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Age of the Camagüey Gold-Silver District, Cuba: Tectonic Evolution and Preservation of Epithermal Mineralization in Volcanic Arcs**

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Abstract

Epithermal precious metal deposits commonly form in middle to late Cenozoic volcanic arcs several kilometers above the level at which batholiths are emplaced. This relationship has led to the guideline that epithermal deposits should not be sought in volcanic arcs where batholiths are widely exposed. The Camagüey district in central Cuba violates this tenet and provides important insights into arc-forming processes that create and expose epithermal deposits.

The Camagüey district hosts the Jacinto and Florencia low-sulfidation vein deposits and the Deseada and Golden Hill high-sulfidation prospects, all of which are within a few kilometers of the large Camagüey batholith. Some of the deposits, such as Jacinto, lie immediately below a local paleosurface that exposes the batholith and probably formed when rhyolite domes were emplaced onto this surface. A second group of deposits, such as the Deseada high-sulfidation system, is hosted by volcanic rocks that overlie the Camagüey batholith and stand above the paleosurface.

New Ar-Ar age measurements indicate that Jacinto-type deposits and prospects cooled through Ar/Ar closure temperatures for adularia and muscovite at about 71 Ma and are slightly younger than the widespread granodiorite facies of the Camagüey batholith. In contrast, Deseada-type deposits and mineralized zones cooled through roughly similar closure temperatures for sericite, illite, and alunite at about 80 Ma, which is older than the age of the immediately underlying Camagüey batholith. These ages are best explained if the Camagüey batholith and surrounding volcanic rocks underwent rapid uplift, probably by tectonic unroofing, to form the paleosurface below which Jacinto-type deposits formed, and if the older Deseada-type deposits were thrust into place over this surface. This tectonic unroofing probably took place in an extensional regime generated during oblique convergence of Cuba with Yucatan as the Greater Antilles arc moved north into the Caribbean region during late Cretaceous time. Thrusting probably accompanied late stages of this convergence and/or later collision with the Bahamas Bank in Eocene time. All of the epithermal deposits were covered by Late Cretaceous-Eocene sedimentary rocks that have been removed only recently by erosion, thus accounting for the preservation of these unusually old epithermal deposits.

Extensional events causing tectonic unroofing are probably common in arcs that undergo oblique convergence and could be an important agent for formation of epithermal deposits in other parts of the world. Preservation of these deposits might be aided by deposition and later erosion of sedimentary cover related to later collisions.

**Electronic supplemental material related to this paper is available at <http://segweb.org/EG/papers/vol99-5.htm>

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