

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Technical Letter  
Saudi Arabian Mineral  
Exploration - 11  
Prepared August 1, 1965  
Issued August 20, 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 11  
THE OCCURRENCE OF TUNGSTEN IN  
THE SOUTHWESTERN PORTION OF  
THE WADI AR RIMAH QUADRANGLE,  
SAUDI ARABIA

by

Abdullah O. Ankary\*

Sincerely,

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

\* Directorate General for Mineral Resources, Jiddah, Saudi Arabia

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THE OCCURRENCE OF TUNGSTEN  
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by

Abdullah O. Ankary\*

During the field trip to the North Afif area from May 12 to June 15, 1965, a side trip to the El-Koom area was taken to re-sample geochemically the tributaries in the tungsten area. Hand specimens from quartz veins carrying tungsten were collected in addition to twenty-two geochemical samples of wadi sediment and magnetite. The numbers and locations of these samples are shown on the attached map (Figure 1).

The most important geological feature in the El-Koom area is the body of basic diorite that forms a ring around a younger mass of gray biotite granite. The texture of the diorite ranges from coarse-to fine-grained, and diorite porphyry is also present. The hills that surround the granite are made up of coarse-grained diorite whereas areas of low relief are made up of fine-grained diorite. In the northwest part of the map a 300 x 100 meter sillified body (jasper) intrudes the diorite. In the southwest part the fine-grained basic diorite is stained by hematite. The gray biotite granite is younger than the diorite as indicated by the diorite and andesite inclusions in the granite. There are two sets of dikes composed of diorite, andesite and rhyolite that penetrate the granite. The sets trend NE and NW. Most of the dikes are in the NE set.

Quartz veins containing tungsten are located in the southeast part of the granite body. Most of them trend about N.70°W., and they occupy fractures in the dikes as well as in the granite. They range between 400 feet and 3000 feet in

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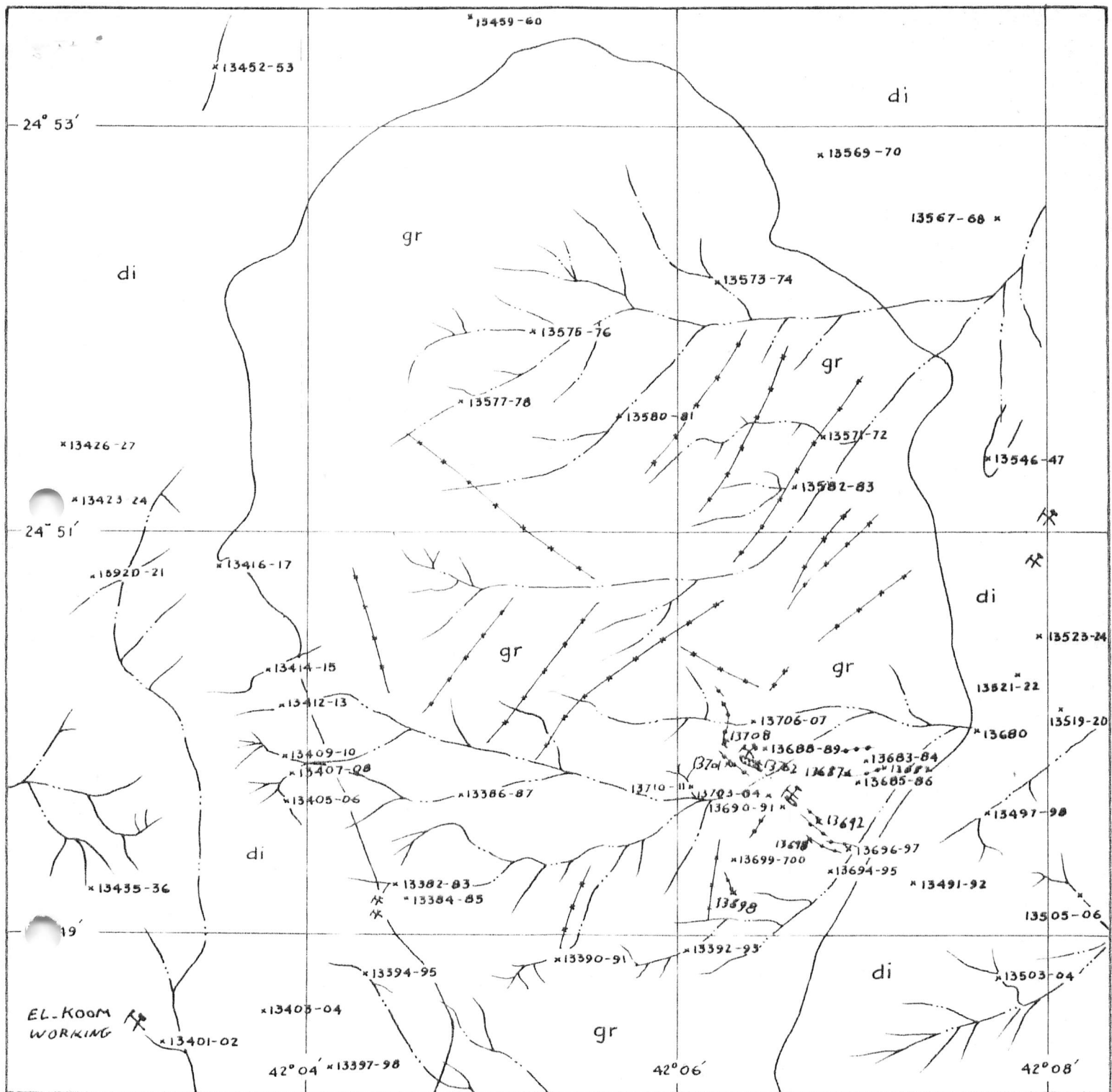
length and between 1 foot and 3 feet in width. The quartz tends to be milky to translucent and is stained with hematite. Usually the tungsten minerals are found in the parts of the veins where there are well-developed crystals of quartz. In two small workings located in this area the quartz veins contain malachite and free gold.

The tungsten minerals are wolframite (ferberite-huebnerite) and scheelite. The wolframite was identified by Charles Thompson of the U. S. Geological Survey. The scheelite was identified by the writer through use of an ultra-violet light in the field. The most abundant mineral is wolframite which occurs in the quartz as nodules and crystals ranging in size from about 2 millimeters to 4 centimeters. The tungsten minerals are distributed throughout the vein.

Quartz veins containing some scheelite were also found approximately 100 kilometers south of El Koom. The location is about  $24^{\circ}07'N.x 42^{\circ}10'E$ . Here three groups of veins occur in the Halaban formation. They trend NE to SW, and are 400 feet to 2000 feet long. East of this group of veins a NS belt of sheared andesite is present which contains veins of quartz throughout its extent that carry scheelite in very small amounts.

Further work is recommended in the El-Koom area including detailed geological mapping accompanied by geophysical work.

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**GEOLOGIC MAP OF EL-KOOM AREA SHOWING LOCATION OF MINES AND TUNGSTEN BEARING QUARTZ VEINS**

Scale 1:50,000

**EXPLANATION**

*Bar scale*

- |  |                                      |  |                              |
|--|--------------------------------------|--|------------------------------|
| <span style="border: 1px solid black; padding: 2px;">gr</span> | Gray biotite granite                 |  | Tungsten-bearing quartz vein |
| <span style="border: 1px solid black; padding: 2px;">di</span> | Fine grained basic diorite           |  | Mine                         |
|  | Geological contact                   |  | Sample locality              |
|  | Diorite, andesite and rhyolite dikes |  |                              |

**Figure 1**