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(C O P Y) RED ROVER MINE

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LOUIS I. REHFUSS

MINING GEOLOGIST

Phoenix, Arizona

July 26, 1927.

Mr. B. A. Gillespie,
Los Angeles, California.

Dear Sir:

The report which I hereby submit is only a discussion of the geologic conditions noted during my recent studies in and around the Main Underground Workings, known as the Red Rover Mine, together with eleven maps listed below giving the geologic facts as noted. These will give a much better idea as to the conditions as they exist than any worded description might convey.

Map No. 1	Topographic and Geologic
Map No. 2	Composite Map of Underground Workings.
Map No. 3	Composite Map showing Topography & Underground Workings.
Map No. 4	Cross-section along Line A-A on Map 1.
Map No. 5	Plan Tunnel Level & 50 and 60-foot Levels.
Map No. 6	Plan 180 and 200-foot Levels.
Map No. 7	Plan 240 and 300-foot Levels.
Map No. 8	Plan 360 and 380-foot Levels.
Map No. 9	Plan 500-foot Level.
Map No.10	Plan 700-foot Level.
Map No.11	Plan 850-foot Level.

In my study of the Red Rover Workings I have confined my efforts to noting such geologic conditions as would have future commercial value. Copper stained rocks with high silver values near the surface and in major faults and minor breaks in the formations in depth have no great commercial significance in themselves, because they are not the ore channels along which the ore solutions rose and deposited the values in the form of copper and silver sulphides.

These ore channels, otherwise called veins, are the things that must be located and developed before you can ever hope to make a mine of the Red Rover. You must stop chasing copper stained crushed rock along faults as you have in the past and confine your efforts to either showings with copper sulphides (chalcopyrite or bornite) or the gossan showings which represent the oxidized residues of the above sulphides.

This I would say is my major conclusion.

You have one such sulphide showing in the 500 North Orebody. This apparently was cut again in the Diamond Drill Hole No. 3 on the 700-foot Level, more oxidized, but showing strong gossan with considerable ~~rable~~ native copper. The mineralization on the 500-foot Level appears to stand nearly vertical, and as the showing on the 700-foot level appeared nearly vertically below in the drill hole, the natural assumption is that the ore channel stands approximately vertical.

In view of the above and in view of the fact that you do not feel prepared to do a great amount of development work in the near future my only recommendation can be that you run a crosscut due northwest from the present face on the 850-foot Level, your lowest level, thereby giving you your best chance to encounter the vein in the zone of permanent sulphides. This will cut the mineralized showing encountered on the 500 and 700-foot Levels at about 150 feet from the present face of the 850-foot Level. Further work would have to be guided entirely by what was found.

If sulphides were encounted drifting both ways would be advisable. It might also be advisable to extend the crosscut farther to the northwest to cut the other mineralized showings noted in the drill cores and shown on Maps 4 and 11.

If a strong vein, but still highly oxidized was encountered diamond drilling from the 850-foot Level would be advisable to cut the vein at deeper levels where the permanent sulphides will eventually be found.

The gossan showings on the 360-foot Level (see Map No. 9) from the inclined shaft has some significance, but from the way it is cut by the fault along which the 360-foot Level was run little can be said as to its importance. They appear to stand vertical in the footwall of the fault and to have been cut off by it.

This should be followed far enough to see whether it is a definite ore channel or not. Sulphides may be found on this level, but even if the gossan should prove to be continuous in the footwall block of the Footwall fault another ore channel will have been located and definitely established and the future potential value of the property increased. Again further work will have to be done based on what is found.

All future work should be done under much closer technical supervision than in the past.

The fact that you have a well defined ore channel in the 500 North orebody showing, together with the strong possibility of a second in the gossan showing on the 360-foot level gives the property merit. What the grade of ore will be in these ore channels can only be determined by future work but the high grade of the oxidized ores indicates that the sulphides will be of sufficient grade to fully justify the money spent in their development.

Respectfully submitted,
(SIGNED) LOUIS U. REHFUSS.

RED ROVER

ROCK FORMATIONS:-

The sedimentary rocks in the vicinity of the Red Rover underground workings consist of a series of reddish, brownish, and greenish colored sandstones and shales with some recrystallized limestone. These formations are of the very oldest known sedimentary rocks of pre-Cambrian age, and they have therefore in the past been subjected many times to great compressive forces which developed their schistosity obliterating the previous bedded structure.

(d) Into this sedimentary series was intruded the great masses of diabase which tore off from them great blocks of limestone together with some of the sandstone and shales. In places the diabase was intruded more or less parallel to the strike of the formation in the form of a sill and roughly following the old bed of limestone. The diabase in and around the old inclined shaft and extending northeast thru Camp shows it in many small sills, dikes and irregular masses. Behind the Mess House a well defined block of limestone is found entirely engulfed in diabase. Other such occurrences are to be seen in the Old Tunnel (See Map No. 5).

Such an occurrence of the rocks as above described does not give a normal sedimentary succession where the various beds, or horizons, can be used as markers to trace out the faulting, and a glance at the various level maps will show at once that any regularity of succession of the different strata is not to be looked for. In a general way, though, the limestone with the intruded diabase underlies the series of sandstone and shales also cut and intruded with diabase.

From the above facts, it can be seen that it will be difficult to trace the various dislocations of the veins with any degree of accuracy.

(e) To the south of this sedimentary series with their intruded diabase occurs a formation composed of schists and volcanic material. It lies in fault contact with the above series, but as the workings in the old Incline Shaft so closely followed this fault it cannot be stated definitely whether or not this fault did not follow more or less closely the stratagraphic contact between the limestone and the now schisted formation forming the hill on which the Gillespie bungalow is located. It lies as a bed against the schists and volcanic material farther to the south.

This formation in the vicinity of the Gillespie bungalow has aroused considerable discussion as to what it really is. There is no question but that it is a schist and that it is a safe classification, but a schist is any rock, volcanic or sedimentary, that has taken on a schistosity due to great compressive forces. Whether it is a sedimentary schist or a volcanic schist, that is, a rhyolite or granite schist, as it has been classified, could only be determined by a close microscopic examination, possibly with many other expensive tests.

If one scans thru the literature of the geologic studies of these old pre-Cambrian rocks, one will find many discussions as to whether this or that rock is a schist of volcanic or sedimentary origin and the various ways and tests whereby one can be determined from the other. Oftentimes the definite knowledge that it is one or the other has great commercial significance, and this fact alone should be the deciding factor whether or not it is worth while taking the time or spending the necessary money to make a definite classification.

In this case, I would say no, as this formation has taken mineralization at several places, as shown at the cut on the trail to the Gillespie bungalow and to the east of Triangulation Point 'E'. Therefore in due time it must be prospected along with the other formations to see if the veins in it carry commercial values. Whether it is schist of volcanic or sedimentary origin does not enter into the question. Because of the complicated nature of the formation and because its prospecting will be left to the more distant future I have mapped the whole as Undifferentiated Shcists and Volcanic Material.

All of the above formations have a northeasterly strike and a dip usually about 45 degrees to the northwest, but at various places underground this does not hold true because of the above-mentioned ireegularity of intrusion to faulting.

Overlying all of the above mentioned formations are to be found basalt and rhyolite flows. They are much younger geologically than any other of the other formations described and were lava flows which flowed out and filled the valleys and capped the hills formed in the other formations. They have not taken part in any of the major fault movements noted in the other formations and hence are not schisted and faulted to any great extent. These formations are not vein bearing but merely cap and mask the underlying formations, and in that way make a geological study still more difficult. For example, the position of the rhyolite around the collar of the Main Shaft makes the outcropping of the 500 North Orebody impossible.

FAULTING:-

While the maps of the various underground workings show up a host of faults, all but two, as far as can be determined from their position with respect to the underground workings have little or no significance. These have been called the Footwall and the Apfield Faults.

The so-called Footwall Fault was followed in nearly all of the workings down thru the Old Inclind Shaft. It outcrops in the gully in front of the hill on which the Gillespie bungalow is located. This fault undoubtedly cut some ore bearing channel for in nearly every foot of the work done along it, some copper stained rock was found, but as nearly all of the work so closely followed the fault and is now timbered, nothing but crushed copper stained rock can be noted, and no definite ore channel showing either copper sulphides or the gossan residues of the former could be located.

The fact that this fault has a similar strike and dip to that of the main formations leads one to believe that this fault follows very closely the stratagraphic contact between the limestone with its intruded diabase and schisted underlying formation.

The Apfield Fault shown on Map One courses thru what is known as the Fault Shaft in a north 20 degrees east direction and is followed almost continuously in the Main Shaft from immediately below the rhyolite capping. Neither from the surface croppings of the two faults or from points where they were cut in the underground workings could it be determined which fault is the older, in other words which one cuts and moves the other. This point is a very important one, as it will have a great bearing on locating the ore channels in the different faults blocks.

The position of what is taken to be the Apfield Fault on the 300, 500 and 700 foot Levels is shown on Maps 8, 9 and 10 respectively.

Looking at the map of the 500-foot level (Map #9) it is seen that all of the work done to the north of the shaft lies to the west of this fault, while that to the south lies to the east of it, giving one no definite way to determine either the direction or amount of throw along this fault. The surface is our only guide and altho we have no perfect matching of identical beds on either side of the fault it is seen that limestone with the diabase lies much farther to the north on the west side of the fault than on the east side, showing that the block to the east of this fault has moved down and to the south.

The ore channel, known as the 500 North Orebody lies to the west of this fault and was cut off by it when it was drifted onto the northeast from a point where it was first cut by the drill hole and later by the crosscut. It also lies well up in the hanging wall block of the Footwall Fault with not much danger of being cut off above the 1200 or 1300 foot level. This will give one of this ore channel a great distance to the west prospect and also in depth well within the zone of permanent sulphides. Therefore this 500 North Orebody showing should be thoroughly tested both laterally and in depth, to see if the permanent sulphides have commercial value.

Later, if on development this segment of the 500 North Orebody Vein proved of commercial value, it can be drifted on to the points where it is cut by either of the two faults above mentioned. Work on the other side of these faults could best be done by diamond drilling until the direction and amount of throw was accurately determined by picking up the vein on the other side of the fault in question. As the stratagraphic contacts are unreliable, for this purpose, as above explained, the veins become your only markers for determining fault movements. This work would undoubtedly give one the data for determining the relative ages of the two faults also, which would be valuable in all further work in developing the mine.

ORE OCCURRENCES:-

Oxidized Ores - The high grade oxidized ores consisting of the carbonates or copper (malachie and azurite), oxide of copper (cuprite), secondary sulphide of copper (chalcocite) together with some chloride of silver constitute the chief and most ore in every crack and crevice that the major efforts in the past were directed.

This occurred mainly along the Footwall Fault and made especially large where the Apfield Fault or some other minor cross fault joined it. The showing on the 300 and 500-foot levels are such especially large masses of copper stained rock.

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The only significance showings like these can have, lies in the fact that they indicate the presence of some copper-bearing veins which were oxidized and leached and the values carried and deposited in the crushed zone alone the faults. I do not hesitate to say the ores of this type will never in themselves pay any dividends to the stockholders of the Red Rover Copper Company, and therefore they should be ignored in the future until the commercial value of the copper sulphides in the true veins has been determined.

GOSSAN SHOWINGS:-

In the Old Tunnel about 225 feet from the portal occurs a zone of mineralized, altered and leached diabase showing heavy zones up to 30 inches of good gossan or iron oxide material, in places still showing faint copper stains. This showing lies to the east of the Apfield Fault which was cut a short distance to the north It has a north 25 degrees east strike and stands vertical.

This showing would be immediately cut off in depth by the Footwall Fault and to the north it probably lies some distance to the west of any of the workings on the 500 and 700 foot levels. This showing must be kept in mind in any future work, for it must be determined whether the 500 North Orebody Vein joins it or cuts in its westward continuation.

On the 360-foot Level near the winze to the 380 foot-level one can see distinctly three zones of good gossan material standing vertical apparently in the footwall block of the Footwall Fault, and cut off by it, as none of it is to be seen on the north side of the drift. These are shown on the map of the 360 and 380-foot levels (see Map #8)

The middle of these zones should be drifted on far enough to determine definitely whether it is a well defined vein extending into the footwall block of the Footwall Fault, closely watching it and keeping the gossan always in the face of the drift. There is a possibility, if this proves to be another channel, of drifting out of gossan into sulphides as a greater distance from the Footwall Fault is obtained.

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G. M. C.

Tentative Statement
~~Preliminary~~
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G. S. Inc
1930

RED ROVER and BLUE BIRD MINES

The Red Rover Property consists of 22 or 26 patented claims - the Blue Bird 17 unpatented claims. Both are located near Camp Creek about 50 miles north of Phoenix. Owned by F. A. Gillespie, P. O. Box #1925, Tulsa, Oklahoma. Gillespie asks $700,000 for the property but will agree to a five year bond and lease on the basis of a 15% royalty, which will apply on the purchase price

DEVELOPMENT

Property is partially developed by a shaft and drifts to the 850' level but only a small amount of work is done below the 500 from which level the ore has recently been mined. The orebody has not been found on the 700' level but a diamond drill is said to have cut it and passed through about 60' of well mineralized ground, of which 12 to 15' might be considered as good grade ore. A crosscut has been run out to within 40' of this ore and could readily be extended to prove up the ore, and could readily be extended to prove up the ore.

Mining in the upper ##### workings was carried on at intervals for a number of years, the ore being largely oxidized, consisting of copper carbonates carrying a high percentage of silver. Below the 300' level sulphide ore made its appearance principally chalcopyrite and some bornite, and recent shipments of ore from the 500 level contained on the average better than 30 oz. silver per ton and over 4% copper. This shipping ore was about

8 or 10 feet wide but in many places there is a width of 35 feet which should average about 10 oz. silver and 2% copper, and would be suitable for milling. There is no large tonnage of ore blocked out but the main vein is very strong and gives promise of developing into a large orebody, and other parallel veins have shown good ore in the upper workings and should be developed with depth. The bulk of the ore will no doubt be sulphide and even though some carbonates are present, it is probable that the run of mine could be treated in a concentrator with good recovery of values and because of the distance of the mine from any railroad it is essantial that this ore should be concentrated on the spot.

The property is well equipped with oil engines and a good mining plant sufficient to permit current development and the hoisting of about 100 tons of ore per day. Some years ago a mill was erected, designed to treat the ore by the SO_2 Leaching Process, which, however, proved entirely unsuitable and new equipment would have to be installed/ If this property were leased, an initial expenditure of $25,000 should immediately be made for development, and the equipment in the mill would cost in addition $25,000.

The mining costs during the last operation (1929) were as follows:

Mining.....$	5.00
Hauling ore to Railroad.....	9.00
Freight to Hayden.....	1.50
Smelter charge.....	3.00
Total.....$	18.50

The average return on the ore shipped was about $23.00 per ton.

Resuming operations with a properly equipped concentrator, the following costs are estimated:

Mining and development.....	$ 4.00
Concentration (5 to 1).....	2.00
Hauling concentrates.....	1.50
Freight.....	.30
Smelting charge.....	.60
Royalty.....	1.60
Total.....	$ 10.00

It should be possible to mine an average grade of ore with a net recoverable value as paid for by the smelter of about $12.00 per ton, thus yielding a profit of $2.00 to the mining operations. The freight rate from Phoenix to Humboldt is about the same as to Hayden, but the concentrates would be a very desirable charge for the Humboldt Smelter and every effort should be made to secure this property which in itself gives promise of becoming a very valuable mine, although it falls far short of justifying the purchase price now asked.

The Blue Bird Property contains a large deposit of low grade basic copper sulphide mixed with iron. Unless there are high grade strongers in this deposit or better gold values than appear in most of the ore, this mine could not be operated with profit under present conditions but if improved transportation facilities were later provided this character of material would be very advantageous for treatment at Humboldt and might perhaps be shipped largely as a flux with very small margin of profit to operators and to the smelter. The property may have a considerable value at some future date and should therefore be acquired along with the Red Rover but probably no work other than a small amount of development will be justified at present.

Copied 2/26/34

NOTES BY G.M.C RE HOULES REPORT AND RED ROVER MINE

Moores Estimates present cost of hauling to and from the mine at $4.00 per ton.

No indications that Houle actually sampled the mine which is disappointing but he estimates as probable 20,000 tons of ore above the 700' level. Nothing in his report suggests that he places the value of the mine at anything like $600,000 which was an exhorbitant figure in 1930 and is even more so today. At least 120,000 tons of high grade ore would have to be positively blocked out to justify such a purchase price.

Moore estimates that the cost of starting operations would be $10,000 which should probably be increased to $20,000 with proper allowance for a careful sampling of the mine and working capital.

Based on the last shipments of about 2500 tons the average of the high grade ore may be taken as 40 oz. Ag and 5% Cu., representing a gross value at present market of $33.00 per ton.

Costs may be figured as follows:

Mining and ~~drill~~ development.	5.00
Hauling	4.00
Rail freight with moisture	2.00
Royalty	3.00
Smelter charge	3.00
" deduction	4.50
Overhead etc	1.50
	23.00

This should leave a net profit of $10.00 per ton or a total of $200,000 on the 20,000 tons which Houle seems to consider probable.

The $20,000 preliminary expenditure might be repaid from the profit on the first 2000 tons of ore shipped and I think it is reasonably certain that there is at least this tonnage of high grade ore left in the mine.

However the value of the greater part of the ore reserve appears

to me uncertain and in the absence of a complete sampling there is no justification for assuming that it will equal the average of these last shipments.

Information on this point can only be gained by unwatering the mine to the 700 foot level and making a thoro examination.

Moore's estimates the cost of fixing up the pumping plant and dewatering about $1500 if I understand his figures correctly. The cost of sampling and measuring the accessible ore I estimate at about the same figure.

I suggest that an agreement might be made with Moore to advance against some collateral or for some consideration up to $4000 for this work,--allowing for possible troubles and delays in unwatering, and that further advances should be subject to the result of such an examination.

All advances to be repaid from the shipments until repayment completed and parties advancing money (up to say $20,000 if required) to be given half interest in Moores lease and technical control of all mining operations and development and milling or other treatment if this should be decided on later. Moores to have full charge of all trucking and transportation of the ore.

Interview with Moores 2/27/34

The ore which would first be mined is in the old stope just below the 500' level. This could be worked by a winze from this 500' level but it would be better to put up a raise from the 700' level and work it out that way. The shaft between the 500 and 700 should be in good shape. The 700' level did not actually tap the ore shoot but this was reached with a diamond drill.

The old incline shaft is open to the 300' level but the drift to the main workings is cared in places and would have to be cleaned out. There

(over)

is some ore near the old incline which might be taken out by leasers and from the dump one or two cars of high grade ore could be sorted out.

Moores lease has no debts except the taxes (about $300) due in May 1934. The Red Rover Co. must pay the 1932 taxes which are now delinquent.

Moores lease runs for 5 years to run from June, 1933 and is in good standing. If it were desired to build a plant for treating the low grade ore of which there may be a large tonnage an extension of the lease probably be obtained.

Moore could produce and ship at least 20 tons of ore per day. A new road is now being built from Cave Creek to go thru to Bloody Basin or to Cordes, this might bring the road distance from Red Rover to Humboldt down to about 50 miles.

Additional notes on Red Rover, revisited with Chas. Lambie, Feb. 28th, 35

Obtained a copy of the Lease which however is not complete, On the face of this lease it does not appear that the lessee (Moores) has properly complied with its terms and it would be necessary to obtain from the owner a written statement to the effect that the lease is still in good standing and also permission for the Lessee to assign a part interest in the lease and the return from operations to other parties in consideration of their providing the necessary funds for the conditioning and operation of the mine.

Checked over Moores estimates of the preliminary expense with due consideration to the actual condition of the property and equipment and found them reasonable but believe that a larger fund should be allowed for contingencies and for difficulties which may be encountered in re-timbering the shaft and drifts and that a total fund of $15000 should be provided for preliminary expense plus $5000 for sampling the mine and working capital.

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This $20,000 should be repaid from the Lessees profits on the shipment of 2000 tons of high grade ore similar in value to the last shipments.

The shaft is in such a dangerous that no underground work even sampling could be undertaken until the shaft is retimbered and unwatered to the 500' level.

The ore immediately available for mining lies in the main shoot below the last underband stope from the 300' level and above the back of the 500' level in what appears to be faluted section of the ore or a different shoot entirely. In the back of the 500' level a stope has been started and the ore can be sampled here for a length of 35' and a width of 30' (according to Moores) and if it goes up only 20' this should provide the 2000 tons required to repay the initial investment.

The main ore body lies below the 500' level and should be developed by a winze which would later be connected to a raisefrom the 700' level. The distance between these levels on the incline dip of the ore is about 240 so that 24000 tons of ore might lie between these levels but the shoot has not yet been found on the 700' level unless by the diamond drill.

The mines make about 60 gallons of water per minute, mostly along the 500' level.

Nearly all the surface equipment is in fair shape and quite adequate for development and mining on a small scale, up to say 50 ton per day.

Would take about 3 or 4 mos to get mine in operation

3/10/34

Moores called to say that he had secured financial backing from Howard Fields crowd & was proceeding to prepare for operation.

(COPY)

R E P O R T

on the

RED ROVER COPPER COMPANY

Magazine Mining District

Maricopa County, Arizona

THE PROPERTY
and
THE LOCATION

The Red Rover Copper Company comprises a group of 37 patented mining claims all situated in the northeast corner of Maricopa County, Arizona, about midway between the Agua Fria and Verde Rivers. The mining claims are located between Cave Creek and Lime Creeky normally dry creek beds which drain the high lands in this section. Lime Creek empties into the Verde River while Cave Creek outlets into the Salt River.

The altitude at the mining property varies from 3,900 to 4,300 feet above sea level.

Wood is reported to have been abundant in the early days of mining operation. At this time the hills show only a scant growth of cacti and an occasional mesquite bush.

Water is scarce, although a sufficient supply for mining operations and domestic use has been developed in the mine workings. The available water supply is said to be approximately 100 gallons per minute.

ACCESSIBILITY

The property is reached by an automobile highway which runs northeast of Phoenix, following northward through Paradise Valley then along Cave Creek to Cave Creek Station, then a winding narrow road northeast to the property. The total distance from Phoenix is 54 miles. All of the distance except the last 8 miles is a state highway of good width and is well maintained. The remaining 8 miles is kept in repair by the mining company, and is passable but is not well laid out.

Fuel oil, also, all mining and camp supplies are trucked from Phoenix to the property. Ore shipments from the mine to the railroad at Phoenix are handled under contract for $9.00 per ton. Automobile trucks of six-ton capacity are used. One round trip is made daily. Trucking service is easily maintained on this schedule in the normally dry climate of the district.

HISTORY

The first mining locations were made in 1883. From the time of the original discovery small tonnages of rich copper, silver ores were made. These irregular shipments continued during the next twenty years. Transportation difficulties prevented extensive operations. The properties were allowed to lapse in 1903, but were relocated in 1906. In 1916 the

mining claims were sold to the Gillespie interests, oil developer and operators, of Tulsa, Oklahoma. The new owners organized the Red Rover Copper Company to develop and operate the property. An extensive campaign was undertaken and several shafts were sunk. From the shafts approximately 12,000 feet of development work was prosecuted on various levels of the property.

The property was equipped with good machinery so that development work was carried out in a creditable manner.

A vertical shaft (2½) compartment, was sunk to a depth of 860 feet. Levels were run from this shaft on the 200,300,500,700, and 800. On the 200,300 and 500 levels connections were made with the old irregular drifts run from an inclined shaft sunk on the surface outcrops of good ores found near the discovery locations.

The incline shaft reached a depth of 380 feet. The workings around this shaft indicated a good tonnage of low grade oxidized copper ores, silicates, oxide and carbonate of copper carrying 3% copper and 8 to 12 ounces silver per ton. The ores are found in an altered silicious limestone.

Selected and sorted high grade ores were shipped direct to smelters. For ores of less value than could be shipped to smelters, a leaching plant was installed. The lixiviant was to be ferrous silphate followed by electrolytic precipitation of the dissolved copper. The installation was unsuccessfully operated. This plant was abandoned. The latest effort to mill the ores was by means of a combined gravity concentration and flotation plant. This operation was also a failure. In recent months the entire property has been in the hands of leasers.

The entire property was leased for a five year period, to A. N. Moores & Son, freighting contractors of Phoenix, Arizona. A. N. Moores is manager of operations, assisted by A. C. Simpkins, who is directing the technical end. Lease operations began in August, 1929. Ore shipments under the lease started in December, 1929.

A total of 2,000 tons of first class ore has been shipped to smelters during the past four months. The ore shipments to date returned an average value of approximately 6% copper, and 40 ounces of silver per ton. The gross net smelter returns of shipments from the lease has been nearly $45,000.00 after deducting railroad freight, smelter deductions and charges.

Royalty deductions of 25% of the net smelter returns, trucking and mining costs nearly absorb the net smelter returns. A small profit per ton is being made on an output of 20 tons daily of first class ore.

Most of this production is coming from an ore shoot now being mined between the 400 and 500 foot levels.

The ores now being shipped are rough sorted on surface. The values occur as carbonates, silicates and oxides of copper, mixed with copper glance and occasional specs of tetrahedrite. The glance and tetrahedrite ores assay high in silver values. The ores carry 35%-40% insoluble; 15 - 20 CaO; and less than 5% Fe.

GEOLOGY

Copper mineralization is found in a vein striking N 50° E cutting through limestone. The vein dips to the northwest at an average of 55 degrees. The vein is well marked along the surface for a distance of slightly more than 500 feet, and then disappears under a surface capping of andesite flows.

(a) The surface outcrops are marked by silicious copper-stained croppings in altered limestone. Holes sunk by prospectors and miners for high grade disclose the evidence that diabase cutting into the limestone are responsible for the mineralization. The vein or fissure formed subsequent to the diabase intrusion into the limestone. Faulting accompanied the vein fissure and along fault fractures channels formed which permitted free circulation of mineral solutions and downward leaching, oxidation and concentration of values into lenses and ore pockets of enriched ore.

Near surface very rich silver ores were found in small kidneys, but typical leached ground showing mangenese and oxides of iron indicated concentration into secondary ores rich in copper and silver.

The vein material varies in width from 2 feet to more than 30 feet wide. Copper stains indicate values and justify prospecting for the enriched lenses of high grade ore.

The main shaft has been unwatered to 20 feet below the 500 foot level. From surface down to the 500' level, two lenses of rich ore have been found and recent prospecting indicates a third ore pocket.

However, the enriched ore shoots are surrounded by leached and oxidized ores, therefore, there may be reasonable expectation that concentration will continue to greater depths.

(b) The limestone is exposed in a narrow belt on surface, but is capped or covered by an andesite lava flow to the north, east and west of the mineral outcrops. On the south the immediate contact with limestone is a rhyolite intrusive about 1,000 feet wide, and this rhyolite contacts with granite farther southward.

Onyx has been quarried from an extension of the limestone area about one mile west of the main shaft.

(c) The extent of the diabase intrusive cannot be determined at this time, but it is certain that fingers of diabase penetrate the lime stone at various horizons and the main mass of diabase will be found northeast of the main shaft.

The diabase when unaltered shows pyritic primary minerals, pyrite and chalcopyrite. The primary chalcopyrite assays 2 to 4 ounced silver and it is reasonable to assure commercial copper ores will be found in the main diabase intrusive.

From surface to the 500 foot level and the lenses of enriched ores have been proven for a length of 500 feet. The average width is approximately 8 feet.

DEVELOPMENT WORK - BELOW WATER LEVEL:

The main shaft at this date has been unwatered to the 520 foot level. On the 500 foot level about 130 feet southwest of the shaft, a wide body of low grade ore is exposed in the main drift for a length of 50 feet, averaging about 30 feet wide. This ore shoot has been square setted and carefully sampled in the bottom of each set with individual sets 5 feet square assaying sufficient values to permit of direct shipment to the smelter.

It is proposed to unwater the shaft to the 700 foot level and do further proppecting and raising from the 700 to the 500 to block out this ore body.

Drifting on the 700 level had not progressed far enought to the southwest to encounter the downward continuation of the 500 orebody.

The maps of the 700 level show a smouth drift for 50 feet. At the 75 foot point in the north drift a crosscut was advanced 140 feet northwest. This crosscut is reported to have cut several feet in width of copper bearing ledge matter assaying from 1 to 3% copper and 4 to 11 ounces silver per ton. Spots of glance ore are reported from this ore showing.

In the face of the northwest drift, a diamond drill hole tested formations by a flat hole and did not disclose any new ore showings. Cores from this hole show andesite.

From the face of the north drift in which is 155 feet north of the shaft, a flat diamond drill hole was bored. The core from this hole now stored at the mine appears to confirm the reports that a good showing of oxidized ores was encountered for a length of about 50 feet. This showing begins after 40 feet of drilling continues to the 92 foot point.

The cores show good hematite, copper stained ledge matter or leached ground showing an abundance of metallic copper, also occasional seams and spots of copper glance. A paper note in the box mentions the shipment of important pieces of core to the company directors in Los Angeles and Tulsa. The good mineral showing is further corroborated by the diamond drill operators.

The drill data, together with the showing in drill cores now stored indicates that the 700 level north drift will within 50 feet encounter an important new ore horizon.

The 800 level development is said to have confirmed to cutting a station.

The vertical shaft was bottomed at 860 feet, but no record obtainable by persons now living at the mine as to what was encountered in sinking below the 700 level.

On the 500 level, vertically above the showing encountered by drilling on the 700 level, there was found small bunches and spots of primary sulphide ores in diabase. The mineralized cores from the 700 level are mineralized ledge material in limestone.

CONCLUSION

Without question, the Red Rover Copper Company property has a reasonable change to develop a small tonnage of rich copper-silver ores. In my opinion, there will be found between the 500 and 700 levels more than 20,000 tons of ores sufficiently rich in copper and silver to permit of direct shipment to the smelters. This indicated tonnage is not sufficient to justify an option to purchase the property for a price commensurate with the expenditure already made for purchase and development by the Red Rover Company.

Without considering royalty payment, it is probably that ore tonnage in sight above the 500, and probably between the 500 and 700 level could be mined, shipped and smelted to produce a profit of $7.00 per ton with copper metal selling at 14 cents per pound, and silver at 42 cents per ounce.

Under present royalty terms, payable to owners by the leasers, of 25% net smelter returns after payment of railroad freight and smelter charges, the probable profit would be cut to $2.67 per ton.

It is estimated that the ores can be mined and rough sorted for $6.00 per ton.

The profit margin is too small under present lease terms to warrent operation and unwatering the shaft below the 500 level.

It is probable that a modification of royalty payments can be obtained together with an option to purchase the property during the lease period. If modified terms can be secured, I recommend that the purchase of the lease and further exploration of the 700 and 800 levels with reasonable assurance that the cost of undertaking this development will be returned in profit for ores to be obtained in the development work.

The chances for developing a small high grade property at a reasonable cost is indicated and worthy of the capital expenditure upwards of $100,000 to prove the property.

The property is sufficiently equipped to carry out this development campaign when and if the lease terms are modified and a reasonable option to purchase is obtained from the Red Rover Copper Company.

Respectfully submitted,

Arthur Houle, (Signed)
E.M.

CAVE CREEK DISTRICT

Red Rover Mine

Visited with Bill Gohring and E. M. Moores Feb. 1st, 1930. Owned by F. A. Gillespie, Box 1925, Tulsa, Okla. but Moores of Phoenix has lease.

Red Rover Group 22 or more patented claims and Blue Bird Group of 17 unpatented claims.

Located 50 miles north of Phoenix via Cave Creek and Camp Creek.

Many shipments were made to Hayden carrying 30-60 oz. silver per ton and 3-6% copper.

Shows a considerable tonnage of good ore and a lot of low grade suitable for milling. Mine was once developed to depth of 850'.

On the 500' level some good ore was developed and mined and the drift on the 700' level has good showing. Drift on 850' level was apparently run under the ore.

A high grade vein carried 45 oz. Ag and 6% Cu and another ore body partly developed on this 500 and 750' levels has a width of 30' and unknown length and is said to average 24 oz. Ag. and nearly 5% Cu.

IN CONSIDERATION of said lease the said lessee hereby covenants and agrees with the lessor as follows:

To within ninety (90) days from the date hereof, enter upon said mine and mining claims and to repair and put in proper and efficient condition for operation the machinery on and used in connection with said mine and mining claims, to re-timber in proper and substantial manner the mine shaft of said mine where needed, to make the same safe and secure and efficient to operate, to install an auxiliary power plant to the power plant now upon said premises, and to do all of the said work and to make all of said repairs and improvements at the sole expense of the lessee.

All new machinery, equipment, buildings, timbers and other material and equipment placed upon said premises shall, when placed thereon, become the property of the lessor and shall be maintained upon said premises and property during this lease and left thereon at the termination of this lease; provided, however, if in the judgment of the lessee he shall deem it advisable to enlarge or place a newer and larger auxiliary power plant thereon then the one to be installed thereon by the lessee at the beginning of this lease, the lessee may remove said auxiliary power plant to be installed at the beginning of this lease at such time as he has installed such newer or larger auxiliary power plant.

After said machinery and equipment, shafts and other portions of said mine have been placed in proper condition of repair, the same and the whole thereof shall be kept in good repair

Copy

L E A S E

THIS LEASE, made and entered into this sixth day of June, A. D. 1933, by and between RED ROVER COPPER COMPANY, an organization organized and existing under the laws of the State of Delaware, with office for the transaction of business in Phoenix, Maricopa County, State of Arizona, herinafter called lessor, and E. M. MOORES of Phoenix, Maricopa County, Arizona, hereinafter called lessee,

W I T N E S S E T H:

That the lessor for and in consideration of the rents, royalties, covenants, promises and agreements hereinafter reserved and mentioned to be paid and kept and performed by the lessee has let and by these presents does let unto said lessee all of that mining property belonging to the lessor consisting of approximately_____ patented lode mining claims situated in the Magazine Mining District, Maricopa County, State of Arizona, together with power plant, mill, mining machinery and equipment, tools, camp buildings, camp equipment and other materials belonging to the lessor and situated on and used in connection with said mining claims.

TO HAVE AND TO HOLD unto said lessee for a term of five (5) years from the date hereof and expiring on the sixth day of June, A. D. 1938, unless sooner terminated as hereinafter provided.

and running order throughout the term of this lease and left in good repair and running order at the termination of this lease.

At such time as the lessee has completed said repairs, the lessee shall operate said mine and mining claims and develop the same and extract ore therefrom continuously throughout the balance of the term of this lease to the end that said mine and mining claims shall be properly developed as a producing mine and ore extracted and milled therefrom for the benefit and profit of both parties.

In mining said property the lessee will unwater said mine to the seven hundred (700) foot level and thereafter keep the water below said seven hundred (700) foot level throughout the balance of the term of this lease, and in mining and developing the same, the lessee will perform said work in a good and miner-like manner and in a manner which will develop the same according to the most approved methods; extending, enlarging and developing the same as a workable mine, and in the development and operation of said mine and mining claims the lessee shall expend in the actual development, operation and mining thereof not less than the sum of One Thousand ($1,000.00) Dollars per month throughout the term of this lease.

Provided, however, that during any period of this lease all of the custom smelters reasonably accessable to said mine shall be closed down and/or not accepting or purchasing ores of the nature mined from said mine, or if other causes intervene to make it impossible to operate said mine,

which causes are beyone the control of the lessee, the term of this lease shall cease to run during any such period, and shall be extended a like period beyone the Sixth day of June, A. D. 1938.

In the event that the lessee shall fail during any period of thirty (30) days of the term of the operation of said mine or mining claims to expend in the operation, development and mining thereof the sum of at least One Thousand ($1,000.00) Dollars per month, except in the case of the closing down of the smelters, or causes beyond the control of the lessee as above provided, and the lessee shall fail within the next consecutive sixty (60) days period thereafter to expend such amount for said thirty (30) day period, then the lessor may, at its option, forthwith terminate this lease by notice of such termination mailed to the lessee at Phoenix, Arizona, or delivered to the lessee in person, and in such event the lessee shall forthwith surrender up possession of said leased property and premises to the lessor.

In all new development work in said mine and in other places where needed the same shall be properly and sufficiently timbered in a good miner-like manner as the work progresses.

The lessee shall occupy and hold all cross or parallel lodes, dips, spurs, feeders, crevices or mineral deposits of any kind which may be discovered in the working under this lease or in any tunnel running to intersect any vein on said property or by the said lessee or any person or persons under him in any manner, to any point within

three hundred

feet of the center line of any vein on said property with privilege to the lessee of working the same as an appurtenance of the premises herein leased during the term of this lease, and not to locate or record the same or allow the same to be located or recorded except in the name of the lessor.

It is further agreed and understood that the Lessor reserves the "Gillespie Bungalow" for its own use exclusively.

The lessee shall keep at all times during the term of this lease accurate books of account showing the amount of ores extracted from said mine and mining claims, the amount shipped, sold or treated and the values extracted therefrom, and all ore extracted from said mine and mining claims and concentration thereof shall be smelted by the lessee at a custom smelter or smelters, and from and out of the values from the ores so extracted, and mined from said mine and mining claims and reduced, milled, treated, sold or shipped the said lessee shall pay to the lessor royalties as follows:

Ten (10%) per cent of the smelter returns on all ore running Fifteen ($15.00) Dollars per ton or less, fifteen (15%) per cent of the smelter returns on all ore running from Fifteen ($15.00) Dollars to Twenty-five ($25.00) Dollars per ton, and twenty (20%) per cent of the smelter returns on all ore running Twenty-five ($25.00) Dollars per ton or over.

Where ore is milled on the property the percentage of royalties as above fixed, comint to the lessor shall be determined by dividing the value of the concentrates by the ratio of concentration.

Said royalties are to be free of any charge or expense for texes, labor, mining, milling or transporting from the mine to Phoenix or other railroad shipping point and free and clear of expense of all materials, fuel, equipment or other expenses in the production of said ore, including production tax, it being expressly understood and agreed that all expenses and all taxes, both property and production taxes, shall be paid by the lessee except the expense of transporting said ore or concentrate from Phoenix or other shipping point to the smelter and the cost of smelting the same, which expenses of railroad transportation and smelting shall first be deducted from the gross smelter returns, and from said balance said royalties shall be paid in the percentages above mentioned. The balance of said royalties shall be retained by the lessee as fumn compensation for all expense in the operation and development of said mine and mining claims, the production of said ore and the transporting of the same to the railroad or other shipping point.

It is further understood and agreed that a duplicate of all mill, smelter or retort returns shall be furnished to the lessor, and that said royalties shall be paid direct by said smelter to the lessor.

All books of account to be kept by the lessee as above provided and all reports and other information pertaining to the operation and conduct of said mine and mining claims shall be open for insepction at all reasonable times by the lessor.

It is further understood and agreed that the lessor, its agents and representatives, shall have the

privilege of entering upon said mine and mining claims at any time during the term of this lease for the purpose of inspection.

It is further understood and agreed that the lessee shall not assign, transfer or in anywise incumber this lease or any interest herein or rights hereunder or sublet any part of said premises and property without the written consent of the lessor first obtained, and that any attempted assignment, transfer or incumbrance or subletting thereor without such written consent first obtained from the lessor will bevvoid and of no effect. The lessee shall further not permit any person or persons or corporation except the lessee and him employees to take or hold possession of any portion of said mining claims or mine under any pretense whatsoever.

The lessee agrees that throughout the term of this lease he will post and keep posted at any and all workings notice of non-liability on the part of the lessor and of said mine and mining claims for labor, materials and supplies of every character furnished thereon or used in the performance of any of the work herein contemplated in such manner as to fully comply with the provisions of the laws of the State of Arizona regarding non-liability of the owner or lessor pertaining thereto.

It is further understood and agreed that the lessee will carry all necessary insurance for the protection of all

(C O P Y)

RED ROVER MINE

LOUIS I. REHFUSS

Mining Geologist
Phoenix, Arizona

July 26, 1937

Mr. B. A. Gillespie,
Los Angeles, California

Dear Sir:

The report which I hereby submit is only a discussion of the geologic conditions noted during my recent studies in and around the Main Underground Workings, known as the Red Rover Mine, together with eleven maps listed below giving the geologic facts as noted. These will give a much better idea as to the conditions as they exist than any worded description might convey.

Map No. 1	Topographic and Geologic
Map No. 2	Composite Map of Underground Workings.
Map No. 3	Composite Map showing Topography & Underground Workings.
Map No. 4	Cross-section along Line A-A on Map 1.
Map No. 5	Plan Tunnel Level & 50 and 60-foot levels.
Map No. 6	Plan 180 and 200-foot levels.
Map No. 7	Plan 240 and 300-foot levels.
Map No. 8	Plan 360 and 380-foot levels.
Map No. 9	Plan 500-foot level.
Map No. 10	Plan 700-foot level.
Map No. 11	Plan 850-foot level.

In my study of the Red Rover Workings I have confined my efforts to noting such geologic conditions as would have future commercial value. Copper stained rocks with high silver values near the surface and in major faults and monor breaks in the formations in depth have no great commercial significance in themselves, because they are not the ore channels along which the ore solutions rose and deposited the values in the form of copper and silver sulphides.

These ore channels, otherwise called veins, are the things that must be located and developed before you can ever hope to make a mine of the Red Rover. You must stop chasing copper stained crushed rock along faults as you have in the past and confine your efforts to either showings with copper sulphides (chalcopyrite or bornite) or the gossan showings which represent the oxidized residues of the above sulphides.

This I would say is my major conclusion:

You have one such sulphide showing in the 500 North Ore-body. This apparently was cut again in the Diamond Drill Hole No. 3 on the 700-foot level, more oxidized, but showing strong gossan with considerable native copper. The mineralization on the 500-foot level appears to stand nearly vertical, and as the showing on the 700-foot level appeared nearly vertically below in the drill hole, the natural assumption is that the ore channel stands approximately vertical.

In view of the above and in view of the fact that you do not feel prepared to do a great amount of development work in the near future my only recommendation can be that you run a crosscut due nort h-west from the present face on the 850-foot level, your lowest level, thereby giving you your best chance to encounter the vein in the zone of permanent sulphides. This will cut the mineralized showing encountered on the 500 and 700-foot levels at about 150 feet from the present face of the 850-foot level. Further work would have to be guided entirely by what was found.

If sulphides were encountered drifting both ways would be advisable. It might also be advisable to extend the crosscut farther to the northwest to cut the other mineralized showings noted in the drill cores and shown on Maps 4 and 11.

If a strong vein, but still highly oxidized was encountered diamond drilling from the 850-foot level would be advisable to cut the vein at deeper levels where the permanent sulphides will eventually be found.

The gossan showings on the 360-foot level (see Map No. 9) from the inclinded shaft has some significance, but from the way it is cut by the fault along which the 260-foot level was run little can be said as to its importance. They appear to stand vertical in the footwall of the fault and to have been cut off by it.

This should be followed far enough to see whether it is a definite orechannel or not. Sulphides may be found on this level, but even if the gossan should prove to be continuous in the footwall block of the Footwall fault another ore channel will have been located and definitely established and the future potential value of the property

increased. Again further work will have to be done based on what is found.

All future work should be done under much closer technical supervision than in the past.

The fact that you have a well defined ore channel in the 500 North orebody showing, together with the strong possibility of a second in the gossan showing on the 360-foot level gives the property merit. What the grade of ore will be in these ore channels can only be determined b future work but the high grade of the oxidized ores indicates that the sulphides will be of sufficient grade to fully justify the money spent in their development.

Respectfully submitted,

(Signed) Louis U. Rehfuss

3/10/34

NOTES BY G. M. COLVOCORESSES RE HOULES REPORT
AND RED ROVER MINE

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Moores Estimates present cost of hauling to and from the mine at $4.00 per ton.

No indications that Houle actually sampled the mine which is disappointing but he estimates as probable 20,000 tons of ore above the 700' level. Nothing in his report suggests that he places the value of the mine at anything like $600,000 which was an exhorbitant figure in 1930 and is even more so today. At least 120,000 tons of high grade ore would have to be positively blocked out to justify such a purchase price.

Moore estimates that the cost of starting operations would be $10,000 which should probably be increased to $20,000 with proper allowance for a careful sampling of the mine and working capital.

Based on the last shipments of about 2500 tons the average of the high grade ore may be taken as 40 oz. Ag and 5% Cu., representing a gross value at present market of $33.00 per ton.

Costs may be figured as follows:

Mining and development	5.00
Hauling	4.00
Rail freight with moisture	2.00
Royalty	3.00
Smelter charge	3.00
" deduction	4.50
Overhead etc.	1.50
	23.00

This should leave a net profit of $10.00 per ton or a total of $200,000 on the 20,000 tons which Houle seems to consider probable.

The $20,000 preliminary expenditure might be repaid from the profit on the first 2000 tons of ore shipped and I think it is reasonably certain that there is at least this tonnage of high grade ore left in the mine.

However, the value of the greater part of the ore reserve appears to me uncertain and in the absence of a complete sampling there is no justification for assuming that it will equal the average of these last shipments.

Information on this point can only be gained by unwatering the mine to the 700 foot level and making a thorough examination.

All advances to be repaid from the shipments until repayment completed and parties advancing money (up to say $20,000 if required) to be given half interest in Moore's lease and technical control of all mining operations and development and milling or other treatment if this should be decided on later. Moore's to have full charge of all trucking and transportation of the ore.

Interview with Moores 2/27/34

The ore which would first be mined is in the old stope just below the 500' level. This could be worked by a winze from this 500' level but it would be better to put up a raise from the 700' level and work it out that way. The shaft between the 500 and 700 should be in good shape. The 700' level did not actually top the ore shoot but this was reached with a diamond drill.

The old incline shaft is open to the 300' level but the drift to the main workings is caved in places and would have to be cleaned out. There is some ore near the old incline which might be taken out by leasers and from the cump one or two cars of high grade ore could be sorted out.

Moores lease has no debts except the taxes (about $300) due in May 1934. The Red Rover Co. must pay the 1932 taxes which are now delinquent.

Moores lease runs for 5 years to run from June, 1933 and is in good standing. If it were desired to build a plant for treating the low grade ore of which there may be a large tonnage an extension of the lease probably be obtained.

Moore could produce and ship at least 20 tons of ore per day. A new road is now being built from Cave Creek to go thru to Bloody Basin or to Cordes, this might bring the road distance from Red Rover to Humboldt down to about 50 miles.

Additonal notes on Red Rover, revisited with Chas. Lambie, February 28th, 1935.

Obtained a copy of the lease which however is not complete, On the face of this lease it does not appear that the Lessee (Moores) has properly complied with its terms and it would be necessary to obtain from the owner a written statement to the effect that the lease is still

in good standing and also permission for the Lessee to assign a part interest in the Lease and the return from operations to other parties in consideration of their providing the necessary funds for the conditioning and operation of the mine.

Checked over Moores estimates of the preliminary expense with due consideration to the actual condition of the property and equipment and found them reasonable but believe that a larger fund should be allowed for contingencies and for difficulties which may be encountered in retimbering the shaft and drifts and that a total fund of $15,000 should be provided for preliminary expense plus $5,000 for sampling the mine and working capital.

This $20,000 should be repaid from the Lessees profits on the shipment of 2000 tons of high grade ore similar in value to the last shipments.

The shaft is in such a dangerous condition that no underground work even sampling could be undertaken until the shaft is retimbered and unwatered to the 500' level.

The ore immediately available for mining lies in the main shoot below the last underhand stope from the 300' level and above the back of the 500' level in what appears to be faulted section of the ore or a different shoot entirely. In the back of the 500' level a stope has been started and the ore can be sampled here for a length of 35' and a width of 30' (according to Moores) and if it goes up only 20' this should provide the 2000 tons required to repay the initial investment.

The main ore body lies below the 500' level and should be developed by a winze which would later be connected to a raise from the 700' level unless by the diamond drill.

The mines make about 60 gallons of water per minute, mostly along the 500' level.

Nearly all the surface equipment is in fair shape and quite adequate for development and mining on a small scale, up to say 50 tons per day.

Would take about 3 or 4 men to get mine in operation.

3/10/34

Moores called to say that he had secured financial backing from Howard Fields crowd and was proceeding to prepare for operation.

G. M. Colvocoresses - Recent Notes

RED ROVER MINE

(last visited November 30th, 1934)

December 3, 1934.

Distance from Phoenix 51 miles, last 4½ miles very rough and slow going, Driving time about 2½ hours.

Mine is now operating, but work is confined to extending the drift on the 700 ft. level in an effort to pick up a shoot of ore which Gillispie reported having found with a diamond drill. Bernard Gillispie is paying for this and the drift has now been advanced over 60 ft. but no vein has been encountered. The drift will probably be extended about 40 feet further and will then be topped if nothing has been found. The present face of the drift shows nothing more than decomposed rock with no stains of copper.

On this level there is another drift running to the left from the main heading in which a number of stringers of ore were encountered, and at one point a little shoot of ore was found, but this pinched out about 20 ft. above the level.

At several points the drifts appeared to pass through the apex of small shoots of ore which might be further developed by winzes or from a lower level, but no real ore body has been found on the 700 ft. level and no work was done previously on the 850 except to cut a station from the shaft.

They are working also above the 500' level in an old stope which extended up to the 380 and in which some ore was left. The filling from this old stope is now being drawn and some ore is sorted out and Moores hopes to find and to mine a small quantity of high grade ore which he thinks was left behind but the chances are that this will not represent any large tonnage.

The equipment of the mine is all in good shape and the pumps are easily handling the water. The upper portion of the shaft was retimbered and all of the shaft is now good and the skip works very well. Everything is in condition to carry on a small operation and produce ore under favorable conditions, but there is really no ore developed and available for stoping except the ends of some of the old shoots, and

the pillars. It is therefore necessary to undertake additional development or exploration in the hope of finding new bunches of ore or otherwise it would be necessary to thoroughly measure and sample the low-grade ore which was left in the upper workings, especially the workings from the incline shaft and if a sufficient tonnage of satisfactory grade material is actually found to exist, then a mill would have to be provided.

I estimate that an accurate measurement and sampling of all low grade ore indicated in the upper workings would probably involve an expense of $1200 to $1500 and if it were found possible to operate for the treatment of this ore on the basis of about 50 tons per day the fost of the necessary repairs to the mine and of a proper concentrating mill will probably be close to $20,000.

The working cost for mining, milling royalty, marketing might be figured at approximately $10.00 per ton, and if the average grade of the mill ore was sufficient to provide a net recovery of $15.00 per ton, the above expense would only be justified in case it were possible to estimate at least 10,000 tons of developed ore and preferably a larger quantity.

The ore is in the form of carbonate and silicate of copper from which it is not possible to make a very good recovery by flotation, but the tests conducted by the Mineral Separation Company and elsewhere indicate that approximately 85% of the copper and silver values can be recovered in concentrates.

In the old workings the content of the ore was quite uniformly about 6 oz. of silver for each per cent of copper, except in the high grade shoots where the silver ran up.

Ore of a similar character to that which has soo far been developed could undoubtedly be treated with advantage by the C. V. process, but the installation would involve a heavy expense.

Arthur Houle and also an engineer named Schmidt, have recently examined the mine and Houle appears to have been disappointed in not finding the 20,000 tons of high-grade ore which he previously thought existed between the 500' and the 700' levels. Houle has now

developed a theory that all of the workings in which the ore is found in kidneys or bunches represent a leached zone in or along the contact with the limestone. He believes that below this there should be found an extensive area of secondary enrichment above the primary ore.

This theory could probably be verified or refuted by a careful petrographic investigation involving the preparation of microscopic slides and a study of these at some university. The total cost of such an examination would be considerable but much less than the expense of attempting to prove Houle's theory by drilling or further development at greater depth.

I do not altogether agree with Houle since it appears to me that the lime should have neutralized the acids in the leaching solutions and precipitated the metals in the upper portion of the mineralized zone, and I am inclined to think that the present conditions of ore occurence will be found to continue downward until the primary ore is actually reached. The depth at which the primary ore may be found is uncertain but probably will not be more than 1000' below the surface, but the quantity and quality of primary ore is very problematical.

The present operators have a five year lease dated Nov. 13, 1934 but there is no option to purchase except at an exorbitant figure. Recent shipments have amounted to only four or five cars and the grade was not good since considerable waste was mixed with the ore.

I did not see Maguire, who has financed the recent operations, since he was away from the property. Maguire has spent about $25,000 during the past six or eight months and has probably reached the end of his rope and is about ready to quit. Satisfactory terms could be made with Maguire and Moore for taking over the present lease, but it is obvious that no one would wish to continue operations at the Red Rover unless they were prepared to spend some $25,000 for the equipment necessary and the treatment of the low grade mill ore. Before any conclusion could be reached as to the advisability of taking this gamble a thorough examination and sampling of the low-grade ore should be conducted and this should be paid for by the present operators.

GMC:

(Note - October 1937 by G. M. Colvocoresses)

Operations ceased in 1936 by which date Maguire had lost about $40,000 and all developments had proved disappointing. They confined their efforts to a search for high grade ore while in my opinion there is still a fair chance to develop a considerable tonnage of the low grade ore which is indicated near the surface and to work this out with some profit. In spite of the record of repeated failure in attempting to work this mine, I am of the opinion that it still has worthwhile possibilities and consider that a further investigation would be well justified if reasonable terms could now be secured from the owner.

The Blue Bird Mine to which reference is made in the statements should also be considered along with the Red Rover.

G. M. C.

To the south of this sedimentary series with their intruded diabase occurs a formation composed of schists and volcanic material. It lies in fault contact with the above series, but as the workings in the old Incline Shaft so closely followed this fault it cannot be stated definitely whether or not this fault did not follow more or less closely the stratagraphic contact between the limestone and the now schisted formation forming the hill on which the Gillespie bungalow is located. It lies as a bed against the schists and volcanic material farther to the south.

Overlying all of the above mentioned formations are to be found basalt and rhyolite flows. They are much younger geologically than any other of the other formations described and were lava flows which flowed out and filled the valleys and capped the hills formed in the other formations. They have not taken part in any of the major fault movements noted in the other formations and hence are not schisted and faulted to any great extent. These formations are not vein bearing but merely cap and mask the underlying formations, and in that way make a geological study still more difficult. For example, the position of the rhyolite around the collar of the Main Shaft makes the outcropping of the 500 North Orebody impossible.

These showings in no wise represent an ore channel or vein and the copper and silver values will no doubt decrease in depth. The primary copper values in the veins were either chalcopyrite or bornite both copper-iron-sulphides. During the process of oxidation and leaching the copper is taken out leaving behind the red oxide of iron which is insoluble in underground waters and constitutes the gossan residue so often spoken of in relation to copper deposits. In these showings very little or no gossan is to be noted, therefore, these oxidized copper values have been leached from some vein which was cut by the faults and the copper deposited in the open spaces along the cut by the faults and the copper deposited in the open spaces along the crushed zone of the faults. This copper staining can be carried anywhere by downward moving underground waters into every minute space between rock fragments and in every slip and fault, and therefore will be encountered anywhere in the underground workings.

The only significance showings like these can have, lies in the fact that they indicate the presence of some copper-bearing veins which were oxidized and leached and the values carried and deposited in the crushed zone along the faults.

Tetrahedrite-Tennantite-Gray Copper

(Cu. Fe. Ag.) As, Sb, S

Dark lead gray to steel gray, luster metallic opaque, streak dark gray to brownish.

H = 3-4, G = 4.4-5.1

Pure mineral from 46.7 to 52.7% Cu.

NOTES RE GEOLOGY OF RED ROVER MINE

The surface outcrops are marked by silicious copper-stained croppings in altered limestone. Holes sunk by prospectors and miners for high grade disclose the evidence that diabase cutting into the limestone are responsible for the mineralization. The vein or fissure formed subsequent to the diabase intrusion into the limestone. Faulting accompanied the vein fissure and along fault fractures channels formed which permitted free circulation of mineral solutions and downward leaching, oxidation and concentration of values into lenses and ore pockets of enriched ore.

However, the enriched ore shoots are surrounded by leached and oxidized ores, therefore, there may be reasonable expectation that concentration will continue to greater depths.

The limestone is exposed in a narrow belt on surface, but is capped or covered by an andesite lava flow to the north, east and west of the mineral outcrops. On the south the immediate contact with limestone is a ryholite intrusive about 1,000 feet wide, and this ryholite contacts with granite farther southward.

The extent of the diabase intrusive cannot be determined at this time but it is certain that fingers of diabase penetrate the limestone at various horizons and the main mass of diabase will be found northeast of the main shaft.

The diabase when unaltered shows pyritic primary minerals, pyrite and chalcopyrite. The primary chalcopyrite assays 2 to 4 ounces silver and it is reasonable to assume commercial copper ores will be found in the main diabase intrusive.

The sedimentary rocks in the vicinity of the Red Rover underground workings consist of a series of reddish, brownish, and greenish colored sandstones and shales with some recrystallized limestone. These formations are of the very oldest known sedimentary rocks of pre-Cambrian age, and they have therefore in the past been subjected many times to great compressive forces which developed their schistosity obliterating the previous bedded structure.

Into this sedimentary series was intruded the great masses of diabase which tore off from them great blocks of limestone together with some of the sandstone and shales. In places the diabase was intruded more of less parallel to the strike of the formation in the form of a sill and roughly following the old bed of limestone. The diabase in and around the old inclined shaft and extending northeast through Camp shows it in many small sills, dikes and irregular masses. Behind the Mess House a well defined block of limestone is found entirely engulfed in diabase. Other such occurrences are to be seen in the Old Tunnel (See map No. 5).

Such an occurrence of the rocks as above described does not give a normal sedimentary succession where the various beds, or horizons, can be used as markers to trace out the faulting.

R

PHOENIX DISTRICT

Red Rover Mine

Call from E. M. Moore, Box 2002, Phoenix, who is now getting the property in shape to resume operations and hopes to begin shipping in March about 50 tons per day. (probably less)

Ore will run 40 oz. Ag
5% Cu.
little Fe
7% CaO
1% S
65% Insol.

(Can probably get this for Humboldt and according to Arthur Hatle they have over 30000tons of this ore blocked out.)

3/15-34

Moore has found a financial backer & is starting to fix up for operations. They might be shipping by June or July.

—

Maguire lost about $40,000 in this venture & quit work in late 1935.

Mine idle in 36

RED ROVER

(From Interviews with Mr. Simkins
November 17 & 18, 1930)

The property is located in the Magazine District, Maricopa County, just at the junction with the line of Yavapai County. The distance is 50 miles from Phoenix, elevation 4,000 feet. For geology, note the Rehfuss report which Simkins considers unreliable in many particulars, and Simkins believes that all the primary ore is derived from the diabase, and that the Apfield Fault was the channel through which the orebearing solutions ascended and mineralized the limestone and rhyolite. He also thinks that this fault permitted subsequent oxidation of the ore.

Have no details regarding the history of the property which apparently was worked by old-timers and operated on an extensive scale at some time prior to 1897. Gillespie acquired the property about 1916 and sunk the vertical shaft, also provided the present equipment which consists of oil engines, hoist, compressor, etc. Also a mill building which could be utilized for installation of flotation machinery.

Aside from the production made from stringers near the surface and some stopes open from the incline shaft, the principal ore has been taken from the 500' level, from the main shaft, and has been stoped up through the 380' level and up to the 300'. This ore occurs in the east or sometimes called North Vein and there are two other veins indicated further to

the west which have not yet been developed although they have been cut by diamond drills and, according to Gillespie, the drill cores showed commercial ore. The ore, where stoped, had a width of 30' and upwards, and on the 500' level at the bottom of the stope the width was 48'.

All ore was sampled by Moores and Simkins but assays are not available. The shipments may be taken as indicative of the grade of ore actually produced which was of the best material.

Samples which are noted on some of the drawings show low grade ore containing 2 to 3% copper and 5 to 15 ozs. in silver.

G. M. C.

11-19-30 - Red Rover.

A study of the maps and attached report by Rehfuss seems to indicate that all of the old workings from the incline shaft followed the dip of the structure and were principally along the footwall fault where some substantial bodies of ore were discovered and mined. The main ore channels, or veins, appear to lie well to the west and north of these workings and the three veins shown on the section map strike about N 20° E, and the North Vein was cut on the 500' level and by drill holes from the 700'. No information as to the width and value of this vein is at present available. The same applies to two other veins lying to the N.W.

of the North Vein, which are shown on the section map.

In order to intelligently examine this property and form an estimate of its probable future value, the mine should be unwatered to the 700' level and the main shaft repaired, if necessary, so that the cage or skip could be run. This should permit sampling the ore in the North Vein on the 500' level, as well as the ore which was stoped along the footwall on this level and from the upper workings. Gillespie should go to the expense of this unwatering and keep the property in condition for examination during a short period of time, say thirty days. There should also be compiled in proper form the record of all the samples taken in the mine, and particularly the samples of the drill cores which are supposed to have cut the North Vein, and the two other parallel veins on the 500 and 700' levels. Assays of these samples should be plotted in on the maps and a record of all shipments from the property attached.

Also information should be given concerning the metallurgy of the ore and one or more representative samples of ore should be made available for testing by flotation or other concentration methods. The terms on which prospective purchasers might do business should be clearly stated and it would be essential that these should provide for giving an option for a sufficiently long period to permit additional crosscutting and drifting on the 500 and 700' levels, also on the 850' level if desired, and for such additional diamond drilling as might seem expedient.

C. M. C.

RED ROVER and BLUE BIRD MINES

(Tentative statement by G. M. Colvocoresses)

The Red Rover Property consists of 22 or 26 patented claims - the Blue Bird 17 unpatented claims. Both are located near Camp Creek about 50 miles north of Phoenix. Owned by F. A. Gillespie, P. O. Box #1925, Tulsa, Oklahoma. Gillespie asks $700,000 for the property but will agree to a five year bond and lease on the basis of a 15% royalty, which will apply on the purchase price.

DEVELOPMENT

Property is partially developed by a shaft and drifts to the 850' level but only a small amount of work is done below the 500 from which level the ore has recently been mined. The orebody has not been found on the 700' level but a diamond drill is said to have cut it and passed through about 60' of well mineralized ground, of which 12 to 15' might be considered as good grade ore. A crosscut has been run out to within 40' of this ore and could readily be extended to prove up the ore, and could readily be extended to prove up the ore.

Mining in the upper workings was carried on at intervals for a number of years, the ore being largely oxidized, consisting of copper carbonates carrying a high percentage of silver. Below the 300' level sulphide ore made its appearance principally chalcopyrite and some bornite and recent shipments of ore from the 500 level contained on the average better than 30 oz. silver per ton and over 4% copper. This shipping ore was about 8 or 10 feet wide but in many places there is a width of 35 feet which should average about 10 oz. silver and 2½% copper, and would be suitable for milling. There is no large tonnage of ore blocked out but themain vein is very strong and gives promise of developing into a large orebody, and other parallel veins have shown good ore in the upper workings and should be developed with depth. The bulk of the ore will no doubt be sulphide and even though some carbonates are present, it is probable that the run of mine could be treated in a concentrator with good recovery of values and because of the distance of the mine from any railroad it is essential that this ore should be concentrated on the spot.

The property is well equipped with oil engines and a good mining plant sufficient to permit current development and the hoisting of about 100 tons of ore per day. Some years ago a mill was erected, designed to treat the ore by the SO_2 Leaching Process, which, however, proved entirely unsuitable and new equipment would have to be installed. If this property were leased, an initial expenditure of $25,000 should immediately be made for development, and the equipment in the mill would cost in addition $25,000.

The mining costs during the last operation (1929) were as follows:

Mining	$5.00
Hauling ore to Railroad	9.00
Freight to Hayden	1.50
Smelter charge	3.00
Total	$18.00

The average return on the ore shipped was about $23.00 per ton.

Resuming operations with a properly equipped concentrator, the following costs are estimated.

Mining and development	$4.00
Concentration (5 to 1)	2.00
Hauling concentrates	1.50
Freight	.30
Smelting charge	.60
Royalty	1.60
Total	$10.00

It should be possible to mine an average grade of ore with a net recoverable value as paid for by the smelter of about $12.00 per ton, thus yielding a profit of $2.00 to the mining operations. The freight rate from Phoenix to Humboldt is about the same as to Hayden, but the concentrates would be a very desirable charge for the Humboldt Smelter and every effort should be made to secure this property which in itself gives promise of becoming a very valuable mine, although it falls far short of justifying the purchase price now asked.

The Blue Bird Property contains a large deposit of low grade basic copper sulphide mixed with iron. Unless there are high grade strongers in this deposit or better gold values than appear in most of the ore, this mine could not be operated with profit under present

conditions but if improved transportation facilities were later provided this character of material would be very advantageous for treatment at Humboldt and might perhaps be shipped largely as a flux with very small margin of profit to operators and to the smelter. The property may have a considerable value at some future date and should therefore be acquired along with the Red Rover but probably no work other than a small amount of development will be justified at present.

Re Red Rover

Box 2002,
Phoenix, Arizona,
January 19, 1934.

A 1/22 34

Mr. G. M. Colvocoresses,
Luhrs Tower,
Phoenix, Arizona.

Dear Sir:

I have recently signed another five year lease on the Red Rover mine, a silver and copper property situated 52 miles north of Phoenix. This property, consisting of approximately fifty claims, about half of them patented, belongs to Mr. F. A. Gillespie, of Tulsa, Oklahoma and was operated by him a number of years ago under the name of the Red Rover Copper Company. This Company sank a 900 foot shaft, did considerable drifting and diamond drilling. They also built a mill at a cost of one hundred and fifty thousand dollars, entirely unsuited to the character of the ore. The mill was a complete washout and as at that time the Company was paying twenty dollars per ton for transportation from Phoenix to the mine, on account of the deplorable road conditions then in existence, shipping crude ore to the smelter was out of the question.

Gillespie's Company spent in excess of six hundred thousand dollars in purchasing and improving the property, but no systematic r edords were kept of the results of developments. The property had lain idle for a number of years when I started operations under a lease late in 1929, just prior to the break in the prices of metals. We operated above the 500 foot level only, and, having no records to guide us, had to feel our way. However, we did ship fifty carloads of ore, having an average content per ton of 40 ounces silver and 5.34 per cent copper, mine run. I am enclosing a copy of these smelter returns.

On account of our inadequate pumping equipment at that time, we did not un-water the mine below the 500 level, but on that level the same ore can be seen continuing downward and it's width is 30 feet. Our sampling in 1930 shows it to be the same grade, or better, than we shipped. During our former operations I was informed by the man who had done the diamond drilling for the Company that his drill cores taken of the 700 foot level exposed the vein at that depth. I verified his statement by finding these drill cores intact in their original boxes. Strange as it seems, these cores had not been assayed by the owners.

Early in 1930 Mr. Arthur Houle made an examination of the property on behalf of the Calumet and Arizona Mining Company and through me made the owners an offer to take over the mine and reimburse them for the total amount they had expended, which was in excess of six hundred thousand dollars.

The owners procrastinated for two months, during which time prices went to pieces and negotiations were dropped. Mr. Houle assured me that in the event his Company failed to make a deal, he, personally, would be very much interested in going in with me and was prepared to mine on a large scale, provided I could get a renewal of my lease for a five year period. The depression upset this plan also.

I have now taken over the property again and although I was unable to get an option, due to a sentimental whim of the owner, I have signed a very satisfactory five year lease.

Under my former lease I was paying 25 per cent royalty on the net smelter returns, after deducting treatment and rail freight charges. My new lease specifies 10 per cent royalty on net smelter returns, after deducting treatment and rail freight on ore up to $15.00 value; 15 per cent on ore up to $25.00 value; 20 per cent on all ore of value over $25.00. During our former operations we figured our hauling at $9.00 per ton. It can now be contracted to reliable parties at $4.00 per ton.

Mr. Houle told me that in the report to his Company he had stated that from the information gathered from the drill cores of the 700 level there is reasonably assured in sight, 20,000 tons that should assay 40 ounces silver and 6 per cent copper. Also that there are two other ore shoots exposed.

The mine makes about 65 gallons of water per minute, though there is more available from a long drill hole to the southeast, should it later be needed.

The ground stands well, as when we mined the 2500 tons formerly shipped, we consumed less than three board feet of lumber per ton of ore.

The following is my estimate of operating costs and earnings, assuming the same freight and treatment charges and the same grade of ore.

40 ounces of silver @ 64.5 ¢	$25.80	
5.34 per cent copper, less 8 #, 99.8 pounds @ 5¢,	4.99	
	$30.79	
less 5 per cent,	1.56	$29.23
mining and overhead,	$4.00	
hauling,	4.00	
rail freight,	1.80	
smelting charge,	2.50	
royalty,	3.73	16.03
net profit, based on 50 tons per day,		$13.20

I had a mill test run at the laboratories of the American Smelting and Refining Company, El Paso three years ago, which gave a saving in excess of 90 per cent. This should be bettered some now.

If milling should later prove practical and desirable, there is a first class mill building on the property and considerable usable mill equipment.

I estimate it would require $10,000.00 to put the mine in shape to begin shipping, with an additional $5000.00 with which to carry on pending initial smelter returns. I am enclosing a memorandum of the estimated expenditures.

Should you care to finance this operation, I would give you a one-half interest, with the understanding that you be fully reimbursed for the total amount expended, before I participate in any division of profits.

Very truly yours,

E M Moores

E. M. Moores.

Shafts and 4 & 8, 5

ESTIMATED AMOUNT OF MONEY REQUIRED TO REHABILITATE THE RED ROVER MINE

40,000 feet of shaft timbers, framed, fob mine,	$1700.00
10,000 feet of miscellaneous lumber " "	450.00
labor, gasoline, etc., retimbering to the 300 level,	1800.00
motor and head for our de-watering pump,	500.00
cost of un-watering,	800.00
temporary station pump, 300 level, rental and installing,	250.00
overhauling machinery,	500.00
miscellaneous tools and equipment,	500.00
pick-up truck, payments,	350.00
second installment of taxes for 1933,	350.00
road work, preliminary,	500.00
125 HP Waukesha truck engine, to be direct connected to the auxiliary generator for use as a stand-by only, for pumping,	500.00
boarding house and bunk house equipment, etc.,	250.00
total,	$8450.00
incidentals, say,	1550.00
	$100,00.00

2 mos to turn shaft;
pumping for 10 days

Red River Shipments 1979 & 1980

To Hayden — Crude Ore

		Tons	Avg.	Cu
3/29	30	32	26.60	5.54
3/16	30	39	24.3	4.05
3/		56	28.3	3.90
3/		45	26.1	3.60
4/26		47	29.2	3.40
4/25		48	41.7	4.00
4/25		48	49.7	4.85
4/25		52	66.9	4.78
4/26		47	29.2	3.40
4/25		48	41.7	4.00
4/25		48	49.7	4.85
4/14		53	56.65	4.80
4/8		41	21.60	5.10
4/		44	19.70	6.28
3/24		46	32.00	6.42
3/6		38	35.50	5.60
3/4		53	23.00	6.17
3/4		57	28.00	6.16
2/26		47	32.20	4.65
2/24		47	25.40	5.58
2/21		47	29.00	7.86
2/19		46	33.30	6.60
2/18		50	45.90	7.10
2/11		45	16.60	3.45
2/11		54	16.05	3.56
2/11		47	33.90	3.95
1/17		49	65.35	5.55
2/7		56	30.20	4.75
2/7		45	55.50	3.86
2/7		53	37.10	3.56
1/23		34	49.50	4.15
1/15		50	58.25	4.95
1/14		55	57.30	4.35
1/7		45	40.70	5.67
1/8		55	36.60	4.68
1/10		53	51.80	4.05
1/		57	34.90	5.25
12/30	29	51	29.50	5.15
12/27		48	51.30	6.95
12/27		57	41.60	5.85
12/23		51	45.80	6.34
12/21		43	54.80	5.45

Red River Shipments, (Contd) ②

Date		Tons.	Ag.	Cu.
12/10	29	45	46.00	4.68
12/9		38	31.42	6.35
12/6		43	32.00	6.10
12/2		48	80.60	6.93
11/18		48	54.18	7.36
11/5		5	52.38	17.44
11/6		17	106.00	12.10
11/4		1	312.65	28.78
11/4		10	125.16	15.23

Freights, to Hayden from Phoenix, on c/l lots 1.30 to 2.80 acc to grade for ore to

H_2O = 2 - 4%

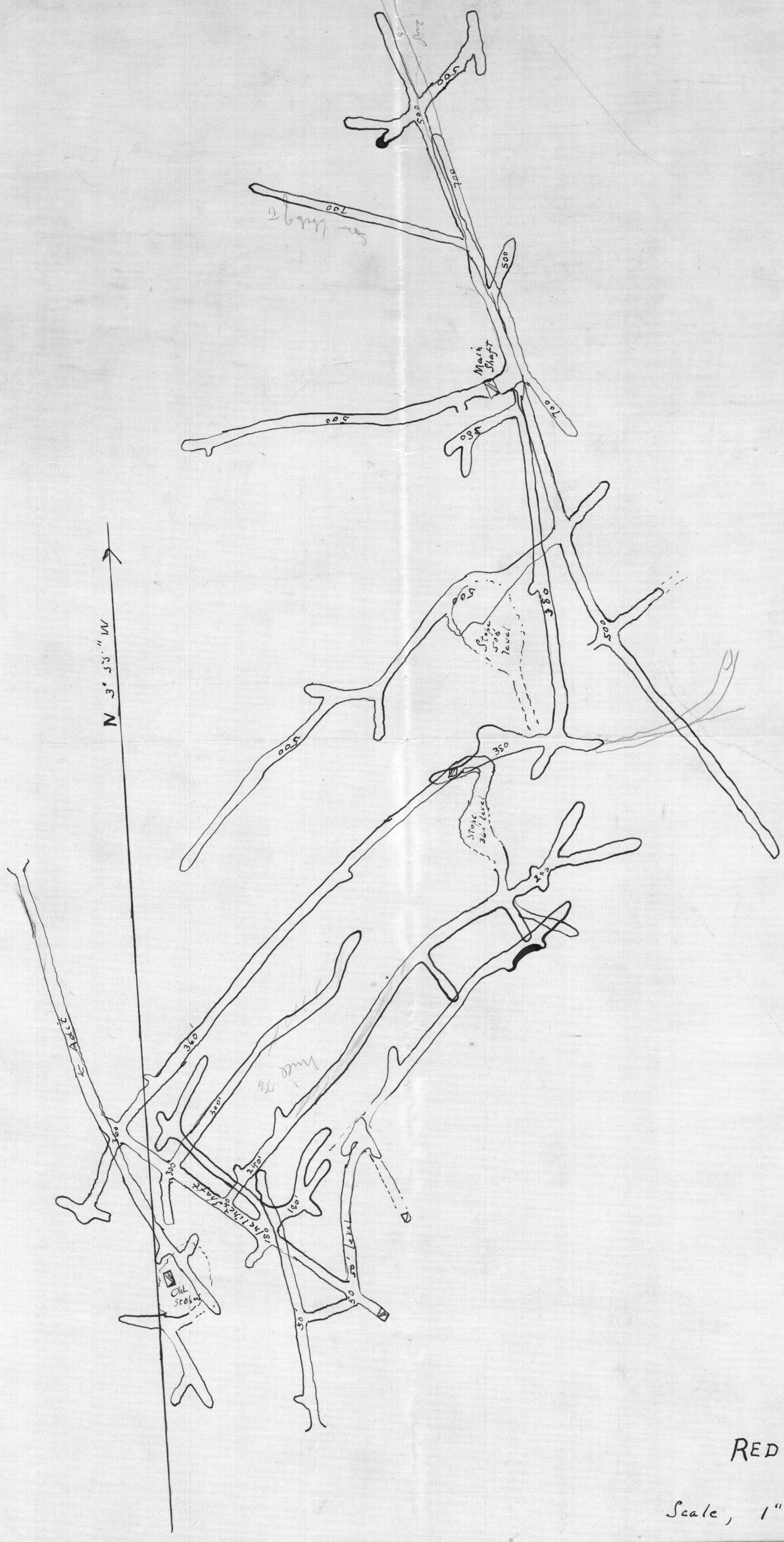
Smelting charge 2.50 per ton up to 30.00 ore

~~and lots of ore.~~

Pay for 95% of silver @ market

" " ~~90% of copper~~ copper less .8# @

market less 2.5 ¢ per lb.



RED ROVER

1927

Scale, 1" = 50'