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Structural analysis of Hired mining area and its relation with gold mineralization using aeromagnetic data, satellite images and field studies, southern Birjand, Iran

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Hired area is located in the northeastern border of Lut zone and western vicinity of Sistan suture zone. Northern part of Sistan suture zone trending NW-SE with complicated structure is the locality of several considerable ore deposits. We have employed aeromagnetic data, satellite images and field observations to consider the relation of surface and subsurface structures to the significant superficial structural features of Hired mining area. Aeromagnetic data processed by appropriate filters including Reduction to pole and First vertical derivative for proper distinguishing the magnetic features. In addition, high pass filters were used for edge sharpening of the ASTER images.

Aeromagnetic data have demonstrated two main N-S and NW-SE structural directions which follow northern Sistan sature zone. Presence of mineralized and altered veins and brittle shear zones with the same trend around the fractures is noticeable. Moreover, fractures accumulation and conjuncture place is dramatically compatible with mineralization areas. Another result we have derived from aeromagnetic data is identification of a circular structure in the east of studied area. The gold mineralization has taken place in the interior part of mentioned structure which is strongly affected by NNW striking features. Satellite images in addition to confirmation of aforesaid struc-

tural trends imply a third structural NE-SW strike which in the aeromagnetic map has an ambiguous trace and is not vivid. Our field measurements verify this new structural trend as well. This research expresses significant role of aeromagnetic data and processed satellite images with high resolution accompanied by field studies to better understand the surface and subsurface structures that provide an essential method for mineral exploration with high accuracy at low cost.