

Exploring the geological settings of Paleoproterozoic gold deposits in Suriname, South America

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Gold has played a significant role in the economy of Suriname for over a century and is currently the country's most important mineral commodity. Major companies and abundant small-scale operations are mining for gold at many different locations. The first large-scale open pit mine commenced commercial production in the Rosebel property in 2004. This operation generated an annual gold production of 736,000t oz in 2013. A second large-scale operation started in October 2016. In addition to these major operations, there are currently a large number of small artisanal mining activities, which generate more than one-half of Suriname's total production. Most of the gold deposits occur in a NW-SE trending Paleoproterozoic granitoid-greenstone belt, which formed during the Trans-Amazonian Orogeny (2,260 – 2,080 Ma) and is part of a regional series of greenstone domains in the Northern Guiana shield, stretching from Venezuela to NE Brazil. Gold occurs both as primary and secondary (alluvial) deposits. The primary varieties are classified as orogenic and have possible genetic links with gold mineralization of similar Proterozoic age in West Africa, in view of the common geological history prior to the opening of the Atlantic Ocean. The gold deposits of Suriname are hosted in a range of low-medium grade metamorphic lithologies including turbiditic sedimentary sequences, conglomerates, banded-iron formations, lavas, and intrusions. They are mostly located near major structures and are locally often associated with syn- to late-tectonic quartz veins. A comprehensive insight into geological settings and genetic controls of Suriname's gold mineralization is lacking to date. Also, the timing of the gold formation has nowhere been determined with certainty, and is only inferred from correlation with other deposits in the Guiana Shield. Taking these limitations into account, this presentation will give an overview of Suriname's gold deposits and discuss available conceptual genetic models according to the current status of information. Despite their "orogenic" label, recently acquired data hint at the possibility that (some of) the gold was already accumulated prior to the Trans-Amazonian Orogeny and that metamorphic overprints obscure the underlying sequence of events. Examples from new field-based petrological and mineralogical studies will be presented to illustrate this hypothesis.