

Going underground in Ghana: The Golden Star story

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Since Golden Star's beginning 25 years ago, the company has focused almost exclusively on open pit gold mining. Golden Star owns and operates two gold mines on the Ashanti Belt in southwestern Ghana and during the company's history it has produced over 4 Moz of gold.

Golden Star acquired the Bogoso open pit mine in 1999 and added the adjacent Prestea Underground mine in 2001. Although an underground drilling program yielded encouraging results, defining very high grade Mineral Resources of approximately 20 g/t of gold, the decision was taken to keep Prestea Underground on care and maintenance and to focus on the surface targets instead.

The nearby Wassa mine was acquired in 2005 and open pit mining continued from purchase through to 2017.

In 2011, deep drilling at Wassa indicated economic underground mining grades and an extensive exploration drilling program commenced, culminating in a feasibility study in late 2014. Due to the low gold price environment and consequently the availability of experienced personnel and mining equipment in the industry, Golden Star decided to adopt an owner-operator strategy, rather than employing a contract miner. Project construction commenced in early 2015 and commercial production from sub-level longhole stoping was achieved in January 2017.

In parallel with the construction of Wassa Underground, a feasibility study was completed for Prestea Underground. Prestea was first mined in the late 1800s and has produced approximately 9 Moz of gold during its 100 year history. It consists of narrow, high-grade, steeply dipping, gold-bearing quartz veins, historically mined via conventional shrinkage methods.

Golden Star took the decision to adopt a new mining approach using Alimak raise climbers in order to ensure optimal safety conditions and reduced footwall access development. Similarly to Wassa, the company chose to be an owner-operator, although an experienced Alimak contractor was hired to provide training in all aspects of Alimak stoping for an extended period of time.

This paper discusses the successes, lessons learned, and pitfalls associated with transforming a company from being an open pit operator to an underground miner. It will look at how the assumptions made during the feasibility process differed from the reality on the ground during the construction and initial operation of the two mines, underlining the close relationship between successful project construction and a feasibility study built on realistic expectations and assumptions.