The Jibal Qutman Gold Project, Kingdom of Saudi Arabia. Deposit-Scale Structural Models in an Underexplored Terrane to Drive Discoveries

Nadia St-Jean
Gold and Minerals Co., Bisha, Saudi Arabia

The Arabian-Nubian shield is one of the largest Neoproterozoic cratons on earth and covers significant areas of Eastern Africa and the Middle East. It comprises accreted intra-oceanic arc volcanic terranes, multiple events of batholith intrusions, and late metasedimentary molasse basins. The shield extends from Egypt in the NW to Yemen in the SE, with a significant portion of the overall area located in Saudi Arabia. Despite being host to several Tier 1 deposits (Sukari Gold mine, Jibal Sayid VMS deposit, Mansourah/Masarrah Gold mine), the shield is largely underexplored. In particular, the tectonic and structural history remains poorly understood. In recent years, the political and legislative changes implemented by the Kingdom of Saudi Arabia has resulted in the promotion of and renewed interest in mineral exploration for all commodities (Au, Cu, Ag, Zn, Lithium, REEs). The Jibal Qutman gold project lies in the Asir Terrane of the Arabian Shield, along the regional-scale Nabitah-Tathlith fault zone. The JQ project has recently undergone renewed exploration work as it advances toward production. The deposit is hosted within tholeiitic-intermediate volcanic and metasedimentary rocks and is a classic example of greenstone-hosted gold. Mineralization style is present as disseminated pyrite and shear-hosted quartz-carbonate veins. The structural paragenesis of the deposits shows an early F_1 fold event resulting in isoclinal NW- to WNW-oriented folds associated with a pervasive regional foliation. The early fold event is crosscut by brittle-ductile N-S–oriented thrust faults hosting thick, mineralized quartz-carbonate veins. Both structural events are interpreted to be associated with mineralization and predate the regional-scale Najd strike-slip event, which has also been historically linked to gold mineralization. Whereas previous exploration focussed on N-S–trending anomalies, this additional deposit-scale structural control aids in future target generation and may support the discovery of blind deposits at depth.