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Item 2

(See also map files)

Ely, Nevada.

Mar. 7, 1912.

Preliminary Report on the "Tungsten Mining and Milling Company's" tungsten property at Tungsten, Nevada.

Location

This property is located fifty miles southeast of Ely, Nevada on the east side of Spring Valley and the west slope of Mt. Wheeler. There is a good wagon road between the mine and Ely; this being the nearest railroad point. The average elevation of the camp is 8000 feet. Just above the camp on Mt. Wheeler there is an abundance of timber for all mining and construction purposes.

Equipment

The present equipment consists of, one air compressor of four drills capacity, four 2-3/4 inch drills, one 50 ton concentrating plant, one steam plant, one water power plant (each of the latter being of sufficient horse power to run both the conpressor and mill), an office, mess house and bunk houses enough to accomodate 35 or 40 men. All of the above is of good construction and in first class condition. The mill is well adapted to the ore, made a good saving of values during the time it was running, and is a good piece of construction throughout. The water power plant can be run during the summer months only. Probably six months out of the twelve. The first one and one quarter miles of the flume is an open ditch and this fills with snow and freezes during the winter.

Claims

I am enclosing a claim map (No. 1) of the Company's holdings which shows that they own practically the entire district. I believe

that this map is correct except that the open fractions which are shown on it have since been located.

Geology

The whole area consists of a very regular grade of rather fine grained granite. The percentage of mica is very small and it is always muscovite. Capping this granite higher up on Mt. Wheeler, and dipping at such an angle that 100 feet less erosion would have left it over the entire area, there is a large body of quartzite. It seems to me that this fact may have had an important bearing on the ore deposition, to be mentioned later.

The granite body is cut by nine (known) parallel veins. Their strike is about N - 70 - E and their dip 70° to the north. These veins are all of about the same size, having average widths of about three feet. The vein material is a clean,white, hard quartz and is identical in all the veins. The tungsten ore occurs in the veins as hubnerite (tungsten with manganese). Specimens of schelite (tungsten with calcium) have been found near surface but only in very small quantities. The hubnerite occurs in the quartz in one or more stringers (usually several) with the best one on the hanging wall. All nine of the veins have traces of ore on surface, much the best showing however is on the so called Hubnerite Vein; which has received most of the development work. The second best showing being on the Side Issue Vein which has received a little development.

Development Work

The development work done on the Hubnerite Vein consists of 1200 feet of drifting and 300 ft. of raises. The location of all

of this work is shown on the enclosed profile (No. 2). The development on the Side Issue Vein consists of a cross cut tunnel driven to the vein and a raise on the vein from there to surface, a distance of 80 feet. At the tunnel level the vein is only a stringer. Going up the raise it gradually increases in width until it is 2½ feet wide at surface. It shows no values except in the first 25 ft. from surface, however. (No map of this)

The result of the development has been discouraging. You will note from the profile that they have gone through the ore into a barren zone in five different places as follows -
Main Tunnel, Hub Tunnel, Shaft D and Upper Tunnel on the Hubnerite Vein and in the one raise on the Side Vein.
At no point developed does the ore extend more than 50 feet below surface. I have drawn in this ore zone, in yellow, on the profile map. The white background denotes the stoped portion and the dark the unstoped. I have figured five blocks of ore, i e, A, B, C, D and E, which are also designated on the profile. I have obtained the following tonnages.

<u>Ore in Sight</u>

Block A - - - - - - 1300 tons
" B - - - - - - 290 "
1590 tons in sight

<u>Probable Ore</u>

Block C - - - - - - 610 tons
" D - - - - - - 750 "
" E - - - - - - 1000 "
2360 tons probable ore.

2360
1590
3950 total ore in sight and probable ore.

At 50 tons per day this amount would run the mill but 79 days. To me it would not seem advisable to start the mill for so short a run.

The outcrop of the vein between Tunnel E and the Upper Tunnel is as good as in the other portions. In case it should be the same width and depth upon development, it would give an extra tonnage of about 7500 tons. This seems to be the outside limit of ore contained in the surface zone of the vein. To summarize it consists of the following -

1590 tons in sight
2360 " probable ore.
7500 " undeveloped possible ore.
11450 total possible ore from surface zone.

Costs.

I have gone over all the conditions quite carefully and have figured that the 4850 tons of "ore in sight" and "probable ore" could be mined, milled and the concentrates delivered at New York at a cost of $4.10 per ton by water power, or $5.00 per ton by steam power.

From mill records the ore taken out of the mine averaged 2.40% tungsten. I think we are safe in using the same value for the above ore. Their milling gave them an extraction of 90%. The present quotations on tungsten ore delivered in New York, and of 60% grade (which can be obtained at the mill) is $6.65 per unit. This gives us 2.40% x 90% = 2.16% extraction value.

2.16 x $6.75 = $14.58 extraction value per ton.

$14.58 extraction value
4.10 total costs using water-power
$10.48 probable profit per ton using water power.

$10.48 x 4850 tons = $50,828.00 probable profit using water power.

$14.58 - extraction value
5.00 - total cost using steam
$ 9.58 - probable profit per ton using steam.

$ 9.58 x 4850 tons = $46,463.00 - probable profit using steam.

I have figured that by means of an inclined raise about 60 feet below surface, (and parallel to it) and with vertical raises to surface at intervals of 80 ft. along it, that the ground between Tunnel E and the Upper Tunnel could be developed for about $25,000. If this work showed up the 7,500 tons of ore as estimated above, it would give a development cost per ton of $25,000 ÷ 7,500 tons = $3.33 per ton.

Using the same total costs and values as before we have -

$ 4.10 - total costs (without development) using water power
3.33 - development costs
$ 7.43 - total costs on undeveloped ore " " "

$14.58 - extraction value
7.43
$ 7.15 - probable profit per ton " " "

$ 7.15 x 7,500 tons = $53,625.00 - probable profit using water power.

$ 5.00 - total costs (without development) using steam
3.33 - development costs
$ 8.33 - total costs on undeveloped ore " "

$14.58
8.33
$ 6.25 - probable profit per ton " "

$ 6.25 x 7,500 tons = $44,062.50 - probable profit using steam.

$50,828.00 - profit on ore in sight and probable ore using water power
$53,625.00 - profit figured on undeveloped ore using water power
$104,453.00 - total profit using water power.

$46,463.00 - profit on ore in sight and probable ore using steam
$44,062.00 - profit figured on undeveloped ore using steam
$90,525.00 - Total profit using steam.

This covers all the surface possibilities of the vein. The figures are much better than I expected them to be when I sent you the telegram on March 6th. I would call your attention to facts that if, the undeveloped part of the veim did not prove as good as expected, if I have been misinformed as to the values, or if the management were not first class, that these profits would not be realized. Before any investment is made the ore values, especially, should be gone into more thoroughly. On the other hand I think the above is a fair estimate of what the owners may expect.

My advice would be to start the inclined raise at once, using steam power for the air drills. If this were pushed as rapidly as possible it would be far enough ahead by June first so that the mill could be started on water power with a reasonable assurance that it could be kept going all summer. Our total estimate of 11,450 tons would keep the mill running 230 days. Whatever ore was left in the fall could either be run out with steam power or held over until the following spring.

Whether or not it would be advisable to do any deep work to determine if there are ore bodies below the surface zone I would rather leave entirely to Mr. Spurr.

I am told that at a similar deposit in Boulder, Colo. they went through a deep barren zone and then came into the ore again. I have had no experience in the matter.

During the time that other wark is being carried on the Hub Tunnel could be driven 1000 feet along the vein at a cost of about $8,000. It would seem that this would cut any lower ore bodies that might be there.

Respectfully yours,

(signed) M. B. Huston.