

## THE MINERAL INDUSTRY OF

# NICARAGUA

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By fall 1998, Nicaragua's economic reforms had begun to overcome the effects of a decade of civil war and economic dislocation when Hurricane Mitch came ashore. The country, which was one of the poorest in Central America, was one of the hardest hit. Having sustained more than \$1 billion in damage, the country will probably not recover quickly from the storm. Nicaragua's gross domestic product (GDP), based on purchasing power parity, was estimated to be \$11.6 billion in 1998 (the latest available datum for marking the country's economic growth, which had been at the rate of about 4% per year). The overall damage from the storm will likely slow the GDP growth rate as much as one percentage point in the 1999 and 2000 period (U.S. Central Intelligence Agency, 1999, Nicaragua—Economy, World Factbook, accessed May 1, 2000, at URL <http://www.odci.gov/cia/publications/factbook/nu.html>).

It was only in 1997, after many years of relatively low output, Nicaragua's gold production seemed ready to accelerate toward higher levels; Nicaragua had been the world's 14th or 15th largest gold producer in the 1940's and 1950's. Even so, mineral production in 1999 accounted for only a fraction of 1% of the country's GDP.

Corporacion Nicaraguense de Minas (INMINE) was established in 1979 to nationalize, administer, direct, and promote the country's mining industry and to control permits and licenses for mining concessions. Since 1990, the Government of Nicaragua has devoted increasing attention to modernizing its legal framework. All metallic and nonmetallic resources are the property of the State. The mining law of 1996 was to bring the awarding of concessions and the tax structure into closer accord with practice in much of the rest of the western world. Changes were made to this law in 1997 that would lift the ban on all new natural resource concessions, except for those in forestry, which were to be dealt with later. Besides encouraging the formation and investment of private capital, the 1996 law was simplified in the context of current mining technology. Environmental remediation is a growing priority, given that past mining operations had a poor history of responsibility in Nicaragua. Concession holders are required to maintain environmental standards and to restore any environmental damage. In rural areas, the social and economic value of small-scale miners, or *guiriseros*, was recognized, and they were given legal access to resources, mainly gold (Mining Journal, 1996, p. 4).

INMINE operated several small gold and silver mines mostly in sparsely populated areas in the northwest and primarily for export, which was controlled by the Central Bank of Nicaragua. Most output of bentonite, gypsum, and lime was also exported. Other industrial minerals, such as cement, salt, and sand and gravel, were consumed domestically (table 1). Although

INMINE controlled most of the country's mineral exploration and production operations, the Government established the Corporaciones Nacionales del Sector Publico in 1990 to acquire INMINE with the aim of returning firms to former owners, selling them to private investors, and closing unprofitable companies.

El Limon property, which was Nicaragua's largest producer of gold, was operated by Minera de Occidente S.A., 95% of which was owned by Triton Mining Corp. (Canada), but acquired by Black Hawk Mining Inc. (Canada) when it merged with Triton. The property included two open pits with an adjacent cyanide-processing plant and the underground Talavera Mine 4 kilometers (km) to the west. The mill was expanded to treat 1,000 metric tons per day (t/d), 500 to 600 t/d from the Talavera Mine, and the remainder from the open pits, an arrangement that enabled production of 36,839 ounces, slightly more than 1,200 kilograms (kg) in 1996 (David Jenkins, Vice President Exploration, Triton Mining Corp., oral commun., 1997) and 48,000 ounces (nearly 1,500 kg) in 1997. Black Hawk realized an output of 49,658 ounces (about 1,545 kg) in 1998 and expected to produce more than 2 metric tons (t) of gold in 1999. Proven and probable reserves at the beginning of 1999 amounted to 12.3 t of gold (Metal Bulletin, 1999b).

Canada-based Greenstone Resources Ltd. acquired a 75% interest in La Libertad gold mine from the Nicaraguan Government in 1994 and negotiated for the other 25% share of ownership in 1996. Originally, the 120-square-kilometer concession surrounded a small open pit mine, but after nearly 13,000 meters of reverse-circulation drilling, Greenstone projected reserves of 1.5 million ounces (about 46.7 t) of gold at La Libertad concession's Cerro Mojon locality (Greenstone Resources Ltd., 1997). By the beginning of 1997, major stockpiles were created for heap leaching, and the first gold was poured during the second quarter. Leach agglomeration using lime was changed to cement to effect better recovery. Output fluctuated but was to be about 1,850 kg by the end of 1997 (Northern Miner, 1998). Technical delays, some weather related, others merely startup problems that are not uncommon in the mining world, however, took place from time to time into 1998.

Meanwhile, during a period of adjustment of the heap-leach process, an aggressive drilling program by Greenstone identified a 15-km-long structure of continuous mineralization, now called the Cerro Mojon corridor, along which more than 30 en echelon target veins are positioned (Northern Miner, 1997). Greenstone contemplated a 4-km-long surface-mining "super pit" provided gold prices stabilized in a range comfortably above \$300 per ounce. Gold prices remained soft through 1998 and most of 1999, however, and production at a cost of \$273 per ounce at Cerro Mojon and \$286 per ounce at the Bonanza Mine did not support expenses. After writing down its reserves to reflect lower prices and selling the Bonanza mine (Metal Bulletin,

1999a), Greenstone found itself in a situation of borderline solvency at the end of the year (Northern Miner, 1999).

Cement was produced by the state-owned Compania Nacional Productora de Cemento. Empresa Nicaraguense de Minerales No Metalicos controlled several of the state's industrial mineral companies, which included Empresa Rotowa S.A. for bentonite, Yesera Centroamericana S.A. for gypsum, and Empresa Piedra Cal S.A. and Empresa Cal El Pueblo for limestone. Inversiones Mineras S.A. (IMISA) functioned as a holding company to promote and expand its affiliated production companies. IMISA incorporated Arenas S.A. (sand and gravel), Canteras S.A. (dimension stone), and Calizas S.A. (limestone). Salt was produced by private companies.

Nicaragua relied on imports for mineral fuel, especially crude oil from Venezuela, although the Government conducted long-term studies in support of exploration for both oil and natural gas offshore the Caribbean and Pacific coasts. Esso Standard Oil S.A. Ltd. of Nicaragua supplied most of the country's petroleum.

Geothermal energy, which was an important energy resource, had an estimated potential of 1,200 megawatts (MW). The 70-MW Momotombo geothermal plant, on the north shore of Lake Managua, accounted for 20% of Nicaragua's installed capacity, but was not producing more than a modest fraction of its capacity. Unocal Geotermica Nicaragua S.A., Unocal's (United States) corporate unit, agreed to an exploration contract for geothermal energy in Nicaragua, which marked the company's first geothermal venture in Latin America, but had not revealed any successes through 1999 in the mining literature (Reuters Limited, 1997).

Mining in Nicaragua has great potential for expansion. The Government planned to revive the industry with financial and technical aid from abroad, but recovery from the effect of Hurricane Mitch would probably be a higher priority in terms of remediation and reconstruction.

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## Major Sources of Information

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TABLE 1  
NICARAGUA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodities 3/	1995 e/	1996 e/	1997 r/	1998	1999 e/
Bentonite	800	850	926	875 e/	900
Cement	324,000	360,000 r/ 4/	377,000	377,000	350,000
Gold, mine output, Au content	kilograms 1,316 4/	1,500	2,562	3,834	2,700
Gypsum and anhydrite, crude	12,500	12,500	15,820	22,660	23,000
Lime	3,600	3,600	7,285	58,527	58,000
Petroleum refinery products	thousand 42-gallon barrels 4,800	4,455 r/ 4/	5,559	5,650 e/	5,600
Salt, marine e/	15,000	15,000	13,619	15,132	15,000
Sand and gravel	thousand tons 1,300	1,350	434	696	700
Silver, mine output, Ag content	kilograms 2,400	2,500	1,077	1,945	1,400

e/ Estimated. r/ Revised.

1/ Estimated data are rounded to no more than three significant digits.

2/ Includes data available through May 1, 2000.

3/ In addition to the commodities listed, Nicaragua produced a variety of industrial minerals to meet domestic needs. Output of these materials was not reported, and information was inadequate to make reliable estimates.

4/ Reported figure.

TABLE 2  
NICARAGUA: STRUCTURE OF THE INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity ownership	Location of main facilities	Annual capacity
Bentonite	Empresa Rotowa S.A. [(Corporacion Nicaraguense de Minas (INMINE), (Government, 100%)]	South of Sebaco, Matagalpa Department	4
Cement	Compania Nacional Productora de Cemento (Government, 100%)	San Rafael del Sur, Managua Department	700
Gold-silver	kilograms Minera de Occidente S.A. [Blackhawk Mining Inc. (Canada), 95%]	El Limon Mine, Leon Department	2,000
Do.	do. Mining of Nicaragua S.A. (Greenstone Resources Ltd., 100%)	Cerro Mojon Mine, Chontales Department	1,850
Gypsum	Yesera Centroamericana S.A. (INMINE, 100%)	Santa Rosa del Penon, Leon Department	25
Petroleum products	thousand 42-gallon barrels Esso Standard Oil S.A. Ltd. (100%)	Managua, Managua Department	5,700