

568

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COLORADO SCHOOL OF MINES  
GOLDEN, COLORADO

(Copy)

Boulder Mill  
Boulder Co., Colo.

Denver, Colorado, March 23rd, 1914

Mr. Jacob J. Mayer,  
Brown Palace Hotel,  
Denver, Colorado  
Dear Sir:-

According to your instructions, I sent the following telegram, preceding the report in full given below:

"J. C. Gallup,  
1837 East 81 Street, Cleveland, Ohio.

Mr. Mayer asks me to wire you results of mill tests. They show that you can make a commercial product by proper sorting at mine and milling the ore. Eleven hundred pounds concentrates from Boulder mill, running fifty six per cent., tungstic acid brought up in test at Steele mill to sixty six per cent, tungstic acid and sixteen hundred pounds concentrates from Boulder mill running fifty per cent, brought up to sixty four per cent, at same test in Steele mill. Full report follows."

On Thursday March 20th, 1914 I went with you to see the concentrates you had obtained from a mill run at a mill in Boulder, Colorado, treating two tons of tungstene ore per day, and doing custom work.

From a report of the mill man, Mr. R.A. Mann, dated March 20th, 1914, I see that you shipped 10,000 pounds of ore to him. That ore assayed 21.20% tungstic acid per ton. They crushed the ore, screened it and concentrated it into two products. They have recovered 1121 pounds of concentrates coarser than 70 mesh and 1632 pounds finer than 70 mesh. From a superficial examination, but without having seen the test made, which renders this conclusion somewhat uncertain, I believe that they crushed the ore too fine.

I took about 15 pounds of each kind of concentrates and had them retreated by a dry concentration process, in the Sutton, Steele & Steele Mill, near Denver, where this test was made Friday, March 21st, 1914.

In that test, they separated further the concentrates that the millman at Boulder was able to, with the following results:

The samples for assay were taken by me and were assayed by Mr. George J. Ermlich, Assayer at 1721 Stout Street, Denver.

Concentrates from the Boulder Mill, coarser than a 70 mesh:

Boulder mill, Heads or concentrates as they came from the 56% tungstic acid.  
Ore screened from 20 to 40 mesh, and treated through the Sutton, Steele & Steele mill,  
Concentrates, 66% tungstic acid.  
Tailings, 37% tungstic acid.

In other words, the Sutton, Steele & Steele Mill took the concentrates from the Boulder mill and separated them into two products, one running 66% tungstic acid and the other 37% tungstic acid.

with some assays - why?  
no separately.

A similar test was made on the concentrates from the Boulder Mill running below 70 mesh, with the following results:

Heads, or concentrates, as they came from the Boulder mill,

Ore running 100 mesh and under, treated through the Sutton, Steele & Steele Mill,

Concentrates,	64.80%	tungstic acid.
Tailings,	35.80%	" "

At the Sutton Mill, we sized up the concentrates in a number of products, running from 20 to 40 mesh, that is to say passing through a screen of 20 mesh and not through one of 40 mesh, from 40 to 60 mesh, from 60 to 100 mesh and finer than 100 mesh.

I had the sampling done and the assay made on the two extreme products, the coarsest and the finest.

The results of these tests show that you can easily get a product running 60% tungstic acid, either by close milling methods, or in mixing together some concentrates running from 50 to 55% tungstic acid, with ore running sufficiently above 60% tungstic acid, to bring the mixture as near 60% tungstic acid as possible.

The conditions in which the tungstene ores are bought are such as to make it very advantageous to the miners to sell ores running as near 60% tungstic acid (W03) as possible.

The method of mixing concentrates of different grades to make a product of uniform grade, running as close as 60% in tungstic acid is common practice. It will probably be the best method for you to follow, as you will mine the low grade ore, with the high grade. The limit of the low grade you can take out and make pay will be regulated by the costs of sorting and milling the ores and by the amount of concentrates running above 60% tungstic acid, which you can mix with the lower concentrates, to bring the mixture up to the required grade.

#### CONCLUSIONS

In conclusion, I can say that the concentrates you have obtained from the Boulder Mill could easily be brought to a grade running 60% tungstic acid, either by better milling methods that we employed at that mill, or by the mixing of high grade concentrates with others, so as to get a mixture averaging as nearly 60% tungstic acid as possible. The complete testing of a carload of ore at the Sutton, Steele & Steele Mill will give some very valuable information, on that subject. What tests have been made there show that you can easily get concentrates running well above the required limit of 60% tungstic acid. It will be easy then to make a mixture meeting the requirements of the trade.

The results of the milling test show that the only problem which confronts you now is to develop the mine, as as to produce a sufficient regular supply for the mill. The proper milling of the ore can be done successfully.

(Signed) E. A. Ritter