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Lithological-structural setting mineralisation styles of the Gilar epithermal deposit in the Lök-Qarabağ volcanic arc, the Lesser Caucasus, Azerbaijan.

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Abstract

The Gilar deposit belongs to the Gədəbəy ore district of the Shamkir uplift which is part of the Lök-Qarabağ volcanic arc that is one of the main structural formations of the Lesser Caucasus. The deposit is located over the East flank of the Böyük-Qalaça local deep fault. Gilar was discovered during geological exploration work of the northeast flank of the Gedabek gold-copper mine by the Gedabek Exploration Group (GEG) of Azerbaijan International Mining Company in 2019. Gilar will be the 4th deposit discovered that will be constructed to a mine. Gilar deposit is located between two systems: the Maarif porphyry and the Ərtəpə mineral occurrences. The rocks are Upper Bathonian extrusive represented by mostly felsic and intermediate composition rhyolite-dacites, andesite-porphyry, andesites and their tuffs distributed from the surface to depth. Ore minerals are hosted in the metasomatic rhyolite-porphyry of the Upper Bajocian age, at depths ranging from about 130 meters to more than 400 m from the surface. Preliminary field mapping and outcrop sampling identified a continuous epithermal quartz vein, hosted in a rhyolite volcanic in the northern Gilar area. To the south of the vein system, significant massive mineralisation has been discovered. Mineral content is visual, however, further petrographic studies by polished-thin section were carried out on samples taken from outcrop and drill core. The majority of core samples from Gilar, samples contain high-grade gold, copper, and zinc. According to these observations and studies, pyrite is the main mineral which is observed in all drill core and nearby outcrop samples exhibit crystal structures: massive, disseminated, euhedral, anhedral, etc. with associated chalcopyrite, sphalerite, and other sulfide minerals. Jasper, magnetite, barite, and limonite are non-sulfide minerals present. The mineral composition, textures, relationships, the chemical composition suggest a high sulphidation type of epithermal system for the Gilar deposit.