

## Ground magnetic survey to explore mineral resources and determine relative depth and extension of intrusive bodies causing alteration and mineralization in the east of Keybarkuh area (southwest of Khaf)

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**Abstract:** Keybarkuh area is located about 70 Km southeast of Khaf city in Khorassan Razavi Province. The study area, with 60 km<sup>2</sup>, is bounded to the east by Zouzan (Ghasemabad) and to the west by Keybarkuh. Rock units mapped in the area consist of sandstone, shale, limestone (Carboniferous to Paleocene); slate, mica schist (Paleozoic) and a complex of intrusive rock (Cretaceous to Tertiary) formed as dyke and stock. The composition of intrusive rocks varies between granite to diorite. Based on magnetic susceptibility, intrusive rocks are divided into ilmenite (reduced) and magnetite (oxidant) series. Propylitic alteration zones with broader extension and sericitic, argilic and silicic alteration with lesser extension are located in the southern section. Skarn zones were identified in some location. Pyrite, chalcopyrite, magnetite, galena and barite mineralization were identified in the south of the studied area. Ground magnetic survey carried out to determine relative depth and extension of intrusive bodies related to mineralization. 526 stations with 25 and 50 m spacing in ten profiles with 600 to 700 m apart oriented northeast-southwest were surveyed. After correction and processing of magnetic data, TMI, RTP, 1VD, and Upward Continuation maps were produced. Using these maps, distribution and relative depth of the magnetic source of A, B, C, D, E and F anomalies, which are intrusive bodies, were identified. Magnetic anomalies in the RTP map, which are related to intrusive bodies and alteration zones in the southern part of the area, have a circular to semicircular pattern arise from the presence or absence of magnetite in the intrusive bodies and alteration zones. Based on the mineralization evidences, alteration zones, intrusive rocks, and magnetic anomalies, the southern part of the area has potential for porphyry copper mineralization. Considering the presence of iron skarn and high magnitude of the magnetic anomaly D, the central part of the area has potential for magnetite skarn.

**Keywords:** *Ground magnetic; magnetite maps; porphyry copper; magnetite.*

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