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10/22/25

PRELIMINARY REPORT

ON THE GROUP OF MINING CLAIMS OWNED BY

S T A T E   C O P P E R   C O M P A N Y

YAVAPAI COUNTY,   ARIZONA

(Swallow Mine)

LOCATION OF PROPERTY

A group of mining locations, comprising fifteen lode claims located within, and being a part of Sections Six and Seven, Township Eight North, Range Two West, Gila and Salt River Principal Meridian of Arizona, is the subject of this report.

This property is located in the extreme south end of Yavapai County, thirty-two miles south and three miles east of Prescott, the County Seat. In other words, forty-two miles north and twenty-four miles west of Phoenix, the State Capitol.

The nearest railroad point is the small mining town of Wickenburg twelve miles west and seven miles south of the property. The immediate territory is served by the Atchison Topeka and Santa Fe Railroad. A branch line extending from Wickenburg to Phoenix and from Wickenburg to the main line at Ash Fork, or west to the main line by way of Parker and Cadiz. From this description the exact location of the property may be found on any map of the State.

MINING DISTRICT

The property is a part of what is organized as the "Castle Creek Mining District." The area is drained on the south and east by the Agua Fria River, and on the north and west by the Hassayampa River. The better known mines in the immediate vicinity of this property are numerous. I will mention the Copperopolis, Constellation, Keystone, King Solomon, Monte Cristo, Abe Lincoln and the Vulture. All are, or have been producers - *& all failures except the Vulture.*

TOPOGRAPHICAL FEATURES

The district is mountainous in all directions. The Bradshaw mountains to the east; the Wickenburg mountains to the south; the Vulture mountains to the west and the Weaver mountains to the north. Swallow mountain, comprising part of the group, reaches an elevation of 4400 feet above sea level. Most of the work on this group is between the elevation of 3400 and 3800 feet above sea level. The mountains are not rugged nor abrupt for the most part and roads and trails are easily made.

ROADS

From Wickenburg to your property is a distance of 17 miles by the present road. The eleven miles out from Wickenburg is not a bad road, but one would have to draw on the imagination to some extent to call the last six miles a road. This, however, is not a very serious handicap as

good roads could be built on easy grades from your property for a distance of about 8 miles at a moderate cost. The most serious drawback at the present time is on account of the high cost of hauling fuel oil and supplies over the road in its present condition. A proposed State highway connecting Morrystown and Prescott, by way of Minnehaha Flat, if built as proposed will pass over or very near to your property. The town of Wickenburg is connected with Phoenix on the south, and Prescott on the north by a splendid State highway.

#### TIMBER

For practical mining purposes there is no timber on the property, and timber for building purposes or underground use would have to be brought in. The south end of the Prescott National Forest Reserve starts 6 miles north of the property, and timber may be obtained at a reasonable price.

#### WATER

The water supply is limited during a short portion of the year, especially the summer months, and the small creek that crosses your property becomes a "dry wash" during this part of the year. During the dry season the only source of water is to sink wells along the creek channel where considerable water may be obtained. The mine workings make considerable water which could be conserved and used for milling purposes. During the winter and rainy months water is plentiful for milling or other mine uses.

#### CLIMATE

The climate is very hot and dry during the summer months with only an occasional shower. During the fall, winter and spring months the climate is said to be very delightful. There is very little or no snow fall during the winter. Climatic conditions at the mine would be considered very favorable.

#### HISTORICAL

The history of this property is not unlike that of many others in the remoter mining districts of the west. Discovered and located by a prospector of very limited means; held by him and worked in a crude way through the best efforts he could put forth without funds. Later through his own resources and the help of friends, a small five stamp mill, and still later another more modern stamp mill. Still later, during the war period of high copper prices leasers mined and shipped crude, a considerable tonnage of copper ore. The property has been worked intermittently, mostly for its gold values, for a number of years. The local reports of the total production is in excess of \$150,000. I have no way of judging the correctness of these figures. However, it is apparent that considerable ore has been mined and milled, and I presume it produced the money used in the development of this property, at least the greater part of it. It is very plain that the ore must have carried good values to pay the cost of mining, handling and milling or marketing in the crude way it was done.

#### TITLE TO GROUND

Practically all of the Public Domain, not on Indian Reservations, that is known or thought to be mineral bearing, is open to mineral

locations by citizens of the United States, who comply with the statutes of the Federal Government and the State of Arizona. This ground is held by right of location and compliance with the laws of the United States and the State of Arizona. It is my understanding that this ground has been held for a long period of years. The more recent records were made for the purpose of perfecting title, and on January 1st, 1920, eleven of the claims were relocated. Four of the claims were located on July 3rd, 1923, by the State Copper Co.

It is my opinion that there are no conflicting areas with the adjoining claims and there is no litigation effecting title or rights. The question of ownership is clear and undisputed. The mineral character of the land can never be questioned, and it is almost safe to say that the Federal Government will not claim the timber or water, so long as the annual assessment work is performed, and Federal and State requirements complied with, title to unpatented mining ground is absolutely safe.

### SURFACE EQUIPMENT

Present surface improvements consist of two small bunk houses or sleeping quarters for men, a small kitchen and boarding house, shown to advantage in pictures No. 1-2-3. A small office building shown at the right in picture No. 3.

A shallow well for a domestic water supply from which water is pumped to a tank and piped to the different buildings. Other buildings comprise the stamp mill building shown in picture No. 4, and the engine and compressor building, with annexed blacksmith shop shown in picture No. 6. While the buildings are not elaborate they serve the purpose for which they are intended,--The housing of a small crew.

### MINING EQUIPMENT

The principal machinery constituting the present mine equipment is housed in a frame building 36' x 40' at the portal or entrance to the main crosscut or lower working tunnel. The engines and all the machinery are well installed on concrete foundations, and it is rather pleasing to note that the machinery is cared for by men who are interested in seeing that every piece of equipment performs smoothly except the clock, for which they seem to have no regard. The equipment for the most part consists of:

One-60 Horse Power Foos gasoline engine  
One-60 Horse Power Commercial gasoline engine  
One-50 K.W. General Electric Generator  
One-10' x 12' Sullivan compressor complete  
One-Electric Hoist at shaft station  
One-Electric Sinking pump  
One-Electric Light installation complete  
Blacksmith and other necessary tools.

For drifting or tunnel work the equipment is sufficient for the present needs of the property, but it is not so well adapted for shaft sinking. Power is rather expensive on account of the cost of truck transportation of fuel oil from Wickenburg over the road in its present condition.

The stamp mill is rather antiquated but it is my opinion that it could be overhauled and used to advantage. The equipment consists of five stamps installed. A battery installed for five additional stamps which are on the ground, but have never been put in place. Also a Wilfley concentrating table which is in good condition. There is also a small crusher which is usable. There is also on the ground a 22 h.p. Fairbanks-Morse gasoline engine which was used to run the stamp mill, but is now at the Swallow shaft.

### MAPS

I have prepared a number of maps to use in connection with this report. While these maps were made hurriedly they are reliable and are made from actual surveys on the ground. All information was obtained from reliable government information. Each map is designated by a letter as "Map-A" or "Map-B" and they will be so referred to throughout this report. Instead of long descriptions which are tiresome as well as confusing I will depend largely on the maps. I will, therefore, ask that the attached maps, either bound with this report, or in the pocket, be considered a part of the report. Following is a short description of each map:

"Map-A" shows on a scale of 600 ft. to the inch. sections 6 and 7, Township 8 North, Range 2 West, and the relative position of the fifteen mining locations embracing the group.

The tabulated statement following "Map-A" gives the names of the claims, date of location, date of recording, name of locator and other information relating to the ground.

"Map-B" is a portion of the "Congress Quadrangle" of the U. S. Geological Survey, and shows accurately the topographical features of the surrounding country as well as the ground embraced within the claims.

"Map-B-1" is a small portion of the "Congress Quadrangle" enlarged 6 times and shows the contour lines and elevation of the ground embraced, and that to the west. It also shows roads, trails, water courses and some of the surrounding mines.

"Map-C" is a plan showing the underground workings of the "Swallow Shaft" with its different levels, drifts and crosscuts.

"Map-D" is a sectional map of "Map-C" made looking in the direction of the dip of the vein, or looking N 51 degrees E.

"Map-E" shows the underground works in connection with the Swallow Shaft and their relation to the surface. It also shows the location of the "Whim Shaft" and the "Golden Wonder Shaft" and their relation on the surface to the "Swallow Shaft". Also the calculated relation of the "Whim Vein" on the level of the main crosscut tunnel.

"Map-F" shows a plan and section of the "Moon Light Shaft" and tunnel. This shaft is approximately 3.45 degrees E 3350 ft. from the "Golden Wonder Shaft."

"Map-G" shows a plan and section over the crosscut tunnel. These maps together with the 30 and 50 foot maps already sent you should make clear the general conditions at the property.

### SURFACE DEVELOPMENT

It is very seldom that I see a mining property that has so many shallow surface cuts, shafts and short tunnels. Each of the 15 claims have from 1 to 10 or more of these small openings and the amazing thing about it is the fact that they all contain more or less ore. Nor are these shallow openings confined to the 15 claims, but as far as I can determine they prevail in all directions from the group owned by your company. To describe each of these, or even the more important ones, would require space prohibited in this report. I pass them with the remark that I have never examined a copper property that had such a display of high grade copper ore. Ore is found at practically all places where the veins outcrop to the surface.

### DEEPER DEVELOPMENT

The deeper and more important development on the "Whim Vein" consists of the "Golden Wonder Shaft" sunk on the foot wall of the vein for an inclined distance of something near 100 ft. This shaft is on the "Treasure Vault Claim" and in point of elevation is the highest on the property. Elevation of Collar is 3799.67 ft. See upper dump in picture No. 6 station 69 on larger maps.

The next shaft of importance is the "Whim Shaft" on the "Whim Vein" 380 ft. southeast of the "Golden Wonder Shaft." This shaft is also on the foot wall and is sunk an inclined distance of 100 ft. Both shafts dip from 55 degrees to 60 degrees, or practically the same as the "Swallow Shaft". I did not go down either of these shafts for the reason that I did not consider the timber in the "Whim Shaft" safe, and the "Golden Wonder" had no timber nor ladders.

While these 2 shafts are the main workings on the "Whim Vein" the vein is developed on the surface for several hundred feet north of the "Golden Wonder Shaft" and also to the south of the "Whim Shaft."

Also a tunnel from near station 68, follows the vein to the northwest and connects with the "Golden Wonder Shaft". The tunnel is filled near the portal by material washed down the gulch and was not entered by me.

### SWALLOW SHAFT

This is a two-compartment inclined shaft sunk on the foot-wall of the "Swallow Vein" for an inclined depth of 232.90 ft. to the tunnel level, and on Sept. 11th, an additional inclined depth of 57.00 ft. below the tunnel, making 289.90 ft. on the incline. The dip varies from 68 degrees at the collar for a short distance to 50 degrees, and the average is 56 degrees--58' from the collar to the tunnel level. From the tunnel level down the dip is 60 degrees from the horizontal. The total vertical distance from collar to bottom is 243.36 ft. Horizontal distance 154.69 feet. Strike of horizontal distance N.51 degrees - 07'E. The elevation of the collar is 3600.93 ft.

At a vertical distance of 67.02 ft. below the collar a drift has been extended along the course of the vein a total of 319.5 ft. in a northerly direction. At a point 204.50 ft. from the shaft a crosscut was extended to the west a distance of 72.00 feet to the "Patterson Vein". On this vein a drift was extended to the south 65.00 ft., and a drift to the north 131.00 ft.

From the shaft station a tunnel connects with the surface at a distance of 170 ft. southeasterly from the shaft. Elevation of portal, floor level 3531.92, station 55 surface map.

On this level is a total of 881.5 ft. of drift and 72.00 ft. of crosscut, or 953.50 ft. of work.

At a vertical distance of 153.30 ft. from the collar of the shaft a drift has been extended to the north a distance of 169 ft. At a distance of 83.00 ft. from the shaft a crosscut was extended to the east a distance of 62.00 ft. At a point 131.00 ft. from the shaft a crosscut was extended westerly a distance of 127.00 ft. to a vein. On this vein a drift was extended to the south a distance of 56.50 ft., and to the north a distance of 65.00 ft. The crosscut continues west a distance of 30.00 ft.

On this level a total of 290.50 ft. of drift and 219.0 ft. of crosscut, or 509.50 ft. of work.

The above constitutes the work that was done in the shaft from the surface working as a shaft or incline.

#### MAIN WORKING CROSSCUT TUNNEL

After acquiring the property the State Copper Co. moved the engines and compressors from the collar of the "Swallow Shaft" to the location selected for the crosscut tunnel. A building was erected to house the equipment, the machinery was installed and the tunnel was driven some 900 ft in a northwesterly direction with the idea that the vein would be reached near where the shaft would be, if extended downward. Work on the tunnel was then suspended until early in the present year. When work was resumed, within a few feet the tunnel broke into the sump of the "Swallow Shaft." The crosscut was then continued along the vein as a drift for a distance of 234.03 ft. When this drift was completed a station was cut at the shaft, the vein crosscut, an electric hoist installed and in August of this year sinking was commenced on a double compartment shaft, it being a continuation of the "Swallow Shaft." At the time I left the property, this shaft was down a distance of 57.00 ft.

In order that this work may be properly understood, let us reverse the order and view it from the standpoint of a working tunnel.

We enter the mine by a diagonal crosscut tunnel 913.21 ft. to the shaft station. We then have 61.00 ft. of crosscut across the vein at the station, 25 ft. of this being in foot wall country. We have 234.03 ft. of drift on the vein. A crosscut to the left 20.00 ft. and a crosscut to the right 12.00 ft. In other words we have 1242.24 ft. of work on the tunnel level.

From this level we have a winze 57.00 ft. deep and at 47 ft. we have a drift 20 ft. and 30 ft. of crosscut. Or below the tunnel we have 107.00 ft. of work.

#### THE MOON LIGHT TUNNEL AND SHAFT

The portal of the "Moon Light Tunnel" is about 1600.00 ft. to the southeast of the portal of the "Swallow Tunnel". The elevation of the floor at the portal is 3547.01 ft. The tunnel is run in a southwesterly direction a distance of 183.00 ft. It then turns sharply to the left and continues in a southeasterly direction for a distance of 91.00 ft., where a vein is encountered, upon which a short drift was extended. From this drift a raise was put up a short distance and a winze was sunk to a depth of 38.00 ft.

The main tunnel was continued in a southeasterly direction 66.00 ft. to a point where the second vein was intersected. On this vein some drifting was done; a small amount of sinking and a connection made with the shaft to the surface. The shaft is an incline and has a length of about 180 ft. The elevation of the collar being 3690.28 feet. This tunnel, while it does not seem to go any place, is interesting because it shows an immense wide mineralized area, somewhat different from anything else on the property. A rather large stope would indicate that considerable ore had been removed along the course of the shaft and above the tunnel. Total length of tunnel and drifts 502.80 ft. Incline shaft 180.00 ft.

Altogether, I have described 469.90 ft. of shaft and 3547.94 ft. of tunnel. I would estimate that the small shafts and tunnels on the property would bring the aggregate to about 600.00 feet of shaft work and 4000.00 feet of tunnel.

#### VEINS AND VEIN SYSTEM

If we take the average strike of the "Swallow Vein" as indicated on the tunnel level at N. 23 degrees -00'W. then the diagonal crosscut tunnel actually crosscut 720 ft. of your ground at right angles to the vein system. Your ground is 6 claims, or 3600 ft. wide. Therefore, it would require the equivalent of 5 such tunnels to crosscut your ground at right angles to the veins. Including the "Swallow Vein" this tunnel intersected and crossed five separate and distinct veins. I have no basis to figure, other than to say, that if you intersect 5 veins in 720 ft., you certainly have reasons to expect that you would intersect 25 veins in 3600 ft. This is not merely a case of arithmetic because on the ground you have the evidence to show that this number of veins might even be increased.

Station 10, near the discovery cut of the "Maud S" claim, is on one of the best veins on the property. Station 13, near station 10, is the only transit point where I have ever set up a transit on copper ore in place extending above the surface of the ground. This vein can be traced by ore on the surface for 800 ft. It is entirely east of any work I have described or will cover in this report. Your claims to the northeast, in my opinion have surface showings far more promising than anything near where the deeper work has been done. Further remarks on this subject seem unnecessary at this time.

I have traced and will attempt to describe and locate three of these veins on the surface.

First, in my opinion, is the "Whim Vein" the apex of which is covered by the "Treasure Vault" on the north, then passing in a south-easterly direction through the "Speculator" "Old Homestead" and "Crystal" claims.

One can walk on the foot wall of this vein from a point 400 feet north of the "Golden Wonder Shaft" to station 81 near the boarding house, a distance of 2600 ft. Refer to surface map, 200 ft. to the inch, and note the location of transit points No. 84-89-68-67-79-78-77-81. These points represent approximately the foot wall of this vein. They are not merely transit points, but are actual surface exposures of the vein. In at least five cases the actual wall of the vein.

The second is the "Swallow Vein", marked on the north and by a surface exposure at station 57, where the vein comes to the surface and is visible and exposed through to Stations 58-59 and 60. Station 59 represents the collar of the "Swallow Shaft". Stations 58 and 60 represent the north and south end of stopes that come to the surface. The vein is again exposed at the portal of the tunnel, Station 56, elevation 3531.92. From this point on south to Stations 30-44 and 39 on the south hill.

The third vein is represented on the surface, only approximately in some cases, by Stations 80-70-52-44-33-20-16-32. This is the No. 4 vein in the "Swallow" or main crosscut tunnel; It is the same vein that the stamp mill building is sitting on. It is exposed by the creek tunnel just south of the mill building, and then immense blowout south of the creek marked by Station 32. It is also one of the "Moon Light" tunnel veins.

Call this a vein system or whatever you wish. It is a mineralized area over 3600 ft. wide, and extends beyond your end lines in either direction.

### GEOLOGY

The eleven days spent on the property would not permit me to devote much time to a study of the geology.

I consider this of the utmost importance. The preceding description of the vein system would indicate a complex geological condition that cannot be worked out in a few days. It is especially important that this subject be gone into very thoroughly before any deep or permanent work is undertaken.

For the following reason, if you had no other:

West of, and on the west side of your claims the veins dip to the northeast from 50 degrees to 60 degrees from the horizontal. As you go east on your property the dip becomes greater until they are vertical, or approximately so. Further east, say from one-half to one mile, the veins dip to the northwest. The strike also changes in this respect. Standing at the "Moon Light Shaft" the veins on the west strike, we will say N. 45° W. Assume the "Whim Vein" strikes N. 35° W., the "Swallow Vein" N. 25° W., the No. 4 vein in the crosscut tunnel strikes N 15° W.

the "Bell of the South" vein strikes true north, others to the east would strike to the northeast. In other words, fan-like, with the handle at the "Moon Light" shaft. This may not be a technical description, but it described conditions that should not be overlooked.

Getting to the geology proper; your country rock is granite, and it is found in all its stages of alteration. I would say that your property is in a schist belt, and that there are local areas of granite. The older volcanic rocks are also represented, and it would require a rather detailed study of the rocks to attempt anything like a correct classification. The veins are well defined, in respect to the foot wall. The hanging wall is a gradual alteration into the country rock. The vein filling is largely hematite iron. The copper is very closely associated with the specular iron. The country is cut by numerous white quartz veins and veinlets; also heavy spar veins up to two feet wide. The copper ore is entirely the oxides and carbonates. There is no trace of a sulphide copper either on the surface or at the deeper workings. The iron oxidation has altered the wall rock, more especially the hanging wall a considerable distance from the vein.

#### SURFACE ORE

I do not know just what constitutes a real surface showing of copper in Arizona, but there are 50 or more showings that would be considered excellent prospects in copper countries where I have mined. It is impossible for me to conceive of such a showing as you have that would not lead to a deposit of copper with sufficient depth. I do not see that any long discussion in this report on the manner as to how this copper got there would be of any benefit. You have the copper and you have the rocks, or formations that copper is known to occur in in Arizona and in other parts of the world, and I know of no reason why it should not continue to depth.

From the general nature of the country, it is my opinion that the effects of erosion and surface waters, the sulphide zone will be deep on this property.

#### ASSAYS

My sampling of the property is entirely preliminary. I did not deem it necessary to make a complete sampling for the purpose of this report. The samples taken give me the information I was most anxious to have. I attach hereto duplicate assay certificate which I had checked and found to be correct.

Sample "L-1" was taken to represent a wide area in the stope in the Moon Light Tunnel. To determine if possible to obtain a large tonnage of low grade leaching ore.

"L-2" represents the face of the west drift on the 67 foot level from the Swallow Shaft. Taken to determine gold content. This covers three feet across the face.

"L-3"--End of stope up, north of shaft 67 ft. level, 5 feet wide. Taken for gold determination.

"L-4" - At station "P" minus 5 ft., drift on tunnel level. Sampled five feet wide.

"L-5" - At station "K" plus 12 feet, drift on tunnel level. Sampled 10 feet wide.

"L-6" - At station "J" minus three feet, drift on tunnel level. Sampled five feet wide.

"L-7" - At station "L" plus, across crosscut, drift on tunnel level. Sampled 12 feet wide.

"L-8" - At station "G" minus 24 ft., foot wall at left of shaft station, tunnel level. Sampled 2 feet wide.

"L-9" - North of station 58, surface. At end of old stope to surface near Swallow shaft. Vein rock in place backfilled below

"L-10" - Picked gold ore. Along north drift. West vein 153 ft. level. Width 2 to 6 inches.

"L-11" - North face of west drift, 153 ft. level. Sampled 3 ft. wide across face.

"L-12" - Taken 32 ft. back from North face, west drift 153 ft. level.

"L-13" - Taken 12 ft. south of station "G-1" west drift, 153 ft. level.

"L-14" - Picked sample, along tunnel level, covering 100 ft. from shaft station.

"L-15" - Ore sorted from drift at bottom of shaft. Taken out Sept. 10th.

Check Assay by Sill & Sill, Los Angeles

L-10	..... Gold	.....1.50	... Ounces	.....	\$31.00
L-11	..... Gold	.....0.18	... Ounces	.....	3.72
L-12	.....Gold	.....0.10	... Ounces	.....	2.06
L-13	..... Gold	.....0.64	... Ounces	.....	13.23
L-16	..... Gold	.....0.64	... Ounces	.....	13.23

RECOMMENDATIONS

It is my opinion that the permanent enriched copper zone that will be found immediately above the sulphide zone is deep, and that this zone will not be reached for several hundred feet.

It is my further opinion that you have a good chance of finding several important bodies of the copper oxides and carbonates near the surface, that could be made commercial by a leaching plant on the ground.

Further that you have very excellent chances for opening large bodies of commercial gold ore near the surface, or above your tunnel level.

I do not consider your vein system explored above the tunnel level. The "Whim Vein" in my opinion, the best vein on the property, is not explored to any extent above the tunnel level. From the standpoint of a gold property, I believe you have veins between the "Swallow Vein" and the "Whim Vein" that are more important than either of these veins.

These points may all be determined very quickly, and with a reasonable amount of money.

A very short crosscut makes it possible to drift on the "Whim Vein" and explore it to a vertical depth of 428 feet, and this depth will do more than the same amount of money spent in sinking, or continuing the present "Swallow Shaft".

I, therefore, recommend that the drift be continued on the "Swallow Vein" until opposite a point corresponding to the "Whim Shaft" be reached, and then a direct crosscut be driven to the "Whim Vein" by the shortest course.

In other words, acquire depth by extending your present working tunnel into "Swallow Mountain" rather than by sinking. Your veins extend into and through "Swallow Mountain" and it is possible to acquire over 1000 ft. on the dip of your veins by this means.

This, I think, should be done in preference to sinking at the present time. I fail to see any change in the shaft that would warrant sinking to a depth of less than 600 ft.

I would even prefer to see the same amount of money spent in diamond drill work below the tunnel level. In fact, I would very strongly urge a considerable amount of diamond drilling before beginning the sinking of a permanent working shaft.

### CONCLUSIONS

I arrived on your property on September 1st, this year, and spent 11 days on the ground, and have devoted my entire attention to the work from that date.

I would not feel that I had done justice to your property without acknowledging the kindly treatment received at the hands of Mr. P. L. Woodman. A man who has spent years in the service of the mining industry in Arizona. A man who spent 23 and one-half years as underground superintendent of one of the greatest copper mines the world has ever known. A man who knows every district and camp, mine and prospect in the State. His judgment alone should be sufficient in the case of the State Copper Company's property, and as an Engineer, it would be perfectly agreeable to me to erase all that I have written and merely say: "Give Mr. Woodman what he needs and let him make another Copper Queen. Yes, another Bisbee, if you please."

I do not necessarily mean that you should give Mr. Woodman two or three million dollars to do this work with. In fact, I think his better judgment would dictate another course.

You always have the South African method of developing a mining property. That is, to draw the diagonal lines covering your property boundaries, then sink a shaft two thousand feet deep where they intersect, and if it is not there sink another shaft.

Before suggesting that method of procedure, I would want to see your lines extended to cover 4 square miles of country. You have other and better means of developing your property which may be worked out by your company without the expenditure of a stupendous sum of money.

First, you should give attention to a policy of continuing work along modest lines until you are warranted in the installation of a reasonable sized plant, sufficient to take care of the tonnage that I believe could be developed above your present tunnel. This could be done without any mill or treatment plant until such time as warranted.

I have in mind and propose the following course which I believe can be worked out to advantage and will involve but a very modest sum of money.

You have on your property at the present time ten stamps,--not the most modern machinery in any sense of the word, and not what I would buy and haul to the property, but they are on the ground and they are paid for. In fact, you have engine, crusher, concentrating table, stamps and battery and mill building.

The mill building could easily be moved to a location near the portal of the present tunnel. To this mill you could bring your ore from any part of the "Whim" or "Swallow" veins at a minimum cost. You could haul ore from any of the other parts of the property by truck at a small cost per ton.

In connection with this small mill I would install a small copper leaching plant to take care of the copper ore that is now available, and that will be made available as development work progresses.

In considering this plan keep in mind that this property has been worked by a prospector without financial means; that it has been high graded and worked by leasers and chloriders, and the tonnage of ore that is immediately available is limited.

Also keep in mind that it was formerly worked by shaft, and that hoisting and pumping of water, and hauling the ore off the hill from the different shafts and tunnels was expensive, and interfered with the net returns. Whereas, in its present condition with a working tunnel, making a vast tonnage of ore available at much less expense, conditions are more favorable.

I do not believe that you have large bodies of thirty or forty dollar ore, but I do believe you have and can very easily and cheaply develop large bodies of ten or twelve dollar ore which should be mined and milled at a good profit to your company, and should furnish the funds necessary to carry on your work of developing another "Copper Queen."

This plan of procedure as outlined above calls for the expenditure of a very small amount of money, and the expenditure would not be a loss regardless of what the future policy of the mine might be. The mill could be used as a small pilot mill, and the cost is justified if used for no other purpose than as a means of sampling the mine.

This is a preliminary report in that I would require at least six months more time to spend on the ground before making a final report, preparatory to advising you, provided you cared to proceed with this property in a large way.

My limited knowledge of what constitutes a sufficient showing in Arizona prompts me to proceed slowly, and yet I do not hesitate to cheerfully recommend the expenditure of the sums necessary to carry out the work I have just outlined.

For the larger expenditure, I ask for more time to consider, and would likely ask that I be given the assistance of other talent.

Respectfully submitted,

/s/ Henry M. Lancaster  
Mining Engineer.

Signed in triplicate Oct. 22, 1925

June 2nd, 1944

Mr. John N. Brown  
914 South 2nd Avenue  
Phoenix, Arizona

Re: Swallow Mine *file*

Dear Mr. Brown:

I have finally been able to carefully consider the data and maps in reference to this property which you left at my office some time ago, and I have had copies of all of the more essential data made for my file.

It is my opinion that you have a very interesting property which may have good possibilities of being developed into a large deposit of low grade copper-gold ore and perhaps there might be substantial shoots of high grade material in some of the veins after the water level has been reached.

However, it also appears that the value of this property could only be determined after a very substantial expenditure had been made for further exploration and development and because of general conditions which make all work of that nature extremely expensive and also because of the inaccessibility of the mine I do not believe that my friends would be interested in following the matter up at the present time.

I have also had an opportunity to discuss this property with an independent engineer who made an examination of same some years ago, and the above represents his conclusions as well as my own.

At a later date I may be able to bring up the subject for further discussion, and in any event I should always be glad to talk things over with you if you care to come to the office at your convenience. Meantime, the maps and other documents which you left with me are all in shape to be returned to you, and this will be done by mail if you prefer, or on the occasion of your next visit to the office.

Thanking you for having brought this matter to my attention, I remain

Yours very truly,



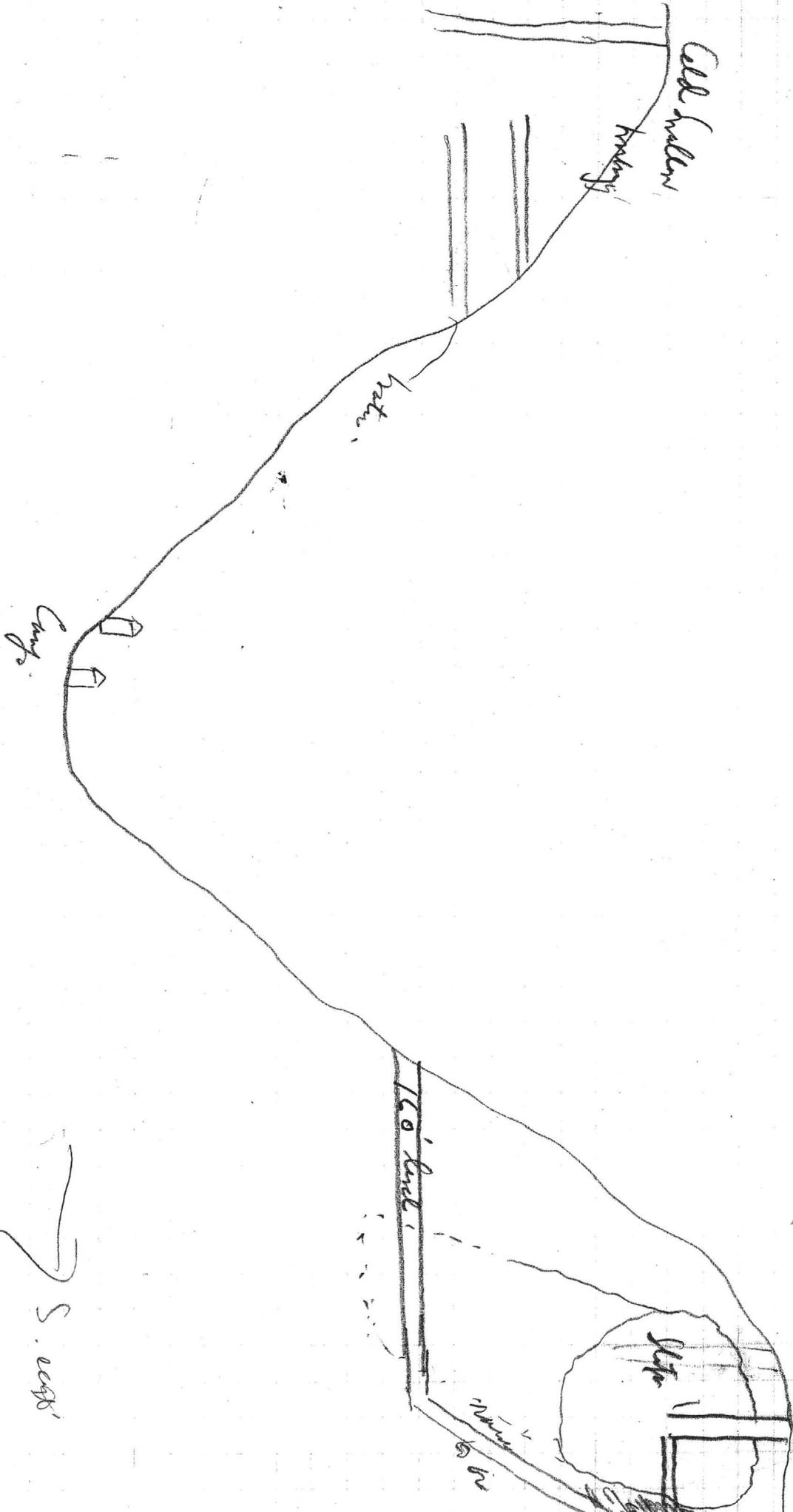
GMC/b

Shellen  
Chuni

Stalls

Wounded  
Dam

Sept 60



5/15/44

Harlow D. Phelps, formerly of Prescott and now with U. S. Bureau of Mines, Tucson (P. O. Box 4097, University Station) told me that some years ago he had made a thorough examination of this property and had a report and maps which I could examine at his office. He had turned the property down for his client because he found that nearly all of the high grade gold ore had been worked out from the upper levels and elsewhere he could only find very low grade material, which would not have an average value in excess of \$2.00 per ton including gold and copper.

He thought that there was a bare chance that there might be a large body of disseminated copper ore but this was not investigated.

Brown called and will send in reports. He says that the mine lies two to three miles northwest of the Whipsaw and that a new road is now being built to the Abe Lincoln and from this one should turn off and climb over Morgan Hill and then take the right fork where the road to the Groom Mine forks to the left.

He drove some tunnels and topped the old Swallow Ledge and thinks that there is a big deposit of copper in a porphyry dike where a lot of ore has been taken out. Woodman tried to reach this dike but did not go far enough. Since then Brown has taken over the mine and worked there until late in 1941. Values in the gold vein are from \$2.00 to \$300.00 and very erratic. Brown claims that there is a ledge 6 to 8' wide which will carry over 2% copper and \$5.00 in gold and elsewhere that there are shoots of ore containing 5 to 8% copper associated with specularite and lime in wide bands. The gold is mostly associated with the red hematite. The foot wall of the ore zone is granite and the hanging wall is porphyry.

The water from a tunnel amounted to 12 gals. per minute and was piped to the mill (on which there is still a 25-ton ball mill). The gold values were saved in the mill, but the oxidized (carbonate) copper was lost.

When the mine was operated in 1900 it was reported to have shipped 1000 tons of \$60.00 gold ore to the plant at Briggs. There is very little silver.

Company has 15 unpatented claims and some water rights. Most of the workings are now inaccessible but if the main adit were extended it would open up a back of 425' of stoping ground.

Electric power is now carried to the Monte Cristo Mine about 4 miles distant by air-line.

Adjoining the Swallow Claim on the northeast is a patented claim known as the "Belle of the South."

All this district is well known to an old man named Rudd who still lives at Wickenburg.

Ore was once shipped to Humboldt and to Douglas.

To reach the property at present it would be necessary to walk or ride horseback from the Abe Lincoln Mine, -- some three miles or more by trail.

SWALLOW (NOTES MADE IN 1938 and FEB. 1939).

Examined in April, 1938 by George Kingdon, Mills and Peach who thought that it had little or no value, but suggested further investigation of the long tunnel driven by the old-timers which might develop a substantial tonnage of mill ore with fair values in copper.

This mine was at one time owned and developed by Parker Woodman and his son, Thos. Woodman, who had held for many years a responsible position with the Copper Queen Co. at Bisbee. He was of the opinion that it had the makings of a large low grade copper mine with depth but it does not appear that any of his workings reached the zone of primary or sulphide ore.

Further development may be justified and this appears to have been the opinion of George Kingdon. However, the district is not well thought of and has a poor record except for small production by leasers from small pockets and veins near the surface. Mr. Woodman based his opinions on a series of copper-bearing outcrops which seemed likely to converge with depth where he thought that they might form a large body of primary sulphide ore, but he did not expect to find this condition until he had reached a depth of about 500' and his present shaft near the portal of the lower adit is only about 100' deep.

NOTES -- JUNE 1, 1944

From settlement sheets left by Brown it appears that the mine shipped nearly \$6000 worth of gold bullion to the Phoenix National Bank in 1900 and 1901. In 1915 and 1916 several small shipments were made to the A.S. & R. and Phelps Dodge Corp. aggregating about 20 tons of sorted ore with average of about 0.6 oz. gold and over 20% copper.

In 1937 the Pay Dirt Mining Co., which then operated the property shipped about 140 tons of ore to Hayden and in 1939 Brown shipped about 25 tons.

Analysis of ore is roughly as follows:

	<u>1916</u> <u>Shipments</u>	<u>1937</u>	<u>1939</u>
Au oz.	0.60	0.30	1.15
Ag oz.	0.20	0.12	.09
Cu %	22.0	5.00	2.47
Pb	--	--	--
SiO <sub>2</sub>	30.0	65.0	55.0
Al <sub>2</sub> O <sub>3</sub>	2.5	6.0	13.0
Fe	19.0	10.0	11.0
CaO	1.0	1.0	1.3

If this record of shipments is in any way complete it is certainly not impressive.

The long report was made by Henry M. Lancaster of Grants Pass, Oregon in 1925,--I know nothing of his reputation. At that time the property seems to have been held by the State Copper Co. Lancaster's statements of essential facts are meagre but he adds his favorable opinion to that of Parker L. Woodman and believes that the property merits a thorough development in depth with the expectation of finding large bodies of primary copper ore. This opinion is also shared by Emery W. Fisher whose record of the early history of the mine is interesting.

From study of all the above it appears to me that a great deal of money has been wasted in gophering around near the surface where,--aside from the original shoot of high-grade, only small pockets or stringers of

ore have been found and the extent of the workings is out of all proportion to the production. Apparently there is little or no pay ore now developed and future work would be mainly in the nature of exploration and development which would be rendered difficult and expensive because of transportation conditions.

No competent engineers or geologists (other than Woodman) appear to have ever made any careful examination of this property but in view of the favorable opinion of those who have seen it (especially Kingdon) it seems to me that it would be worth while to secure the report of Phelps and any other reports that might be available and perhaps to look over the ground to note the present condition of the workings.

I think that a careful and detailed study by a competent geologist should be a preliminary to any other procedure which could then be outlined or condemned.

The possibilities seem to lie in (1) strong shoots or primary copper ore coming in to the principal veins with depth; (2) Disseminated copper ore in the porphyry dikes.

In each case the values in gold might be appreciable.

C O P Y

This is the history and my observation of the following property to the best of my knowledge and recollection.

Respectfully submitted,

Emery W. Fisher

S W A L L O W M I N E S

The property known as the Swallow Group of mines located in Castle Creek mining district, Yavapai County, Arizona, was located by Gideon Roberts, a prospector from Trinidad, Colorado, about the year of 1890.

At that time the entire Group consisted of 32 Quartz claims, and the principal mine was named the George R. Swallow after the man who was at that time the Treasurer of the State of Colorado.

This mine has a heavy cropping and is a ledge of iron and porphyry ore rich in free gold.

The entire group was sold for the sum of (\$20,000) Twenty Thousand Dollars cash to William E. Gray, J. N. Large, and Judge Strong of Denver, Colorado. They repaired a five stamp mill three miles distant on Castle Creek, added five more stamps, and commenced operation. At this time I was hired as an amalgamater to run one shift at the mill. The first 1,000 tons we ran plated (\$60.00) Sixty Dollars per ton on the plates. We were forced to hang up the stamps every six hours and clean the plates in order to keep the amalgam from scuffing and losing the gold.

The deeper we went down on the ledge the more leached the ore became and carrying lower values in gold though the ledge became wider and the filling softer, composed of a combination of iron and porphyry with a strong showing of copper.

After running the mill for about 2 years it was closed down and I took charge of the work at the mine, sinking the shaft to water. I have forgotten the exact depth, but believe it was about two hundred and twenty-five feet.

At this time an engineer from Denver by the name of Burlingame made an examination and sampled the mine. I remember his assays across the ledge at water level gave a return of (\$21.00) Twenty-one Dollars in gold.

About this time I quit the employment of the company. I understood that Burlingame did not take over the property because the company asked for too large a payment in cash to start with.

Afterwards the property was leased to a man by the name of Large, a nephew of J. N. Large, one of the original owners. He undertook to sink the shaft deeper but had too small a pump and could not handle

the flow of water. He took out and shipped considerable ore from the Moonlight Mine lying south of Buzzard Roost Gulch, a south extension of the Swallow Mine, that ran high in copper and \$22.00 in gold.

After Large returned to Denver, the property fell into the hands of John Doubler who moved a five stamp mill to the property and worked out considerable gold from different parts of the property. And I have understood that while he was in control that a long tunnel was run to connect with the ledge below the bottom of the shaft, but they gained no great depth and the tunnel was a failure as far as developing the ledge.

My opinion of the mine has always been that at depth there would be found large bodies of copper ore carrying high values in gold and silver. In my judgment the vein is leached to quite a depth. This also was the opinion of Burlingame, the Denver expert, as his plan of future work was to sink the shaft to the 800 foot level or until he reached the sulphide zone, then crosscut and drift N and S on the ledge especially north under the porphyry dike or cropping.

The formation encasing the ledge is a disintegrated granite. The ledge is from 10 to 15 feet wide with two slick walls with a clay gouge on each wall wherever there was one this gouge ran from 50 to 60 dollars in gold but was hard to mill as it was inclined to form in flakes in the battery and had to be mined with rock or quartz to cause it to disintegrate.

## SWALLOW MINE

(note by G. M. Colvocoresses - November 1937)

I was once at this old mine some years ago but at that time it was idle and nothing of much interest was to be seen.

During the past six months Rhodes has frequently visited the mine which is being worked by a couple of practical miners who obtained some financial backing from San Francisco with which they purchased and installed a small compressor and some other mining equipment.

They have not reopened the mine workings of the old mine but have cleaned out an old inclined shaft across the gulch and have extended the old drifts on the 60 and 160' levels into a new shoot of ore which is apparently in the gouge of a fault and is soft earthy material with decomposed iron oxide and some copper silicate and oxide. All this ore pans well for gold.

Several shipments have been made with gold and copper values running from \$20 to \$50.00 per ton and the present output is at the rate of about one car (30 tons) per month.

There seems to be a chance that this work may result in opening up a good little mine but from considerable experience with similar deposits in that district I am inclined to think that only a few of the richer pockets near to the surface will ever be worked with profit and that the tonnage will prove extremely limited.

SWALLOW MINE

From talks with "Dusty" Rhodes, July and August, 1937.  
Located near head of Castle Creek but reached over bad road from  
Wickenburg via Buckhorn Canyon.

Owned by Brown who operates with some associates  
including Jack Stone of Phoenix. Financed for a time by officials  
of the Electrolux Co. of San Francisco who put up \$6000.00.

They have a small compressor and drill and the mining  
work has been well done and some ore has been shipped (one carload  
netted \$800) and more ore is broken in a chute and an old stope  
and there is a lot of lower grade material in the dump.

Drifts on 60' level and 160' level and some high  
grade copper carbonate and oxide ore has been found with high  
gold values, character is much the same as at the Whipsaw and it  
will probably prove very pockety.

Note old U. S. G. S. reports on the Swallow.

11/20

Owned by J. M. Brown  
914 So 2nd Ave.  
Phoenix

Lat 42 5 car ran 21.05 of 2

has up to 1 molybdenum claim across the canyon from  
old works

### SWALLOW MINE

(Note by G. M. Colvocoresses - 6/12/37.)

Recently reopened by friends of W. W. Rhodes. These men have worked near the surface and mined and shipped some high grade gold, copper ore and claim to have over 100 tons blocked out. They are working across a hill from the old shaft and main workings and plan to run an adit tunnel which will give them quite a bit of backs on the ore shoot.

Rhodes left with me some nice samples (much like those from the Whipsaw) showing chrysocolla and copper pitch. FROM U. S. G. E.  
782--Page 184.

The Swallow Mine, owned by John Dobler, is at an altitude of 3,225. The place is also known as Buzzard's Roost. It is accessible from the Abe Lincoln Mine, 12 miles from Wickenburg, by a road in poor repair leading down Whipsaw Creek and thence north to the head of a small gulch leading down to Castle Creek. The mine is half a mile west of the Bradshaw Mountains quadrangle in the Congress quadrangle, but it is described here, being in the Castle Creek district. There is a 10 stamp mill on the property.

The country rock is Bradshaw granite with dikes of andesite and granite porphyry. Half a mile southeast of Buzzard's Roost is the south shaft, 225 feet deep. The vein strikes N. 10° W. and dips 70° E. The best ore, which is a copper-stained rusty mass with chrysocolla and brown copper pitch ore, contains 1 to 2 ounces of gold to the ton. The ore averages 3 to 15 feet in width and much of this has been milled. The ore on the dump carries about 8% copper and several dollars in gold to the ton.

North of the house and 300' above it is a shaft 300' deep and presumably on a different vein. Much ore has been stoped to points 150' north and 50' south of this shaft. The vein strikes 2-N. 33° W. and dips 60° E. Another vein is found 100' north of this deposit. Still farther north and above the shaft is a tunnel driven on the same or a parallel vein.

The vein is several feet wide and the oxidized filling shows mainly platy specularite with oxidized copper ores, quartz, calcite and some fluorite. It has been mined as a gold ore with free gold in the well-oxidized material. Undoubtedly poorer ore with less free gold will be

found in depth.

A specimen of bismuthinite altered to bismuth ocher, said to have come from this mine, was obtained from Mr. Dobler.

Along the trail from the mine to Briggs, on Castle Creek, another parallel vein crops out, showing oxidized ore with some copper and dipping steeply west."

SWALLOW MINE SAMPLES

Fire Assay --- Per Ton

No.	<u>Gold Oz.</u>	<u>Valued at</u>	<u>\$35.00</u>
1	0.26	\$ 9.10	
2	0.16	5.60	
3	0.15	5.25	
4	0.23	8.05	
5	0.29	10.15	
6	0.12	4.20	
7	0.42	14.70	
8	0.35	12.25	
9	0.09	3.15	

Attach to center map on which location  
of samples is marked

*Whipsaw*

SWALLOW MINE

6/12/37

*into 3 hrs. opened*

*h.w.*

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*copy made from my*

*g. w.*

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6/14/37

Rhodes visited this property on the 13th, bad road for greater part of 15 miles from Wickenburg, and little or no other mining going on in that district.

Jack Stone of Phoenix financing the work which is being done by Brown and one or two associates who appear to be good miners and have shipped one car for which they claim to have received \$800.00.

They have not reopened the main workings at the old Swallow but are working on a hillside across the gulch in which is located the old camp and a fine spring of water.

They have opened up an old inclined shaft and have extended the old drifts on the 60' and 160' levels and advanced into a new shaft of ore which is soft earthy material with iron oxide

*shaft*

3-

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mine files S  
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10-22-25  
25  
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PRELIMINARY REPORT

ON THE GROUP OF MINING CLAIMS OWNED BY  
STATE COPPER COMPANY  
YAVAPAI COUNTY, ARIZONA

LOCATION OF PROPERTY

(Swallow Mine)

A group of mining locations, comprising fifteen lode claims located within, and being a part of Sections Six and Seven, Township Eight North, Range Two West, Gila and Salt River Principal Meridian of Arizona, is the subject of this report.

This property is located in the extreme south end of Yavapai County, thirty-two miles south and three miles east of Prescott, the County Seat. In other words, forty-two miles north and twenty-four miles west of Phoenix, the State Capitol.

The nearest railroad point is the small mining town of Wickenburg twelve miles west and seven miles south of the property. The immediate territory is served by the Atchison Topeka and Santa Fe Railroad. A branch line extending from Wickenburg to Phoenix and from Wickenburg to the main line at Ash Fork, or west to the main line by way of Parker and Cadiz. From this description the exact location of the property may be found on any map of the State.

MINING DISTRICT

The property is a part of what is organized as the "Castle Creek Mining District." The area is drained on the south and east by the Agua Fria River, and on the north and west by the Hassayampa River. The better known mines in the immediate vicinity of this property are numerous. I will mention the Copperopolis, Constellation, Keystone, King Solomon, Monte Cristo, Abe Lincoln and the Vulture. All are, or have been producers — *& all failures except the Vulture.*

TOPOGRAPHICAL FEATURES

The district is mountainous in all directions. The Bradshaw mountains to the east; the Wickenburg mountains to the south; the Vulture mountains to the west and the Weaver mountains to the north. Swallow mountain, comprising part of the group, reaches an elevation of 4400 feet above sea level. Most of the work on this group is between the elevation of 3400 and 3800 feet above sea level. The mountains are not rugged nor abrupt for the most part and roads and trails are easily made.

ROADS

From Wickenburg to your property is a distance of 17 miles by the present road. The eleven miles out from Wickenburg is not a bad road, but one would have to draw on the imagination to some extent to call the last six miles a road. This, however, is not a very serious handicap as

good roads could be built on easy grades from your property for a distance of about 8 miles at a moderate cost. The most serious drawback at the present time is on account of the high cost of hauling fuel oil and supplies over the road in its present condition. A proposed State highway connecting Morrirstown and Prescott, by way of Minnehaha Flat, if built as proposed will pass over or very near to your property. The town of Wickenburg is connected with Phoenix on the south, and Prescott on the north by a splendid State highway.

#### TIMBER

For practical mining purposes there is no timber on the property, and timber for building purposes or underground use would have to be brought in. The south end of the Prescott National Forest Reserve starts 8 miles north of the property, and timber may be obtained at a reasonable price.

#### WATER

The water supply is limited during a short portion of the year, especially the summer months, and the small creek that crosses your property becomes a "dry wash" during this part of the year. During the dry season the only source of water is to sink wells along the creek channel where considerable water may be obtained. The mine workings make considerable water which could be conserved and used for milling purposes. During the winter and rainy months water is plentiful for milling or other mine uses.

#### CLIMATE

The climate is very hot and dry during the summer months with only an occasional shower. During the fall, winter and spring months the climate is said to be very delightful. There is very little or no snow fall during the winter. Climatic conditions at the mine would be considered very favorable.

#### HISTORICAL

The history of this property is not unlike that of many others in the remoter mining districts of the west. Discovered and located by a prospector of very limited means; held by him and worked in a crude way through the best efforts he could put forth without funds. Later through his own resources and the help of friends, a small five stamp mill, and still later another more modern stamp mill. Still later, during the war period of high copper prices leasers mined and shipped crude, a considerable tonnage of copper ore. The property has been worked intermittently, mostly for its gold values, for a number of years. The local reports of the total production is in excess of \$150,000. I have no way of judging the correctness of these figures. However, it is apparent that considerable ore has been mined and milled, and I presume it produced the money used in the development of this property, at least the greater part of it. It is very plain that the ore must have carried good values to pay the cost of mining, handling and milling or marketing in the crude way it was done.

#### TITLE TO GROUND

Practically all of the Public Domain, not on Indian Reservations, that is known or thought to be mineral bearing, is open to mineral

locations by citizens of the United States, who comply with the statutes of the Federal Government and the State of Arizona. This ground is held by right of location and compliance with the laws of the United States and the State of Arizona. It is my understanding that this ground has been held for a long period of years. The more recent records were made for the purpose of perfecting title, and on January 1st, 1920, eleven of the claims were relocated. Four of the claims were located on July 3rd, 1923, by the State Copper Co.

It is my opinion that there are no conflicting areas with the adjoining claims and there is no litigation effecting title or rights. The question of ownership is clear and undisputed. The mineral character of the land can never be questioned, and it is almost safe to say that the Federal Government will not claim the timber or water, so long as the annual assessment work is performed, and Federal and State requirements complied with, title to unpatented mining ground is absolutely safe.

#### SURFACE EQUIPMENT

Present surface improvements consist of two small bunk houses or sleeping quarters for men, a small kitchen and boarding house, shown to advantage in pictures No. 1-2-3. A small office building shown at the right in picture No. 3.

A shallow well for a domestic water supply from which water is pumped to a tank and piped to the different buildings. Other buildings comprise the stamp mill building shown in picture No. 4, and the engine and compressor building, with annexed blacksmith shop shown in picture No. 6. While the buildings are not elaborate they serve the purpose for which they are intended,--The housing of a small crew.

#### MINING EQUIPMENT

The principal machinery constituting the present mine equipment is housed in a frame building 36' x 40' at the portal or entrance to the main crosscut or lower working tunnel. The engines and all the machinery are well installed on concrete foundations, and it is rather pleasing to note that the machinery is cared for by men who are interested in seeing that every piece of equipment performs smoothly except the clock, for which they seem to have no regard. The equipment for the most part consists of:

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- One-60 Horse Power Foos gasoline engine
- One-60 Horse Power Commercial gasoline engine
- One-50 K.W. General Electric Generator
- One-10' x 12' Sullivan compressor complete
- One-Electric Hoist at shaft station
- One-Electric Sinking pump
- One-Electric Light installation complete
- Blacksmith and other necessary tools.

11

For drifting or tunnel work the equipment is sufficient for the present needs of the property, but it is not so well adapted for shaft sinking. Power is rather expensive on account of the cost of truck transportation of fuel oil from Wickenburg over the road in its present condition.

The stamp mill is rather antiquated but it is my opinion that it could be overhauled and used to advantage. The equipment consists of five stamps installed. A battery installed for five additional stamps which are on the ground, but have never been put in place. Also a Wilfley concentrating table which is in good condition. There is also a small crusher which is usable. There is also on the ground a 22 h.p. Fairbanks-Morse gasoline engine which was used to run the stamp mill, but is now at the Swallow shaft.

### MAPS

I have prepared a number of maps to use in connection with this report. While these maps were made hurriedly they are reliable and are made from actual surveys on the ground. All information was obtained from reliable government information. Each map is designated by a letter as "Map-A" or "Map-B" and they will be so referred to throughout this report. Instead of long descriptions which are tiresome as well as confusing I will depend largely on the maps. I will, therefore, ask that the attached maps, either bound with this report, or in the pocket, be considered a part of the report. Following is a short description of each map:

"Map-A" shows on a scale of 600 ft. to the inch. sections 6 and 7, Township 8 North, Range 2 West, and the relative position of the fifteen mining locations embracing the group.

The tabulated statement following "Map-A" gives the names of the claims, date of location, date of recording, name of locator and other information relating to the ground.

"Map-B" is a portion of the "Congress Quadrangle" of the U. S. Geological Survey, and shows accurately the topographical features of the surrounding country as well as the ground embraced within the claims.

"Map-B-1" is a small portion of the "Congress Quadrangle" enlarged 6 times and shows the contour lines and elevation of the ground embraced, and that to the west. It also shows roads, trails, water courses and some of the surrounding mines.

"Map-C" is a plan showing the underground workings of the "Swallow Shaft" with its different levels, drifts and crosscuts.

"Map-D" is a sectional map of "Map-C" made looking in the direction of the dip of the vein, or looking N 51 degrees E.

"Map-E" shows the underground works in connection with the Swallow Shaft and their relation to the surface. It also shows the location of the "Whim Shaft" and the "Golden Wonder Shaft" and their relation on the surface to the "Swallow Shaft". Also the calculated relation of the "Whim Vein" on the level of the main crosscut tunnel.

"Map-F" shows a plan and section of the "Moon Light Shaft" and tunnel. This shaft is approximately 3.45 degrees E 3350 ft. from the "Golden Wonder Shaft."

"Map-G" shows a plan and section over the crosscut tunnel. These maps together with the 30 and 50 foot maps already sent you should make clear the general conditions at the property.

### SURFACE DEVELOPMENT

It is very seldom that I see a mining property that has so many shallow surface cuts, shafts and short tunnels. Each of the 15 claims have from 1 to 10 or more of these small openings and the amazing thing about it is the fact that they all contain more or less ore. Nor are these shallow openings confined to the 15 claims, but as far as I can determine they prevail in all directions from the group owned by your company. To describe each of these, or even the more important ones, would require space prohibited in this report. I pass them with the remark that I have never examined a copper property that had such a display of high grade copper ore. Ore is found at practically all places where the veins outcrop to the surface.

### DEEPER DEVELOPMENT

The deeper and more important development on the "Whim Vein" consists of the "Golden Wonder Shaft" sunk on the foot wall of the vein for an inclined distance of something near 100 ft. This shaft is on the "Treasure Vault Claim" and in point of elevation is the highest on the property. Elevation of Collar is 3799.67 ft. See upper dump in picture No. 6 station 69 on larger maps.

The next shaft of importance is the "Whim Shaft" on the "Whim Vein" 380 ft. southeast of the "Golden Wonder Shaft." This shaft is also on the foot wall and is sunk an inclined distance of 100 ft. Both shafts dip from 55 degrees to 60 degrees, or practically the same as the "Swallow Shaft". I did not go down either of these shafts for the reason that I did not consider the timber in the "Whim Shaft" safe, and the "Golden Wonder" had no timber nor ladders.

While these 2 shafts are the main workings on the "Whim Vein" the vein is developed on the surface for several hundred feet north of the "Golden Wonder Shaft" and also to the south of the "Whim Shaft."

Also a tunnel from near station 68, follows the vein to the northwest and connects with the "Golden Wonder Shaft". The tunnel is filled near the portal by material washed down the gulch and was not entered by me.

### SWALLOW SHAFT

This is a two-compartment inclined shaft sunk on the foot-wall of the "Swallow Vein" for an inclined depth of 232.90 ft. to the tunnel level, and on Sept. 11th, an additional inclined depth of 57.00 ft. below the tunnel, making 289.90 ft. on the incline. The dip varies from 68 degrees at the collar for a short distance to 50 degrees, and the average is 56 degrees--58' from the collar to the tunnel level. From the tunnel level down the dip is 60 degrees from the horizontal. The total vertical distance from collar to bottom is 243.36 ft. Horizontal distance 154.69 feet. Strike of horizontal distance N.51 degrees - 07'E. The elevation of the collar is 3600.93 ft.

At a vertical distance of 67.02 ft. below the collar a drift has been extended along the course of the vein a total of 319.5 ft. in a northerly directoon. At a point 204.50 ft. from the shaft a crosscut was extended to the west a distance of 72.00 feet to the "Patterson Vein". On this vein a drift was extended to the south 65.00 ft., and a drift to the north 131.00 ft.

From the shaft station a tunnel connects with the surface at a distance of 170 ft. southeasterly from the shaft. Elevation of portal, floor level 3531.92, station 55 surface map.

On this level is a total of 881.5 ft. of drift and 72.00 ft. of crosscut, or 953.50 ft. of work.

At a vertical distance of 153.30 ft. from the collar of the shaft a drift has been extended to the north a distance of 169 ft. At a distance of 83.00 ft. from the shaft a crosscut was extended to the east a distance of 62.00 ft. At a point 131.00 ft. from the shaft a crosscut was extended westerly a distance of 127.00 ft. to a vein. On this vein a drift was extended to the south a distance of 56.50 ft., and to the north a distance of 65.00 ft. The crosscut continues west a distance of 30.00 ft.

On this level a total of 290.50 ft. of drift and 219.0 ft. of crosscut, or 509.50 ft. of work.

The above constitutes the work that was done in the shaft from the surface working as a shaft or incline.

#### MAIN WORKING CROSSCUT TUNNEL

After acquiring the property the State Copper Co. moved the engines and compressors from the collar of the "Swallow Shaft" to the location selected for the crosscut tunnel. A building was erected to house the equipment, the machinery was installed and the tunnel was driven some 900 ft in a northwesterly direction with the idea that the vein would be reached near where the shaft would be, if extended downward. Work on the tunnel was then suspended until early in the present year. When work was resumed, within a few feet the tunnel broke into the sump of the "Swallow Shaft." The crosscut was then continued along the vein as a drift for a distance of 234.03 ft. When this drift was completed a station was cut at the shaft, the vein crosscut, an electric hoist installed and in August of this year sinking was commenced on a double compartment shaft, it being a continuation of the "Swallow Shaft." At the time I left the property, this shaft was down a distance of 57.00 ft.

In order that this work may be properly understood, let us reverse the order and view it from the standpoint of a working tunnel.

We enter the mine by a diagonal crosscut tunnel 913.21 ft. to the shaft station. We then have 61.00 ft. of crosscut across the vein at the station, 25 ft. of this being in foot wall country. We have 234.03 ft. of drift on the vein. A crosscut to the left 20.00 ft. and a crosscut to the right 12.00 ft. In other words we have 1242.24 ft. of work on the tunnel level.

From this level we have a winze 57.00 ft. deep and at 47 ft. we have a drift 20 ft. and 30 ft. of crosscut. Or below the tunnel we have 107.00 ft. of work.

#### THE MOON LIGHT TUNNEL AND SHAFT

The portal of the "Moon Light Tunnel" is about 1600.00 ft. to the southeast of the portal of the "Swallow Tunnel". The elevation of the floor at the portal is 3547.01 ft. The tunnel is run in a southwesterly direction a distance of 183.00 ft. It then turns sharply to the left and continues in a southeasterly direction for a distance of 91.00 ft., where a vein is encountered, upon which a short drift was extended. From this drift a raise was put up a short distance and a winze was sunk to a depth of 38.00 ft.

The main tunnel was continued in a southeasterly direction 66.00 ft. to a point where the second vein was intersected. On this vein some drifting was done; a small amount of sinking and a connection made with the shaft to the surface. The shaft is an incline and has a length of about 180 ft. The elevation of the collar being 3690.28 feet. This tunnel, while it does not seem to go any place, is interesting because it shows an immense wide mineralized area, somewhat different from any thing else on the property. A rather large stope would indicate that considerable ore had been removed along the course of the shaft and above the tunnel. Total length of tunnel and drifts 502.80 ft. Incline shaft 180.00 ft.

Altogether, I have described 469.90 ft. of shaft and 3547.94 ft. of tunnel. I would estimate that the small shafts and tunnels on the property would bring the aggregate to about 600.00 feet of shaft work and 4000.00 feet of tunnel.

#### VEINS AND VEIN SYSTEM

If we take the average strike of the "Swallow Vein" as indicated on the tunnel level at N. 23 degrees -00'W. then the diagonal crosscut tunnel actually crosscut 720 ft. of your ground at right angles to the vein system. Your ground is 6 claims, or 3600 ft. wide. Therefore, it would require the equivalent of 5 such tunnels to crosscut your ground at right angles to the veins. Including the "Swallow Vein" this tunnel intersected and crossed five separate and distinct veins. I have no basis to figure, other than to say, that if you intersect 5 veins in 720 ft., you certainly have reasons to expect that you would intersect 25 veins in 3600 ft. This is not merely a case of arithmetic because on the ground you have the evidence to show that this number of veins might even be increased.

Station 10, near the discovery cut of the "Maud S" claim, is on one of the best veins on the property. Station 13, near station 10, is the only transit point where I have ever set up a transit on copper ore in place extending above the surface of the ground. This vein can be traced by ore on the surface for 800 ft. It is entirely east of any work I have described or will cover in this report. Your claims to the northeast, in my opinion have surface showings far more promising than anything near where the deeper work has been done. Further remarks on this subject seem unnecessary at this time.

I have traced and will attempt to describe and locate three of these veins on the surface.

First, in my opinion, is the "Whim Vein" the apex of which is covered by the "Treasure Vault" on the north, then passing in a south-easterly direction through the "Speculator" "Old Homestead" and "Crystal" claims.

One can walk on the foot wall of this vein from a point 400 feet north of the "Golden Wonder Shaft" to station 81 near the boarding house, a distance of 2600 ft. Refer to surface map, 200 ft. to the inch, and note the location of transit points No. 84-69-68-67-79-78-77-81. These points represent approximately the foot wall of this vein. They are not merely transit points, but are actual surface exposures of the vein. In at least five cases the actual wall of the vein.

The second is the "Swallow Vein", marked on the north and by a surface exposure at station 57, where the vein comes to the surface and is visible and exposed through to Stations 58-59 and 60. Station 59 represents the collar of the "Swallow Shaft". Stations 58 and 60 represent the north and south end of stopes that come to the surface. The vein is again exposed at the portal of the tunnel, Station 56, elevation 3531.92. From this point on south to Stations 30-44 and 39 on the south hill.

The third vein is represented on the surface, only approximately in some cases, by Stations 80-70-52-44-33-20-16-32. This is the No. 4 vein in the "Swallow" or main crosscut tunnel; It is the same vein that the stamp mill building is sitting on. It is exposed by the creek tunnel just south of the mill building, and then immense blowout south of the creek marked by Station 32. It is also one of the "Moon Light" tunnel veins.

Call this a vein system or whatever you wish. It is a mineralized area over 3600 ft. wide, and extends beyond your end lines in either direction.

### GEOLOGY

The eleven days spent on the property would not permit me to devote much time to a study of the geology.

I consider this of the utmost importance. The preceding description of the vein system would indicate a complex geological condition that cannot be worked out in a few days. It is especially important that this subject be gone into very thoroughly before any deep or permanent work is undertaken.

For the following reason, if you had no other:

West of, and on the west side of your claims the veins dip to the northeast from 50 degrees to 60 degrees from the horizontal. As you go east on your property the dip becomes greater until they are vertical, or approximately so. Further east, say from one-half to one mile, the veins dip to the northwest. The strike also changes in this respect. Standing at the "Moon Light Shaft" the veins on the west strike, we will say N. 45° W. Assume the "Whim Vein" strikes N. 35° W., the "Swallow Vein" N. 25° W., the No. 4 vein in the crosscut tunnel strikes N 15° W.

the "Bell of the South" vein strikes true north. others to the east would strike to the northeast. In other words, fan-like, with the handle at the "Moon Light" shaft. This may not be a technical description, but it described conditions that should not be overlooked.

Getting to the geology proper; your country rock is granite, and it is found in all its stages of alteration. I would say that your property is in a schist belt, and that there are local areas of granite. The older volcanic rocks are also represented, and it would require a rather detailed study of the rocks to attempt anything like a correct classification. The veins are well defined, in respect to the foot wall. The hanging wall is a gradual alteration into the country rock. The vein filling is largely hematite iron. The copper is very closely associated with the specular iron. The country is cut by numerous white quartz veins and veinlets; also heavy spar veins up to two feet wide. The copper ore is entirely the oxides and carbonates. There is no trace of a sulphide copper either on the surface or at the deeper workings. The iron oxidation has altered the wall rock, more especially the hanging wall a considerable distance from the vein.

#### SURFACE ORE

I do not know just what constitutes a real surface showing of copper in Arizona, but there are 50 or more showings that would be considered excellent prospects in copper countries where I have mined. It is impossible for me to conceive of such a showing as you have that would not lead to a deposit of copper with sufficient depth. I do not see that any long discussion in this report on the manner as to how this copper got there would be of any benefit. You have the copper and you have the rocks, or formations that copper is known to occur in in Arizona and in other parts of the world, and I know of no reason why it should not continue to depth.

From the general nature of the country, it is my opinion that the effects of erosion and surface waters, the sulphide zone will be deep on this property.

#### ASSAYS

My sampling of the property is entirely preliminary. I did not deem it necessary to make a complete sampling for the purpose of this report. The samples taken give me the information I was most anxious to have. I attach hereto duplicate assay certificate which I had checked and found to be correct.

Sample "L-1" was taken to represent a wide area in the stope in the Moon Light Tunnel. To determine if possible to obtain a large tonnage of low grade leaching ore.

"L-2" represents the face of the west drift on the 67 foot level from the Swallow Shaft. Taken to determine gold content. This covers three feet across the face.

"L-3"--End of stope up, north of shaft 67 ft. level, 5 feet wide. Taken for gold determination.

"L-4" - At station "P" minus 5 ft., drift on tunnel level. Sampled five feet wide.

"L-5" - At station "K" plus 12 feet, drift on tunnel level. Sampled 10 feet wide.

"L-6" - At station "J" minus three feet, drift on tunnel level. Sampled five feet wide.

"L-7" - At station "L" plus, across crosscut, drift on tunnel level. Sampled 12 feet wide.

"L-8" - At station "G" minus 24 ft., foot wall at left of shaft station, tunnel level. Sampled 2 feet wide.

"L-9" - North of station 58, surface. At end of old stope to surface near Swallow shaft. Vein rock in place backfilled below

"L-10" - Picked gold ore. Along north drift. West vein 153 ft. level. Width 2 to 6 inches.

"L-11" - North face of west drift, 153 ft. level. Sampled 3 ft. wide across face.

"L-12" - Taken 32 ft. back from North face, west drift 153 ft. level.

"L-13" - Taken 12 ft. south of station "G-1" west drift, 153 ft. level.

"L-14" - Picked sample, along tunnel level, covering 100 ft. from shaft station.

"L-15" - Ore sorted from drift at bottom of shaft. Taken out Sept. 10th.

Check Assay by Sill & Sill, Los Angeles

L-10	..... Gold	.....1.50	... Ounces	.....	\$31.00
L-11	..... Gold	.....0.18	... Ounces	.....	3.72
L-12	.....Gold	.....0.10	... Ounces	.....	2.06
L-13	..... Gold	.....0.64	... Ounces	.....	13.23
L-16	..... Gold	.....0.64	... Ounces	.....	13.23

RECOMMENDATIONS

It is my opinion that the permanent enriched copper zone that will be found immediately above the sulphide zone is deep, and that this zone will not be reached for several hundred feet.

It is my further opinion that you have a good chance of finding several important bodies of the copper oxides and carbonates near the surface, that could be made commercial by a leaching plant on the ground.

Further that you have very excellent chances for opening large bodies of commercial gold ore near the surface, or above your tunnel level.

I do not consider your vein system explored above the tunnel level. The "Whim Vein" in my opinion, the best vein on the property, is not explored to any extent above the tunnel level. From the standpoint of a gold property, I believe you have veins between the "Swallow Vein" and the "Whim Vein" that are more important than either of these veins.

These points may all be determined very quickly, and with a reasonable amount of money.

A very short crosscut makes it possible to drift on the "Whim Vein" and explore it to a vertical depth of 428 feet, and this depth will do more than the same amount of money spent in sinking, or continuing the present "Swallow Shaft".

I, therefore, recommend that the drift be continued on the "Swallow Vein" until opposite a point corresponding to the "Whim Shaft" be reached, and then a direct crosscut be driven to the "Whim Vein" by the shortest course.

In other words, acquire depth by extending your present working tunnel into "Swallow Mountain" rather than by sinking. Your veins extend into and through "Swallow Mountain" and it is possible to acquire over 1000 ft. on the dip of your veins by this means.

This, I think, should be done in preference to sinking at the present time. I fail to see any change in the shaft that would warrant sinking to a depth of less than 600 ft.

I would even prefer to see the same amount of money spent in diamond drill work below the tunnel level. In fact, I would very strongly urge a considerable amount of diamond drilling before beginning the sinking of a permanent working shaft.

#### CONCLUSIONS

I arrived on your property on September 1st, this year, and spent 11 days on the ground, and have devoted my entire attention to the work from that date.

I would not feel that I had done justice to your property without acknowledging the kindly treatment received at the hands of Mr. P. L. Woodman. A man who has spent years in the service of the mining industry in Arizona. A man who spent 23 and one-half years as underground superintendent of one of the greatest copper mines the world has ever known. A man who knows every district and camp, mine and prospect in the State. His judgment alone should be sufficient in the case of the State Copper Company's property, and as an Engineer, it would be perfectly agreeable to me to erase all that I have written and merely say: "Give Mr. Woodman what he needs and let him make another Copper Queen. Yes, another Bisbee, if you please."

I do not necessarily mean that you should give Mr. Woodman two or three million dollars to do this work with. In fact, I think his better judgment would dictate another course.

You always have the South African method of developing a mining property. That is, to draw the diagonal lines covering your property boundaries, then sink a shaft two thousand feet deep where they intersect, and if it is not there sink another shaft.

Before suggesting that method of procedure, I would want to see your lines extended to cover 4 square miles of country. You have other and better means of developing your property which may be worked out by your company without the expenditure of a stupendous sum of money.

First, you should give attention to a policy of continuing work along modest lines until you are warranted in the installation of a reasonable sized plant, sufficient to take care of the tonnage that I believe could be developed above your present tunnel. This could be done without any mill or treatment plant until such time as warranted.

I have in mind and propose the following course which I believe can be worked out to advantage and will involve but a very modest sum of money.

You have on your property at the present time ten stamps,--not the most modern machinery in any sense of the word, and not what I would buy and haul to the property, but they are on the ground and they are paid for. In fact, you have engine, crusher, concentrating table, stamps and battery and mill building.

The mill building could easily be moved to a location near the portal of the present tunnel. To this mill you could bring your ore from any part of the "Whim" or "Swallow" veins at a minimum cost. You could haul ore from any of the other parts of the property by truck at a small cost per ton.

In connection with this small mill I would install a small copper leaching plant to take care of the copper ore that is now available, and that will be made available as development work progresses.

In considering this plan keep in mind that this property has been worked by a prospector without financial means; that it has been high graded and worked by leasers and chloriders, and the tonnage of ore that is immediately available is limited.

Also keep in mind that it was formerly worked by shaft, and that hoisting and pumping of water, and hauling the ore off the hill from the different shafts and tunnels was expensive, and interfered with the net returns. Whereas, in its present condition with a working tunnel, making a vast tonnage of ore available at much less expense, conditions are more favorable.

I do not believe that you have large bodies of thirty or forty dollar ore, but I do believe you have and can very easily and cheaply develop large bodies of ten or twelve dollar ore which should be mined and milled at a good profit to your company, and should furnish the funds necessary to carry on your work of developing another "Copper Queen".

This plan of procedure as outlined above calls for the expenditure of a very small amount of money, and the expenditure would not be a loss regardless of what the future policy of the mine might be. The mill could be used as a small pilot mill, and the cost is justified if used for no other purpose than as a means of sampling the mine.

This is a preliminary report in that I would require at least six months more time to spend on the ground before making a final report, preparatory to advising you, provided you cared to proceed with this property in a large way.

My limited knowledge of what constitutes a sufficient showing in Arizona prompts me to proceed slowly, and yet I do not hesitate to cheerfully recommend the expenditure of the sums necessary to carry out the work I have just outlined.

For the larger expenditure, I ask for more time to consider, and would likely ask that I be given the assistance of other talent.

Respectfully submitted,

/s/ Henry M. Lancaster  
Mining Engineer.

Signed in triplicate Oct. 22, 1925

PRELIMINARY REPORT

ON THE GROUP OF MINING CLAIMS OWNED BY

S T A T E      C O P P E R      C O M P A N Y

YAVAPAI COUNTY,      ARIZONA

(Swallow Mine)

LOCATION OF PROPERTY

A group of mining locations, comprising fifteen lode claims located within, and being a part of Sections Six and Seven, Township Eight North, Range Two West, Gila and Salt River Principal Meridian of Arizona, is the subject of this report.

This property is located in the extreme south end of Yavapai County, thirty-two miles south and three miles east of Prescott, the County Seat. In other words, forty-two miles north and twenty-four miles west of Phoenix, the State Capitol.

The nearest railroad point is the small mining town of Wickenburg twelve miles west and seven miles south of the property. The immediate territory is served by the Atchison Topeka and Santa Fe Railroad. A branch line extending from Wickenburg to Phoenix and from Wickenburg to the main line at Ash Fork, or west to the main line by way of Parker and Cadiz. From this description the exact location of the property may be found on any map of the State.

MINING DISTRICT

The property is a part of what is organized as the "Castle Creek Mining District." The area is drained on the south and east by the Agua Fria River, and on the north and west by the Hassayampa River. The better known mines in the immediate vicinity of this property are numerous. I will mention the Copperopolis, Constellation, Keystone, King Solomon, Monte Cristo, Abe Lincoln and the Vulture. All are, or have been producers.

TOPOGRAPHICAL FEATURES

The district is mountainous in all directions. The Bradshaw mountains to the east; the Wickenburg mountains to the south; the Vulture mountains to the west and the Weaver mountains to the north. Swallow mountain, comprising part of the group, reaches an elevation of 4400 feet above sea level. Most of the work on this group is between the elevation of 3400 and 3800 feet above sea level. The mountains are not rugged nor abrupt for the most part and roads and trails are easily made.

ROADS

From Wickenburg to your property is a distance of 17 miles by the present road. The eleven miles out from Wickenburg is not a bad road, but one would have to draw on the imagination to some extent to call the last six miles a road. This, however, is not a very serious handicap as

good roads could be built on easy grades from your property for a distance of about 8 miles at a moderate cost. The most serious drawback at the present time is on account of the high cost of hauling fuel oil and supplies over the road in its present condition. A proposed State highway connecting Morrystown and Prescott, by way of Minnehaha Flat, if built as proposed will pass over or very near to your property. The town of Wickenburg is connected with Phoenix on the south, and Prescott on the north by a splendid State highway.

#### TIMBER

For practical mining purposes there is no timber on the property, and timber for building purposes or underground use would have to be brought in. The south end of the Prescott National Forest Reserve starts 8 miles north of the property, and timber may be obtained at a reasonable price.

#### WATER

The water supply is limited during a short portion of the year, especially the summer months, and the small creek that crosses your property becomes a "dry wash" during this part of the year. During the dry season the only source of water is to sink wells along the creek channel where considerable water may be obtained. The mine workings make considerable water which could be conserved and used for milling purposes. During the winter and rainy months water is plentiful for milling or other mine uses.

#### CLIMATE

The climate is very hot and dry during the summer months with only an occasional shower. During the fall, winter and spring months the climate is said to be very delightful. There is very little or no snow fall during the winter. Climatic conditions at the mine would be considered very favorable.

#### HISTORICAL

The history of this property is not unlike that of many others in the remoter mining districts of the west. Discovered and located by a prospector of very limited means; held by him and worked in a crude way through the best efforts he could put forth without funds. Later through his own resources and the help of friends, a small five stamp mill, and still later another more modern stamp mill. Still later, during the war period of high copper prices leasers mined and shipped crude, a considerable tonnage of copper ore. The property has been worked intermittently, mostly for its gold values, for a number of years. The local reports of the total production is in excess of \$150,000. I have no way of judging the correctness of these figures. However, it is apparent that considerable ore has been mined and milled, and I presume it produced the money used in the development of this property, at least the greater part of it. It is very plain that the ore must have carried good values to pay the cost of mining, handling and milling or marketing in the crude way it was done.

#### TITLE TO GROUND

Practically all of the Public Domain, not on Indian Reservations, that is known or thought to be mineral bearing, is open to mineral

locations by citizens of the United States, who comply with the statutes of the Federal Government and the State of Arizona. This ground is held by right of location and compliance with the laws of the United States and the State of Arizona. It is my understanding that this ground has been held for a long period of years. The more recent records were made for the purpose of perfecting title, and on January 1st, 1920, eleven of the claims were relocated. Four of the claims were located on July 3rd, 1923, by the State Copper Co.

It is my opinion that there are no conflicting areas with the adjoining claims and there is no litigation effecting title or rights. The question of ownership is clear and undisputed. The mineral character of the land can never be questioned, and it is almost safe to say that the Federal Government will not claim the timber or water, so long as the annual assessment work is performed, and Federal and State requirements complied with, title to unpatented mining ground is absolutely safe.

#### SURFACE EQUIPMENT

Present surface improvements consist of two small bunk houses or sleeping quarters for men, a small kitchen and boarding house, shown to advantage in pictures No. 1-2-3. A small office building shown at the right in picture No. 3.

A shallow well for a domestic water supply from which water is pumped to a tank and piped to the different buildings. Other buildings comprise the stamp mill building shown in picture No. 4, and the engine and compressor building, with annexed blacksmith shop shown in picture No. 6. While the buildings are not elaborate they serve the purpose for which they are intended,--The housing of a small crew.

#### MINING EQUIPMENT

The principal machinery constituting the present mine equipment is housed in a frame building 36' x 40' at the portal or entrance to the main crosscut or lower working tunnel. The engines and all the machinery are well installed on concrete foundations, and it is rather pleasing to note that the machinery is cared for by men who are interested in seeing that every piece of equipment performs smoothly except the clock, for which they seem to have no regard. The equipment for the most part consists of:

- One-60 Horse Power Foos gasoline engine
- One-60 Horse Power Commercial gasoline engine
- One-50 K.W. General Electric Generator
- One-10' x 12' Sullivan compressor complete
- One-Electric Hoist at shaft station
- One-Electric Sinking pump
- One-Electric Light installation complete
- Blacksmith and other necessary tools.

For drifting or tunnel work the equipment is sufficient for the present needs of the property, but it is not so well adapted for shaft sinking. Power is rather expensive on account of the cost of truck transportation of fuel oil from Wickenburg over the road in its present condition.

The stamp mill is rather antiquated but it is my opinion that it could be overhauled and used to advantage. The equipment consists of five stamps installed. A battery installed for five additional stamps which are on the ground, but have never been put in place. Also a Wilfley concentrating table which is in good condition. There is also a small crusher which is usable. There is also on the ground a 22 h.p. Fairbanks-Morse gasoline engine which was used to run the stamp mill, but is now at the Swallow shaft.

### MAPS

I have prepared a number of maps to use in connection with this report. While these maps were made hurriedly they are reliable and are made from actual surveys on the ground. All information was obtained from reliable government information. Each map is designated by a letter as "Map-A" or "Map-B" and they will be so referred to throughout this report. Instead of long descriptions which are tiresome as well as confusing I will depend largely on the maps. I will, therefore, ask that the attached maps, either bound with this report, or in the pocket, be considered a part of the report. Following is a short description of each map:

"Map-A" shows on a scale of 600 ft. to the inch. sections 6 and 7, Township 8 North, Range 2 West, and the relative position of the fifteen mining locations embracing the group.

The tabulated statement following "Map-A" gives the names of the claims, date of location, date of recording, name of locator and other information relating to the ground.

"Map-B" is a portion of the "Congress Quadrangle" of the U. S. Geological Survey, and shows accurately the topographical features of the surrounding country as well as the ground embraced within the claims.

"Map-B-1" is a small portion of the "Congress Quadrangle" enlarged 6 times and shows the contour lines and elevation of the ground embraced, and that to the west. It also shows roads, trails, water courses and some of the surrounding mines.

"Map-C" is a plan showing the underground workings of the "Swallow Shaft" with its different levels, drifts and crosscuts.

"Map-D" is a sectional map of "Map-C" made looking in the direction of the dip of the vein, or looking N 51 degrees E.

"Map-E" shows the underground works in connection with the Swallow Shaft and their relation to the surface. It also shows the location of the "Whim Shaft" and the "Golden Wonder Shaft" and their relation on the surface to the "Swallow Shaft". Also the calculated relation of the "Whim Vein" on the level of the main crosscut tunnel.

"Map-F" shows a plan and section of the "Moon Light Shaft" and tunnel. This shaft is approximately 3.45 degrees E 3350 ft. from the "Golden Wonder Shaft."

"Map-G" shows a plan and section over the crosscut tunnel. These maps together with the 30 and 50 foot maps already sent you should make clear the general conditions at the property.

#### SURFACE DEVELOPMENT

It is very seldom that I see a mining property that has so many shallow surface cuts, shafts and short tunnels. Each of the 15 claims have from 1 to 10 or more of these small openings and the amazing thing about it is the fact that they all contain more or less ore. Nor are these shallow openings confined to the 15 claims, but as far as I can determine they prevail in all directions from the group owned by your company. To describe each of these, or even the more important ones, would require space prohibited in this report. I pass them with the remark that I have never examined a copper property that had such a display of high grade copper ore. Ore is found at practically all places where the veins outcrop to the surface.

#### DEEPER DEVELOPMENT

The deeper and more important development on the "Whim Vein" consists of the "Golden Wonder Shaft" sunk on the foot wall of the vein for an inclined distance of something near 100 ft. This shaft is on the "Treasure Vault Claim" and in point of elevation is the highest on the property. Elevation of Collar is 3799.67 ft. See upper dump in picture No. 6 station 69 on larger maps.

The next shaft of importance is the "Whim Shaft" on the "Whim Vein" 380 ft. southeast of the "Golden Wonder Shaft." This shaft is also on the foot wall and is sunk an inclined distance of 100 ft. Both shafts dip from 55 degrees to 60 degrees, or practically the same as the "Swallow Shaft". I did not go down either of these shafts for the reason that I did not consider the timber in the "Whim Shaft" safe, and the "Golden Wonder" had no timber nor ladders.

While these 2 shafts are the main workings on the "Whim Vein" the vein is developed on the surface for several hundred feet north of the "Golden Wonder Shaft" and also to the south of the "Whim Shaft."

Also a tunnel from near station 68, follows the vein to the northwest and connects with the "Golden Wonder Shaft". The tunnel is filled near the portal by material washed down the gulch and was not entered by me.

#### SWALLOW SHAFT

This is a two-compartment inclined shaft sunk on the foot-wall of the "Swallow Vein" for an inclined depth of 232.90 ft. to the tunnel level, and on Sept. 11th, an additional inclined depth of 57.00 ft. below the tunnel, making 289.90 ft. on the incline. The dip varies from 68 degrees at the collar for a short distance to 50 degrees, and the average is 56 degrees--58' from the collar to the tunnel level. From the tunnel level down the dip is 60 degrees from the horizontal. The total vertical distance from collar to bottom is 243.36 ft. Horizontal distance 154.69 feet. Strike of horizontal distance N.51 degrees - 07'E. The elevation of the collar is 3600.93 ft.

At a vertical distance of 67.02 ft. below the collar a drift has been extended along the course of the vein a total of 319.5 ft. in a northerly direction. At a point 204.50 ft. from the shaft a crosscut was extended to the west a distance of 72.00 feet to the "Patterson Vein". On this vein a drift was extended to the south 65.00 ft., and a drift to the north 131.00 ft.

From the shaft station a tunnel connects with the surface at a distance of 170 ft. southeasterly from the shaft. Elevation of portal, floor level 3531.92, station 55 surface map.

On this level is a total of 881.5 ft. of drift and 72.00 ft. of crosscut, or 953.50 ft. of work.

At a vertical distance of 153.30 ft. from the collar of the shaft a drift has been extended to the north a distance of 169 ft. At a distance of 83.00 ft. from the shaft a crosscut was extended to the east a distance of 62.00 ft. At a point 131.00 ft. from the shaft a crosscut was extended westerly a distance of 127.00 ft. to a vein. On this vein a drift was extended to the south a distance of 56.50 ft., and to the north a distance of 65.00 ft. The crosscut continues west a distance of 30.00 ft.

On this level a total of 290.50 ft. of drift and 219.0 ft. of crosscut, or 509.50 ft. of work.

The above constitutes the work that was done in the shaft from the surface working as a shaft or incline.

#### MAIN WORKING CROSSCUT TUNNEL

After acquiring the property the State Copper Co. moved the engines and compressors from the collar of the "Swallow Shaft" to the location selected for the crosscut tunnel. A building was erected to house the equipment, the machinery was installed and the tunnel was driven some 900 ft in a northwesterly direction with the idea that the vein would be reached near where the shaft would be, if extended downward. Work on the tunnel was then suspended until early in the present year. When work was resumed, within a few feet the tunnel broke into the sump of the "Swallow Shaft." The crosscut was then continued along the vein as a drift for a distance of 234.03 ft. When this drift was completed a station was cut at the shaft, the vein crosscut, an electric hoist installed and in August of this year sinking was commenced on a double compartment shaft, it being a continuation of the "Swallow Shaft." At the time I left the property, this shaft was down a distance of 57.00 ft.

In order that this work may be properly understood, let us reverse the order and view it from the standpoint of a working tunnel.

We enter the mine by a diagonal crosscut tunnel 913.21 ft. to the shaft station. We then have 61.00 ft. of crosscut across the vein at the station, 25 ft. of this being in foot wall country. We have 234.03 ft. of drift on the vein. A crosscut to the left 20.00 ft. and a crosscut to the right 12.00 ft. In other words we have 1242.24 ft. of work on the tunnel level.

From this level we have a winze 57.00 ft. deep and at 47 ft. we have a drift 20 ft. and 30 ft. of crosscut. Or below the tunnel we have 107.00 ft. of work.

### THE MOON LIGHT TUNNEL AND SHAFT

The portal of the "Moon Light Tunnel" is about 1600.00 ft. to the southeast of the portal of the "Swallow Tunnel". The elevation of the floor at the portal is 3547.01 ft. The tunnel is run in a southwesterly direction a distance of 183.00 ft. It then turns sharply to the left and continues in a southeasterly direction for a distance of 91.00 ft., where a vein is encountered, upon which a short drift was extended. From this drift a raise was put up a short distance and a winze was sunk to a depth of 38.00 ft.

The main tunnel was continued in a southeasterly direction 66.00 ft. to a point where the second vein was intersected. On this vein some drifting was done; a small amount of sinking and a connection made with the shaft to the surface. The shaft is an incline and has a length of about 180 ft. The elevation of the collar being 3690.28 feet. This tunnel, while it does not seem to go any place, is interesting because it shows an immense wide mineralized area, somewhat different from anything else on the property. A rather large stope would indicate that considerable ore had been removed along the course of the shaft and above the tunnel. Total length of tunnel and drifts 502.80 ft. Incline shaft 180.00 ft.

Altogether, I have described 469.90 ft. of shaft and 3547.94 ft. of tunnel. I would estimate that the small shafts and tunnels on the property would bring the aggregate to about 600.00 feet of shaft work and 4000.00 feet of tunnel.

### VEINS AND VEIN SYSTEM

If we take the average strike of the "Swallow Vein" as indicated on the tunnel level at N. 23 degrees -00'W. then the diagonal crosscut tunnel actually crosscut 720 ft. of your ground at right angles to the vein system. Your ground is 6 claims, or 3600 ft. wide. Therefore, it would require the equivalent of 5 such tunnels to crosscut your ground at right angles to the veins. Including the "Swallow Vein" this tunnel intersected and crossed five separate and distinct veins. I have no basis to figure, other than to say, that if you intersect 5 veins in 720 ft., you certainly have reasons to expect that you would intersect 25 veins in 3600 ft. This is not merely a case of arithmetic because on the ground you have the evidence to show that this number of veins might even be increased.

Station 10, near the discovery cut of the "Maud S" claim, is on one of the best veins on the property. Station 13, near station 10, is the only transit point where I have ever set up a transit on copper ore in place extending above the surface of the ground. This vein can be traced by ore on the surface for 800 ft. It is entirely east of any work I have described or will cover in this report. Your claims to the northeast, in my opinion have surface showings far more promising than anything near where the deeper work has been done. Further remarks on this subject seem unnecessary at this time.

I have traced and will attempt to describe and locate three of these veins on the surface.

First, in my opinion, is the "Whim Vein" the apex of which is covered by the "Treasure Vault" on the north, then passing in a south-easterly direction through the "Speculator" "Old Homestead" and "Crystal" claims.

One can walk on the foot wall of this vein from a point 400 feet north of the "Golden Wonder Shaft" to station 81 near the boarding house, a distance of 2600 ft. Refer to surface map, 200 ft. to the inch, and note the location of transit points No. 84-69-68-67-79-78-77-81. These points represent approximately the foot wall of this vein. They are not merely transit points, but are actual surface exposures of the vein. In at least five cases the actual wall of the vein.

The second is the "Swallow Vein", marked on the north and by a surface exposure at station 57, where the vein comes to the surface and is visible and exposed through to Stations 58-59 and 60. Station 59 represents the collar of the "Swallow Shaft". Stations 58 and 60 represent the north and south end of stopes that come to the surface. The vein is again exposed at the portal of the tunnel, Station 56, elevation 3531.92. From this point on south to Stations 30-44 and 39 on the south hill.

The third vein is represented on the surface, only approximately in some cases, by Stations 80-70-52-44-33-20-16-32. This is the No. 4 vein in the "Swallow" or main crosscut tunnel; It is the same vein that the stamp mill building is sitting on. It is exposed by the creek tunnel just south of the mill building, and the immense blowout south of the creek marked by Station 32. It is also one of the "Moon Light" tunnel veins.

Call this a vein system or whatever you wish. It is a mineralized area over 3600 ft. wide, and extends beyond your end lines in either direction.

### GEOLOGY

The eleven days spent on the property would not permit me to devote much time to a study of the geology.

I consider this of the utmost importance. The preceding description of the vein system would indicate a complex geological condition that cannot be worked out in a few days. It is especially important that this subject be gone into very thoroughly before any deep or permanent work is undertaken.

For the following reason, if you had no other:

West of, and on the west side of your claims the veins dip to the northeast from 50 degrees to 60 degrees from the horizontal. As you go east on your property the dip becomes greater until they are vertical, or approximately so. Further east, say from one-half to one mile, the veins dip to the northwest. The strike also changes in this respect. Standing at the "Moon Light Shaft" the veins on the west strike, we will say N. 45° W. Assume the "Whim Vein" strikes N. 35° W., the "Swallow Vein" N. 25° W., the No. 4 vein in the crosscut tunnel strikes N 15° W.

the "Bell of the South" vein strikes true north, others to the east would strike to the northeast. In other words, fan-like, with the handle at the "Moon Light" shaft. This may not be a technical description, but it described conditions that should not be overlooked.

Getting to the geology proper; your country rock is granite, and it is found in all its stages of alteration. I would say that your property is in a schist belt, and that there are local areas of granite. The older volcanic rocks are also represented, and it would require a rather detailed study of the rocks to attempt anything like a correct classification. The veins are well defined, in respect to the foot wall. The hanging wall is a gradual alteration into the country rock. The vein filling is largely hematite iron. The copper is very closely associated with the specular iron. The country is cut by numerous white quartz veins and veinlets; also heavy spar veins up to two feet wide. The copper ore is entirely the oxides and carbonates. There is no trace of a sulphide copper either on the surface or at the deeper workings. The iron oxidation has altered the wall rock, more especially the hanging wall a considerable distance from the vein.

#### SURFACE ORE

I do not know just what constitutes a real surface showing of copper in Arizona, but there are 50 or more showings that would be considered excellent prospects in copper countries where I have mined. It is impossible for me to conceive of such a showing as you have that would not lead to a deposit of copper with sufficient depth. I do not see that any long discussion in this report on the manner as to how this copper got there would be of any benefit. You have the copper and you have the rocks, or formations that copper is known to occur in in Arizona and in other parts of the world, and I know of no reason why it should not continue to depth.

From the general nature of the country, it is my opinion that the effects of erosion and surface waters, the sulphide zone will be deep on this property.

#### ASSAYS

My sampling of the property is entirely preliminary. I did not deem it necessary to make a complete sampling for the purpose of this report. The samples taken gives me the information I was most anxious to have. I attach hereto duplicate assay certificate which I had checked and found to be correct.

Sample "L-1" was taken to represent a wide area in the stope in the Moon Light Tunnel. To determine if possible to obtain a large tonnage of low grade leaching ore.

"L-2" represents the face of the west drift on the 67 foot level from the Swallow Shaft. Taken to determine gold content. This covers three feet across the face.

"L-3"--End of stope up, north of shaft 67 ft. level, 5 feet wide. Taken for gold determination.

"L-4" - At station "P" minus 5 ft., drift on tunnel level. Sampled five feet wide.

"L-5" - At station "K" plus 12 feet, drift on tunnel level. Sampled 10 feet wide.

"L-6" - At station "J" minus three feet, drift on tunnel level. Sampled five feet wide.

"L-7" - At station "L" plus, across crosscut, drift on tunnel level. Sampled 12 feet wide.

"L-8" - At station "G" minus 24 ft., foot wall at left of shaft station, tunnel level. Sampled 2 feet wide.

"L-9" - North of station 58, surface. At end of old stope to surface near Swallow shaft. Vein rock in place backfilled below

"L-10" - Picked gold ore. Along north drift. West vein 153 ft. level. Width 2 to 6 inches.

"L-11" - North face of west drift, 153 ft. level. Sampled 3 ft. wide across face.

"L-12" - Taken 32 ft. back from North face, west drift 153 ft. level.

"L-13" - Taken 12 ft. south of station "G-1" west drift, 153 ft. level.

"L-14" - Picked sample, along tunnel level, covering 100 ft. from shaft station.

"L-15" - Ore sorted from drift at bottom of shaft, Taken out Sept. 10th.

Check Assay by Sill & Sill, Los Angeles

L-10	..... Gold	.....1.50	... Ounces	.....	\$31.00
L-11	..... Gold	.....0.18	... Ounces	.....	3.72
L-12	.....Gold	.....0.10	... Ounces	.....	2.06
L-13	..... Gold	.....0.64	... Ounces	.....	13.23
L-16	..... Gold	.....0.64	... Ounces	.....	13.23

RECOMMENDATIONS

It is my opinion that the permanent enriched copper zone that will be found immediately above the sulphide zone is deep, and that this zone will not be reached for several hundred feet.

It is my further opinion that you have a good chance of finding several important bodies of the copper oxides and carbonates near the surface, that could be made commercial by a leaching plant on the ground.

Further that you have very excellent chances for opening large bodies of commercial gold ore near the surface, or above your tunnel level.

I do not consider your vein system explored above the tunnel level. The "Whim Vein" in my opinion, the best vein on the property, is not explored to any extent above the tunnel level. From the standpoint of a gold property, I believe you have veins between the "Swallow Vein" and the "Whim Vein" that are more important than either of these veins.

These points may all be determined very quickly, and with a reasonable amount of money.

A very short crosscut makes it possible to drift on the "Whim Vein" and explore it to a vertical depth of 428 feet, and this depth will do more than the same amount of money spent in sinking, or continuing the present "Swallow Shaft".

I, therefore, recommend that the drift be continued on the "Swallow Vein" until opposite a point corresponding to the "Whim Shaft" be reached, and then a direct crosscut be driven to the "Whim Vein" by the shortest course.

In other words, acquire depth by extending your present working tunnel into "Swallow Mountain" rather than by sinking. Your veins extend into and through "Swallow Mountain" and it is possible to acquire over 1000 ft. on the dip of your veins by this means.

This, I think, should be done in preference to sinking at the present time. I fail to see any change in the shaft that would warrant sinking to a depth of less than 600 ft.

I would even prefer to see the same amount of money spent in diamond drill work below the tunnel level. In fact, I would very strongly urge a considerable amount of diamond drilling before beginning the sinking of a permanent working shaft.

#### CONCLUSIONS

I arrived on your property on September 1st, this year, and spent 11 days on the ground, and have devoted my entire attention to the work from that date.

I would not feel that I had done justice to your property without acknowledging the kindly treatment received at the hands of Mr. P. L. Woodman. A man who has spent years in the service of the mining industry in Arizona. A man who spent 23 and one-half years as underground superintendent of one of the greatest copper mines the world has ever known. A man who knows every district and camp, mine and prospect in the State. His judgment alone should be sufficient in the case of the State Copper Company's property, and as an Engineer, it would be perfectly agreeable to me to erase all that I have written and merely say: "Give Mr. Woodman what he needs and let him make another Copper Queen. Yes, another Bisbee, if you please."

I do not necessarily mean that you should give Mr. Woodman two or three million dollars to do this work with. In fact, I think his better judgment would dictate another course.

You always have the South African method of developing a mining property. That is, to draw the diagonal lines covering your property boundaries, then sink a shaft two thousand feet deep where they intersect, and if it is not there sink another shaft.

Before suggesting that method of procedure, I would want to see your lines extended to cover 4 square miles of country. You have other and better means of developing your property which may be worked out by your company without the expenditure of a stupendous sum of money.

First, you should give attention to a policy of continuing work along modest lines until you are warranted in the installation of a reasonable sized plant, sufficient to take care of the tonnage that I believe could be developed above your present tunnel. This could be done without any mill or treatment plant until such time as warranted.

I have in mind and propose the following course which I believe can be worked out to advantage and will involve but a very modest sum of money.

You have on your property at the present time ten stamps,--not the most modern machinery in any sense of the word, and not what I would buy and haul to the property, but they are on the ground and they are paid for. In fact, you have engine, crusher, concentrating table, stamps and battery and mill building.

The mill building could easily be moved to a location near the portal of the present tunnel. To this mill you could bring your ore from any part of the "Whim" or "Swallow" veins at a minimum cost. You could haul ore from any of the other parts of the property by truck at a small cost per ton.

In connection with this small mill I would install a small copper leaching plant to take care of the copper ore that is now available, and that will be made available as development work progresses.

In considering this plan keep in mind that this property has been worked by a prospector without financial means; that it has been high graded and worked by leasers and chloriders, and the tonnage of ore that is immediately available is limited.

Also keep in mind that it was formerly worked by shaft, and that hoisting and pumping of water, and hauling the ore off the hill from the different shafts and tunnels was expensive, and interfered with the net returns. Whereas, in its present condition with a working tunnel, making a vast tonnage of ore available at much less expense, conditions are more favorable.

I do not believe that you have large bodies of thirty or forty dollar ore, but I do believe you have and can very easily and cheaply develop large bodies of ten or twelve dollar ore which should be mined and milled at a good profit to your company, and should furnish the funds necessary to carry on your work of developing another "Copper Queen".

This plan of procedure as outlined above calls for the expenditure of a very small amount of money, and the expenditure would not be a loss regardless of what the future policy of the mine might be. The mill could be used as a small pilot mill, and the cost is justified if used for no other purpose than as a means of sampling the mine.

This is a preliminary report in that I would require at least six months more time to spend on the ground before making a final report, preparatory to advising you, provided you cared to proceed with this property in a large way.

My limited knowledge of what constitutes a sufficient showing in Arizona prompts me to proceed slowly, and yet I do not hesitate to cheerfully recommend the expenditure of the sums necessary to carry out the work I have just outlined.

For the larger expenditure, I ask for more time to consider, and would likely ask that I be given the assistance of other talent.

Respectfully submitted,

/s/ Henry M. Lancaster  
Mining Engineer.

Signed in triplicate Oct. 22, 1925

PRELIMINARY REPORT

ON THE GROUP OF MINING CLAIMS OWNED BY  
S T A T E     C O P P E R     C O M P A N Y

YAVAPAI COUNTY,     ARIZONA

*(Swallow Mine)*

LOCATION OF PROPERTY

A group of mining locations, comprising fifteen lode claims located within, and being a part of Sections Six and Seven, Township Eight North, Range Two West, Gila and Salt River Principal Meridian of Arizona, is the subject of this report.

This property is located in the extreme south end of Yavapai County, thirty-two miles south and three miles east of Prescott, the County Seat. In other words, forty-two miles north and twenty-four miles west of Phoenix, the State Capitol.

The nearest railroad point is the small mining town of Wickenburg twelve miles west and seven miles south of the property. The immediate territory is served by the Atchison Topeka and Santa Fe Railroad. A branch line extending from Wickenburg to Phoenix and from Wickenburg to the main line at Ash Fork, or west to the main line by way of Parker and Cadiz. From this description the exact location of the property may be found on any map of the State.

MINING DISTRICT

The property is a part of what is organized as the "Castle Creek Mining District." The area is drained on the south and east by the Agua Fria River, and on the north and west by the Hassayampa River. The better known mines in the immediate vicinity of this property are numerous. I will mention the Copperopolis, Constellation, Keystone, King Solomon, Monte Cristo, Abe Lincoln and the Vulture. All are, or have been producers.

TOPOGRAPHICAL FEATURES

The district is mountainous in all directions. The Bradshaw mountains to the east; the Wickenburg mountains to the south; the Vulture mountains to the west and the Weaver mountains to the north. Swallow mountain, comprising part of the group, reaches an elevation of 4400 feet above sea level. Most of the work on this group is between the elevation of 3400 and 3800 feet above sea level. The mountains are not rugged nor abrupt for the most part and roads and trails are easily made.

ROADS

From Wickenburg to your property is a distance of 17 miles by the present road. The eleven miles out from Wickenburg is not a bad road, but one would have to draw on the imagination to some extent to call the last six miles a road. This, however, is not a very serious handicap as

good roads could be built on easy grades from your property for a distance of about 8 miles at a moderate cost. The most serious drawback at the present time is on account of the high cost of hauling fuel oil and supplies over the road in its present condition. A proposed State highway connecting Morrystown and Prescott, by way of Minnehaha Flat, if built as proposed will pass over or very near to your property. The town of Wickenburg is connected with Phoenix on the south, and Prescott on the north by a splendid State highway.

#### TIMBER

For practical mining purposes there is no timber on the property, and timber for building purposes or underground use would have to be brought in. The south end of the Prescott National Forest Reserve starts 6 miles north of the property, and timber may be obtained at a reasonable price.

#### WATER

The water supply is limited during a short portion of the year, especially the summer months, and the small creek that crosses your property becomes a "dry wash" during this part of the year. During the dry season the only source of water is to sink wells along the creek channel where considerable water may be obtained. The mine workings make considerable water which could be conserved and used for milling purposes. During the winter and rainy months water is plentiful for milling or other mine uses.

#### CLIMATE

The climate is very hot and dry during the summer months with only an occasional shower. During the fall, winter and spring months the climate is said to be very delightful. There is very little or no snow fall during the winter. Climatic conditions at the mine would be considered very favorable.

#### HISTORICAL

The history of this property is not unlike that of many others in the remoter mining districts of the west. Discovered and located by a prospector of very limited means; held by him and worked in a crude way through the best efforts he could put forth without funds. Later through his own resources and the help of friends, a small five stamp mill, and still later another more modern stamp mill. Still later, during the war period of high copper prices leasers mined and shipped crude, a considerable tonnage of copper ore. The property has been worked intermittently, mostly for its gold values, for a number of years. The local reports of the total production is in excess of \$150,000. I have no way of judging the correctness of these figures. However, it is apparent that considerable ore has been mined and milled, and I presume it produced the money used in the development of this property, at least the greater part of it. It is very plain that the ore must have carried good values to pay the cost of mining, handling and milling or marketing in the crude way it was done.

#### TITLE TO GROUND

Practically all of the Public Domain, not on Indian Reservations, that is known or thought to be mineral bearing, is open to mineral

locations by citizens of the United States, who comply with the statutes of the Federal Government and the State of Arizona. This ground is held by right of location and compliance with the laws of the United States and the State of Arizona. It is my understanding that this ground has been held for a long period of years. The more recent records were made for the purpose of perfecting title, and on January 1st, 1920, eleven of the claims were relocated. Four of the claims were located on July 3rd, 1923, by the State Copper Co.

It is my opinion that there are no conflicting areas with the adjoining claims and there is no litigation effecting title or rights. The question of ownership is clear and undisputed. The mineral character of the land can never be questioned, and it is almost safe to say that the Federal Government will not claim the timber or water, so long as the annual assessment work is performed, and Federal and State requirements complied with, title to unpatented mining ground is absolutely safe.

#### SURFACE EQUIPMENT

Present surface improvements consist of two small bunk houses or sleeping quarters for men; a small kitchen and boarding house, shown to advantage in pictures No. 1-2-3. A small office building shown at the right in picture No. 3.

A shallow well for a domestic water supply from which water is pumped to a tank and piped to the different buildings. Other buildings comprise the stamp mill building shown in picture No. 4, and the engine and compressor building, with annexed blacksmith shop shown in picture No. 6. While the buildings are not elaborate they serve the purpose for which they are intended,--The housing of a small crew.

#### MINING EQUIPMENT

The principal machinery constituting the present mine equipment is housed in a frame building 36' x 40' at the portal or entrance to the main crosscut or lower working tunnel. The engines and all the machinery are well installed on concrete foundations, and it is rather pleasing to note that the machinery is cared for by men who are interested in seeing that every piece of equipment performs smoothly except the clock, for which they seem to have no regard. The equipment for the most part consists of:

- One-60 Horse Power Foos gasoline engine
- One-60 Horse Power Commercial gasoline engine
- One-50 K.W. General Electric Generator
- One-10' x 12' Sullivan compressor complete
- One-Electric Hoist at shaft station
- One-Electric Sinking pump
- One-Electric Light installation complete
- Blacksmith and other necessary tools.

For drifting or tunnel work the equipment is sufficient for the present needs of the property, but it is not so well adapted for shaft sinking. Power is rather expensive on account of the cost of truck transportation of fuel oil from Wickenburg over the road in its present condition.

The stamp mill is rather antiquated but it is my opinion that it could be overhauled and used to advantage. The equipment consists of five stamps installed. A battery installed for five additional stamps which are on the ground, but have never been put in place. Also a Wilfley concentrating table which is in good condition. There is also a small crusher which is usable. There is also on the ground a 22 h.p. Fairbanks-Morse gasoline engine which was used to run the stamp mill, but is now at the Swallow shaft.

## MAPS

I have prepared a number of maps to use in connection with this report. While these maps were made hurriedly they are reliable and are made from actual surveys on the ground. All information was obtained from reliable government information. Each map is designated by a letter as "Map-A" or "Map-B" and they will be so referred to throughout this report. Instead of long descriptions which are tiresome as well as confusing I will depend largely on the maps. I will, therefore, ask that the attached maps, either bound with this report, or in the pocket, be considered a part of the report. Following is a short description of each map:

"Map-A" shows on a scale of 600 ft. to the inch. sections 6 and 7, Township 8 North, Range 2 West, and the relative position of the fifteen mining locations embracing the group.

The tabulated statement following "Map-A" gives the names of the claims, date of location, date of recording, name of locator and other information relating to the ground.

"Map-B" is a portion of the "Congress Quadrangle" of the U. S. Geological Survey, and shows accurately the topographical features of the surrounding country as well as the ground embraced within the claims.

"Map-B-1" is a small portion of the "Congress Quadrangle" enlarged 6 times and shows the contour lines and elevation of the ground embraced, and that to the west. It also shows roads, trails, water courses and some of the surrounding mines.

"Map-C" is a plan showing the underground workings of the "Swallow Shaft" with its different levels, drifts and crosscuts.

"Map-D" is a sectional map of "Map-C" made looking in the direction of the dip of the vein, or looking N 51 degrees E.

"Map-E" shows the underground works in connection with the Swallow Shaft and their relation to the surface. It also shows the location of the "Whim Shaft" and the "Golden Wonder Shaft" and their relation on the surface to the "Swallow Shaft". Also the calculated relation of the "Whim Vein" on the level of the main crosscut tunnel.

"Map-F" shows a plan and section of the "Moon Light Shaft" and tunnel. This shaft is approximately 3.45 degrees E 3350 ft. from the "Golden Wonder Shaft."

"Map-G" shows a plan and section over the crosscut tunnel. These maps together with the 30 and 50 foot maps already sent you should make clear the general conditions at the property.

### SURFACE DEVELOPMENT

It is very seldom that I see a mining property that has so many shallow surface cuts, shafts and short tunnels. Each of the 15 claims have from 1 to 10 or more of these small openings and the amazing thing about it is the fact that they all contain more or less ore. Nor are these shallow openings confined to the 15 claims, but as far as I can determine they prevail in all directions from the group owned by your company. To describe each of these, or even the more important ones, would require space prohibited in this report. I pass them with the remark that I have never examined a copper property that had such a display of high grade copper ore. Ore is found at practically all places where the veins outcrop to the surface.

### DEEPER DEVELOPMENT

The deeper and more important development on the "Whim Vein" consists of the "Golden Wonder Shaft" sunk on the foot wall of the vein for an inclined distance of something near 100 ft. This shaft is on the "Treasure Vault Claim" and in point of elevation is the highest on the property. Elevation of Collar is 3799.67 ft. See upper dump in picture No. 6 station 69 on larger maps.

The next shaft of importance is the "Whim Shaft" on the "Whim Vein" 380 ft. southeast of the "Golden Wonder Shaft." This shaft is also on the foot wall and is sunk an inclined distance of 100 ft. Both shafts dip from 55 degrees to 60 degrees, or practically the same as the "Swallow Shaft". I did not go down either of these shafts for the reason that I did not consider the timber in the "Whim Shaft" safe, and the "Golden Wonder" had no timber nor ladders.

While these 2 shafts are the main workings on the "Whim Vein" the vein is developed on the surface for several hundred feet north of the "Golden Wonder Shaft" and also to the south of the "Whim Shaft."

Also a tunnel from near station 68, follows the vein to the northwest and connects with the "Golden Wonder Shaft". The tunnel is filled near the portal by material washed down the gulch and was not entered by me.

### SWALLOW SHAFT

This is a two-compartment inclined shaft sunk on the foot-wall of the "Swallow Vein" for an inclined depth of 232.90 ft. to the tunnel level, and on Sept. 11th, an additional inclined depth of 57.00 ft. below the tunnel, making 289.90 ft. on the incline. The dip varies from 68 degrees at the collar for a short distance to 50 degrees, and the average is 56 degrees--58' from the collar to the tunnel level. From the tunnel level down the dip is 60 degrees from the horizontal. The total vertical distance from collar to bottom is 243.36 ft. Horizontal distance 154.69 feet. Strike of horizontal distance N.51 degrees - 07'E. The elevation of the collar is 3600.93 ft.

At a vertical distance of 67.02 ft. below the collar a drift has been extended along the course of the vein a total of 319.5 ft. in a northerly directoon. At a point 204.50 ft. from the shaft a crosscut was extended to the west a distance of 72.00 feet to the "Patterson Vein". On this vein a drift was extended to the south 65.00 ft., and a drift to the north 131.00 ft.

From the shaft station a tunnel connects with the surface at a distance of 170 ft. southeasterly from the shaft. Elevation of portal, floor level 3531.92, station 55 surface map.

On this level is a total of 881.5 ft. of drift and 72.00 ft. of crosscut, or 953.50 ft. of work.

At a vertical distance of 153.30 ft. from the collar of the shaft a drift has been extended to the north a distance of 169 ft. At a distance of 83.00 ft. from the shaft a crosscut was extended to the east a distance of 62.00 ft. At a point 131.00 ft. from the shaft a crosscut was extended westerly a distance of 127.00 ft. to a vein. On this vein a drift was extended to the south a distance of 56.50 ft., and to the north a distance of 65.00 ft. The crosscut continues west a distance of 30.00 ft.

On this level a total of 290.50 ft. of drift and 219.0 ft. of crosscut, or 509.50 ft. of work.

The above constitutes the work that was done in the shaft from the surface working as a shaft or incline.

#### MAIN WORKING CROSSCUT TUNNEL

After acquiring the property the State Copper Co. moved the engines and compressors from the collar of the "Swallow Shaft" to the location selected for the crosscut tunnel. A building was erected to house the equipment, the machinery was installed and the tunnel was driven some 900 ft in a northwesterly direction with the idea that the vein would be reached near where the shaft would be, if extended downward. Work on the tunnel was then suspended until early in the present year. When work was resumed, within a few feet the tunnel broke into the sump of the "Swallow Shaft." The crosscut was then continued along the vein as a drift for a distance of 234.03 ft. When this drift was completed a station was cut at the shaft, the vein crosscut, an electric hoist installed and in August of this year sinking was commenced on a double compartment shaft, it being a continuation of the "Swallow Shaft." At the time I left the property, this shaft was down a distance of 57.00 ft.

In order that this work may be properly understood, let us reverse the order and view it from the standpoint of a working tunnel.

We enter the mine by a diagonal crosscut tunnel 913.21 ft. to the shaft station. We then have 61.00 ft. of crosscut across the vein at the station, 25 ft. of this being in foot wall country. We have 234.03 ft. of drift on the vein. A crosscut to the left 20.00 ft. and a crosscut to the right 12.00 ft. In other words we have 1242.24 ft. of work on the tunnel level.

From this level we have a winze 57.00 ft. deep and at 47 ft. we have a drift 20 ft. and 30 ft. of crosscut. Or below the tunnel we have 107.00 ft. of work.

#### THE MOON LIGHT TUNNEL AND SHAFT

The portal of the "Moon Light Tunnel" is about 1600.00 ft. to the southeast of the portal of the "Swallow Tunnel". The elevation of the floor at the portal is 3547.01 ft. The tunnel is run in a southwesterly direction a distance of 183.00 ft. It then turns sharply to the left and continues in a southeasterly direction for a distance of 91.00 ft., where a vein is encountered, upon which a short drift was extended. From this drift a raise was put up a short distance and a winze was sunk to a depth of 38.00 ft.

The main tunnel was continued in a southeasterly direction 66.00 ft. to a point where the second vein was intersected. On this vein some drifting was done; a small amount of sinking and a connection made with the shaft to the surface. The shaft is an incline and has a length of about 180 ft. The elevation of the collar being 3690.28 feet. This tunnel, while it does not seem to go any place, is interesting because it shows an immense wide mineralized area, somewhat different from anything else on the property. A rather large stope would indicate that considerable ore had been removed along the course of the shaft and above the tunnel. Total length of tunnel and drifts 502.80 ft. Incline shaft 180.00 ft.

Altogether, I have described 469.90 ft. of shaft and 3547.94 ft. of tunnel. I would estimate that the small shafts and tunnels on the property would bring the aggregate to about 600.00 feet of shaft work and 4000.00 feet of tunnel.

#### VEINS AND VEIN SYSTEM

If we take the average strike of the "Swallow Vein" as indicated on the tunnel level at N. 23 degrees -00'W. then the diagonal crosscut tunnel actually crosscut 720 ft. of your ground at right angles to the vein system. Your ground is 6 claims, or 3600 ft. wide. Therefore, it would require the equivalent of 5 such tunnels to crosscut your ground at right angles to the veins. Including the "Swallow Vein" this tunnel intersected and crossed five separate and distinct veins. I have no basis to figure, other than to say, that if you intersect 5 veins in 720 ft., you certainly have reasons to expect that you would intersect 25 veins in 3600 ft. This is not merely a case of arithmetic because on the ground you have the evidence to show that this number of veins might even be increased.

Station 10, near the discovery cut of the "Maud S" claim, is on one of the best veins on the property. Station 13, near station 10, is the only transit point where I have ever set up a transit on copper ore in place extending above the surface of the ground. This vein can be traced by ore on the surface for 800 ft. It is entirely east of any work I have described or will cover in this report. Your claims to the northeast, in my opinion have surface showings far more promising than anything near where the deeper work has been done. Further remarks on this subject seem unnecessary at this time.

I have traced and will attempt to describe and locate three of these veins on the surface.

First, in my opinion, is the "Whim Vein" the apex of which is covered by the "Treasure Vault" on the north, then passing in a south-easterly direction through the "Speculator" "Old Homestead" and "Crystal" claims.

One can walk on the foot wall of this vein from a point 400 feet north of the "Golden Wonder Shaft" to station 81 near the boarding house, a distance of 2600 ft. Refer to surface map, 200 ft. to the inch, and note the location of transit points No. 84-69-68-67-79-78-77-81. These points represent approximately the foot wall of this vein. They are not merely transit points, but are actual surface exposures of the vein. In at least five cases the actual wall of the vein.

The second is the "Swallow Vein", marked on the north and by a surface exposure at station 57, where the vein comes to the surface and is visible and exposed through to Stations 58-59 and 60. Station 59 represents the collar of the "Swallow Shaft". Stations 58 and 60 represent the north and south end of stopes that come to the surface. The vein is again exposed at the portal of the tunnel, Station 56, elevation 3531.92. From this point on south to Stations 30-44 and 39 on the south hill.

The third vein is represented on the surface, only approximately in some cases, by Stations 80-70-52-44-33-20-16-32. This is the No. 4 vein in the "Swallow" or main crosscut tunnel; It is the same vein that the stamp mill building is sitting on. It is exposed by the creek tunnel just south of the mill building, and the immense blowout south of the creek marked by Station 32. It is also one of the "Moon Light" tunnel veins.

Call this a vein system or whatever you wish. It is a mineralized area over 3600 ft. wide, and extends beyond your end lines in either direction.

### GEOLOGY

The eleven days spent on the property would not permit me to devote much time to a study of the geology.

I consider this of the utmost importance. The preceding description of the vein system would indicate a complex geological condition that cannot be worked out in a few days. It is especially important that this subject be gone into very thoroughly before any deep or permanent work is undertaken.

For the following reason, if you had no other:

West of, and on the west side of your claims the veins dip to the northeast from 50 degrees to 60 degrees from the horizontal. As you go east on your property the dip becomes greater until they are vertical, or approximately so. Further east, say from one-half to one mile, the veins dip to the northwest. The strike also changes in this respect. Standing at the "Moon Light Shaft" the veins on the west strike, we will say N. 45° W. Assume the "Whim Vein" strikes N. 35° W., the "Swallow Vein" N. 25° W., the No. 4 vein in the crosscut tunnel strikes N 15° W.

the "Bell of the South" vein strikes true north, others to the east would strike to the northeast. In other words, fan-like, with the handle at the "Moon Light" shaft. This may not be a technical description, but it described conditions that should not be overlooked.

Getting to the geology proper; your country rock is granite, and it is found in all its stages of alteration. I would say that your property is in a schist belt, and that there are local areas of granite. The older volcanic rocks are also represented, and it would require a rather detailed study of the rocks to attempt anything like a correct classification. The veins are well defined, in respect to the foot wall. The hanging wall is a gradual alteration into the country rock. The vein filling is largely hematite iron. The copper is very closely associated with the specular iron. The country is cut by numerous white quartz veins and veinlets; also heavy spar veins up to two feet wide. The copper ore is entirely the oxides and carbonates. There is no trace of a sulphide copper either on the surface or at the deeper workings. The iron oxidation has altered the wall rock, more especially the hanging wall a considerable distance from the vein.

#### SURFACE ORE

I do not know just what constitutes a real surface showing of copper in Arizona, but there are 50 or more showings that would be considered excellent prospects in copper countries where I have mined. It is impossible for me to conceive of such a showing as you have that would not lead to a deposit of copper with sufficient depth. I do not see that any long discussion in this report on the manner as to how this copper got there would be of any benefit. You have the copper and you have the rocks, or formations that copper is known to occur in in Arizona and in other parts of the world, and I know of no reason why it should not continue to depth.

From the general nature of the country, it is my opinion that the effects of erosion and surface waters, the sulphide zone will be deep on this property.

#### ASSAYS

My sampling of the property is entirely preliminary. I did not deem it necessary to make a complete sampling for the purpose of this report. The samples taken gives me the information I was most anxious to have. I attach hereto duplicate assay certificate which I had checked and found to be correct.

Sample "L-1" was taken to represent a wide area in the stope in the Moon Light Tunnel. To determine if possible to obtain a large tonnage of low grade leaching ore.

"L-2" represents the face of the west drift on the 67 foot level from the Swallow Shaft. Taken to determine gold content. This covers three feet across the face.

"L-3"--End of stope up, north of shaft 67 ft. level, 5 feet wide. Taken for gold determination.

"L-4" - At station "P" minus 5 ft., drift on tunnel level. Sampled five feet wide.

"L-5" - At station "K" plus 12 feet, drift on tunnel level. Sampled 10 feet wide.

"L-6" - At station "J" minus three feet, drift on tunnel level. Sampled five feet wide.

"L-7" - At station "L" plus, across crosscut, drift on tunnel level. Sampled 12 feet wide.

"L-8" - At station "G" minus 24 ft., foot wall at left of shaft station, tunnel level. Sampled 2 feet wide.

"L-9" - North of station 58, surface. At end of old stope to surface near Swallow shaft. Vein rock in place backfilled below

"L-10" - Picked gold ore. Along north drift. West vein 153 ft. level. Width 2 to 6 inches.

"L-11" - North face of west drift, 153 ft. level. Sampled 3 ft. wide across face.

"L-12" - Taken 32 ft. back from North face, west drift 153 ft. level.

"L-13" - Taken 12 ft. south of station "G-1" west drift, 153 ft. level.

"L-14" - Picked sample, along tunnel level, covering 100 ft. from shaft station.

"L-15" - Ore sorted from drift at bottom of shaft, Taken out Sept. 10th.

Check Assay by Sill & Sill, Los Angeles

L-10	..... Gold	.....1.50	... Ounces	.....	\$31.00
L-11	..... Gold	.....0.18	... Ounces	.....	3.72
L-12	.....Gold	.....0.10	... Ounces	.....	2.06
L-13	..... Gold	.....0.64	... Ounces	.....	13.23
L-16	..... Gold	.....0.64	... Ounces	.....	13.23

RECOMMENDATIONS

It is my opinion that the permanent enriched copper zone that will be found immediately above the sulphide zone is deep, and that this zone will not be reached for several hundred feet.

It is my further opinion that you have a good chance of finding several important bodies of the copper oxides and carbonates near the surface, that could be made commercial by a leaching plant on the ground.

Further that you have very excellent chances for opening large bodies of commercial gold ore near the surface, or above your tunnel level.

I do not consider your vein system explored above the tunnel level. The "Whim Vein" in my opinion, the best vein on the property, is not explored to any extent above the tunnel level. From the standpoint of a gold property, I believe you have veins between the "Swallow Vein" and the "Whim Vein" that are more important than either of these veins.

These points may all be determined very quickly, and with a reasonable amount of money.

A very short crosscut makes it possible to drift on the "Whim Vein" and explore it to a vertical depth of 428 feet, and this depth will do more than the same amount of money spent in sinking, or continuing the present "Swallow Shaft".

I, therefore, recommend that the drift be continued on the "Swallow Vein" until opposite a point corresponding to the "Whim Shaft" be reached, and then a direct crosscut be driven to the "Whim Vein" by the shortest course.

In other words, acquire depth by extending your present working tunnel into "Swallow Mountain" rather than by sinking. Your veins extend into and through "Swallow Mountain" and it is possible to acquire over 1000 ft. on the dip of your veins by this means.

This, I think, should be done in preference to sinking at the present time. I fail to see any change in the shaft that would warrant sinking to a depth of less than 600 ft.

I would even prefer to see the same amount of money spent in diamond drill work below the tunnel level. In fact, I would very strongly urge a considerable amount of diamond drilling before beginning the sinking of a permanent working shaft.

#### CONCLUSIONS

I arrived on your property on September 1st, this year, and spent 11 days on the ground, and have devoted my entire attention to the work from that date.

I would not feel that I had done justice to your property without acknowledging the kindly treatment received at the hands of Mr. P. L. Woodman. A man who has spent years in the service of the mining industry in Arizona. A man who spent 23 and one-half years as underground superintendent of one of the greatest copper mines the world has ever known. A man who knows every district and camp, mine and prospect in the State. His judgment alone should be sufficient in the case of the State Copper Company's property, and as an Engineer, it would be perfectly agreeable to me to erase all that I have written and merely say: "Give Mr. Woodman what he needs and let him make another Copper Queen. Yes, another Bisbee, if you please."

I do not necessarily mean that you should give Mr. Woodman two or three million dollars to do this work with. In fact, I think his better judgment would dictate another course.

You always have the South African method of developing a mining property. That is, to draw the diagonal lines covering your property boundaries, then sink a shaft two thousand feet deep where they intersect, and if it is not there sink another shaft.

Before suggesting that method of procedure, I would want to see your lines extended to cover 4 square miles of country. You have other and better means of developing your property which may be worked out by your company without the expenditure of a stupendous sum of money.

First, you should give attention to a policy of continuing work along modest lines until you are warranted in the installation of a reasonable sized plant, sufficient to take care of the tonnage that I believe could be developed above your present tunnel. This could be done without any mill or treatment plant until such time as warranted.

I have in mind and propose the following course which I believe can be worked out to advantage and will involve but a very modest sum of money.

You have on your property at the present time ten stamps,--not the most modern machinery in any sense of the word, and not what I would buy and haul to the property, but they are on the ground and they are paid for. In fact, you have engine, crusher, concentrating table, stamps and battery and mill building.

The mill building could easily be moved to a location near the portal of the present tunnel. To this mill you could bring your ore from any part of the "Whim" or "Swallow" veins at a minimum cost. You could haul ore from any of the other parts of the property by truck at a small cost per ton.

In connection with this small mill I would install a small copper leaching plant to take care of the copper ore that is now available, and that will be made available as development work progresses.

In considering this plan keep in mind that this property has been worked by a prospector without financial means; that it has been high graded and worked by leasers and chloriders, and the tonnage of ore that is immediately available is limited.

Also keep in mind that it was formerly worked by shaft, and that hoisting and pumping of water, and hauling the ore off the hill from the different shafts and tunnels was expensive, and interfered with the net returns. Whereas, in its present condition with a working tunnel, making a vast tonnage of ore available at much less expense, conditions are more favorable.

I do not believe that you have large bodies of thirty or forty dollar ore, but I do believe you have and can very easily and cheaply develop large bodies of ten or twelve dollar ore which should be mined and milled at a good profit to your company, and should furnish the funds necessary to carry on your work of developing another "Copper Queen".

This plan of procedure as outlined above calls for the expenditure of a very small amount of money, and the expenditure would not be a loss regardless of what the future policy of the mine might be. The mill could be used as a small pilot mill, and the cost is justified if used for no other purpose than as a means of sampling the mine.

This is a preliminary report in that I would require at least six months more time to spend on the ground before making a final report, preparatory to advising you, provided you cared to proceed with this property in a large way.

My limited knowledge of what constitutes a sufficient showing in Arizona prompts me to proceed slowly, and yet I do not hesitate to cheerfully recommend the expenditure of the sums necessary to carry out the work I have just outlined.

For the larger expenditure, I ask for more time to consider, and would likely ask that I be given the assistance of other talent.

Respectfully submitted,

/s/ Henry M. Lancaster  
Mining Engineer.

Signed in triplicate Oct. 22, 1925

SWALLOW MINE

From talks with "Dusty" Rhodes, July and August, 1937.  
Located near head of Castle Creek but reached over bad road from  
Wickenburg via Buckhorn Canyon.

Owned by Brown who operates with some associates  
including Jack Stone of Phoenix. Financed for a time by officials  
of the Electrolux Co. of San Francisco who put up \$6000.00.

They have a small compressor and drill and the mining  
work has been well done and some ore has been shipped (one carload  
netted \$800) and more ore is broken in a chute and an old stope  
and there is a lot of lower grade material in the dump.

Drifts on 60' level and 160' level and some high  
grade copper carbonate and oxide ore has been found with high  
gold values, character is much the same as at the Whipsaw and it  
will probably prove very pockety.

Note old U. S. G. S. reports on the Swallow.

11/20

Canned by J. M. Brown  
914 So 2nd Ave.  
Plumage

Lat 4w 5 can saw 21.5 ft

have up in 1 horizontal line across the canyon for  
old works

*Whipsaw*

SWALLOW MINE

6/12/37

*lots of 3 hrs*  
*opened*

*h.w.*

Recently reopened by friends of ~~Dusty~~ Rhodes. These men have worked near the surface and mined and shipped some high grade gold, copper ore and claim to have over 100 tons blocked out. They are working across a hill from the old shaft and main workings and plan to run an adit tunnel which will give them quite a bit of backs on the ore shoot.

Rhodes left with me some nice samples (much like those from the Whipsaw) showing chrysocolla and copper pitch.

FROM U. S. G.S. 782--Page 184

"The Swallow Mine, owned by John Dobler, is at an altitude of 3,225. The place is also known as Buzzard's Roost. It is accessible from the Abe Lincoln Mine, 12 miles from Wickenburg, by a road in poor repair leading down Whipsaw Creek and thence north to the head of a small gulch leading down to Castle Creek. The mine is half a mile west of the Bradshaw Mountains quadrangle in the Congress quadrangle, but it is described here, being in the Castle Creek district. There is a 10 stamp mill on the property.

The country rock is Bradshaw granite with dikes of andesite and granite porphyry. Half a mile southeast of Buzzard's Roost is the south shaft, 225 feet deep. The vein strikes N. 10° W. and dips 70° E. The best ore, which is a copper-stained rusty mass with chrysocolla and brown copper pitch ore, contains 1 to 2 ounces of gold to the ton. The ore averages 3 to 15 feet in width and much of this has been milled. The ore on the dump carries about 8% copper and several dollars in gold to the ton.

North of the house and 300' above it is a shaft 300' deep and presumably on a different vein. Much ore has been stoped to points 150' north and 50' south of this shaft. The vein strikes

*Copy included from my*

*gum*

2-N. 33° W. and dips 60° E. Another vein is found 100' north of this deposit. Still farther north and above the shaft is a tunnel driven on the same or a parallel vein.

The vein is several feet wide and the oxidized filling shows mainly platy specularite with oxidized copper ores, quartz, calcite and some fluorite. It has been mined as a gold ore with free gold in the well-oxidized material. Undoubtedly poorer ore with less free gold will be found in depth.

A specimen of bismuthinite altered to bismuth ocher, said to have come from this mine, was obtained from Mr. Dobler.

Along the trail from the mine to Briggs, on Castle Creek, another parallel vein crops out, showing oxidized ore with some copper and dipping steeply west. "

6/14/37

Rhodes visited this property on the 13th, bad road for greater part of 15 miles from Wickenburg, and little or no other mining going on in that district.

Jack Stone of Phoenix financing the work which is being done by Brown and one or two associates who appear to be good miners and have shipped one car for which they claim to have received \$800.00.

They have not reopened the main workings at the old Swallow but are working on a hillside across the gulch in which is located the old camp and a fine spring of water.

They have opened up an old inclined shaft and have extended the old drifts on the 60' and 160' levels and advanced into a new shaft of ore which is soft earthy material with iron oxide

shard

and copper silicates and oxides in the vein all of which seems to pan well for gold.

They plan to further extend the 160' level and thus hope to open<sup>up</sup> the downward extension of the ore shoot and block out a substantial tonnage of high grade and a larger amount of low grade for the treatment of which they may require a mill.

They have good mining equipment and Rhodes thinks very highly of their prospects but present showing would seem to be too small to interest any one with whom I am in contact.

5/15/44

Harlow D. Phelps, formerly of Prescott and now with U. S. Bureau of Mines, Tucson (P. O. Box 4097, University Station) told me that some years ago he had made a thorough examination of this property and had a report and maps which I could examine at his office. He had turned the property down for his client because he found that nearly all of the high grade gold ore had been worked out from the upper levels and elsewhere he could only find very low grade material, which would not have an average value in excess of \$2.00 per ton including gold and copper.

He thought that there was a bare chance that there might be a large body of disseminated copper ore but this was not investigated.

Brown called and will send in reports. He says that the mine lies two to three miles northwest of the Whipsaw and that a new road is now being built to the Abe Lincoln and from this one should turn off and climb over Morgan Hill and than take the right fork where the road to the Groom Mine forks to the left.

He drove some tunnels and topped the old Swallow Ledge and thinks that there is a big deposit of copper in a porphyry dike where a lot of ore has been taken out. Woodman tried to reach this dike but did not go far enough. Since then Brown has taken over the mine and worked there until late in 1941. Values in the gold vein are from \$2.00 to \$300.00 and very erratic. Brown claims that there is a ledge 6 to 8' wide which will carry over 2% copper and \$5.00 in gold and elsewhere that there are shoots of ore containing 5 to 8% copper associated with specularite and lime in wide bands. The gold is mostly associated with the red hematite. The foot wall of the ore zone is granite and the hanging wall is porphyry.

The water from a tunnel amounted to 12 gals. per minute and was piped to the mill (on which there is still a 25-ton ball mill). The gold values were saved in the mill, but the oxidized (carbonate) copper was lost.

When the mine was operated in 1900 it was reported to have shipped 1000 tons of \$60.00 gold ore to the plant at Briggs. There is very little silver.

Company has 15 unpatented claims and some water rights. Most of the workings are now inaccessible but if the main adit were extended it would open up a back of 425' of stoping ground.

Electric power is now carried to the Monte Cristo Mine about 4 miles distant by air-line.

Adjoining the Swallow Calim on the northeast is a patented claim known as the "Belle of the South."

All this district is well known to an old man named Rudd who still lives at Wickenburg.

Ore was once shipped to Humboldt and to Douglas.

To reach the property at present it would be necessary to walk or ride horseback from the Abe Lincoln Mine, ~~1~~ some three miles or more by trail.

SWALLOW (NOTES MADE IN 1938 and FEB. 1939).

Examined in April, 1938 by George Kingdon, Mills and Peach who thought that it had little or no value, but suggested further investigation of the long tunnel driven by the old-timers which might develop a substantial tonnage of mill ore with fair values in copper.

This mine was at one time owned and developed by Parker Woodman and his son, Thos. Woodman, who had held for many years a responsible position with the Copper Queen Co. at Bisbee. He was of the opinion that it had the makings of a large low grade copper mine with depth but it does not appear that any of his workings reached the zone of primary or sulphide ore.

Further development may be justified and this appears to have been the opinion of George Kingdon. However, the district is not well thought of and has a poor record except for small production by leasers from small pockets and veins near the surface. Mr. Woodman based his opinions on a series of copper-bearing outcrops which seemed likely to converge with depth where he thought that they might form a large body of primary sulphide ore, but he did not expect to find this condition until he had reached a depth of about 500' and his present shaft near the portal of the lower adit is only about 100' deep.

NOTES -- JUNE 1, 1944

From settlement sheets left by Brown it appears that the mine shipped nearly \$6000 worth of gold bullion to the Phoenix National Bank in 1900 and 1901. In 1915 and 1916 several small shipments were made to the A.S. & R. and Phelps Dodge Corp. aggregating about 20 tons of sorted ore with average of about 0.6 oz. gold and over 20% copper.

In 1937 the Pay Dirt Mining Co., which then operated the property shipped about 140 tons of ore to Hayden and in 1939 Brown shipped about 25 tons.

Analysis of ore is roughly as follows:

	<u>1916</u> <u>Shipments</u>	<u>1937</u>	<u>1939</u>
Au oz.	0.60	0.30	1.15
Ag oz.	0.20	0.12	.09
Cu %	22.0	5.00	2.47
Pb	--	--	--
SiO <sub>2</sub>	30.0	65.0	55.0
Al <sub>2</sub> O <sub>3</sub>	2.5	6.0	13.0
Fe	19.0	10.0	11.0
CaO	1.0	1.0	1.3

If this record of shipments is in any way complete it is certainly not impressive.

The long report was made by Henry M. Lancaster of Grants Pass, Oregon in 1925,--I know nothing of his reputation. At that time the property seems to have been held by the State Copper Co. Lancaster's statements of essential facts are meagre but he adds his favorable opinion to that of Parker L. Woodman and believes that the property merits a thorough development in depth with the expectation of finding large bodies of primary copper ore. This opinion is also shared by Emery W. Fisher whose record of the early history of the mine is interesting.

From study of all the above it appears to me that a great deal of money has been wasted in gophering around near the surface where,--aside from the original shoot of high-grade, only small pockets or stringers of

ore have been found and the extent of the workings is out of all proportion to the production. Apparently there is little or no pay ore now developed and future work would be mainly in the nature of exploration and development which would be rendered difficult and expensive because of transportation conditions.

No competent engineers or geologists (other than Woodman) appear to have ever made any careful examination of this property but in view of the favorable opinion of those who have seen it (especially Kingdon) it seems to me that it would be worth while to secure the report of Phelps and any other reports that might be available and perhaps to look over the ground to note the present condition of the workings.

I think that a careful and detailed study by a competent geologist should be a preliminary to any other procedure which could then be outlined or condemned.

The possibilities seem to lie in (1) strong shoots or primary copper ore coming in to the principal veins with depth; (2) Disseminated copper ore in the porphyry dikes.

In each case the values in gold might be appreciable.

June 2nd, 1944

Mr. John N. Brown  
914 South 2nd Avenue  
Phoenix, Arizona

Re: Swallow Mine 

Dear Mr. Brown:

I have finally been able to carefully consider the data and maps in reference to this property which you left at my office some time ago, and I have had copies of all of the more essential data made for my file.

It is my opinion that you have a very interesting property which may have good possibilities of being developed into a large deposit of low grade copper-gold ore and perhaps there might be substantial shoots of high grade material in some of the veins after the water level has been reached.

However, it also appears that the value of this property could only be determined after a very substantial expenditure had been made for further exploration and development and because of general conditions which make all work of that nature extremely expensive and also because of the inaccessibility of the mine I do not believe that my friends would be interested in following the matter up at the present time.

I have also had an opportunity to discuss this property with an independent engineer who made an examination of same some years ago, and the above represents his conclusions as well as my own.

At a later date I may be able to bring up the subject for further discussion, and in any event I should always be glad to talk things over with you if you care to come to the office at your convenience. Meantime, the maps and other documents which you left with me are all in shape to be returned to you, and this will be done by mail if you prefer, or on the occasion of your next visit to the office.

Thanking you for having brought this matter to my attention, I remain

Yours very truly,



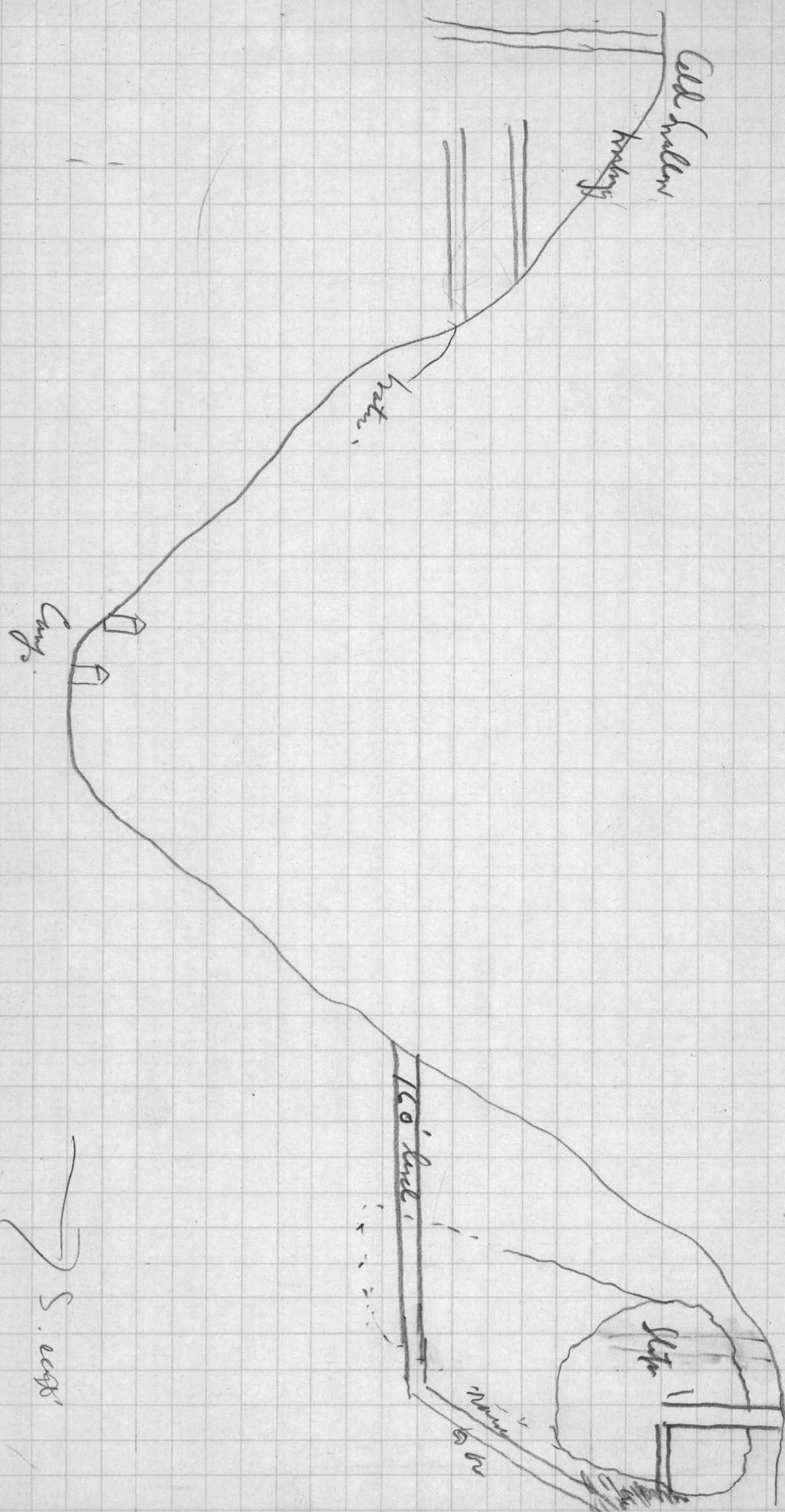
GMC/b

Shaleen  
Humi

Shute

Wounded

100'



→ S. 100'

mine files S.  
SWALLOW MINE

6/12/37

Recently reopened by friends of Dusty Rhodes. These men have worked near the surface and mined and shipped some high grade gold, copper ore and claim to have over 100 tons blocked out. They are working across a hill from the old shaft and main workings and plan to run an adit tunnel which will give them quite a bit of backs on the ore shoot.

Rhodes left with me some nice samples (much like those from the Whipsaw) showing chrysocolla and copper pitch.

FROM U. S. G.S. 782--Page 184

"The Swallow Mine, owned by John Dobler, is at an altitude of 3,225. The place is also known as Buzzard's Roost. It is accessible from the Abe Lincoln Mine, 12 miles from Wickenburg, by a road in poor repair leading down Whipsaw Creek and thence north to the head of a small gulch leading down to Castle Creek. The mine is half a mile west of the Bradshaw Mountains quadrangle in the Congress quadrangle, but it is described here, being in the Castle Creek district. There is a 10 stamp mill on the property.

The country rock is Bradshaw granite with dikes of andesite and granite porphyry. Half a mile southeast of Buzzard's Roost is the south shaft, 225 feet deep. The vein strikes N. 10° W. and dips 70° E. The best ore, which is a copper-stained rusty mass with chrysocolla and brown copper pitch ore, contains 1 to 2 ounces of gold to the ton. The ore averages 3 to 15 feet in width and much of this has been milled. The ore on the dump carries about 8% copper and several dollars in gold to the ton.

North of the house and 300' above it is a shaft 300' deep and presumably on a different vein. Much ore has been stoped to points 150' north and 50' south of this shaft. The vein strikes

2-N.  $33^{\circ}$  W. and dips  $60^{\circ}$  E. Another vein is found 100' north of this deposit. Still farther north and above the shaft is a tunnel driven on the same or a parallel vein.

The vein is several feet wide and the oxidized filling shows mainly platy specularite with oxidized copper ores, quartz, calcite and some fluorite. It has been mined as a gold ore with free gold in the well-oxidized material. Undoubtedly poorer ore with less free gold will be found in depth.

A specimen of bismuthinite altered to bismuth ocher, said to have come from this mine, was obtained from Mr. Dobler.

Along the trail from the mine to Briggs, on Castle Creek, another parallel vein crops out, showing oxidized ore with some copper and dipping steeply west.

6/14/37

Rhodes visited this property on the 13th, bad road for greater part of 15 miles from Wickenburg, and little or no other mining going on in that district.

Jack Stone of Phoenix financing the work which is being done by Brown and one or two associates who appear to be good miners and have shipped one car for which they claim to have received \$300.00.

They have not reopened the main workings at the old Swallow but are working on a hillside across the gulch in which is located the old camp and a fine spring of water.

They have opened up an old inclined shaft and have extended the old drifts on the 60' and 160' levels and advanced into a new shaft of ore which is soft earthy material with iron oxide

3-

and copper silicates and oxides in the vein all of which seems to pan well for gold.

They plan to further extend the 160' level and thus hope to open/<sup>up</sup>the downward extension of the ore shoot and block out a substantial tonnage of high grade and a larger amount of low grade for the treatment of which they may require a mill.

They have good mining equipment and Rhodes thinks very highly of their prospects but present showing would seem to be too small to interest any one with whom I am in contact.

SWALLOW MINE SAMPLES

Fire Assay --- Per Ton

No.	<u>Gold Oz.</u>	<u>Valued at</u>	<u>\$35.00</u>
1	0.26	\$ 9.10	
2	0.16	5.60	
3	0.15	5.25	
4	0.23	8.05	
5	0.29	10.15	
6	0.12	4.20	
7	0.42	14.70	
8	0.35	12.25	
9	0.09	3.15	

Attach & center map on which location  
of samples is marked

### SWALLOW MINE

(note by G. M. Colvocoresses - November 1937)

I was once at this old mine some years ago but at that time it was idle and nothing of much interest was to be seen.

During the past six months Rhodes has frequently visited the mine which is being worked by a couple of practical miners who obtained some financial backing from San Francisco with which they purchased and installed a small compressor and some other mining equipment.

They have not reopened the mine workings of the old mine but have cleaned out an old inclined shaft across the gulch and have extended the old drifts on the 60 and 160' levels into a new shoot of ore which is apparently in the gouge of a fault and is soft earthy material with decomposed iron oxide and some copper silicate and oxide. All this ore pans well for gold.

Several shipments have been made with gold and copper values running from \$20 to \$50.00 per ton and the present output is at the rate of about one car (30 tons) per month.

There seems to be a chance that this work may result in opening up a good little mine but from considerable experience with similar deposits in that district I am inclined to think that only a few of the richer pockets near to the surface will ever be worked with profit and that the tonnage will prove extremely limited.

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C O P Y

This is the history and my observation of the following property to the best of my knowledge and recollection.

Respectfully submitted,

Emery W. Fisher

S W A L L O W M I N E S

The property known as the Swallow Group of mines located in Castle Creek mining district, Yavapai County, Arizona, was located by Gideon Roberts, a prospector from Trinidad, Colorado, about the year of 1890.

At that time the entire Group consisted of 32 Quartz claims, and the principal mine was named the George R. Swallow after the man who was at that time the Treasurer of the State of Colorado.

This mine has a heavy cropping and is a ledge of iron and porphyry ore rich in free gold.

The entire group was sold for the sum of (\$20,000) Twenty Thousand Dollars cash to William E. Gray, J. N. Large, and Judge Strong of Denver, Colorado. They repaired a five stamp mill three miles distant on Castle Creek, added five more stamps, and commenced operation. At this time I was hired as an amalgamater to run one shift at the mill. The first 1,000 tons we ran plated (\$60.00) Sixty Dollars per ton on the plates. We were forced to hang up the stamps every six hours and clean the plates in order to keep the amalgam from scuffing and losing the gold.

The deeper we went down on the ledge the more leached the ore became and carrying lower values in gold though the ledge became wider and the filling softer, composed of a combination of iron and porphyry with a strong showing of copper.

After running the mill for about 2 years it was closed down and I took charge of the work at the mine, sinking the shaft to water. I have forgotten the exact depth, but believe it was about two hundred and twenty-five feet.

At this time an engineer from Denver by the name of Burlingame made an examination and sampled the mine. I remember his assays across the ledge at water level gave a return of (\$21.00) Twenty-one Dollars in gold.

About this time I quit the employment of the company. I understood that Burlingame did not take over the property because the company asked for too large a payment in cash to start with.

Afterwards the property was leased to a man by the name of Large, a nephew of J. N. Large, one of the original owners. He undertook to sink the shaft deeper but had too small a pump and could not handle

the flow of water. He took out and shipped considerable ore from the Moonlight Mine lying south of Buzzard Roost Gulch, a south extension of the Swallow Mine, that ran high in copper and \$22.00 in gold.

After Large returned to Denver, the property fell into the hands of John Doubler who moved a five stamp mill to the property and worked out considerable gold from different parts of the property. And I have understood that while he was in control that a long tunnel was run to connect with the ledge below the bottom of the shaft, but they gained no great depth and the tunnel was a failure as far as developing the ledge.

My opinion of the mine has always been that at depth there would be found large bodies of copper ore carrying high values in gold and silver. In my judgment the vein is leached to quite a depth. This also was the opinion of Burlingame, the Denver expert, as his plan of future work was to sink the shaft to the 800 foot level or until he reached the sulphide zone, then crosscut and drift N and S on the ledge especially north under the porphyry dike or cropping.

The formation encasing the ledge is a disintegrated granite. The ledge is from 10 to 15 feet wide with two slick walls with a clay gouge on each wall wherever there was one this gouge ran from 50 to 60 dollars in gold but was hard to mill as it was inclined to form in flakes in the battery and had to be mined with rock or quartz to cause it to disintegrate.

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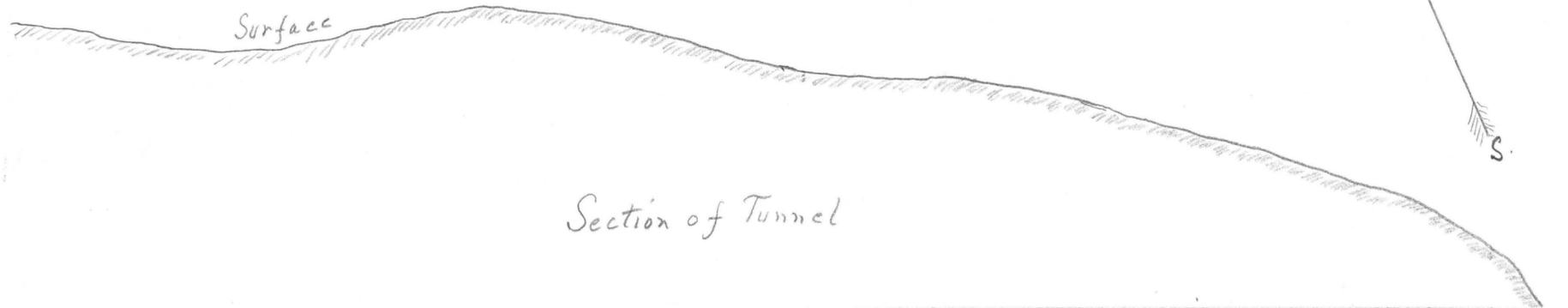
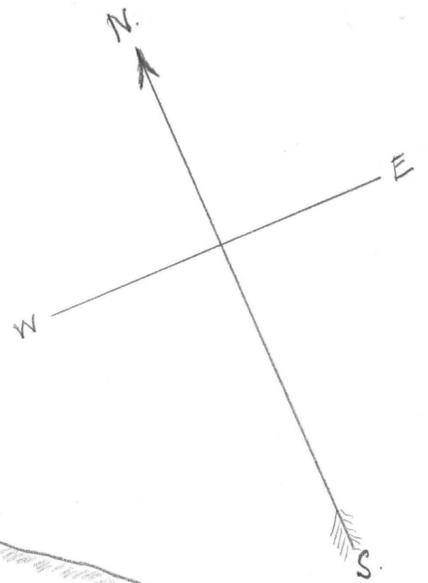
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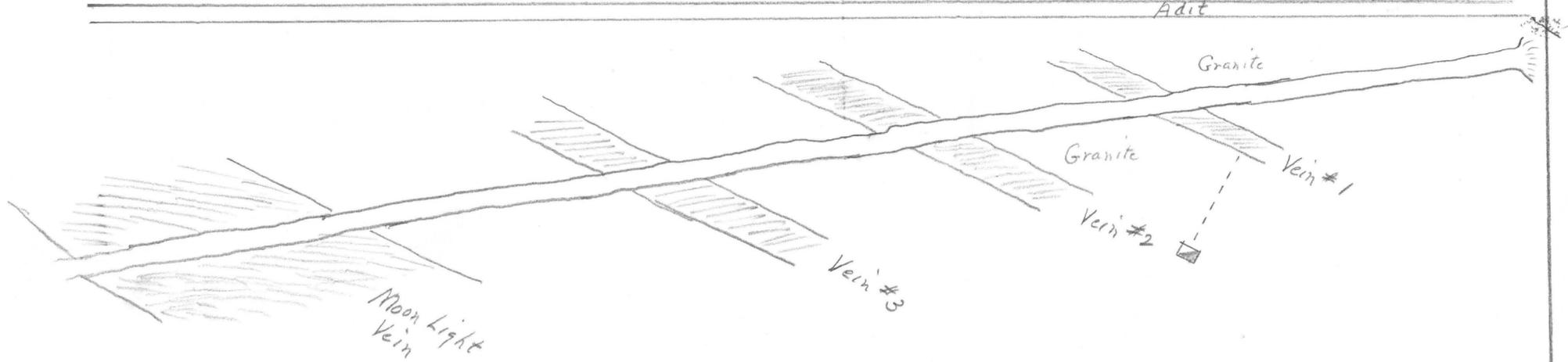


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# Swallow Mine (after Lancaster 1925)



Section of Tunnel



Plan of Swallow Crosscut Tunnel

Scale 1" = 50'