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November 12, 1962

Mr. James Ryan, Jr.  
6725 Casas Adobes Road  
Tucson, Arizona

Dear Jim:

With regard to our cursory examination of the Mame Shaft Area of 9 November 1962 I offer the following brief opinions, conclusions and recommendations for your consideration.

First I must assume that from previous investigations you have established or estimated the grade and tonnage of mineral available for leaching, the suitable metallurgical treatment process, the total available water for leaching and its chemistry, and the economic factors involved in size of plant, rate of production, etc. Therefore, I shall concern myself only with the physical problem of circulating the water in such a manner as to reach the greatest amount of mineralized ground suitable for leaching. As described to me, the proposed plant investment, the time factors involved and the cost of operation would require closed circuit circulation of 500 gallons of water per minute assuming that such water contained an average of 1 gram of copper per liter to provide approximate production of 100 tons of copper per month with investment return to be expected in six months.

The proposed method of water circulation is to pump 1,000 gallons per minute from the Mame Shaft and to surface irrigate by sprinkling a rather limited area, with water return to be provided by filtration through the fissures and fractures in the mineralized breccia zone to the underground workings and thence to the shaft sump.

Following my brief examination I must conclude that the chance of circulating even a small portion of the desired 500 gallons per minute by this means is extremely remote other than that water which may find its way to existing shafts and drill holes and caved or open stopes connected to the Mame Shaft workings.

Fractures in the breccia zone appear to be quite well healed with what is probably calcium and magnesium carbonates. There are local zones of greater permeability as evidenced by staining and minor water seeps but the existing mineral permeability is not considered great enough over this limited area to approach the desired production rate. This is not to say that the property does not offer a good opportunity for in-place leaching and there are a number of alternative methods by which this objective could perhaps be accomplished.

Of the several approaches I have considered, all would require the creation of artificial permeability by blasting except the first. The first approach would be to reduce the amount of the initial plant investment and operate on a more modest basis by circulating the water through the mine workings and the existing fill therein. This has been tried in the past and found to be technically if not economically successful. Several reasons of which you are aware have been offered for its apparent economic failure. Creation of artificial permeability could be accomplished by blasting in the existing Sunshine drill holes and in shafts, stopes, etc. from surface to the first level. In all probability this would destroy first level workings and eliminate access to ore lying below this level. This might be undesirable from the standpoint that there is evidence that the ore grade increases below the first level and that the first 50 feet below surface is essentially barren. If this alternative were selected, however, it would probably prove beneficial to supplement the existing drill holes with additional wagon drill holes to improve breakage. Such a program could be initiated on a pilot plant - test basis in one or more areas of limited size.

If time factors permitted and sufficient ore has been or could be proven, an even larger scale program than is currently considered might prove feasible. Second and perhaps third level workings could be drilled and shot from the first level and the first level from the surface, essentially providing broken ground for leaching from surface to third level. In this case, rate of circulation and therefore production should only be limited by plant size.

Mr. James Ryan, Jr.

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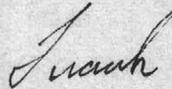
November 12, 1962

Assuming that my evaluation of the situation is correct that natural permeability is not sufficient to permit circulation of 500 gpm by surface sprinkling, the selection of any of the alternatives involving breaking of ground by drilling and shooting would require some further economic and engineering study integrating all available data.

I hope that this will give you something to work on Jim, and if we can be of any further service don't hesitate to let us know. Our statement is enclosed.

Very truly yours,

HEINRICHS GEOEXPLORATION CO.



Franklin A. Seward, Jr.  
Geophysicist

FAS:jh  
Enclosure: 1 cc.

November 12, 1962

S T A T E M E N T

To: Mr. James Ryan, Jr.  
6725 Casas Adobes Road  
Tucson, Arizona

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Re: Examination of Mame Shaft Area, Cochise County, Ariz.  
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Professional Services:

November 9 - 12, 1962-----\$100.00