

## THE MINERAL INDUSTRY OF

# LAOS

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The Lao People's Democratic Republic is a tiny landlocked country on the Indochinese Peninsula. The economy is small, undiversified, and dominantly agrarian; it is based primarily on rice farming and slash-and-burn cultivation. The mining and quarrying sector of the economy in 1994 was virtually negligible. However, the small-scale mining of minerals, such as antimony, precious gemstones, gold, lead, silver, and tin, has had a long history. The French, with the founding of the Service Geologique de l'Indochine in the latter part of the 19th century, conducted a systematic geological survey of the country that resulted in the cataloging of a large number and variety of mineral occurrences. However, the survey made no substantial new discoveries and no new mining activities of any significance resulted.

The Government passed in April a more liberal foreign investment law that took effect June 20, supplanting its 1988 predecessor. The new law established a flat-rate corporate tax of 20%, a 1% import duty, and allows 100% foreign ownership of business ventures.<sup>2</sup>

Although the mineral resources of Laos included antimony, bauxite, chrome, coal including lignite, gold, gypsum, iron ore, lead and zinc, manganese, potash, rock salt, sapphire, silver, tin, and, probably, petroleum, the only minerals of consequence in the country during the year were gypsum and tin. Gypsum has been mined in Savannakhet Province for about 15 years and tin has been the foremost mineral produced in the country for more than 30 years.

Some of the other mineral resources have been extracted, but only by using primitive and unsystematic methods. In addition, limestone has been quarried near Thakhek in Khammouane Province and used locally for highway construction; some also has been exported to Thailand. Other construction materials, such as sand and gravel, also have been extracted on a small scale, mainly from the renewable deposits of the Mekong River that constitutes most of the country's western boundary with Thailand. Essentially, the mineral industry of Laos was unstructured, sporadic, and minor, accounting for only about 1% to 2% of the county's gross domestic product.

Gold was found throughout Laos in deposits occurring in primary quartz veins, in association with base metals, and in placer deposits. Production in 1994 continued to be obtained by panning at numerous sites along tributaries of the Mekong River in both the north and the south of the country. Newmont Mining Corp. of the United States entered into a

long-term agreement with the Government to explore for and produce gold from a 6,500-square kilometer (km<sup>2</sup>) area in the provinces of Sayabouri and Vientiane. Australia's CRA Exploration Pty. Ltd. acquired the prospecting rights for gold over a 5,000-km<sup>2</sup> area in Khammouane and Savannakhet Provinces in the south of the country.<sup>3</sup>

Production of gypsum was from Savannakhet Province and was marketed to customers across the border in Vietnam where demand depended on the cement industry. The mine and plant originally were developed with Vietnamese assistance in 1979, but mining was operated by the State Mining Enterprise, the State-owned company in the mining sector. Production characteristically has been suspended during the rainy season, typically occurring from June to October, although stockpiled material may be processed during this period. The gypsum underlies potash and rock salt horizons in a thick and extensive evaporite sequence. High-grade rock salt formerly was mined from these evaporite deposits. However, mining methods, production, and marketing patterns of the product were unknown.

Laos' iron ore deposits occur mainly in Xiang Khoang Province, in the north-central part of the country, where an iron mine previously was developed with assistance from Vietnam. The principal deposits were Pha Lek and Phou Nhouan, both of which have been deemed to have economic potential. However, they remained basically undisturbed owing to inaccessibility, lack of infrastructure, and the high capital cost required for development. Other significant deposits also have been located northeast of Vientiane.

Tin mining continued to be from a group of small mines supporting a cottage industry in the Nam (River) Pathene Valley, about 60 kilometers (km) north of Thakhek in Xiang Khoang Province. All concentrate production was sent to Malaysia for refining. Until gypsum mining started in 1979, tin was the only mineral produced in significant quantities in Laos. Production was mainly from surface enrichments of cassiterite, an oxide of tin, in alluvial and residual material. However, exploration programs have indicated that at least five other areas in the central region of the country are prospective for tin mineralization. These areas, including Ban Thana, to the west in Khammouane Province, and Lak Sao, Nam Pan, Ban Nape, and Ban Nakadok, all in Borikhamxay Province to the northeast, may contain deposits of low-grade ores that could support larger-scale mining operations.<sup>4</sup>

Sapphire was mined, or collected, on an artisanal scale by the local population from placer deposits near Ban Houei Sai, Bokeo Province, in the northwest and from streambeds throughout the southern part of the country.

Anthracite reportedly has been mined since about 1985 from deposits at Bochan, northwest of Vientiane in Vientiane Province. Recent production has been about 10,000 metric tons per year, with an estimated 20% used to cure tobacco domestically and the remainder exported to Thailand. Coal also occurs in the south of the country in Salavan Province and in the north of the country in Phongsaly Province.<sup>5</sup>

The Thai Laos Lignite consortium led by the Ngarn Tavee Group began in the spring an assessment of the country's lignite potential with the assistance of the Electricity Generating Authority of Thailand. The consortium was planning to develop a 600-megawatt (MW) lignite-burning power station based on a provisional estimate of 150 million metric tons of lignite reserves in the northern province of Chiangon Hongsa. All of the power generated will be exported for use in Thailand.<sup>6</sup>

Laos remained in 1994 one of the world's poorest countries. Its infrastructure was primitive at best, having no railroads (although a Thai railroad reaches Nong Khai, across the Mekong River from Vientiane, which serves as a main trade artery for the country) and only a rudimentary transportation system. There were almost 27,530 km of roads, of which about 1,855 km were paved. Another 7,450 km consisted of gravel, crushed stone, or other types of improved surface. The remaining 18,225 km or so of road

was unimproved loose surface, often impassable during the rainy season.

The country has almost 4,590 km of inland waterways, primarily the Mekong River and its tributaries. An additional 2,900 km was navigable by craft drawing less than 0.5 meters (m).

The country had one 136-km pipeline for petroleum refinery products that was thought to be in the process of being extended from Vientiane to Vinh, Vietnam.

There were 53 airports in the country, 41 of which were considered usable. There were only eight airports with paved runways. There were no airports with runways more than 3,659 m in length and only one airport with a runway longer than 2,440 m. Only one airport, the Wattay International in Vientiane, had regularly scheduled flights.

Laos had an electric power generating capacity of 226 MW and produced power at the approximate level of 220-kilowatt-hours per capita.<sup>7</sup>

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<sup>1</sup>Text prepared June 1995.

<sup>2</sup>Indochina Chronology, V. XIII, No. 2, Apr.-June 1994, p. 13.

<sup>3</sup>Mining Annual Review 1995. Laos. Mining Journal (London), in press.

<sup>4</sup>Centre for Petroleum and Mineral Law and Policy, University of Dundee, UK, 1993: Mineral Investment Conditions in Lao PDR, Professional Paper No. 5, p. 32.

<sup>5</sup>U.S. Embassy, Vientiane, Laos. State Dep. Telegram 00004, Jan. 3, 1994, 2 pp.

<sup>6</sup>Mining Journal (London). V. 322, No. 8272, Apr. 22, 1994, p. 290.

<sup>7</sup>U.S. Central Intelligence Agency, Washington, DC: The World Factbook 1994, p. 225.

TABLE 1  
LAOS: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/	1990	1991	1992	1993	1994
Coal, all grades	3,500	5,000	7,500	10,000	10,000
Cement (from imported clinker)	6,500	7,000	7,000	7,000	10,000
Gemstones (sapphires) carats	30,000	35,000	35,000	35,000	40,000
Gypsum	53,000 4/	76,800 4/	79,900 4/	80,000	85,000
Salt, rock	8,000	8,000	8,000	8,000	8,000
Tin, mine output, Sn content	300 t/ 4/	300	300	300	200

e/ Estimated.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits.

2/ Table includes data available through June 6, 1995.

3/ In addition to the commodities listed, crude construction materials such as sand and gravel and varieties of stone presumably are produced, but available information is inadequate to make reliable estimates of output levels.

4/ Reported figure.