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W. T. VOTE

CHELSEA GROUP.

REPORT BY W. TOVOTE.

The Chelsea Group of mining claims was formerly known as the Mint Mine. It comprises six unpatented claims and is owned by Mr. D. A. Byrne, of Prescott, Ariz.

The property is situated in the Copper Basin Mining District, Yavapai County, Arizona, about 14 miles S.W. from Prescott. It is about 8 miles from either Skull Valley or Kirkland, - stations on the Santa Fe, Prescott and Phoenix Railroad, a Branch of the Atchison, Topeka and Santa Fe R. R. (Santa Fe System). The shortest distance to railroad is about five miles and a wagon road was built to this point, about half-way between Skull Valley and Kirkland. It is downhill over easy grades practically all the way from the mine and, as far as I saw the road, it is still in fairly good condition.

The mine is at an approximate elevation of 4500 ft. in the low gentle foot hills south from Copper Basin proper. Only brush grown here but on the higher hills between the mine and Prescott splendid pine timber is available.

Water for milling purposes is encountered in the mine and stands now at about 60 ft. below the collar of shaft. Drinking water rises in the creek east of camp.

The mine is about two miles from the Commercial Copper Mine, of the Phelps Dodge Corporation.

DEVELOPMENT: The mine is opened by an old inclined shaft, around which ore was stoped. This caused the shaft to cave. A new vertical shaft was then sunk, with levels at 100 ft. and 200 ft. These workings are now under water. Both shafts are on Chelsea No.2.

A 150' tunnel on the Charlotte claim follows another vein and ore was stoped here for about 50 ft. length, from the tunnel level to the surface. This is apparently the length of the ore shoot here and ore immediately beyond is of low grade. Good indications for improvement farther ahead are found on the surface. Other workings are only shallow pits, cuts and shafts, exposing the veins in many places.

EQUIPMENT: From former operations, which to all available information, were very poorly conducted and ceased in 1912, a good deal of equipment remains on the property, much of which is in good condition and can be utilized.

At the shaft is a good gallows frame, 20 H.P. Fairbanks-Morse Gasoline Hoist; about 300 ft. of 5/8" cable, bucket, boiler, a dump car, blower and minor accessories.

The hoist is well mounted and housed, but the hoist house

needs repairs.

ON CHELSEA NO. 3. Claim: 300 ft. south of the shaft is a 10 stamp mill. The building is good but some of the corrugated iron cover is gone. It contains an 8" jaw crusher, bin, 10 stamps of probably 750 lbs. weight, amalgamation tables whose plates have been removed, two old wilfeleys and one gasoline engine of perhaps 20 H.P. or more.

ON CHELSEA NO. 4 CLAIM: Farther southwest are two frame dwellings and two dug out cabins in close proximity to the spring, all of which could be made habitable with little work.

GEOLOGY OF COPPER BASIN: Copper Basin is an exclusively volcanic area, if we disregard the superficial conglomerate and gravel deposits of recent times. While the volcanic rocks vary widely, they could probably be designated as monzonites into which younger rhyolite has been intruded.

The monzonites are much differentiated. The main mass is made up of orthoclase and amphibole (syenite) with accessory plagioclase and quartz. In some varieties the quartz and plagioclase become predominant, in others the basic minerals (amphibole and biotite) prevail almost to the exclusion of other constituents. This basis facies inclines to schistosity.

The other extreme of differentiation is represented by quartz dikes, quartz-orthoclase (alaskite) and quartz-tourmaline or amphibole dikes grading into normal quartz porphyry or rhyolite.

In the Basin proper a very thorough copper mineralization has been introduced into this complex probably by and in consequence of the rhyolite intrusion. In the central part of the district this takes the form of a dissemination, producing low grade ore with occasional veins and lenses of higher grade material. Copper represents the principal values here, accompanied by gold, silver and molybdenum.

In the periphery of this copper area mineralization has been confined to veins and the ores found so far are less in quantity and higher in grade. Besides copper, silver, gold, lead and zinc ores have been explored, but no thorough exploration has been undertaken anywhere. Still some good ore bodies have been opened up in several places and are shipped on a small scale, principally by the claim owners themselves.

VEIN SYSTEM OF THE CHELSEA GROUP. On the Chelsea group two different vein systems and two periods of mineralization are indicated, - only one of these systems has been explored so far. This is a system of veins striking NE/SW and dipping normally with steep dip to the SW. These veins are very persistent and can be traced for considerable distance. They follow usually zones of laminated amphibole schist, an alteration product of a basis intrusive.

Besides this laminated and frequently chloritized amphibole schist they show leached ironstained vein material and streaks of

vein quartz, whose honey combed and rusty appearance points to former sulphide mineralization.

Frequently good indications for lead can be noted in them and good gold values have been found. It was the latter only, which attracted the early prospectors and ultimately led to the construction of the mill. But there is no doubt that deeper down sulphide ore will be found and base metal will accompany the gold. In fact I am assured by disinterested parties that the stope at the caved shaft encountered slabs of native copper and bunches of chalcocite with the gold ore mined. The milling was not very successful, I understand, because a great amount of micaceous hematite interfered with the amalgamation, but the ore milled from the old shaft is said to have plated from \$8.00 to \$9.00, while the ore mined from the tunnel is said to have given a recovery of from \$12.00 to \$14.00 per ton. How much the ore contained and how much has been lost in milling could not be ascertained.

While these gold-bearing veins are from 4 ft. to 10 ft. wide, the pay streak is usually narrow and seldom will exceed 3 ft. in width and frequently is less than a foot wide.

While veins as narrow as this are not very attractive the possibilities of the property are not confined to them. The second vein system which crosses the older veins, has all appearances of strong mineralization. Intersection points between the two vein systems seem to hold out the best promise on this property. Neither the intersection points nor the second vein system itself have been prospected so far.

The younger veins are very wide and strong; they strike NW/SE and usually dip rather flat to the NE. They are marked by iron-stained outcrops from 10 ft. to over 100 ft. in width and grade in their course into dikes of acid porphyry or pegmatite quartz with tourmaline or hornblende.

The rusty outcrops are strongest where these veins cross the NW/SE veins. While some of the rusty appearance might be due to decomposition of epidote and similar iron-containing minerals, most of it is undoubtedly due to hematite and decomposition of original sulphide mineralization. In a few places relatively fresh rock, containing impregnated pyrite was found. Veins of this type are said to carry gold and quicksilver values on a neighboring property. The whole width of some of those veins shows marked rusty discoloration, but in the wide altered mass are found well pronounced streaks along which mineralization is concentrated and where strong deformation has taken place. The NW/SE veins apparently displace the NE/SW veins, but evidence in this direction is not final and it might be that both systems of fracturing are more or less in conjunction and that not a displacement but a deflection has taken place. The NE/SW veins will probably contain lead mineralization besides gold, while the NW/SE outcrops rather indicate copper mineralization in depth.

RECOMMENDATIONS AND CONCLUSIONS: If further work is contemplated I would advise that special attention be paid to these intersection points, where the hitherto explored gold veins enter the wide shear zones of the cross veins. It is very regrettable that the water logged condition of the shaft prevented an examination of the lower

workings. From surface indications it is very probable that a NW vein will dip across the shaft at moderate depth and this might disclose the shaft vein.

The openings from the shaft contain in all probability evidence which might allow of more definite conclusions as to the possibility in depth. However, I have absolutely no reason to doubt my information that native copper and copper pyrite were taken from these workings. A circumstance which is decidedly promising; also the statement that former operations were not conducted in a workmanlike manner and with good judgment seems substantiated by much evidence on the property. From surface conditions and accessible openings I conclude that the property has very well defined veins with up to 3' stopping width which have been mined on a small scale for their gold values and which most decidedly will contain sulphides of the base metals in depths.

The heretofore unexplored cross veins offer possibilities for much larger ore bodies than in the narrow veins explored by the present workings.

In case operations are resumed I would recommend that the shaft be unwatered and a study of the old workings here undertaken to determine the possibilities and lay out a development plan accordingly. In the meantime the tunnel should be extended as it is approaching a section where very good outcrops on the explored vein show on the surface and where this vein is intersected by a series of cross veins. If such intersection points are as favorable as they appear to be here is an opportunity to determine most rapidly and cheaply their influence on the veins.

Respectfully submitted,

(Signed) W. Fovote,

Mining Engineer & Geologist.

March 15, 1919.