

Geology of Jabal Intaq Cu-Mo Prospect, Saudi Arabia

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The Jabal Intaq project lies within a 200 km-long NW-SE oriented Cryogenian arc-related plutonic and supracrustal rocks of the Suwaj terrane in eastern parts of the Arabian Nubian Shield. New observations and ongoing drilling by Maaden reveal a complex emplacement history that includes multi-phase intrusive paragenesis; high-temperature vein formations; and widespread hydrothermal alteration assemblages that are consistent with a deeply emplaced, batholith-hosted, calc-alkaline porphyry Cu-Mo system.

The earliest vein type is composed of biotite halo veins (EDMs/EHs). They occur as irregular networks of individual veins with fine dissemination of chalcopyrite-(bornite) in dark mica-rich halo extending well onto the wallrock. These are in turn cut by planar, often sheeted grey granular early- quartz veins that have well-developed internal fracture-networks infilled by later sulphides (pyrite-chalcopyrite-molybdenite). Although rare, chalcopyrite-(pyrite) veinlets with and without haloes crosscut earlier formed veins. Deep milky, often smoky quartz-tourmaline-(biotite) veins are ubiquitous, particularly in the late- to post-mineral porphyries.

At least three generations of porphyry intrusions are identified through cross-cutting relations. Much of the hypogene Cu mineralization is associated with extensive hydrothermal biotite alteration and veining in the early inter-mineral intrusions. Texture-obscuring metre-scale flooding of biotite with fine disseminations and infills of chalcopyrite-(bornite) is characteristic. The early mineralized intrusions are largely intruded by late, low-grade, inter- to post-mineral intrusions. The late- intrusions commonly exhibit extensive albite-silica alteration (de-magnetizing) and barren tourmaline veining, especially at depth. The overall low total sulphide content and characteristic vein formations such as pegmatitic-aplitic vein dykes, unidirectional-solidification textures (USTs), and deep milky quartz networks at or near surface suggest that the magmatic-hydrothermal system(s) are eroded and deeply emplaced in the batholithic pluton.

Systematic exploration by Maaden is currently ongoing to define the full lateral and vertical extent of the hydrothermal system(s), with potential for discovery of additional mineralized centre(s) in the district.