

FIJI

By I Nagata

The confidence of the newly elected government has augured well and helped in many ways to restore economic and political stability since May 2000. There are continued positive signs of an upturn in Fiji's economy despite the current weak global economic and financial conditions. The real mover towards improved exploration expenditure has, however, been the improved forecast for the gold price.

The 2002 budget saw a number of initiatives, including the development of a new taxation package for the mining sector which has significant advantages for the industry including: the removal of the earlier 3% export tax on gold imposed after 1987; reduced import duties on items specific to the industry (including fuel for power generation); and a new royalty regime for gold with a rate varying according to the gold price. The intention of government is to have a consistent and relatively favourable fiscal policy across the board for all projects.

The economy is on track with an estimated growth of 4.4% in GDP terms for 2002 compared with 4.3% in 2001. The outlook for 2003 is for the economy to grow by 5.7%. Tourism now dominates Fiji's economy with strong contributions from sugar, garments, gold, fish, timber, dalo, yaqona and mineral water. The estimated gross revenue for 2002 from tourism totalled F\$607.2 million (F\$495.5 million in 2001), while the combined earnings from sugar, garments, gold, fish, timber, dalo, yaqona and mineral water totalled F\$625.3 million.

The mining sector continued to perform well, despite global and local constraints and remains an integral part of the country's economy. Emperor Mines continued to be the only operating mine and recorded a total production in the calendar year amounting to 123,115 oz of gold and 61,135 oz of silver respectively valued at F\$82.5 million (F\$75.7 million in 2001). Exploration licences, current or granted, were typically for gold, base metals, bauxite, limestone/marble, aggregate, petroleum and natural gas, and geothermal heat. Gold, however, remains the main focus of mineral exploration in Fiji. There was a significant increase in mineral exploration expenditure during the year total with total expenditure for the year being F\$6.6 million (F\$3.97 million for 2001). This figure, although an improvement is tempered by the fact that it is limited to only a handful of companies, with major contributions coming from exploration activity at Emperor (Vatukoula) and the Namosi copper project which has had a consistent exploration programme since its commencement in November 2000.

Fiji forms part of the Pacific 'Rim of Fire'. This active tectonic boundary between the Pacific and Indo-Australian Plate is well recognised as the locus of several major world-class porphyry copper-gold and epithermal gold

mineralisations. Fiji's central geographic location on the major trade routes, coupled with this strategic geological setting, has normally attracted multinational exploration companies to invest and prospect for potential mineral deposit in Fiji for a number of years. The recent decline in exploration, as evidenced by falling exploration investment, has been a concern and a number of government initiatives are being considered to address this. The latest fiscal package is only part of this initiative, which includes completion of a comprehensive review of the Mining Act and the development of a compensation policy to address landowner concerns. An active promotional programme is also under consideration.

Exploration

Companies or individuals actively undertaking exploration in Fiji during 2002 included Emperor Mines Ltd, Nittetsu Mining Co., Wing Investment, Asia Pacific Resources, Burdekin Resources, Geopacific, Nationwide Mine, Britannia Gold, Oribi, Climax, Algen, Aurun Exploration, Pacmin, Beta, A Tora and Ratu Vunibula. Dampier Oil Ltd of Australia was granted licences early in the year to undertake exploration for hydrocarbons in the offshore areas. At the end of 2002, a total of 41 (39 in 2001) licences were in existence for mineral exploration: there were seven for oil exploration licences (OELs) all held by Dampier. The total area under licence is 317,784 ha (329,906 ha in 2001) on land and 52,416 km² for oil exploration offshore off Viti Levu and in the Lau Group of islands.

To some extent, exploration activity in Fiji has been, and continues to be, limited by the lack of sufficient drilling capability within the country. This is an area that needs to be addressed with some urgency as many projects move on from reconnaissance or basic exploration.

Base metals

At Namosi, Nittetsu Mining has continued with exploration activities targeting both copper and gold mineralisation. This includes extending the exploration to add to the known resources at porphyry copper-gold prospects located at the Waisoi, Waivaka, and Wainabama prospects, and a number of polymetallic veins and skarns developed peripheral to the prospects. No new additions to the known resource estimate of 93 Mt averaging at 0.45% Cu, 0.14 g/t Au and 0.005% Mo previously provided by Placer Pacific Ltd, have been published to date.

Nittetsu Mining has undertaken an extensive exploration programme aimed at discovering additional potential high-grade copper deposits within the large area of the licence and near the periphery of previously known and explored deposits. Since inception of its exploration programme in late 2000, the company has expended a total of around F\$7.7 million. Exploration programme during 2002 included geological mapping, geo-structural mapping, geochemical surveying (soil/stream sampling), a geophysical IP survey, environmental baseline surveys, and a drilling programme. Diamond drilling was concentrated in the Waivaka area with a total of four drill holes totalling 1,006 m. Drilling intersected mineralised quartz veins associated with disseminated copper, and sulphide minerals included chalcopyrite, bornite,

pyrite and magnetite. Preliminary results have been encouraging and drilling is to be continued in 2003 targeting 2,000 m to ascertain the continuity of intersections. Drilling proposed for 2003 would also be targeted at areas in the vicinity of the Waisoi prospect to test responses from extensive geophysical and geochemical studies carried out in 2002.

Asia Pacific Resources (APR) has shown keen interest in re-opening the old Wainivesi mine (oxide zone) in Tailevu. APR intends to lodge an application for a mining licence/permit early in 2003, with the aim of commencing mining as soon as possible thereafter if the project is approved. Work began on pilot mining to test the ore metallurgy and other characteristics towards the end of the year. The oxide ore zone has been estimated at 100,000 t at 1.5 g/t Au, by Solpac. Indicated resources defined by Solpac are 107,000 t at 2.6 g/t Au, 90 g/t Ag, 1% Cu and 12% Zn.

Gold (Tables 1 and 2)

Emperor Mines, the owner of the gold mines at Vatukoula, has a number of exploration licences adjacent to the mine lease and elsewhere around Fiji, including the Tuvatu gold prospect near the Nadi, the Balevuto prospect to the south of Ba and the Vunimoli area on Vanua Levu. Exploration activities undertaken in all tenements apart from those adjacent to the mine lease have been limited and have included geological, geochemical and geophysical surveys. In addition, a helicopter-borne geophysical survey was flown over an area of 113 km² at Vatukoula and part of the Balevuto licences. At the Tuvatu prospect, encouraging results were obtained from the Nubunidike/Davui vein system following geochemical sampling, including spur/ridge and trenching programmes which have warranted follow up work in future. The Tuvatu gold prospect has an estimated resource of 1.6 Mt of ore at an average grade of 8.5 g/t Au, containing 446,000 oz of gold.

Close to, and immediately north of Tuvatu, at the Banana Creek prospect, Oribi Resources (Alcaston Mining NL) continued prospecting in the area and work included geological mapping, rock-chip sampling, and a drilling programme. The company drilled three diamond holes with a total at 595.2 m at the Banana creek prospect. A notable 0.6 m intersection in one drill hole obtained bonanza-style epithermal quartz veins with grades of 3.42 g/t Au and 0.88 g/t Ag. Unfortunately, a further drilling programme was cancelled due to prolonged wet weather. Oribi/Alcaston proposed a work programme for 2003 including further geological mapping, geochemical sampling, and drilling, dependent on the results.

On the mine lease and areas immediately adjacent to the Emperor mine, there has been a major resurgence in exploration aimed at locating additional resources to meet the requirements for a proposed expansion of production. This increase in production is aimed at meeting in full the capacity available at the mill. Total surface diamond drilling was 8,170 m (1,264 m in 2001), while underground diamond drilling was 29,379 m (18,824 m in 2001). Mine exploration was concentrated in the Smith, R1 and Cayzer sections of the mine, but drilling increased at Philip shaft and focused on targets below the major Prince structures. The other major structures targeted included

Matanagata E FM, CCS Main structures, and the Crown X flatmake and Kava FW/FM structures. The best surface drilling results obtained were 30.4 g/t Au at 0.2 m and 63.5 g/t Au at 0.4 m, intersecting the Matanagata NE structures. Underground drilling at Smith shaft also indicated promising individual results, including 1,786.5 g/t Au over 0.1 m, 20.1 g/t Au over 0.9 m, 8.7 g/t Au over 1.6 m and 8.9 g/t Au over 2.5 m. At RI/Cayzer shaft the best individual results obtained included 161 g/t Au over 1.9 m, 104 g/t Au over 0.1 m and 140 g/t Au over 1.4 m. Underground exploration of the Philip orebodies included the Prince FM, 166N and Vunivalu structures, North Dipper and 90 FM structures, Prince William HW No.1 FM and the 2000N flatmake. The best individual results obtained included 108.5 g/t Au at 0.1 m, 81.0 g/t Au at 0.3 m and 41.0 g/t Au at 0.4 m. Encouraging results were also encountered from the decline with the best individual results including 155.0 g/t Au at 0.3 m, 83 g/t Au over 0.6 m and 40.3 g/t Au over 0.1 m.

At Mt Kasi, Burdekin Pacific Ltd and its reorganised wholly-owned entity Audesso Mining, had its Mining Lease renewed at the end of the year for a minimum period of five years. This was to enable the company to raise funds for a major feasibility study. The mine, with an estimated mineral resource of over 300,000 oz of gold, ceased operation in June 1998. The Mt Kasi epithermal gold deposit is hosted by basaltic volcanic flows and breccias that have been intruded by andesitic to dacitic plugs. The mineralisation is recognised as being of a high sulphidation epithermal style occurring in NNW trending structures known as the Mt Kasi fault corridor.

Subject to secure funding from capital raising on stock markets, the company's key objectives are to complete a comprehensive drilling programme and to start a new feasibility study in 2003. This proposed drilling programme is designed to improve the overall confidence in, and understanding of, the resources, better define the potential high-grade zones and target potential lateral and depth extension to the main ore body. An estimated drilling programme of 10,000 m for both diamond and RC drilling is planned.

Southwest of Nadi at the Nabila and Kakavukavu gold prospects, Millennium Mining continued evaluating the potential for gold mineralisation in the area. The company continued re-assessment and compilation of field works. It was also involved in data interpretation including geological interpretation based on aerial photographs, and notably finalising a resource estimate based on a new geological model, familiarisation with the drill core photographs to assist in identification of the potential mineralisation, and re-appraisal of geochemical data from previous results. The company has proposed a drilling programme to commence in April 2003 further to evaluate the potential of Nabila and to identify additional resources in the area. The mineralisation type may either be epithermal or methothermal mineralisation. The current measured and indicated resources stand at 920,000 t at 4.9 g/t Au.

Bauxite

There has been recent interest in exploring for potential bauxite deposits in Vanua Levu conducted by Aurun Exploration. Bauxite, usually in the form of

gibbsite in laterite clay, is found at a number of localities. Important deposits occur in western Vanua Levu, and there are minor occurrences in other parts of Fiji, including Wainunu in Bua.

Marble/limestone

Wing Investment (WI) has continued prospecting for marble at Qalimare in the upper Sigatoka Valley for the past couple of years. The proposed drilling has been rescheduled to 2003, and will comprise more than 600 m of core. Recent drilling and sampling conducted by WI confirms the Qalimare deposit to be a high-grade marble deposit. At Wainivesi on eastern Viti Levu, and close to the old Wainivesi mine, Pacific Calcite Ltd has been granted a licence to prospect and evaluate potential marble deposits in the area. No fieldwork had however been conducted on the prospect during the year.

Hydrocarbons

Dampier Oil Ltd has shown interest in exploring for oil and a total of seven licences (OEL) were granted covering a total area of 5,241 km². The company's areas of interest include the Baravi Basin, Great Sea Reef, Bligh Waters, Bau Waters, Beqa waters, Northern Lau and Southern Lau.

Co-operative projects

A joint Fiji/Japan Co-operative project for mineral exploration on Viti Levu South has commenced covering an area of 4,000 km². The project is fully funded by the Japan International Co-operation Agency (JICA) for a period of two years. This project is essentially an environmental baseline study and includes hydrological, meteorological, multi-element stream sediment chemistry, fauna and flora studies. Phase 1 of the project has been completed and Phase 2 is to be conducted in 2003. The project would assist in identification of geochemical anomalies, and serve as a baseline to monitor the effects of mineral exploration in the region.

Mining operations

Mining operation at Emperor progressed steadily during the calendar year, recording a combined total gold and silver production of 184,251 oz (186,820 oz in 2001) with a total value of F\$85.5 million (F\$75.5 million in 2001). The level of management and production represents a 16% increase over the previous year, resulting in an operating profit of A\$2.54 million compared with last year's loss of A\$1,483 million. Gold prices have increased strongly from a low of US\$266/oz in July 2001 to a high of US\$327/oz in May 2002. Gold production for the financial year (to June 30, 2002) was 131,175 oz (113,389 oz in 2001) achieved by treating 547,702 t at a grade of 8.37 g/t Au with a recovery rate of 89%. The key results were attributed to good strategic mine plan management, efficient operation in extracting good quality ore and improved mill recoveries.

A total of 547,702 t of underground ore was treated, at a grade of 8.37 g/t Au compared with 520,575 t at 7.71 g/t Au in 2000-01. Gold recovery improved by 1.1% from 88% to 89%, primarily due to improved milling and flotation technology. Hedging in gold production was 361,845 oz (446,986 oz in 2000-01), almost 19% lower than the previous year. The mining reserve and

resources has substantially increased, including an increase of 37% in reserves have 1.02 Moz at an average gold grade of 8.5 g/t, including the identified mineral resources, which were increased to 10.8 Mt at 10.2 g/t Au. Tailings reserves stood at 5.2 Mt (242,600 oz) averaging 1.5 g/t Au.

Emperor has embarked on a serious expansion plan aimed at boosting production to make full use of excess milling capacity at Vatukoula. A five-year plan aims to increase mine production from about 1,500 t/d to around 2,200 t/d by 2004-05. The final end result is to increase gold production by some 35% to around 180,000 oz/y. The project termed 'phase 2 long-term strategy' would involve additional exploration, mine development, improved ventilation and replacement of an ageing underground heavy vehicle fleet amongst other initiatives.

Table 1: Tenement Information

Year	Expenditure (F\$ million)	Area ('000 ha)	Licences
1998	4.13	586.6	49
1999	4.02	374.5	35
2000	2.50	217.7	33
2001	3.97	329.9	39
2002	6.60	317.8	41

Table 2: Production Statistics

	1998	1999	2000	2001	2002
Emperor Gold Mining:					
Ore treated (t)	586,499	509,242	568,903	520,903	547,702
Gold produced (kg)	3,501	3,881	3,841	4,907	3,971
Silver produced (kg)	1,804	2,159	1,474	2,109	1,972
*Mt Kasi:					
Ore treated (t)	170,328	0	0	0	0
Gold produced (kg)	384	0	0	0	0
Silver produced (kg)	43.0	0	0	0	0

*The mine-ceased operation in June 1998 due to financial constraints.
Exchange rate as at 10/04/03.
F\$ 1.00 = US\$ 0.5278.