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PRELIMINARY EVALUATION
of the
TEHAMA MINES
Santa Clara District
Pershing County - Nevada

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Charles E. Melbye

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of the

TEHAMA MINES

Santa Clara District
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INTRODUCTION

A one-day underground and surface examination was made of the Tehama Mine by Charles E. Melbye, Geological Engineer, on July 31, 1956. The purpose was to determine the advisability of proceeding on a more comprehensive exploration and development program. Only the tunnel level at the main workings could be examined as the winze and another long crosscut across the canyon were flooded.

PROPERTY & ACCESSIBILITY

The claims, consisting of 8 patented and 3 unpatented claims in Tehama Canyon, are easily reached by travelling 8 miles south from Imlay, Nevada and thence 2 miles west up the canyon. The area is part of the northeastern end of the Humboldt Range. Elevations of the claims range from 5,000' to 6,500'. The now nearly abandoned, but once thriving camp of Unionville lies 10 miles south. Underground development in the main Tehama workings consists of a 250-foot adit intersecting a 205-foot shaft, together with small stopes and crosscuts. Two crosscuts, 560' and 150' in length, have also been driven nearby.

REGIONAL GEOLOGY

The Tehama Mines are at the north end of a belt of lower temperature gold, antimony and antimonial silver deposits including the major Rochester and Buena Vista districts. The Humboldt Range consists of a late Jurassic intrusive core upon which rest Triassic and Jurassic sediments and Tertiary rhyolites and basalts. The entire range is believed to be a tilted fault block and is cut by many types of intrusives. All of the silver deposits south of Unionville, of which the Sheba and Arizona mines were the chief producers, are part of the same metallogenetic environment.

HISTORY

Mining in the northeastern Humboldt Range commenced with the discovery of silver deposits in nearby Star Canyon in 1861 and continued with short interruptions until 1880. The Sheba, De Soto and Arizona mines were the important silver mines. Since 1880 the deposits have been worked only sporadically. The total production of the area is estimated to be $5,000,000 in silver, $75,000 - $100,000 in antimony and $50,000 in gold.

LOCAL GEOLOGY

Stratigraphy

All rocks in the mine area are Triassic in age. The Koipata formation, consisting of interbedded rhyolite flows, limy and carbonaceous shales, and chlorite schists, is overlain by the limestones, sandstones and shales of the Star Peak formation. Intense metamorphism has rendered the rhyolite to a tan, silicified rock which has been mistaken for a "hull" quartz vein. The shales are largely schistose and silicified, and green chlorite schists are derived from volcanic tuffs. The top of the rhyolite is the Koipato-Star Peak contact. The rhyolite marker bed is easily identified by its resistant nature and the abundant limonite staining, and is shown on the geological map.

Structure

The normal dip of the sediments is 20° - 30° west. Two northwest normal faults displace the beds in the mine area. Between the two faults the dip has steepened to 65° west and on the east side of the faults the beds are overturned to dip 60° - 85° east. The easternmost fault is probably the same as the major normal fault along the eastern side of the range from Unionville north. The veins are along faulted and sheeted zones, which are believed to be pre-mineral, but certain post-mineral movement has taken place. The normal faults are largely post-mineral.

Mineralization

The Tehama mineralization is essentially copper-silver with minor amounts of gold. Chalcopyrite and pyrite are the principal ore minerals but freibergite, galena and sphalerite have been identified. Abundant secondary blue chalcanthite (copper sulphate) is present in all cracks and openings in the wallrock and Western Mercury is now attempting to leach this secondary copper by flooding the mine workings, then precipitating the

copper on tin can scrap. Quartz, ankerite, and adularia are abundant gangue minerals.

Mineralization is localized in the faulted and brecciated zone along or near the Koipato rhyolite - shale contact, although at the end of the Tehama drift the fault is striking into the rhyolite and away from the contact. Other copper mineralization can be seen along shattered zones in the schistose shales. The faulting dips parallel to the bedding or at about 65° west. A' zone of about 10 feet on either side of the vein is fractured and filled with secondary copper sulphate, although the vein itself is 3' - 10' wide. Intense alteration, sometimes indicative of an economic deposit, is present as silicification, sericitization, and pyritization of the rhyolite. Oxidation of the pyrite has accounted for the characteristic limonite-stained outcrops of rhyolite.

Some extension of mineralization was picked up in the 560-foot crosscut driven N63°W, which intersected the vein near the end of the crosscut and at the rhyolite-shale contact. Little is known about the continuity of mineralization along the fault contact, although a similar type has been mined at the Santa Clara mine 2 miles south.

Past production, although unknown, must have been small, judging from the small stopes. A 15-ton mill has been operated on the property to recover gold-silver and the remains still stand in fair condition. The copper values were probably not recovered. The lack of time prevented the author's sampling of the workings, but comprehensive sampling results are available from various consulting reports and from one by Calumet & Hecla Copper Company, which are herewith listed:

Type of Sample	Area	Oz.Au	Oz.Ag	% Cu
Cuts	Shaft, winze & tunnel.	.02	5.6	1.95
Back sample by blasting.	Tunnel	.10	10.1	2.2
Cars (22)	Raise	.02	30.4	2.5
Cuts	Tunnel	.09	23.0	
Drill cuttings	Bottom of shaft	.04	3.2	3.29

(Average sampled width was about 6')

ECONOMIC FACTORS

Mining

The deposit appears to be conducive to a lower-cost mining method,

such as shrinkage stoping, as the walls are silicified and hard. Mine timbers are not available in the area and would have to be purchased at somewhat above-normal cost. Water for mining would be available most of the year from the intermittent stream or from nearby springs. The large number of mining operations in this part of Nevada attracts miners, and labor should be no problem, although housing facilities would probably have to be constructed at the mine for single miners.

Milling

The old 15-ton mill building is in fair condition and could be rehabilitated as part of the mill facility. One shaking table appears as if it could be repaired and used but all other equipment is in poor condition or obsolete and would have to be discarded. Additional water supplies would have to be developed for any size of milling operation. There is considerable winter snow from this elevation to the summit, which could possibly be caught and stored, and ground water should also be adequate. A mill would be a necessity for the property as the present indicated grade of ore would not bear direct shipping and smelting costs.

CONCLUSIONS

1- The Tehama mine warrants exploration to determine the grade and tonnage of mineralization with depth. Although some sulphides remain, the ores in the present workings are mostly oxidized and better copper-silver values may occur with depth, as is indicated by the samples from the shaft bottom. Little supergene enrichment was noted in the exposed vein, and this may be a factor at depth.

2- The faulting and alteration along the vein are quite strong, indicating the possibility for an economic mineralization.

3- Economic factors are, in general, favorable. The problems of water and timber are the normal ones encountered at any mine in this part of Nevada.

RECOMMENDATIONS

1- A program of detailed geological mapping in the mine area should be undertaken, as only in this manner can the geological complexities be interpreted in terms of ore-finding.

2- Based on the geological work, about 3 inclined diamond drill holes should be drilled in the gulch to the west of the main

workings. These should intersect the vein from 150' - 200' below tunnel level, as the shaft when pumped out exposes the vein 125' below the tunnel. Some consideration should also be given to horizontal extensions of the mineralization, as little is presently known.

3- The results of the above work will determine whether sufficient tonnage can be developed to justify a mining and milling operation.

Respectfully submitted,

Charles E. Melbye

CHARLES E. MELBYE
Geological Engineer

August 14, 1956