND MEDIUM SCALE MINING DEVELOPMENT PROJECT

The World Bank has recently granted a \$105 million loan to support Mexico's small and medium sized mining industry. The loan is part of a \$210 million project in which the Mexican federal government and several agencies including the Mining Commission, the Mineral Resources Council and the Fund for Non-Metallic Minerals are participating.

The loan will be directed toward financing exploration activity and increasing mine production with technical assistance and the acquisition of equipment. The project will also focus on strengthening those institutions which support small and medium-sized mining operations.

a. Project Executing Agencies

1) Programa Especial Complementario de Apoyo a la Pequeña y Mediana Minería (PECAM).

PECAM (Special Complementary Program for small and medium-scale mining development) was established by the Mexican government with the assistance of the World Bank in 1980 to provide financial and technical assistance to small and medium sized mining companies. PECAM is supervised by a senior coordinating committee headed by the Deputy Minister of Parastatal Industry from the Department of Energy, Mines and Parastatal Industry, with representatives from the Ministry of Finance, Nacional Financiera (the State Development Bank), CFM, FNM and CRM.

2) Comisión de Fomento Minero (CFM)

See Section 3(d) for agency description.

3) Consejo de Recursos Minerales (CRM)

See Section 3(e) for agency description.

4) Fideicomiso de Minerales No Metálicos (FNM)

See Section 3(f) for agency description.

Interested Canadian suppliers of equipment and services should contact the World Bank in Washington and the above Mexican agencies directly for information regarding foreign purchases which will be made under this loan. The appropriate Mexican contacts are indicated below.

DEPARTMENT OF ENERGY, MINES AND PARASTATAL INDUSTRY

Act. Mario Barreiro Perera

Subsecretario de la Industria Paraestatal de
Transformación

Secretaría de Energía, Minas e Industria Paraestatal
Insurgentes Sur No. 552, piso 5
06769 México, D.F.

COMMISSION FOR MINING DEVELOPMENT

Lic. Luis de Pablo Serna

Director General

Comisión de Fomento Minero

Puente de Tecamachalco No. 26
11000 México, D.F.

MINERAL RESOURCES COUNCIL

Ing. Jorge Leipen

Director General

Consejo de Recursos Minerales

Niños Héroes No. 139
06720 México, D.F.

TRUST FUND FOR MEXICAN NON-METALLIC MINERALS

Inq. Moisés Kolteniak Toyber

Director General

Fideicomiso de Minerales No Metálicos Mexicanos

Av. Chapultepec No. 536, 6 piso

México, D.F.

APPENDIX

All tonnages in metric tons

All values in U. S. Dollars

Table I Total Annual Production - Mexico 1954-1984
for silver, lead, zinc and copper.

Table II Mexican Mineral Production 1983-1984
Volume.

Table III Mexican Mineral Production 1983-1984
Value.

Table IV Distribution of Mexican Mineral Production
(by value) for selected years.

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TRUST FUND FOR MEXICAN METALLIC MINERALS

Ind. Miguel Kofman Tójar
Director General
Fideicomiso de Minerales No. Mexicanos
Av. Chapultepec No. 230, 5 piso
México, D.F.

servicio de intermediación de recursos humanos y servicios
de notificación de sus datos en los Estados Unidos
relacionados con el comercio exterior mexicano
dentro de los límites de la ley de comercio exterior
Las direcciones de contacto se indican a continuación.

DEPARTMENT OF ENERGY, MINES AND PARASTATAL INDUSTRY

Act. Mario Barrota Penabaz
Subsecretaría de la Industria Parastatal de
Transformación
Secretaría de Energía, Minas e Industria Parastatal
Insurgentes Sur No. 562, piso 5
06760 México, D.F.

COMMISSION FOR MINING DEVELOPMENT

Lic. Luis de Pablo Serna
Director General
Comisión de Fomento Minero
Puente de Tecamachalco No. 26
11000 México, D.F.

MINERAL RESOURCES COUNCIL

Ind. Jorge Leibon
Director General
Consejo de Recursos Minerales
Niños Héroes No. 126
06720 México, D.F.

TOTAL ANNUAL PRODUCTION - MEXICO

Year	silver	lead	zinc	copper
Prod.	Prod.	Prod.	Prod.	Prod.
1984	1,287	183,314	290,238	189,111
1983	1,911	167,402	257,444	206,062
1982	1,250	142,827	232,146	239,091
1981	1,622	127,384	211,629	230,466
1980	1,473	142,249	228,231	172,399
1979	1,237	173,422	242,477	107,109
1978	1,267	170,212	240,101	84,628
1977	1,462	192,212	252,469	89,662
1976	1,326	200,827	259,483	88,970
1975	1,182	204,725	228,821	78,196
1974	1,206	179,296	271,272	80,201
1973	1,162	182,188	252,972	78,720
1972	1,140	158,522	224,972	63,120
1971	1,322	170,894	223,272	66,167
1970	1,234	170,894	223,272	66,167
1969	1,248	170,894	223,272	66,167
1968	1,252	170,894	223,272	66,167
1967	1,256	170,894	223,272	66,167
1966	1,260	170,894	223,272	66,167
1965	1,264	170,894	223,272	66,167
1964	1,268	170,894	223,272	66,167
1963	1,272	170,894	223,272	66,167
1962	1,276	170,894	223,272	66,167
1961	1,280	170,894	223,272	66,167
1960	1,284	170,894	223,272	66,167
1959	1,288	170,894	223,272	66,167
1958	1,292	170,894	223,272	66,167
1957	1,296	170,894	223,272	66,167
1956	1,300	170,894	223,272	66,167
1955	1,304	170,894	223,272	66,167
1954	1,308	170,894	223,272	66,167

PRODUCTION

All tonnages in metric tons
All values in U. S. Dollars

Table I Total Annual Production - Mexico 1954-1984 for silver, lead, zinc and copper.

Table II Mexican Mineral Production 1983-1984 Volume.

Table III Mexican Mineral Production 1983-1984 Value.

Table IV Distribution of Mexican Mineral Production (by value) for selected years.

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1978 base year = 100
Production: Metric tons
Secretaría de Patrimonio Nacional
Dirección General de Minas y Petróleo
Secretaría de Programación y Presupuesto

TABLE I
TOTAL ANNUAL PRODUCTION - MEXICO

Year	silver		lead		zinc		copper	
	Prod.	%	Prod.	%	Prod.	%	Prod.	%
1954	1,240	79	216,624	127	260,206	108	54,806	64
1955	1,379	88	187,205	110	294,135	123	71,567	85
1956	1,342	86	200,087	118	281,965	117	79,188	94
1957	1,324	84	204,856	120	267,351	111	71,721	85
1958	1,459	93	198,300	116	247,880	103	68,248	81
1959	1,398	89	194,624	114	259,551	108	62,372	74
1960	1,359	87	177,029	104	253,000	105	56,647	67
1961	1,191	76	184,287	108	271,600	113	46,818	55
1962	1,272	81	181,770	106	251,210	105	54,019	64
1963	1,297	83	184,334	108	241,097	101	55,090	65
1964	1,250	82	169,957	99	244,933	102	52,072	62
1965	1,152	75	166,780	98	232,875	97	55,248	65
1966	1,155	74	174,245	102	232,913	97	56,513	67
1967	1,190	76	163,907	96	241,215	101	56,012	67
1968	1,245	82	174,169	102	240,021	100	61,110	73
1969	1,334	85	170,894	100	253,375	105	66,167	79
1970	1,332	85	176,597	104	266,400	111	61,012	73
1971	1,140	73	156,852	92	264,972	110	63,150	75
1972	1,165	74	161,358	95	271,844	113	78,720	93
1973	1,206	77	179,296	105	271,373	113	80,501	95
1974	1,167	74	218,021	128	262,716	109	82,670	98
1975	1,182	75	178,615	105	228,851	95	78,196	93
1976	1,326	85	200,027	118	259,183	108	88,970	105
1977	1,463	93	163,479	96	265,469	110	89,662	106
1978	1,567	100	170,212	100	240,101	100	84,658	100
1979	1,537	98	173,455	102	245,477	102	107,109	127
1980	1,473	94	145,549	86	238,231	99	175,399	207
1981	1,655	106	157,384	92	211,629	88	230,466	272
1982	1,550	99	145,827	86	232,146	97	239,091	282
1983	1,911	122	167,405	98	257,444	107	206,062	243
1984	1,987	127	183,314	108	290,236	121	189,111	223

1978 base year = 100

Production: Metric tons

Sources: Secretaría de Patrimonio Nacional
Dirección General de Minas y Petróleo
Secretaría de Programación y Presupuesto

TABLE II

MEXICAN MINERAL PRODUCTION 1983 - 1984

VOLUME

PRODUCT	PRODUCTION		84/85 %
	1983	1984	
Precious Metals Kilograms			
Gold	6,930	7,058	+ 1.8
Silver	1,910,839	1,986,690	+ 4.0
Non-Ferrous Metals (contained metal) metric tons			
Lead	167,405	183,314	+ 9.5
Zinc	257,444	290,230	+ 12.7
Copper	206,062	189,111	- 8.2
Antimony	2,519	3,064	+ 21.6
Arsenic	3,452	4,164	+ 20.6
Tin	50	416	+732.0
Cadmium	1,341	1,135	- 15.4
Tungsten	90	274	+204.4
Molybdenum	5,866	4,054	- 30.9
Iron and Steel Utilized Minerals metric tons			
Iron (contained metal)	5,306,343	5,489,343	+ 3.4
Coke	2,424,826	2,375,480	- 2.0
Manganese (contained mineral)	133,004	180,940	+ 36.0
Non-Metallic Minerals metric tons			
Sulphur	1,602,029	1,825,729	+ 14.0
Graphite	44,327	41,529	- 6.3
Barite	357,043	426,095	+ 19.3
Fluorite	556,977	627,433	+ 12.6
Gypsum	2,127,453	2,300,413	+ 8.1
Phosphate	498,112	518,293	+ 4.1

* Average free party 180.28

** Average free party 184.97

TABLE III

MEXICAN MINERAL PRODUCTION 1983 - 1984

VALUE

PRODUCT	1 9 8 3*		1 9 8 4*		% PERCENT CHANGE USA DLLS 84/83
	PESOS	USA DLLS.	PESOS	USA DLLS.	
	(000'S)	(000'S)	(000'S)	(000'S)	
Gold	11,674,555	77,696	15,129,352	81,794	+ 5.3
Silver	83,425,751	555,209	92,860,634	502,031	- 9.6
Lead	7,698,059	51,232	14,876,128	80,425	+ 57.0
Zinc	23,577,473	156,911	47,968,840	259,333	+ 65.3
Copper	37,158,217	247,293	41,747,695	225,700	- 8.7
Antimony	544,494	3,624	1,449,256	7,835	+116.2
Cadmium	267,231	1,778	513,203	2,775	+ 56.1
Molybdenum	6,129,865	40,795	3,989,128	21,566	- 47.1
Iron	13,959,075	92,899	21,077,510	113,951	+ 22.7
Coke	1,370,027	9,118	1,342,146	7,256	- 20.4
Manganese	2,318,435	15,429	4,255,613	23,007	+ 49.1
Sulphur	12,576,606	83,699	31,372,955	169,611	+102.6
Graphite	436,511	2,905	574,007	3,103	+ 6.8
Barite	1,966,053	13,084	3,367,043	18,203	+ 39.1
Fluorite	6,103,406	40,619	8,449,296	45,679	+ 12.4
Phosphate	254,037	1,691	264,329	1,429	+ 15.5

* Average free parity 150.26

** Average free parity 184.97

Secretaría de Patrimonio Nacional
 Dirección General de Minas y Petróleo
 Secretaría de Hacienda y Presupuesto

TABLE IV

DISTRIBUTION OF MEXICAN MINERAL PRODUCTION

(by value)

Y E A R S

MINERAL	1965	1970	1975	1980	1983	1984
Gold	2.2	1.2	2.2	5.3	5.5	5.0
Silver	14.5	12.8	16.0	41.9	39.6	30.6
Antimony	0.5	4.2	1.1	0.3	0.3	0.5
Bismuth	1.0	1.2	0.6	0.2	0.1	0.2
Cadmium	1.2	2.7	1.0	0.4	0.1	0.2
Copper	10.3	14.9	8.8	16.2	17.6	13.8
Iron	3.6	9.0	10.6	5.9	6.6	7.0
Manganese	1.4	2.2	2.1	1.1	1.1	1.4
Lead	15.5	10.4	8.3	6.1	3.7	4.9
Zinc	8.9	15.7	18.7	7.9	11.2	15.8
Sulphur	10.7	7.9	9.5	6.4	6.0	10.3
Barite	2.1	1.0	0.7	0.5	0.9	1.1
Coke	4.4	5.4	9.0	2.5	0.6	0.4
Fluorite	5.5	5.5	6.8	3.6	2.9	2.8
Sub-total	81.8	94.1	95.4	98.3	96.2	89.5
Others	18.2	5.9	4.6	1.7	3.8	10.5
	100.0	100.0	100.0	100.0	100.0	100.0

TOTAL VALUE OF PRODUCTION (000 dollars)

1965	1970	1975	1980	1983	1984
386,184	594,756	1,044,418	2,227,000	1,402,880	1,639,433

MOST IMPORTANT MINERALS

Lead	Zinc	Zinc	Silver	Silver	Silver
Silver	Copper	Silver	Copper	Copper	Zinc
Sulphur	Silver	Iron	Zinc	Zinc	Copper
Copper	Lead	Sulphur	Sulphur	Iron	Sulphur
Zinc	Iron	Coke	Lead	Sulphur	Iron

Decree Which Establishes Fiscal Incentives to Encourage Investment in Mining Activities

(Unofficial Translation)

This decree was published in the May 30, 1985 Official Gazette.

FEDERAL EXECUTIVE BRANCH SECRETARIAT OF TREASURY AND PUBLIC CREDIT

Decree which establishes fiscal incentives to encourage investment in mining activities, in the margin a seal with the Mexican Coat-of-Arms, reading: UNITED STATES OF MEXICO, Presidency of the Republic.

MIGUEL DE LA MADRID H., Constitutional President of the United States of Mexico, exercising the faculty conferred on me by article 89, section I of the Political Constitution of the United States of Mexico, and based on articles 31, section IV, 33, section X of the Organic Law of Federal Public Administration; 12, section I, subsection n), of the Law of Revenues of the Federation for the 1985 Fiscal Period and 39 of the Fiscal Code of the Federation, and

WHEREAS

The Political Constitution of the United States of Mexico indicates the legal ownership, imprescriptible and inalienable, of the Nation over mining resources and establishes that their utilization be carried out to the benefit of the interests of the community;

Mining constitutes a strategic sector in the fulfillment of the goals of the 1983-1988 National Development Plan, in relation, basically, to the supply of raw materials required by national industry for its contribution to regional development, to the generation of more job opportunities, and for its capacity to generate surpluses for export;

It is necessary, according to the strategy of promotion established by the 1984-1988 National Mining Program, to create conditions favorable for promoting survey and exploration works, as well as to support the development of new mining projects;

Within the framework of national mining it is necessary to support the development of small and medium mines, both because they are one of the most dynamic components of the sector with projects of fast maturity and a higher index of job generation per unit of capital, and because they are a factor for the direct encouragement of regional development and often form the basis for projects on a larger scale;

As an integral part of the 1984-1988 National Development Financing Program, fiscal incentives constitute, among other political tools, an important element to selectively direct economic activities in conformity with the established guidelines;

The sector's potential for contributing to national development is based on the ample mineral resources of the country, of which only a minor portion of land with metallogenetic conditions has been exploited;

Fiscal incentives contribute towards inducing and increasing productive investments, both in the areas of surveying and exploration, and in the development of infrastructure required to increase mining reserves and guarantee in this way sustained growth of the mining sector.

I have seen fit to issue the following:

Decree which establishes fiscal incentives to encourage investment in mining activities

ARTICLE 1. Physical or moral entities of Mexican nationality involved in exploration, extraction and working the minerals referred to in article 3 of the Regulatory Law of article 27 Constitutional in mining matters, may obtain the fiscal incentives provided for in this Decree.

ARTICLE 2. For the enforcement of the present Decree the following shall be understood:

I. Surveying Expenses.

Those applied to the prior search and inspection of a mineralized body through studies and topographic preliminary surveys, field geology, photogrammetry, photogeology, geochemistry, magnetic, electric, seismic, gravimetric and similar, which allow the fulfillment of such an objective, as well as the metallurgical tests made with the samples resulting from said activities.

II. Exploration Expenses.

Those applied to the more complete and precise examination of the qualitative and quantitative aspects of a mineralized body through diamond drilling, direct works such as fronts, shafts, auxiliary shafts, wells, fougasses, cleavages, tunnels and similar works which also allow the fulfillment of such an objective, as well as the sampling and metallurgical tests that are carried out aimed at the evaluation of the potential of the field under study.

III. Infrastructure Works.

Those which are indispensable for the initiation and development of a mining project such as means of communication, supply and distribution of water and electric energy, camps and other investments which in the view of the Secretariat of Treasury and Public Credit, subject to the opinion of the Secretariat of Energy, Mining and Parastate Industries, might be considered of a similar nature.

IV. Small and Medium Mining.

Those which in the previous year had received gross revenues on sales of minerals of up to 3,500 times the general minimum salary raised in the year, in force in the economic zone named "Federal District Metropolitan Area."

When various enterprises qualifying as small or medium mining industries belong to the same person or group of persons or when one or the other are the owners of the majority of the capital stock of enterprises of this nature, the combined total shall be considered for the purposes of this Decree.

V. Selected Minerals.

Those defined in the 1984-1988 National Mining Program, taking into account their importance as raw materials for national industry, their potential for generating foreign currency and their possibilities of substituting imports, among which are found:

a) Metallic Minerals:

Aluminum, antimony, arsenic, bismuth, cadmium, copper, chrome, tin, iron, manganese, molybdenum, nickel, gold, silver, lead and zinc.

b) Non-metallic Minerals:

Clay, asbestos, sulphur, barium oxide, bentonite, borax, limestone.

china clay, sodium carbonate, cokable carbon, non-cokable carbon, fluorite, phosphorite, graphite, potassium, salt and silica.

The foregoing list may be modified under the terms established in article 31 of the Law of Planning. The Secretariat of Energy, Mining and Parastate Industries shall formulate the corresponding proposals, heeding the opinions of the Board of Mineral Resources and of the Commission for Promotion of Mining. This modification should be published in the Official Gazette of the Federation jointly by the Secretariats of Treasury & Public Credit and of Energy, Mining & Parastate Industries.

ARTICLE 3. The carrying out of the expenses and investments on the part of those referred to in article 1 of this Decree, who, during the previous calendar year had received gross revenues on sales of minerals higher than 3,500 times the general minimum salary increase for the year, in force for the economic zone named "Federal District Metropolitan Area," will be eligible for a credit against federal taxes not applied to a specific end, under the following terms:

I. 10% of the expenses for surveying and exploration that they perform in their operating mines.

II. In the development of new projects which originate in areas other than the operating mines, 20% of the expenses for surveying and exploration, and of the investments in infrastructure works, provided these expenses and investments are directed specifically to the search and evaluation of deposits of the minerals indicated in article 2, section V.

III. 20% of the value of the investment in acquisition of new locally-manufactured machinery and equipment, or of new or used if imported, which forms part of the fixed assets of the company and is directly related to the activities of surveying, exploration and knock-down or start-up of the minerals indicated in article 2, section V, as well as the lifting and hauling of same.

IV. Those taxpayers who by virtue of having just started up operations have not received income from the sale of minerals on the date of the presentation of the application, are entitled to the incentives indicated in this article. Once they are in possession of the income figures for the sale of minerals during their complete first operating period, they may apply for the fiscal incentives they are due in accordance with the accredited value of their revenues.

V. When the expenses and investments are carried out by those persons defined as small and medium miners under the terms of article 2, section IV, the incentive corresponding to section I shall be 30% and for sections II & III it shall be raised to double that indicated in this article.

ARTICLE 4. To arrive at the value of the expenses and investments eligible for benefits as referred to in article 3, the procedure will be along the following lines:

I. When the expenses for surveying and exploration are involved, consideration will be given to the costs of the materials and direct labor, as well as the indirect costs duly verified and which in the judgment of the Secretariat of the Treasury and Public Credit form an integral part of the total cost of the categories mentioned.

II. When the constructions and installations for infrastructure development are involved, account will be taken of the verified expenses which the applicants present. In case said expenses are significantly higher than the average expenses for the type of activity involved and the region in which they are located, the applicant will be notified in order for him to expound the reasons to justify the difference. In case these reasons are found to be unsatisfactory, the basis to be used to calculate the incentive shall be the average costs which can be identified in the marketplace.

III. When the acquisition of locally-manufactured machinery and equipment is involved, account shall be taken of the values shown in the commercial invoice; if they are imported goods, the invoice shall be considered at the controlled rate of exchange on that date, which same must coincide in foreign currency with the value declared on the corresponding customs declaration, excluding any other payments for duties, interests, commissions, insurance, freights or other expenses related to the acquisition.

If it should be felt that the declared values are excessive and do not correspond to the prices in force in the market, account may be taken

of the reports on national and international quotations or some other specialized reference.

ARTICLE 5. In order to be eligible for the fiscal incentives provided for in this Decree, applicants should satisfy the following requirements:

a) Fulfill the provisions of the Regulatory Law of article 27 Constitutional on Mining matters.

b) Be a Mexican investor under the terms of the Law for the Promotion of Mexican Investment and Regulation of Foreign Investment and of General Resolutions of the National Commission on Foreign Investments.

c) In the case of concedable minerals, present the verification of the Public Mining Registry and, if applicable, the certificate that the rights of concession are approved by the Secretariat of Energy, Mining and Parastate Industries. With regard to non-concedable minerals, presentation should be made of the legal documents which credit the properties with the rights of their exploitation.

d) Not be subject to exemptions, reductions, incentives nor benefits chargeable to state or municipal taxes, or to the corresponding state participation.

e) Fulfill the fiscal obligations which correspond to them for the activities which they perform.

ARTICLE 6. The incentives established in this Decree shall be granted by means of Fiscal Promotion Certificates, which are the documents in which the right of the owner is substantiated for him to credit the value against any federal tax charged to him, with the exception of taxes applied with a specific end.

ARTICLE 7. The incentives established in this Decree may not be accumulated to any other incentive, except for that provided for in article 9 of the "Decree which Establishes Fiscal Incentives for the Promotion of Employment and Investment in Industrial Activities," published in the Official Gazette of the Federation on March 6, 1979, and its modifications.

ARTICLE 8. The applications for obtaining the fiscal incentives provided for in this decree shall be presented to the Secretariat of Treasury and Public Credit, on the forms which for this purpose are authorized, duly requisitioned and subscribed by the applicants or their legal representatives, filling in the data and reports which are required by them and accompanied by the documentation which is indicated in each case, in accordance with the following times and terms:

I. When expenses for surveys and exploitation are involved, they should contain the quarterly report on expenses made during this period and they shall be presented within 30 working days after the end of each calendar quarter.

II. As regards investments made in infrastructural works, the applicants shall have the option of presenting their applications, at the latest, 60 working days after each calendar semester on the progress of the work, or within 90 working days following the date of termination of the investments.

In case the parties present their application on the progress of the work, they should include at the end of each calendar semester, the report on the progress of same. When the parties present their application upon termination of the works, they should attach proof of their termination.

In both cases the application must be presented accompanied by appraisals of the work which have been covered and by their corresponding receipts or invoices. In case the works were carried out by administration, the appraisals that the applicant included based on his costs of operation shall be attached.

III. When the acquisition of machinery and equipment referred to in article 3 section III is involved, within 60 working days following the date on which this was carried out, or if they were acquired from abroad, on the date of their transfer into the country. In both cases the invoices shall be presented which attest to the acquisition of the goods, which should satisfy the necessary legal requirements. If imported goods are involved, the respective customs declaration should also be attached.

Only the applications presented on time and under the mentioned terms will be accepted, and therefore if there are any omissions or if the data, reports or documents supplied are insufficient, the Secreta-

riat of Treasury and Public Credit will require that the party complete them within a time frame which shall not exceed 30 working days, warning him that failure to comply will cause the application to be cancelled.

ARTICLE 9. In the interest of the parties' being able to count on the fiscal incentives as quickly as possible, the Secretariat of Treasury and Public Credit will take the necessary measures so that within a period no longer than 30 working days after the date of receipt of the duly filled-out applications, the Fiscal Promotion Certificates which apply will be issued, or otherwise the applicant will be advised of the rejection, with due explanation as to the foundation and motives for same.

ARTICLE 10. With regard to the investments in infrastructural works and machinery and equipment as referred to in the present decree, the beneficiaries of the fiscal incentives should, during a period of not less than five years from the date of issue of the Fiscal Promotion Certificate:

I. Direct them exclusively to the development of the activities which created the benefit.

II. Not transfer their properties, except in the cases of inheritance or merging of companies, when the company which survives or which comes into being due to the merger continues performing the activities which resulted in the granting of the benefit and complies with the requirements established in this Decree.

III. Under no circumstances cede its use or temporary benefit to third parties, regardless of the legal form which is applied for this purpose.

IV. Utilize it exclusively at the locality which was indicated in the application.

If during the course of the period mentioned the beneficiaries can show the necessity of modifying any of said requirements, the Secretariat of Treasury and Public Credit, heeding the opinion of the Secretariat of Energy, Mining & Parastate Industries, may grant the respective authorization.

ARTICLE 11. If the beneficiary does not comply with the obligations this Decree imposes on him, or fails to satisfy the requirements and conditions which make up the basis of its granting and benefits, he will lose the right to the incentive concerned and the cancellation of same will be effected.

The Secretariat of Treasury and Public Credit shall take the needed measures to charge the beneficiary with the incorrectly accredited duties and corresponding surcharges under the terms of the Fiscal Code of the Federation, without impairment of imposing any fines which might legally be in order.

ARTICLE 12. The beneficiaries of the incentives covered in this Decree are obligated to supply the information required of them by the Secretariat of Treasury and Public Credit, within the period which for this purpose will be stated. In this same way, they will give the personnel of said Secretariat all necessary facilities for them to effect the inspections and supervision related to the application of said incentive.

ARTICLE 13. In the case of mining-metallurgical companies which belong to the same mining group by virtue of one person or group of persons, all Mexican nationals, being owners of the majority of their

capital stock, the Fiscal Promotion Certificate, subject to the authorization of the Secretariat of Treasury and Public Credit, may be utilized separately by any one of them, provided the party applying the Certificate satisfies the requirements and conditions indicated in the Decree.

The individuals who opt for the manner referred to in the last paragraph, and who have carried out the benefited investments, should indicate, upon applying for the incentives, the name of the company which shall apply the Certificate that is issued in their favor.

ARTICLE 14. The beneficiaries of the fiscal incentives which this Decree establishes who do not have federal taxes charged to them may utilize the Fiscal Promotion Certificates to pay off credits they may have contracted with National Credit Societies with funds proceeding from the Mining Promotion Board, the Mineral Resources Board, the Mexican Non-Metallic Minerals Trust or other specialized promotional public funds.

The banking institutions which under the terms of this Decree receive Fiscal Promotion Certificates from the beneficiaries in payment of credits contracted may discount 2% of the value of said Certificates for operating expenses, at the time of crediting them.

ARTICLE 15. The holders of the Fiscal Promotion Certificates must advise the Secretariat of Treasury and Public Credit yearly of the amounts credited for incentives and the federal tax against which the credits are made during the lifetime of the said Certificates, on the forms which for this purpose are provided for them.

ARTICLE 16. The beneficiaries of the incentive conceded in this Decree shall pay for supervisory dues a quota equivalent to 4% of the fiscal incentive which the respective resolution indicated, in conformity with the Federal Law of Duties.

This mentioned quota should be covered in one single payment, within a period not to exceed 20 working days commencing on the date of the granting of the incentive, at the Bank of Mexico, its branches, agencies or correspondents, advising the Secretariat of Treasury and Public Credit of the mentioned payment. For this purpose they must fill out the forms established for same and present the required information.

Transitory Articles

ARTICLE ONE. This Decree shall enter into force on the day following its publication in the Official Gazette of the Federation and its duration shall not exceed December 31, 1988.

ARTICLE TWO. The applications for fiscal incentives corresponding to expenses and investments made between January 1, 1985 and the date of the publication of the present Decree, should be presented within the 60 working days following the date on which the decree enters into force.

Granted in the Residence of the Federal Executive Power on the twenty-ninth day of the month of May of nineteen hundred and eighty five. The Secretary of Treasury and Public Credit, Jesús Silva Herzog, Signature. The Secretary of Energy, Mining and Parastate Industries, Francisco Labastida Ochoa, Signature.

INCREASE OF GNP TOTAL AND
GROSS PRODUCT MINING
(MILLIONS OF DOLLARS CONSTANT 1970)

YEAR	GNP	ANNUAL CHANGE	G. P. MINING	ANNUAL CHANGE	G. P. MINING CURRENT	ANNUAL CHANGE
1983	68,945	(4.7)	819	(5.9)	1,700	(5.6)
1982	72,307	(0.5)	870	0.4	1,800	(27.7)
1981	72,701	8.0	867	10.4	2,489	(5.7)
1980	67,348	8.3	786	10.4	2,632	14.2
1979	62,173	9.2	712	6.7	1,822	22.8
1978	56,929	8.3	667	2.4	1,194	16.3
1977	52,618	3.4	633	(2.2)	1,027	(2.3)
1976	50,866	4.2	647	2.7	1,021	3.0
1975	48,728	2.6	612	(2.7)	1,020	9.2
1974	46,202	6.1	629	9.6	934	45.3
1973	43,542	8.4	574	8.1	643	33.9
1972	40,167	8.2	531	4.2	519	7.7
1971	37,024	4.2	508	(1.0)	482	(6.0)
1970	35,542	1.1	513	1.1	513	10.6
1969	34,474	4.4	502	4.8	464	3.8
1968	32,406	8.1	479	2.4	447	20.2
1967	29,982	6.3	468	2.8	371	9.1
1966	28,202	6.8	451	1.7	340	11.2
1965	26,404	2.2	439	(2.0)	302	11.3
1964	24,777	11.0	448	2.1	274	13.2
1963	22,169	8.0	432	0.0	242	10.0
1962	20,518	4.7	429	8.9	220	10.0
1961	19,602	4.9	403	(3.4)	200	(2.7)
1960	18,682	-	417	-	212	-

INCREASE OF GNP TOTAL AND GROSS PRODUCT MINING

(1960 - 1983)

The gross National Product of Mexico has grown dramatically from 1960 through 1981 as shown on the accompanying table. The mining industry, however, has had a much slower Gross Product growth. As in developed and developing countries the Gross Product for mining will decrease as a percentage of GNP due primarily to increases in manufacturing and other industries.

Year	GNP	GP Mining	GP Mining - average annual increase
1983	68,945	819	-
1960	35,542	513	-
1983 - 1960	33,403	306	2.58
1983 - 1960	33,403	306	9.47

* G.P. Mining: Except petroleum and coal
Source: Secretaría de Programación y Presupuesto
Sistema de Cuentas Nacionales

INCREASE OF GNP TOTAL AND
GROSS PRODUCT MINING

(MILLIONS OF DOLLARS CONSTANT 1970)

<u>YEAR</u>	<u>GNP</u>	<u>ANNUAL CHANGE %</u>	<u>G. P. MINING*</u>	<u>ANNUAL CHANGE %</u>	<u>G.P. MINING CURRENT PRICES</u>	<u>ANNUAL CHANGE %</u>
1960	18,682	-	417	-	212	-
1961	19,602	4.9	403	(3.4)	200	(5.7)
1962	20,518	4.7	439	8.9	220	10.0
1963	22,169	8.0	439	0.0	242	10.0
1964	24,771	11.0	448	2.1	274	13.2
1965	26,404	6.6	439	(2.0)	305	11.3
1966	28,202	6.8	451	2.7	340	11.5
1967	29,985	6.3	468	3.8	371	9.1
1968	32,406	8.1	479	2.4	447	20.5
1969	34,474	6.4	502	4.8	464	3.8
1970	35,542	3.1	513	2.2	513	10.6
1971	37,024	4.2	508	(1.0)	482	(6.0)
1972	40,167	8.5	531	4.5	519	7.7
1973	43,545	8.4	574	8.1	643	23.9
1974	46,205	6.1	629	9.6	934	45.3
1975	48,798	5.6	612	(2.7)	1,020	9.2
1976	50,866	4.2	647	5.7	1,051	3.0
1977	52,618	3.4	633	(2.2)	1,027	(2.3)
1978	56,959	8.3	667	5.4	1,194	16.3
1979	62,173	9.2	712	6.7	1,825	52.8
1980	67,348	8.3	786	10.4	2,632	44.2
1981	72,701	8.0	867	10.4	2,489	(5.4)
1982	72,307	(0.5)	870	0.4	1,800	(27.7)
1983	68,942	(4.7)	819	(5.9)	1,700	(5.6)

GNP	-	average annual increase	1960 - 1983	=	5.84	%
GP Mining	-	average annual increase	1960 - 1983	=	2.98	%
GP Mining	-	average annual increase	1960 - 1983	=	9.47	%
Current Prices						

* G.P. Mining: Except petroleum and coal

Source: Secretaría de Programación y Presupuesto
Sistema de Cuentas Nacionales

APPENDIX IV

APPENDIX IV Major Mining Companies and Major Operations.

Major Mining Company	Major Operations
Grupo Industrial Minera Mexico, S.A. de C.V. Industrial Minera Mexico, S.A.	San Martin Santa Fe Tama Chihuahua smelter - lead Monterrey refinery - lead, silver San Luis smelter - copper Electrolytic zinc plant Rosita plant and Agujita unit
Minerales Metalicos del Norte, S.A.	Velardeña Santa Barbara
Zinc de Mexico, S. A.	Parral Fluorita
Carbonifera de Mexico, S.A. Industrias Peñoles, S.A. de C.V.	Campana de Plata Topia La Negra La Encantada La Minita Rio Verde Met-Mex smelter, refinery
Compañia Fresnillo, S.A. de C.V. and Zimapan, S.A.	Fresnillo Meica El Monte Cuete Carrizal

INCREASE OF GNP TOTAL AND
GROSS PRODUCT MINING

(MILLIONS OF DOLLARS CONSTANT 1970)

YEAR	GNP	ANNUAL CHANGE %	G.P. MINING*	ANNUAL CHANGE %	G.P. MINING CURRENT PRICES	ANNUAL CHANGE %
1960	18,682	-	517	-		
1961	19,602	4.9	493	(4.5)		
1962	20,518	4.7	435	8.9		
1963	22,169	8.0	437	0.4		
1964	24,771	11.0	448	2.5		
1965	26,408	6.6	474	5.8		
1966	28,202	6.8	485	2.3		
1967	29,985	6.3	468	(3.6)		
1968	32,406	8.1	479	2.3		
1969	34,474	6.4	403	(17.6)		
1970	35,542	3.1	517	28.3		
1971	37,024	4.2	508	(1.7)		
1972	40,167	8.5	531	4.5		
1973	43,545	8.4	574	8.1		
1974	46,285	6.2	629	9.5		
1975	48,794	5.4	612	(2.7)		
1976	50,866	4.2	647	5.7		
1977	52,615	3.4	633	(2.1)		
1978	56,958	8.3	687	8.4		
1979	62,173	9.2	712	3.6		
1980	67,348	8.3	788	10.7		
1981	72,701	8.0	857	8.7		
1982	72,307	(0.5)	870	1.5		
1983	68,942	(4.7)	819	(5.9)		

GNP - average annual increase 1960 - 1983 = 5.34 %
 G.P. Mining - average annual increase 1960 - 1981 = 2.98 %
 G.P. Mining - average annual increase Current Prices 1960 - 1983 = 9.47 %

* G.P. Mining: Except petroleum and coal

Source: Secretaría de Programación y Presupuesto
 Sistema de Cuentas Nacionales

APPENDIX IV

Index of Major Mining Companies and Major Operations.

Major Mining Company	Major Operations
Grupo Industrial Minera Mexico, S.A. de C.V.	
Industrial Minera Mexico, S.A.	Charcas San Martin Santa Eulalia Taxco Chihuahua smelter - lead Monterrey refinery - lead, silver San Luis smelter - copper Electrolytic zinc plant Rosita plant and Agujita unit
Minerales Metalicos del Norte, S.A.	Velardeña Santa Barbara
Zinc de Mexico, S. A.	Parral Fluorita
Carbonifera de Mexico, S.A.	
Industrias Peñoles, S.A. de C.V.	Campana de Plata Topia La Negra La Encantada La Minita Rio Verde Met-Mex smelter, refinery
Compañia Fresnillo, S.A. de C.V. and Zimapan, S.A.	Fresnillo Naica El Monte Cuale Carrizal

Major Mining Company

Major Operation

Grupo Guanajuato

Torres
Cedros
Peregrina
Bolañitos
Cebada

Frisco, S.A. de C.V.

San Francisco del Oro
Lampazos
Cumobabi

Industrias Luismin, S.A. de C.V.

Tayoltita

Compañía Minera Autlan, S.A. de C.V.

Tetzintla
Nonoalco

Compañía Minera de Cananea, S.A.

Cananea

Mexicana de Cobre, S.A.

La Caridad

Minera Real de Angeles, S.A. de C.V.

Real de Angeles

Pachuca
Bolaños
Las Cuevas

Production of Iron Ore in Mexico in 1984 by company

Production of Coal in Mexico in 1984

MAJOR MINING COMPANIES

COMPANY NAME Grupo Industrial Minera Mexico, S.A. de C.V.
 HEAD OFFICE ADDRESS Baja California #200
 Mexico 7, D. F.
 Tel. 564-7066

SALES, PROFITS AND PRODUCTION

1983

Net sales millions of dollars \$ 337.56
 Net profit millions of dollars \$ 25.59

Production

Smelters refineries plants

Silver kg. 669,662
 Lead tons. 63,892
 Zinc tons. 76,741
 Copper tons. 32,661

Company mines

Silver kg. 407,586
 Lead tons. 54,156
 Zinc tons. 145,621
 Copper tons. 14,199
 Fluorite tons. 48,051

DESCRIPTION

Grupo Industrial Minera Mexico is a 100% Mexican holding company whose major holding is Subtenedora Mexico, Desarrollo Industrial Minera, S.A. which is owned 66% by Grupo Mexico and 34% by ASARCO of the U. S. This company in turn controls six separate mineral companies: Minerales Metalicos del Norte, S.A., Zinc de Mexico, S.A., Industrial Minera Mexico, S.A., Carbonifera de San Juan, S.A., Carbonifera de Nueva Rosita, S.A. and Carbonifera de Mexico, S.A.

OPERATING PROPERTIES

NAME Charcas S.L.P.
OWNERSHIP IMMSA
PRODUCTION 1,250 Tons per day
APPROXIMATE HEAD GRADES 90qAg, 0.6%Pb, 5% Zn
TYPE OF OPERATIONS Underground mine, flotation concentrator
ESTIMATED RESERVES Adequate for at least 8 years at new increased capacity.
PRODUCTS Concentrates of lead, zinc and copper.

REMARKS Presently expanding concentrator from 1,250 tpd to 3,450 tpd. The mineral occurs in veins and as limestone replacement. Mining is primarily by the cut and hydraulic fill method.

NAME San Martín, Zacatecas
OWNERSHIP IMMSA
PRODUCTION 6,600 Tons per day
APPROXIMATE HEAD GRADES 110qAg, 5% Zn, 1% Cu
TYPE OF OPERATIONS Underground mine, flotation concentrator
ESTIMATED RESERVES 24 Million tons.
PRODUCTS Concentrates of zinc and copper

REMARKS The new 6,600 tpd plant went on-stream in late 1984. The mineral occurs in a contact metamorphic deposit. Mining is by the cut and hydraulic fill method. This is presently the largest underground mine in Mexico.

NAME Santa Eulalia, Chih.
OWNERSHIP IMMSA
PRODUCTION 900 Tons per day
APPROXIMATE HEAD GRADES 90qAg, 2%Pb, 7% Zn
TYPE OF OPERATIONS Underground mine, flotation concentrator
ESTIMATED RESERVES 9.5 Million tons.
PRODUCTS Concentrates of lead and zinc.
REMARKS This 900 tpd concentrator is being considered for an expansion to 1,200 tpd. The mineral is in a metasomatic contact replacement deposit. Mining is by cut and hydraulic fill. pumping is at the rate of 1,500 gal. per minute.

NAME Taxco, Morelos
OWNERSHIP IMMSA
PRODUCTION 3,300 tpd
APPROXIMATE HEAD GRADES 170qAg, 1.7% Pb, 3.3% Zn
TYPE OF OPERATIONS Underground mine, flotation concentrator
ESTIMATED RESERVES 8.5 Million tons.
PRODUCTS Concentrates of lead and zinc.
REMARKS This is a new flotation plant in operation only a few years. The mineral occurs in veins and mantos in a number of separated mines. Mining is by sublevel stoping and cut and hydraulic fill.

NAME Chihuahua lead smelter, Avalos, Chih.
 OWNERSHIP IMMSA
 PRODUCTION 110,000 Tons per year lead capacity
 TYPE OF OPERATION Lead smelter
 PRODUCTS Pig lead
 REMARKS This is a custom smelter but most of its feed comes from Grupo Mexico mines. This is an old smelter but has gone through many modernizations. The lead pigs are shipped to the IMMSA refinery in Monterrey.

NAME Monterrey refinery, Monterrey, N.L.
 OWNERSHIP IMMSA
 PRODUCTION Has produced over 20 million oz silver per year
 TYPE OF OPERATION Lead-silver refinery
 PRODUCTS Refined lead, antimonial lead, bismuth, gold.
 REMARKS This refinery is a conventional silver-lead fire refinery.

NAME San Luis copper smelter, S.L.P.
 OWNERSHIP IMMSA
 PRODUCTION 42,000 Tons per year copper capacity.
 TYPE OF OPERATION Copper smelter
 PRODUCTS Blister copper, arsenic, sulphuric acid.
 REMARKS This is an old conventional fire furnace smelter. Due to the feed from polymetallic mines the blister produced is quite contaminated (dirty).

NAME Electrolytic zinc plant S.L.P.
OWNERSHIP IMMSA
PRODUCTION 113,000 Tons per year zinc capacity
TYPE OF OPERATIONS Electrolytic zinc refinery
PRODUCTS Zinc, cadmium, sulphuric acid.
REMARKS This plant went on-stream in late 1983.
 Feed for this plant comes primarily from
 Grupo Mexico mines.

NAME Rosita plant and Agujita unit, Rosita, Coah.
OWNERSHIP IMMSA
PRODUCTION 200,000 Tons per year coke
TYPE OF OPERATION Coke ovens
PRODUCTS Coke and coal sub-products.
REMARKS Besides the coke ovens IMMSA operates an
 old scotch hearth zinc smelter that is
 gradually being phased out of production.
 A number of carbo-chemicals are produced.

OPERATING PROPERTIES

MAJOR MINING COMPANIES

COMPANY NAME

Minerales Metalicos del Norte, S. A.

HEAD OFFICE ADDRESS

Baja California #200

Mexico 7, D. F.

Tel. 564-7066

SALES, PROFITS AND PRODUCTION

Consolidated under Grupo Industrial Minera

Mexico, S.A. de C.V.

DESCRIPTION

Ownership of Minerales Metalicos del Norte, S.A., is 66% Grupo Mexico and 34% ASARCO.

Minerales Metalicos del Norte, S.A. operates two mining units; Unidad Velardeña and Unidad Santa Barbara.

OPERATING PROPERTIES

NAME Velardeña Durango
OWNERSHIP Minerales Metalicos del Norte, S.A.
PRODUCTION 850 Tons per day
APPROXIMATE HEAD GRADES 140gAg, 3.0%Pb, 5.6% Zn
TYPE OF OPERATION Underground mines, flotation concentrator
ESTIMATED RESERVES 1,400,000 Tons
PRODUCTS Concentrates of lead and zinc.
REMARKS No new expansions are being planned for this 900 tpd capacity operation. Feed is approximately 600 tpd from the Santa Maria mine, 150 tpd from Reina de Cobre and 150 tpd from Los Azules. A long 3Km. crosscut is being driven to come below the Reina de Cobre deposit. The deposits occur as chimneys and contact metasomatic bodies.

NAME Santa Barbara Chihuahua
OWNERSHIP Minerales Metalicos del Norte, S.A.
PRODUCTION 4,800 Tons per day
APPROXIMATE HEAD GRADES 110g Ag, 2.2% Pb, 4.3% Zn, 0.4% Cu
TYPE OF OPERATION Underground mines, flotation concentrator
ESTIMATED RESERVES 22,000,000
PRODUCTS Concentrates of lead, zinc and copper.
REMARKS The mineralization occurs principally in veins. The mining methods include sub-level and shrinkage stoping. Hydraulic tailings fill is used in most of the stopes.

MAJOR MINING COMPANIES

COMPANY NAME Zinc de Mexico, S. A.

HEAD OFFICE Baja California #200

Mexico 7, D. F.

Tel. 564-7066

SALES, PROFITS AND PRODUCTION

Consolidated under Grupo Industrial Minera Mexico, S.A. DE C.V.

DESCRIPTION

Ownership of Zinc de Mexico, S.A. is 66% Grupo Mexico and 34% ASARCO. Zinc de Mexico, S.A. operates one mining unit, Unidad de Parral, and one fluorite recovery unit, unidad Fluorita.

OPERATING PROPERTIES

NAME	Parral, Chihuahua
OWNERSHIP	Zinc de Mexico, S.A.
PRODUCTION	1,400 Tons per day
APPROXIMATE HEAD GRADES	130g Ag, 1% Pb, 1% Zn
TYPE OF OPERATION	Flotation concentrator accepting feed from small mines.
ESTIMATED RESERVES	600,000 Tons.
PRODUCTS	Concentrates of lead and zinc.
REMARKS	The Parral flotation concentrator accepts feed from various small mines in the Parral district but the majority of the feed will come from the Veta Colorada, Sierra de Plata section which contains the great majority of the reserves. The local mines are vein deposits.
NAME	Santa Barbara
OWNERSHIP	Mineralas
NAME	Fluorita, Parral, Chihuahua
OWNERSHIP	Zinc de Mexico, S.A.
PRODUCTION	2,000 Tons per day capacity
APPROXIMATE HEAD GRADES	15% CaF ₂
TYPE OF OPERATION	Tailings reclamation and flotation concentrator
ESTIMATED RESERVES	7,000,000
PRODUCT	Fluorite concentrate
REMARKS	The fluorite concentrator is fed reclaimed tailings from the old Parral sulphide flotation concentrator. Tailing reclamation is by monitor.

OPERATING PROPERTIES

MAJOR MINING COMPANIES

MAJOR MINING COMPANIES

COMPANY NAME Carbonifera de Mexico, S.A.

HEAD OFFICE ADDRESS Baja California #200

Mexico 7, D.F.

Tel. 564-7066

SALES, PROFIT AND PRODUCTION

Consolidated under Grupo Industrial Minera Mexico, S.A. de C.V.

DESCRIPTION

Ownership of Carbonifera de Mexico, S.A. is 66% Grupo Mexico and 34% ASARCO. Carbonifera de Mexico, S.A. operates three coal mining units, Mina Carbonifera No. 1, Sabinas Coahuila; Mina Carbonifera No. 7 Nueva Rosita, Coahuila and Tajos Abiertos No. 1 and No. 2 at Nueva Rosita Coahuila. These Tajos Abiertos are open pit coal mines while the Minas Carbonifer No. 1 and No. 7 are underground long wall coal mines. Total coal production in 1984 was 755,000 Tons and reserves are estimated to be 75 million tons.

MAJOR MINING COMPANIES

COMPANY NAME **Industrias Peñoles, S.A. de C.V.**

HEAD OFFICE ADDRESS **Paseo de la Reforma 383
Mexico 06500, D.F.
Tel. 211-0054**

SALES, PROFITS AND PRODUCTION

	1983
Net sales Millions of dollars	\$689.8
Net profit millions of dollars	\$ 57.7

Production for fiscal year of 11 months

Smelters refineries plant

Gold kg.	3,595
Silver kg.	1,041,734
Lead tons.	109,133
Zinc tons.	70,319
Copper tons.	6,634
Sodium sulphate tons	365,297

Company controlled mines

Gold kg.	1,307
Silver kg.	528,000
Lead tons.	52,475
Zinc tons.	49,324
Copper tons.	3,466
Fluorite tons.	108,010
Barite tons.	52,800

DESCRIPTION

Industrias Peñoles, S.A. de C.V. is a holding company that holds 100% of four mining companies and between 55.2% and 60% of an additional eight mining companies the largest of which is Cia. Fresnillo. In addition Industrias Peñoles holds 60% of Met-Mex Peñoles a smelting and refining company with 40% held by Bethlehem Company of the U.S.A. Additionally Industrias Peñoles owns chemical companies producing, primarily, sodium, sulphate and magnesium oxide and refractories. Industrias Peñoles holds 51% of a refractory company in Argentina and 46% of a Spanish company producing sodium sulphate.

OPERATING PROPERTIES

NAME Campana de Plata, Zacualpan, Edo. de Mexico
OWNERSHIP Industrias Peñoles, S.A. de C.V.
PRODUCTION 400 Tons per day
APPROXIMATE HEAD GRADES 250g Ag, 0.9% Pb, 0.15% Au.
TYPE OF OPERATION Underground mines, flotation and cyanidation concentrators.
ESTIMATED RESERVES 1,000,000 Tons.
PRODUCTS Concentrate of lead, gold-silver precipitate
REMARKS A new shaft was completed in early 1985 allowing for increased efficiency and slightly increased production. The mineral is in veins with mining by shrink stoping or cut-and-fill. Some high grade material is sent directly to the smelter.

NAME Topia Topia, Durango
OWNERSHIP Industrias Peñoles, S.A. de C.V.
PRODUCTION 150 Tons per day
APPROXIMATE HEAD GRADES 360g Ag, 2.5% Pb, 2.5% Zn, 0.9g Au
TYPE OF OPERATION Underground mines, flotation concentrator
ESTIMATED RESERVES 200,000 Tons
PRODUCTS Concentrates of lead and zinc
REMARKS The mineral is in narrow veins and therefore, costs are high but the grade is also high. Topia is in a remote location which adds to the costs. Mining is by shrink stoping or cut-and-fill stoping.

NAME	La Negra Maconi, Queretaro
OWNERSHIP	Industrias Peñoles, S.A. de C.V.
PRODUCTION	1,000 Tons per day
APPROXIMATE HEAD GRADES	150g Ag, 0.9% Pb, 2.6% Zn, 0.2% Cu.
TYPE OF OPERATION	Underground mine, flotation concentrator
ESTIMATED RESERVES	2,700,000 Tons
PRODUCTS	Concentrates of lead and zinc.
REMARKS	La Negra is a contact metasomatic type deposit with the mineral found in chimneys with mining by sub-level and open stoping. The production of the concentrator was increased to 1,000 tpd from 850 tpd in 1984.
NAME	La Encantada La Encantada, Coahuila
OWNERSHIP	Industrias Peñoles 60% Lacana Mining 40%
PRODUCTION	600 Tons per day
APPROXIMATE HEAD GRADES	340 g Ag, 6% Pb
TYPE OF OPERATIONS	Underground mine, flotation (sulphadizing) concentrator
ESTIMATED RESERVES	700,000 Tons
PRODUCTS	Concentrates of lead, high grade direct shipping ore.
REMARKS	Although most of the ore at La Encantada is oxidized, reasonable recoveries are made in the sulphadizing flotation concentrator but a large quantity of plus 1 kilograms per ton silver ore is shipped directly to the smelter. The mineral occurs in chimneys and mantos as replacement bodies in limestone. Ground conditions are poor and mining is done by room-and-pillar with waste filling immediately after extraction.

NAME La Minita La Minita, Michoacan
 OWNERSHIP Industrias Peñoles, S.A. de C.V.
 PRODUCTION 1,500 Tons per day
 APPROXIMATE HEAD GRADES 63g Ag, 0.3% Pb, 3% Zn, 40%BaSO₄
 TYPE OF OPERATION Open pit mine, flotation concentrator
 ESTIMATED RESERVES 4,700,000 Tonx.
 PRODUCTS Concentrates of lead and zinc and barite.
 REMARKS This operation began capacity production in 1984. It is primarily a barite mine with by-products silver, lead and zinc. This is a koroko, vulcanogenic deposit. Mining is by open pit. Barite bagging facilities are at the railhead.

NAME Rio Verde Alamos, Guanajuato
 OWNERSHIP Industrias Peñoles, 60%, International Minerals and Chemicals 40%
 PRODUCTION 600 Tons per day
 APPROXIMATE HEAD GRADES 50% CaF₂
 TYPE OF OPERATION Underground mine, flotation concentrator
 ESTIMATED RESERVES 1,900,000 Tons.
 PRODUCTS Metallurgical, ceramic and acid grades of fluorite
 REMARKS With the worldwide recession and lower steel demand, this mine has not been operating at capacity. Mineralization is found in limestone adjacent to rhyolite and forms in chimneys. Mining is by room and pillar method with waste fill.

NAME Met-Mex Peñoles Smelter-Rerinery, Torreon, Coah.

OWNERSHIP Industrias Peñoles 60%, Bethlehem 40%

PRODUCTION 180,000 Tons per year Pb, 105,000 Tpy Zn,
35 Million oz Ag

TYPE OF OPERATION Lead smelter, lead refinery, zinc refinery

PRODUCTS Lead, zinc, silver, gold, bismuth cadium,
antimonial lead, sulphuric acid, antimony.

REMARKS The zinc refinery has not been operating at capacity due to lack of concentrates. An expansion of the antimony trioxide plant has just been completed. Basic engineering has been completed for a gas scrubber system that will produce sulphuric acid and ammonium sulphate.

NAME La Encarnación, Coahuila

OWNERSHIP Industrias Peñoles, 60%, Bethlehem 40%

PRODUCTION 500 Tons per day

TYPE OF OPERATION Lead smelter

PRODUCTS Lead, zinc, silver, gold, bismuth, cadmium, antimonial lead, sulphuric acid, antimony.

REMARKS The zinc refinery has not been operating at capacity due to lack of concentrates. An expansion of the antimony trioxide plant has just been completed. Basic engineering has been completed for a gas scrubber system that will produce sulphuric acid and ammonium sulphate.

MAJOR MINING COMPANIES

COMPANY NAME Cia. Fresnillo, S.A. de C.V. and Zimapan, S.A.

HEAD OFFICE ADDRESS Paseo de la Reforma 383
06500 Mexico, D. F.
Tel. 533-4872

SALES, PROFITS AND PRODUCTION

Consolidated under Industrias Peñoles, S.A.
de C.V.

DESCRIPTION

Ownership of Cia. Fresnillo, S.A. de C.V. and Zimapan, S.A. is 60% Industrias Peñoles, S.A. de C.V. and 40% AMAX. Cia. Fresnillo controls and operates the Fresnillo, Naica, El Monte and Veta Grande units. They also operate the Torres, Cedros, Peregrina, Boloñitos and Golondrinas mines for Grupo Guanajuato, Zimapan, S.A. controls and operates the Cuale, Carrizal and San Jose mines.

OPERATING PROPERTIES

NAME	Fresnillo	Fresnillo, Zacatecas
OWNERSHIP	Cia. Fresnillo	
PRODUCTION	1,200 Tons per day	Mill 2,100 Tpd
APPROXIMATE HEAD GRADES	360g Ag, 0.8% Pb, 1.6% Zn.	
TYPE OF OPERATIONS	Underground mines, flotation concentrator	
ESTIMATED RESERVES	3,300,000 Tons.	
PRODUCTS	Concentrates of lead and zinc.	
REMARKS	Reserves more than doubled at Fresnillo in the last two years and the concentrator capacity was increased from 1,500 to 2,200 tpd in 1984. Mineralization occurs primarily in veins although chimneys and mantos are known in the mine. Most mining is by cut and hydraulic fill methods. The new San Luis shaft to the Santo Niño area will be in service in 1986.	

NAME	Naica	Naica, Chihuahua
OWNERSHIP	Cia. Fresnillo, S.A. de C.V.	
PRODUCTION	2,100 Tons per day	
APPROXIMATE HEAD GRADES	150g Ag, 4.7% Pb, 3.8% Zn, 0.4% Cu.	
TYPE OF OPERATION	Underground mine, flotation and gravity concentrator	
ESTIMATED RESERVES	4,500,000 Tons.	
PRODUCTS	Concentrates of lead, zinc, copper and WO ₃	
REMARKS	Ore minerals are located in chimneys and mantos. Mining is by open stoping. Water pumping is 13,000 gal. per minute and constitutes a major cost. The Naica shaft is being sunk to the 850 level and will be the main hoisting shaft. It is presently connected to the bottom of the Gibraltar shaft on the 541 level. Present mill capacity 3,000 Tons per day.	

NAME El Monte Zimapan, Hidalgo
 OWNERSHIP Cia. Fresnillo, S.A. de C.V.
 PRODUCTION 750 Tons per day Mill 1,100 Tons per day
 APPROXIMATE HEAD GRADES 140g Ag, 1.0% Pb, 1.6%Zn, 0.4% Cu.
 TYPE OF OPERATION Underground mine, flotation concentrator
 ESTIMATED RESERVES 1,000,000 Tons.
 PRODUCTS Concentrates of lead, zinc and copper.
 REMARKS This is a contact metasomatic deposit with replacement mineralization in limestone and within the intrusive. Mining is by sub-level stoping.

NAME Cuale Cuale, Michoacan
 OWNERSHIP Zimapan, S. A.
 PRODUCTION 800 Tons per day.
 APPROXIMATE HEAD GRADES 160g Ag, 2% Pb, 6% Zn, 0.3%Cu, 0.6g Au.
 TYPE OF OPERATION Open pit and underground mines, flotation concentrator
 ESTIMATED RESERVES 600,000 Tons.
 PRODUCTS Concentrates of lead and zinc
 REMARKS Previously most production was from open pit operations but more mineral is now being produced from underground. This is a complex vulcanogenic deposit. Various underground extraction methods are used depending on ground conditions.

NAME Carrizal Zimapan, Hidalgo

OWNERSHIP Zimapan, S. A.

PRODUCTION 300 Tons per day

APPROXIMATE HEAD GRADES 190g Ag, 2.6% Pb, 4.0% Zn, 0.3% Cu.

TYPE OF OPERATION Underground mine

ESTIMATED RESERVES 400,000 Tons

PRODUCTS Ore shipped to El Monte Concentrator

REMARKS This small operation is able to operate because of its relatively high grade material. Mineralization is found as replacement in limestone controlled by structure and proximity to acid intrusives and occurs in chimneys, mantos and veins. Open stoping is the most common mining method.

REMARKS
 Various underground
 extraction methods are used depending on
 conditions.
 Minerals are located in chimneys and mantos.
 Mining is by open stoping. Water pumping is
 13,000 gal. per minute and constitutes a major
 cost. The Waica shaft is being sunk to the 850
 level and will be the main hoisting shaft. It
 is presently connected to the bottom of the
 Gibraltar shaft on the 541 level. Present mill
 capacity 3,000 Tons per day.

OPERATING PROPERTIES
MAJOR MINING COMPANIES

COMPANY NAME Grupo Guanajuato
 OWNERSHIP Cia. Minera Las Torres
 HEAD OFFICE ADDRESS Paseo de la Reforma 383
 06500 Mexico, D. F. 2,000 Tons per day
 APPROXIMATE HEAD GRADES Tel. 533-4872

SALES, PROFIT AND PRODUCTION

ESTIMATED RESERVES Consolidated under Industrias Peñoles,
 PRODUCTS S.A. de C.V. of Lead.

REMARKS This is a wide vein deposit with mining by
 cut and hydraulic fill methods.

NAME Cedros, Guanajuato, Guanajuato
 OWNERSHIP Cia. Minera Cedros
 DESCRIPTION Ownership of Grupo Guanajuato is somewhat complex.
 The operator is Cia. Fresnillo. There are three
 APPROXIMATE HEAD GRADES companies in the Grupo Guanajuato which, with
 TYPE OF OPERATION their ownership, are as follows:
 ESTIMATED RESERVES 1. Cia. Minera Las Torres
 33% Zimapan, 37% Cia. Fresnillo, 30%
 PRODUCT Lacana Mining.
 2. Negociacion Minera Santa Lucia, S.A. de C.V.
 33% Zimapan, 37% Cia. Fresnillo, 30%
 REMARKS Lacana.
 3. Cia. Minera Cedros
 37.69% Zimapan, 31.45% Cia. Fresnillo,
 15.86 Lacana Mining, 15% Comision de
 Fomento Minero.

MAJOR MINING COMPANIES & ...

COMPANY NAME

HEAD OFFICE ADDRESS

DESIGNATION

SALES, PROFIT AND PRODUCTION

CONTRIBUTED UNDER INDUSTRIAS PÉROLAS

Ownership of Grupo Guasajuato is somewhat complex. The operator is Cia. Fresnillo. There are three companies in the Grupo Guasajuato which, with their ownership, are as follows:

1. Cia. Minera Las Torres
33% Zimapan, 37% Cia. Fresnillo, 30% Lascana Mining.
2. Negociacion Minera Santa Lucia, S.A. de C.V.
33% Zimapan, 37% Cia. Fresnillo, 30% Lascana.
3. Cia. Minera Cedros
37.6% Zimapan, 31.4% Cia. Fresnillo, 12.8% Lascana Mining, 12% Comiston de Pamento Minero.

DESCRIPTION

OPERATING PROPERTIES

NAME Torres Guanajuato, Guanajuato
 OWNERSHIP Cia. Minera Las Torres
 PRODUCTION 550 Tons per day Mill 2,000 Tons per day
 APPROXIMATE HEAD GRADES 240g Ag, 1.2g Au.
 TYPE OF OPERATION Underground mine, flotation concentrator
 ESTIMATED RESERVES 400,000 Tons.
 PRODUCTS Concentrate of lead.
 REMARKS This is a wide vein deposit with mining by cut and hydraulic fill methods.

NAME Cedros, Guanajuato, Guanajuato
 OWNERSHIP Cia. Minera Cedros
 PRODUCTION 650 Tons per day
 APPROXIMATE HEAD GRADES 170g Ag, 1.0g Au.
 TYPE OF OPERATION Underground Mine
 ESTIMATED RESERVES 900,000 Tons
 PRODUCT Ore sent to Torres concentrator
 REMARKS The Cedros workings adjoin the Torres mine. This is a wide vein deposit being mined by the cut and hydraulic fill method.

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NAME	Peregrina	Guanajuato, Guanajuato
OWNERSHIP	Negociacion Minera Santa Lucia	
PRODUCTION	340 Tons per day.	
APPROXIMATE HEAD GRADES	340g Ag, 4.5g Au.	
TYPE OF OPERATION	Underground mine	
ESTIMATED RESERVES	550,000 Tons.	
PRODUCTS	Ore shipped to Torres concentrator	
REMARKS	The mineral is found in veins that are being mined by shrinkage stoping.	

NAME	Bolañitos	Guanajuato, Guanajuato
OWNERSHIP	Cia. Minera Las Torres	
PRODUCTION	260 Tons per day	
APPROXIMATE HEAD GRADES	220g Ag, 2.2g Au.	
TYPE OF OPERATION	Underground mine	
ESTIMATED RESERVES	240,000 Tons.	
PRODUCTS	Ore shipped to Torres concentrator	
REMARKS	Mineralization found in veins. Mining method used is shrinkage stoping.	

OPERATING PROPERTIES
NAME Cebada Guanajuato, Guanajuato
OWNERSHIP Negociacion Minera Santa Lucia
PRODUCTION 210 Tons per day
APPROXIMATE HEAD GRADES 285g Ag, 3.4g Au.
TYPE OF OPERATION Underground mine
ESTIMATED RESERVES 350,000 Tons.
PRODUCTS Ore shipped to Torres concentrator
REMARKS Mineralization found in veins. The mining method used is cut and waste fill.

NAME Lampazos, Sonora
OWNERSHIP Frisco 68X Comision de Fomento Minero 32X
PRODUCTION 450 Tons per day.

APPROXIMATE HEAD GRADES 340g Ag, 0.4% Pb, 0.4% Zn, 0.2g Au
DESCRIPTION Frisco, S.A. de C.V. is a holding company that
 holds 100% of Minera Lampazos, S.A. de C.V. and
 68% of Minera Lampazos, S.A. de C.V. (32X Comision
 de Fomento Minero), 32X of Minera Real de Angeles,
 S.A. de C.V. (32X Comision de Fomento Minero) and
 32.58% of Bufeta Fluor,
 S.A. de C.V., a producer of hydrofluoric acid plus
 some other non mineral or exploration holdings.

MAJOR MINING COMPANIES

COMPANY NAME Frisco, S.A. de C.V.

HEAD OFFICE ADDRESS Jaime Balmes No. 11
Torre C 5^a Piso
11510 Mexico, D. F.
Tel. 395-5403

SALES, PROFITS AND PRODUCTION

	1983
Net sales millions of dollars	\$63.81
Net profit millions of dollars	\$15.53
Production	
Silver kg.	116,386
Lead tons.	17,357
Zinc tons.	25,355
Copper tons.	3,035
Molybdenum tons.	1,204

DESCRIPTION

Frisco, S.A. de C.V. is a holding company that holds 100% of Minera San Francisco del Oro, S.A. de C.V. and 100% of Minera Cumobabi, S.A. de C.V. 68% of Minera Lampazos, S.A. de C.V. (32% Comision de Fomento Minero), 33% of Minera Real de Angeles, S.A. de C.V. (33% Comision de Fomento Minero and 34% Placer Development), 32.88% of Quimica Fluor, S.A. de C.V., a producer of hydrofluoric acid plus some other non mineral or exploration holdings.

OPERATING PROPERTIES

NAME	San Francisco del Oro, Santa Barbara, Chihuahua
OWNERSHIP	Frisco, S.A. de C.V.
PRODUCTION	2,800 Tons per day
APPROXIMATE HEAD GRADES	110g Ag, 2.5% Pb, 4.4% Zn, 13% CaF ₂
TYPE OF OPERATION	Underground mines, flotation concentrator
ESTIMATED RESERVES	5,500,000 Tons
PRODUCTS	Concentrates of lead, zinc, copper and fluorite
REMARKS	The San Francisco del Oro deposits are of the narrow vein type. Mining is by shrinkage stoping and cut-and-fill stopes.

NAME	Lampazos Lampazos, Sonora
OWNERSHIP	Frisco 68% Comision de Fomento Minero 32%
PRODUCTION	450 Tons per day.
APPROXIMATE HEAD GRADES	340g Ag, 0.4% Pb, 0.4% Zn, 0.2g Au
TYPE OF OPERATION	Underground mine, flotation concentrator
ESTIMATED RESERVES	1,000,000 Tons.
PRODUCTS	Concentrate of lead
REMARKS	Lampazos is a narrow vein mine, exploited by shrinkage and cut-and-fill stoping

NAME	Cumobabi Cumpas, Sonora
OWNERSHIP	Frisco, S.A. de C.V.
PRODUCTION	2,000 Tons per day
APPROXIMATE HEAD GRADES	0.2% Cu, 0.21% Mo.
TYPE OF OPERATION	Open pit mine, flotation concentrator MoS roaster
ESTIMATED RESERVES	2,000,000 Tons.
PRODUCTS	Concentrates of copper and molybdenum and molybdenum oxide
REMARKS	Cumobabi is a copper-molybdenum porphyry deposit mined by open pit. A MoS roaster is part of the operation allowing sales of molybdenum oxide.

MAJOR MINING COMPANIES

COMPANY NAME Industrias Luismin, S.A. de C.V.

HEAD OFFICE ADDRESS Campos Eliseos 400 8^a Piso
11000 Mexico, D.F.
Tel. 540-3293

SALES, PROFITS AND PRODUCTION

	1983
Net sales millions of dollars	\$74.95
Net profit millions of dollars	\$16.19

Production

Gold Kg.	1,124
Silver Kg.	71,429
Fluorite Tons.	74,795
Acid grade	3,986

DESCRIPTION

Industrias Luismin, S.A. de C.V. is a holding company with its greatest assets and profits from mining. This company, however, also has interests in the production of aluminium, in retail sales (Woolworth) and manufacturing of equipment used in mining and construction (Skega). In mining they control 100% the Cia. Minera MSL, S.A. de C.V. which operates the Tayoltita and La Libertad silver, gold mines. A 37.7% of La Domincia, S.A. de C.V. a fluorite producer, and 52.1% of Cia. Minera Real de Asientos y Anexas, S.A. de C.V. which was a silver-base metal operation, which is temporarily suspended. Industrias Luismin also has 79.6% of Cia. Minera Astumex, S.A. which has a major prospect, Cerro Dolores, in Guerrero.

OPERATING PROPERTIES

NAME	Tayoltita, Durango
OWNERSHIP	Industrias Luismin through Cia. Minera MSL
PRODUCTION	740 Tons per day
APPROXIMATE HEAD GRADES	400g Ag, 5.3g Au
TYPE OF OPERATION	Underground mine, cyanide concentrator
ESTIMATED RESERVES	1,000,000 Tons
PRODUCTS	Silver and gold dore
REMARKS	The Tayoltita mine has numerous complex veins and vein systems. Mining is by cut and fill, shrinkage or open stope depending on the vein size and conditions. The La Libertad mine of Luismin has been closed due to diminishing reserves and grade.

MAJOR MINING COMPANIES

COMPANY NAME Cia. Minera Autlan, S.A. de C.V.

HEAD OFFICE ADDRESS Mariano Escobedo No. 510 - 5^a
Mexico 5, D.F.
Tel. 250-1977

SALES, PROFITS AND PRODUCTION

During 1982 and 1983 when Mexican and worldwide demand for manganese and ferroalloys was low Autlan decreased production and was not profitable. With slightly increased demand in 1984 production increased some 40% over 1983 in all products: Manganese carbonates and nodules, battery grade manganese, ferromanganese, silicomanganese and ferrosilica. Although final figures are not available Autlan will show a fair profit in 1984.

DESCRIPTION

Cia. Minera Autlan, S.A. de C.V. is a group with a mixed capital structure with some 66% owned by the private sector and the public sector with 34%. Of the private holdings, Simitomo Corporation of Japan controls some 10.5%. Autlan also has a major holding in Hornos Electricos de Venezuela, S.A.

Autlan has manganese mines near Molango Hidalgo, a calcination, semi-reduction plant at Molango, and smelting plants in Tezuitlan, Puebla and Tamos, Veracruz.

OPERATING PROPERTIES

NAME Tetzintla, Molango, Hidalgo
OWNERSHIP Cia. Minera Autlan
PRODUCTION Capacity 5,000 Tons per day
APPROXIMATE HEAD GRADES 27% Mn
TYPE OF OPERATION Open pit and underground mines
ESTIMATED RESERVES 14 Million tons.
PRODUCTS Manganese ore
REMARKS The open pit mine is being phased out as the underground mine is being developed. This is a manto type deposit some 6 to 8 meters thick which is steeply dipping. Mining is by the sub-level stoping method. The stopes are not filled and are allowed to cave on a retreating system.

NAME Nonoalco, Molango, Hidalgo
OWNERSHIP Cia. Minera Autlan
PRODUCTION 40,000 Tons per year capacity
APPROXIMATE HEAD GRADES 34% Mn
TYPE OF OPERATION Open pit mine, washing-gravity concentrator
ESTIMATED RESERVES 240,000 Tons.
PRODUCTS Battery grade manganese
REMARKS Nonoalco is one of the largest if not the largest battery grade manganese mine in the world. Mining of the 8 to 11 meter thick bed is by open pit. The washing gravity plant separates the clay silica and iron oxides from the MnO_2 . This material has an electrochemical voltage ratio in excess of 1.6 volts.

MAJOR MINING COMPANIES

COMPANY NAME Compañía Minera de Cananea, S.A.

HEAD OFFICE ADDRESS Insurgentes Sur No. 1377 - 120
Mexico 20, D.F.
Tel. 598-1400

SALES, PROFITS AND PRODUCTION

Cia. Minera de Cananea did not publish figures for 1983 and none are available for 1984. Production for their one producing mine at Cananea, Sonora will be listed under operating property. The company has not been profitable for the last few years.

DESCRIPTION

Cia. Minera de Cananea is a parastate operated Company with the major holding by Nacional Financiera 69%, Comision de Fomento Minero 14%, Cobre de Mexico 5% and the rest held by public and private sources. There are no foreign holdings in Cia. Minera de Cananea. The company operates the Cananea mine, concentrator and smelter complex in Sonora.

MAJOR MINING COMPANIES

COMPANY NAME Mexicana de Cobre, S. A.

HEAD OFFICE ADDRESS Insurgentes Sur No. 432 - 6^a Piso
 Mexico 7, D. F.
 Tel. 584-9399

SALES, PROFITS AND PRODUCTION

Operations began in 1979. No sales, profit or production figures were published for 1983. The company has not shown a profit since operations began due to a combination of extremely high debit, and therefore debit service, and low copper prices.

DESCRIPTION

Mexicana de Cobre, S.A. is owned 38% by Nacional Financiera and 6% by Comision de Fomento Minero. The remaining 56% is controlled primarily by the Jorge Larrea Group. The company operates the La Caridad mine and concentrator complex in Sonora and is constructing a smelter near the mine.

OPERATING PROPERTIES

NAME	La Caridad, Nacozari, Sonora
OWNERSHIP	Mexicana de Cobre, S.A.
PRODUCTION	72,000 Tons per day capacity
APPROXIMATE HEAD GRADES	0.68% Cu. 0.02% Mo
TYPE OF OPERATIONS	Open pit mine, flotation concentrator
ESTIMATED RESERVES	640 Million tons.
PRODUCTS	Concentrates of copper and molybdenum
REMARKS	Present design capacity at La Caridad is 72,000 Tons per day. The deposit is a porphyry copper type. Mining is by open pit. An expansion to 90,000 tpd is in the preliminary construction phase.

MAJOR MINING COMPANIES

COMPANY NAME Minera Real de Angeles, S.A. de C.V.

HEAD OFFICE ADDRESS Insurgentes Sur No. 1999
01000 Mexico, D. F.
Tel. 548-8640

SALES, PROFITS AND PRODUCTION

No published figures for sales and profit.

1984 Operating Statistics

Total tons mined (WMT) 13,868,000

Tons milled (DMT) 4,355,000

Metal Produced

Silver ounces 8,922,000

Lead tons 31,180

Zinc tons 24,880

NAME Bolaños

OWNERSHIP Minas de Bolaños 51% Mexican, 49% Kennecott

PRODUCTION 600 Tons per day

APPROXIMATE HEAD GRADES 210g Ag, 1.3 Pb

DESCRIPTION Minera Real de Angeles, S.A. de C.V. is jointly held by Placer Development 34%, Frisco, S.A. de C.V. 33% and Comision de Fomento Minero 33%.

ESTIMATED RESERVES

PRODUCTS The company operates the Real de Angeles mine and concentrator at Noria de Angeles, Zacatecas.

REMARKS

OPERATING PROPERTIES

OPERATING PROPERTIES

NAME	Real de Angeles Noria de Angeles, Zacatecas
OWNERSHIP	Minera Real de Angeles, S.A. de C.V.
PRODUCTION	12,000 Tons per day
APPROXIMATE HEAD GRADES	78g Ag, 1% Pb, 1% Zn.
TYPE OF OPERATION	Open pit mine, flotation concentrator
ESTIMATED RESERVES	58 Million tons.
PRODUCTS	Concentrates of lead and zinc.
REMARKS	Real de Angeles is one of the major silver producers in the world. The mineral occurs in a stockwork and disseminated body in silicified shale and greywacke rocks.

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081,7E

088,45

DESCRIPTION

Minera Real de Angeles, S.A. de C.V. is jointly held by Placer Development S.A., Frisco, S.A. de C.V. and Compañía de Fomento Minero S.A. de C.V. The company operates the Real de Angeles mine and concentrator at Noria de Angeles, Zacatecas.

NAME	Pachuca
OWNERSHIP	Comision de Fomento Minero
PRODUCTION	1,800 Tons per day
APPROXIMATE HEAD GRADES	160g Ag, 1g Au, 0.2%Pb, 0.9% Zn
TYPE OF OPERATION	Underground mines, cyanidation concentrator, flotation concentrator, silver refinery.
ESTIMATED RESERVES	3 Million tons.
PRODUCTS	Gold, silver, concentrates of lead and zinc.
REMARKS	This old mining district is being operated by a government agency. Mineralization occurs in veins in volcanics. Mining is by cut and fill and shrink stoping. Costs are high and efficiencies are low.

NAME	Bolaños
OWNERSHIP	Minas de Bolaños 51% Mexican, 49% Kennecott
PRODUCTION	600 Tons per day
APPROXIMATE HEAD GRADES	210g Ag, 1.3 Pb
TYPE OF OPERATION	Underground mine, flotation concentrator
ESTIMATED RESERVES	1.5 Million tons.
PRODUCTS	Concentrate of lead
REMARKS	The mineralization at Bolaños occurs in veins. Mining is primarily by cut and fill stoping.

OPERATING PROPERTIES

NAME	Las Cuevas	San Luis Potosi
OWNERSHIP	Cia. Minera Las Cuevas, 51% Mexican, 49% Noranda	
PRODUCTION	1,000,000 Tons per year capacity	
APPROXIMATE HEAD GRADES	80% Ca F ₂	
TYPE OF OPERATION	Underground mine	
ESTIMATED RESERVES	12 Million tons	
PRODUCTS	From mine fluorite ore. Metallurgical, ceramic and acid grades produced at San Luis Potosi	
REMARKS	Las Cuevas is a massive fluorite deposit as a replacement in limestone at the contact with rhyolite. Mining is by shrink stoping and forced caving.	

Bolafios
 Mines de Bolafios 51% Mexican, 49% Kennecott
 600 tons per day
 5100 Ag, 1.3 Pb
 UNDERGROUND MINE, FLOTATION CONCENTRATOR
 1.2 Million tons
 Concentrate of lead
 The mineralization at Bolafios occurs in veins. Mining is primarily by cut and fill stoping.

First Quarter 1985

Smelter Schedule - Lead

PRODUCTION OF IRON ORE IN MEXICO IN 1984 BY COMPANY

	TONS (000)
LA PERLA	2,250
HERCULES	420
CERRO DE MERCADO	1,000
LAS TRUCHAS	4,422
PEÑA COLORADA	4,414
EL ENCINO	1,656
OTHERS	24
TOTAL	14,186

ESTIMATED 1984 RESERVES IN MEXICO 736 MILLION TONS.

PRODUCTION OF COAL IN MEXICO IN 1984

3.3 MILLION TONS OF WASHED COAL

2.6 MILLION TONS OF COKE

1.9 MILLION TONS STEAM COAL (RIO ESCONDIDO)

ESTIMATED 1984 RESERVES IN MEXICO 860 MILLION TONS.

APPENDIX V

SMELTER SCHEDULES

OWNERSHIP TONS (000) 1,350
 PRODUCTION 450
 APPROXIMATE 1,000
 TYPE OF OPERATION
 ESTIMATED 1,000
 PRODUCTS 24
 14,188

REMARKS
 136 MILLION TONS

PRODUCTION OF IRON ORE IN MEXICO IN 1984 BY COMPANY
 LA BELLA
 HERCULES
 CERRO DE HERCULES
 LAS TRUCHAS
 PARRA COLIAR
 EL ENCINO
 TOTAL
 ESTIMATED 1984 RESERVES IN MEXICO
 and foreign reserves

PRODUCTION OF COAL IN MEXICO IN 1984
 2.3 MILLION TONS OF WASHED COAL
 2.6 MILLION TONS OF COKE
 1.9 MILLION TONS STEAM COAL (CRIO ESCONDIDO)
 ESTIMATED 1984 RESERVES IN MEXICO
 860 MILLION TONS

First Quarter 1985

Smelter Schedule - Lead

Price (Dollars U.S.)

- Silver - Monthly average of Handy and Harman and LME spot price minus 1% minus \$0.00125
- Gold - World price times 1.06675 divided by 35
- Lead - Official Mexican price

Payments (Dollars U.S.)

- Silver - If over 50 grams per ton pay at 95% of calculated price
- Gold - If over 1 gram per ton pay at calculated price
- Lead - If over 5% subtract 1.5 units and pay for the remainder at 90% of the official price minus refinery charge of 12.077 £ U.S. per kilogram

Charges (Dollars U.S.)

- Smelting - \$83.14 Dlls/ton concentrate

Normal penalties vary by contract

Arsenic		
Sulphur	2 %	free
Zinc	12 %	free
Insol.	10 %	free
Others		

Right to Produce Tax

Tax percentage of official price applied to paid content of metal

- Silver - 7% of official silver price times the silver assay of the concentrate
- Gold - 7% of the official gold price times the gold assay of the concentrate
- Lead - 5% of the official lead price times 90% of the lead assay minus 1.5 units.

First Quarter 1985

Refinery Schedule - Zinc

Price (Dollars U.S.)

- Silver - As calculated for lead smelter
- Gold - As calculated for lead smelter
- Zinc - Official Mexican price

Payments (Dollars U.S.)

- Silver - Subtract 150 g per ton then pay for 60% of remainder at 95% of calculated price
- Zinc - Pay for 85% of zinc content or content minus 8% whichever is less at official price
- Cadmium - Varies by contract

Charges (Dollars U.S.)

- Refining - \$151.01 Dollars per ton concentrate
- Electricity - \$137.32 Dollars per ton of contained zinc

Normal penalties which vary by contract

- Iron 8 % free
- Arsenic 0.1 % free
- Anthimony 0.2 % free
- Others

Escalation Charge for preferred clients is the European producer price of zinc in dollars per pound times 2204.62 minus the base price which is \$387.75 dollars per metric ton times a rate of \$0.08511 U.S. dollars. This is the escalation charge per ton of zinc contained.

Right to Produce Tax

Tax percentage of official price applied to paid content of metal

- Silver - 7% of official price times 60% of the silver content remaining after reducing silver assay by 150 grams.
- Zinc - 5% of official price times 85% of the zinc assay or zinc assay minus 8 units whichever is less.

APPENDIX VI

CANADIAN BANKS IN MEXICO

BANK OF MONTREAL	-Rodolfo Salcedo
Reforma 300-20 piso	Senior Representative
06600 México, D.F.	
Tel. 533-30-20	-Erick Carlberg
525-71-09	Assistant Representative
525-77-28	
	-Miguel Angel Noriega
	Assistant Representative
	...
BANK OF NOVA SCOTIA	-Antonio José Uribe
Reforma 390, Desp. 1301	Senior Representative
06600 México, D.F.	
Tel. 533-39-13	-David Cotterall
	Assistant Representative
	...
TORONTO DOMINION BANK	-David Frame
Reforma 390-1402	Representative
06600 México, D.F.	
Tel. 528-55-20	-Michael Cope
	Assistant Representative
	...
CANADIAN IMPERIAL BANK OF COMMERCE	-Antonio Damião de Medeiros
Reforma 199-1101	Resident Representative
06600 México, D.F.	
Tel. 592-35-77	
	...
THE ROYAL BANK OF CANADA	-Ronald Cameron
Hamburgo 172 -5 piso	Regional Representative
Apdo. 6-1020	
06600 México, D.F.	-Carlos Rodríguez
	Assistant Representative
	-Herman Krutzfeldt
	Assistant Representative
	-Roberto Forbes
	Account Executive

APPENDIX VII

PRINCIPAL ORGANIZATIONS
IN THE MEXICAN MINING SECTOR

1. SECRETARIA DE ENERGIA, MINAS E INDUSTRIA PARAESTATAL
Av. Insurgentes Sur 552, 3^a Piso
06769 Mexico, D. F.
Minister: Lic. Francisco Labastida Ochoa

2. COMISION DE FOMENTO MINERO
Puente de Tecamachalco 26
11000 Mexico, D. F.
Director General: Lic. Luis de Pablo

3. CONSEJO DE RECURSOS MINERALES
Niños Heroes 139, 3^a Piso
Mexico, D. F.
Director General: Lic. Jorge Leipen Garay

4. FIDEICOMISO MINERALES NO METALICOS MEXICANOS
Av. Chapultepec No. 536 - 6^a Piso
Mexico, D. F.
Director General: Ing. Moises Kolteniak Toyber

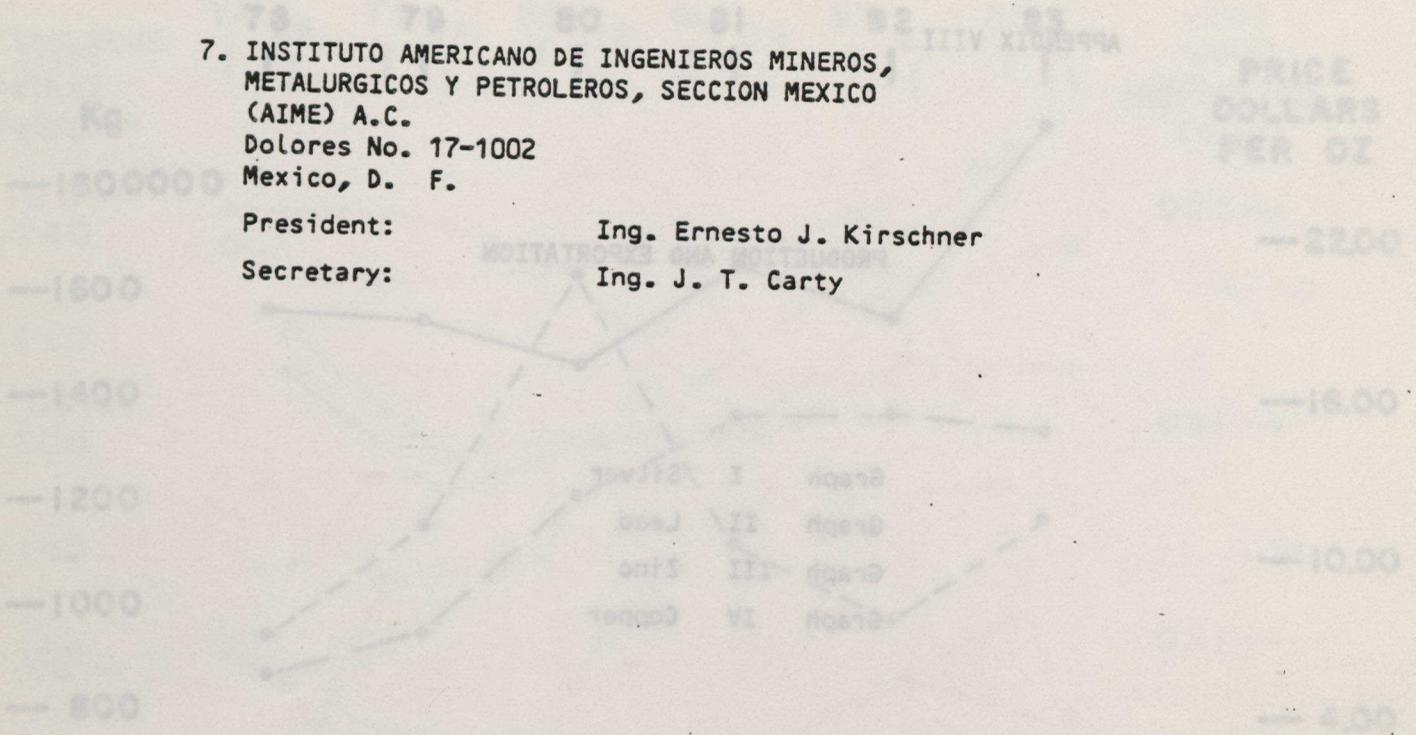
5. CAMARA MINERA DE MEXICO
Sierra Vertientes 369
Lomas de Chapultepec
11000 Mexico, D.F.
President: Ing. Antonio Madero B.
Manager: Lic. Eduardo Gonzalez Guerrier

6. ASOCIACION DE INGENIEROS DE MINAS METALURGISTAS
Y GEOLOGOS DE MEXICO, A.C.
Tacuba No. 5, 19-B
Col. Centro
Delegacion Cuauhtemoc
06000 Mexico, D. F.
President: Estanislao Zarate Lujano

PRODUCTION AND EXPORTATION OF SILVER
MEXICO 1978-1983

7. INSTITUTO AMERICANO DE INGENIEROS MINEROS,
METALURGICOS Y PETROLEROS, SECCION MEXICO
(AIME) A.C.
Dolores No. 17-1002
Mexico, D. F.

President: Ing. Ernesto J. Kirschner
Secretary: Ing. J. T. Carty



- Production
- - -○- Exportation- Refined net incl. export in concentrates (Cu, Zn)
-○..... Average price Hendy & Harman

GRAPH - 1

APPENDIX VIII

PRODUCTION AND EXPORTATION

1. SECRETARIA DE ECONOMIA
 Av. Insurgentes No. 1600
 06709 Mexico, D. F.
 Director General: Lic. Francisco Labastida

2. COMISION DE PROMOCION MINERA
 Puente de Tula
 11000 Mexico, D. F.
 Director General: Lic. Pablo de Pablo

- Graph I Silver
- Graph II Lead
- Graph III Zinc
- Graph IV Copper

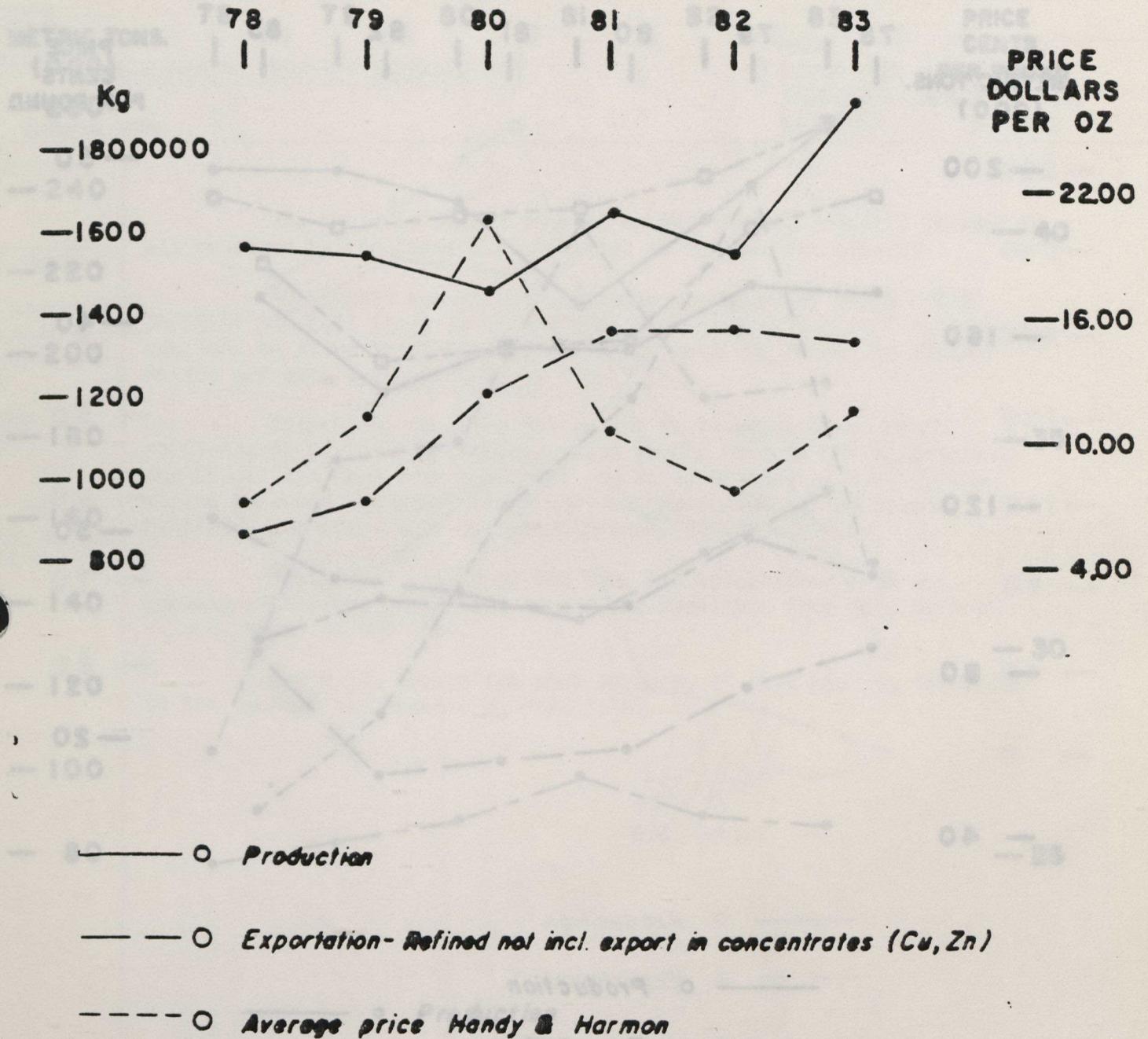
3. CONSEJO DE RECURSOS MINERALES
 Niños Heroes 139, 2º Piso
 Mexico, D. F.
 Director General: Lic. Jorge Leipen Garza

4. FIDEICOMISO MINERALES NO METALICOS MEXICANOS
 Av. Chapultepec No. 536 - 6º Piso
 Mexico, D. F.
 Director General: Ing. Moises Koltaniak Toyber

5. CAMARA MINERA DE MEXICO
 Sierra Vertientes 369
 Lomas de Chapultepec
 11000 Mexico, D.F.
 President: Ing. Antonio Madero B.
 Manager: Lic. Eduardo Gonzalez Guerrier

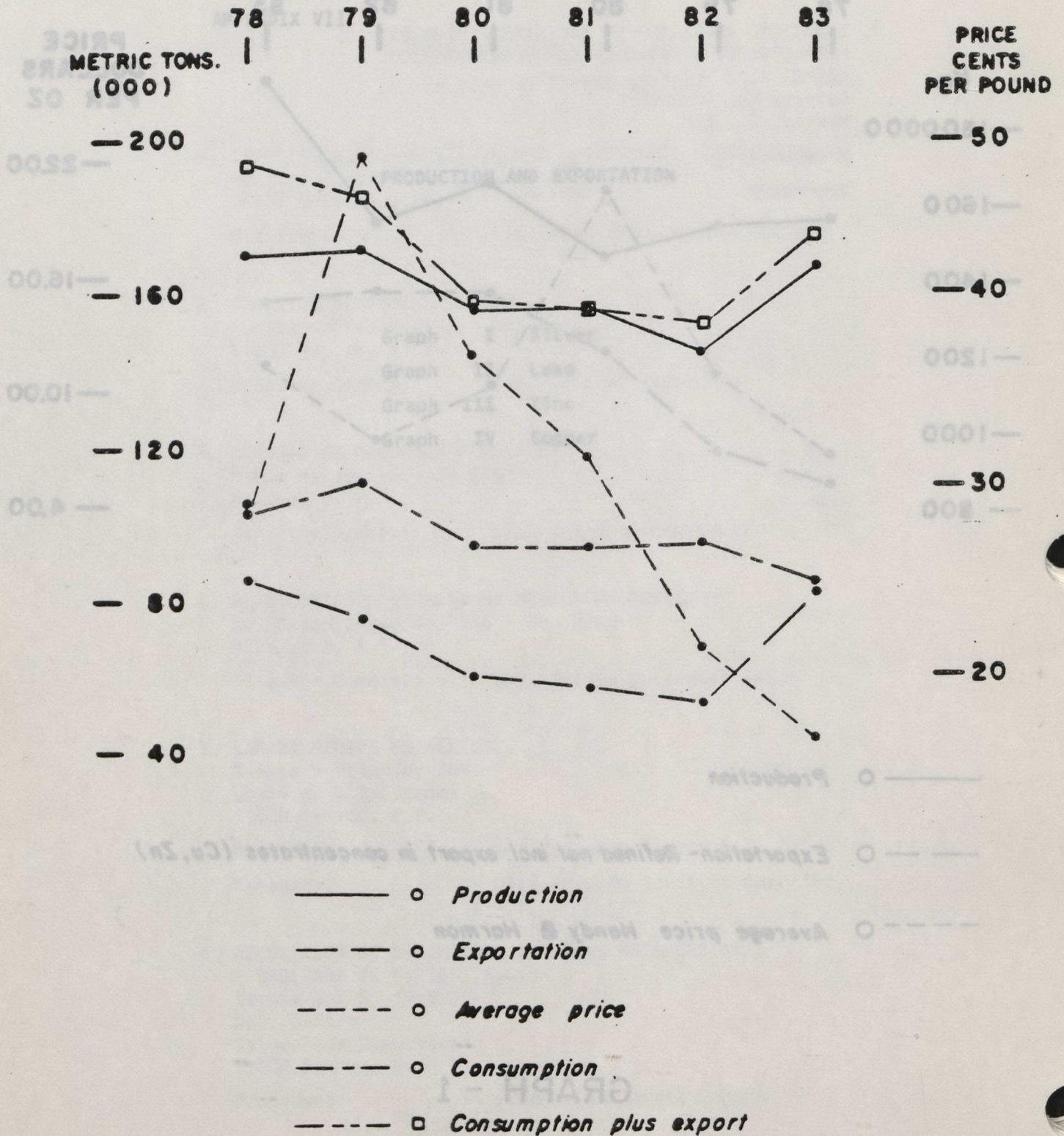
6. ASOCIACION DE INGENIEROS DE MINAS METALURGISTAS
 Y GEOLOGOS DE MEXICO, A.C.
 Tacuba No. 5, 19-B
 Col. Centro
 Delegacion Cuauhtemoc
 06000 Mexico, D. F.
 President: Estanislao Zarza Lujano

PRODUCTION AND EXPORTATION OF SILVER MEXICO 1978 - 1983



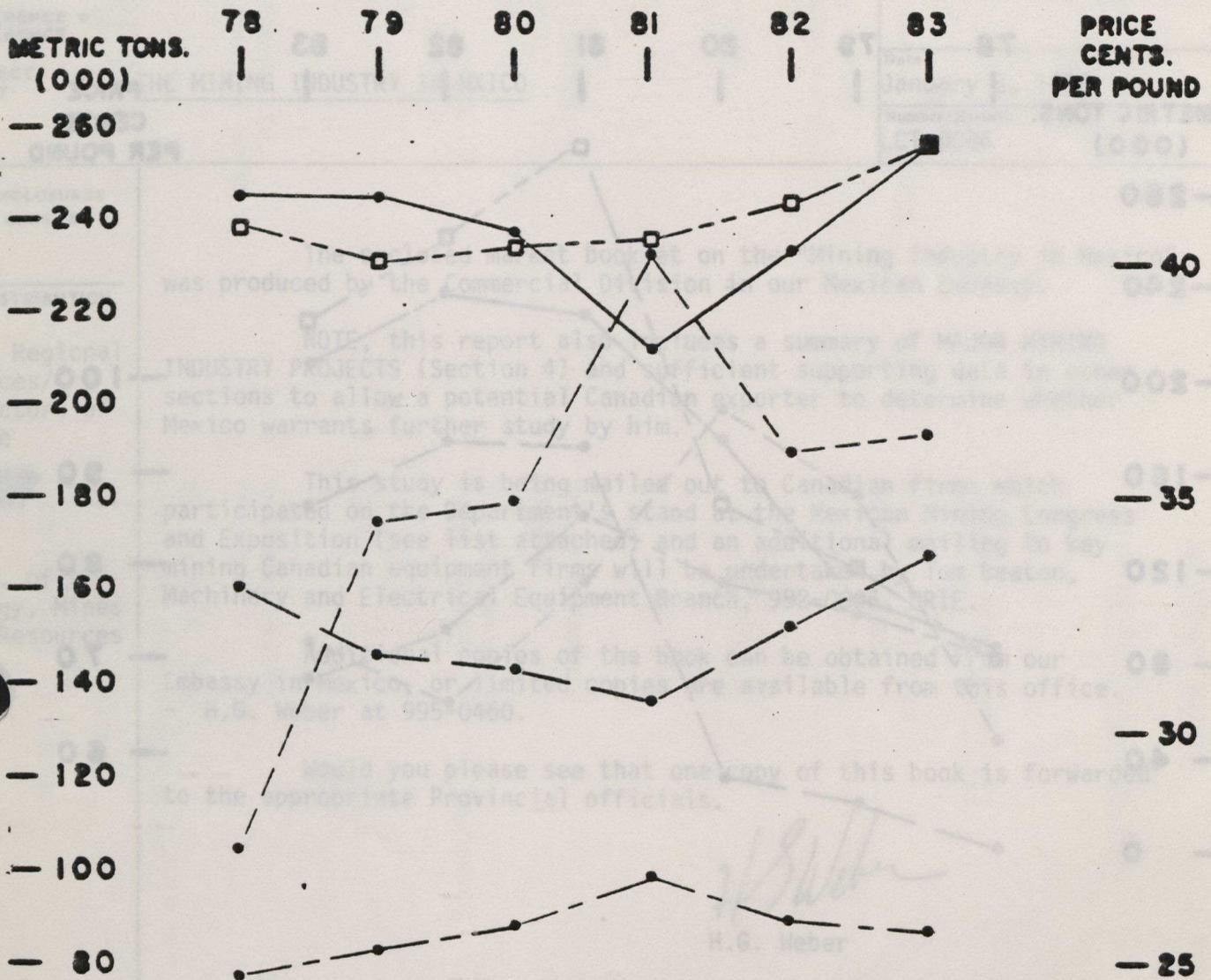
GRAPH - 1

PRODUCTION AND EXPORTATION OF LEAD MEXICO 1978 - 1983



GRAPH - 2

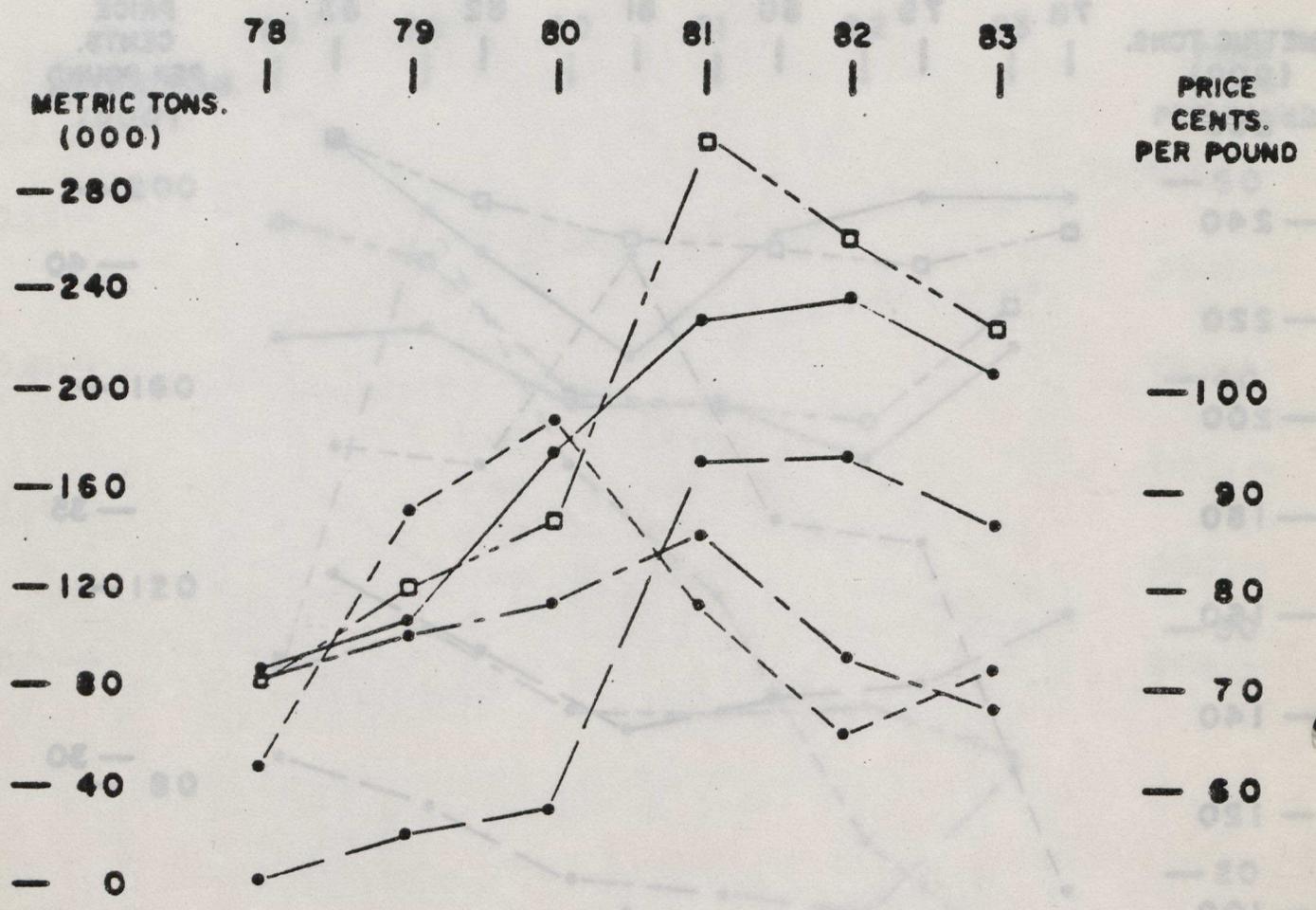
PRODUCTION AND EXPORTATION OF ZINC MEXICO 1978 - 1983



- Production
- - -○- Exportation
- - -○- Average price
- - -○- Consumption
- - -□- Consumption plus export

GRAPH - 3

PRODUCTION AND EXPORTATION OF COPPER MEXICO 1978 - 1983



- Production
- - -○- Exportation
- - -○- Average price
- · - -○- Consumption
- · - -○- Consumption plus export

GRAPH - 4

Documents.

TO/À • See distribution below

• LCT

REFERENCE
RÉFÉRENCE •

SUBJECT
SUJET • THE MINING INDUSTRY IN MEXICO

Security/Sécurité
Accession/Référence
File/Dossier 6110-MEX/MCH 6147-MEX-60
Date January 8, 1986
Number/Numéro LCT-0036

ENCLOSURES
ANNEXES

DISTRIBUTION

DRIE Regional
Offices/
Directors of
Trade

MGL
TEIC

Dept. of
Energy, Mines
and Resources

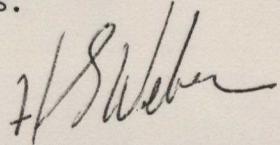
The enclosed market booklet on the "Mining Industry in Mexico" was produced by the Commercial Division in our Mexican Embassy.

NOTE, this report also includes a summary of MAJOR MINING INDUSTRY PROJECTS (Section 4) and sufficient supporting data in other sections to allow a potential Canadian exporter to determine whether Mexico warrants further study by him.

This study is being mailed out to Canadian firms which participated on the Department's stand at the Mexican Mining Congress and Exposition (see list attached) and an additional mailing to key mining Canadian equipment firms will be undertaken by Tom Beaton, Machinery and Electrical Equipment Branch, 992-0096, DRIE.

Additional copies of the book can be obtained from our Embassy in Mexico, or limited copies are available from this office.
- H.G. Weber at 995-0460.

Would you please see that one copy of this book is forwarded to the appropriate Provincial officials.



H.G. Weber

Form with header information, including a title and a date field.

THE UNIVERSITY OF TEXAS AT AUSTIN

LIBRARY OF THE UNIVERSITY OF TEXAS AT AUSTIN

The enclosed report, prepared by the Mining Industry in Mexico, was prepared by the National Bureau of Economic Research.

This report also includes a summary of the findings of the study. The study was conducted by the National Bureau of Economic Research, and the findings are presented in the report. The report is available for purchase from the National Bureau of Economic Research, 1200 16th Street, N.W., Washington, D.C. 20036.

Additional copies of the report can be obtained from the National Bureau of Economic Research, 1200 16th Street, N.W., Washington, D.C. 20036.

You may also obtain a copy of the report from the National Bureau of Economic Research, 1200 16th Street, N.W., Washington, D.C. 20036.

The report

MEXICAN MINING CONGRESS

MAZATLAN, MEXICO

List of Participants

COMPANY

Teledyne Canada Mining Products
P.O. Box 130
35 Elgin Street, North
Thornbury, Ontario
N0H 2P0

Tel: (519) 599-2015
Telex: 06-875792

John T. Hepburn Limited
914 Dupont Street
Toronto, Ontario
M6H 1Z2

Tel: (416) 671-2200
Telex: 06-968793

R.A. Warren Equipment Ltd.
P.O. Box 67, Highway 11 North
North Bay, Ontario
P1B 8G8

Tel: (705) 474-2331
Telex: 067-76114

ON-SITE REPRESENTATIVES

Mr. Mike Mulligan
Sales Manager

Mr. John Hepburn
Manager

Mr. Went Wheatley
Sales Manager, Mining Equipment

Mr. Henry Bursey
President

Mr. Ralph K. Clark
Sales and Marketing Manager

Sr. Thomas J. Baker
Vice Presidente
Contrapoceras y Equipos

PRODUCTS

Pneumatic rock drill spare parts,
hydraulic breaker systems,
underground service vehicles.

Single drum, double drum and friction
type mine hoists and hoist accessories.

Spare parts for underground mining
equipment, remanufactured underground
mining equipment.

MINING EQUIPMENT

Telex: 083-18114
Tel: (705) 434-5331

918 808
North Bay, Ontario
P.O. Box 87, Highway 11 North
R.A. Harten Equipment Ltd.

Telex: 02-368793
Tel: (416) 671-5500

McH 125
Toronto, Ontario
314 Dupont Street
John T. Heppburn Limited

Telex: 06-832795
Tel: (513) 599-5015

MOH 590
Thornbury, Ontario
32 Elgin Street, North
P.O. Box 130
Teredyne Canada Mining Products

COMPANY

Construoceras y Equipos
Vice Presidente
Sr. Thomas J. Baker

Sales and Marketing Manager
Mr. Ralph K. Clark

President
Mr. Henry Bursey

Sales Manager, Mining Equipment
Mr. Mont Wheatley

Manager
Mr. John Heppburn

Sales Manager
Mr. Mike Mulligan

ON-SITE REPRESENTATIVES

List of Participants

MEXICAN MEXICO

MEXICAN MINING CONGRESS

mining equipment,
equipment, remanufactured underground
Spare parts for underground mining

Type mine hoists and hoist accessories,
single drum, double drum and friction

underground service vehicles,
hydraulic breaker systems,
pneumatic rock drill spare parts,

PRODUCTS

Dynatec Mining Limited
10720 Yonge Street
Richmond Hill, Ontario
L4C 3C9

Tel: (416) 883-4022
Telex: 06-986679

Mr. F. Edwards
Vice President, Engineering
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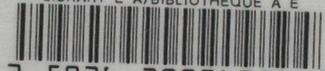
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