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UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Technical Letter  
Saudi Arabian Mineral  
Exploration - 3  
Prepared March 31, 1965  
Issued August 15, 1965

Dr. Fadil K. Kabbani  
Deputy Minister for Mineral Resources  
Directorate General for Mineral Resources  
Ministry of Petroleum and Mineral Resources  
Jiddah, Saudi Arabia

Dear Dr. Kabbani:

Transmitted herewith are 10 copies of:

TECHNICAL LETTER NUMBER 3  
GEOLOGICAL RECONNAISSANCE OF THE  
WESTERN PART OF THE WADI AR  
RIMAH QUADRANGLE, SAUDI ARABIA

by

James W. Mytton\*

Sincerely,

*Glen F. Brown*  
Glen F. Brown, Chief  
Saudi Arabian Mineral Exploration Project

\* U. S. Geological Survey, Jiddah, Saudi Arabia

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GEOLOGICAL RECONNAISSANCE OF  
THE WESTERN PART OF THE  
WADI AR RIMAH QUADRANGLE,  
SAUDI ARABIA

by

James W. Mytton\*

During the month of March the area bounded by  $24^{\circ}45'$  and  $25^{\circ}99'$  N. latitude and  $42^{\circ}00'$  and  $42^{\circ}30'$  E. longitude was mapped by Abdullah Ankary, Directorate General for Mineral Resources, who located and examined all the ancient mines and did geochemical sampling of the wadis. A brief visit was made to the area by J. W. Mytton during which time the major geological units were checked and reconnaissance trips were made as far north as Jabal ash Shabbah and as far south as Hadbat 'Akliyah.

In the area of Ankary's investigation, most of the attention was given to the regions around Jabals Ashumta and al Koom. Graywacke and associated conglomerate, siltstone and argillite are the dominant rocks at Jabal Ashumta and vicinity and the unit as a whole is similar to that north of Wadi Ar Rimah. At Jabal Ashumta,  $24^{\circ}51'$  N. x  $42^{\circ}19'$  E. where extensive workings are present, the graywacke has been converted to hornfels by the emplacement of gray biotite granite of the same character as that present in the northern part of the Wadi Ar Rimah quadrangle. Conglomerate is interbedded with the graywacke and is part of a cyclic sequence of graded bedding consisting of conglomerate beds about 4 inches in thickness overlain by coarse graywacke grading upwards into finer-sized wacke. Southeast of the Jabal, the graywacke and conglomerate give way to dirty siltstones. Northward, the wackes are associated with argillaceous shales and a major conglomerate unit which is quite extensive.

\* U. S. Geological Survey, Jiddah, Saudi Arabia

At Jabal Ablan, north of Jabal al Koom, the graywacke sequence includes basal greenish siltstone, graywacke and boulder conglomerate composed of diorite and monzonite derived from the complex of diorite and andesite which the sequence unconformably overlies. This basal unit is overlain by a succession of fine-grained siltstones, in turn overlain by a sequence of green argillites with intervening conglomerates containing pebbles and cobbles. The argillites grade upward into a mixture of graywacke and argillite along with relatively thick units of conglomerate.

The complex of diorite and andesite of Jabal al Koom and vicinity consists of a variety of rocks including fine-grained basic diorite and andesite which are intruded by a series of monzonites, monzonite porphyries, latites, and adamellites. All these rocks are incorporated into the boulder conglomerate of Jabal Ablan and are therefore part of an epoch pre-dating the deposition of the graywacke sequence. Both the diorite-andesite complex and the graywacke unit are intruded by gray biotite granite. In the al Koom area a circular body of this granite contains xenoliths of diorite similar to that of the surrounding hills. The al Koom workings,  $24^{\circ}49'N.x 42^{\circ}04'E.$ , located to the southwest of this body are in quartz veins in fine-grained basic diorite. Some of the monzonites between al Koom and Jabal Ablan have slightly mineralized veins of quartz and calcite with traces of malachite and pyrite. Tungsten-bearing quartz was discovered by Abdulla Ankary in old mine workings,  $24^{\circ}50'N.x 42^{\circ}07'E.$ , located near the southeast end of the circular body. The composition of the material sampled as well as its mode of occurrence is discussed in a report by Ankary.

Numerous quartz veins were examined in the graywacke unit south of the village of Al Ba'jah close to its contact with the gray granite. All of these contained white to gray barren quartz and some silicified breccia occupying fractures parallel to the bedding. The diorite-andesite complex continues southward occurring as isolated segments in the granite terrain. Two mines were examined near the contact of the diorite and the gray granite namely Shobrom,  $24^{\circ}45'N.x 42^{\circ}35'E.$ , located northwest of Hadbat 'Akliyah

and Furdaykhinyah,  $24^{\circ}34'N.$  x  $42^{\circ}16'E.$  The workings at both localities are completely buried. At Shobrom the vein material observed on the dumps is fractured quartz containing specular hematite, pyrite and a flake or two of gold. The workings are in epidotized granite which appears to have intruded diorite. Other than the Shobrom workings, no mines were found in the Hadbad 'Akliyah area. At Furdaykhinyah the vein material is fractured milky quartz which occurs in reddish felsites or rhyolites that have intruded basic diorites and andesites. One piece of quartz was coated with malachite and contained pyrite in the fractures. Other quartz examined was barren with the exception of hematite. Grinding stones of granite and diabase were found at the site.

A very extensive linear body of bluish-white finely crystalline limestone or marble trending N. occurs just east of Wadi al Jarir in the south-west corner of the Wadi Ar Rimah quadrangle. It is in contact with dark siltstone and graywackes that have been intruded by sills of fine-grained diabase and andesite porphyry.