



DESCRIPTION OF MAP UNITS

Qes EOLIAN SAND OF THE GREAT NEFUD AND IRQ AL JUMAYMAH (QUATERNARY)—Quartz sand, fine- to medium-grained (mostly 0.25-0.5 mm), rounded to well-rounded with high sphericity; about 1 percent heavy minerals, no feldspar. Dunes include barchanoid, ridge, transverse, and linear types (D. J. Faulkender, oral commun., 1983). Thickness 0 to 200+ m

Qu UNDIFFERENTIATED ALLUVIUM (QUATERNARY)--Eolian sand mixed with sheetflood and lag gravels; both gravels are composed of angular to subangular pebbles, cobbles, and sparse boulders of metamorphic and igneous rocks derived from adjacent and subjacent bedrock. Thickness 0 to 30 m

DSOR

TABUK FORMATION(?) (DEVONIAN, SILURIAN, AND ORDOVICIAN)--

According to Brown and others (1979), the Tabuk consists of interbedded sandstone, siltstone, and shale. Sandstone and siltstone are brown to tan and buff, weathering black; sandstone is mostly medium grained and well bedded; commonly crossbedded. Shale is olive green to gray, silty, sandy, locally calcareous, and in places, contains the Early Ordovician graptolite Dimerograptus protobifidus Elles. According to Brown and others (1979), only the lower part is present in this area. Thickness 0 to 300+ m

Q57a RAM AND UM SAHM SANDSTONES, UNDIVIDED (ORDOVICIAN AND CAMBRIAN)—Upper part consists of alternating beds of sandstone, siltstone, and mudstone; lower part is nearly entirely sandstone that occurs in alternating sets of cross-stratified and flat-stratified beds; entire sequence probably of beach and marginal-marine origin. Sandstone is fine to coarse grained; brown, pale yellow brown, chocolate brown, and buff; some thin beds with abundant ferruginous and manganiferous (?) cement are nearly black; lower part contains numerous lenses of conglomeratic sandstone containing subrounded and rounded granules, pebbles, and cobbles of white quartz. According to Brown and others (1979), the Ram and Um Sahn sandstones may be equivalent in part to the Saq sandstone (Powers and others, 1966). Thickness 0 to 1,000+ m

RYHOYLITE DIKES (PRECAMBRIAN)—Ring dikes show textural variations ranging from fine-grained, pink-gray granite to porphyritic dark-brownish or pinkish-gray rhyolite; the former has a sugar-textured groundmass consisting of quartz and alkali feldspar and abundant tiny prisms of black amphibole; it contains sparse phenocrysts of alkali feldspar to 5 mm long, and black acicular amphibole, also to 5 mm long; the porphyritic rhyolite contains 25 to 30 percent phenocrysts consisting of 27 percent quartz to 3 mm, 64 percent alkali feldspar to 7 mm, 1 percent biotite, and as much as 7 percent sodic amphibole 0.1 to 0.3 mm; the dense groundmass appears to be mostly quartz and alkali feldspar. Rocks in the linear dikes are similar but their darker gray groundmasses probably attest to a more mafic composition; these commonly contain about 5 percent small phenocrysts of alkali feldspar and quartz.

ap APLITE (PRECAMBRIAN)--Pink, fine-grained, sugar-textured
aplite with considerable tiny flakes of biotite;
alkali-feldspar to plagioclase ratio is about 6:1

8r GRANDPHYRE (PRECAMBRIAN)--Brown, porphyritic granophyre with glomerophenocrysts of alkali feldspar to 8 mm in a micrographic-spherulitic groundmass in which alkali feldspar far exceeds quartz. The rock is probably quartz syenite in composition

pfg PINK FINE-GRAINED GRANITE (PRECAMBRIAN)-Porphyritic granite with 20 to 30 percent phenocrysts consisting of inconspicuous alkali feldspar to 6 mm and subequal quartz to 4 mm. Groundmass is microgranular and appears to consist solely of quartz and alkali feldspar; contains sparse oxidized amphibole(?)

bag BIOTITE ALKALI-FELDSPAR GRANITE (PRECAMBIAN)—Pink to light-red, medium-grained granite; contains 35 percent quartz, 59 percent alkali feldspar (perthite and microcline), 2.8 percent interstitial plagioclase (probably albite), 1.3 percent biotite, and 0.5 percent oxidized amphibole

hsg HORNBLende SYENOGRANITE (PRECAMBRIAN)--Pink, medium-grained syenogranite, contains 25 to 30 percent quartz, 48 to 52 percent alkali feldspar (mostly perthite), 20 to 25 percent plagioclase, and 2.5 to 7.0 percent oxidized hornblende

bsg BIOTITE SYENOGNANITE (PRECAMBRIAN)—Pink, medium-grained syenogranite; very similar to above hornblende granite except the oxidized mafic appears to be principally biotite

32 GABBRO (PRECAMBRIAN)—Dark-gray to black, medium-grained, granular textured gabbro; 57 percent plagioclase, 23 percent clinopyroxene, 17 percent actinolite-chlorite after clinopyroxene, and 2 percent opaque iron oxide. The plagioclase is labradorite or bytownite in composition and has a bronze chatoyancy. Age with respect to other plutons uncertain.

di DIABASE DIKES (PRECAMBRIAN)--Green, fine-grained diabase with most of the original pyroxene altered to chlorite and actinolite. Probably closely related to the gabbro

mg MONZOGRANITE (PRECAMBRIAN)--Light-gray to pink monzogranite; medium- to coarse-grained but grain size varies exceedingly within short distances. Five thin sections and stained slabs give the following modal ranges: 28 to 29 percent quartz, 24 to 33 percent alkali feldspar, 26 to 39 percent plagioclase, and 2 to 7 percent biotite except sample 203999 which contained 4 percent hornblende and only trace amounts of biotite

gd **GRANODIORITE (PRECAMBRIAN)**—Light-gray, medium- to coarse-grained granodiorite containing extremely variable amounts of biotite; commonly porphyritic with plagioclase and (or) alkali feldspar as large as 2 cm; three thin sections give the following ranges: 30 to 35 percent quartz, 6.8 to 22.0 percent alkali feldspar, 44 to 53 percent plagioclase, and 2 to 15 percent biotite. The rock actually grades from tonalite on the one extreme to monzonite on the other.

to TONALITE (PRECAMBRIAN)—Gray to dark-gray, fine- to medium-grained; grades in composition from tonalite to diorite; fine-grained tonalite near contact with Had'n Formation contains 31 percent quartz, 65 percent plagioclase, and 3.5 percent clinopyroxene; the medium-grained tonalite contains as little as 10 percent quartz and as much as 30 percent clinopyroxene and other mafic minerals

hac Conglomerate—Dark-gray with clasts ranging in size from less than 1 cm to as large as 25 cm. Larger boulder-sized fragments are well rounded, the cobbles and pebbles become less rounded with decreasing size; matrix consists of fine- to coarse-grained, poorly sorted, feldspathic sandstone. Clasts consist of about 70 percent volcanic rocks ranging in composition from basalt to rhyolite and about 30 percent granitic rocks ranging in composition from tonalite to syenogranite.

Hadn formation, undivided—Gray and green dense volcanic rocks of rhyolite and basalt compositions and even-bedded, thin-bedded, purple and green feldspathic sandstones and siltstones; these clastic rocks are only gently folded and little metamorphosed. Thin beds of gray limestone occur locally

hag Hadn formation and granitic rocks, undivided--Mixture of
Hadn formation and variegated granitic rocks in an area
of extremely poor exposures

SYMBOL:

 FARMING AREA

IGNEOUS DIKE

———— CONTACT—Approximately located; queried where uncertain.

----- FAULT--Inferred and concealed; arrows show direction of relative horizontal movement; queried where extension is doubtful; in section, T = toward, A = away from observer

SYNCLINE--Showing trace of axial plane; approximately located

203422
X SAMPLE LOCALITY--Showing sample number

Prefix 203 (E. B. Ekren)

Prefix 128 (D. B. Stoesser)

STRIKE AND DIP OF BEDDING

 Inclined, showing di

DATA STORAGE

No Mineral Occurrence Documentation System (MODS) localities were identified in the quadrangle.

Work materials related to the Jibāl Hibran quadrangle are archived as data file USGS-DF-04-01 (Ekren, 1984), which is available for reference in the Jiddah office of the U. S. Geological Survey Saudi Arabian Mission.

REFERENCES CITED

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Powers, R. W., Ramirez, L. F., Redmond, C. D., and Elberg, E. L., Jr., 1966, Geology of the Arabian Peninsula--Sedimentary geology of Saudi Arabia: U.S. Geological Survey Professional Paper 560-D, 147 p.