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Mine Management
Mine Production

Licensed
Bonded

(191)
Item 24
Development
Exploration

J. H. WREN & COMPANY

Mining Contracting Engineers

Cable Address
WRENCO

AUGUST 30, 1966

Post Office Box 2021
Reno, Nevada 89505
Phone (702) 322-4840

SUBJECT:

COPPER MOUNTAIN MINE

During the month of March, 1966, the writer requested and obtained permission to examine the Copper Mountain Mine, Mineral County, Nevada, at his own expense. Several trips were made to the property, the last one on August 27, 1966.

The Copper Mountain Mine's preliminary evaluation held sufficient economic outlook to justify this firm in making a contract purchase offer for the purchase of the holdings. That offer was rejected as being too low and at this time we are not prepared to go any higher. Therefore, as our relationship with the owners is excellent, as a matter of courtesy this outline of unguarded non-promotional observations is being presented them without charge.

LOCATION:

The property is located some 29 miles from Schurtz, Nevada, via the Dead Horse Wells road in an Easterly direction. Approximately eight miles of this distance can be reduced with one day's heavy bulldozer work out of the North-Westerly end of the patented mining claims to the Schurtz road.

Other road access to the property is: Hawthorne, Nevada road via Thorne, a RR shipping point, about 35 miles. 14 miles to the oiled Nevada Scheelite road which makes a junction with the Highway 50 near Frenchman's Station, and a road to Nolan some 14 miles from the property. Nolan was a former Southern Pacific Railroad shipping point which is now inactive. Easterly another road connects with the Gabbs-Luning oiled highway.

Schurtz, Nevada, at this time would be the railroad shipping point for Copper Mountain Mine crude ore and milling plant concentrates.

Copper Mountain Mine Outline of August 30, 1966:

PROPERTY EXTENT:

The Copper Mountain Mine holdings comprise five patented lode mining claims amounting to approximately 96.169 acres in the Rand (Bovard) Mining District of Mineral County, Nevada. The U. S. Mineral Survey of the claims was made October 15 - 19, 1907 and designated Mineral Survey No. 3332.

HISTORY:

The Bovard Mining District, also known as the Rand or Copper Mountain District, is on the East flank of the Gabbs Valley Range. It was discovered by Al Bovard and other prospectors from the "Rawhide Mining Boom" during the early 1900's. Chief production period was 1915 through 1917 in the district with most of the output being derived from the Copper Mountain Mine.

The Copper Mountain Mine has an accountable crude copper ore sales amounting to some \$125,000 at the 1914 through 1918 quoted copper markets. The probability with lessee ore is that over \$150,000 gross returns was achieved. Copper market during the period was: 1914 = 13.60¢, 1915 = 17.275¢, 1916 = 27.202¢, 1917 = 27.180¢, 1918 = 24.628¢, and the yearly average price rapidly lowered to 12.502¢ per pound of copper in the years to 1921.

According to J. K. Turner, who was in charge of the operation, the economic cut-off point for crude ore shipment grade was 6% copper. He reported much positive ore tonnage developed which averaged 4.00% to 6.00% Cu. Management's objective at that time was to install a concentrating plant to capitalize upon the stockpiled surface ore and the blocked out underground tonnage. At some considerable metallurgical research cost, Sill & Sill of Los Angeles, California ran 127 separate mill tests in 1918. Those mill tests are available for scrutiny. Their only practical value now is to illustrate the representative mill head samples and their testing problems. During the years 1918 through 1938, a metallurgical baseline was established in handling such minerals as occur in the Copper Mountain Mine. Those baselines, 1939 to date, have been sufficiently refined to effectively treat combined oxide-sulphide ores with precipitation-flotation methods. The primitive Sill & Sill results with high treatment cost and poor recovery undoubtedly is the reason a concentrating plant was not built after an economic analysis of the tests was made.

Copper Mountain Mine Outline of August 30, 1966:

In 1937, an attempt was made to raise capital to produce and concentrate the ore reserves as copper price had improved from 9.47¢ in 1936 to 13.16¢ but fell to 10¢ in 1938 average price, so the financing attempt was dropped. Copper price raised only to 11.775¢ average in 1945 from the year of 1938.

GEOLOGY:

Copper mineralization at the Copper Mountain Mine occurs on or near intrusive contact between granodiorite and massive dark gray limestone, (Mesozoic). The surface contact zone is quite irregular as well as downward on a generally steep dip to the South.

Deposition of copper ore appears to be in veins along contacts and pre-mineral fault lines. Subsequent exploration may disclose copper ore bodies in areas of limestone replacement.

Metamorphism along the contacts has been noted and silicification-recrystallization of the limestone. Surface and old dumpage indicates aplitic and basic dikes' intrusion into the contact zones. It is supposed that these dikes are pre-mineral and while not directly responsible for the later periods of copper ore deposition were in areas of weakness which were also subsequently favorable for copper mineralization.

Detailed geologic mapping on this property and in the mine workings is a definite long range requirement.

MINERALOGY:

The chief copper minerals on the surface and to a reported depth below 200' are the carbonates, malachite and azurite.

Turner reported that in the 315' vertical shaft, it cut 12' to 14' of 4.2% sulphide copper ore at an inclination of 65 degrees. The dump bears out his statement with regard to sulphide occurrence as chalcopyrite, chalcocite and bornite were observed in the dumpage.

Complex, combined minerals with regard to requirement of complicated milling and concentrate penalty would increase cost items. However, such condition does not exist at this mine. While gold and silver has not been a production projection of the early technical studies, it is suspected that the sulphide flotation concentrates will hold some additional values in form of these metals.

Copper Mountain Mine Outline of August 30, 1966:

It is believed that gradation of carbonates into sulphides will occur at some depth between 200' and 250' in view of the 12' - 14' width at 4.2% Cu in the 315' deep vertical shaft. A secondary enrichment zone of presently undetermined depth will be found just below the straight carbonate ores and above the primary zone.

In view of the geology, existing minerals like garnet present, some possibility of tungsten occurrence on the property in form of scheelite is possible. The writer plans to check this on the next trip.

EXISTING DEVELOPMENT:

The J. K. Turner Report herewith describes existing exploration - development work in some detail.

In spite of some 48 years of project inactivity at the property, the shaft collars are in surprisingly good condition as far as one can see from the surface. The dry air with very little moisture fall in Winter has delayed normal timer deterioration.

The 5,000' of exploration - development work is of some considerable inventory value to any new operation commencement. Under average, normal mine operating cost about 25% of the total cost is spent on exploration and preliminary setup plus engineering, etc. About 25% is spent on mine development. In the case of the Copper Mountain Mine, a good portion of that above described 50% cost will be saved any operator.

Present replacement value of the development minus rehabilitation cost is:

770' of shafting-winzes	@ \$150 per foot	= \$ 115,500
4,200' of drifting-x-cutting	@ \$ 40 ft.	= 168,000
300' of miscellaneous raising	@ \$ 40 ft.	= 12,000
Surface cuts in ore, and miscellaneous utilities		= 15,000

Total replacement value = \$ 310,500

RECOMMENDATIONS:

In order to thoroughly evaluate all aspects of the Copper Mountain Mine, the following "Schedule No. 1" would adequately cover. However, if at this time only a minor verification of existing reserves and temporary access is desired, "Schedule No. 2" would be less costly but would not deliver the detailed economic accuracy of the first schedule.

Copper Mountain Mine Outline of August 30, 1966:

RECOMMENDATIONS: (continuation)

Schedule No. 1:

1. a). Run a representative scree and precipitation test of stockpiled surface tonnage.
- b). Run a screen and precipitation test on surface ore exposures that can be cheaply mined with a small frontend loader for fast immediate production.
- c). a). and b). above, field time, laboratory time, assaying fees are estimated to cost\$1,200.00
2. a). Set up a transit control grid system for engineering and geologic mapping.
- b). Map surface and underground workings.
- c). Make x-sections of the workings showing geology and mineralization.
- d). Put new ladders in shafts, raises and winzes. There are about 770' of shaft and winzes and over 300' of raises. Install some landings at intervals and scale down loose rock in the workings, particularly shafts, winzes and raises. This is needed for access to blocked out ore reserves.
- e). Rent a portable gasoline winch to lower ladders, supplies, and hoist samples from various shafts. Only one winch is required as it can be moved from shaft-to-shaft.
- f). Considerable mapping and evaluation cost verification is saved at this property due to no pumping and extensive timbering being necessary.
- g). No. 2, Schedule No. 1 cost estimate. \$ 6,500.00.

Copper Mountain Mine Outline of August 30, 1966:

RECOMMENDATIONS: Continuation

3. a). Sample all available ore reserves, both surface and underground. Compile assay maps. As there are over 5,000' of underground workings, and quite a bit of open cut surface footage in mineralization, in-order-to accurately evaluate POSITIVE, PROBABLE and POSSIBLE ore reserves, at least 200 underground and 50 surface samples will have to be taken.

b). Cost estimate with assay fees included... \$ 3,500.00.

4. Evaluation, mapping, lab work, access installation, trailer rental, timber, etc., total \$11,200.00

20% Contingency = \$ 2,240.00

Estimated total appraisal cost = \$13,440.00

It is quite probable that above cost is more than balanced by tonnage now on the surface.

Time element to complete schedule: Six weeks to two months.

Schedule No. 2:

1. In the event that elements of "Schedule No. 1" cannot conveniently be carried out at this time, in-order-to gain entry down the various shafts and winzes, ladders and landings require being installed. This will furnish access for interested investigating parties as well as a complete evaluation, geologic mapping and accurate ore reserves calculations at a subsequent time. The following cost estimates cover the taking, packaging, express fees, and assay fees on about 50 character and check samples to verify the general accuracy of the J. K. Turner ore widths and values. The costs do not, however, include the engineer's fee for work alignment and check sampling.

- a). No. 1 Lessee Shaft is 100' deep with 48' of winze. Reported values on the winze levels are:
2.5 Cu = \$18.00 value to 5% Cu = \$36.00 per ton in the winze drift.

Access and check sampling cost estimate = \$ 750.00.

Copper Mountain Mine Outline of August 30, 1966:

RECOMMENDATIONS: Continuation

Schedule No. 2 (continued)

1. b). No. 1 Company Shaft is 80' deep with reported 3' of 7% Cu = \$50.00 per ton and 5' of 4% Cu = \$28.80 PT on this shaft's levels.

Access and check sampling cost estimate = \$ 400.00.

- c). No. 2 Company Shaft is 200' deep with 3' of 8% Cu ore = \$57.60 per ton and 5' of 4% Cu = \$28.80 PT on the levels.

Access and check sampling estimate = \$1,000.00

- d). Main shaft is 315' deep with reported 12' to 14' of sulphide copper ore of 4.2% Cu = \$30.24 per ton. This shaft, if connected to the more Easterly ore shoots on the property, would make available some 500' of mining backs above its lowest level.

Access and check sampling estimate = \$1,000.00

Total estimates = \$3,150.00

20% Contingency = \$ 630.00

Total access-check sampling = \$3,780.00

- e). Above includes winch rental, timber and ladders, three manshifts of labor per day, trailer house rental, service and supplies.

Time Element: Two weeks site work
One week getting assays out.

METALLURGY:

Sill and Sill, of Los Angeles, California, who were at the time the most prominent consulting mining engineers and metallurgists, from May 17, 1918 through October 20, 1918, ran 127 separate mill tests of Copper Mountain Mine prospective millhead ore. While these tests, no doubt, cost several thousands of dollars, their results are of no practical value now other than the representative assay grade of the samples' heads. The ore tested as millhead representative tonnage all would be of economic value at this time.

Copper Mountain Mine Outline of August 30, 1966:

METALLURGY: (continuation)

New mill tests will be required at the Copper Mountain Mine but advancement of copper metallurgy relative to precipitation and flotation has progressed very far from the primitive knowledge known of such ores' treatment in 1918.

The lack of complex minerals, combined with the copper in the mine's ore, will increase recovery and insure metallurgical efficiency. For over 20 years combined precipitation-bulk-flotation has been a normal, daily production practice at many U. S. and foreign copper enterprises.

ECONOMICS:

Mining and milling cost estimates, as laid out by Mr. J. K. Turner in 1918, and subsequently in 1937, are no longer accurate. In some instances, by use of modern mechanization, tungsten-carbide drill bits, better explosives, etc., costs will be less than originally calculated and in some instances 1966 costs will be greater. However, mill recovery now will be considerably better and modern trucks on the haul to the railroad much more efficient than the 1917 vintage rolling stock.

The copper outlook trend indicates a rising price in view of the fact that South American operations are about to raise their price for export copper. Therefore the calculations herein that are based upon 36¢ per copper pound would be improved by a rise in the metal's market price.

There are about 2,000 tons plus of stockpiled ore of a 3% to 4% Cu grade. At 3%, this represents a gross value of some \$43,200.00. It may be amendable to fine crushing and screen beneficiation. A series of screen tests will prove if beneficiation by this cheap simple method is practical. Surface, and near surface, ores that can be inexpensively produced with a frontend-loader-ripper will swell the immediately available tonnage of this type of ore.

According to the J. K. Turner reports, it would seem that the minimum millhead grade existing in the positive ore reserves is 4.00% Copper, or 80 pounds to the ton. This would be a gross value of \$28.80, an excellent millhead considering that the major amount of development footage is already in effect.

Copper Mountain Mine Outline of August 30, 1966:

ECONOMICS: (Continuation)

At this time, a combination precipitation-flotation plant will cost 2,000 dollars per ton capacity, if procurement of equipment is carefully selected and without "middlemen" adding to the cost. Therefore, a 100 ton plant will cost some \$200,000 and if J. K. Turner's millhead ore grades are accurate, would net above mining and milling, plus amortization, approximately \$1,000 per day. The mining installation setup cost would be some \$100,000. A detailed cost breakdown can be presented as soon as some check sampling has been accomplished underground and from surface cuts, slots, and pits as well as the stockpiled tonnage sampling.

If the thorough evaluation itemized in "Schedule No. 1" is used, possibly the property may justify a larger mill than 100 tons capacity. A 200 ton treatment plant would cost about \$325,000 and operate with the same amount of mill labor and supervision but on 4.00% Cu ore would net above amortization, and before taxes, about \$2,300 per day.

Camp employee housing would amortize itself if setup with modern trailer houses and the workmen charged rents as required by the Internal Revenue Department.

SUMMARY:

Public utility power is some four miles from the property.

Milling water would be available near the property if a well was drilled, and the water pumped to the concentration site.

The writer has no knowledge of any available mining property with developed millhead grade as reported by experienced, graduate engineers in their studies of the Copper Mountain Mine.

Evaluation cost, as herein estimated, is quite nominal in view of the reported average ore grades in the various developed mine sections.

The fact that the property is patented is an asset of importance during these days of government encroachment and disqualification of lode mining claims held under location laws.

Copper Mountain Mine Outline of August 30, 1966:

SUMMARY: (continuation)

The Copper Mountain Mine is in a weather zone which will permit a full twelve months per year operation.

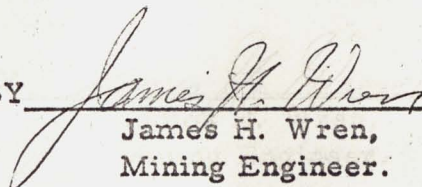
Generally, it is understandable to see why the original operators were hampered in their mining efforts with a 6.00% copper economic cut-off point on their crude ore shipments and the primitive metallurgy available in 1918 to treat the mine's developed tonnage.

Schedule No. 1, to thoroughly evaluate the property, is by far the better method with which to compile factual data. However, if the cost estimate cannot be met at this time, Schedule No. 2 is the only means of checking previous technical reports and the standing ore reserves. It would furnish access, for interested firm's engineers-geologists, to areas of copper ore reserves if a property sale was being negotiated.

Very truly yours,

J. H. WREN & COMPANY,

BY


James H. Wren,
Mining Engineer.

No. 2 Shaft before⁶ repair



Collar No. 2 shaft repaired



SEP • 66

8' mining width on surface



can be cheaply produced

200' shaft guarded



SEP • 66

incine before laddering



Ore on wall of incline



SEP . 66

100' level No. 2 shaft



Ore above drift near incline



128' Level ore



SEP • 66

No. 1 shaft guard 200' deep

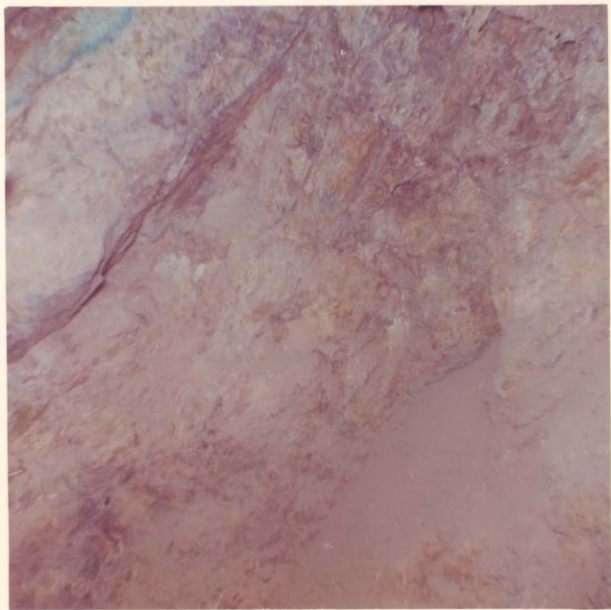


SEP • 66

No. 3 shaft seen from incline ore



168' level ore -No. 2 shaft



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No. 3 Shaft with new guard rail



SEP . 66

Good ore on upper dump



SEP . 66

Roy Hardy , C. Wright at No. 2



shaft under repair

No. 2 shaft ore dump



SEP . 96

No. 3 shaft 315' deep verticle



crosses ore at 260' 11' wide



Incline after laddering



315' Shaft dump seen from ore



on 80' shaft dump

No. 2 shaft 100' level ore



Ore at collar of incline



SEP . 66

Upper workings ore

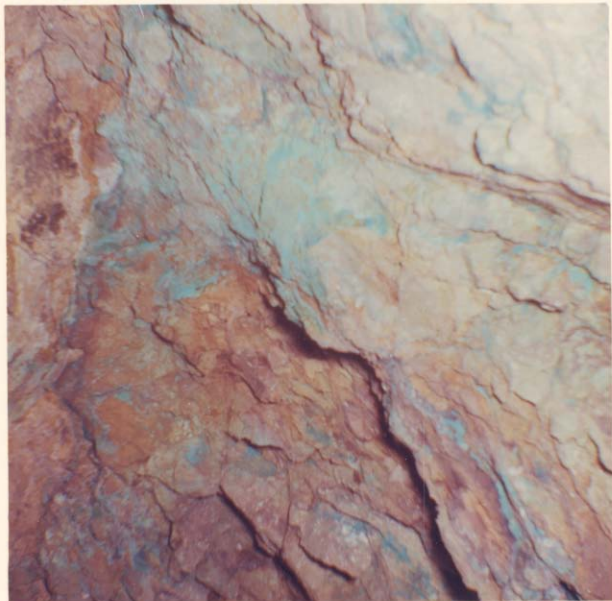


SEP . 43 66

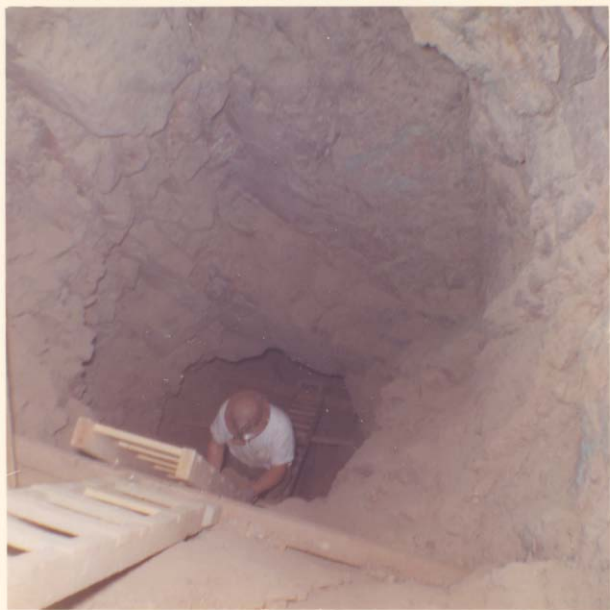
Wren and Wright taking sample



of stockpiled 1,000 tons ore



WINZE BELOW 128' level No. 2 Sh.



128' level ore



8' good ore on surface

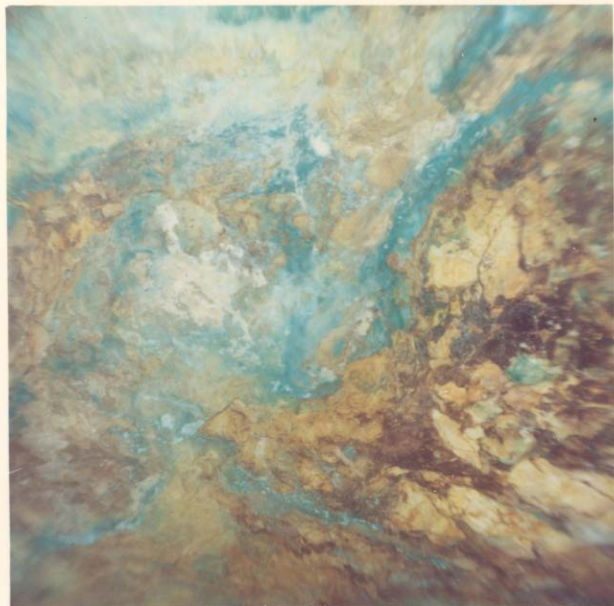


SEP • 66

60' level stope No. 2 shaft



60' Level Ore No. 2 shaft



Two days of blade work here
will reduce some six miles of
distance between mine and
railroad shipping point of
Schurtz, Nevada

MINE.



Looking Southerly from the
Schurtz shipping point road,
to the Copper Mountain Mine.
Hooking up here will save over
six miles of distance.



200' shaft No. 1⁶⁶ Collar



Copper Mountain Mine
workings behind this hill.
Road view from Deadhorse Wells.

LOOKING WESTERLY



NO. 1

SET NO. 2

NO. 3



No. 3 Shaft 315' ^{OCT 66} deep

Note carbonate ore dump
over guard railing



ORE ON SURFACE IN PLACE EAST END



OCT • 66
15' width of ore near No. 2



Old lessee shaft⁶⁶ in ore





ON MINE PROPERTY LOOKING
EASTERLY. GABBS , NEVADA IN
BACKGROUND.

GABBS



80' shaft collar covered, it
is connected with
No.2's 100'
level



NO. 2 SHAFT COLLAR.



Schurtz Road • OCT 66



No. 1 No. ⁰⁰²2 • Incline No. 3



INCLINE SHAFT COLLAR ON VEIN



Looking up 315' shaft

007 66



ORE DUMP UPPER WORKINGS 3% Cu



ORE STOCKPILED EAST END

