Extorre Gold employs two drilling contractors at Cerro Moro: Boart Longyear (drill rig shown) and Major Drilling
Photo: L Williams

associated with the epithermal-vein mineralisation, may have the potential for large-scale lower-grade disseminated gold and silver, which could prompt a new burst of exploration activity.

EDITORIAL VISIT

Mining Magazine has had the privilege of visiting some of these exploration projects. This included a flight over Cerro Vanguardia, which, with its multiplicity of small, steep-sided narrow open pits, is a fascinating operation to view from the air. It is also one of the lowest-cost gold mines in the world, a fact which obviously has not escaped the attention of a number of the explorers in the region.

The more significant operations in the region are listed below.

- **Cerro Vanguardia**

Owned 92.5% by AngloGold Ashanti and 7.5% by Formicruz, this mine can be considered the pioneer of precious-metals mining in Patagonia. The deposit was discovered in 1978 but only entered production in 1998.

Current mining operations consist of multiple small, steep-sided, lozenge-shaped open pits with high stripping ratios (the high-grade veins are narrow and steeply dipping). The orebodies comprise a series of hydrothermal vein deposits containing vast quantities of silver, which is produced as a by-product. There are plans, already in progress, to develop underground operations as the pits are becoming too deep.

The gold and silver mineralisation at Cerro Vanguardia occurs within a vertical range of 150-200m in a series of narrow, banded quartz veins that occupy structures within the Chon Aike ignimbrites. These veins form a typical structural pattern related to major north-south (Concepcion) and east-west (Vanguardia) shears. Two sets of veins have formed in response to this shearing: one set strikes about N40°W and generally dips 65° to 90° to the east; while the other set strikes about N75°W and the veins dip 60° to 80° to the south.

The focus of a recent four-year exploration programme was to determine the life of the mine, and to delineate the shallow, high-grade mineral resource. In all, 300,000oz of gold and 8Moz of silver were added to mineral resources.

Work started in 2009 on a study to investigate the underground mining potential and also to determine the ultimate high-grade (and high stripping-ratio) open-pit reserves. This project will improve the capital efficiency of the current operation and optimise the feed grade. Production from the underground operation is due to begin shortly, lifting Cerro Vanguardia's output to some 560,000oz gold and 6.3Moz of silver.

The company has been stockpiling lower-grade material from its operation, and studies have almost been completed on a heap-leach operation to treat this material. This could add another 20,000oz/y to the mine's production.

- **San José**

This operation is owned 51% by Hochschild and 49% by Minera Andes (whose geologists discovered the mineralised system).