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GARFIELD

BLUE RIBBON COPPER PROSPECT

Mineral Co., Nevada

AN ANALYSIS

FOREWORD:

Prior to visitingnthe Blue Ribbon property, references to Mineral County's Santa Fe mining district were consulted.

Reports furnished by Mr. J. M. Reynolds, lessee, and Mr. Jay MacKenzie, Reynold's consulting geologist, added to preliminary impressions.

Accompanied by Mr. MacKenzie, portions of December 16 qnd 17, 1970, were spent in covering all claims. Three days have been needed to complete maps and sections, coordinate information from several sources, and to reach the conslusions and recommendations, listed below.

Our text is supported by Plates A through D, listed as follows:

A. Index Map

B. Regional Pattern: 2000 scale

C. Blue Ribbon Copper Prosppct, 600 scale

D. Sections; 600 scale.

Reference to illustrations is urged.

PURPOSE OF REPORT:

On the basis of two days of field study a detailed understanding of the property cannot be claimed. Reports in lessee's files do not fill in the gaps since all speak in generalities. The property and its environs is very much in need of a detailed geological study and sampling job.

The two days of study and what we have read does, however, provide a favorable impression.

We have recognized, however, the broad distribution of a zone of alteration, characterized throughout by copper staining.

The pumpose of our report is to first indicate its size and urge that it be drilled systematically; and, second, to point to the complexity of mineralization and the need for laboratory testing, as drilling progresses.

PROCEEDURES:

The property's major occurrences were first covered by Jeep-reconnaissance. We found it impossible to coordinate field observations on maps in use. As reported above, mineral occurrences were genrralties; road systems, sketched in, were without accuracy and could not be used.

Our initial examination was continued, therefore, by running 8000 feet of Brunton compass-controlled pacing traverse through the heart of the property's zone of alteration, ~~tying the survey to~~ STARTING FROM an identifiable claim corner. The survey could then be tied, accurately, to the overall claim map.

Seven samples from typical 'shows' and of average ~~low to medium~~ Copper Tactite alteration grade were cut during the survey's progrss. It was possible also to roughly establish the contact between fresh limestone and the underlying tactite on the eastern side, to tie in a portion of the volcanics covering the tactite area, and tomestablish the swing of the tactite unit to the northwest in the Black Diamond No. 2 claim.

Plate "C" is the product of the proceedures outlined above. Plate "B", "Regional Pattern", has asits base the excellent 7½ minute sheet, Mina N.W. Quadrangle. Sections have been constructed using both B and C.

Reports by others have supported but not added to observations. A seemingly ACCURATE soil sample map, in Reynold's files, has contributed both to geological thinking and the accuracy of our 600 scale Plate "C".

CONCLUSIONS:

This analysis concluded that:

1- Reynold's Blue Ribbon claims cover an area of extremely altered limestone-porphyry, called tactite, with length and width established, but with thickness still to be determined;

2- flanked on both sides by bedded limestones, the zone, on Reynolds claims, has a long axis of 6000 feet and an average width of 1250 feet;

3- with mineralization, copper and minor tungesten, an arithmetic average of earlier samples indicated the possibilities of 0.85%, with percent WO_3 to be determined;

4- area, as indicated within the confines of Reynolds property would provide 50,000,000 tons for every 100 feet of vertical extent;

5- possibilities exist that the trend can be continued into the Windup mine on the north and into the Jeep mine on the southeast.

RECOMMENDATIONS:

Assuming that and fair and equitable arrangement can be reached with Mr. Reynolds, this analysis recommends that:

1- the property be diamond drilled in a systematic fashion;

2- within a reasonable time, after the start of drilling, and assuming encouraging results by that time, metallurgical testing of typical Blue-Ribbon mineralization be continued.

LOCATION:

With reference to Plate A, the property lies about 3½ miles southwest of Luning, Nevada, in east-central Mineral County. Claims fall in the southeast quarter of section 7, and the south half of

section 8, Township 7 North, Range 34 East, Mt. Diablo Base and Meridian. Mining district is Santa Fe. Properties lie on the north portion of Black Dyke Mountain, and slope is steeply east into the Soda Spring Valley.

GENERAL AND LIMITING CONDITIONS:

Access:

Property lies 170 miles, via paved highways, from Reno, Nevada, with the exception of the last 3 miles which is good gravel and desert hard pan.

Luning, on a barnch of the Southern Pacific Railroad is 4½ miles to the northeast, over gravel and pavement.

As reported by H.M. Walker, in a report dated March 10, 1969:

Power:

" a power line passes within 500 feet of the property line."

Water Supply:

" Sufficient water can be obtained by drilling to a depth of 200 feet". ie: not at mine area, but to the east, probably in the fanglomerates, east of the range

Mill Sites:

"there are nine millsites, approximately 45 acres, located about 3 miles east, between U.S.Highway 95 and the Southern Pacific Railroad."

Tailings Disposal:

Probably the area is adequate for a small to medium sized operation. However, should the area described below have substantial thickness, further tailings disposal studies should be made.

Climate:

Year-round surface operations appear a reasonable possibility.

LEGAL TITLE:

Properties consist of three patented and 18 unpatented mining claims. According to Mr. J. M. Reynolds, the legal description of claims, as recorded in the official records of Mineral County, Nevada, are:

Patented Lode Mining Claims:

Blue Jacket # 1
Blue Jacket # 2
Copper John

Book 14 of Deeds, pages 506-507

Unpatented Lode Mining Claims:

Blue Ribbon #1
Blue Ribbon #2
Blue Ribbon #3

Book 13 of Deeds, pages 544-545

Blue Ribbon #4
Blue Ribbon #5
Blue Ribbon #6

Book 14 of Deeds, pages 163-164

Blue Ribbon #7

Book 14 of Deeds, page 471

Blue Diamond #1

Book 13 of Deeds, page 566

Blue Diamond #2
Blue Diamond #3
Blue Diamond #4
Blue Diamond #5
Blue Diamond #6

Book 26 of Deeds, pages 497-499

Blue Ribbon #8
Blue Ribbon #9

Book 7 of Deeds, pages 59-60

Blue Diamond #7
Blue Diamond #8
Blue Diamond #9

Book 7 of Deeds, pages 61-63

Owner of the Blue Ribbon gorup in 1961 was Mr. C. F. Noble of Mine, according to the Nevada Bureau of Mines. H.M.Walker reports that Mr. J.M. Reynolds acquired the property in July 1966, taking a lease and option at that time. It is reported that Mr. Noble's end price, at the time, was $500,000.

Mr. J.M.Reynolds has been lessee, therefore, for 4½ years.

No check has been made of County Court House records.

HISTORY OF PROPERTY AND DISTRICT:

The area is a part of the Santa Fe mining district, the bulk of which lies east of highway #95.

F. C. Lincoln's "Mining Districts of Nevada" reports:

> "The Santa Fe Silver mine was discovered in 1879, and a number of other silver, silver-lead, and silver-copper claims were located in thedistrict. These silver properties were exploited up to 1893. Work upon the copper-lead deposits began about 1906——".
>
> "From 1906 to 1921 the district produced 88,019 tons of ore, containing 8,849,597 pounds of copper, $123,146 in gold, 233,058 ounces in silver, and 253,019 pounds of lead——".

Concerning the Blue Ribbon, Windup, Jeep, Tungsten Dyke, Kay and other prospects in the general area of the Santa Fe District, west of Highway #95, references fail to report discovery dates. With most of them staked for copper, probably around 1915-1918, no copper has been produced; they have shipped some tungsten.

Mr. Walker refersto "shallow drilling done by a contractor in 1963 whom I personally know." Mr. J. M. Reynolds refers to such drilling but has been unable to present locations or values of material cut.

An undated memorandum by Mr. William F. Hutchens, geologist, reports:

> "some claims held below the Reynolds claims by various individuals are leased to the Bear Creek Mining Company, who have core drilled their holdings to the maximum depth

of their drilling eqipment, ie: below the 2000 fott level. The drilligg found that values increased with depth in copper gold, silver and lead."

With reference to our submitted Plate B, it would appear that the Jeep Mine area, on which roads and drill sites are apparent, are the center to which Mr. Hutchens refers. It is our understanding that the activity was recent, perhaps 1968 or 1969.

GEOLOGY:

Mappable Units:

With reference to Plate C, note the references to limestone tactite and volcanics. The three units are outstanding and easily recognized. Less obvious, but definitely present are acid to slightly basic intrusives, mixed with the tactite but unmapped, because of the detail required and lack of time.

We believe that the terms "limestone" and "volcanics" are familiar ones, requiring no further explanation.

Concerning "tactite", Grout's "Petrology and Pertography" has the following to offer:

> "Tactite: a contact-mineralized rock with various minerals, formed from limestones and other soluble rocks by igneous emanations".

Tactite on these properties is a group or unit classification. Variations, depending on origin, do exist.

In greater detail the limestones are dark gray to almost black, very well bedded, and away from the contact, on the hanging wall side, truly limestones. However, moving in the opposite direction and into the footwall area, limes slowly lose their identity, passing rapidly into an area where lime remenents exist as black 'ghosts' in a very siliceous ground mass, and finally to the highly siliceous, darkish-gray to green, finely crystalline tactite condition.

The volcanics, where definite, appear thinly layered, relatively soft, occasionally platey; in plades, light-gray rhyolitic appearing, and in other areas reddish and andesitic looking. Whereas, initially, it was our opinion that the volcanics might be mid-Tertiary and post mineral, covering limestone, tactite and mineralization, others have concluded that the volcanics are pre-mineral, describing some of the tactite as highly metamorphosed volcanics

The tactite unit suggests a mixture of origens, namely limestones, intrusives, and possibly volcanics. The unit is hard and difficult to shatter, probably because of its massive silica. Finely crystalline silica is dominant, shades of green to gray persist and, locally, ghosts of less absorbed limestone and porphyritic material can be recognized. Tactite limits are sharp.

STRUCTURE:

Major Possibilities:

Deformation throughout the area is intense but whether the tactite zone and the intrusive which was responsible for such alteration was structurally controlled must remain a question.

With reference to Plate B, our very obvious inference that the same tactite zone runs from the Windup mine, through the Blue Ribbon area, the Jeep mine area and possibly to the Kay mine area, suggests regional structural control.

The fact, too, that the limestones on both sides of the alteration trend are twisted and contorted, with changes in dip and strike and even with folds, locally recumbent, suggests a strong structural unit, perhaps, even a regional overthrust.

With reference to Section X-X', on Plate D-D', if the limestones shown on the two sides of the tactite unit are identical, structure has definitely entered into the emplacement of an intrusive and its halo of tactite alteration.

To further investigate the possibility of regional structural controls would be the purpose of continued mapping.

Minor Structures:

Quartz veins with widths as great as two feet, cut across the east-west trend of the tactite zone, in scattered areas. Strike of these vein structures varies from N 15° E to N 65° E, with dips steep to the southwest to near vertical.

It is conceivable that the structures and the massive to vuggy copper stained quarts and the scheelite might suggest a continuation of tactite alteration as well as mineralization at depth, throughout the 6000 by 1250 feet of area; since the greater part of the veining appears to favor the south portion of the alteration zone, and not the more pronounced tactite of the north side, the entire 1250 feet of average width must be considered seriously.

One of these 'minor' structural trends can be traced for about 1400 feet, inclined diagonally to the true width of the tactite zone.

MINERALIZATION:

Copper

Personally observed and on the basis of references, copper mineralization is wide spread, consisting of malachite and azurite (carbonates), undoubtedly crysocolla (the silicate) and some disseminations of chalcopyrite (the double sulphide with iron).

Copper is reported at the Windup mine, north of the property, and the Jeep mine (Tungsten Dyke?) on the east.

For further reference note that the Blue Ribbon block of claims also encompasses the Houghton-O'Boyle mine and the Atom Lorna mine. The former, as indicated by Nevada Bureau of Mines maps, seems represented by the development on Blue Diamond 1 and 2 claims. The latter seems to have been located in the northeast corner of section 7, between the Blue Ribbon and Windup mines. It is not shown on submitted maps.

The Houghton-O'Boyle was first located as a copper prospect, but small production in tungsten as well as copper is reported.

Malachite and azurite are disseminated in the limestones of the Windup mine. Copper stained quartz characterizes the Kay mine in section 15.

Tungsten

Mr. Reynolds reports that the Blue Ribbon claims and patented ground were mined (high-graded) for the calcium tungstate, scheelite.

Concerning the Houghton-O'Boyle, it has been described in NBM Bulletin 58 (Mineral County), as follows:

> "shafts (two, each with an inclined depth of 80 feet) follow a silicified zone 4 to 5 feet thick in limestone; abundant iron stain with stringers and veinlets of quartz; scheelite scattered; locally up to 4% WO_3 in crystals up to ½ inch long".

Disseminated scheelite occurs with the copper at the Windup mine. The Tungsten Dyke (near the Jeep) reports a scheelite bearing tactite stringer in the limestone.

Miscellaneous

Sphalerite (ZnS) was observed in some of the soil samples on the Blue Ribbon property

At the Atom Lorna pyrite, galena (PbS) and sphalerite (ZnS) occur in the limestone.

In the H.-O'Boyle area large masses of iron oxide (hematite), noted as 'gossan' on older maps, were observed.

Pyrite, of course, is widespread.

Overall Personal Reaction

The existence of copper mineralization, throughout the tactite zone is the property's main attraction. Carbonates and silicates

of copper occur in fractures cutting the silicified tactite unit, and probably as fine disseminations, throughout the greenish mass. Chalcopyrite, in minor quantities, and, too, as disseminations appears to be widespread. Copper shows accompany the quartz veins.

Field studies did appear to verify the existence of tungsten with materials, characterized by abnormal 'heft', observed close to quartz veining. The property was not examined with a black light, and our rapid reconnaissance aas inadequate for purposes of establishing any wide-spread, low grade WO3 possibilities.

DEVELOPMENT:

Except for scattered pits and trenches, a few short tunnels into obvious tungsten zones, and several short inclined shafts to a maximum depth of 80 feet, the properties are without any serious, systematic development. No attempt was made to map any of the workings.

According to Mr. Reynolds, the owner, Mr. Noble had a series of short holes, to as deep as 50 feet, drilled in 1963.

The writer is concerned that results are "hear-say". Apparently no records exist. Of concern, too, is that since 1966, lessee has been unable to further test the property with short holes, to check Noble results.

SAMPLES:

Seven samples were cut during the progress of this study. Efforts were made to pick average exposures of typical tactite, trying to avoid down or up-grading.

Assay results, with work provided by Metallurgical Laboratories of San Francisco, are listed on page 12, as follows:

Assay #	Claim	% Cu	Comments
A	Blue Ribbon #9	0.43	Face of north cut, above road on side line common with Blue Ribbon #6
B	dto	0.14	Pit at center of claim on B.R. #6 side line, south of Sample A.
C	Blue Ribbon # 1	0.063	Tunnel above road, marked C on P ate C; cut across alteration at portal
D	dto	0.54	Tunnel north of C; grab sample from tunnel ribs in area of WO3 mining.
E	dto	0.15	Tactite in bank west of road, and southwest of division of roads.
F	Black Diamond #2	0.67	Center of claim, chip samples across 100 feet of tactite exposure
G	Blue Ribbon #5	0.026	chipped from pit in center of claim.

Of interest and significant because of reasonable grade are the following samples, provided by Mr. Joe Reynolds. Mr. Reynolds spoke well of the parties responsible for samples and assays, who were associated with the Colorado School of Mines. Copied from a well drafted map of the property, results are as follows:

Samplee#	Width	Cu %	Comments
A	18 in.	0.50	Blue Ribbon #8, south end of east line
B	45 in.	1.20	B.R.#9; across east line, opposite samp. A
C-1	10 ft.	0.35	Blue Ribbon #1; same area as our samples Cp D, and E
C-2	7 ft.	0.80	dto
C-3	7 ft.	0.70	dto
D-1	45 in	0.135	Blue Jacket #2; Center of west side line.

Sample #	Width	Cu %	Comments
D-2	40 in.	0.75	Same as D-1 location
D-3	30 in	1.00	dto
E	30 in	1.70	Copper John; center South end line
F	45 in	2.70	Blue Jacket 1 and 2 Center common side line.
G	chips	15.00	Same area as DLE's Number F.

See Triangles on Map C for locations.

Concerning recent soil sampling, by a very reputable company, those analyses reported in percent copper have been added to Plate C; values in 'parts per million (PPM) are enclosed in parentheses.

ORE RESERVES:

No ore reserves exist, at this stage of development. An estimate of up to 7,000,000 tons by Mr. H.M. Walker was based on "shallow drilling by a contractor whom I personally know."

One set of data infers a 2% copper average grade for the copper zone. William F. Hutchens refers to "assays have been from five per-cent to thirty per cent".

On the other hand considering the "School of Mines" list above, and throwing out the list's 'G' sample, one is considering an average of between 0.75% and 1.00% copper, which in this day and age with large tonnage is adequate, to say the least. With a tonnage of 30,000,000 tons or better, such a grade would underwrite an ore deposit.

Only by proper drilling and detailed mapping, to provide the thickness to accom any the square area, can a true ore reserve be established.

DEVELOPMENT POTENTIAL

Area of tactite shown on Plate C and projected to the north line of Blue D_1 amond No. 1, amounts to 5,937,000 square feet. Using a factor of 12 cubic feet to the ton, the square area represents 495,000 tons per vertical foot, 4,950,000 tons per 10 feet of vertical depth, and 49,500,000 tons per 100 feet of vertical extent.

Financial Requirements

RECAPITULATION:

The property has many excellent features. Considering access, power supply, shipping points, mill site with respect to mine, climate, et cetera, conditions are exceptionally favorable.

Slopes would provide and ideal and cheap open pit mining operation, in the event reserves could be developed.

Terrain is such that operator could move through the property with ease, establishing drill pads, and drilling out the property. It is also believed that the compact tactite could be efficiently cored by a knowledgeable contractor.

It is believed that with continued laboratory study, the ideal flow sheet could be devised, to handle the complex carbonate-silica copper ores, the minor sulphides, and the possible tungsten bi-values.

But, until the property is drilled, the thickness and grade of the tactite zone must remain only a guess. A ten foot zone, establishing some 5,000,000 tons would be considered insufficient. Thicknesses of mineralization approaching 100 feet, and an overall grade of about 0.75% copper would indicate an economic possibility. It is believed that $50,000 or some 5,000 feet of hole would mae or break the property.

In light of the uncertainties and hasards, encountered to date, this report would not go along with the exceedingly large down payments the lessee has had in mind.

Respectfully submitted,

David LeCount Evans