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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Technical Letter
Saudi Arabian Mineral
Exploration - 7
Prepared April 4, 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 7
MINERAL INVESTIGATIONS IN THE
BIR AL BAYDA - AL 'ULA AREA,
SAUDI ARABIA

by

Virgil A. Trent*

Sincerely,

Glenn F. Brown
Glenn F. Brown, Chief
Saudi Arabian Mineral Exploration Project

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

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MINERAL INVESTIGATIONS IN
THE BIR AL BAYDA - AL 'ULA AREA,
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by

Virgil A. Trent*

During our trip of February 21-March 28, 1965 to the Bir Al Bayda area (northeast of Wajh) R. F. Johnson and myself spent several hours examining an ancient copper mine located 40 km. southwest of Al 'Ula (Direct distance) in Wadi Shism. The approximate coordinates are 26°27'N.x 36°29'E. in the Northwestern Hijaz quadrangle. Slag piles are clearly visible on photo Nos. 11, 429-30, line No. 102. The mine area is just to the north of these dumps in the high hills. We believe it is the Shism-Al Tasa mine described in a SAMS report by R. I. Shanks dated February 19, 1936 and now on file in the Ministry under this code: 3/204/6023.

The large slag piles in Wadi Shism adjacent to the mine contain an estimated 1500-2000 tons of material some of which may assay fairly high in copper. Pieces of charcoal are common in the slag. We found no grindstones or mill tailings. R. F. Johnson found evidence of drilling in some of the canyon prospect pits, thus SAMS may have undertaken a sampling program recommended by R. I. Shanks (2-15-36).

The general area is one of major faulting mainly in greenstone, granitic rocks and Hadiyah Slates. The most striking structural feature in the area is a long (about 20 km.) fault trending W.N.W. mainly within the wadi south of Wadi Shism. The rocks along this fault have been silicified and commonly exhibit either a reddish-brown color (oxidation of pyrite and/or magnetite) or appear bleached. Several samples were collected along this fault to try to pick up additional traces of mineralization.

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The main workings in the mine itself are located high on a hill in sheared and fractured greenstone. A 7 to 10 foot thick mineralized shear zone strikes N.60°W. and dips 50°NE. The largest opening we could inspect was at least 100 feet deep and probably Station "A" on Shanks prospecting plan. This fractured zone contains small amounts of chrysocolla, chalcocite, pyrite and chalcopyrite. The bulk of the mining was probably along this zone. Several samples were collected from the dumps near these stopes for analysis. The canyon below the line of openings is along a subsidiary fault with a bearing of N.50°- 60°W. There is a good deal of localized mineralization here, much of it secondary, and prospect pits are common. Wadi Shism follows an east-trending fault adjacent to and south of the mine.

The mineralization is primarily structurally controlled and hydrothermal in nature. We think this area warrants some ground geophysics to try to detect the sulphide mineralization, locate its limits and decipher the relationship to the structure. If the results of the analysis of the wadi samples we have submitted is favorable, then a regional net of geochemical samples would be called for. The results of our sample analysis will have considerable control on future planning.

A large ring structure in the Sc schist unit located at 27°00'N.x 36°30'E. is another area in which some additional work would be helpful. It appears to be differentiated in composition (granitic to gabbroic) possibly due to dynamic metamorphism and has many small pods, blobs and lenses of magnetite. Most of the source rock seems to be diorite. The largest mass seen was 10 meters by 20 meters and the total amount exposed is small. This would be an excellent area for an airborne magnetometer survey. In lieu of that three magnetometer profiles along the northeastern branches of Wadi Hayyan would give useful information about the possibilities of similar magnetite masses located at depth.

Some chalcocite was found in gabbroic rock adjacent to a large fault in this area. Analyses of samples taken on this trip will give us a better idea of what is here and how to plan our future work. Photo location: Line No. 108 Nos. 9386-9388.