



# 2009 Minerals Yearbook

---

**LAOS**

---

# THE MINERAL INDUSTRY OF LAOS

By Yolanda Fong-Sam

In 2009, Laos produced a variety of mineral commodities. These included silver, zinc, gold, and copper of which production increased by 119.8%, 54.6%, 16.2%, and 5.4% respectively, compared with that of 2008 (table 1).

## Government Policies and Programs

The Department of Geology and the Department of Mines are the two Government agencies that oversee Laos' Mining Law, which includes inspecting and monitoring mineral development activities in the country. Both agencies also assist in the negotiation of mining contracts and in mineral exploration and mining licensing activities, promote investment in the mining sector, maintain geologic databases, and provide mineral exploration support and data analysis studies (Department of Geology and Mines of Laos PDR, 2010a, b).

## Structure of the Mineral Industry

Laos has a variety of undeveloped mineral resources. The Government recognized mining as a critical sector of the economy and continued to support development of the sector by promoting local and foreign investment. In 2009, the significant producers of copper, gold, and silver in Laos were the Australian companies Minerals and Metals Group Lane Xang Minerals Ltd. (MMG LXML) and PanAust Ltd. The country's major mineral industry facilities are listed in table 2.

## Commodity Review

### Metals

**Base and Precious Metals.**—In 2009, the Sepon copper-gold project produced a total of 67,561 metric tons (t) of copper cathodes, 3,267 kilograms (kg) of gold, and 1,031 kg of silver, which represented increases of 5.4% and 12.9% and a decrease of 40.7%, respectively, compared with those of 2008. MMG LXML held a 90% interest in the Sepon project, and the Government held the remaining 10% interest. The project was located 40 kilometers (km) north of the town of Sepon in Savannakhet Province in the south-central region of the country. In late 2009, the Sepon project started a \$60.4 million expansion development that would increase its copper cathode production capacity to 80,500 metric tons per year (t/yr) from 65,000 t/yr when commissioned in late 2010. For 2010, the company projected that copper cathode production would stay at about 70,000 t and that gold production would be about 3,000 kg. Through 2009, MMG LXML continued copper resources definition drilling in the Thengkham South area of the project to identify copper oxides; as for gold, the company drilled on the margins of the Khanong pit to study a previously identified gold mineralization in the oxide zone (Minerals and Metals Group, 2009, p. 6-8; 2010, p. 1).

PanAust through its Lao-registered company Phu Bia Mining Ltd. (PBM) owned a 90% interest in the Phu Kham copper-gold operation, and the Government owned the remaining 10%. The Government and PBM had a mineral exploration and production agreement that regulated exploration and mining within the company's 2,636-square-kilometer-(km<sup>2</sup>) contracted area. In 2009, the Phu Kham copper-gold operation, which is located approximately 120 km north of the capital city of Vientiane, completed its first full year of copper concentrate production with total output of 54,019 t. The mine also produced 1,341 kg of gold and 13,695 kg of silver. The company planned to finish a review of the Phu Kham project in 2010 to determine options to expand its operations to maintain copper production at 70,000 t/yr as ore grade levels decrease. Another project held by PanAust in Laos was the Phu Kham heap-leach gold operation; this operation produced 425 kg of gold in 2009, which was a decrease of 35% compared with the 652 kg produced in 2008. The company anticipated the cessation of the heap-leach gold project operation sometime in 2010 owing to gold ore depletion. In 2009, PanAust conducted a feasibility study in the Ban Houayxai gold-silver deposit, which is located 25 km west of the Phu Kham copper-gold operation. Following encouraging results based on the feasibility study, which focused in the open pit mining and carbon-in-leach processing of oxides, the company started a drilling program to determine the extent of the project resources (PanAust Ltd., 2009, p. 5-6).

**Bauxite and Alumina.**—In 2009, the Laos Bolaven Plateau bauxite project, which was located in the southern part of the country, was being developed through Sino Australian Resources (Laos) Co., Ltd. (SARCO), which was a joint venture between China Nonferrous Metals Industry's Foreign Engineering and Construction Co., Ltd. of China (51%) and ORD River Resources Ltd. of Australia (49%). SARCO had two tenements in the property; they were the LSI tenement, which covered a 66-km<sup>2</sup> area, and the Yuqida tenement, which covered a 421-km<sup>2</sup> area. SARCO applied for a license to explore an additional 867-km<sup>2</sup> area (located adjacent to the two existing tenements), but by the end of 2009, it was still awaiting Government approval on the new tenement (ORD River Resources Ltd., 2009, p. 4).

### Industrial Minerals

**Potash.**—In January, SinoAgri Mineral Resources Exploration Ltd., which was a joint venture between Chinese companies Beijing Jiang Zhi Yuan Investment Ltd. and China National Agricultural Means of Production Group Corp. (CNAMPGC), signed a 30-year agreement with the Government of Laos for a potash exploitation license in a 35-km<sup>2</sup> area. The joint-venture owned a prospecting license for potash deposits in an area of about 237 km<sup>2</sup>. In 2009, SinoAgri Mineral Resources continued the construction of a 100,000-t/yr-capacity potash pilot plant. The plant, which is located in northeast Sakhon Nakon Basin in Khammouan Province, was expected to be

completed by 2010 at a cost of about \$37 million. The first batch of potash was expected to be produced by the first quarter of 2010. The company planned to increase the plant's capacity to 1 million metric ton per year (Mt/yr) in a second phase of development (no date was yet set), and a subsequent expansion of the plant would increase the capacity to 3 Mt/yr by 2017 (Fertilizer Week, 2009; Fertilizer.org, 2010).

During 2009, several other potash projects were in progress in Laos. These included the development of a potash mine and plant in Vientiane Province. The mine, which was under construction by Sinohydro Corp. of China, was expected to be commissioned in 2011 and would have an initial capacity of 120,000 t/yr of potash; further expansion plans were projected to increase the mine's capacity to 1 Mt/yr of potash. The potash plant was being built by Yuntian Yunnan Zhongliao Mining Development and Investment Co. Ltd. of China and had a planned capacity of between 0.5 and 1 Mt/yr. Also in 2009, the Viet-Lao Rock Salt and Chemical Joint Stock Co., which was a joint venture between Vietnam National Chemical Corp. (Vinachem) and the Government of Laos, was developing a potash mining project in Khammouan Province with a capacity of between 0.5 and 1 Mt/yr (Fertilizer Week, 2009).

### **Mineral Fuels**

**Oil and Natural Gas.**—In 2009, Salamander Energy PLC of the United Kingdom (30%, operator) analyzed two-dimensional seismic data and geochemical samples in order to select a location at which to drill the Bang Nouan-1 well in 2010. The well will be drilled on acreage held under the Savannakhet production-sharing contract (PSC), which covers an area of 19,520 km<sup>2</sup>. In December 2009, Salamander farmed out 30% of the Savannakhet Block to Origin Energy Ltd. of Australia; the remaining assets were distributed as follows: PetroVietnam (25%), IFC (10%), and NCD/LIBC (5%). Salamander also had a 20% interest in the Champasak & Saravan PSC, which covers 41,140 km<sup>2</sup> and is located south of the Savannakhet PSC. Salamander was planning to acquire seismic data and to begin further exploration of the Champasak & Saravan PSC by 2011 (Salamander Energy PLC, 2010a, p. 12-13; 2010b, c).

### **Outlook**

In 2010, copper cathode production in the Sepon project is expected to remain at about 70,000 t, and gold production, at

about 3,000 kg. Copper production is expected to increase in 2011 to 80,500 t/yr after an expansion project is commissioned in the Sepon project in late 2010. Production of copper concentrates in the Phu Kham project is expected to remain at 70,000 t/yr during 2010. Laos is expecting to begin producing potash in 2010 once the SinoAgri Mineral Resources potash pilot plant is commissioned. Increases in the production of potash are expected in the next few years as mines and plants that begin construction in 2009 are completed in 2010 and 2011.

### **References Cited**

- Department of Geology and Mines of Laos PDR, 2010a, Department's functions: Department of Geology and Mines of Laos PDR. (Accessed January 27, 2010, at <http://www.dgm.gov.la/>.)
- Department of Geology and Mines of Laos PDR, 2010b, Policy and legislation: Department of Geology and Mines of Laos PDR. (Accessed January 27, 2010, at <http://www.dgm.gov.la/>.)
- Fertilizer.org, 2010, SINO-AGRI potash project in Laos: China National Agricultural Means of Production Group Corp. and SINO-AGRI Mineral Resources Co. Ltd., presentation, November. (Accessed December 6, 2010, at [www.fertilizer.org/ifacontent/download/46697/677426/version/1/file/2010\\_crossroads\\_wang\\_slides.pdf](http://www.fertilizer.org/ifacontent/download/46697/677426/version/1/file/2010_crossroads_wang_slides.pdf).)
- Fertilizer Week, 2009, Projects—CNAMPGC jv builds potash pilot plant in Laos: Fertilizer Week, v. 23, no. 29, p. 4.
- Minerals and Metals Group, 2009, Quarterly report for the three months ending 30 December 2009: Minerals and Metals Group, 9 p. (Accessed August 16, 2010, at [http://www.mmg.com/common/files/100128\\_MMG\\_Dec\\_Quarterly\\_Report\\_09\(1\).pdf](http://www.mmg.com/common/files/100128_MMG_Dec_Quarterly_Report_09(1).pdf).)
- Minerals and Metals Group, 2010, Sepon fact sheet: Minerals and Metals Group, 2 p. (Accessed August 16, 2010, at [http://www.mmg.com/common/files/MMG\\_Sepon\\_Oct-2010.pdf](http://www.mmg.com/common/files/MMG_Sepon_Oct-2010.pdf).)
- ORD River Resources Ltd., 2009, Annual report: Sydney, Australia, ORD River Resources Ltd., 81 p. (Accessed December 2, 2010, at [http://www.ord.com.au/ASX/Announcements/ORD\\_A.report.2009.pdf](http://www.ord.com.au/ASX/Announcements/ORD_A.report.2009.pdf).)
- PanAust Ltd., 2009, Annual report 2009: PanAust Ltd., 99 p. (Accessed August 16, 2010, at [http://www.panaust.com.au/sites/default/files/reports/Annual\\_Report\\_2009.pdf](http://www.panaust.com.au/sites/default/files/reports/Annual_Report_2009.pdf).)
- Salamander Energy PLC, 2010a, Annual report 2009: Salamander Energy PLC, 88 p. (Accessed April 30, 2010, at [http://www.salamander-energy.com/~media/Files/S/Salamander/PresentationsReportsPDFs/Salamander\\_AR\\_2009.pdf](http://www.salamander-energy.com/~media/Files/S/Salamander/PresentationsReportsPDFs/Salamander_AR_2009.pdf).)
- Salamander Energy PLC, 2010b, Operations—Champasak & Saravan: Salamander Energy PLC. (Accessed December 13, 2010, at <http://www.salamander-energy.com/operations-map/where-we-operate/lao-pdr/champasak.aspx>.)
- Salamander Energy PLC, 2010c, Operations—Savannakhet: Salamander Energy PLC. (Accessed December 13, 2010, at <http://www.salamander-energy.com/operations-map/where-we-operate/lao-pdr/savannakhet.aspx>.)

TABLE 1  
LAOS: ESTIMATED PRODUCTION OF MINERAL COMMODITIES<sup>1,2</sup>

(Metric tons unless otherwise specified)

Commodity <sup>3</sup>	2005	2006	2007	2008	2009
Barite	28,500	29,000	29,000	29,000	29,000
Cement	250,000	400,000	400,000	400,000	400,000
Clay	8,155 <sup>4</sup>	5,200	5,500	5,500	5,500
Coal, lignite	232,934 <sup>4</sup>	233,000	620,000	600,000	600,000
Copper:					
Mine output, Cu content	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	--
Concentrate	--	--	--	24,929 <sup>4</sup>	54,019 <sup>4</sup>
Metal, refined	30,480 <sup>4</sup>	60,803 <sup>4</sup>	62,541 <sup>4</sup>	64,075 <sup>r,4</sup>	67,561 <sup>4</sup>
Gemstones, sapphire	carats	1,180,000	1,200,000	1,200,000	1,200,000
Gold	kilograms	6,232 <sup>r,4</sup>	6,068 <sup>r,4</sup>	5,137 <sup>r,4</sup>	4,333 <sup>r,4</sup>
Gravel		97,400	100,000	120,000	120,000
Gypsum		774,000	775,000	775,000	775,000
Limestone		750,000	750,000	750,000	750,000
Salt, rock		34,139 <sup>4</sup>	35,000	35,000	35,000
Sand, construction materials		85,300	90,000	100,000	100,000
Silver	kilograms	3,405 <sup>4</sup>	6,331 <sup>4</sup>	4,500 <sup>4</sup>	6,700 <sup>r</sup>
Tin, mine output, Sn content <sup>5</sup>		830 <sup>r</sup>	650 <sup>r</sup>	570 <sup>r</sup>	690 <sup>r</sup>
Zinc, mine output, Zn content		3,410	1,100	3,000 <sup>r</sup>	2,200 <sup>r</sup>

<sup>r</sup>Revised. -- Zero.

<sup>1</sup>Estimated; estimated data are rounded to no more than three significant digits.

<sup>2</sup>Table includes data available through November 10, 2010.

<sup>3</sup>In addition to the commodities listed, crude construction materials, such as sand and gravel, and varieties of stone were produced irregularly.

<sup>4</sup>Reported figure.

<sup>5</sup>Estimated figures based on Laos inferred exports of titanium ores to China, Thailand, and Vietnam.

Sources: Laos' Ministry of Industry and Handicraft, Lao PDR 2004 Mineral Yearbook; U.S. Geological Survey Minerals Questionnaire for Laos (2002-07); Oxiana Ltd. Annual Reports 2005-08 and Quarterly Reports 2005-07; Pan Australian Resources Ltd., Annual Report 2009 and Quarterly Reports 2005-07; Minerals and Metals Group Lane Xang Minerals Ltd. (MMG LXML) Quarterly Reports 2009; World Metal Statistics, December 2010.

TABLE 2  
LAOS: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
Barite		Barite Mining Co., Inthavong Mining Co., Lao Development Construction Co., Phethongkham Co., Oravan Barite Co., and Singphooufar Co.	Muongfuong and Sanakham, Vientiane Province	30,000 <sup>1</sup>
Cement		Wanrong Cement I	Vangvieng, Vientiane Province	78,000
Do.		Wanrong Cement II (Yuannan Industrial Economic Co., 60%, and Agricultural and Forestry Development and Service Co. of Laos, 40%)	do.	200,000
Do.		Wanrong Cement III	Savannakhet Province	200,000
Coal:				
Anthracite		Agriculture Industry Development Enterprises	do.	60,000
Lignite		Viengphoukha Coal Mine Co. Ltd.	Viengphoukha, Luangnamtha Province	300,000
Copper:				
Mined ore output, Cu content		Minerals and Metals Group Lane Xang Minerals Ltd. (MMG LXML), 90%, and Government, 10%	Sepon, Vilabouly District, Savannakhet Province	67,600
Refined		do.	do.	65,000
Do.		Phu Bia Mining Ltd. (wholly owned subsidiary of PanAust Ltd.), 90%, and Government, 10%	Xaisomboun special zone, 120 kilometers north of Vientiane, Vientiane Province	65,000
Gemstones, sapphire	carats	Bokeo Mining Co. Ltd.	Bokeo Province	300,000
Do.	do.	Buhae Industrial Corp.	Houaxay District, Bokeo Province	500,000
Do.	do.	Lao International Trade and Service	do.	400,000
Gold, mine output, Au content	kilograms	Minerals and Metals Group Lane Xang Minerals Ltd. (MMG LXML), 90%, and Government, 10%	Sepon, Vilabouly District, Savannakhet Province	7,500
Do.	do.	Phu Bia Mining Ltd. (wholly owned subsidiary of PanAust Ltd.), 90%, and Government, 10%	Xaisomboun special zone, 120 kilometers northeast of Vientiane, Vientiane Province	1,700
Gypsum		Lao State Gypsum Mining Co. Ltd.	Champhon District, Savannakhet Province	200,000
Do.		Mining Development Economy Cooperation (OECD)	Tha Kect District, Khammouane Province	150,000
Do.		Savan Gypsum Mining Co. Ltd.	Champhon District, Savannakhet Province	70,000
Do.		LAVICO Co. Ltd. (a Laos-Vietnam joint venture)	Xebangfay District, Khammouane Province	100,000
Limestone		Laos Cement Co. Ltd. (a Laos-China joint venture)	Vangvieng, Vientiane Province	250,000
Do.		Agriculture Industry Development Enterprises	do.	150,000
Do.		V.S.K. Co. Ltd.	Tha Kect District, Khammouane Province	150,000
Do.		Phanangnon Co. Ltd.	do.	100,000
Silver	kilograms	Phu Bia Mining Ltd. (wholly owned subsidiary of PanAust Ltd.), 90%, and Government, 10%	Xaisomboun special zone, 120 kilometers northeast of Vientiane, Vientiane Province	14,000
Tin, mine output, Sn content		Lao-North Korea Tin Mines	Hinboune District, Khammouane Province	120
Do.		S V Mining Co. Ltd.	do.	300
Zinc, mine output, Zn content		Padeang Industry Public (Laos) Co. Ltd. [Majority interest owned by Padeang Industry (Public) Co. Ltd., and minority interest owned by the Government of Laos]	Kaiso, Vangvieng, Vientiane Province	1,100

<sup>e</sup>Estimated; estimated data are round to no more than three significant digits. Do., do. Ditto.

<sup>1</sup>Estimated combined capacity of the six local barite mining companies.