

## PARAGUAY

*By Gerald M. Ellis*

In 2002, a significant development could be observed in Paraguay's metallic minerals scene. What had taken place in the two preceding years, namely an exploration joint venture between Yamana Resources Inc. and a subsidiary of Newmont Mining Corp. on the former's concessions, signalled the beginning of modern minerals exploration in Paraguay. Yamana Resources' concession comprised an alkaline igneous rock complex quite similar to the long-established Cripple Creek gold district of Colorado. The joint venture did not show the presence of economic mineralisation on completion of a drilling programme, but did demonstrate that potential exists. Non-metallic potential also exists and hydrocarbon exploration is continuing.

Yamana Resources became active in Paraguay during the 1990s, and helped the country to formulate a national mineral law that encourages exploration and development. The law was promulgated by the Congress on June 20, 1996, and Yamana was granted a concession. In 1997 the first drilling programme for gold got under way, with one drill hole intersecting gold values in a fluorite breccia in the Sapucaí area, some 100 km east of Asunción. This activity was later followed by the joint venture exploration agreement with Newmont Mining whereby Newmont would spend US\$5 million over a six-year period to earn a 70% interest, and a further US\$4 million for a 75% interest.

Newmont completed extensive regional and detailed geophysics, geochemical sampling and geological mapping, including the Sapucaí area. After completing a 14,000 line km airborne magnetic/radiometric survey the land holdings were extended for a total of 1,208 km<sup>2</sup> under a second national law that was promulgated on July 6, 2000. A new drilling programme was begun in February 2001 to test six high-priority gold targets, four in the Sapucaí area and two in the Guazu Cua area, located some 7 km distant. In Sapucaí, the targets included sulphide-bearing alkaline intrusives which were identified by detailed IP/resistivity surveys and surface soils by strong gold and fluorine geochemical 'leakage' anomalies. The initial drilling by Yamana in 1997 had intersected 16 m of 2.48 g/t Au, including 2 m of 6.72 g/t Au in the fluorite-bearing Picua breccia. The follow-up exploration by Newmont indicated that the Picua breccia was a small outcrop and part of a large intrusive complex largely concealed by old lava flows. This became one of the prime targets for Newmont.

Results of drilling were not deemed economical. Yamana Resources announced in May 2001 that, based upon the results of an eleven-hole 2,274 m diamond drilling programme in Guazucua (two holes) and Sapucaí (nine holes), Newmont Overseas Exploration Ltd had served notice of its withdrawal from exploration in Paraguay and its termination of the option agreement with Yamana.

For the time being, Yamana holds no active mineral concessions in Paraguay. It has released the mineral concessions and temporarily ceased operations in Paraguay due to difficulties in financing early-stage exploration opportunities. But the results of Newmont's efforts were quite encouraging, despite failure to find significant gold concentrations in the limited number of holes drilled. The positive aspect is that Yamana now owns the Paraguay jv database which contains extensive regional geochemistry, airborne magnetics/radiometrics, satellite imagery and interpretations. The large intrusive alkaline complex is thought to be one of the largest bodies in South America. Newmont thought that the gold-rich parts of the complex had been removed by erosion. However, the drilling confirmed the conceptual model even though Sapucaí seemed to contain very little gold at depth. The target is present and requires more drilling. Yamana Resources may go back to the area when financing for early-stage opportunities in under-explored districts is secured.

### **Industrial minerals**

Paraguay possesses deposits of limestone, gypsum, kaolin, various types of clays, silica sands and ornamental stone, some of which are highly productive. Ornamental stone has been exported in the past, in addition to domestic consumption. Good quality limestone deposits have been developed and operated in Concepcion Department at Puerta Vallemi, and at Itapucumi. Cement is produced by Industria Nacional del Cemento which also operates the limestone quarries in Concepcion.

### **Energy sector**

Paraguay does not produce hydrocarbons, however CGX Energy has applied for two areas in the northwestern Chaco Basin, referred to as the Lagerenza Blocks. These two blocks have a total extent of 4,620 km<sup>2</sup>. Kilwer SA is also interested in the Alto Parana Block, and Guarana Exploration and Development Corp., could be a participant in exploration and production there.

A new investment group in Paraguay has applied for a prospecting permit for hydrocarbons in the Cretaceous Purity Sub-basin, which includes part of the Arcticneftegasa Purity contract area and the Cano Martinez 470/94 concession areas.

However, the last exploration well drilled in Paraguay was the 1997 outpost well Independencia 2 in the Gabino Mendoza Block in the Carandaity Sub-basin. Attempts in 2002 to test this well proved negative but this was attributed to lack of experience and knowledge by the technical crew. Local operator PrimoCano Martinez had planned to drill four shallow wells in the Middle Devonian Givetian Formation, each with a planned total depth of 600 m, as well as a deeper 3,000 m well to test the Lower Devonian Pragian-Emsuian potential. The status of these plans were uncertain at the end of the year. IHS Energy personnel are following closely this activity in Paraguay and make frequent reports.

The Republic of Paraguay has always been known for its vast hydroelectric potential such as the joint Paraguayan-Brazilian hydroelectric project at Itaipu

on the Parana River, and the joint Paraguayan-Argentinian hydroelectric project at Yacyreta. (The Paraguay River divides the country into two diverse regions, Gran Chaco or Paraguay Occidental to the west, and Paraguay or Paraguay Oriental to the east.)