

## GEOLOGICAL MAP OF IRAN

### 1:100.000 SERIES

### SHEET 7149- PARIZ

The area of the pariz sheet is situated northeast of sirjan. The northeast of the area is mountainous, with altitudes of over 3,000 meters along the kuh-e-mamzar ridge. The altitudes in the plains are between 1700 and 2000 meters. In the extreme southeast of the area are the slopes of kuh-e-tambur. The drainage net in the northeast is centripetal, and parallel in the central and parallel in the central and southern part of the area, oriented toward the southeast concordantly with the aggradation plane of the dasht. Largest river is the Rud-e-tangu. Through the southeast of the area passes the (Kerman-) Bardsir-sirjan (-Bandar-Abbas) first class road, and through the south-western part of the area the second class road sirjan-shahr-e-Babak. The plain sirjan- pariz is covered by a dense network of motorable and other tracks that connect the villages along the hillsides. To the north, only the sirjan- pariz (-Rafsanjan) road is passable, with only one connection toward sar cheshmeh mine.

#### REVIEW OF FORMATIONS

**PALEOZOIC (?)** – the lower part of the Paleozoic (?) series is composed of dolomites, black to grey marbles with some chert or lydites, sericite, meta-sandstones and quartzites; the upper part is composed of albite-chlorite- micaschists, albite-mica-schists, meta-sandstones and quartzites with interstratified mylonitized mylonitized albite-diabases, keratophyres, and some albitized and epidotized hornblend-quartz-diorite. The metamorphism of rocks corresponds to the green-schist facies-the main mineral components of these rocks are carbonates, quartz, sericite, albite, chlorite, epidote, and actinolite.

**COLOURED MELANGE**- this formation is composed of a rather chaotic mixture of submarine spilitic and diabase agglomerates and masses, gabbro-diabase and gabbro-porphyrific dykes, and carbonaceous and radiolarite sediments, that are less frequent. The magmatites consist of basic plagioclases, usually albitized, uralite, chlorite, epidote and carbonates. A normal feature in these rocks is automorphic albitization, epidotization and silicification.

**Eocene** – the Eocene rocks at the north-eastern-eastern part of the sheet belong to the upper part of the volcanogenic complex, represented by pyroclastics and lava flows, which correspond to pyroxene trachy-andesites, less frequently pyroxene-andesites and trachy-basalts. They consist of plagioclase, monoclinic pyroxene, some olivine, very rare feldspar, with a groundmass composed of variable quantities of alkaline feldspars and, less frequently, of glass, in addition to plagioclase and pyroxene. Among the low-temperature minerals, particularly in and around the dykes, are frequent epidote, albite, chlorite, zeolite, secondary quartz and other minerals.

The southern part of the sheet area shows mainly andesitic rocks from the middle part of the volcanogenic complex. The rocks are composed of plagioclase phenocrysts, monoclinic pyroxene and some rare hornblende, with a groundmass composed of microlites of the same minerals, with glass present locally as well.

Sedimentary rocks, mainly sandstones and, less frequently, limestones, have very subordinate development.

**PLUTONITES**- the plutonic rocks form discordant hypabyssal massifs and stocks in the Eocene complex, accompanied by numerous intrusive dykes, the intrusives southeast of Band-e-Mamzar and at Deh siah are basically monzonitic, with rare transitions into grano-syenites and syenites. The kuh-e-mamzar and sar cheshmeh intrusive are mainly granodioritic, with transitions into quartz-diorite, diorite and monzodiorite, less frequently, into monzonite and quartz-monzonite. The intensely argillized granodiorite of the sar cheshmeh stock is intersected by granodiorite and diorite dykes, with a dominant north-south strike, the other intrusions are mainly quartz-dioritic and dioritic. Generally, all plutonites, represent neutral rocks of low quartz content. The plagioclases are zoned labradorites and andesines. The alkaline feldspars, with regular perthite, are either orthoclase or anorthoclase. Among the dark minerals, augite is the most frequent biotite and very rare, hornblende.

The Eocene rocks are widely metamorphosed around plutons into hornfels of potassium feldspar-cordierite, amphibolite and albite-epidote facies. The plutonites are frequently metamorphosed by automorphic processes; at Deh siah even greisenization was observed. The copper mineralizations are found in rather abundant zones of hydrothermal alterations, related to this plutonism.

**OLIGOCENE-MIOCENE** – these sediments crop out in the southeastern and eastern parts of the area, overlying unconformably the Eocene and the colored mélange formation in the area southeast of the rud-e-tangu, they are composed of basal rudites, with fragments of older rocks in a carbonaceous

matrix, followed by limestones breccias with biomicrite fragments. In the upper parts, the breccias alternate with sandy limestones and tuffitic sandstones and siltstones. The thickness of the series is over 200 meters.

To the east of Bid khab village outcrops a series of sediments, composed of pinkish clastic rocks, and representing the continuation of the same rocks from the east. For these rocks an Oligocene-Miocene age has been postulated, as in the area of the Chahar Gonbad sheet.

**NEOGENE-** Two sedimentary members, separated by an unconformity. Have been identified in the Neogene succession.

The lower member outcrops in the domain of kahuiyeh village. It is composed mainly of medium- to fine-grained sandstones with gypsum veinlets and halite intercalations.

The upper member consists of loosely consolidated or almost unconsolidated, unsorted and poorly stratified sediments. In lower parts are conglomerates and sandstones, and in upper parts they contain fragments and well-rounded pebbles and blocks of dacites

**NEOGENE VOLCANOGENIC ROCKS-** are represented by two strato-volcanoes, kuh-e-Ghul and sar Cheshmeh. Both volcanoes have developed a primary pyroclastic cone, composed of stratified agglomerates. They were followed by the formation of caldera with agglomerates and tuffs. The magmatic emanation concluded the volcanic succession, forming numerous dykes and the needle which forms the peak of kuh-e-Ghul. In the sar Cheshmeh volcano, the central part of the cone is also preserved, composed of bressias and ignimbrites. All these volcanites correspond mainly to hornblende-biotite dacites, dactoids with rare quartz phenocrysts, and cryptomorphous phenol-andesites.

**QUATERNRY-** Sediments of this age cover a large area of the sheet. On the map are separated calcareous terraces (north of Sar Cheshmeh), vaste areas of dasht covering the plains, recent alluvium, and the area covered by sand in the south-western part of the sheet. Depositional sand-forms are generally not pronounced.

## STRUCTURAL FEATURES

The north-eastern part of the sheet area represent a large dome-like brachy-anticline, highly faulted and intruded by numerous plutonic masses, which may have genetic relations with the form itself. The axial trend of this structure is roughly east-west, and the trends of a number of accompanying smaller structures is the same. The faults form a generally irregular pattern, with a radial tendency. The dominant zones have ENE-WSW and north-south strikes. The latter is well developed in the Sar Cheshmeh area, where it is manifested by a system of silicified dykes and quartz veins.

The anticline is flanked by younger Tertiary strata. The lower Neogene member has steep: the higher is almost horizontal and its dips may be inferred only from the cuestas.

The air-borne geophysical survey has detected the presence of a large regional dislocation along the northern border of the pariz-sirjan plain. This dislocation separates the zone of Upper Cretaceous Coloured Melange formation from the northern block, and has been found also on the adjacent sheets. It extends, in the pariz sheet area, most probably through the zone limited by Hoseyn Abad and Korran at the southeast, and by pariz and Kuh-e-Ghul at the northwest. It may be supposed that this dislocation zone was rejuvenated in the Upper Neogene as well, but traces of Quaternary movements have not been found.

In the southern part of the sheet, the Paleozoic (?) strata form a syncline, with axis plunging gently toward the southeast. Only the extreme northern parts of this syncline are situated in the sheet area. At the western margin of the sheet, Eocene volcanogenic rocks form a broad syncline, with its axis plunging towards the south-west.

## ORE OCCURRENCES

Copper occurrences are relatively common in the north-eastern part of the sheet, being located exclusively inside the Eocene volcanogenic comply, intruded by numerous plutonic stocks and massifs. They occur as impregnations and thin veinlets, with chalcopyrite as the dominant copper mineral. Chalcopyrite and pyrite mineralizations, sometimes associated with subordinate quantities of galena and sphalerite, are also present. The copper occurrences, related to the plutonic rocks, are relatively frequent and more important (Sar Cheshmeh, Darrehzar, Bagh Khoshk, Now Chun). The copper minerals that contain some molybdenum. Form the porphyry copper deposits in quartz-diorite and grandiorite bodies. The sar cheshmeh ore body is a typical disseminated porphyry copper deposit, with a leached zone developed at the surface, followed downward by a zone of secundary enrichment. Chalcocite, disseminated in the form of small grains, and less frequently, veinlets, is abundant in the zone of secondary enrichment, and chalcopyriter represents the main ore mineral. Bornite, covellite,

native copper, malachite, azurite, chrysocolla, pyrite, galena, sphalerite and molybdenite are also present.

North of Guin, in the area locally known as Darrehzar, the copper minerals are disseminated in the argillized, silicified and limonitized diorite-porphry. The surface zone is usually leached and is locally up to 50 meters thick.

A different hydrothermal-type mineralization, represented by a quartz vein, has been located north of Darrehzar. The vein is mineralized by chalcopyrite galena, azurite, malachite and pyrite. The veins in the Deh siah area are of the same type; there some old workings are recorded.

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