

Temporality of Veinlet Formation in the Jurassic Porphyry Deposit Mirador Through Cross Cut Relationships-South East Ecuador

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The M(014-149-245) boreholes intersect intrusive to subvolcanic units of Jurassic age, classified according to the timing of mineralizing events as pre-, syn-, inter-, and post-mineral. These units are named the Zamora Jurassic Batholith, Early Porphyry, Inter-mineral Porphyry, and post-mineral faulting. The first two were described by Drobe et al. (2012), and the latter two are described in this study.

The Zamora Batholith, with its quartz monzonitic composition and phaneritic texture, acts as the host rock. It contains irregular and sinuous veinlets of Qz+Py+Cpy with a rare to incipient Fk halo. These veinlets are cut by regular to straight quartz veinlets with an Fe+Cu+Mo sulfide suture in a biotite/Fk alteration zone. These are further cut by veinlets with a Py suture and a centimeter-sized halo of white mica, destroying the original rock texture in a pervasive quartz alteration zone with white mica and pyrite. Magnetite veinlets are present in areas of Fk and chlorite/epidote alteration assemblages. These veinlets cut early quartz veinlets and late white mica and sulfate veinlets. Fine pyrite veinlets with a non-destructive white mica halo and centimeter-sized massive sulfide veinlets are also present, the latter being the most recent and of epithermal origin.

The early porphyry, with a quartz-feldspathic composition and porphyritic texture, consists solely of pyrite veinlets with a centimeter-thick halo of chlorite and white mica, which either maintains or destroys the original rock texture.

The intermineral porphyry, with a feldspathic composition and crowded texture, is composed solely of early quartz veinlets and is responsible for generating inverse cross-sectional relationships, where early quartz veinlets cut and displace white mica and sulfide veinlets, truncate later veinlets, and create chilled contacts. The late event is a dextral faulting of quartz veinlets and epithermal milky quartz infilling, identified in the intermineral porphyry.