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July 3, 1954

Mr. J. Paul Strother
Aldon, Iowa

Dear Mr. Strother:

Re my letter and report to ^{you} of June 9, 1954, I have not yet received payment, and I thought it best to remind you, as the matter must have escaped your attention.

If by some chance the report never reached you, please let me know.

Very Truly Yours,

John E. Kinnison

Mr. J. Paul Strother
Eldon, Iowa

June 9, 1954

Dear Sir:

Enclosed is my report on the Scott property.

Charges are as follows:

Inspection trip, one day	50 dollars
Assaying, lab. work, report.	10 dollars
Total	60 dollars

Please let me know if at any time in the future I can
be of further assistance.

Very Sincerely,

John E. Kinnison
221 N. Morris Ave.
Tucson, Arizona



TELEPHONE
RES. 155 - OFF. 132

J. PAUL STROTHER

STROTHER & RIEHM, INC. LADSDALE COAL COMPANY
HIGHWAY CONTRACTORS STRIP MINE OPERATORS
J. P. STROTHER CONSTRUCTION CO.
ELDON, IOWA

Mr. J. Paul Strother
Eldon, Iowa

June 9, 1954

Dear Sir:

Pursuant to your request, I have here summarized facts and opinions concerning a copper prospect, near the abandoned mining town of Troy, Arizona, which is generally known as the Scott property. These are the result of a brief visit to the property with you on the day of June 4, 1954.

Geology.-- No attempt was made to compile a detailed map of the prospect during my brief visit. The enclosed sketch presents only the gross features, and is not intended to be accurate in detail. In general, the rocks of the pre-Cambrian Apache group sedimentary series form a homoclinal structure, and appear to be underlain by granite. Diabase has intruded both the granite and Apache group, as sills and dikes, near their contact. This contact was not exposed, however, and its nature was not determined. On the state geological map of Arizona, this granite is mapped as intrusive into the Apache group, and assigned to the late Cretaceous and Tertiary igneous activity.

There has been much faulting along the bedding of the Apache group, particularly near the granite contact. The mineralization occurs mainly in the shaly members of the Apache group, and partly in the diabase intrusives. The mineral bodies are replacement veins along bedding faults and in adjacent diabase sills. The mineralized zones vary from about two to ten feet, and average about six feet in thickness.

The minerals observed in the oxide zone were malachite ($\text{Cu}_2\text{CO}_3(\text{OH})_2$), hematite (Fe_2O_3), limonite (hydrated iron oxide), and some undetermined green copper salts which appear to be minutely dispersed through fault gouge, clay, and serpentine. In the primary sulfide zone the minerals observed were magnetite (Fe_3O_4), specularite (Fe_2O_3), pyrite (FeS_2), chalcopyrite (CuFeS_2), bornite (Cu_5FeS_4), sphalerite (Zn, FeS), and molybdenite (MoS_2). The copper sulfides are sparsely distributed through the mineralized zone. Alteration minerals are clay (hydrated aluminum silicate), serpentine (hydrated magnesium silicate), chlorite (hydrated Mg, Al, Fe, silicate), and muscovite (hydrated K, Al, silicate).

It was stated by the owners that the lode formed a continuous ore body from the western to the eastern end. I do not believe this to be true for the following reasons: (1) Assuming that originally there was a continuous ore body, it has since been displaced by cross faults, thus forming a series of faulted vein segments. (2) Assuming that originally there was a continuous mineralized lode, the commercial ore shoots are likely to be irregularly distributed within the mineralized zone. (3) In a few places only was there indication of primary sulfide minerals. Most of the oxide

copper minerals appear to have been transported, as does the limonite. I observed only one occurrence of much residual limonite, and this may have been largely derived from pyrite. In one prospect pit a few grains of chalcopyrite were observed. The sulfide mineralization in the Rattler Tunnel is banded and sparsely distributed, and most of this is pyrite. (4) There is no assurance that the mineralized outcrops ever formed a continuous lode prior to the cross faulting mentioned in reason (1) above.

Mining and Milling.-- It was stated by the owners that the lode could probably be mined by open pit and/or block caving methods. The lode is a tabular body dipping into the hill at about 30 degrees. Its width varies from about two to ten feet. This type of ore body is definitely not amenable to block caving methods, and it would not be at all feasible to mine it by open pit methods. The lode, if mined at all, must be mined by underground methods applicable to slightly dipping, thin veins.

The owners demonstrated a leaching method utilizing a solid reagent. The solutions were tested, and found to be acid and high in sulfate content. This indicates that the leaching is accomplished by a sulfuric acid solution. The white compound used to form the sulfuric acid is believed to be sodium bisulfate. This compound is readily soluble in water, and will produce sulfuric acid. To my knowledge this process has never been used commercially, mainly because of the cost. Less sulfate radical will be produced per unit volume from sodium bisulfate than is available in the same volume of concentrated sulfuric acid. Thus on the basis of transportation cost alone, the sodium bisulfate method would be more expensive. Furthermore, sulfuric acid is relatively inexpensive, and is cheaper than the solid reagent.

Grade of Ore expected.-- It was stated by the owners that the oxide ore probably would average about two to three per cent copper. This probably a maximum, and most of the ore may be of lower grade. The sulfide ore does not appear to be of much higher grade. It must also be remembered that the ore varies from place to place, and that there is much barren and low grade material. A sample of the oxide ore assayed 2.68 per cent copper, and a sample of the sulfide ore assayed 0.04 per cent copper. These samples were cut from about five feet of vein in each case. The oxide sample may be more or less typical of the higher grade ore. The sulfide sample was taken in neither the richest nor leanest appearing ore, but it is problematical whether this represents the average grade. I doubt that it does.

Conclusions.-- Due to the complex faulting of the lode, the sparseness of mineralization within the lode, the improbability of finding a sizable ore shoot, the difficulties and cost to be encountered in searching for a commercial ore shoot, and the probability that the grade of ore will not exceed three per cent, I can not recommend any investment in the Scott property. If the project is continued, however, the first two steps must of necessity be as follows: (1) Preliminary mill tests on lots of 100 pounds or more, to determine whether or not the ore is amenable to some form of leaching or concentration. (2) A detailed geological investigation and sampling followed by such prospecting and development procedures as would then seem most desirable, to determine the location, grade, and tonnage of any ore shoots.

Respectfully,

John S. Kinnison
221 N. Morris Ave.
Tucson, Arizona