Introduction

Although exploitation of alluvial and residual gold concentrations along the margins of the San Lucas range dates from pre-Colombian times (Restrepo, 1888), the region remains an active generative exploration target and large tracts, especially in the south, remain essentially unexplored. Observed primary Au manifestations are mostly hosted within the Jurassic Norosí and San Martin Batholiths and the Norosí Formation, but also occur within the Meso-Proterozoic and Paleozoic metamorphic rocks which form basement to the San Lucas granitoids. (Leal-Mejía, 2011; Cochrane, 2013).

Field and petrographic observations suggest a close relationship between the mineralization and the lithologic setting of the Norosí and San Martin batholiths (e.g., occurrence of inherited subparallel vein arrays and gabbroic dykes). The same genetic system is also interpreted to control gold mineralization at Mina Uno, Mina Seca - Mina Brisa Trend, within the Meso-Proterozoic and Paleozoic basement rocks. Based upon the analysis of mineral assemblages, the protoliths, the age of alteration and mineralization, and the genetic similarity to gold deposits worldwide, the Serranía de San Lucas Au Province is interpreted to be a typical gold metallogenic province.

The Serranía de San Lucas Au Province

The Serranía de San Lucas Au Province, Colombia

Stage 1

Jurassic pluton-related Au-Ag mineralization at Mina Uno, Mina Seca - Mina Brisa Trend, Serranía de San Lucas Au Province, Colombia

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Conclusions

The 40Ar/36Ar sericite age of 183.6±1.9 Ma is comparable particularly well with the 184.6±3.6 Ma age for the Norosí Batholith Au occurrence (Sample 84H6L2, near the sample 8H6-L6 locality (Figure 4)). The comparison indicates that the ages determined using the two methods are in general agreement.

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References

The sample SB-HL-Ser yielded a plateau age of 183.5±2 Ma containing 15 steps, and a step 10 set (0.0004 ppm) at 185.4±0.5 Ma. This age is interpreted to represent the formation of the Norosí Batholith, and also suggests a prolonged multi-stage paragenetic history of Au mineralization at Mina Uno. The step 10 set is interpreted to represent the formation of a late-stage coarse-grained chloritoid-bearing muscovite greisenized vein that is the product of late-stage hydrothermal activity associated with the post-orogenic stage of the Norosí Batholith.

Results

Gold mineralization hosted in the Norosí and San Martin batholiths is generally confined to Jurassic N-S to E-W and NE-facing ridges, containing up to 3 km wide, transverse for various periods of time along strike (e.g., San Martin de Loita, Casa de Barros, Mina Seca, Mina Nueva, San Lucipas – San Pedro Fino), containing massive quartz veins and breccias and hosted within metamorphosed and hydrothermally altered wallrock. Westrock alteration associated with, and minerals associated with, the formation of the Norosí Batholith individual structures exhibits a complex and prolonged multi-stage paragenesis (Figure 5).

The samples for the step 10 set were divided into two sets, each containing a single step, and the data for these sets were used to calculate the step 10 set age of 185.4±0.5 Ma. The age is interpreted to represent the formation of the late-stage coarse-grained chloritoid-bearing muscovite greisenized vein that is the product of late-stage hydrothermal activity associated with the post-orogenic stage of the Norosí Batholith.