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Item 1

REPORT

on the

OHIO MINE

in the

REBEL CREEK MINING DISTRICT

HUMBOLDT COUNTY, NEVADA

for

MR. E. L. RICHARDSON

of

MILWAUKEE, WISCONSIN

by

JAY A. CARPENTER, E. M.

Reno, Nevada.
November 20, 1954.

REPORT ON THE OHIO MINE

LOCATION

The Ohio Mine is a group of six patented claims, the Ohio, Scioto, Pride of the Valley, A jax, Sucker and Buckeye, all located in Sections 32 and 33 in T 44 N. R 38E in Northern Humboldt County, Nevada.

It is reached by travelling north from the Western Pacific or Southern Pacific Railways at Winnemucca, Nevada, on improved gravelled highway, 45.8 miles to Oravada, thence 4.4 miles northerly on the old valley highway past Snap's ranch, thence on poor road northeasterly 1.4 miles to the ranch at the mouth of Eagle Creek and 2 miles easterly up Eagle Creek to below the dump of the Fourth Level Tunnel, a total distance of 51 miles from Winnemucca.

PURPOSE OF THE EXAMINATION

The purpose of my examination was neither to make a detailed geological mapping of the property nor to make a thorough sampling of all ore faces, but rather to check up on the accuracy of reports already in your files, to supply important missing information upon the mine, and to present my conclusions to you, as the legal representative of the owner, upon the favorable and unfavorable features affecting its possible sale.

GEOLOGY

The gold and silver bearing quarts vein that gives the property its value, outcrops on the hill top in the vicinity of the common end lines of the Ohio and Scioto claims. (See claim map of Surveyor O'Leary).

The first level is a drift on this vein from the Open Cut for a distance of 300 feet to beyond the last northerly winze, giving a course to the

vein of N20E. Along this drift the vein has a variable dip to the eastward of 20 to 40 degrees, but with depth it flattens to less than 20 degrees.

The width of the vein between walls is also variable, varying from 3 ft. to over 10 ft., but in most places 4 to 6 ft.

The vein material is mainly a brittle white quartz with iron oxides on fracture faces and in vugs. Occasionally the green of copper carbonates or the black of a sulphide shows up. All these minor minerals occur in greater abundance closer to the hangingwall of the vein. The ore would be termed an oxidized quartz ore, and the 3rd Level ore, about 850 ft. down on the dip, is similiarly oxidized.

The gold is in the form of fine free gold, and the silver mainly as silver chloride. The free gold probably resulted from the oxidation of a gold bearing pyrite while the silver chloride from that of argentite and a silver bearing copper sulphide. There is no fixed ratio between the gold and silver content of the ore but, in contrast, a surprising variation from sample to sample. However, the more iron stained rock next to the hangingwall carries more gold and silver than the whiter quartz below it. Knowing this, the miners of the '80's sorted back the broken white quartz as stope fill, only hoisting the more colored quartz, and again out in the sun light they resorted out a small tonnage of richer ore that would bear the shipping expense.

The vein lies in a slate formation and somewhat conformable to the bedding, but the slate has been subjected to much banding and twisting and considerable pre-mineral faulting. While the vein has distinct hanging and foot walls, these too are quite irregular and the vein swells and pinches correspondingly. I am inclined to believe this quartz occurs in lens-like masses rather than shifted by minor post mineral faulting as has been suggested. However, the vein as so far developed for three hundred feet along the strike and three hund-

red and fifty feet on the dip, is practically one continuous body of quartz and there is no evidence of the faulting of the vein at the most advanced faces on the strike or dip.

The slate is fairly hard and blocky where it is not altered by slips or faults to the appearance of the schist.

As a consequence it was not necessary to timber the drifts, raises, and winzes, and after 50 years the roofs of the openings are as solid as the day the openings were driven. One exception to this is the north drive on the Fourth Level Tunnel, where at 100 ft. out the roof has caved up to a fault several feet above it, thus blocking this drive. This north drive is under the vein, and this fault apparently did not disturb the vein directly above the 3rd level.

In the larger stopes, the low grade ore was piled back in the stopes for roof support, and a few stulls used. These stulls, even where no fill was used, remain practically intact. This leads to the conclusion that the vein can be mined by the simple method of open stulled stopes, and even the old stope fill can be pulled for milling.

The statement in Mr. Ferguson's report that the vein has a slate hangingwall and a porphyry foot wall and is, therefore, on a deep-seated contact fissure, is, I believe, a very erroneous and misleading statement. The only sign of an igneous rock that I saw was a narrow band of highly altered rock in the hangingwall of the vein near the surface, and again entirely in the schist in the Fourth Level Tunnel. It may be that the intrusion of this igneous rock and that of the quartz of the vein may be closely related in geological time.

Mr. Ferguson's optimistic statement that the vein can be traced for over 2000 ft. on the surface is also most misleading. To the south of the surface openings on top of the hill the vein on account of its flatness outcrops on

its dip on the side of the gulch to the south, and thus the outcrop can be followed in a southeasterly direction, giving a horseshoe bend as shown on the accompanying map. Across the gulch to the south, and off your property, there is no visible sign that the vein continues on.

As to the continuation of the outcrop of the vein to the north, it is not in evidence to the north of the raise on the vein to the surface, at A on the map, where the upper tunnel encountered the vein. However, the north drift on this tunnel (or First Level) continues on the vein to where a winze (marked B on the map) was sunk on the vein. Near the winze is a raise that at about 12 ft. above the back of the drift, encounters the apex of the vein, and explains why it does not continue to outcrop on the surface. The drift beyond the winze encounters and runs beyond the apex, thus making it an unfavorable face to develop. Likewise on the north drift of the "Second Level" that estends farther north than the first level, the vein for the last 150 feet is very narrow and poorly defined. This likewise makes development to the north on this level unfavorable.

The indication then is that the vein in its northeasterly course is a blind vein that does not outcrop. This is sustained by the fact that pits dug along the projected strike to the north do not disclose the vein. Several hundred feet to the northeast there is an outcrop of quartz and also one near "U.S.M.M. No.1-131" but both have the appearance of lenses of quartz rather than part of a vein outcrop and both carried but traces of gold and silver.

On the Scioto and Pride of the Valley claims to the north and west of the "U.S.M.M. (mineral monument) No.1-131" there is a very prominent outcrop of a wide quartz vein which outcrop can be traced for several hundred feet southerly. This is probably the vein that Ferguson refers to as the "Pride of the Valley"

vein. A cut sample from the tunnel driven under this outcrop (Sample No.18) assayed under $1.00 (see assay certificate) and another sample taken along the outcrop for some distance to the south (Sample No.15) assayed likewise. This, along with the absence of work in the past, indicates that this vein offers little inducement for further exploration work.

On the surface of these claims are occasional surface pits on isolated croppings. Samples from these turned in to the State for free assay, gave but traces.

From the standpoint of a fine showing of vein quartz, the best place to carry on development, in my opinion, is on the Third Level. Here the vein lies very flat and is apparently 12 ft. or greater in thickness. A foot wall drift (C to D on map) is in continuous quartz, as is likewise the shorter (E to F on map) hangingwall drift. All faces on these drifts are still in quartz. It is a surprisingly larger showing of quartz compared with that on the Second Level.

It is a fair assumption that if the drifts on this Third Level, and also on the Second Level, be continued to the south that they would come out to the surface on the side hill to coincide with the continuation of the outcrop on the dip of the vein.

The flatness of the vein on this Third Level explains why the Fourth Level tunnel did not encounter it. A raise, now open, from the north drive from this tunnel, just before the caved ground is reached, (as shown on the map, See point G) encounters the hangingwall drift about 40 ft. above the tunnel.

Mr. Melody in a letter to you in December of 1913 sent you a sketch showing that beyond the present cave a short drive to the east picked up the "vein" and from this there was a South Inside Drift and a North Inside Drift and

he told you the north drift encountered "18 inch. of 300-oz. ore" which was stoped up on but did not connect with the Third Level. He advised re-opening this drift by a new drive from the main tunnel.

I am very skeptical that these "Inside Drifts" were on the same strong vein of the Third Level, for if so this vein must abruptly change in its dip from nearly flat to nearly vertical. Mr. Melody's memory at the present time is that no ore was found on this lower tunnel level.

Strange to relate Deputy Mineral Surveyor F. R. O'Leary's map of the claims in 1914 shows this north drive to continue for two hundred feet but without a crosscut to the east or any "Inside Drifts"!

Under these circumstances I would not advise doing any work to re-open the north drive in the Fourth Level Tunnel until much more exploratory work was done on the Third Level.

As the dip of the vein on the Third Level is flatter than the hillside above the Fourth Level Tunnel, there is a strong probability that this vein, due to the erosion of Eagle Creek gulch, outcrops on its dip as far down as on the hillside above the tunnel. This is rather an unusual assumption to make but the flat-lying quartz outcrop (See Point H) on the line of the tunnel about 50 ft. vertically above it, adds additional evidence, while its assay value (Sample No.25) of $10.51 seems to connect it up with the vein. The old time miners must have eventually conceived this idea for there are two vertical raises in the tunnel between the portal and the north drive. The absence of timbers make their inspection impossible but pique one's curiosity.

To the north, by projection, the vein should in a short distance fail to show on the surface on its dip. Surface cuts should be made to explore the extent of this last mentioned outcrop of quartz ore.

Another place that piqued my curiosity was the winze in the north end of the first level which was driven nearly vertical in order to follow down on the vein. The assay of the vein at the head of the winze (Sample No.4) of $14.08, and the strong vein exposed on the side of the winze as far as the beam of light carried, made one wonder if this could possibly be the same flat vein that raises from the Second Level follow up in the direction but not to a possible intersection with this vertical vein. One of these raises (marked J on the accompanying sample map) should be extended up to definitely decide this point to be sure that a vertical vein has not been overlooked. There is also no long crosscut in the foot wall from the Second Level, therefore, the old time miner must have had no such idea or curiosity.

MINE SAMPLING

Mr. Ferguson's map of the underground workings made by "Olmstead and Rich, U. S. Mineral Surveyors, Goldfield, Nevada", a copy of which you gave me, proved to be quite accurate. This map showed also Mr. Ferguson's sample numbers but not the length of cuts he took or gold and silver values he obtained. His numbers start with 1 on the Third Level and finish with 65 on the surface dumps. He gives as an average of 56 samples, a gold content of $3.62 (0.18 oz.) and $8.00 in silver (or 16.0 oz. of silver figured at 50¢ an oz.). At present metal prices this average ore would have a value, at $35.00 an oz. for gold and 64.5¢ for silver, of $16.30. Such a value for all the quartz ore in sight, so continuous and so easily to be mined, would make it a valuable ore body worthy of much development to extend its limits on its strike to the north and on its dip.

However, according to reports in your office, a Mr. Scott in 1928 carefully sampled the dumps and especially the strong showing of quartz ore on

the Third Level. He reported "with keen regret" that he took "120 samples over half being from the deepest showing of ore, the Third Level, and the general average was "under $5.00" ".

The sample map he sent you shows 52 samples on the Third Level of 6 to 7 ft. average cuts expressed only in dollar values. They averaged $7.35, with silver, at that time, selling for about 58¢.

However, if five high value samples of shorter cut lengths be not averaged in, the average dollar value would be but $4.10.

All the ore broken on development work on the Third Level was probably dropped to the "Fourth Level" Tunnel. His tonnage of 700 tons of quarts ore on this dump checks this fairly close, and his average value for this ore was $5.00, which checks his sampling fairly close.

The average ratio of gold to silver in this ore is very erratic but my 24 samples averaged one ounce of gold to 105 ounces of silver. This ratio with present gold and silver selling price, would change this $5.00 value to one for the Third Level ore of $6.20.

His sampling of the quartz ore on the upper dumps, which came from the First and Second Levels, totalling about ~~$11.40~~ 1140 tons, averaged $14.90 a ton. A small tonnage of high grade was shipped while a large tonnage of lower grade was sorted out in the stopes, therefore, a $14.90 value for the average value of the First and Second Level ore as mined is just an approximate one. As a whole this sampling indicates richer ore near the surface and lower grade ore on the lowest level, which is very often the case due to surface enrichment near the surface, due in turn to ages of weathering and concentration.

An experienced mining engineer knows that stopes are started where the drifts have disclosed the highest grade ore and the stope faces are stopped

when the good values play out. Thus in an old worked mine the richest ore has been mostly mined out. Sampling in later years upon the exposed faces will naturally be on lower grade ore, but there is always the chance that actual mining beyond these faces may encounter more of the higher grade ore.

In my sampling I took nine cut samples on my first trip, October 19,21, and after studying these I took 15 more on my second trip on Nov. 2-4th. Accompanying this report is a copy of the assay certificates and also a blueprint of an assay map to better show the location of the places sampled.

On the first trip, the first three samples were taken on the north end of the second level where the 3-1/2 to 4 ft. vein is well developed but unstoped. The average value of $2.05 (figured on $35.00 gold and 64.5¢ silver) explains why it was not stoped and bears out Mr. Ferguson's truthful statement that "it is too low for milling".

The fourth sample, was taken across the 6-ft. vein at the winze on the north end of the First Level, on the basis that it was because of good values the winze was sunk. This assayed $14.08 and indicates at least good milling ore from the back of this north drift up to the vein apex.

The fifth sample was taken at a stope face between the First and Second Levels, of 30-inch width next to the hangingwall which was more promising looking than the white quartz below. This assayed $11.53, showing that the old timer carried his stope face into his "low grade" ore.

The sixth sample was taken in a flat winze below the second level, being in an unstoped area below the large north stope between the First and Second Levels. My 5-1/2-ft. cut across the strong vein here disclosed, assayed $17.40, which gives good hope of extending a stope from the second level down to a point

in advance of any present north work on the Third Level. If several samples verified such good ore, then extending the Third Level to the north would be most attractive development work.

Samples 7, 8 and 9 were taken on the Third Level at sampling points shown on Scott's assay map. My No. 7 sample of a 6-ft. cut assayed $2.46, where he had two 7-ft. samples assaying $1.20 and $18.10 respectively. My No. 8 sample of 18 inches next to the hangingwall in a raise assayed $5.61, where he had a 12 inch sample of $29.50, and two three-foot samples of $2.80 and $5.00. My No. 9 sample of 5 ft. assayed $0.85, where his 6-ft. sample assayed $5.00. My conclusion is that Mr. Scott, after sampling the Third Level, even from the standpoint of a possible buyer, probably was correct in calling the average of this level as "under $5.00", or at present prices, $6.20.

On my second trip Samples Nos. 11, 12 and 13 were taken in workings close to the surface outcrops (see map) and averaged rather low, $10.00. Sample No. 14 was sampled sample near the outcrop showing carbonate of copper and assayed correspondingly high, $26.16. Samples 18, 19, 20 and 21 were cut from stope faces on the south end of the Second Level, and averaged but $4.55, which explains why this ore was left unmined.

On the long crooked raise from the Second Level to the Third Level there is continuous quartz ore for 100 ft. but no stopes. If this ore were present day milling ore it would indicate a large tonnage between these levels. Samples 22 and 23 from this raise averaged but $4.15.

On the Third Level, on the hangingwall drift Mr. Scott had a sample of 5 ft. of $56.30 ore. An inspection of this place showed the green stain of copper carbonate and vugs of iron oxide and my 4-ft. cut assayed $34.16. This indicates that although the average quartz ore on the Third Level is very white and low

grade that there are richer spots. Drifting north on this level might, therefore, disclose a better grade of ore beneath the good shoot of ore on the north end of the Second Level.

CONCLUSIONS FROM GEOLOGY AND SAMPLING

There is no large tonnage of 50,000 tons of $11.00 ore blocked out, as Mr. Ferguson states, even at present metal prices. Most of the present faces are in $4.00 to $10.00 ore at today's metal prices, with a probable tonnage of 25,000 tons in sight.

Sorting the broken ore or breaking only the ore next to the hanging-wall would not, in my opinion, be economically feasible.

The present showing of ore in sight considering tonnage and value, does not justify the erection of a reduction plant. Low grade ore such as disclosed on the Third Level must be worked very economically and on a large daily tonnage basis to keep costs down to even a small profit basis.

The favorable places to develop more milling ore on this property are very limited, due to conditions I have described; however, I believe the development of the Third Level toward the north is an attractive project that could be carried out at a moderate cost per foot, due to the connection with the Fourth Level tunnel. Due to the thickness of the vein on this Third Level, if it comes up to milling ore grade large tonnages would be developed rapidly.

METALLURGY OF THE ORE

Since this is an oxidized gold-silver ore it is not adapted to concentration either by tables or flotation, contrary to Mr. Ferguson's statement that it is "a splendid concentrating ore".

Being over 95% white quartz, it appears to be an ideal cyaniding ore, providing, first, the small sulphide content will yield its metal values to cyanide, and, second, that the copper content does not consume too much cyanide.

To check this I took equal parts of assay samples Nos. 4, 5 and 6 which should average 0.225 oz. gold and 10.9 oz. silver, or a $15.00 ore. Since the oxidized minerals are in vugs and on fracture faces of the quartz, I concluded that fine grinding was not necessary and I ground the ore to pass a 40-mesh screen, with 40% above a 100-mesh.

My assay on this sample was 0.26 oz. gold and 9.80 oz. silver, thus closely checking the first assayer's results.

A 500-gram portion of this pulp with 2 grams of lime, was agitated for 48 hours in 1500 c.c. of 2.3 lb. sodium cyanide solution.

At the end of this time the ore assayed but 0.005 oz. gold and 0.80 oz. silver, thus giving an extraction of 98.0% on the gold and 92.0% of the silver, or a total value extraction of 95.0%.

At the end of the test the cyanide solution titrated 2.0 lbs. and was alkaline, so that the cyanide consumption was under 1.0 lbs. and the lime under 8.0 lbs.

These excellent results show that the ore is quite ideal for cyaniding and that probably it would yield its values when crushed coarse enough to be treated in leaching tanks, thus assuring a very cheap method of metallurgical treatment.

GENERAL CONSIDERATIONS

Modern road building has resulted in the mine being less than 2 hours ride from Winnemucca, and in a possible 10¢ to 15¢ a ton-mile rate for hauling freight to the mine after repairs are made on the desert road from the highway

up to the mine.

This is a gradual climb from 4,600 ft. elevation at the valley road to approximately 6,000 ft. at the mine.

The portal of the Fourth Level Tunnel is over 100 ft. higher than the creek in the main Eagle Creek gulch, thus affording a good site for mine and milling plant.

This creek only flows water part of the year. My trip to the head of it shows only a small water shed, and a small flowing spring at this time of year. A ranch below the mine uses the water and has been short of water during the past years of drought. About 2 miles to the north there is a larger creek with a large water shed. The mine workings are entirely dry. Wells sunk near the creek bed might supply enough water for mining purposes.

For development work, gasoline engines would be used for power. If mining and milling were undertaken, Diesel engines would be used.

FINANCIAL ADVICE

If you can afford to do so I would advise you to appropriate $10,000.00 to spend on development, equipment and work on the Third Level with the hope of developing sufficient additional ore of a milling grade to justify a reduction plant.

If you do not wish to carry on this work, I would advise you to grant a liberal option to reliable parties who will undertake this mining risk.

I doubt if the present ore body would show any profit from mining and milling at present gold and silver prices. However, there is hope of higher prices that would result in a fair but not large margin of profit. On this hope, I believe the property can be optioned on a requirement that the Third Level

development work be carried out.

Since, in my judgment, the mine will probably never justify over a 100-ton reduction plant, treating a rather low margin of profit ore, I would, therefore, advise a sharp drop over your previous option prices in order to interest reliable people.

I suggest, at your request for a figure, that a $50,000.00 price on a 3 to 4-year option with provisions for required work and 10% royalty on milling ore with, also, a good discount from this price if taken up for cash within a year. Even under these terms at present gold and silver prices I would rather represent the seller than the buyer.

_____E.M.