

Mineralization and interpretation of geophysical survey, IP/RS, in Hassan Abad Gold-Antimony, northeast of Iran

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Abstract: Hassan Abad Au-Sb prospect area is located in north of Khorasan Razavi Province about 45 km south of Neyshabour. Volcanic rocks (rhyolite, rhyodacite, trachyandesite and andesitic-basalt) and sub-volcanic intrusive (Eocene-Oligocene) such as biotite diorite porphyry, biotite hornblende diorite porphyry, hornblende monzonite porphyry, biotite micogranite, micogranodiorite, and granodiorite were identified in the study area. Alteration zones which are mapped in the surface and sub-surface are: 1- argillic zone, 2- sericite-quartz-pyrite zone, 3- carbonate zone, 4- propylitic zone, and 5- silicified zone. Vein type mineralization is dominated with minor veinlets, breccia and disseminated. Eight exploratory holes were drilled in the exploration area. In this research, IP/RS pseudo section in profiles 0, 150W and 300W were interpreted using drilled core observation and studies. Profile 0 has a chargeability anomaly greater than 25 milli second in the south eastern part of Gold- Antimony vein which is smaller than 150W and is at greater depth. In profile 150W, chargeability anomaly reach to greater than 50 millisecond with northeast-southwest trend and is highest in the center of the vein and is dissected by a fault. Chargeability anomaly extends towards northwest of the main Gold-Antimony vein and is observed as three small discontinuous anomaly in profile 300W. High chargeability anomaly and its extension in all three pseudo sections confirm the presence of conductive sulfide and correlates with the results of observed mineralization on the drilled cores. Increase in electrical resistivity in profile 150W is related to subvolcanic intrusive body of quartz monzodiorite porphyry which is observed on drilled cores and appears to be younger than granite. Observed mylonite in drilled core and dissection of chargeability anomaly infer a fault which mylonite the quartz monzonite sub-volcanic body before the creation of mineralization. Detailed surface and sub-surface geological, alteration and mineralization studies correlate well with IP/RS anomalies and confirm them. Thus it can be predicted that in the north eastern portion of profile P150W where no mineralization is observed in the surface but it well extend at depth and two drill cores at 200 and 440 meter distance on the north are proposed.

Keywords: *Antimony, induced polarization, electrical resistivity, sulfide mineralization, alteration.*

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