



2015 Minerals Yearbook

FIJI [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF FIJI

By Sean Xun

The Republic of Fiji, an island country in the South Pacific Ocean, is composed of more than 300 islands. It is located on the Pacific Rim at the boundary between the Pacific and Indo-Australian tectonic plates. Several porphyry copper-gold and epithermal gold deposits have been discovered and mined in the Pacific Rim. The mineral industry was of minor importance to Fiji's economy and accounted for less than 1% of the country's gross domestic product (GDP) in recent years. Gold has been the major mineral produced in Fiji since gold was first discovered there in the 1930s. A number of bauxite deposits had been identified in recent years, and foreign investment in these exploration and mining projects was adding value and diversity to the mineral industry (Dome Gold Mines Ltd., 2016b; Fiji Bureau of Statistics, 2016a; Ministry of Lands and Mineral Resources, 2016a).

Minerals in the National Economy

Fiji's real GDP growth rate was 4.2% in 2015 compared with 5.3% in 2013, representing the 6th consecutive year of economic expansion since 2010. The nominal GDP was about \$3.6 billion (FJD7.5 billion¹) in 2015. The manufacturing sector contributed 12% to the GDP, which was the highest among all sectors. The transport and storage, construction, and mining and quarrying sectors contributed 8.2%, 3%, and 0.8% to the GDP, respectively. The construction sector expanded by 12.9% and was one of the fastest growing sectors in 2015. The transport and storage, mining and quarrying, and manufacturing sectors expanded by 8.4%, 6.4%, and 1.4% in 2015, respectively. Domestic cement sales increased by 42.2% to 178,340 metric tons (t) in 2015 owing to the increase in construction activity in Fiji (Reserve Bank of Fiji, 2016a, p. 11; 2016b, p. A48–A50).

Government Policies and Programs

The Ministry of Lands and Mineral Resources is the Government agency that manages all public land initiatives related to the country's mineral and groundwater resources. The total Government-leased land area that is managed by the Ministry of Lands and Mineral Resources accounted for about 4% of the total land mass of Fiji. The Mineral Resources Department (MRD), which is a subunit of the Ministry of Lands and Mineral Resources, is Fiji's national geological survey and mining organization. The MRD develops mining policies, provides geologic information, assists mining investors, and facilitates the exploration for and the development of mineral and petroleum resources in the country. The Ministry of Lands and Mineral Resources performs its duties as authorized by such relevant laws and regulations as the Mining Act, the Oil and Petroleum Act, the Quarry Act, the Surveyors Act, the Land Use Decree 2010, the Land Use Regulations, and

the Environment Management Act (Ministry of Lands and Mineral Resources, 2016a–c).

Production

Gold production increased by 15% to about 1,368 kilograms (kg) in 2015 from 1,187 kg (revised) in 2014. The increase in gold production was attributed to the increase in the amount of ore produced at the Vatukoula gold mine. Silver production decreased by 2% to 354 kg in 2015 from 361 kg (revised) in 2014. Bauxite production, which was estimated based on trade data and stockpile data, decreased by 61% to 250,000 t from 640,000 t in 2014. The decrease was owing to the closure of the Nawailevu Mine and to low output at new mine sites. Cement production increased by 8.5% to 204,000 t owing to increased production at the Tengy Cement factory in Lami and the expansion of construction activities in 2015 (table 1; AICircle.com, 2015; Silaitoga, 2015; Reserve Bank of Fiji, 2016b, p. A49; Tengy Cement Fiji Ltd., 2016; Vatukoula Gold Mines Plc, 2016b; Zhongrun Resources Investment Corp., 2016, p. 9).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities in Fiji. Most of the producing mining companies in Fiji were privately owned. International companies, mainly from China, had started investing in Fiji in recent years. As of yearend 2015, Zhongrun Resources Investment Corp. of China (Zhongrun Resources) owned a 66% interest in the Vatukoula gold mine and planned to purchase the remaining interest in 2016. China's Shandong Xinfu Aluminum & Electricity Group (Xinfu), which owned a bauxite mining business in Fiji, was awarded a mining lease for the third and largest bauxite site in Fiji. The cement plant owned by Tengy Cement Company Ltd. of China had its first full year of operation in 2015 (AICircle.com, 2015; Vatukoula Gold Mines Plc, 2015a, b; Tengy Cement Fiji Ltd., 2016).

Mineral Trade

The value of Fiji's exported goods decreased to \$900 million (FJD1.9 billion), or by 18% compared with that of 2014. The value of reexported goods decreased by 37% to \$360 million (FJD750 million), and the value of domestic exports increased by 2% to \$540 million (FJD1.1 billion). The leading export partners were the United States, which received 16% of Fiji's total exports; Australia, 15%; China, Tonga, and New Zealand, 5% each; and the United Kingdom, 4%. Fiji's major mineral commodity export was gold. In 2015, 1,244 kg of gold was exported compared with 1,232 kg in 2014. Gold exports accounted for 8.3% of total domestic exports, in terms of value, compared with 8.2% in 2014; bauxite contributed 0.4% compared with 1.5% in 2014 (Fiji Bureau of Statistics, 2016b, c).

¹Where necessary, values have been converted from Fiji dollars (FJD) to U.S. dollars at an annual average exchange rate of FJD2.08 = US\$1.00 for 2015.

In 2015, the value of the country's total imports increased to \$2.1 billion (FJD4.4 billion), or by 12.9% compared with that of 2014. The value of imported mineral products (gas oil, aviation and turbine fuel, and light oil) decreased by 28% to \$495 million (FJD1.0 billion), and the value of imports of base metals and articles thereof (iron and steel, and articles of iron and steel) decreased by 1% to \$115 million (FJD239 million). The leading import partners were Singapore, which supplied 19% of Fiji's total imports; Australia and China, 15% each; New Zealand, 14%; the Republic of Korea, 6%; and Japan, 5% (Fiji Bureau of Statistics, 2016b, c).

Commodity Review

Metals

Bauxite and Alumina.—Xinfa, through its subsidiary Xinfa Aurum Exploration (Fiji) Ltd., operated bauxite mines in Fiji. The company had first started bauxite mining at the Nawailevu Mine in Lekutu District, Bua Province, in 2011. That mine was closed in 2014, and rehabilitation of the mine site was in process in 2015. In November 2014, a lease was approved by the Government allowing Xinfa to develop a new bauxite mining site at Votua in Lekutu District, Bua Province. The mine at Votua was expected to yield 400,000 t of bauxite during the life of the mine. Production was started at the mine in April 2015. Also in April, the company was granted a lease for bauxite mining at Dreketi, Macuata, which was its third and largest site in terms of land area. The lease was for an area of 222 hectares (ha) compared with 150 ha for the Nawailevu Mine. Xinfa made 22 shipments of bauxite totaling about 1.2 million metric tons (Mt) to China between 2012 and 2015. According to Xinfa reports, the company made only two shipments in 2015 because of a decrease in market demand. Also, the bauxite in Bua is not classed as high-grade bauxite, and is not attractive at the market. This factor, along with the slow recovery of bauxite prices, contributed to the reduced exports in 2015 (Butabua, 2014; AlCircle.com, 2015; Silaitoga, 2015, 2016; Naidu, 2016).

Gold.—The Vatukoula gold mine, which was the only producing gold mine in Fiji, was owned and operated by United Kingdom-registered Vatukoula Gold Mines Plc (VGM). The mine is located in the northern part of Fiji's main island, Viti Levu. According to VGM, the mine had 128 t of gold resources and 23 t of reserves. The mine had both open pit and underground operations. In 2015, VGM produced an estimated 1,368 kg of gold compared with 1,188 kg in 2014. About 386,000 t of ore and waste were mined at the underground mine in 2015 compared with about 377,000 t in 2014. The average grade of ore from the underground mine in 2015 was 4.64 grams per metric ton (g/t) gold compared with 5.2 g/t gold in 2014. About 474,000 t of ore in total (including 332,000 t of underground ore, 43,000 t of waste fine, and 46,000 t of oxidized ore) was processed compared with 338,000 t in 2014. The average ore head grade was 3.79 g/t in 2015 compared with 4.47 g/t in 2014. The lower grade in 2015 was owing to the lower grade of the underground ore, a higher percentage of low-grade oxidized ore, and reprocessed tailings. The overall mill recovery decreased to 76% in 2015 from 81% in 2014 owing to a higher volume fraction of oxidized ore and reprocessed tailings used in the year. Oxidized

ore and reprocessed tailings have lower recovery rates (about 55% and 40%, respectively) than underground ore. The operating cash cost was \$1,121 per troy ounce (\$36,000 per kilogram) in 2015 compared with \$1,478 per troy ounce (\$48,000 per kilogram) in 2014; the decrease was mainly owing to lower prices for fuel, supplies, and consumables in 2015. According to Zhongrun Resources Investment Corp., operations at VGM in 2015 were focused on increasing production and reducing cost (Vatukoula Gold Mines Plc, 2016a, b; Zhongrun Resources Investment Corp., 2016, p. 9).

Zhongrun International Mining Co. Ltd. (Zhongrun International) of China increased its total holding in VGM to about 66% in 2014 and became the controlling shareholder. In December 2015, Zhongrun International announced that it was ready to begin acquiring the outstanding ordinary shares of VGM, starting on January 11, 2016. According to VGM, substantial funding would be needed to sustain ore output in 2016 and reach the mine's nameplate production capacity of 680,000 metric tons per year (t/yr) in the future (Vatukoula Gold Mines Plc, 2015a; 2015b, p. 1, 2, 15; Zhongrun Resources Investment Corp., 2016, p. 9, 25).

Lion One Metals Ltd. (Lion One) of Canada owned the Tuvatu gold project, which is located 50 kilometers (km) south of the Vatukoula Mine. The total indicated resource of the Tuvatu project was estimated to be about 1.1 Mt grading 8.17 g/t gold, and the inferred resource was 1.3 Mt grading 10.6 g/t gold. In March, a special mining lease was approved by Fiji's Minister of Lands and Mineral Resources that provided exclusive rights for the potential development, construction, and operation of mining, processing, and waste management infrastructure at Tuvatu and the surrounding area. The approval represented the last step of the permitting process. An independent preliminary economic assessment was completed in June 2015. Also in June, the company announced that the first phase of the underground work program would include both dewatering and refurbishment of the existing decline to access mineralization targeted for initial development. During the second phase of the underground work program, a new western portal and a 500-meter decline would be developed to enable access to the central mineralized zone. As of yearend 2015, the company had entered into an agreement with a merchant banking company, Red Lion Management Ltd. of Canada, for an initial \$500,000 line of credit to fund development expenditures, and the site had been cleared for the proposed processing plant facilities and infrastructure. The project was projected to have a mine life of about 6 years, an average recovery rate of 86.3%, and average annual production of 1,782 kg of gold (Freudigmann and others, 2015, p. 1.12; Lion One Metals Ltd., 2015a–d).

The Namosi project, which covers an area of approximately 724 square kilometers, is located in Namosi and Naitasiri Provinces, approximately 30 km west of Suva. The project was owned by the Namosi Joint Venture (Newcrest Mining Ltd. of Australia, 70.67%; Mitsubishi Materials Corp. of Japan, 27.33%; and Nittetsu Mining Co. Ltd. of Japan, 2%). As of 2015, exploration activities at Namosi were focused on the Waisoi copper-gold deposit, the Waivaka Corridor deposit, and some early-stage exploration targets. The Waisoi project, which consists of two deposits, Waisoi East and Waisoi West,

was a copper and gold project in the prefeasibility stage. An environmental impact assessment aimed at evaluating the potential social and environmental impacts of a mine at Waisoi was underway in 2015. The project, once developed, would be an open pit mine that produces copper concentrate with gold as a byproduct for export. As of December 2015, the indicated and inferred resource of the Namosi project was estimated to be about 1.5 billion metric tons at grades of 0.11 g/t gold and 0.35% of copper. The probable reserve was estimated to be about 940 Mt at grades of 0.12 g/t gold and 0.37% of copper (Namosi Joint Venture, 2015; Newcrest Mining Ltd., 2015, 2016).

Dome Gold Mines Ltd., through its wholly owned Fijian subsidiaries Dome Mines Ltd. and Magma Mines Ltd., held 100% of the shares of two gold exploration tenements in Fiji: the Ono Island project (SPL1451) and the Nadrau project (SPL1452). The Nadrau tenement encompasses 42,570 ha on Viti Levu Island, adjacent to the Namosi copper-gold project. The tenement contains two large copper-gold-silver ionic leach geochemical anomalies (the Namosi and the Wainivau prospects). The Ono Island tenement encompasses 4,400 ha located on Kadavu Island and Ono Island. Geologic mapping during 2015 identified two high-sulfidation epithermal gold-silver targets and possible deeper porphyry copper-gold exploration targets (the Naqara East and the Naqara West prospects). Early-stage exploration activities, such as induced polarization geophysical surveys and magnetometer surveys, were underway for both projects in 2015 (Dome Gold Mines Ltd., 2015, p. 4–5; 2016a, p. 1–2; 2016b).

Industrial Minerals

Cement.—Pacific Cement Ltd. (PCL) had a cement production capacity of 215,000 t/yr. Fijian Holdings Ltd. held a 50.1% interest in PCL and Vinod Patel Group held a 47% interest. PCL's revenue decreased by 8% compared with that of 2014 owing to decreased sales locally as well as a decrease in exports; sales of cement totaled about 126,000 t in 2015 compared with 135,000 t in 2014. The year 2015 was the first full year in which PCL was under competition from the country's second-ranked cement producer, Tengy Cement, which started production in August 2014. Tengy Cement's plant was located at Veisari near Lami and was built at a cost of more than \$50 million (Fijian Holdings Ltd., 2015, p. 13, 29, 35; Tengy Cement Fiji Ltd., 2016).

Outlook

Gold production is expected to continue to increase as VGM continues to increase output and reduce costs. Substantial funding, however, is projected to be required to sustain ore output in the coming years. Zhongrun International is expected to continue to increase its interest in VGM in 2016. In the long run, gold production is expected to increase once the Tuvatu project and the Namosi project are fully developed. Cement production is expected to increase provided demand from the domestic construction sector remains strong. Bauxite production is expected to remain at a low level because of low demand as well as the low grade of the ore produced at the new mine sites.

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TABLE 1
FIJI: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²		2011	2012	2013	2014	2015
Bauxite ^e		50	500	600	640	250
Cement, hydraulic		170	150	181	188 ^f	204
Gold, mine output, Au content	kilograms	1,572	1,453	1,218	1,187 ^f	1,368
Limestone ^e		50	50	60	60	60
Silver, mine output, Ag content	kilograms	418	342	462	361 ^f	354

^eEstimated; estimated data are rounded to no more than three significant digits. ^fRevised.

¹Table includes data available through July 26, 2016.

²In addition to the commodities listed, crushed and dimension stone, coral sand, marble, and other construction materials were produced, but data were insufficient to make reliable estimates of output.

TABLE 2
FIJI: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Bauxite	Shandong Xinfu Aluminum & Electricity Group	Nawailevu Mine in Lekutu district, Bua Province ¹	400
Cement	Pacific Cement Limited (PCL) (Fijian Holding Ltd. Corp., 50.1%, and Vinod Patel Group, 47%)	Lami, Suva	215
Do.	Tengy cement factory (Tengy Cement Company Ltd.)	do.	50
Gold	kilograms Vatukoula Gold Mines Plc (Zhongrun International Mining Co. Ltd., 66%)	Vatukoula, Viti Levu	2,000
Silver	do.	do.	500

^eEstimated. Do. do. Ditto.

¹Mine was closed in 2015.