



Nov 30, '42



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J. B. Miller, Jr.

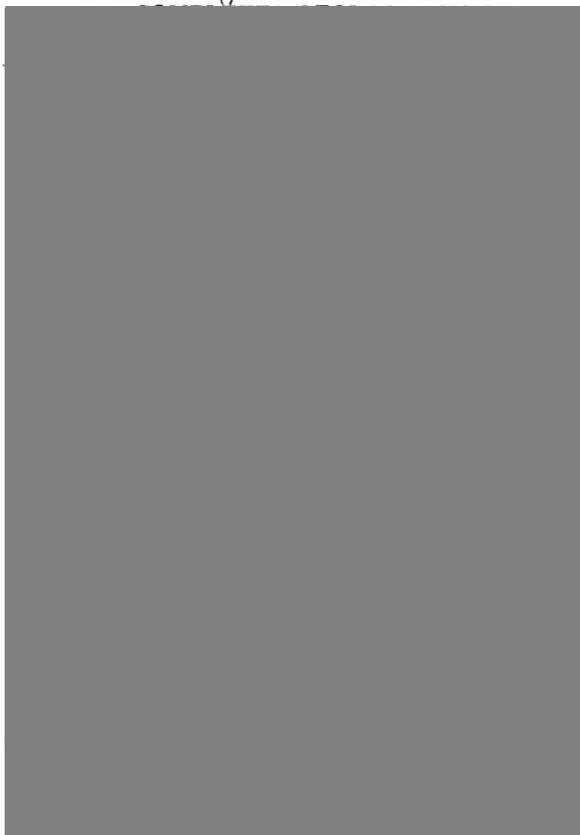
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Irrig. Butler file:

Min. Junc. Feb 15, 42

ARIZONA BUREAU OF MINES





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Trini Balle



Miss Jones
Nov 30 42 *Ann Butler* **THE MIN**



February 20, 1943

Mr. Robert E. Hackett
Room 1112
229 East Wisconsin Avenue
Milwaukee, Wisconsin

Re: Twin Buttes

file

Dear Mr. Hackett:

Since I have not heard from you for a long time past I am not sure that the contents of this letter will be of any particular interest but thought it well to communicate with you in the event that you are still watching developments in the Twin Buttes District.

I assumed that you did not come out this way in December as I believe I have seen Mr. Taylor since that time and he would have told me if he had had an opportunity to meet you personally. On the occasion of my last visit to Tucson a few weeks ago I was not able to see Taylor as he was occupied elsewhere but I have had several interesting conferences with officials of the American Smelting and Refining Company and of the Eagle-Fischer Company on which occasions the Twin Buttes District was mentioned and I have also been watching in a general way the news items referring to that location.

I presume that you receive regular reports from Messrs. Foy and Taylor concerning the progress of the unwatering of the Glance and the Morgan Mines both of which I hope have been making good progress although I understood that a great many difficulties had developed at the Glance and that the work was costing more than had been anticipated.

The Esperanza Mine not far from your mine has received a preliminary Government loan and it will be interesting to see if this opens up in a satisfactory manner.

At the Plumed Knight property which is a part of the Mineral Hill holdings, local people have apparently gone ahead with the construction of a small concentrator and I believe that they are planning to treat some of the dumps and perhaps later on to open up the old workings although this latter procedure will certainly be an expensive undertaking and personally I doubt very much if the ore which was left in the mine will repay the investment.

Should these people operate a custom mill there might be an opportunity to deliver to them for treatment some of the ore from your mines although I am afraid that in the future as in the past

Mr. Robert E. Hackett - 2

most of this ore will not prove suitable for concentration and that it will have to be shipped to the smelters, which is of course a comparatively expensive proceeding.

The ^{wise} most important development in the district has been the purchase of the San Xavier lead-zinc mine by the Eagle-Picher Company who are definitely planning to erect a 250 tons concentrator and will undoubtedly reopen the mine in a substantial manner and also consider taking over any other lead-zinc properties in the district which might contribute suitable feed to the ~~mine~~ ^{mine}.

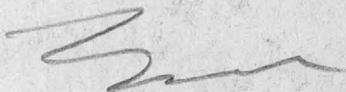
The manager of this company discussed with me at some length your holdings at the time that they were negotiating to make this purchase but I was sorry that I could not give them any encouragement in believing that any substantial quantities of lead-zinc ore were likely to be developed in your mines. There was a record of some zinc ore in the Copper King and also similar ore was supposed to have been found in the Minnie but in either case it did not appear likely that the tonnage would be substantial. If by chance you have among your records any additional information concerning lead-zinc which was not sent to me at the time that I made the examination of the property I suggest that copies of this data might be made up and sent to me so that I can forward them to the Eagle-Picher people who will be very glad to give any information of this kind careful consideration.

I personally feel that it is of great importance to the district that the Eagle-Picher should have finally determined to operate there on a fairly extensive scale and even though their present activities may be confined entirely to lead-zinc and principally to the San Xavier Mine they are a very progressive company and may later on expand their activities to cover copper operations particularly if the ore in the deeper workings of the copper mines should become a sulphide and therefore suitable for flotation concentration.

If at any time you believe that the situation is such that it would be well to approach the Eagle-Picher people I will be glad to send you the address of their local manager or take the matter up on your behalf as my relations with Eagle-Picher have been very close and very friendly for some years past.

Personal regards.

Yours very truly,



GMC:cg

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HISTORY OF TWIN BUTTES

By William F. Foy

November 21, 1939

The known history of Twin Buttes mining district dates from the nineties when four prospectors gophered various surface out-crops of copper carbonates hauling same to Tucson by wagon. This continued up to the year 1905, when a group of men headed by David S. Rose, then Mayor of Milwaukee, who formed the Twin Buttes Mining and Smelting Company, which acquired all the favorable property in the district and built a standard gauge railroad from Tucson to Twin Buttes, 28 miles in length. They began mining operations in 1906 and erected a smelter near the Santa Cruz river nine miles from the mines. They operated until the spring of 1913, directing most of their attention on the Morgan group, as this group had the best surface showing.

During these operations the Twin Buttes Mining and Smelting Company produced a gross of \$3,110,000.00. Most of this came from the Morgan mine; the balance from the Copper Glance, Copper Queen, and Copper King. The latter group, being on a different contact with very little surface showing, was not considered worth much at that time. However, later operations by Ed Bush and myself proved this contact to be the richest zone of the district, higher grade ore and larger ore bodies. Our gross production from this contact to date is \$6,115,597.30; this with the old company's production of \$3,110,000.00 make a grand total of \$9,225,597.30 for the district.

In 1913 after some of the old heads of the company had died or passed out of the picture they ceased operations. From then on until 1918 the Morgan mine was worked by leasers.

In 1914 Ed Bush from Butte, Montana, who had been leasing at the Morgan, took a lease and bond on the old Minnie mine which lay on the Glance-King contact adjoining the Copper Buttes on the west. He and his partners netted over \$400,000.00 in the years 1914-15 and 1916. While operating the Minnie and seeing the possibilities of this contact, Bush then took a lease and bond on the Copper Glance which had been previously worked by the old company. This contract was for \$300,000.00 for 3 years on a 10% royalty basis. During 1916-17 and 1918 and until the drop of copper after the armistice, he paid \$233,796.16 in royalties to the old company and netted a substantial sum besides.

Then in 1917 after being more convinced than ever of the possibilities of this contact, Bush took a 3-year lease and bond for \$100,000.00 on the Copper Queen. He paid this \$100,000.00 by royalties after the second year and netted besides \$180,643.72 for himself and partners.

I was associated with Bush from 1916 until his illness and death in 1920. From then on I operated the mines with three associates from Milwaukee who were financially interested with me. As manager I opened the Queen mine, which had been worked three times before and considered depleted. After unwatering and expending a small sum prospecting I struck ore and paid monthly dividends during the years 1923-24-25 and 1926 amounting

to \$412,218.15. I also sank a 520-foot shaft on the Copper Bullion and a 420-foot shaft on the Gladstone, our intention being to develop these properties later. The costs of these two shafts were absorbed in our mining costs.

About this time I began to negotiate with my partners to purchase their interests. I finally consummated this deal in 1928 for \$100,000.00, making the final payment in 1929, and became the sole owner of the railroad and all interests of the Midland Copper Co. I then formed the Buttes Copper Company on these holdings and options on other contiguous properties embracing all the worth while properties on the contact. This was all done and in shape for financing on a scale for big program of development. I then went to New York and was getting along fairly well with the financing when the market crash came in October. That stopped any further financing as far as I was concerned. In 1930 I lost control on most of these properties and succeeded only in the past year to get a new hold on a basis that involves no payments. All that is needed is a small amount of capital to reopen the mines.

The present set-up is this: I have the four best mines on the contact on a 10-year lease and bond with 9 more years to run. There are no payments, the only obligation being a 10% royalty on ore shipments. When the royalties amount to \$200,000.00 all the property is mine. These mines are all patented and include the Copper Glance which, as stated before, paid \$233,796.16 in royalties from one operation alone, the Copper King with production record of \$150,000.00, the Copper Bullion, and Copper Buttes. Each of these mines has a shaft with depths as follows: Copper Bullion 520 feet vertical; Copper Glance, 625 feet vertical with 60-foot winze on lower level in ore; Copper King 270 foot about 72° incline following ore fracture; Copper Buttes 300 feet about 72° incline following contact. I have all the maps of workings and production records including smelter liquidation sheets. Most of this ore was treated in smelters at El Paso, Hayden, Sasco, and the Pioneer smelter. Some of the earlier shipments were made to Douglas.

While the Glance has a tonnage of ore especially on the lower level, it will be necessary to repair shaft and unwater before this ore is available, so I have selected the King mine as the first unit to operate because in my belief it will give the quickest results with the least expense. On this property we can take advantage of a 270-foot shaft needing only slight repairs. Also there are many places on the way down along the fractured zone that prospecting work can be carried on that should give good results. The shaft should be sunk to the point where the fracture meets the granite contact which I believe to be from 150 to 200 feet farther down. Here is where we should encounter ore in quantity. This is in line with our experience on this contact.

Up to the present, not a single foot of development has been done on the Copper King. The only work done was gophering of ore in fracture from surface down and laterally 100 feet on each side

of shaft. However, this small zone produced \$150,000.00. The carbonates from this fracture averaged around 8% copper and 2 ounces silver. On the footwall side there was a body of zinc oxide that averaged 25% and 2 oz. silver. The extent of either of these zones was never determined.

The King has been a sadly neglected property, as evidence of our last work on the Queen near the King end line proved. I tried to acquire the King at various times since 1916, but the old company wanted \$250,000.00 on a 3-year payment plan. I thought the price was too high on such a rigid contract, so I bided my time and last year got it included with the other properties on a 10-year contract as described above.

From my experience and knowledge of the underground conditions as part owner and manager for the past 23 years, I have every reason to believe that by prudent judgment in doing the work, a shaft already down 270 feet, good highways, camp already established, and other favorable conditions, that \$15,000.00 will take care of obligations and put us in ore. I do not promise to make shipments of 50 tons per day at once, but, like my other operations here, to build up to that point. With the success that we have had on every one of our other operations here, we could then open the Glance where we have ore, then later the Copper Buttes and Bullion.

As a further advantage I have enough equipment of my own that I will loan for doing this work. This will need few repairs but will save several thousand dollars in the initial outlay. The camp buildings also need some repairs, but after all we can take advantage of many thousands of dollars of work already done.

In conclusion I wish to state that my holdings are not for sale, nor am I asking for a red cent for myself. I have sufficient knowledge of these properties to know what the results will be when the properties are operated properly. I am desirous of contacting individuals or groups who will put \$15,000.00 in the treasury to open one mine. For this I will give an interest to be agreed upon. However there is one condition to this: I must have the management and responsibility as to the expenditure of this money, for I know that with my experience here that I can get more progress from \$15,000.00 than an outsider could get with twice that amount. The salary I ask for my services will be very small until we get into revenue. I would then expect an adjustment commensurate with the revenue. If any of the statements made still are not clear, I have all the evidence and records and invite scrutiny.

November 21, 1939

William F. Foy
Ruby Star Route Box 8
Tucson, Arizona

July 21, 1943

Twin Buttes Mining Company
c/o Mr. Robert E. Hackett
757 North Broadway
Milwaukee, Wisconsin

Gentlemen:

The results of my recent investigation of your property conducted on July 15, 16 and 17 are set forth in the following report which covers my findings on the ground and results of conferences with Messrs. William Foy and Charles Taylor, also with officials of two of the Mining Companies operating in that vicinity.

TWIN BUTTES REPORT

PRESENT CONDITION OF MINES

MORGAN MINE

The three compartment vertical shaft, known as the "Old Shaft" and workings were described at length in my report of May 29, 1942, pages 19 - 24.

Since that date Mr. Taylor and his associates, leasing on this property, have obtained two R.F.C. loans aggregating \$8,000.00 with which the shaft was first put in good shape to the 165' (2nd) level and some new equipment installed. The mine was next pumped out to the 3rd level about 100' below but the condition of the shaft below the 2nd level was found to be very dangerous and it was not considered wise to attempt to recondition it with the limited funds available.

The mine was therefore allowed to refill with water which now stands 30' below the 2nd level and remaining funds have been spent in continuing the west drift on that level in the hope of finding larger and higher grade veins of scheelite than those which had previously been developed. Unfortunately these hopes have not been realized and in the west drift there is still no commercial showing of scheelite, but merely a slight association of this mineral with stringers of quartz which nowhere appear to have any great width or persistence. Five men were employed at the mine and the drift was still being advanced at the time of my visit, the muck being hoisted to the surface and sent to waste.

There is still a remote chance that some better tungsten ore may be found before the R.F.C. money gives out, but I was told that not much of this fund now remained and the results of the work to date have been entirely negative.

From the deepest of the shallow shafts which the Government and Taylor sunk to the southwest of this main shaft Taylor and a sub-leaser (Hilton) are reported to have shipped 277 tons of scheelite ore to a local custom mill. This assayed 0.45%, WO_3 but apparently most of the values were lost in milling and since the returns did not nearly cover costs the shippers had no incentive to continue production. The milling cost was \$4.50 per ton and truck freight to the mill (3 miles west of Tucson) was \$1.50 per ton.

Since there have been no attempts to further develop the showings of copper described and sampled by me last year this situation remains unchanged except that there has been some additional caving along the east drift on the 2nd level and it is reported that both the east and

west drifts on the third level were caved close to the shaft so that no examination of those workings was possible.

I am still of the opinion that some of the copper ore between the surface and the 2nd level would pay to mine if a special bonus price could be obtained and should Taylor decide to relinquish his lease in the near future, as now seems highly probable, I recommend that this matter should be given careful consideration along lines which I shall mention elsewhere in this report.

I am sorry that my original poor opinion of the Morgan Mine as a possible producer of tungsten seems to have been amply confirmed.

GLANCE MINE

On June 8th, 1942 William Foy wrote to your company saying that he had \$25,000.00 available for unwatering and reconditioning the Glance Mine and that he expected to have this work completed in from 90 to 120 days. From his other letters it appeared that this money was to be advanced by his associate Howard Fields.

However, aside from what money Fields may have advanced (the amount being stated by different parties as from \$500.00 to \$4,000) Foy and Fields obtained two R.F.C. loans aggregating \$9,000.00 for this purpose and for retimbering the shaft at the Copper King and although a large part of this money has been spent the water in the Glance still stands about 30' below the 300' level to which I went down on the bucket accompanied by Ed Foy (brother of William).

The shaft is vertical and the timbers to the 300' level have been repaired and are in fairly good shape. On the 300' level we were only able to go a few feet from the shaft as both the east and

west drifts were completely caved, but I noted that the shaft pillars contained high grade sulphide and carbonate ore.

On the 160' level, the east drift had also been caved and no drifting seemed to have been done to the west which is in accord with the map.

One man (Foy's son-in-law, William Lott) was employed repairing the two old compressors in the engine room and it is also intended to repair the #7 Cameron Pump with which Foy plans to dewater the shaft below the 550' level. To dewater the shaft down to the 525' level, Foy still hopes -- as he has been hoping for some months past -- to secure the services of a contractor named Pfister who unwatered the Morgan Mine with a deep well (Peerless) pump and according to Foy the necessary pump rods have finally been obtained and the pumping should start any day. Unless the condition of the shaft timbers should prove to be much worse than anticipated Foy told me that they should have the mines dry to the 525' level very soon after August 1st, and then be able to pump out the lower levels with the Cameron in two or three weeks. If the Government money should run out before this work was completed, Foy assured me that Fields would advance whatever is necessary to complete the job.

I am very sorry that I cannot confirm these expectations to even a small degree for even neglecting the record for non-performance during the past year it is my opinion that: -

- (1) There is still much doubt as to whether Pfister will actually attempt to pump the shaft and complete uncertainty as to the time of starting.

- (2) Since the 525' level drains the Queen Mine as well as the Glance, the old workings above that level form a very large reservoir, and although I have no data which will permit accurate calculation, I have figured roughly that Pfister's pump could not possibly handle this water in less than 3 months of continuous work even if Foy is correct in saying that the mine makes less than 10 gallons per minute which does not agree with information from other sources.
- (3) I expect that broken timbers and caved ground are very likely to be encountered in the shaft and cause many delays and interruptions of the pumping.
- (4) I do not believe that the #7 Cameron Pump which weighs 2380 pounds can be handled with the present hoisting equipment nor that it can be run efficiently by the two old compressors, both of which must still be repaired and may lack parts that cannot readily be secured. In any event the efficient lift of a Cameron Sinking Pump is only 200' so that a station pump for which no provision seems to have been made will have to be installed on the 525' or 450' levels and by what means this is to be operated is a mystery.
- (5) I am very confident that the Government loan will not pay for this work and I have reason to believe that Howard Fields will not pay the additional expense.

To put the matter bluntly I could see no evidence that any serious attempt or even a practical plan had been made to unwater this shaft to date, and it does not appear to me that Foy's present program can have any chance of success.

As to what ore could actually be seen and sampled in the mine after it should be unwatered there is also much uncertainty and Foy is not nearly so optimistic as he was a year ago. He now admits that very little ore of even 4% grade was left in place in the old workings excepting on the 625' level and below where the development was conducted thru a winze which is probably caved. He now says that new ore must be found through further exploration in order to make this property attractive or permit production and he talks of conducting such work in various unspecified locations where his knowledge of the mine leads him to believe that ore exists. Concerning all details he is most secretive and admits that the lower workings may prove to be in such bad shape that a great deal of time and money will have to be spent on repairs before any such exploration can even be started.

COPPER KING MINE

A portion of the Government loan was expended in reconditioning the King Shaft and installing ladders so that for the first time I was able to go down this shaft to its bottom at the 330' level and to examine in company with William Lott practically all of the workings.

The King vein is in a fracture in the limestone and the vein and shaft dip 72° - 75° to the south. All of the work is in the hanging wall of the contact with the granite which contact has not been explored at this point, but Foy had expected that the Bureau of Mines would do some diamond drilling from the 330' level for this purpose. This drilling was not done and the Bureau of Mines have apparently no intention of doing it at any future time.

The 330' level extending east - west is very short as shown on the map and is all in lime with no visible sign of any ore.

On the 212' level there is a drift to the west from which a winze was sunk for perhaps 50' although it does not connect with the lower level as shown on the map. Above this drift from a short crosscut going south there is a raise which is open right up to the surface and connects with the stope above.

From both the winze and raise it is reported that some ore was mined containing rich zinc oxide, but the shoot must have been in the form of a small chimney for no such ore was noted in any part of this working which could be examined.

the 136' level was extended to the east and west. East of the shaft there was some stoping (not shown on the map) and a stringer of copper carbonate was noted in a crosscut, but would be much too narrow to mine. West of the shaft the level runs into the main stope which was largely mined out up to the surface except for some small sills and pillars and probably produced a good grade of copper ore, perhaps also some zinc.

Most of the stoping was done between the 86' level and the surface where east of the shaft some ore has been left in the back of the stope and below the open trench where the shoot was mined from the surface. Ladders and stulls have recently been put in this stope indicating an intention to do some mining, but such work would be expensive and the remaining tonnage of ore is very small.

West of the shaft the drift opens out into the open stope in which only a few pillars of ore have been left, but during the past year some portions of these pillars were mined out by open cuts from the surface

and 18 tons of sorted ore were shipped assaying 2 oz. silver and 12.45% copper. The cost of mining and shipping this lot ^{of} ore was about \$1500.00 which far exceeded its net value.

The small tonnage of ore remaining in the pillars and sills will probably average as per my samples and the record of shipment from 8% to 12% copper, but considering the excessive cost of mining it can be said that there is no pay ore developed in this mine. The exploration of the contact and further work to the east in the Copper Queen ground still appears to me to hold out attractive possibilities, but purely from the standpoint of a mining gamble which would hardly be justified at present considering the abnormally high cost of labor and the expense of drilling and similar operations.

No work has been done during the past year at any of the other mines of the Twin Buttes Company, and therefore their condition is the same as reported in May of 1942.

I learned, however, that Foy's Minnie Mine can now be examined to the bottom (325') level and Foy claims that in this mine there is a reserve of about 30,000 tons of 3% copper ore, very suitable for milling and which might be mined and shipped for treatment to the Eagle-Picher Mill, now building, but no profit from such ore could be anticipated unless a substantial extra bonus were paid for the copper. Apparently Foy is making no effort toward putting that mine in shape for operation.

The R.F.C. loaned Foy \$20,000 to recondition and develop the Contention (North Star) Zinc Mine and I understand that all of this money has been spent with very discouraging results. No work is now in progress at that property, but Foy claims that he will be able to make some shipments to the Eagle-Picher Mill after that starts operating in September or

October. Whether or not the Government will cooperate in that program seems questionable.

The exploration work conducted by the Bureau of Mines in this District has been entirely barren of results. At and near the Morgan Mine they failed to find any commercial body of scheelite ore but merely a few small stringers of low grade material.

The stripping of the overburden which was conducted with a bulldozer on the surface failed to find any outcrops of copper ore and the Bureau of Mines has refused to carry on any underground work or diamond drilling in the King. So far as I can learn they have no intention of doing anything further in that district.

CONCLUSION

To sum up the present situation I am regretfully obliged to inform you that absolutely no work which has been done during the past year has made any of your mines more attractive than they appeared in May of 1942, and the workings are no more accessible than they were at that time, except in the case of the Copper King where the showing is wholly negative.

Contrary to my expectation and to information received prior to this last visit I can see no reasonable prospect that the work of your leasers is likely to improve this situation at any time in the near future and further operations ^{under the present leases} would be saddled with the repayments of the R.F.C. loans which amount to \$8000.00 at the Morgan Mine and to \$9000.00 at the Glance and King. According to the terms on which these loans are granted all net returns, excluding the payment of royalty to the owners, must be applied by the operators to making repayments until the principal of the loans with accrued interest

at the rate of 6% per annum has been completed.

According to Foy a total of \$16,000.00 has been expended at the Glance and the King, -- about half of which was Government money and although he expresses his confidence that his program can be continued either through additional Government loans or with further financial assistance from Fields I must express my firm conviction that he will be disappointed in both of these expectations.

It is almost needless to say that all of the above tends to make the operation of these mines extremely unattractive to any outside capital and seriously handicaps any constructive program that might be devised. Foy expressed his willingness to consider any proposal to take over his lease that might be made to him either by the Twin Buttes Company or any other party, but I strongly suspect that he would demand a consideration that would make the proposition wholly unacceptable including his previous demand that he should be retained as manager with a salary and commission on the returns from shipments.

I took particular occasion to again discuss the situation at Twin Buttes with local officials of the A.S. and R. and the Eagle-Picher Companies, both of whom would be only too glad to cooperate in any plan that seemed good business for them. The A.S. and R. would like to see these mines producing smelting ore which they could treat at Hayden, the Eagle-Picher are looking for copper ore suitable for treatment in the mill which they are building at Sahaurita and they might take over and operate any mine which held a promise of producing such material.

It is my opinion that such ore exists in the Twin Buttes district in sufficient quantity to make an attractive proposition provided that

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the operators could draw this from the Morgan and Glance and also from the Queen and Minnie, which last two mines belong to Foy, and also provided that the War Production Board would agree to pay a special premium price for copper produced from these mines.

In this last connection I might mention that I have recently been successful in obtaining such a premium for ^{two} other mines one of which will receive 21.5¢ per pound, while the other will receive 24.7¢. I think that conditions at Twin Buttes would justify a price of at least 22¢ and that this might be obtained whenever there was a definite prospect that active mining would actually start.

As to the best means of breaking the present dead-lock and putting your company in a position to work out some definite plan of action without resorting to lengthy and expensive litigation I suggest that this is only likely to be accomplished if Howard Fields can be induced to cooperate. I intend to informally sound him out on this matter as quickly as possible. Foy has informed me that under the terms of his agreement with Fields, the latter has acquired an interest in the Queen and Minnie Mines and I think that Fields must appreciate that the present tactics are not going to get them anywhere at all and that his only chance of obtaining any return for his investment will lie in starting negotiations that will put some or all of these mines into active operation while the present war conditions prevail and that steps along these lines should be taken without further delay.

I shall do my best to help to work out some solution of this problem and will keep you fully advised of any progress that may be made.

Yours very truly,

S. M. Colvocoressy

J. J. [unclear]

Sierrita Mountains

The Sierrita Mountains consists of a roughly circular area of mountainous country about 7 miles in diameter. Adjacent to this area of the sierra type of topography are a number of hills and groups of hills, which are residual eminences above the pediments that surround the main mass. The highest peak rises about 2,500 feet above the upper part of the pediment. The mountain slopes are without forests.

According to Ransome, the Sierrita Mountains have an intrusive core of fine-grained biotite granite which forms the main mass. On the west the granite is intruded in a great series of schists with limestone lenses. This rock series, of undetermined age, rests unconformably on granite presumed to be pre-Cambrian. The foothills and much of the mountain pediment on the west side is underlain by these rocks. On the east side of the mountains the granite is intrusive into pre-Cambrian granite, Paleozoic limestone and quartzite, and a series of red and green shales and thin quartzites of presumed Mesozoic age. Andesite also occurs. An extensive pediment extends from the mountains eastward to Mineral Hill, Twin Buttes, and the Tinaja Hills. It is described by Ransome as follows:

For at least 5 or 6 miles from the mountain front this plain had in general a rock surface thinly covered here and there by alluvial detritus. The plain is not perfectly even but is trenched by shallow arroyos and is surmounted by clusters of conspicuous hills, some of which rise as much as 700 feet above its general surface.

MEMO RE: TWIN BUTTES PROPERTY

Attached hereto is a blueprint of the surface of the Copper King Mining Claim showing within the hatched area the small piece of ground the surface rights to which I understood to have been sold by the Twin Buttes Mining Company to Earl B. Rose on January 20, 1906, as per Quit-Claim Deed duly recorded in the records of Pima County, Arizona, in Book 39 of Deeds of Real Estate at page 230 thereof.

I am personally familiar with this piece of property which lies some distance south of the vein outcrop on the Copper King Claim and is located on a sandy flat, almost barren of vegetation, on which are located some old dwellings.

A dirt road runs near to the eastern boundary of this plot of land and a branch from this road runs close to its southern boundary.

Mr. Rose, or one of his successors in interest, had once erected here and for a time operated a small store housed in a frame building which had been abandoned many years ago and it was only because of the fact that Mrs. I. B. Rogers, the present claimant to this land, started to tear down the structure and move away the timbers that the ownership of the said plot of land was recently questioned since the present officials of the Twin Buttes Company seem to have known nothing whatever concerning the transaction mentioned above.

My investigation of the County Records disclosed the record of the sale in 1906 but in the official description of the property the location is erroneously recorded as being in "Township Eighteen (18) South, Range Thirteen (13) East" instead of in Range Twelve (12) East as shown on the map.

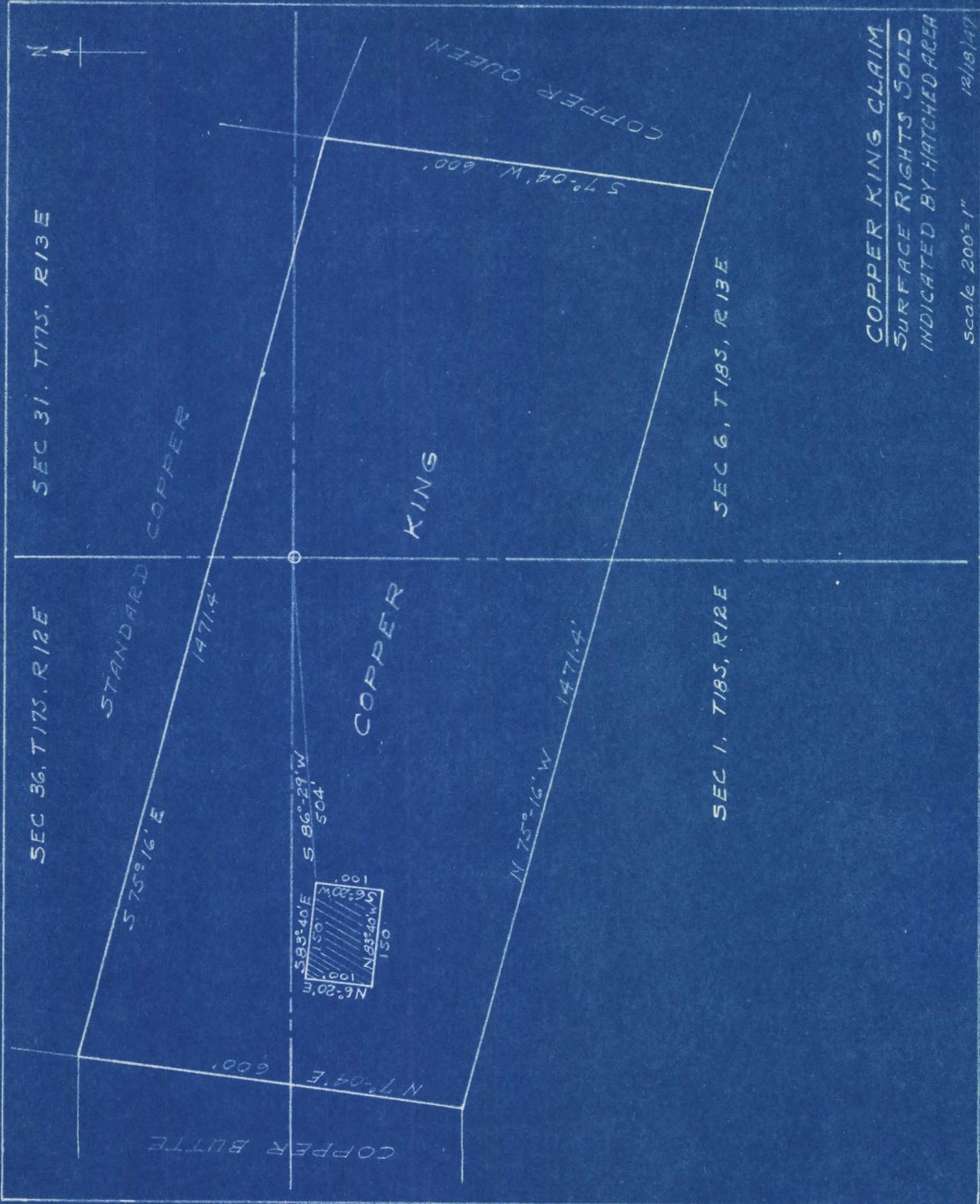
Apparently this error in the record was made in 1906 and was a mutual mistake between the seller and buyer and no correction of same has ever been made since both parties assumed that the transaction referred to the location shown on the map whereas the plot of ground as described in the deed would lie exactly six miles further to the east and to the best of my knowledge was never owned by the Twin Buttes Company nor occupied by Mr. Rose or his successors in interest.

If the present owner of the plot should so desire, it would doubtless be proper to take the necessary steps to correct the County Records or to execute a new deed with proper description, but otherwise it would seem as if this error in the recorded description, might simply be forgotten since once the store building is removed the land is probably quite worthless at present and likely to remain so in future.

Yours very truly,

S. M. Colverson
Representative of Twin Buttes
Mining and Smelting Company

GMC:IM



From The Miners Handbook, 1925 Edition

MIDLAND COPPER COMPANY.

ARIZONA

Office: Wm. Foy, treas.-gen. mgr., P. O. Box 1206 Tucson, Arizona

Mine Address: Twin Buttes, Arizona.

Officers: Jas. R. Ricketson, Pres.; S. L. Kingan, v.p.; G. H. Hughes, sec. Inc. 1917 in Arizona. Cap. \$2,000,000; \$5 par; 120,000 shares outstanding. Annual meeting in February. Property: the Queen group, 6 claims (1 patented), 120 acres, in the Twin Buttes district, Pima county, formerly owned by the Twin Buttes M. & S. Co. Silver-copper sulphide ore occurs in contact deposits between granite and limestone, which have been highly metamorphosed. Development: by 525' incline and 650' vertical shaft and 6,000' of workings. Equipment: 150-h. p. semi-Diesel engine, compressor and hoist. The Twin Buttes Ry. connects mine with the Southern Pacific, 9 miles distant. Production: To Dec. 31, 1922, totals 16,093 tons of ore, yielding 2,787,011 lb. copper and 32,809 oz. silver, with value of \$536,397. After an idleness of 2 years ending September 1922, operations were resumed and shipments started, 50 tons daily, August 1923. The shaft will be sunk to 800', and monthly production expected to average 1,500 tons assaying 7% copper and 2oz. silver per ton.

TWIN BUTTES MINING & SMELTING COMPANY

ARIZONA

Office: 77 Michigan St., Milwaukee, Wis. Mine office: Twin Buttes, Arizona.

Officers: W. A. Barber, pres.; Julius O. Frank and J. H. Tweedy, Jr., v.ps; John Mets, sec; Stephen Hoff, treas., with Ralph M Friend, G. P. Mayer, Fred Wilmanns, R. E. Hackett, and Henry Nunnemacher, directors.

Inc. Sept. 8, 1903, in Arizona. Cap. \$2,000,000; increased, 1905, from \$1,000,000 to \$1,250,000 and again increased, January 1910, to \$3,000,000; \$1 par; 2,000,000 shares outstanding. Capital reduced to \$1,880,000 in July, 1918. Controls the Twin Buttes Railroad Company Wisconsin Trust Company, transfer agent and registrar. Annual meeting, third Monday in February.

Property: At Twin Buttes, in Sierrita Mtns., Pima district, Pima County, 23 miles south of Tucson, originally including the Glance, Queen and Senator Morgan mines. The two first named were acquired by the Glance Mng. Co. (now dead) and Midland Copper Company (q.v.), respectively. Company also owns many other claims partly patented. Lands carry fissure veins in limestone and contact deposits having a limestone foot and granite-porphry hanging wall. The Senator Morgan, developed to the 900' level, is idle.

The Twin Buttes Railway, 10 miles in length, running from Twin Buttes to the S. P. (Nogales line), has 1 locomotive and 3 flat cars.

Geol of Ariz p 284

Sierrita Mountains--Mineral Hill--.

The Sierrita Mountains are a group of peaks and ridges of moderate elevation in the divide between Altar and Santa Cruz valleys, about 30 miles southwest of Tucson. Some data regarding their geology have been given by Ransome. He found that the area consists mainly of intrusive granite with sedimentary rocks and later eruptives on the flanks. On the east are gray limestones with quartzite, shale, and latered andesite rocks. The strata are faulted and considerably metamorphosed. On the west the rocks are prevailingly schistose, closely compressed, and regionally metamorphosed. They include rocks which were conglomerate, sandstone, "graywacke," shale, limestone, and contemporaneous rhyolite and tuff; they appear to be older than the beds on the east side, but their age is undetermined. The crest and higher slopes of the range, judging by their aspect from a distance and material in streams, consist of fine-grained biotite granite somewhat resembling quartz monzonite. The schist on the west side of the range rises in ridges and knobs and in it occur the mines of the Papago district, mainly in limestone, which constitute many bodies from a few feet to 100 feet thick and from 100 feet to more than a mile in length, apparently lenticular deposits. These limestones are considerably silicified. Next west are schists with a few thin beds of dark quartzite, with probably basal conglomerate, which make the ridge known as Hiram Mountain, on the west side of which is coarse granite of probable pre-Cambrian age. Ransome gives the following section:

On the east side of the mountain is a slope of fine-grained intrusive granitic rock, with limestone and interbedded quartzite appearing in Mineral Hill, Helmet Peak, and the hills near Twin Buttes. A few fossils from this limestone were determined by G. H. Girty as probable Pennsylvanian. A poorly preserved form which I found in limestone on the west slope was submitted to E. Kirk and determined as a probable *Camerotoechia* of Devonian age. About Mineral Hill and Twin Buttes is porphyritic intrusive granite, and west of Mineral Hill is a coarse, crumbling granite with diorite, thought to be pre-Cambrian. In Mineral Hill quartzite appears, and on the south side is limestone downfaulted and penetrated by granite. Between San Xavier Mine and Helmet Peak are red and green shales and hard, thin-bedded sandstone, probably Mesozoic (Lower Cretaceous) in age, in one place faulted against the limestone. West of this area is a rock locally regarded as rhyolite, but which may be an altered arkosic sandstone. Andesite occurs about the Prosperity and Paymaster mines, west of which is granite which may be pre-Cambrian.

Wald

Notes Re Twin Buttes from U. S. Geological Survey Bulletin No. 725

On page 425, Article by Ransome.

Mine was first developed by Twin Buttes Mining and Smelting Company starting in 1903. In 1905 a 26 mile railway line was built from Tucson to Twin Buttes Mine but part of this was later sold to Southern Pacific Railway.

In 1913 the company was shipping 1500 tons per month of copper-silver-lead ore to El Paso. This ore came from the Copper Glance, Copper Queen and Senator Morgan Mines. Copper Glance Mine was later sold to the Glance Mining Company and in 1913 E. G. Bush leased the Senator Morgan Mine and operating as the Midland Mining Company leased and perhaps purchased the Copper Queen Mine. The Glance and Queen were in operation in 1920 but not in 1922 and Ransome made no personal examination. Bush claimed that there was good ore left in the lower levels and that work would later be resumed. Some good ore was left in the bin at the Glance.

The Morgan and Minnie Mines had been idle since 1917 or '18. At the Glance there is a vertical shaft 625' deep sunk on the north slope of a low limestone hill near the contact with the Granite which underlies the plain north of the hill.

On the 35' level a crosscut connects through a raise with the bottom of the 500' Queen incline shaft which is similarly located in reference to another low limestone hill and to the granite. The limestone near the collar of the shaft is pretty well altered to a garnet rock and partly recrystallized as marble. Garnet is yellow-brown variety associated with magnetite. Some portions of the lime were more susceptible to garnetizing than other portions.

The ore consists of chalcopirite, pirite, sphalerite, magnetite,

chlorite, garnet and actinolite, all closely interwoven. The strike of the limestone beds is north 50 to 60° west and dips nearly vertical. The ore bodies lie along the bedding. On the dumps there is much granite with chalcopirite and ~~pyrite~~ ^{pyrite} and veinlets and probably there is also some galena.

The Senator Morgan Mine is on the northeast slope of a low ridge composed of epidote quartzites. The ore strikes along the ridge north 50 degrees west and dips 45 degrees to the southwest. The rock shows varying degrees of epidotization and with films of epidote in the joints of the rock. The formation is in thin beds and there is some shale. The epidote quartzite was probably once a calcareous sandstone. Northwest of the quartzite is a belt of calcareous shale and northeast of this is a belt of gray limestone probably of carboniferous age. The rock is much ^{alt} latered with masses of garnet and bunches of epidote. The ore soon outcrops strongly in this belt of ~~metamorphosed~~ limestone striking north 80 degrees west. There are many openings and one main shaft and later a new shaft was made by raising up from the ~~under~~ ground workings through the belt of shale which outcrops south of the ore. Some workings are said to have reached a depth of 900'.

The dumps at the old shaft shows material which represents products of contact metamorphism, namely ~~pyrite~~ ^{pyrite} and chalcopirite which are associated with magnetite also garnet and green amphibole. There is little granite on the dump or near the shaft and granite is to be noted in a ravine a few hundred yards northeast of the mine buildings and it is said that this formation was reached in the ~~underground~~ workings.

The deposit is the type characteristic of a contact metamorphic ore deposit and its formation was clearly the result of the intrusion

of granite into the limestone. On the lower levels of this mine the ore is reported to have been low grade with much pirite and magnetite. Not far from this property is the Esperanza Mine also the Plumed Knight once operated by the Pioneer Mining Company which had a small smelter.

Apparently there has been more intense mineralization on the east side of the Sierrita Mountains than on the west side where all of the deposits are irregular and variable in character and quality. There may be a good chance to find new bodies of copper and zinc ore and perhaps some silver-lead ore but none of the high grade deposits are likely to be large although there may be fairly large bodies of low grade material in their vicinity.

Fusion along contact + limestone foot of granite

roughly hanging wall

main fault ~ 25' high 9' seen also in 525' and

at 650' high (St. Louis)

roughly 450' 900'

Notes from conference with Simonton at Nogales

Simonton could find no maps or records. He was assayer and clerk at the Twin Buttes Mines for several years until late in 1927. He knows practically nothing of the Morgan Mine which produced comparatively low grade ore and had been worked out before his time but was favorably impressed by surface between Morgan and Gladstone. Nothing but little surface pockets of ore was ever found and mined in the north group of claims but recalls that at one time a leaser worked on the Dewey.(?).

The Central Group he knew very well and says that west of Minnie Shaft there is nothing of value. There is pretty surely some low grade ore left in the Minnie and in the Buttes Claim into which it has pitched, does not think it will carry over 4% but area should be developed.

Thinks well of the King where only one pocket of ore (good grade) was gouged out and no effort made to explore, work was carelessly done or good bet that ore was left along the contact where shaft went off in the footwall.

No extensive mining done in the Glance after 1920 although ore from the Queen was trammed over and hoisted up the Glance Shaft until the Queen was closed in '27. In '23 a little prospecting was done in the Glance with no good result and in the mine is definitely worked out of the high grade and low grade ore down to 3% limit down to the 600' level where the showing was smaller even smaller in the winze, so that it would never pay to attempt to recover this ore. Best showings near the Glance were to the east and toward the Bullion where nothing was found in the 500' shaft which was in line and did not reach the granite contact but if the Glance drifts should be extended some 200-300' further (beyond the little shoot of ore that was mined near a fault) he thinks that cross-cuts might find another good oreshoot but ground is heavy and faulted and drifts are likely to be in bad shape.

This is the most promising section of the property in Simonton's opinion but none too promising at that. The stope filling in the Glance is very low grade. It might be leached in place but pumping out the pregnant acid solutions would be expensive. None of the Glance ore was suitable for milling. It was nearly all carbonate. 5/21

3-Foy

nothing was found to west of the road.

At Morgan Mine the new shaft was about 30' lower than the old shaft which has now been opened up by Taylor.

There must have been quite an extensive layout before the shaft was burned, five concrete foundations and piers and big dumps but no ore in them.

Here the outcrop is all lime but going west toward old shaft iron oxide and then copper ore are noted along the contact and there is an open pit over the outcrop of the ore above the main stope and to the north of this is found the old "Whim Shaft" and a little tunnel (see map) which was apparently run to cut the ore in a footwall vein or stringer and from the dump I took a sample S M #10.

Cu = 4.12%

The main contact vein at this point dips 50° to the south and there is a lot of gossan and copper oxide and carbonate but all pay ore seems to have been well cleaned out for open cut is 20' deep and it is said that ore below this and above the 165' level was worked out from the Whim Shaft.

Several trenches and pits in the footwall show little or no ore and seem to have been run to explore little stringers and gash veins of no importance.

The end line between the King and Queen is only 15' east of the King Shaft and east of this on the Queen there is a good vein which has been mined out from the surface through an open cut but below this Foy claims that there is 400' of the contact which is still virgin ground and which he hopes to soon explore.

Most of the ore from the old open cut and the cut where the men are now working at depth of 30' and about 100' west of the King Shaft is malachite and brown oxide, very little silicate. Lots of hematite in with the ore and along the contact and the King shaft was sunk on

4-Foy

a cross fissure and from this shaft drifts and crosscuts will be run to explore the contact. 5/22

Examination of Morgan Mine

From old shaft, now reopened the drift runs N. 40° W. for some distance to the main stope (see map) but it is all in lime and there is no ore except for little stringers which branch off. Beyond stope drift runs northwest for long distance to new shaft where station is all caved. Dip of the vein on stope is 30° and strike S. 80° west and elsewhere dip 60° to south some 40 to 50 where the back looks pretty good but ore above is said to have been mined out from "Whim Shaft" or "~~Mule Shaft~~" by lessees. At one point there is a split vein with lots of specular hematite but only 18" to 2' of carbonate ore, main vein is 6-8' wide and more in places.

Sample S. M. #5 is from east end of big stope where vein has narrowed to 3½'.

Cu = 4.02

This sample #5 is from the footwall of main vein where the best ore shows up for a width of 3½' although the stope was 12' wide but balance appears to have been low grade.

Sample #6 is from hanging wall streak 3½' wide at some point as #5 and separated by 10' of low grade material.

Cu. = 1.50

Sample #7 is taken at west end of stope on foot wall 3' wide and about 80' west of samples 5 and 6.

Cu = 7.04

Tony says that he once sampled all the ore in this stope and some samples ran 8% copper but average was only a little over 3% and values were very erratic. The reject ore on a part of the dump supposed to have come from these workings ran 2.8% copper.

5-Foy

Sample #8 was taken from the same hanging wall streak of ore as #6 and for a width of 32". This was cut in a cross cut 30' west of the main stope. This stringer does not appear to have been mined to any extent but seems to pinch out going west. $Cu = 2.71$

Course of west (new) drift from shaft (from which took tungsten samples from quartz vein) is S. 45 W. for 100 then S. 30° W. for 60' and then due west for 90'.

Esperanza Mine

Said to have produced some very high grade ore and Tony Zamborine who owns a part interest claims that a lot of ore is left there and that one diamond drill hole showed a 12' width of vein that assayed \$8.00. Mine is now under option to some California people represented by Miller and they are no good.

In Bullion Shaft on 300' level a crosscut hit a good strong vein but without copper values and Tony thinks that they will have to go deeper to find the ore.

About 400' N. 80° W. from Morgan Shaft there is a pit in garnet rock but no ore shows on the dump. It is under the area that Taylor thinks that prospecting should be done from the ^{300'} 600' level which extends out in this direction and from which there are no drill holes or cross-cuts into the walls.

Sample S. M. #9 is grab from dump at another shaft which is quite a bit north of the pit last mentioned and seems to be on the contact, it bears N. 65° west from shaft.

Cu.- 10.06%

West of the North Star Mine there is a shaft on the "Garnet Group" belonging to ^{by Monahan} Manghan. A little zinc was found here.

The North Star (Deception) is sunk in a kind of garnet rock which resembles a gabbro. Shaft has depth of 150' but is now only opened

6-Foy

to 100' level on which there is a drift which opens up a short shoot of ore 18' wide with some copper and high zinc values. The zinc content of the ore increased on the lower level.

The ore is all sulfide and would probably be suitable for selective flotation but tonnage is probably small. Foy expects to secure a Government loan to develop and operate the mine which is now equipped with a pump and engine and a hand windless hoist.

Esperanza

Tony owns 20% interest and the other 80% is owned by I. C. Elston of Paul H. Dans and Company, 10 South La Salle St, Chicago, but they will not work the mine and no maps are now available. The shaft opened up the property to the 200' level when plenty of good copper ore could be seen and some very high grade and in a winze the ore ran 8% copper, 16% lead and 14% zinc with \$2.50 in gold and 20 oz silver (Think that this must have been a picked sample).

Some ore was shipped to the Trench Mill of A. S. & R. at Patagonia. Tonnage in mine very uncertain but Tony naturally thinks that it will be large.

Mineral Hill Mine (Plumed Knight)

Located 2-2½ miles from Helmet Peak which bears S. 50° E. while Empire Zinc Mine (San Xavier) bears S. 20° west.

Noted several shafts mostly vertical. No usable equipment and ladders dangerous.

Dumps indicate very extensive workings in various kinds of rocks including limestone, granite, schist and quartzite but not much ore noted although Tony claims that a portion of the dump which he sampled ran over 3% copper.

Another shaft with a big dump lies to the east 500' and another south of these about 700' both of which visited. A shaft (probably

7-Foy

on the Plumed Knight Claims) was noted 2500' to southeast of first shaft and a shaft with very big dump was/ located on the hill to north of shafts visited some 500' and probably this was the main working.

Seems as if there must be a series of veins or lenses probably dipping to the north but surface showings give practically no information.

Re. Ings

TWIN BUTTES

Glance

Notes from files of A. S. & R.

Copper Glance Shaft, depth 625' vertical and water stands at 385'.

Makes 12,000 gallons water per day, nearly 100 gallons per minute.

Only usable equipment is 310 cu. ft. C. P. compressor and #7 Cameron pump.

Foy claims that there is still a lot of pay ore left in the mine (as of March 1941) which would average 6.5% Cu and 2.00 oz. Ag per ton. (Present gross value would be \$23.50 per ton).

He estimates that it would take \$15,000 to unwater, retimber and equip the mine and that operating costs on production of 1000 tons per month would then be:

My estimate:

Mining	3.00
Haul to R.R.	0.50
Freight	
to Hayden	1.40
Smelting	2.50

7.40

S. M. C. Estimate

3.50 (with development)

0.50 (was 0.75)

1.40 (?)

3.50 (?)

Freight .10 to .20
on water
Royalty 1.20 to 1.50

10.20 to 10.70

Ownership of Claims and History.

See typed sheets (attached) December 2, 1940, pages 2, 3, 4, and 5.

D

Twin Buttes Notes Re: Foy

Quotation from Foy's letter to Hackett about May 10th, 1942

Copy
"If I fail to produce marketable ore within a reasonable time I will surrender the property without fanfare or legal expense and with great gusto."

Foy says that below the 400' level in the Glance Mine there are 100,000 tons of ore that will go 3% copper including the winze which is sunk in ore below the 650' level.

Copy
At Morgan Mine Taylor thinks that much of the copper ore will carry up to 0.5% WO_3 but my sample will tell the story. *Actual 1.04%*

On 650' level there is a long drift to the west from which cross-cuts should be run to catch the ore which outcrops in the pits along the contact. This ground has never been explored.

Samples

0.2%
T. B. #5-picked ~~ore~~ from dump at Bullion Shaft

~~Cu = 11.56%~~

4.4%
At Bullion there is very little ore to be noted in the dump as shaft seems to have been sunk in quartzite and very silicious limestone, some jasper. Probably this shaft was sunk in the hanging wall and Simonton says that it never reached the contact where work should be done but not from this shaft.

4.4%
Some 400' to west of this shaft there are a number of shallow pits and tunnels in line but there is very little ore on the dumps and pits seems to have been sunk on a fracture which runs S. 55° E. from the Glance Shaft and in line with the Queen Shaft. The main contact seems to run S. 80° E. The last 400' along the fracture approaching the Glance Shaft shows pits from which better ore was put on the dumps from two of which I took sample T. B. #6

Cu = 17.10%

2-Foy

Simonton thinks that all this area should be more thoroughly prospected in depth as new shoots of ore might be found there and it is here that Foy plans to carry on development work from the Gance Shaft. Aside from this possibility it would seem that the only high grade ore is likely to be found in the pillars around the shaft and between the levels and the tonnage would probably be small.

Aneacid Reading	Tucson 3100	Elevation	2300	(?)
"	"	Morgan Mine	4100	3
				23000

Re: North Group of Claims 5/23

Pits 700' east of road from which the Queen Shaft bears S. 10° W. and Gance Shaft due south (almost 600') distant are located on west and northwest slope of hill in line with little fractures in which small veins of copper carbonates are noted.

From this peak another hill lies across the road 2500' to west with shaft on east side and a twin peaked hill lies 3500' to the east. On this last peak and across a fence there are three shafts in very coarsely crystalline limestone with very poor showings of copper. About 1000' west and north of these there are pits on a ridge which connects the main hills and from these (about 5000' distant) the Gance Shaft bears S. 20° W and the Queen S. 35° W. and the shaft with shack on west of road is some 3500-4000' distant and bears N. 80° W.

Along this ridge and the south slope of the first hill east of the road there are several pits and a couple of adit tunnels of no interest but near west end of ridge and at 1500' southeast from pits first described there is a heavy dyke of diabase and garnet rock with deeper shafts and a fair showing of copper carbonates and this appears to be close to the granite contact and according to Foy the granite was encountered at a shallow depth and no quantity of ore was ever found. Last showing might be attractive to a leaser. Foy says that

T. B. #4 is grab from better grade ore on dumps along the open cut and small pile of ore which men have recently mined.

Cu = 8.75%

~~Zn~~

The Bullion Claim east of the Glance should be visited also the north group of claims although it is said by all that they are worthless.

A good claim map of the entire Pinal Mining District can be obtained from the T. L. Stevens in the Southern Arizona Bank Building. Large map \$10.00 and small one which should be sufficient for about \$1.50.

At left of left branch of road to Morgan Mine there is a shaft known as the Rossi or Marconi in which there is lead, zinc ore but only 4' wide.

may still be descended.

Shaft inclines to South 75 degrees and the headframe is good.

Sample T. B. 3 is grab from dump presumably rather low grade ore.

Cu = 3.22%
Zn.

It is reported that some low grade ore is still left in the Minnie and especially in the Copper Buttes into which claim the shoot has already raked on the 100' level. Just across the line on the Butte Claim are two shafts one vertical and one inclined, in one of these the ladders are still good. More pits are found going east with outcrops showing some good copper ore and south of these is a vertical shaft with no ore on dump. North of the outcrops and some 1000' from the Minnie Shaft there is an old shaft in the granite. ^{Butte Gap} The outcrops and pits continue to the east at intervals but some distance south of the shaft.

The Queen Shaft is an incline badly caved around the collar. Dump show mostly lime but some ore shows along the outcrops. The buildings, ^{bins,} trestle, etc, could be repaired but repairs to shaft would be very costly.

The King Shaft is an incline in fair condition and on the east side there is an open cut, stope following the view up the hill from 50 to 150' from the shaft. Here there are small pillars of rich carbonate ore but vein is only 2-4' wide. ^{lyph}

West of the shaft there is another open-cut in which Foy's men are now working and mining a little ore with handsteel from pillars and ends fold stope about 100' west of shaft and at depth of 20'.

A windless/ will be used to hoist this ore which looks to be rich but vein is usually not more than 2' wide. Some ore can doubtless be taken from this section and going east to the Queen Claims. Sample

Shippers	#Copper	Value Cu @ 20.	Value Ag.	Total value
Twin Buttes Co. 06-12 Glance Morgan Minnie Queen	5,500,000	\$5,000	\$35,000	\$1,100,000
Bush-Baxter Lease 13-17	9,400,000	20,000	60,000	2,100,000
Midland Co. 18-26 Queen Glance	12,200,000	4,000	80,000	1,050,000
Buttes Co. (29)	330,000		3,000	60,000

See Arizona B. of M. Bulletin #140 *p*

Midland Co. and Bush and Baxter 17-26

Costs: Mining 59,952 tons - 112,005.43

42,738.82

Total per pound of copper \$0.79904 and profit with copper at

13.8% equals \$0.058374

Queen Shaft (incline @ 72°)

1st level @	148' vertical
2nd "	287
3rd "	388
4th "	418
5th "	
6th "	511
7th #	572
8th "	650
9th "	700

A drift in the 7th level connects with the 525' level from the Glance Shaft.

Glance Shaft 625' vertical $1\frac{1}{2}$ compartment and from lowest level (625') and 80' winze in ore. Closed since 1919 and most of production from 200-625' level. Production from 08 to 13 smelted in blast furnace of Pioneer Smelter 1.5 miles west of Sahuarita. From 08 to 19 mined and produced 124,032 net tons with 4.81% H₂O and 118,066 dry tons

Ag. 2.3 and 6.72% of Cu.

Costs of mining and Development	627,601.92
Overhead and taxes	119,756.10
Twin Buttes R. R.	150,078.72
Total costs per lb. Cu -	.136296 and operating profit
was \$612,447.50.	

The Copper Buttes adjoins the Minnie on the east and on this claim there is a 300' shaft (vertical depth 258' in which some oxidized zinc ore was found. The lower workings of this mine are in granite and they could be worked from the 325' level of Foy's Minnie Mine. Foy thinks well of the possibilities of this property.

The Glance Mine was examined in 1914 by J. Kruttschnitt of A. S. & R. when there was an inclined shaft 400' deep in which he found a good vein 8' wide and recommended that the A. S. & R. should negotiate for bond and lease which they did on July 31, 1915. Gordon Hardy of A. S. & R. examined and confirmed Kruttschnitt's opinion and they tried to make a purchase of all Twin Buttes property through Sidney Lementhal ^{ewen} who held option but deal fell through because they could not secure cooperation of bond-holders.

Bush started shipments in '16 at rate of about 1500 tons per month running 6. to 8 % Cu. Krutt's sample on 300' level in hanging wall limestone for a substantial width Au 0.02, Ag 0.3, Cu 1.01%. On west

7-



Cu. 90% (minimum deduction 8#, Max. 20#) @ market less 2.5¢
Smelting charge \$2.50 base, now 3.50.

Net payments for ore with 2 oz. Ag and 6.00% Cu would be

Ag.	\$1.04	
Cu.	15.66	(108# @ 14.5¢)
	<hr/>	
	16.70	
Less charges	10.20	
	<hr/>	
Net profit to shipper	\$6.50	or \$7.70 if shipped by owners.

If we could feel certain that even as little as 3000 tons of this grade of ore were left in the portions of the Glance that would be made accessible by retimbering etc. the profit on shipment of this ore would be \$23,100 and should thus amply repay the expense which should not exceed \$20,000.

Richard believed that the mine could probably be reopened and operated with profit at any time that the price of copper exceeded 15¢/

Production of various mines was as follows:

Senator Morgan 1906-13 shipped 132,502 dry

tons (H₂O was 3.8%)

Cu 5.92% - 1,568,823 #

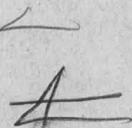
Ag - 254,404 oz.

Cost of copper \$0.13791

Handwritten calculation:
132,502 / 100 = 1325.02
1325.02 * 10 = 13250.2
13250.2 * 10 = 132502

Mine worked out to 400 except for very low grade ore

		Dry tons	Ag. oz.	Cu %
- Glance	08-19	118,066	2.3	6.72
7 Minnie	14-18	62,477	1.8	4.71
Midland Co.	23-26	59,952	2.0	6.55
Queen	17-20	15,234	2.15	9.15



AL

255,729

255,729

with net earnings \$1661,424.59

132,502

388,231

his contract of January 17th, 1938, it may be difficult to refute this statement. Also there might be a question as to when the price of copper was actually advanced above 13.5¢ for while the Government advised that the bonus price of 17¢ would be effective from Feb. 1st 1942, the smelters were not in a position to guarantee to pay that price until some time in March or April and Foy claims that since then he has worked his 100 shifts per month although it does not appear that the 3 men whom I saw working at the King on May 8th and 9th could have started more than two or three days previously. Foy claims that he has a party who had promised to put up \$15,000 to reopen the Glance and that he showed the offer to Hackett and more recently he says that this party will agree to raise \$25,000 and that he can sue for damages if this deal is spoiled by unjust claims of the Twin Buttes Company. Foy's lawyer is Tom Ritchie (?)

Unless lease to Midland Company provided that maps and records should be delivered Twin Buttes Company upon termination of the contract we would have no right to claim them at present.

Mineral Hill including Plumed Knight Group formerly comprised 55 claims but now about 40 claims or 600 acres.

Some high grade sections of the veins carry 10% to 12% Cu. Percy B. Butler was associated with the development of this mine which is 8 miles from the railroad.

For information re Mineral Hill write to E. B. Reeser, Pres. Barnsdall, Corporation, Petroleum Building, Tulsa, Oklahoma.

West of end of King Claim and at junction with Copper Buttes is in limestone formation and no contact is noted, nor can any contact be seen along the Butte Claim to the west end when it joins the Minnie but there are veins in the lime in which some very good but narrow showings of copper are noted especially throughout the last 300' going west to the Minnie shaft which is still in very good shape and according to Foy

December 30, 1947

Twin Buttes Mining & Smelting Company
Room 1112
229 East Wisconsin Avenue
Milwaukee 2, Wisconsin

ATTENTION: Mrs. H. B. Dreyer, Secretary

RE: Twin Buttes

Dear Mrs. Dreyer:

I have to acknowledge your two letters of December 5 and 23rd and in reference to the former, I hope that the directors of the company will have had an opportunity to consider the proposed assignment of the Fields lease to the Allision Steel Company and also the proposed lease of the Senator Morgan and Northern Group.

I have not yet been able to collect the November royalty from Allision Steel Company and presume they are holding back because I have not been able to assure them that the directors of the company will approve of the documents mentioned above.

In reference to the surface rights which were sold from the Copper King Claim as per Quit-Claim Deed which you forwarded to me with your letter of December 23, it appears that the description of this property was accurately copied in my office and actually is in error as will be noted from the attached blueprint with memo of which I am sending you two copies while returning the certified copy of the Quit-Claim Deed.

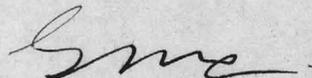
Since the successors to Mr. Rose have undoubtedly acquired some sort of an easement on the property shown on the blueprint and only the surface rights to this plot of land have any value whatever, I hope that we can get by in our transaction with the Allision Steel and Empire Zinc without being obliged to go to any further trouble or expense in correcting the error in the County Records.

I am today sending copy of the blueprint and memo to the Allision Steel people and will advise you further in respect to their reaction.

With personal regards and wishing to all officials of the Twin Buttes Company a very happy and prosperous New Year, I remain,

Yours very truly,

GMC:IM
Enclosures



December 31, 1947

Mr. Charles G. Berls
Allison Steel Company
Post Office Box 2151
Phoenix, Arizona

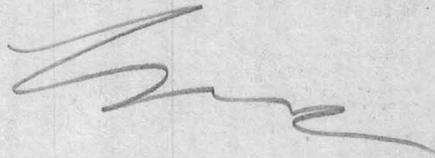
Twin Buttes

Dear Mr. Berls:

Thank you for the enclosed check but, as you will note, you have described it as representing the rent for December, 1947, payable to the Twin Buttes Mining and Smelting Company whereas actually it should have been marked as rent or royalty for November, 1947. I am sending it back to you so that the correction can be made and take this opportunity to renew my wishes to you and your company for a very happy and prosperous New Year.

Sincerely,

GMC:IM
Enclosure



ALLISON STEEL MANUFACTURING COMPANY
JOBBER, FABRICATORS AND ERECTORS

MILD STEEL
STRUCTURAL STEEL
REINFORCING STEEL
BODY STEEL
CRUCIBLE DRILL STEEL
MORSE TWIST DRILLS
THOR-COCHISE DRILLS
UNION WIRE ROPE
BOLTS - - NUTS

ARIZONA DISTRIBUTORS
FENESTRA STEEL SASH • WAYNE ALL-STEEL BUSES • GAR WOOD HOISTS

19TH AVENUE AND SOUTHERN PACIFIC TRACKS
P. O. BOX 2151 PHONE 3-5161

PHOENIX, ARIZONA

December 30, 1947

DUMP BODIES
TRUCK BODIES
TRAILERS
LOGGING TRAILERS
SPRINGS
HARDWOODS
GRADER BLADES
METAL AWNINGS
FIRE ESCAPES

A. 12/31/47

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

Dear Sir:

I am enclosing our check in the sum of \$150 covering
December rental on the Twin Buttes properties which we
have under lease.

Very truly yours,

ALLISON STEEL MANUFACTURING COMPANY

By: *Charles G. Berls*
Charles G. Berls
Accounting Department

C
G
B
.
s
e
f
Enc.



SEC 31, T17S, R13E

SEC 36, T17S, R12E

SEC 6, T18S, R13E

SEC 1, T18S, R12E

STANDARD COPPER

COPPER KING

COPPER QUEEN

COPPER BUTTE

S 75° 16' E

1471.4'

N 75° 16' W

1471.4'

S 7° 04' W 600'

600'

N 7° 04' E

S 86° 29' W
504'



COPPER KING CLAIM
SURFACE RIGHTS SOLD
INDICATED BY HATCHED AREA

Scale 200' = 1"

12/18/47

R
1112, 229 E. Wis. Ave.
Milwaukee 2, Wis.
Dec. 23, 1947.

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona.

R 12/30 47

Dear Mr. Colvocoresses:

I have your letter of December 19, 1947, relating to the description in the quit claim deed to Earl B. Rose from the Twin Buttes Company.

Rather than copy the description in full as it appears in the deed, I decided to send on the certified copy of the deed. This will give you all the information first-hand. When the deed has served your purpose, please return it for my files.

Thank you for your holiday greetings. Wishing you a very Merry Christmas and a Happy New Year, I am,

Yours very truly,

H. B. Dreyer
Sey.

enc: Deed

December 29, 1947

Mr. Charles G. Berls
Allision Steel Manufacturing Company
Post Office Box 2151
Phoenix, Arizona

RE: Twin Buttes

Dear Mr. Berls:

Referring to our previous telephone conversations and letter to you from Mr. Merz dated December 12 of which you sent me a copy, I have carefully checked the description of the land sold by the Twin Buttes Company to Mr. Rose, and the certified copy of the description does not agree with its actual location as the same has been occupied by Mr. Rose and his successors ever since 1906.

This situation will be explained by the enclosed blueprint and the memo which is attached to same and under the circumstances I do not believe that anything would be gained by attempting to correct the error at this late date; however I am enclosing an extra copy of this letter and map which you will doubtless wish to forward to Mr. Merz so that he can draw his own conclusion.

Wishing you all a happy and prosperous New Year.

Yours very truly,

GMC:IM

PS Will you please forward without delay check for \$150.00 covering the royalty due for the month of November. You will recall that we had considerable trouble in obtaining prompt payment from Fields but I felt confident that your company would live up to the obligation and meet these payments by the 20th of the next succeeding month.

COPY

December 12, 1947

Mr. Charles G. Berls
Allison Steel Manufacturing Company
Phoenix, Arizona

Dear Charlie:

I have just re-read the Twin Buttes Group lease of 1945 to Howard Fields, and read the assignment of that lease to Allison Steel, and the Morgan and McKinley leases to Allison Steel. The new material is being copied and will be sent to our New York office at once.

Three questions arise from the Twin Buttes lease assignment. Exactly what ground on the King claim is excluded and to whom and for what purpose has it been leased? A complete description of the ground with relation to section corners was given on page 2, but we have no map showing section corners in the district to which both claims and the ground in question can be tied.

Time will be saved if you will send me an oriented sketch, drawn to any convenient indicated scale, showing the Copper King Claim and the area excluded.

Best regards,

(s) "Andy"
A. Merz, Jr.

AM:ejc

ALLISON STEEL MANUFACTURING COMPANY
JOBBER. FABRICATORS AND ERECTORS

MILD STEEL
STRUCTURAL STEEL
REINFORCING STEEL
BODY STEEL
CRUCIBLE DRILL STEEL
MORSE TWIST DRILLS
THOR-COCHISE DRILLS
UNION WIRE ROPE
BOLTS - - NUTS

ARIZONA DISTRIBUTORS
FENESTRA STEEL SASH • WAYNE ALL-STEEL BUSES • GAR WOOD HOISTS
19TH AVENUE AND SOUTHERN PACIFIC TRACKS
P. O. BOX 2151 PHONE 3-5161
PHOENIX, ARIZONA
December 16, 1947

DUMP BODIES
TRUCK BODIES
TRAILERS
LOGGING TRAILERS
SPRINGS
HARDWOODS
GRADER BLADES
METAL AWNINGS
FIRE ESCAPES

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

Dear Sir:

I am inclosing copy of a letter received today from Mr. Merz of the Empire Zinc Company. Can you answer the three questions that he brings out so that I can send this data back to him at once.

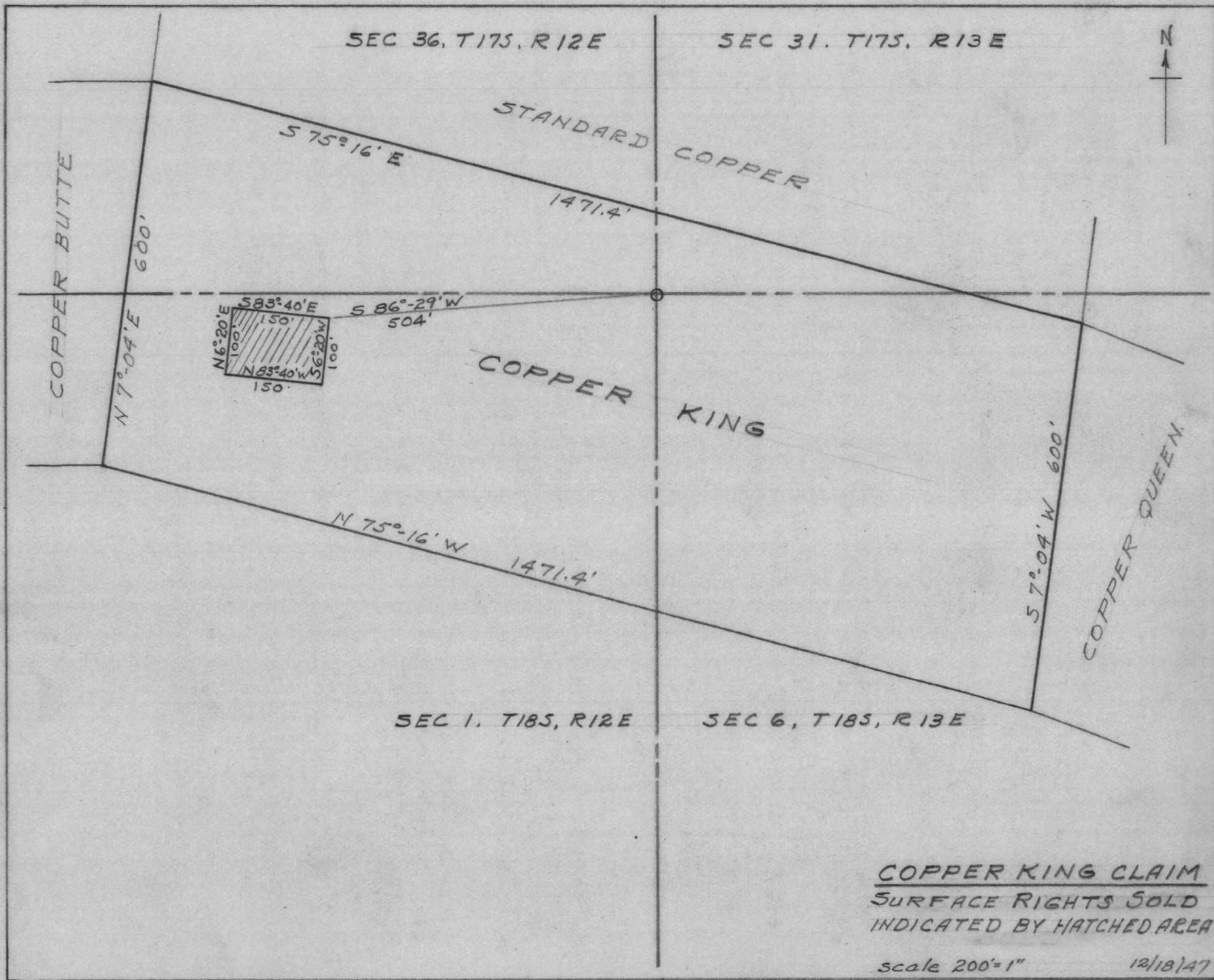
Very truly yours,

ALLISON STEEL MANUFACTURING COMPANY

By: *Charles G. Berls*
Charles G. Berls

CGB/bl

Enc.



SEC 36, T17S, R12E

SEC 31, T17S, R13E

STANDARD COPPER

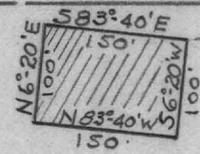
S 75°-16' E

1471.4'

COPPER BUTTE

600'

N 7°-04' E



S 86°-29' W

504'

COPPER KING

KING

N 75°-16' W

1471.4'

57°-04' W 600'

COPPER QUEEN

SEC 1, T18S, R12E

SEC 6, T18S, R13E

COPPER KING CLAIM
 SURFACE RIGHTS SOLD
 INDICATED BY HATCHED AREA

scale 200'=1"

12/18/47

MEMO RE: TWIN BUTTES PROPERTY

Attached hereto is a blueprint of the surface of the Copper King Mining Claim showing within the hatched area the small piece of ground the surface rights to which I understood to have been sold by the Twin Buttes Mining Company to Earl B. Rose on January 20, 1906, as per Quit-Claim Deed duly recorded in the records of Pima County, Arizona, in Book 39 of Deeds of Real Estate at page 230 thereof.

I am personally familiar with this piece of property which lies some distance south of the vein outcrop on the Copper King Claim and is located on a sandy flat, almost barren of vegetation, on which are located some old dwellings.

A dirt road runs near to the eastern boundary of this plot of land and a branch from this road runs close to its southern boundary.

Mr. Rose, or one of his successors in interest, had once erected here and for a time operated a small store housed in a frame building which had been abandoned many years ago and it was only because of the fact that Mrs. I. B. Rogers, the present claimant to this land, started to tear down the structure and move away the timbers that the ownership of the said plot of land was recently questioned since the present officials of the Twin Buttes Company seem to have known nothing whatever concerning the transaction mentioned above.

My investigation of the County Records disclosed the record of the sale in 1906 but in the official description of the property the location is erroneously recorded as being in "Township Eighteen (18) South, Range Thirteen (13) East" instead of in "Range Twelve (12) East" as shown on the map.

Apparently this error in the record was made in 1906 and was a mutual mistake between the seller and buyer and no correction of same has ever been made since both parties assumed that the transaction referred to the location shown on the map whereas the plot of ground as described in the deed would lie exactly six miles further to the east and to the best of my knowledge was never owned by the Twin Buttes Company nor occupied by Mr. Rose or his successors in interest.

If the present owner of the plot should so desire, it would doubtless be proper to take the necessary steps to correct the County Records or to execute a new deed with proper description, but otherwise it would seem as if this error in the recorded description, might simply be forgotten since once the store building is removed the land is probably quite worthless at present and likely to remain so in future.

Yours very truly,

S. M. Colbourne

Representative of Twin Buttes
Mining and Smelting Company

GMC:IM

Milwaukee, Wis.
December 5, 1947.

Mr. George M. Colvocoresses,
1102 Luhrs Tower
Phoenix, Arizona.

A 12/30

Dear Mr. Colvocoresses:

This will acknowledge receipt of your
November 19, 1947 letter with the enclosures.
We have applied the \$450.00 payment as per agreement, -
namely rental due for the months of July, August,
September and October.

47

Just as soon as your time permits, please
draft whatever documents are necessary to complete the
assignment to Allison Steel Company and forward them
to us and we will attend to the execution thereof and
get them back to you.

Thank you for all the attention you have
given this matter.

Yours very truly,

H. B. Dreyer

Secretary

TWIN BUTTES MINING & SMELTING CO.

December 19, 1947

Twin Buttes Mining and Smelting Company
Room 1112
229 East Wisconsin Avenue
Milwaukee 2, Wisconsin

ATTENTION: Mrs. H. B. Dreyer

RE: Twin Buttes

Dear Mrs. Dreyer:

Sometime ago I sent you the certified copy of the Quit-Claim Deed given to Earl B. Rose by Twin Buttes Company on January 20, 1906, and describing the surface rights of a certain area of a certain portion of the Copper King Claim which had been deeded to Mr. Rose at that time.

The officials of Empire Zinc Company, through the Allison Steel people, have requested me to send them a drawing showing this area since it is now to be excluded from the lease which they expect to take over from Howard Fields.

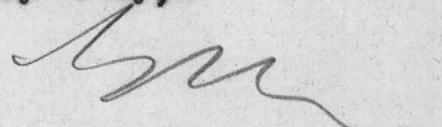
In preparing this drawing, it has been noted that the description of the property states as follows: "Commencing at the northeast corner of Section one (1) Township eighteen (18) south, Range thirteen (13) east in said county. . . ." According to the survey map of the claims, the land which your company sold was in Range twelve (12) east instead of in Range thirteen (13) and the company never owned any property which would correspond to the description and be six (6) miles to the east of the area which is now claimed by Mrs. Rogers.

Will you please check on the certified copy of the deed which I sent you, as it is possible that a typographical error may have been made in copying this deed in my office, and if the reference is actually to Range twelve (12) instead of thirteen (13), I must make corrections accordingly in correspondence with Allison Steel Company and Empire Zinc Company.

If by chance the description of the sold property is actually in error as recorded in Tucson, then the entire affair seems to be pretty well complicated and it is fortunate that the property which we believed to have been sold to Mr. Rose has practically no value, but the situation should none-the-less be straightened out as soon as possible.

Wishing you and other officials of the Twin Buttes Company all the compliments of the approaching holiday season and a very happy and prosperous New Year.

Yours very truly,



GMC:IM

Tom Bar

229 E. Wisconsin Ave.
Milwaukee 2, Wis.
Oct. 2, 1947.

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona.

Dear Mr. Colvocoresses:

As requested in your recent letter, this is

Mr. Rogers address:

Mrs. Isabel Baxter Rogers
University Beauty Shop
929 E. 3rd St.
Tucson, Arizona.

The above is the only address I have in the file.

Yours very truly,

H. B. Dreyer
Secretary
TWIN BUTTES MINING & SMELTING CO.

Twin Butte & Rose (5) (6)
Copper King Claim

Quit Claim Deed. This Indenture made the 20th day of January in the year of our Lord one thousand nine hundred and six, (1906) between the Twin Buttes Mining & Smelting Company (a corporation) the party of the first part, and Earl B. Rose the party of the second part, Witnesseth: That the said party of the first part, for and in consideration of the sum of Five Dollars of the United States of America, to it in hand paid by the said party of the second part, the receipt whereof is hereby confessed and acknowledged, has remised, released and quitclaimed, and by these presents does convey, remise, release and quitclaim unto the said party of the second part, and to his heirs and assigns forever, all the right, title, interest, claim and demand which the said party of the first part has in and to the following described real estate and property situated in the County of Pima and Territory of Arizona, to-wit:

Commencing at the northeast corner of section one (1) Township Eighteen (18) South, Range ^{Twelve} Thirteen ⁽¹²⁾ east in said County, thence south eighty-six degrees (86°) twenty-nine minutes (29') west five hundred and four (504) feet to the northeast corner of the lot hereby conveyed, thence south, west six degrees (6°) twenty minutes (20') one hundred (100) feet, thence west, north eighty-three degrees (83°) and forty minutes (40') one hundred and fifty (150) feet; thence north-east six degrees (6°) and twenty minutes (20') one hundred (100) feet; thence east - south eighty-three degrees (83°) and forty minutes (40') one hundred and fifty (150) feet to the northeast corner of said lot.

It is expressly understood and agreed that the party of the first part hereby reserves from this grant unto itself all mining and mining rights in and to said real estate and all ores, minerals & deposits whatsoever beneath the surface of the ground thereon as well as the right to mine and extract the same, intending hereby only to grant surface rights in and upon the real estate above described; provided however that in mining said ores, minerals & deposits it shall not disturb or damage the improvements, buildings or structures thereon situate.

To have and to hold the same, together with all and singular the appurtenances and privileges thereunto belonging, or in anywise appertaining, and all the estate, right, title, interest and claim whatsoever, of the said party of the first part, either in law or equity, in possession or expectancy, to the only proper use, benefit and behoof of the said party of the second part, his heirs and assigns, forever.

In Witness Whereof, the said party of the first part has hereunto affixed its seal and caused these presents to be subscribed by its president and secretary, the day and year first above written.

Signed and delivered) The Twin Buttes Mining & Smelting Company
in the presence of) By David S. Rose President
H. J. Blakeley Secretary

(SEAL)

Territory of Arizona)
County of Pima) ss

Before me E. W. Graves a Notary Public in and for the County of Pima, Territory of Arizona, on this day personally appeared David S. Rose as president & H. J. Blakeley as secretary of The Twin Buttes Mining & Smelting Co. & known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they executed the same for the purposes and consideration therein expressed for and in behalf of said corporation.

Given under my hand and seal of office, this 20th day of January A.D. 1906.

My commission expires Aug. 15-1907

E. W. Graves
Notary Public

Filed & Recorded at request of H. J. Blakeley, Feby 7, 1906 at 11:05 AM

Chas. A. Shibell
County Recorder

STATE OF ARIZONA,)
County of Pima.) ss.

I, Anna Sullinger, County Recorder in and for the County of Pima, State of Arizona, do hereby certify that the above and foregoing is a full, true and correct copy of Quit Claim Deed from the Twin Buttes Mining & Smelting Company (a corporation) to Earl B. Rose, dated January 20, 1906, and filed February 7, 1906, at 11:05 AM as appears of record in my office in Book 39 of Deeds of Real Estate, at page 230 thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in Tucson, Arizona, this 11th day of September, 1947.
Anna Sullinger, County Recorder,
By Mary T. Bustamante Deputy

April 13, 1948

Mr. J. H. Hedges, Chief
Tucson Branch, Mining Division
Southwest Experiment Station
Box 4097, University Station
Tucson, Arizona

RE: Twin Buttes

Dear Mr. Hedges:

Thanks for your letter of April 8 in reply to mine of March 30 and enclosing prints showing the results of the recent geological and geophysical studies of the Twin Buttes District. These are very interesting and will no doubt be helpful when exploration and development work on the property is actually resumed and I trust that such activity will be commenced in the near future.

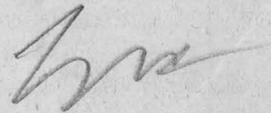
It is interesting to me to note that an area which is apparently favorable for future prospects is found to the south of the King Shaft as this particular portion of our property always seemed to me to be especially favorable for the occurrence of some additional bodies of pay ore, and I hope that its future exploration will bear out this opinion.

I note that the texts of the reports made by the Bureau of Mines can be consulted by authorized persons at your office in Tucson and Mr. Berls has already examined this text and others representing the company or the lessees may perhaps do so at a later date.

Thank you for your consideration.

Yours very truly,

GMC:IM



No. 132 Co.

Phoenix, Arizona,
May 11 1942.

CHAS. A. DIEHL

ARIZONA ASSAY OFFICE

Phone 3-4001

815 315 North First Street

P. O. Box 1148

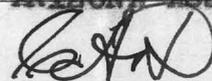
This Certifies That samples submitted for assay by **Mr. G. M. Colvocoresses**

contain as follows per ton of 2000 lbs. Avoir.

MARKS	SILVER		VALUE (Oz.)	GOLD		VALUE (Oz.)	TOTAL VALUE	PERCENTAGE			REMARKS
	Ounces	Tenths		Ounces	Hundths		Of Gold and Silver				
No. T.B.A. #1								Copper			
No. T.B.A. #2								5.43			
No. T.B.A. #3								3.52			
No. T.B.A. #4								3.22			
								8.75			

Charges \$ 4.00

Assayer ARIZONA ASSAY OFFICE.



No. 133 Co.

Phoenix, Arizona,

CHAS. A. DIEHL

May 26 1942

ARIZONA ASSAY OFFICE

Phone 3-4001

815 315 North First Street

P. O. Box 1148

This Certifies That samples submitted for assay by **Mr. G. M. Colvocoresses.**

contain as follows per ton of 2000 lbs. Avair.

MARKS	SILVER		VALUE (Oz.)	GOLD		VALUE (Oz.)	TOTAL VALUE Of Gold and Silver	PERCENTAGE		REMARKS
	Ounces	Tenths		Ounces	Hundths			Copper	%	
No.5 T.B.								11.56		
No.6 T.B.								17.10		
No.5 S.M.								4.02		
No.6 S.M.								1.50		
No.7 S.M.								7.04		
No.8 S.M.								2.71		
No.9 S.M.								10.06		
No.10 S.M.								4.12		
Compo(5 to 10 S.M.)		.8								.04

Charges \$ 12.00

Assayer ARIZONA ASSAY OFFICE.

Chas. A. Diehl

RE TAXES & ASSESSMENT

United Verde Tax Bill, excluding Federal Taxes and property Tax for last year was \$192,000 on production of 67,000,000# Cu @ \$0.00286 per # Cu.

1943 production to end of August 47,557,238#

Taxes are segregated as follows:

Sales Tax to State	0.001	per lb. cu.
Soc. Security & Unemp.	<u>.00186</u>	
Total	.00286	" " "

The assessment for ^{an} June 1st, 1943 was as follows:

Value of producing Mine	11,463,031
Value of other property, (plant, equipment)	<u>3,109,079</u>
Total	14,572,120

We contend that the total value of the producing mine with operative equipment, plant, etc. should be only \$7,094,340 which might be segregated into mine alone \$3,985,261
plant, etc. 3,109,079
\$7,094,340

Taxes on annual net earning ore about as follows:

Arizona State Income	5%
Federal " "	40%
" Excess Profits	<u>5%</u>
	50% of profits

Taxes per lb. of Cu. produced.

State real & personal	\$0.004
" Sales Tax	.001
Soc. Security & Unemployment	<u>.002</u>
Total	.007

200
200
200
200

2000

200
200
200

2000

Irwin Butts

Legal files

2000

2000

2000

2000

2000

2000

2000

2000

2000

2000

No. 131 Co.

Phoenix, Arizona,

May 5 1942.

CHAS. A. DIEHL

ARIZONA ASSAY OFFICE

Phone 3-4001

815315 North First Street

P. O. Box 1148

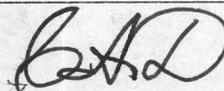
This Certificate That samples submitted for assay by Mr. G. M. Colvocoresses.

contain as follows per ton of 2000 lbs. Avoir.

MARKS	SILVER		VALUE (Oz.)	GOLD		VALUE (Oz.)	TOTAL VALUE Of Gold and Silver	PERCENTAGE			REMARKS	
	Ounces	Tenths		Ounces	Hundredths			%W03.	%Cu.	%Zn.		
S. M. No. 1.								.08	} fine in hand. at large			
No. 2.								.16				
" No. 3.								.08	} fine at large			
" No. 4.								Trace.		3.72	.40	- large dup

Charges \$ 15.00

Assayer ARIZONA ASSAY OFFICE.



No. 132 Co.

Phoenix, Arizona,
May 11 1942.

CHAS. A. DIEHL

ARIZONA ASSAY OFFICE

Phone 3-4001

815 315 North First Street

P. O. Box 1148

This Certifies That samples submitted for assay by Mr. G. M. Colvocoresses

contain as follows per ton of 2000 lbs. Avoir.

MARKS	SILVER		VALUE (Oz.)	GOLD		VALUE (Oz.)	TOTAL VALUE Of Gold and Silver	PERCENTAGE		REMARKS
	Ounces	Tenths		Ounces	Handths			%		
No. T.B.A. #1								5.43		Copper Come to your camp. from " " " ? - Ring for cut.
No. T.B.A. #2							3.52			
No. T.B.A. #3							3.22			
No. T.B.A. #4							8.75			

Jim Butler

Charges \$ 4.00

Assayer ARIZONA ASSAY OFFICE.



No. 133 Co.

Phoenix, Arizona,

CHAS. A. DIEHL

May 26 1942

ARIZONA ASSAY OFFICE

Phone 3-4001

315 North First Street

P. O. Box 1148

This Certifies That samples submitted for assay by **Mr. G. M. Colvocoresses.**

contain as follows per ton of 2000 lbs. Avoir.

MARKS	SILVER		VALUE (Oz.)	GOLD		VALUE (Oz.)	TOTAL VALUE Of Gold and Silver	PERCENTAGE		REMARKS
	Ounces	Tenths		Ounces	Hundredths			%	%	
No. 5 T.B.								11.56	Copper	
No. 6 T.B.								17.10		
No. 5 S.M.								4.02		<i>ft mill 47</i>
No. 6 S.M.								1.50		<i>2 " 50</i>
No. 7 S.M.								7.04		<i>ft " "</i>
No. 8 S.M.								2.71		<i>2 " "</i>
No. 9 S.M.								10.06		<i>put in of bag 1000 new section</i>
No. 10 S.M.								4.12		<i>dup of silver bag</i>
Compo (5 to 10 S.M.)										<i>.04 = .08</i>

Value 6.56

Charges \$ 12.00

Assayer ARIZONA ASSAY OFFICE.

[Signature]

MAY 7, 1942

'Miracle' Lamp Is Minerals Locator

Article Published In "The Arizona Daily Star", Tucson, Arizona,
February 8th, 1945. By William R. Mathews.

VAST UNTAPPED COPPER LODES NEAR TUCSON, EXPERT BELIEVES

Joralemon Feels Region Between Old Helvetia Mine
Site & Twin Buttes Holds Rich Veins of Vital Metals.

There is a big undiscovered copper mine within 30 miles of Tucson. No, it is not in the mountains to the north, east or west of the city. It lies deep underground south of Tucson. The Nogales highway probably passes over a part of this ore body; the Santa Cruz River may flow above it; its surface may be covered by the cotton fields between Sahuarita and Continental.

Exact Site Uncertain.

The exact location of this mine cannot be determined by present day mining men but some day scientists will find a way to locate such an ore body exactly. Draw a line from the old Helvetia Mines in the Santa Rita Mts., across the Santa Cruz Valley to the old mineral workings at Twin Buttes. Somewhere along that line, deep below the present surface of the earth, lies this possible ore body.

One of the world's ablest, busiest and most highly respected geologists, Ira B. Joralemon, described this possibility to me while he and Mrs. Joralemon. were resting in Tucson a few weeks ago. Joralemon has taken an active part in the mining development of Arizona and Mexico. His professional abilities played an indispensable part in the development of the geology of the New Cornelia Mine at Ajo. He was one of John Greenway's right-hand men and also did considerable work in connection with the old Calumet and Arizona (now the Phelps Dodge) workings in lower Bisbee.

Expert Also is Author.

Joralemon is the author of the book, "The Romance of Copper". In this book he has described the development of copper from antiquity down through those buccaneering days in Butte and the strenuous days of 30 and 40 years ago when Bill Greene, General Greenway, Dr. Ricketts and Dr. Mills were in their prime. He sees the search for copper as a great romance. He recognizes the need for great and romantic characters, men who will take big chances, and who are not afraid to lose fortunes in the search for bigger ones. He also sees the need for the more studious men, the scientists who discover the secrets of geology, metallurgy, mineralogy and new mining methods.

Joralemon insists that the Romans had a way of finding copper which is not known today. As proof he cites how in Spain, in the absence of surface indications, they invariably sunk shafts that intercepted ore bodies. He would like to know how they did it. Those shafts are still visible. He has seen them.

We were talking about the ore body that Magma is now exploring near Mammoth, 40 miles north of Tucson, and the prospects of other new developments in the state, when he declared, "I am confident that there is another big copper mine within 30 miles of Tucson."

It was then that he explained that he thought the mineral outcroppings at the Helvetia Mine on one side of the Santa Cruz Valley and the Twin Buttes Mines on the other side indicate the existence of a large main ore body lying between these two points. As a geologist he said he thought these outcroppings had to originate from a much larger mineralized area.

He cautioned, however, that this main ore body might be very deep underground.

"Some day," he said, "we shall learn how to locate it and mine it."

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He cautioned, however, that this main ore body might be very deep underground.

"Some day," he said, "we shall learn how to locate it and mine it."

NOTE FOR TWIN BUTTES FILE

Shipments by Foy from Contention Mine in 1944, 1111.22 tons plus with value of \$3709.19 paid to shipper from which 334 tons of concentrate were produced.

In 1945, 2,238.77 tons of ore from which 414.76 tons of concentrates were produced. Paid to shipper \$8622.83.

Twin Buttes Maps in Folder

- B Patent Survey of Senator Morgan Group
- C " " " Copper Prince, North Group
- D " " " Senator Stewart " "
- E " " " other claims " "
- F " " " claims in Central Group
- A Property Map of all claims (small scale)
- G Section Map of all mine workings in Central Group

Duplicates of above in Blue Print Roll

Heavy Roll

- Surface and underground plan of Morgan Mine
- Surface contours Morgan with section of Minnie on back
- Plan of Morgan levels with drill holes
- Only if value of mine is to be reopened

Small Roll of tracing made in 1907 to 1910

Section of Morgan Mine with geology and plans of various levels from 200 (probably 165') to 900 which seems to show that there was some fairly good ore along the 200' level and from there down to the 400' but below that point very little ore was found except in one short section.

It is a question if the mining of the remaining ore would repay the cost of reopening to the 400' level for while it seems that some of this ore might carry up to 4% copper the bulk of it is likely to run only between 2% and 3% which would not pay to mine and ship.

Examine as completely as for a ton or more.

GERALD JONES
ARCHIE R. CONNER
CHARLES E. CONNER

CONNER & JONES
ATTORNEYS AT LAW
P. O. BOX 310
303-6 VALLEY NATIONAL BUILDING
TUCSON, ARIZONA

January 23, 1945

A 1/25
48

Mr. G. M. Colvocoresses
Mining and Metallurgical Engineer
1102 Luhrs Tower
Phoenix, Arizona

Re: Twin Buttes

Dear Mr. Colvocoresses:

We have yours of the 22nd and enclose herewith copy of quit-claim deed, notice of surrender, and notice of non-liability.

We thought it best to refer to the Twin Buttes Mining and Smelting Company as an Arizona corporation in formal parts of the paper rather than giving its Milwaukee address. This, of course, does not apply to the notice, which properly could be addressed to the company at Milwaukee.

We also do not think that a quit-claim deed should be executed in duplicate and made that change; also we refer to the book and page where the agreement with Foy was recorded.

Your notice of non-liability I think would serve the purpose intended, but the statute does say that the notice should contain a statement that the owner will not be liable for any liens, etc. The legal effect of your language is that it will not be liable but we always put in our notices the statutory language.

For your convenience in carrying out the procedure outlined in the statute we enclose herewith copy of Section 62-210, of the Arizona 1939 Code. There is an Arizona case holding that unless there is strict compliance with the statute, the notices are no good.

We understand from your letter that you will be here shortly, so we will hold the original of these papers awaiting your arrival.

(6) I personally have examined the records, found no liens against Foy and am satisfied that the execution of these papers by Foy and his wife will accomplish the purpose desired. I might say that, strangely enough, no one is sure of Mrs. Foy's first name. Consequently I have to leave it blank. It can, of course, be filled in when the papers are executed.

Yours very truly,
CONNER & JONES

By

Gerald Jones

GJ:ah
Enclosures

GERALD JONES
ARCHIE R. CONNER
CHARLES E. CONNER

CONNER & JONES
ATTORNEYS AT LAW
P. O. BOX 310
303-6 VALLEY NATIONAL BUILDING
TUCSON, ARIZONA

January 24, 1945

A 1/25
4/5

Mr. G. M. Colvocoresses
Mining and Metallurgical Engineer
1102 Luhrs Tower
Phoenix, Arizona

Re: Twin Buttes

Dear Mr. Colvocoresses:

Upon more careful study of the notice of non-liability, I believe it would be better to change the wording and also the method of signing.

The statute requires that the owner must post the notice on or before the day the lessee begins operations. Accordingly I have re-drawn the notice and I believe in this new form it will best serve your purpose.

Yours very truly,

CONNER & JONES

By

Gerald Jones

GJ:ah
Enclosure

Copy letter on separate letter

January 25th, 1945

Messrs. Conner and Jones
Attorneys at Law
P. O. Box 310
Tucson, Arizona

Re: Twin Buttes

Gentlemen:

I acknowledge your two letters of January 23rd and 24th, with which you enclosed the revised and amended copies of the proposed Surrender of the Lease, Quit-Claim Deed, and Non-Liability Notice. I thank you very much indeed for having examined this matter and corrected the documents, and copies of those which you sent me will be prepared for execution.

I was pleased to note that after having examined the County Records you found no liens against Foy or the property and I am now awaiting the return of the Contract of Lease and Option which I forwarded to Milwaukee for execution by the officers of the Twin Buttes Company.

Should these documents arrive by Monday, the 29th of this month, I shall endeavor to arrange for a meeting at Tucson with Fields and Frawley, also Foy, on the 30th or 31st of this month. I will advise you in advance which date is agreed upon, or whether the meeting will have to be postponed.

I will call at your office promptly after arriving in Tucson to discuss these matters with you briefly in person.

With personal regards.

Yours very truly,



GMC/b

June 6th, 1945

Mr. William B. Gohring
Supervising Engineer, R.F.C.
Heard Building
Phoenix, Arizona

Re: Twin Buttes

Dear Gohring:

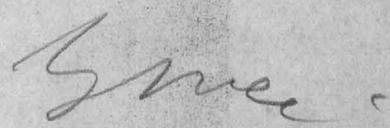
Referring to our conversation of this morning I send you as promised a copy of the Surrender of the Lease and Option granted to William Foy on certain claims of the Twin Buttes Mining and Smelting Company.

(e)

You will notice that in this instrument no reference whatever is made to any previous assignment of the lease, although according to your records Foy had made such an assignment or transfer on July 15th, 1942. If any such transfer or assignment was made I am certain that the officials of the Twin Buttes Mining Company had no notice thereof and had never given any consent, although after going over the provisions of the lease, dated June 17th, 1938 I do not find that there was any specific restriction placed on the lessee in the event that he wished to make such an assignment or transfer.

Trusting that the above will give you the information you desired, and with many thanks for the help which you extended to me, I remain

Yours very truly,



GMC/b
Enclosure 1

QUIT-CLAIM DEED

THIS INDENTURE, made this 1st day of February, 1945,
between WILLIAM FOY and Irene FOY, his wife, first parties,
and TWIN BUTTES MINING & SMELTING COMPANY, an Arizona Corporation,
second party, WITNESSETH:

That the said first parties for and in consideration of the
sum of One Dollar (\$1.00) to them in hand paid by the said second
party, the receipt whereof is hereby confessed and acknowledged,
have remised, released and quit-claimed, and by these presents do
convey, remise, release and quit-claim unto the said second party
and to its successors and assigns forever, all the right, title,
interest, claim and demand which the said first parties have in and
to the following described patented lode mining claims, situate in
the Pima Mining District, Pima County, Arizona, to wit:

Copper Glance	Patent No. 2643
Copper Bullion	Patent No. 2643
Copper King	Patent No. 2643
Copper Butte	Patent No. 2643

and also the right to use water from the Gladstone Mining Claim in
the same district; which said claims are mentioned and described in
a certain Mining Lease, dated June 17th, 1938, between the Grantee
herein, as Lessor and Optionor, and the Grantor herein, William Foy,
as Lessee and Optionee and in a supplementary agreement of same date
covering the right to use water from the Gladstone Claim, the same
being recorded in the office of the Pima County Recorder, in Book 10
of Leases, Page 57.

TO HAVE AND TO HOLD the same, together with all and singular
the appurtenances and privileges thereunto belonging, or in anywise
appertaining, and all the estate, right, title, interest and claim
whatsoever, of the undersigned lessee, either in law or equity, in
possession or expectancy to the proper use, benefit and behoof of the
said second party, its successors and assigns forever.

IN WITNESS WHEREOF, the said first parties have executed this
Quit-Claim Deed as of the day and year hereinbefore written.

/s/ William F. Foy

/s/ Irene Foy

STATE OF ARIZONA)
) SS
COUNTY OF PIMA)

On this 6th day of February, 1945, before me the under-
signed officer, personally appeared William Foy and Irene Foy,
his wife, known to me to be the persons whose names are subscribed to
the within instrument and acknowledged to me that they executed the
same for the purpose therein contained.

IN WITNESS WHEREOF, I have hereunto set my hand and official
seal.

/s/ R. E. Sanderson

Notary Public

My Commission expires
June 14th, 1946

1945 FEB 10 10 45 AM

My commission expires

1945 FEB 10 10 45 AM

1945

IN WILMINGTON DELAWARE

... ..

... ..

...

...

... ..

... ..

... ..

Anna Sullinger
Recorder, Pima County

Book 34 MINE DEEDS
Page 397

February 7th, 9:47 A.M. 1945

Fee \$1.75
G. M. Colvocoresses

2123

... ..

NOTES REGARDING TWIN BUTTES

Records which I obtained from the office of the company and from other parties show that the shipments from the various mines were as listed below:

	<u>Tons</u>	<u>Grade in Copper</u>
<u>Senator Morgan</u> - 1908 - 13 -	132,502-----	5.92 %
After 1913, some work by leasers, no record		
<u>Copper King</u> -----	Not Recorded	---- 8.00 (about)
<u>Copper Queen</u> (now owned by Foy) ---	75,186 -----	8.00 (about)
<u>Copper Glance</u> -----	118,066	6.72
	325,754	
<u>Other Mines</u> -----	62,477	
 Total Smelter Records ---	 388,231	

Records are not complete as much ore was mined and shipped by leasers.

An average analysis of this ore is given as follows, but it may be only approximate:

AVERAGE ANALYSIS OF TWIN BUTTES ORE AS PER SMELTER RECORDS

Au-----	0.05	oz. per ton
Ag-----	2.00	" " "
Cu-----	6.50	% about (nearly all carbonates some glance)
Pb-----	0.70	%
Zn-----	0.80	%
Mn-----	0.30	%
Fe-----	32.00	% (largely sulphide)
S-----	23.00	%
Si O ₂ -----	20.00	%
Ca O-----	5.00	%
Al ₂ O ₃ -----	1.50	%
	89.80	% Plus 10.2% combined H ₂ O and Oxygen

The statement is made that nearly all the copper contained in the ore was oxidized and mostly in the form of carbonates, although a certain amount of chalcotite was also contained in the shipments, and much of the iron was in the form of sulphide, as can be judged from the analysis given above.

It is stated that a certain amount of zinc oxide was mined at the Copper King, but I could find very little of this material left in place when I examined that mine down to the

One Hundred Thirty-sixth ^{shipped} foot level. In the Copper King there was considerable evidence that substantial quantities of copper carbonates had been mined, mainly above the eighty-sixth foot level, and some work was recently done by leasers, who worked down from the surface and showed a little ore, if any - about two ounces of silver and 12 percent copper. Some of this material is still left in place but the ~~ab~~straction would be expensive.

Foy told me his Minnie Mine, down to the three-hundred twenty-five foot level contained 30,000 tons of sulphide copper ore which would be suitable for milling. I understood that the grade was about three percent copper.

From the dump at the Gance Mine I took some samples showing copper carbonates, which varied in grade from 3.5% up to as much as 17 percent copper. I was informed that at this mine the gob that was filled into the old stopes would probably carry on the average two percent copper and might be leached in place, since it was stated that the mine made as much as 100 gallons per minute of water.

In the workings of the Morgan Mine I took samples which ranged from 1 1/2 percent to 7 percent copper, and on the dump some picked samples ran around 4 percent and also showed a small percentage of zinc and a little silver. I am under the impression from what I saw and from various statements that a considerable tonnage of 3 percent copper ore is left in this mine, practically all oxidized.

At the Gladstone Mine there was some narrow veins of high-grade ore carrying up to 10 percent copper, but I judge from information received and from my own inspection, that the tonnage of such material is very limited.

No estimate of tonnage on the various dumps was made by me, but I should think that the dumps at the Gance and Morgan might contain a total of from 30,000 to 40,000 tons and that the average content would be likely to exceed 1 percent copper and might perhaps approach 2 percent. The ore in these dumps could doubtless be leached in place without any very large expenditure for initial investment. Similar procedure could perhaps be applied to ore left in the upper levels of these two mines and also in some of the other workings, but the initial expense would be substantial.

G.M.C. 7/2. 48

File Twin Buttes

April 3, 1950

Mr. Howard H. Fields
Carbo, Sonora
Mexico

Dear Mr. Fields:

In reference to your letter of March 20th, I offer the following.

My father's files on the Twin Buttes properties are quite voluminous, and I have not attempted to examine each item in detail. I have, however, checked over the documents relative to the Senator Morgan since receiving your letter.

Data on the Morgan consists of two sets of maps dated 1907 and 1912 respectively, and a good deal of written matter on the property. The maps are apparently complete sets showing level plans through the 600' level and cross sections of the principal shaft (1 to 900' level) and stopping areas. These maps include geology (with ore references) and diamond drill holes, but there are no assay maps included. Written material includes a complete report of the Twin Buttes properties made by Father in 1942 and which includes a good deal of data on the Morgan. Dad was in on the 162' level and was able to take several samples. Letters and informal reports subsequent to that date cover the work done in 1943 by Mr. Taylor with the aid of RFC loans. The above material includes a good deal of history of the property, records of production and estimates of the property's potentialities, based on available data. To anyone taking an interest in the Twin Buttes properties, the above mentioned data is of unquestionable value.

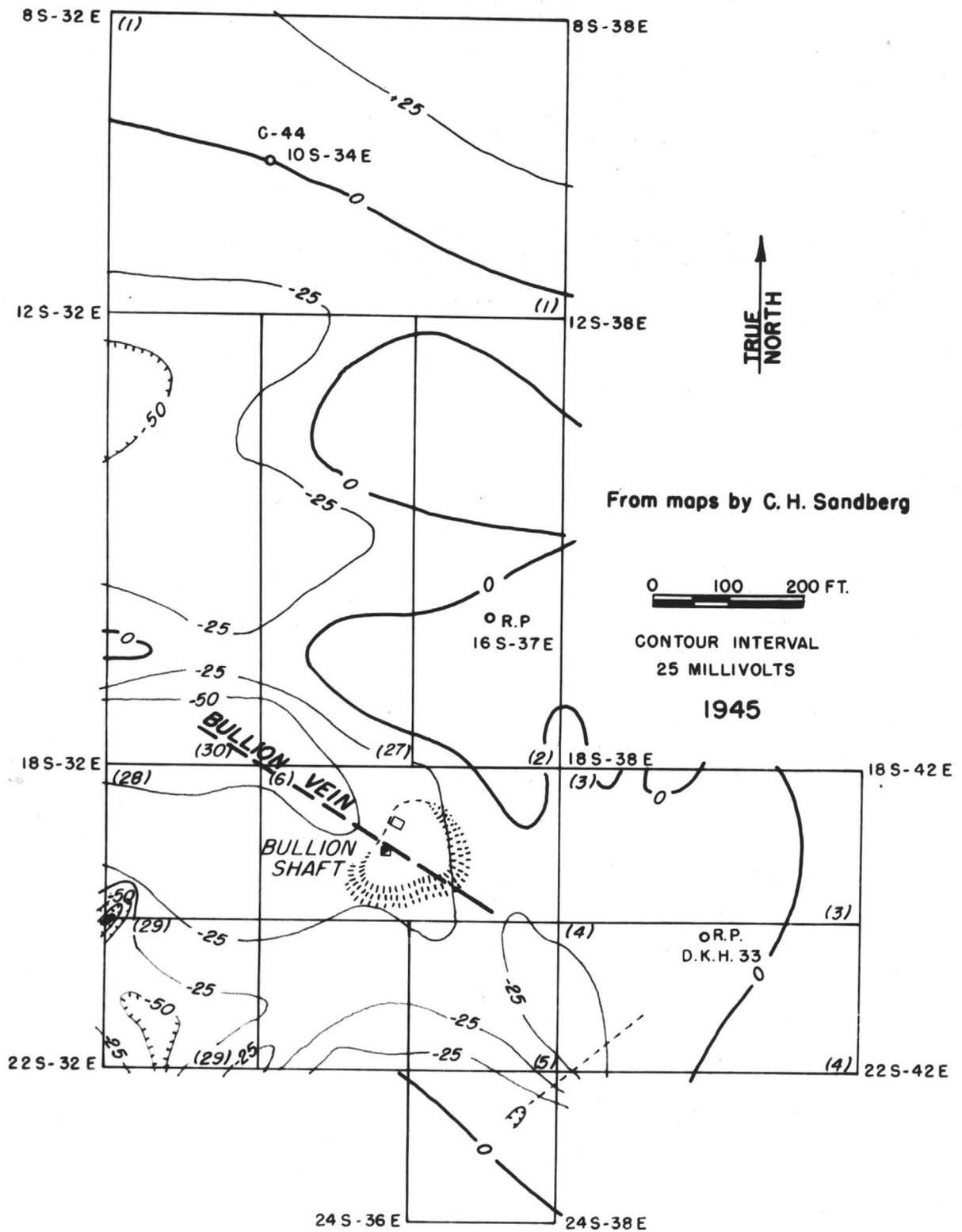
The maintaining and handling of the large amount of data that I have on mines in Arizona and vicinity requires considerable work and expense on my part, and it is, of course, a business proposition.

I will gladly furnish you with copies of the above mentioned maps relative to the Senator Morgan (8 in number) and with a copy of those sections of my father's reports, letters and other data relative to this mine. My charge for this service is \$100.00. Should this arrangement be acceptable to you, please so notify me and I will immediately start completion of the data involved.

Very truly yours,

Alden P. Colvocoresses

APC/kc



NATURAL-POTENTIAL MAP OF BULLION SHAFT AREA

FIG. II-TWIN BUTTES PROJECT 1412, PIMA COUNTY, ARIZONA

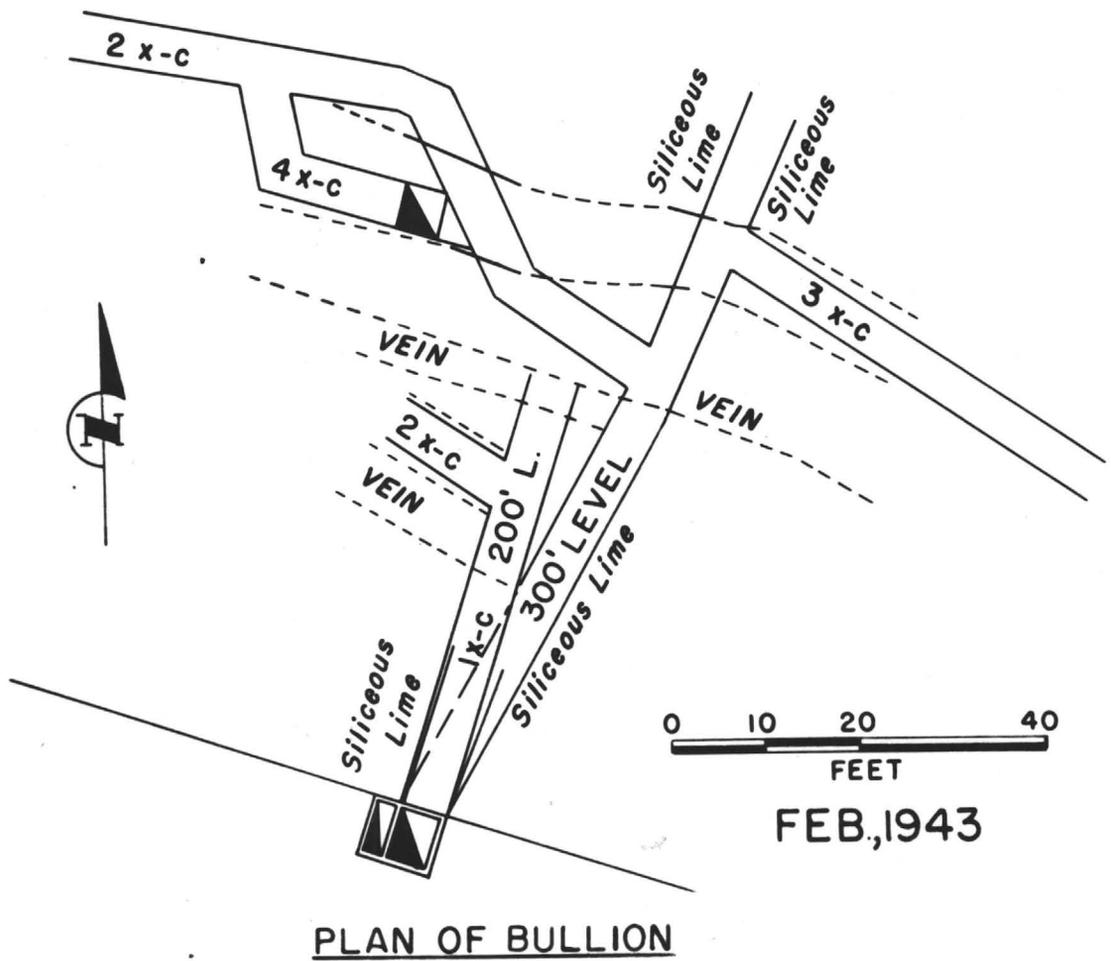
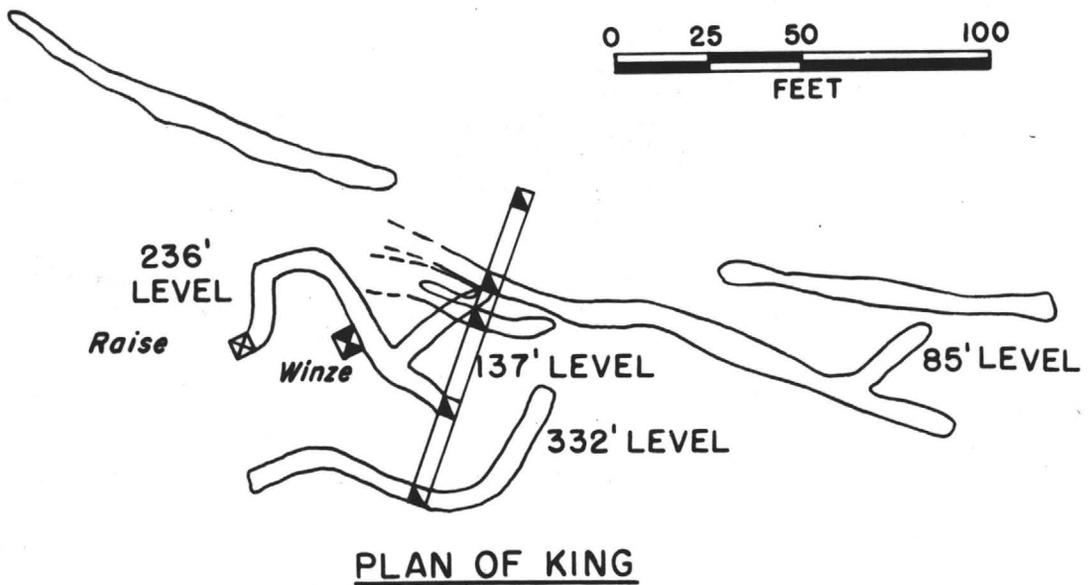


FIG. 5-TWIN BUTTES PROJECT 1412, PIMA COUNTY, ARIZONA

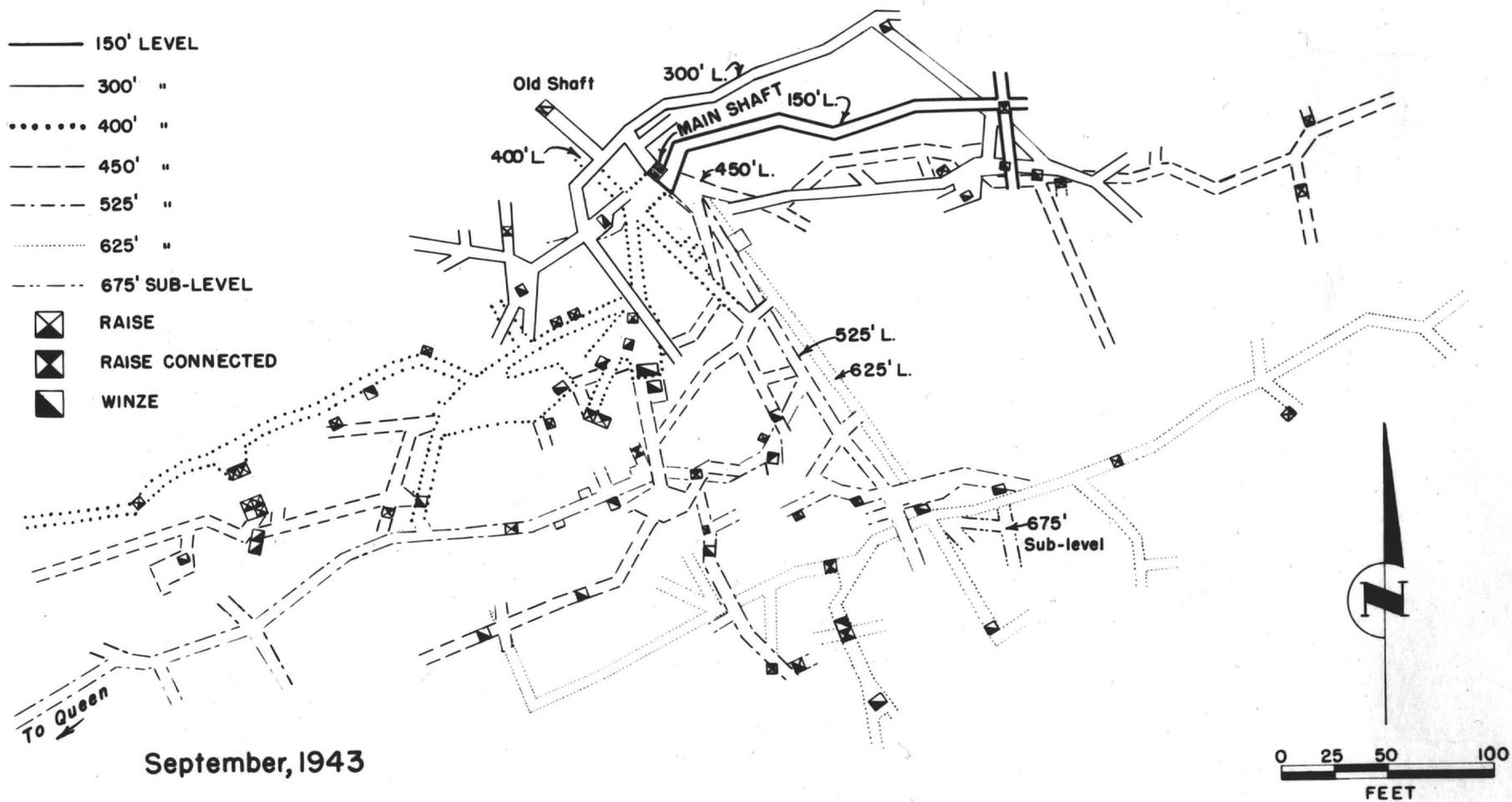
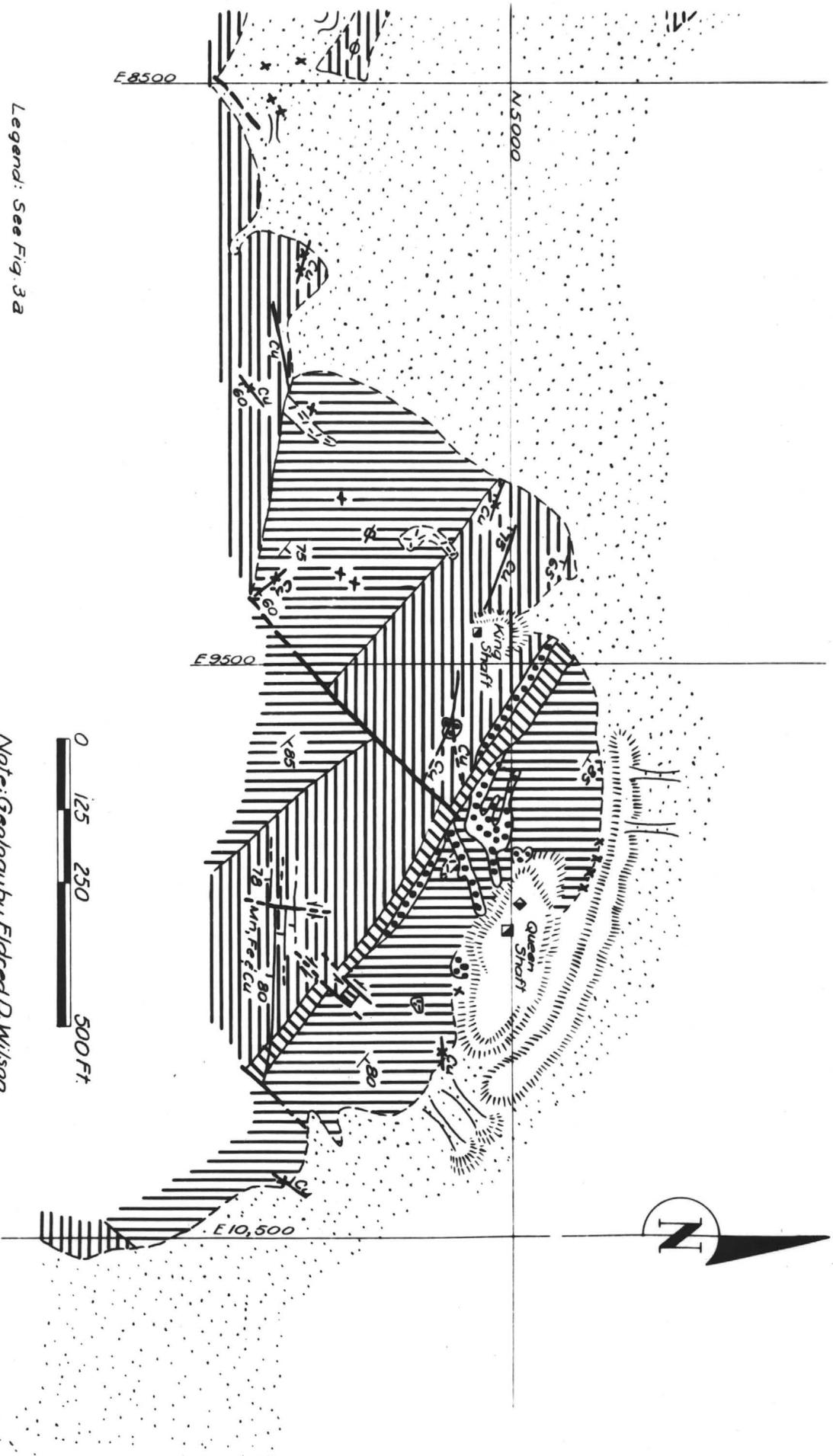


FIG. 7-GLANCE MINE, TWIN BUTTES PROJECT 1412, PIMA COUNTY, ARIZONA

FIG. 3B - GEOLOGIC MAP OF KING & QUEEN MINES AREA, TWIN BUTTES COPPER PROJ.-1412-ARIZ.



Legend: See Fig. 3a

Note: Geology by Eldred D. Wilson,
 Arizona Bureau of Mines
 February, 1943

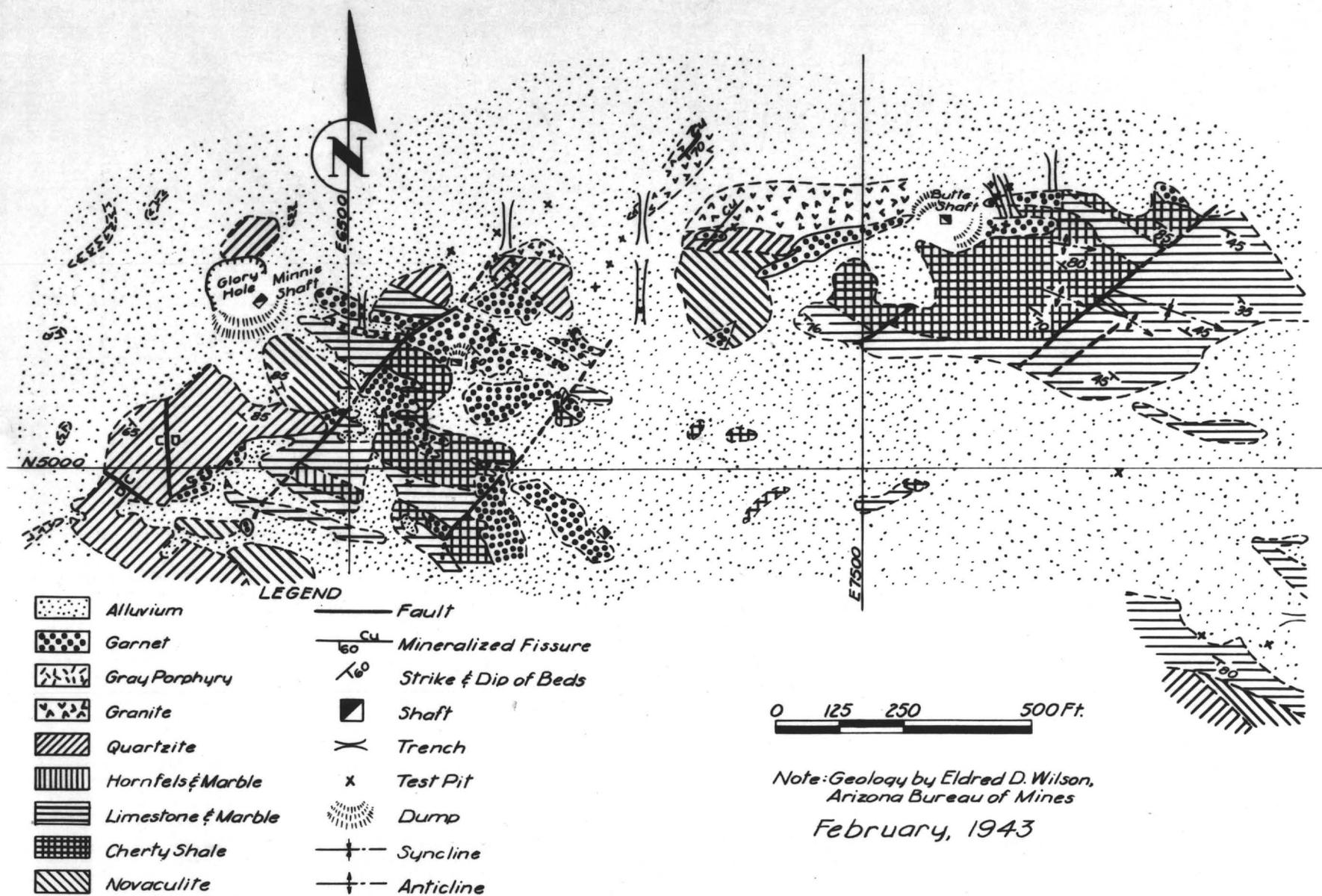
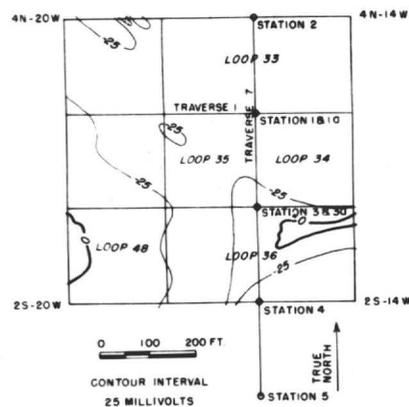
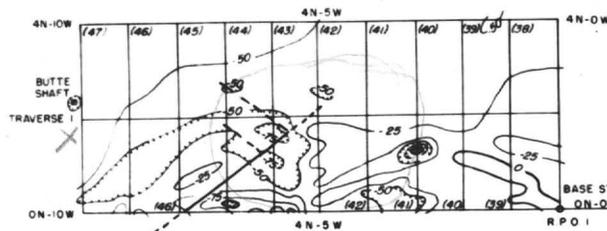
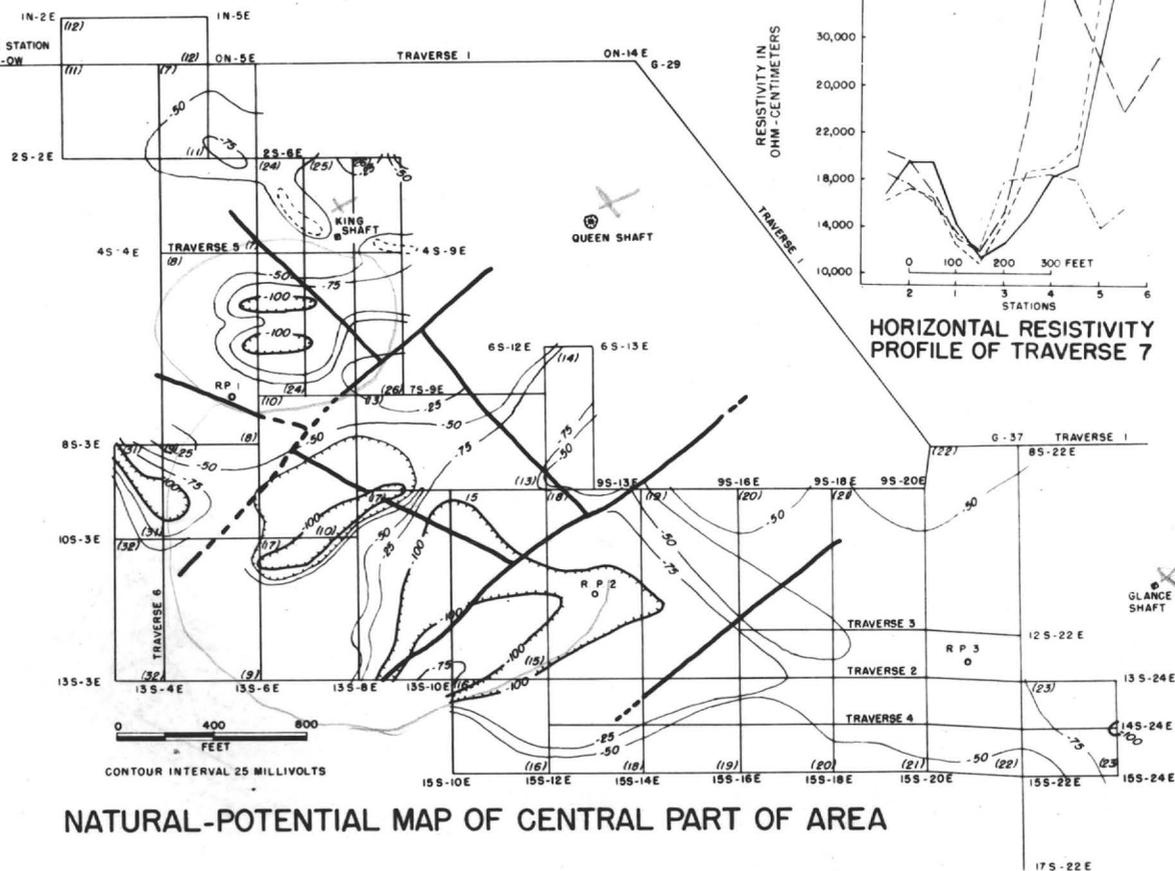


FIG. 3a-GEOLOGIC MAP-MINNIE & BUTTE MINES AREA, TWIN BUTTES PROJ. 1412, PIMA CO., ARIZONA

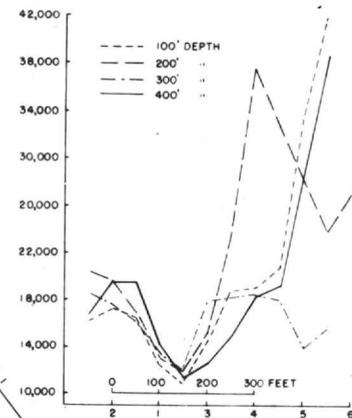


NATURAL-POTENTIAL OF AREA
BETWEEN MINNIE AND BUTTE SHAFTS

From maps by C. H. Sandberg
1945

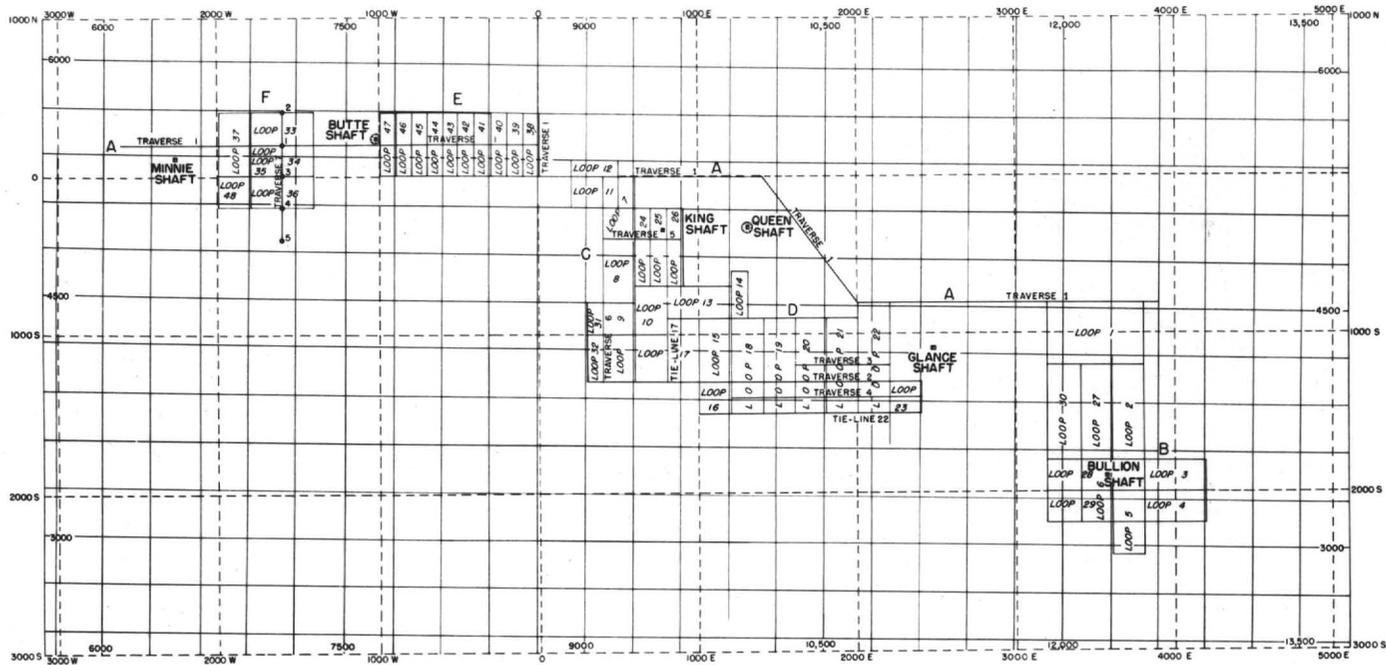


NATURAL-POTENTIAL MAP OF CENTRAL PART OF AREA

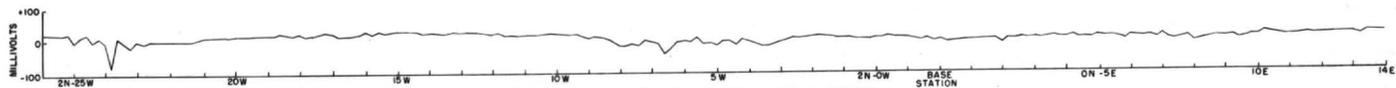


HORIZONTAL RESISTIVITY
PROFILE OF TRAVERSE 7

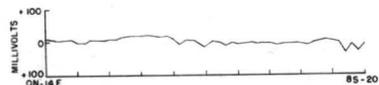
FIG. 12 - TWIN BUTTES PROJECT 1412, PIMA COUNTY, ARIZONA



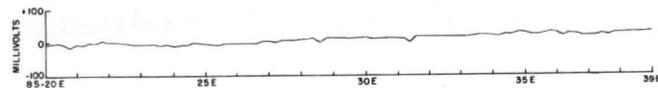
GEOPHYSICAL SURVEY MAP



PROFILE, WEST SECTION, TRAVERSE I



PROFILE, DIAGONAL SECTION, TRAVERSE I



PROFILE, EAST SECTION, TRAVERSE I

1945

From maps by C.H. Sandberg

FIG. 10 - TWIN BUTTES PROJECT 1412, PIMA COUNTY, ARIZONA

Copy (a) on p. 2

July 21, 1943

Twin Buttes Mining Company
c/o Mr. Robert E. Hackett
757 North Broadway
Milwaukee, Wisconsin

Gentlemen:

The results of my recent investigation of your property conducted on July 15, 16 and 17 are set forth in the following report which covers my findings on the ground and results of conferences with Messrs. William Foy and Charles Taylor, also with officials of two of the Mining Companies operating in that vicinity.

TWIN BUTTES REPORT

PRESENT CONDITION OF MINES

MORGAN MINE

The three compartment vertical shaft, known as the "Old Shaft" and workings were described at length in my report of May 29, 1942, pages 19 - 24.

Since that date Mr. Taylor and his associates, leasing on this property, have obtained two R.F.C. loans aggregating \$8,000.00 with which the shaft was first put in good shape to the 165' (2nd) level and some new equipment installed. The mine was next pumped out to the 3rd level about 100' below but the condition of the shaft below the 2nd level was found to be very dangerous and it was not considered wise to attempt to recondition it with the limited funds available.

The mine was therefore allowed to refill with water which now stands 30' below the 2nd level and remaining funds have been spent in continuing the west drift on that level in the hope of finding larger and higher grade veins of scheelite than those which had previously been developed. Unfortunately these hopes have not been realized and in the west drift there is still no commercial showing of scheelite, but merely a slight association of this mineral with stringers of quartz which nowhere appear to have any great width or persistence. Five men were employed at the mine and the drift was still being advanced at the time of my visit, the muck being hoisted to the surface and sent to waste.

There is still a remote chance that some better tungsten ore may be found before the R.F.C. money gives out, but I was told that not much of this fund now remained and the results of the work to date have been entirely negative.

From the deepest of the shallow shafts which the Government and Taylor sunk to the southwest of this main shaft Taylor and a sub-leaser (Hilton) are reported to have shipped 277 tons of scheelite ore to a local custom mill. This assayed 0.45% WO_3 but apparently most of the values were lost in milling and since the returns did not nearly cover costs the shippers had no incentive to continue production. The milling cost was \$4.50 per ton and truck freight to the mill (3 miles west of Tucson) was \$1.50 per ton.

Since there have been no attempts to further develop the showings of copper described and sampled by me last year this situation remains unchanged except that there has been some additional caving along the east drift on the 2nd level and it is reported that both the east and

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west drifts on the third level were caved close to the shaft so that no examination of those workings was possible.

I am still of the opinion that some of the copper ore between the surface and the 2nd level would pay to mine if a special bonus price could be obtained and should Taylor decide to relinquish his lease in the near future, as now seems highly probable, I recommend that this matter should be given careful consideration along lines which I shall mention elsewhere in this report.

I am sorry that my original poor opinion of the Morgan Mine as a possible producer of tungsten seems to have been amply confirmed.

GLANCE MINE

On June 8th, 1942 William Foy wrote to your company saying that he had \$25,000.00 available for unwatering and reconditioning the Glance Mine and that he expected to have this work completed in from 90 to 120 days. From his other letters it appeared that this money was to be advanced by his associate Howard Fields.

However, aside from what money Fields may have advanced (the amount being stated by different parties as from \$500.00 to \$4,000) Foy and Fields obtained two R.F.C. loans aggregating \$9,000.00 for this purpose and for retimbering the shaft at the Copper King and although a large part of this money has been spent the water in the Glance still stands about 30' below the 300' level to which I went down on the bucket accompanied by Ed Foy (brother of William).

The shaft is vertical and the timbers to the 300' level have been repaired and are in fairly good shape. On the 300' level we were only able to go a few feet from the shaft as both the east and

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west drifts were completely caved, but I noted that the shaft pillars contained high grade sulphide and carbonate ore.

On the 160' level, the east drift had also been caved and no drifting seemed to have been done to the west which is in accord with the map.

One man (Foy's son-in-law, William Lott) was employed repairing the two old compressors in the engine room and it is also intended to repair the #7 Cameron Pump with which Foy plans to dewater the shaft below the 550' level. To dewater the shaft down to the 525' level, Foy still hopes -- as he has been hoping for some months past -- to secure the services of a contractor named Pfister who unwatered the Morgan Mine with a deep well (Peerless) pump and according to Foy the necessary pump rods have finally been obtained and the pumping should start any day. Unless the condition of the shaft timbers should prove to be much worse than anticipated Foy told me that they should have the mines dry to the 525' level very soon after August 1st, and then be able to pump out the lower levels with the Cameron in two or three weeks. If the Government money should run out before this work was completed, Foy assured me that Fields would advance whatever is necessary to complete the job.

I am very sorry that I cannot confirm these expectations to even a small degree for even neglecting the record for non-performance during the past year it is my opinion that: -

- (1) There is still much doubt as to whether Pfister will actually attempt to pump the shaft and complete uncertainty as to the time of starting.

- (2) Since the 525' level drains the Queen Mine as well as the Glance, the old workings above that level form a very large reservoir, and although I have no data which will permit accurate calculation, I have figured roughly that Pfister's pump could not possibly handle this water in less than 3 months of continuous work even if Foy is correct in saying that the mine makes less than 10 gallons per minute which does not agree with information from other sources.
- (3) I expect that broken timbers and caved ground are very likely to be encountered in the shaft and cause many delays and interruptions of the pumping.
- (4) I do not believe that the #7 Cameron Pump which weighs 2380 pounds can be handled with the present hoisting equipment nor that it can be run efficiently by the two old compressors, both of which must still be repaired and may lack parts that cannot readily be secured. In any event the efficient lift of a Cameron Sinking Pump is only 200' so that a station pump for which no provision seems to have been made will have to be installed on the 525' or 450' levels and by what means this is to be operated is a mystery.
- (5) I am very confident that the Government loan will not pay for this work and I have reason to believe that Howard Fields will not pay the additional expense.

To put the matter bluntly I could see no evidence that any serious attempt or even a practical plan had been made to unwater this shaft to date, and it does not appear to me that Foy's present program can have any chance of success.

As to what ore could actually be seen and sampled in the mine after it should be unwatered there is also much uncertainty and Foy is not nearly so optimistic as he was a year ago. He now admits that very little ore of even 4% grade was left in place in the old workings excepting on the 625' level and below where the development was conducted thru a winze which is probably caved. He now says that new ore must be found through further exploration in order to make this property attractive or permit production and he talks of conducting such work in various unspecified locations where his knowledge of the mine leads him to believe that ore exists. Concerning all details he is most secretive and admits that the lower workings may prove to be in such bad shape that a great deal of time and money will have to be spent on repairs before any such exploration can even be started.

COPPER KING MINE

A portion of the Government loan was expended in reconditioning the King Shaft and installing ladders so that for the first time I was able to go down this shaft to its bottom at the 330' level and to examine in company with William Lott practically all of the workings.

The King vein is in a fracture in the limestone and the vein and shaft dip 72° - 75° to the south. All of the work is in the hanging wall of the contact with the granite which contact has not been explored at this point, but Foy had expected that the Bureau of Mines would do some diamond drilling from the 330' level for this purpose. This drilling was not done and the Bureau of Mines have apparently no intention of doing it at any future time.

The 330' level extending east - west is very short as shown on the map and is all in lime with no visible sign of any ore.

On the 212' level there is a drift to the west from which a winze was sunk for perhaps 50' although it does not connect with the lower level as shown on the map. Above this drift from a short crosscut going south there is a raise which is open right up to the surface and connects with the stope above.

From both the winze and raise it is reported that some ore was mined containing rich zinc oxide, but the shoot must have been in the form of a small chimney for no such ore was noted in any part of this working which could be examined.

the 136' level was extended to the east and west. East of the shaft there was some stoping (not shown on the map) and a stringer of copper carbonate was noted in a crosscut, but would be much too narrow to mine. West of the shaft the level runs into the main stope which was largely mined out up to the surface except for some small sills and pillars and probably produced a good grade of copper ore, perhaps also some zinc.

Most of the stoping was done between the 86' level and the surface where east of the shaft some ore has been left in the back of the stope and below the open trench where the shoot was mined from the surface. Ladders and stulls have recently been put in this stope indicating an intention to do some mining, but such work would be expensive and the remaining tonnage of ore is very small.

West of the shaft the drift opens out into the open stope in which only a few pillars of ore have been left, but during the past year some portions of these pillars were mined out by open cuts from the surface

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and 18 tons of sorted ore were shipped assaying 2 oz. silver and 12.45% copper. The cost of mining and shipping this lot ^{of} ore was about \$1500.00 which far exceeded its net value.

The small tonnage of ore remaining in the pillars and sills will probably average as per my samples and the record of shipment from 8% to 12% copper, but considering the excessive cost of mining it can be said that there is no pay ore developed in this mine. The exploration of the contact and further work to the east in the Copper Queen ground still appears to me to hold out attractive possibilities, but purely from the standpoint of a mining gamble which would hardly be justified at present considering the abnormally high cost of labor and the expense of drilling and similar operations.

No work has been done during the past year at any of the other mines of the Twin Buttes Company, and therefore their condition is the same as reported in May of 1942.

I learned, however, that Foy's Minnie Mine can now be examined to the bottom (325') level and Foy claims that in this mine there is a reserve of about 30,000 tons of 3% copper ore, very suitable for milling and which might be mined and shipped for treatment to the Eagle-Ficher Mill, now building, but no profit from such ore could be anticipated unless a substantial extra bonus were paid for the copper. Apparently Foy is making no effort toward putting that mine in shape for operation.

The R.F.C. loaned Foy \$20,000 to recondition and develop the Contention (North Star) Zinc Mine and I understand that all of this money has been spent with very discouraging results. No work is now in progress at that property, but Foy claims that he will be able to make some shipments to the Eagle-Ficher Mill after that starts operating in September or

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October. Whether or not the Government will cooperate in that program seems questionable.

The exploration work conducted by the Bureau of Mines in this District has been entirely barren of results. At and near the Morgan Mine they failed to find any commercial body of scheelite ore but merely a few small stringers of low grade material.

The stripping of the overburden which was conducted with a bulldozer on the surface failed to find any outcrops of copper ore and the Bureau of Mines has refused to carry on any underground work or diamond drilling in the King. So far as I can learn they have no intention of doing anything further in that district.

CONCLUSION

To sum up the present situation I am regretfully obliged to inform you that absolutely no work which has been done during the past year has made any of your mines more attractive than they appeared in May of 1942, and the workings are no more accessible than they were at that time, except in the case of the Copper King where the showing is wholly negative.

Contrary to my expectation and to information received prior to this last visit I can see no reasonable prospect that the work of your leasees is likely to improve this situation at any time in the near future and further operations ^{under the present leases} would be saddled with the repayments of the R.F.C. loans which amount to \$8000.00 at the Morgan Mine and to \$9000.00 at the Gance and King. According to the terms on which these loans are granted all net returns, excluding the payment of royalty to the owners, must be applied by the operators to making such repayments until the principal of the loans with accrued interest

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at the rate of 6% per annum has been completed.

According to Foy a total of \$16,000.00 has been expended at the Glance and the King, -- about half of which was Government money and although he expresses his confidence that his program can be continued either through additional Government loans or with further financial assistance from Fields I must express my firm conviction that he will be disappointed in both of these expectations.

It is almost needless to say that all of the above tends to make the operation of these mines extremely unattractive to any outside capital and seriously handicaps any constructive program that might be devised. Foy expressed his willingness to consider any proposal to take over his lease that might be made to him either by the Twin Buttes Company or any other party, but I strongly suspect that he would demand a consideration that would make the proposition wholly unacceptable including his previous demand that he should be retained as manager with a salary and commission on the returns from shipments.

I took particular occasion to again discuss the situation at Twin Buttes with local officials of the A.S. and R. and the Eagle-Picher Companies, both of whom would be only too glad to cooperate in any plan that seemed good business for them. The A.S. and R. would like to see these mines producing smelting ore which they could treat at Hayden, the Eagle-Picher are looking for copper ore suitable for treatment in the mill which they are building at Sahaurita and they might take over and operate any mine which held a promise of producing such material.

It is my opinion that such ore exists in the Twin Buttes district in sufficient quantity to make an attractive proposition provided that

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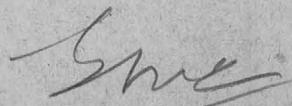
the operators could draw this from the Morgan and Glance and also from the Queen and Minnie, which last two mines belong to Foy, and also provided that the War Production Board would agree to pay a special premium price for copper produced from these mines.

In this last connection I might mention that I have recently been successful in obtaining such a premium for ^{two} other mines one of which will receive 21.5¢ per pound, while the other will receive 24.7¢. I think that conditions at Twin Buttes would justify a price of at least 22¢ and that this might be obtained whenever there was a definite prospect that active mining would actually start.

As to the best means of breaking the present dead-lock and putting your company in a position to work out some definite plan of action without resorting to lengthy and expensive litigation I suggest that this is only likely to be accomplished if Howard Fields can be induced to cooperate. I intend to informally sound him out on this matter as quickly as possible. Foy has informed me that under the terms of his agreement with Fields, the latter has acquired an interest in the Queen and Minnie Mines and I think that Fields must appreciate that the present tactics are not going to get them anywhere at all and that his only chance of obtaining any return for his investment will lie in starting negotiations that will put some or all of these mines into active operation while the present war conditions prevail and that steps along these lines should be taken without further delay.

I shall do my best to help to work out some solution of this problem and will keep you fully advised of any progress that may be made.

Yours very truly,



May 29, 1942

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May 29, 1942

REPORT ON PROPERTY OF TWIN BUTTES
MINING AND SMELTING COMPANY

Twin Buttes Mining & Smelting Company
c/o Robert E. Hackett
Room 1112
229 East Wisconsin Avenue
Milwaukee, Wisconsin

Gentlemen:

As per written and verbal instructions from your Vice-President, Mr. Robert E. Hackett, I have examined the mining claims and accessible workings of your company in the Twin Buttes district, Arizona, and herewith beg to submit the following report which is accompanied by Exhibits as listed in the Index. Also an Appendix.

The impossibility of inspecting any of the underground workings except on one level in the Morgan Mine and the lack of assay maps of reports of operations and underground conditions unfortunately limited and handicapped my investigation but I feel justified in reaching certain conclusions and making certain recommendations which are set forth immediately below while the details and data on which they are based will be found in the body of the report.

CONCLUSIONS

(1) Since the character of your ore does not make it suitable for treatment by concentration it must still be shipped crude to a smelter as in the past. Therefore no ore containing less than 4% copper can be mined with profit and it would be futile to attempt to find or develop lower grade material.

(2) I found no satisfactory evidence that any substantial tonnage of either high grade or low grade copper ore had been left by former operators in any of the mines.

(3) I found no evidence that there is any appreciable content of tungsten in the copper ore in the Morgan Mine: the advisability of attempting to mine scheelite from the quartz ledges found on the surface of that property will be determined by the result of the investigation by the Federal Bureau of Mines which should be made known to you in the near future.

(4) I was ~~very~~ favorably impressed with the probability of finding new shoots of ore in the vicinity of some of the old workings since these are indicated by surface showings especially east of the Glance Shaft and west of the King Shaft and in my opinion an effort to explore and develop these areas should be made.

RECOMMENDATION

Subject to satisfactory adjustment of the present lease, I recommend that a fund of approximately \$30,000 should be obtained and expended for the exploration and development of the most promising showings on the King and Glance Claims as outlined in the body of the report.

The investment of this money will of necessity be of a speculative nature but in my judgment it is a good mining venture in which the chances of success and substantial profit outweigh the chances of loss.

PROPERTY, LOCATION AND GENERAL DESCRIPTION

The property of the Twin Buttes Mining and Smelting Company consists of one small fraction and 23 full sized patented lode mining claims, comprising about 665 acres. These claims, located in the Pima Mining District, Pima County, Arizona, lie 23 miles in air line or 30 miles by good road, (20 miles of which is paved highway) south-southwest of Tucson. They are 8 miles by road southwest of the Southern Pacific Railroad (Wogolen Branch) at Schuerville. The claims comprising three groups as shown on the map (Ex. A.) and described in detail in this report, occupy portions of Townships 17 and 18 south, Ranges 12 and 13 East--Gila and Salt-River base and Meridian.

The contour of the surface is undulating but not rugged with rounded hills rising between the washes or valleys to a height of 700 feet. The average elevation of the property is about 3500 feet above sea level. The slopes are rocky or covered with recent detrital soil as in the valleys and vegetation is sparse; many desert shrubs, cacti and grasses but no trees. The climate is very dry as usual in this part of the country with mean annual rainfall of about 10 inches--the summers are hot and winters mild with occasional light falls of snow and more frequent frosts. Mining work can be carried on without difficulty during the entire year.

The water table is found at from 250 to 400 feet below the surface in all of the shafts and the quality of the water in some of these shafts especially the Glodstone, is excellent while the quantity is ample for all domestic purposes and probably for a small or medium sized mill. An electric power line now passes about 6 miles from the

property from which some power could probably be available although this situation is complicated by war conditions and positive information and rates might only be obtainable after the priority of an active operation had been established.

Transportation by truck to the Railway formerly cost \$0.75 per ton and might now be slightly less and the base freight rate to the nearest market centers at Hayden or Douglas is \$1.40 per ton with increase for areas of high rates.

GEOLOGY AND ORE OCCURRENCE

The general geology of this district has been studied to some extent by Sanoone and Barton of the United States Geological Society as well as others. A report by Fovote was made for the Midland Company but this I could not obtain.

It appears that the oldest formation is a coarse pre-Cambrian granite which is exposed around the Altar Valley and in places in the Sierra Mountains. This was overlain by sandstone, shale, limestone, and quantities of schist deposited during the Devonian and Carboniferous eras during which and subsequently there were many intrusions of finer grained granite and porphyritic rocks.

The present surface, except where covered by recent alluvial sediments, is largely limestone, often silicified, and fine grained granite and there is a suggestion that the intrusive granite in the immediate vicinity of Twin Peaks may have formed a laccolith surrounded by limestone and through contact metamorphism causing the limestone and schist to become more or less garnetized while the quartzite, which was once a calcareous sandstone, developed epidote and amphibole.

The ore deposits were formed as a result of the granite intrusion in fissures and branch veins along or near to the contacts and they are of the contact metamorphic type the principal primary minerals having been sulphides of iron, copper and zinc (carrying some silver and a very little gold) and later altered to carbonates, oxides and secondary sulphides including the copper glance which was found in some of the old workings.

I should not expect that any of these ore deposits would hold strong to any great depth and from the record of the mines it would appear that all of the shoots have been pretty well bottomed except perhaps in the Glance Mine. Nor are ore bodies of this character likely to persist in size or value over any great lateral distance and here they seem to have run true to form since the mine workings indicate that pay values occurred only in comparatively short lenses with barren or very low grade sections between them.

On the other hand such shoots of pay ore forming in the crevices or bulges along an irregular contact and in branching fractures penetrating the wall rock usually occur with great frequency and there is no reason to believe that in the Twin Butte District all of these shoots have been discovered and developed. In support of this opinion I was impressed with the surface showings along certain portions of the contact which appear to have been barely prospected, notably to the west of the King shaft and between the Glance and the Million shafts. It is my opinion that in some of this territory comparatively small but fairly rich shoots of ore will still be found from the workings of the old mines,--a careful program of exploration and development should be carried on along such sections of the more promising but practically unexplored sections of the limestone-granite contact.

Subsequently one of the operating or leasing companies put down a shaft in the western section of the group and did a little drifting and cross-cutting but met with no better success.

Most of the other openings which I was able to find appeared to have been merely dug in order to comply with the requirements for annual assessment work and gave no promise whatever of ever developing any commercial ore although I was told that a few small pockets of high grade had been mined when the claims were first located.

I could obtain no record of any production or shipments made from this northern group of claims and the small tonnage of ore which they have produced was probably shipped along with the output of the working mines. I have rarely seen less promising patented mining claims and my unfavorable opinion was confirmed by everyone from whom I sought information with the exception of one man who told me that he had once found a pocket of high grade copper glance and would have applied for a lease on that claim except for the fact that he could never find the spot again and was uncertain on which claim it was located. He said that he would again try to find it.

This group of claims could probably be abandoned with no loss to the company but since the expense of holding them is trivial this is doubtless a more prudent policy and is therefore recommended, but I could see no justification for expending any money for further exploration nor for attempting to reopen any of the old workings.

ORIGINAL CLAIMS

Of these seven claims the Bullion, Glance, King and Butte are at present held by Willie Foy under a lease, the legal status of which

HISTORY

From such records and information as I was able to obtain it appears that the first mining operations of any consequence were started on the properties in the '80's and in 1900 the Fair Sutter Mining and Smelting Company was organized with Milwaukee capital and this company built a 25 mile standard gauge railway, later sold and dismantled, from the mines to Tucson and operated fairly continuously until 1913 taking most of their ore from the Morgan Mine. Subsequently portions of their property were leased and optioned to Bush and Baxter and to the Midland Copper Company and a large output was made mainly from the Glance and Queen Mines, the Queen being eventually purchased by the Lessee. Leases on certain of the claims are still in effect as will be mentioned later. The production figures given in this report were obtained from various records including those of the smelters and I cannot claim that they are complete or accurate since the mines were worked by operators who did not always specify the source of their shipments.

No figures are available prior to 1900 and since that date I have found records of ore shipments aggregating 300,000 dry tons from which were recovered 42,610,000 pounds of copper, about 350,000 oz. of silver and 2,000 oz. of gold. This would indicate that the ore averaged better than 6% copper.

The production made by the Fair Sutter Company from 1900 to 1912 inclusive came mostly from the Morgan Mine which was then practically closed down. The Bush-Baxter Lease from '13 to '17 incl. worked mainly in the Glance and the Queen as did the Midland Company from '18 to '20 when they discontinued work at the Glance from then until '25 incl.

worked the Queen and the King and purchased the Queen mine from the Twin Butte Company toward the close of that period.

The small production of the "Butte Company" in '22 came partly from ~~the~~ mines which did not then belong to the Twin Butte Company so that it has not been included in my report.

DETAILED DESCRIPTION OF MINING CLAIMS

NORTHERN GROUP

This comprises the following 8 claims:

Copper Prince
Senator Stewart
James C. Blaine
Carfield
McKinley Copper
Admiral Dewey
Hobson Copper
Copper Hill

ant

The patent surveys of these claims were obtained and studied in conjunction with the field examination, which indicated that this entire group of properties appears to be quite worthless or at best only suitable to turn over to lessees.

The surface is nearly all limestone and on the eastern section of the group some of it is very coarsely crystalline. Outcrops of granite and more basic intrusives were noted at intervals and at or near the contacts there were occasional stringers of copper ore which occurred in shallow gash veins or fractures and pinched out entirely a short distance

below the surface

will probably be determined in the near future. This group is located one mile south of the Northern Group and the claims are named as follows: (See Exhibits A and C)

Copper Eagle
Copper Butte
Standard Copper
Copper Ring
Copper Glance
Copper Bullion
Bullion #2

The Copper lode, which lies between the Ring and the Glance, formerly belonged to the Twin Buttes Company. It is reliably reported that the ore in the mine has been worked out and this is admitted by Mr. Foy, the present owner, but he believes that the claim may still produce ore from the western portion which could be worked through the Ring shaft.

The long section map of this group looking north (Ex. B) shows the general relation of the various mine workings all of which are strung out along one of the main contacts between the hanging wall of the limestone and the footwall of intrusive granite. The general strike of this contact is east-west and the dip is to the south at varying degree in different sections.

In some of the principal bays or bulges along this contact ore bodies have been mined while other shoots were found in branch veins or fractures. A study of the geology and surface outcrop indicates that other ore bodies, probably smaller but of similar character, are likely to lie along the intervening and more or less unexplored sections

of the contact.

Since all of the deep shafts in this area were caved or otherwise impossible to safely inspect my physical examination was of necessity confined to the surface outcrops and shaller surface pits and to the dump material at the shafts in addition to which I obtained much information from several parties who were familiar with the old mine workings and although all of their statements were indefinite and many were contradictory I have tried to draw from them such conclusions as seemed reasonably justifiable.

The lack of assay maps of any of the mines and the inaccessibility of their workings makes it quite impossible for anyone to accurately estimate the tonnage or value of the remaining ore. Apparently such assay maps were never prepared while the mines were operating nor could I find any reports by the management or their engineers which contained an estimate of ore reserves at any time, but all opinions expressed to me regarding the remaining ore were given careful consideration.

Starting from the eastern end of this group I shall refer to each claim and to the underground workings in detail.

Bullion No. 2

No outcrops were noted on this claim the surface of which is largely covered by detritus and elsewhere is barren limestone or granite.

Copper Bullion

The eastern section showed some outcrops of iron oxide without copper, but a few copper stains were noted in pits in the south-central section.

The Bullion shaft was sunk vertically to a depth of 580 feet

well in the hanging wall of the contact which at this point appears to have been largely composed of quartzite and very siliceous limestone showing some Jasper and stringers of iron oxide.

It is reliably reported that a strong vein but practically barren of copper values was struck at 300 feet but this shaft never reached the true contact with the granite. Some good ore has been found in the hanging wall fractures for my grab sample of picked specimens from the dump assayed 11.50% copper.

Turning to the west along what appeared to be the outcrop of the fracture vein there are a number of shallow pits extending north 85° west to intersect the main contact on the Glance Claim and narrow seams of rich copper carbonate ore were noted in several of these. The showings were more promising after crossing the east end line to the Glance Claim.

It is my opinion that there is promising prospecting ground on the Bullion along the contact which seems to have been largely unexplored. The ore of more trench veins or fractures which strike to the southeast are probably too small to be mined with profit and there is no reason at present to recommend the Bullion shaft since future development could best be carried on by drifting eastward from the Glance workings.

Copper Glance

For some distance from the east end line of this claim the outcrop of the contact is not well defined but the fracture vein crosses from the Bullion and becomes more prominent as it approaches the Glance shaft.

The carbonate ore in this vein is narrow and irregular but rich. A grab sample from fragments on the dumps of the pits within 400 feet of the shaft carried 17.10% copper. Apparently the narrow and erratic

occurrence of such high grade ore discouraged any attempts to explore or mine at depth but it appears to me that underground explorations should be carried eastward from the Glance shaft and this is also the opinion of Foy and Simonton, both of whom were well acquainted with the old workings.

The Glance B compartment and 1 1/2 compartment shaft was sunk in the footwall of the contact near the west end line of the claim to a vertical depth of 635 feet with five levels and a 60 foot winze sunk below the 635 foot level.

Simple and efficient mining equipment was formerly located here and while the remaining machinery itself is probably unobtainable except for a small compressor and a Cameron pump, which do not belong to the Twin Buttes Company, it appears that the head frame, trestle and ore bins could all be repaired at moderate expense.

The underground workings in this mine were quite extensive as it was for a time the principal producer and it is credited with an output from 1899 through 1919 of 118,000 dry tons averaging 6.72% copper and 3.5 oz. silver. Most of the ore occurred in fissures in the limestone and garnet rock close to the granite contact which dips to the south. The largest ore bodies were found between the 300 and 535 foot levels, some of the stopes being 50 feet in width. Below the 535 foot level both the size and grade of the ore bodies decreased and stoping ceased in 1919 (except for a little subsequent work by leasers) although the shaft was used for several years thereafter to hoist ore mined in the Copper Queen with which mine it was connected by a 1400 foot long drift on the 535 foot level, as shown in Exhibit B.

Opinions as to the quantity and quality of ore now remaining in

this mine are somewhat contradictory but giving due weight to each one of these and especially to the fact that the Midland Company did not find it advantageous to attempt to work the mine at any time subsequent to 1919,--although the equipment was then complete and in good condition and the price of copper ore was satisfactory in '22 and '23-- I am convinced that very little accessible ore containing better than 3% copper was left in this mine except in small pillars around the shaft and drifts such as may now be seen at the surface.

The ore developed along the 625 foot level and in the mine is reported to have been in narrow lenses and low in grade and gave little encouragement to development at greater depth.

Much of the ore taken from the upper stopes was extremely rich, sometimes carrying 10-15% copper and since it was the intention of the management to maintain a shipping average of about 8% copper a lot of 4% and even 3% ore from other sections of the mine were broken and mixed with the high grade material.

The gob or fill which was put into the larger stopes is partly waste and partly low-grade ore but probably would not average 2% copper.

Much of the ore as noted near the surface and on the dump contains a high percentage of iron-pyrites and my sample of larger pieces of what appeared to be the higher grade material found on the dump showed copper 3.43% while the fines carried 3.22% copper.

Foy has estimated that the cost of unwatering and reopening the Glance shaft to the lowest level, purchasing and installing the necessary equipment and carrying on a certain amount of development to prove up some new ore bodies whose location he claims to know, will be around \$80,000 which seems to be a reasonable figure but I could not recommend that this money should be spent in order to recover such ore as is likely

to be found in the old workings themselves. I am obviously in no position to pass judgment on Foy's ability to find additional ore in other sheets of which he will not divulge the location nor the evidence on which he places confidence in his ability to find them, but I agree with his belief that such ore exists and should be sought after.

Since the flow of water in the lower workings of the mine is said to amount to nearly 100 gallons per minute a heavy pumping expense would be continuously involved while the mine was kept open to the bottom and the initial cost of unwatering the extensive openings in the Glance, as well as openings in the Queen Mine down to the connections on the 535 foot level, will be very considerable.

A less ambitious and less expensive program would be to recondition the shaft only down to the water level (which Foy places at 535 feet) and then to carry on some drifting to the east on the 500 foot level to explore the area under the favorable showings in the fracture vein which has been described above.

While it is always difficult to estimate the expense of reopening any long shut-down mine, whose timbers are apt to have rotted and ground may be caved, I believe that this procedure would not be likely to involve any outlay of more than \$15,000 including the purchase or rental of adequate equipment and drifting east as far as the first attractive outcrops. Additional drifting need only be undertaken if this work has given favorable results and some small tonnage of good grade ore could certainly be recovered from the pillars near the shaft and thus reduce the net outlay.

If Foy does not himself proceed as he proposed and proper arrangements can be made in respect to his lease, I should recommend this

latter program as a legitimate and promising mining venture.

West of the Glance shaft the contact outcrop is partly covered by the dump and there are no further showings of importance on the Glance claim. The main road crosses the claims between the Glance and the Queen shafts.

QUEEN MINE

Since this property does not belong to the Twin Buttes Company I merely made a casual examination of the surface and inquiries which lead me to conclude, as previously mentioned, that the mine had been pretty well cleaned out of all pay ore when it was shut down by the Midland Company in 1926. Toy has no thought of reopening this mine or attempting further exploration on the claim except near the west end where work can be carried on from the King shaft.

The outcrop of the contact can be noted at intervals throughout the length of the claims but it is covered over near the shaft where undoubtedly it was the strongest and I did not observe any very promising showings on the surface or in the test pits.

The collar of the 700 foot inclined shaft has decayed in and the surface buildings, trestle and ore bins are in bad shape and would hardly pay to reconstruction even if the remaining ore justified reopening the mine, whose connection with the Glance is through the 575 foot (7th) level.

The Queen is credited with a total production of 75,100 tons of ore averaging close to 35 copper. Future work, if any, in this claim should be done from either the Glance or the King shafts.

QUEEN MINE CLAIM

Crossing the east end line from the Queen there is a vein of

fracture branching from the contact from which ore has been mined in an open but on both of the claims and some of this same ore is now being mined by Foy at a depth of about 30 feet below the surface and 100 feet west of the King shaft which is only 10 feet from the east end line of the claim.

My sample of this ore ran 9.75% copper. The vein is narrow, varying from 1 to 3 feet in width but as long as it continues to hold up in grade the returns from shipments should serve to pay the wages of the three men who are laboriously mining it with hand steel until they reach a depth where mechanical hoisting equipment will be necessary.

The King shaft inclining 75° to the south is reported to have a depth of 300 feet and looking down from the surface it seems to be in fair condition.

According to both Foy and Simenton the only work done here consisted in stopping out one shoot of ore from the fracture vein in the immediate vicinity of the shaft, but it is said that this ore averaged 35 copper and 5 oz. silver per ton and had a gross value of \$100,000.

The body of oxidized ore (sint) was also reported to have been found in depth averaging 25% zinc and 3 oz. silver but of this I could see no evidence.

I was most favorably impressed with the surface showing at the King and this is my first choice for further exploration and development. I feel confident that additional ore will be found in the fracture vein going west and there would also be an excellent chance of finding ore along the contact between the limestone and the granite which appears to be virgin ground and should certainly be investigated.

The cost of equipping and reconditioning the King shaft, drifting

200 feet to the west under the surface workings and cross-cutting to the contact should certainly not exceed \$10,000 and this work I can definitely recommend subject to the proposed adjustment of the Foy Lease.

Throughout the balance of the King Claim going west the surface is limestone and the contact cannot be seen but there are fracture veins which show iron outcrops and in some of the pits a little copper stain is noted but I see nothing to encourage any exploration.

COOPER MINE

Conditions described just above apply to the eastern section of this claim near the north center of which a 300 foot shaft was sunk in an incline of some 70°, the same being now entirely covered and useless. Little or no copper was found here although the shaft passed through the contact and into the granite.

Going west from the shaft the first promising surface showing was noted at some distance and about 500 feet from the end line which is common to the Minnie Claim owned by Foy.

The Minnie shaft inclining 75° to the south is located only a short distance from the end line of the Butte and reached a depth of 325 feet. The ore shoot in this mine is reported to have pitched sharply to the east on the 200 foot level it crossed into the Buttes Claim so that at greater depth the production would come largely from that property. Foy believes that it will be worth while to reopen the shaft which seems to be in pretty good shape and to work to the east and also develop to greater depth but in view of the comparatively low grade of the ore mined here to date and the lack of any evidence to show that it will improve with depth, I should not advise any work here at present. A sample of ore found on the dump carried 4.22% copper and

the total production from the mine, 758,477 tons from 1914 to 1918, averaged 4.71% copper.

There are two shafts and several pits near the eastern end of the Butte claim in which some fair ore is seen in fracture veins and one or both of the shafts are said to connect with the mine workings. Some further prospecting on or near the surface might improve the picture but otherwise I should not advise any underground work at the Butte claim unless evidence could be produced to show that one could be likely to find ore averaging better than 5% copper.

Some zinc was found in the Butte shaft but apparently it had no commercial importance.

The Copper Eagle and Standard Copper Claims which lie respectively north of the Butte and the King are largely covered with top soil and no ore showings were noted nor could I learn that any mining work had been conducted.

Many of the camp buildings were constructed on these claims and several of these structures are still in fair condition and could be made serviceable. But they would require substantial repairs for which purpose a fund of about \$5,000 should be provided.

It may be that, aside from providing a good camp site, these two claims were originally located with the thought that they might hold the apex rights to some veins that would be found in the workings but I see no reason to believe that such has been, or was likely and prove to be a fact.

No prospecting or development work seems called for on either of these claims.

CONCLUSION

These claims are at present held by Charles H. Taylor of Tucson

by virtue of a 9 year lease dated April 7, 1941. However Mr. Taylor expressed himself as ready to cooperate in every way with any program of reopening and operating that may be decided on and financed by the Twin Butte Company or other associates and therefore for all practical purposes they form a part of the holdings of your company.

The group comprises the following claims:

Summit Fraction
Gladstone
Margaret
Senator Morgan
Senator Morgan No. 2
Nellie
Dolly Mine
Pandora

These claims are located one mile to the south and extending one-half mile to the west of the Central Group (See Exhibit A.) They are in a different contact from the Central Group.

All of the mining work has been done on the Gladstone and Morgan Claims to which my examination was largely confined since the surface of the others appeared to show nothing but barren limestone, granite, quartzite and top soil.

SENATOR MORGAN

This was the only mine of which I was able to obtain any of the detailed maps of the underground workings (A, B, C, and F.) and also the only one in which I could personally make an inspection of the mine and that only down as far as the 185 (2nd) level.

It is said that the original outcrop of this mine was more prominent

than any of the others and therefore this was the first one that was worked by the Twin Butte Company. Its total production from 1908 to 1913 being recorded as 138,508 dry tons of ore averaging 3.92% copper and 3 oz. silver per ton.

Subsequent to 1913 some mining was continued by lessees until 1919 since when no mining has been done and the new shaft and head-frame were destroyed by fire.

In 1921 Mr. Taylor and his associates repaired the old three compartment shaft (which will hereafter be referred to as "the shaft") down the 100 foot level and drifted to the southwest 200 feet seeking to cut in depth the quartz veins in whose outcrop some scheelite had been found and hoping to thus develop a tungsten rather than a copper mine. The value of this property as a possible producer of tungsten ore will be discussed below.

The workings of the Morgan Mine are graphically and presumably accurately shown on the accompanying maps (Pls. D, E, and F.)

The shaft (old shaft) is vertical and was sunk in limestone and garnet schist quite close to the contact with the granite which it intersects at the 500 level.

On the surface this contact is marked by a strong gossan outcrop with copper carbonate showing in many places for a length of over 500 feet and a width of 10 feet or more with stringers breaching off into both the foot and hanging walls.

Much of the surface ore has been mined out from open cuts but there are still some small showings from which I took a sample that carried 4.12% copper. Some ore of this grade could still be mined from near the surface but it would be a task for lessees rather than for a company.

between the showings in the surface cuts and those on the 100 foot level from the shaft the mine is inaccessible and the workings are covered. This mining was done from the "Whim shaft" sunk in the footwall of the vein and while neither written records nor the recollection of old time miners throw much light on the question it is a reasonable presumption that all of the better grade of ore has been worked out except for the pill ore which would be difficult to reach and contain a problematical quantity of ore.

Inspection of the 100 foot level from the old to the new shaft, where the station has caved, failed to indicate that any commercial ore had ever been found except in the one shoot on which the big stopes were located. The line of contact east of this stope as far as the new shaft was almost the run of veins and several cross cuts run both to the north and south had failed to find ore in any of the fractures which they intersected. The maps of the lower levels and statements of men who worked in the mine are conclusive evidence that neither by drifts, crosscuts or diamond drilling were any other large shoots of ore discovered and the entire contact area east of this shaft was very thoroughly explored. To the west it appears that only one long drift was run out 500 feet on the 300 foot level where it passed through much garnet rock and quartzite with veins of quartz and iron oxide but found no copper ore at all. On the 400 foot level a 200 foot long cross cut was run from near the shaft in a southeasterly direction with no result.

The reason why crosscutting and drilling, which was so extensively done to the east of the shaft, should have been limited to these two workings on the west is not at all clear but I have no doubt that the operators who were thoroughly familiar with the underground conditions

and geology had good grounds for believing that further work in any direction would be a waste of energy and money when they finally closed down this mine and it would be folly for anyone else less familiar with the situation to dispute their judgment.

As to the one main shoot of ore this was doubtless worked out from top to bottom as completely as was economically feasible.

On the 105 foot level the length of the stope is about 120 feet and the width up to 15 feet in the center and tapering toward each end. The ore seems to have been confined to two veins along the foot and hanging wall with a horse of waste or low grade ore between.

No systematic sampling of the small remnants of the ore shoot was possible but I was able to cut two very unsatisfactory samples from the footwall or south stringer and two more from the hanging wall or north stringer. The first two ran 4.88% and 7.04% copper while the copper in the latter was only 1.50% and 2.71% which explained why only sections of the hanging wall stringer had been mined.

These samples confirmed my impression that the remaining ore was spotty and erratic in value and that only the very small quantity of ore remaining in the footwall vein could possibly be mined with any profit.

Other samples which I took on the dumps gave the following results:

Grab sample from pile of ore near main shaft

Cu 4.12%

Grab sample from small pile of ore on main dump

Cu 3.72%, Zinc 0.40%

The silver content in my underground dump samples was 0.8 oz. per ton so that the silver in this low grade material seems to bear a relation to the copper similar to that which maintained in the higher

grade shipping ore.

From physical examinations and geological maps prepared by others it seems that the footwall rock of the ore bearing fissure is soft siliceous limestone while the hanging wall is hard siliceous lime rock of which might be termed a quartzite, garnet rock and iron. The strike of the vein is nearly east-west and the dip varies but averages about 60° to the south.

It is entirely possible as Charles Taylor, James Pennington, and others believe that some 5% or even 6% ore could still be mined from the ends and pillars of this old stoppage but it would be an expensive procedure and all in all I can see no reason for attempting to reopen the Morgan Mine as a producer of ore per ore.

TUNGSTEN POSSIBILITIES IN MORGAN MINE

It has been the theory of Mr. Taylor that all of the ore in this mine carried some value in tungsten and he expressed the opinion that the average content in WO_3 (tungstic acid) would be as much as 0.5% equal to 10% per ton which might have justified the mining of this ore and erection of a treatment plant for concentrating the tungsten.

Since an analysis of a composite of my samples taken underground showed the content of tungsten to be only .04% and my sample from the dump which carried 3.73% copper showed only a trace of tungsten I feel satisfied that the tungsten content of the ore is in no way proportionate to the copper content and that the very minute percentage of that metal associated in the copper ore would give it no additional value. The same may be said in respect to the zinc content which was less than 10% per ton in the samples which I had tested for that metal.

The presence of tungsten in quartz ledges outcropping to the south and southeast of the shaft had led Mr. Taylor and his associates to

Drift a distance of 500 feet to the southwest in order to cut these veins in depth, but the ledges dip to the west and only one of them appears to have been cut by the drift on the 165 foot level some 50 feet back from the breast shore by sample (in two sections) over a width of 13 feet showed this quartz vein to carry only 2.4* % (0.12%) per ton which is insufficient ~~to~~ ^{to} make it commercial ore.

The grade of surface ore as developed in numerous trenches and pits sunk to varying depths (maximum 55') has been carefully determined by the Engineer of the U. S. Bureau of Mines who has sent some four tons of large samples to be analyzed at Reno, Nevada.

A copy of the report of this engineer has been promised to Mr. Taylor before June 15th and will no doubt be transmitted to your company and this should conclusively establish the value of this deposit which in my own judgment, if it is worth working at all, can best be operated with Government money as a war industry rather than by any private capital with the expectation of financial gain. A copy of a memorandum presented to the Government is included in the appendix to this report.

GLADSTONE CLAIM

Passing west from the Morgan to the Gladstone the surface alters to granite in the northern part of the claim but on or near the contact with the limestone a number of pits have been sunk, mostly in fracture veins, and in several of these narrow stringers of high grade copper ore were noted and sampled, the copper content being 10.06%.

The Gladstone shaft was sunk vertically to a depth of 450 feet but it appears to be entirely in the intrusive granite and no ore is to be found on the dump. It is the opinion of Fay that drifting to the east

and crosscutting to the south from the bottom of this shaft might result in picking up the downward extension of the veins which are noted in the surface pits but since some of these veins appear to be very strong or persistent I do not feel that the expense involved in this procedure would be justified.

A substantial flow of very excellent water was found in this shaft which would be ample for all camp requirements and probably sufficient for a small or medium sized mill. The shaft itself appeared to be in good shape and could be reconditioned for pumping at small expense.

As previously mentioned none of the other claims of this group appeared to have any importance for mining operations.

METALLURGY OF ORE

Practically all of the copper ore produced from the Twin Buttes mine was oxidized with the exception of a certain quantity of copper-glance (chalcocite) which seems to have occurred only in pockets.

The balance of the production and practically all of the ore which I found in any of the showings or on the dumps was green carbonate (malachite) or brown oxide plus a little copper silicate all intimately associated with hematite iron and iron pyrites.

Such an ore will not concentrate by gravity and is not easily concentrated by flotation and therefore it cannot be compared from a commercial standpoint with a sulphide ore of similar grade. Nor would leaching be likely to effect a satisfactory recovery except at prohibitive expense.

It has been suggested that leaching in place might result in a certain recovery of copper ore from the fillis in the Glance and perhaps in the other mine since the solutions could readily percolate through such a mass of broken up material but the pumping of the acid solutions would involve special equipment and the preliminary expense involved

in properly conducting the water to points of dispersion would even to me to be entirely prohibitive.

Therefore I cannot suggest any method of treating the output of these mines which would be more economical and efficient than the former practice of direct shipment to a smelter and I give below an approximate complete analysis of the shipments as taken from smelter records.

	per ton oz.	per ton %
Zn	0.05	
As	2.00	
Cu		0.5
Pb		0.7
Sb		0.8
Mn		0.3
Fe		32.0
S		23.0
SiO ₂		20.0
CaO		0.0
Al ₂ O ₃		1.5
	TOTAL	-----
		89.8
	Combined moisture, oxygen and undetermined	10.2

		100.0

OPERATING COSTS AND CRITICAL VALUE

The custom smelters, particularly the Hayden Smelter of the A. S. & S. will gladly accept this ore with usual treatment charges and the

payments could be based upon the present government price of 17¢ per pound for new copper and 71.1¢ per ounce for silver.

The following table will show the value and net returns per ton of ore of various grades.

	'S oz. Ag 'A 8% Cu	'S oz. Ag 'A 5% Cu	'S oz. Ag 'A 4% Cu	'S oz. Ag 'A 3% Cu
Payment for metals contained	\$ 10.70	14.07	11.43	8.55
Deduct for smelter toll charge, railway freight and trucking (estimated at 50¢ per ton)	0.00	5.00	5.00	5.00
Net return to shipper	\$ 10.70	9.07	6.43	3.55

There will be some slight variation from these figures due to moisture content and changing freight classification for value.

In view of the conditions under which your ore occurs it is my opinion that neither such ore as you may hope to find in any of the old workings or in any new shoots that might be found by further exploration and development could be mined and hoisted for an average working cost of less than \$3.00 per ton to which the general and overhead expenses would add another 50¢ thus making the total cost for mining etc. closely approach a \$4.00 figure and an additional charge of at least \$1.00 per ton should be made for the repayment of the initial capital which will have to be invested for reconditioning and developing the mines thus making it useless to attempt to find or mine any ore body that will not return at least \$5.00 per ton.

on three assumptions any ore containing less than 3.75% copper could only be produced at a loss and the ore which is to be mined would have to average at least 4% in order to yield even a small margin of profit while the venture involved in reopening these properties would not seem to be attractive unless there was good reason to expect that one would find and mine a substantial tonnage of ore averaging better than 4%.

Aside from small and often inaccessible pillars and ends of old shoots I could find no evidence that ore of such grade had been left in any of the old mine workings and I cannot recommend any further work on your property based on the expectation of finding pay ore in the old mines.

On the other hand there are several partially explored sections of the claims where the chance of finding new and similar ore bodies appear to be good and considering these portions of your property as partially developed prospects I feel that their further development is a legitimate and reasonably attractive mining venture and from that standpoint, but from that standpoint only, I recommend the reconditioning of the King Shaft and exploration to the west along and near the contact in the King Claim and, subject to making a satisfactory deal with the owner, eastward in the Queen Claim.

I also recommend a similar procedure in the upper portion of the Glance Shaft and further development to the east on the upper levels to prove up the conditions under the attractive showings of ore which are noted along that section of the surface.

For these two projects plus camp repairs and proper working capital I believe that a fund of at least \$50,000 would be required and it would be safer to make this \$50,000 to provide for contingencies. I believe

that through both of these operations there is a fair chance of finding
new ore that will run 65 or better in copper as did the former productions
which according to the records was very profitable to the operators.
Since the net surplus or operating profit over working costs for
every ton of ore of 65 grade should be in the order ~~to be~~^{of} \$0.70
per ton it would require less than 4,000 tons of such material to repay
the money which would have been risked at the outset.

It is my opinion that the chances of finding far more than 4,000
tons of 65 or higher grade ore are distinctly good.

Respectfully submitted,

Erne

GEORGE M. COLVOCORESSIS
MINING AND METALLURGICAL ENGINEER
1102 LUHRS TOWER
PHOENIX, ARIZONA

Office Copy

May 29, 1942

REPORT ON PROPERTY OF TWIN BUTTES
MINING AND SMELTING COMPANY

Twin Buttes Mining & Smelting Company
c/o Robert E. Hackett
Room 1112
229 East Wisconsin Avenue
Milwaukee, Wisconsin

Gentlemen:

As per written and verbal instructions from your Vice-President, Mr. Robert E. Hackett, I have examined the mining claims and accessible mine workings of your company in the Twin Buttes District, Arizona, and herewith beg to submit the following report which is accompanied by Exhibits as listed in the Index. Also an Appendix.

The impossibility of inspecting any of the underground workings except on one level in the Morgan Mine and the lack of assay maps or reports of operations and underground conditions unfortunately limited and handicapped my investigation but I feel justified in reaching certain conclusions and making certain recommendations which are set forth immediately below while the details and data on which they are based will be found in the body of the report.

CONCLUSIONS

(1) Since the character of your ore does not make it suitable for treatment by concentration it must still be shipped crude to a smelter as in the past. Therefore no ore containing less than 4% copper can be mined with profit and it would be futile to attempt to find or develop lower grade material.

(2) I found no satisfactory evidence that any substantial tonnage of either high grade or low grade copper ore had been left by former operators in any of the mines.

(3) I found no evidence that there is any appreciable content of tungsten in the copper ore in the Morgan Mine; the advisability of attempting to mine scheelite from the quartz ledges found on the surface of that property will be determined by the result of the investigation by the Federal Bureau of Mines which should be made known to you in the near future.

(4) I was very favorably impressed with the probability of finding new shoots of ore in the vicinity of some of the old workings since these are indicated by surface showings especially east of the Glance Shaft and west of the King Shaft and in my opinion an effort to explore and develop these areas should be made.

RECOMMENDATION

Subject to satisfactory adjustment of the present lease, I recommend that a fund of approximately \$30,000 should be obtained and expended for the exploration and development of the most promising showings on the King and Glance Claims as outlined in the body of the report.

The investment of this money will of necessity be of a speculative nature but in my judgment it is a good mining venture in which the chances of success and substantial profit outweigh the chances of loss.

PROPERTY, LOCATION AND GENERAL CONDITION

The property of the Twin Buttes Mining and Smelting Company consists of one small fraction and 22 full sized patented lode mining claims, comprising about 445 acres. These claims, located in the Pima Mining District, Pima County, Arizona, lie 25 miles in air line or 30 miles by good road, (20 miles of which is paved highway) south-southwest of Tucson. They are 8 miles by road southwest of the Southern Pacific Railroad (Nogales Branch) at Sahuarita. The claims comprising three groups as shown on the map (Ex. A.) and described in detail in this report, occupy portions of Townships 17 and 18 south, Ranges 12 and 13 East--Gila and Salt-River Base and Meridian.

The contour of the surface is undulating but not rugged with rounded hills rising between the washes or valleys to a height of 700 feet. The average elevation of the property is about 5500 feet above sea level. The slopes are rocky or covered with recent detrital soil as in the valleys and vegetation is sparse; many desert shrubs, cacti and grasses but no trees. The climate is very dry as usual in this part of the country with mean annual rainfall of about 10 inches--the summers are hot and winters mild with occasional light falls of snow and more frequent frosts. Mining work can be carried on without difficulty during the entire year.

The water table is found at from 250 to 400 feet below the surface in all of the shafts and the quality of the water in some of these shafts especially the Gladstone, is excellent while the quantity is ample for all domestic purposes and probably for a small or medium sized mill. An electric power line now passes about 6 miles from the

property from which some power would probably be available although this situation is complicated by war conditions and positive information and rates might only be obtainable after the priority of an active operation had been established.

Transportation by truck to the Railway formerly cost \$0.75 per ton and might now be slightly less and the base freight rate to the nearest custom smelters at Hayden or Douglas is \$1.40 per ton with increase for ores of high value.

GEOLOGY AND ORE OCCURRENCE

The general geology of this district has been studied to some extent by Ransome and Barton of the United States Geological Society as well as others. A report by Forste was made for the Midland Company but this I could not obtain.

It appears that the oldest formation is a coarse pre-Cambrian granite which is exposed around the Alter valley and in places in the Sierrita Mountains. This was overlain by sandstone, shale, limestone, ~~and quartzites~~ ^{quartzite and} of schist deposited during the Devonian and Carboniferous eras during which and subsequently there were many intrusions of finer grained granite and porphyritic rocks.

The present surface, except where covered by recent alluvial sediments, is largely limestone, often silicified, and fine grained granite and there is a suggestion that the intrusive granite in the immediate vicinity of Twin Peaks may have formed a laccolith surrounded by limestone and through contact metamorphism causing the limestone and schist to become more or less gernetized while the quartzite, which was once a calcareous sandstone, developed epidote and amphibole.

The ore deposits were formed as a result of the granite intrusion in fissures and branch veins along or near to the contacts and they are of the contact metamorphic type the principal primary minerals having been sulphides of iron, copper and zinc (carrying some silver and a very little gold) and later altered to carbonates, oxides and secondary sulphides including the copper glance which was found in some of the old workings.

I should not expect that any of these ore deposits would hold strong to any great depth and from the record of the mines it would appear that all of the shoots have been pretty well bottomed except perhaps in the Glance Mine. Nor are ore bodies of this character likely to persist in size or value over any great lateral distance and here they seem to have run true to form since the mine workings indicate that pay values occurred only in comparatively short lenses with barren or very low grade sections between them.

On the other hand such shoots of pay ore forming in the swells or bulges along an irregular contact and in branching fractures penetrating the wall rock usually occur with great frequency and there is no reason to believe that in the Twin Buttes District all of these shoots have been discovered and developed. In support of this opinion I was impressed with the surface showings along certain portions of the contact which appear to have been barely prospected, notably to the west of the King shaft and between the Glance and the Bullion shafts. It is my opinion that in some of this territory comparatively small but fairly rich shoots of ore will still be found from the workings of the old mines,--a careful program of exploration and development should be carried on along such sections of the more promising but practically unexplored sections of the limestone-granite contact.

HISTORY

From such records and information as I was able to obtain it appears that the first mining operations of any consequence were started on the properties in the '90's and in 1905 the Twin Buttes Mining and Smelting Company was organized with Milwaukee capital and this company built a 28 mile standard gauge railway, later sold and dismantled, from the mines to Tucson and operated fairly continuously until 1915 taking most of their ore from the Morgan Mine. Subsequently portions of their property were leased and optioned to Bush and Baxter and to the Midland Copper Company and a large output was made mainly from the Glance and Queen Mines, the Queen being eventually purchased by the Lessee. Leases on certain of the claims are still in effect as will be mentioned later. The production figures given in this report were obtained from various records including those of the smelters and I cannot claim that they are complete or accurate since the mines were worked by operators who did not always specify the source of their shipments.

No figures are available prior to 1905 and since that date I have found records of ore shipments aggregating 388,231 dry tons from which were recovered 42,818,237 pounds of copper, about 350,000 oz. of silver and 2,000 oz. of gold. This would indicate that the ore averaged better than 6% copper.

The production made by the Twin Buttes Company from 1906 to 1912 inclusive came mostly from the Morgan Mine which was then practically closed down. The Bush-Baxter Lease from '13 to '17 incl. worked mainly in the Glance and the Queen as did the Midland Company from '18 to '20 when they discontinued work at the Glance from then until '26 incl.

worked the Queen and the King and purchased the Queen Mine from the Twin Buttes Company toward the close of that period.

The small production of the "Buttes Company" in '39 came partly from ~~the~~ mines which did not then belong to the Twin Buttes Company so that it has not been included in my report.

DETAILED DESCRIPTION OF MINING CLAIMS

NORTHERN GROUP

This comprises the following 8 claims:

Copper Prince
Senator Stewart
James G. Blaine
Garfield
McKinley Copper
Admiral Beyer
Hobson Copper
Copper Hill

The patent surveys of these claims were obtained and studied in conjunction with the field examination, which indicated that this entire group of properties appears to be quite worthless or at best only suitable to turn over to lessees.

The surface is nearly all limestone and on the eastern section of the group some of it is very coarsely crystalline. Outcrops of granite and more basic intrusives were noted at intervals and at or near the contacts there were occasional stringers of copper ore which occurred in shallow gash veins or fractures and pinched out entirely a short distance

X below the surface.

Subsequently one of the operating or leasing companies put down a shaft in the western section of the group and did a little drifting and cross-cutting but met with no better success.

Most of the other openings which I was able to find appeared to have been merely dug in order to comply with the requirements for annual assessment work and gave no promise whatever of ever developing any commercial ore although I was told that a few small pockets of high grade had been mined when the claims were first located.

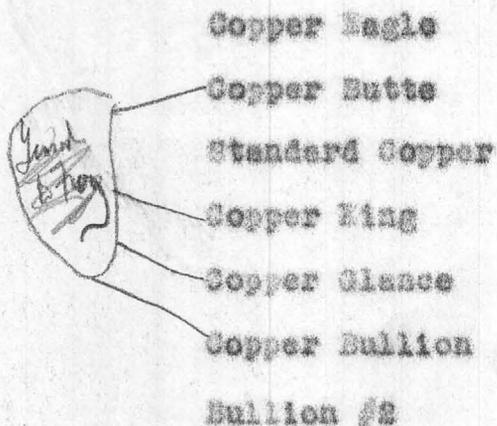
I could obtain no record of any production or shipments made from this northern group of claims and the small tonnage of ore which they have produced was probably shipped along with the output of the working mines. I have rarely seen less promising patented mining claims and my unfavorable opinion was confirmed by everyone from whom I sought information with the exception of one man who told me that he had once found a pocket of high grade copper glance and would have applied for a lease on that claim except for the fact that he could never find the spot again and was uncertain on which claim it was located. He said that he would again try to find it.

This group of claims could probably be abandoned with no loss to the company but since the expense of holding them is trivial this is doubtless a more prudent policy and is therefore recommended, but I could see no justification for spending any money for further exploration nor for attempting to reopen any of the old workings.

CENTRAL GROUP

Of these seven claims the Bullion, Glance, King and Butte are at present held by William Foy under a lease, the legal status of which

will probably be determined in the near future. This group is located one mile south of the Northern Group and the claims are named as follows: (See Exhibits A and C)



The Copper Queen, which lies between the King and the Giance, formerly belonged to the Twin Buttes Company. It is reliably reported that the ore in the mine has been worked out and this is admitted by Mr. Foy, the present owner, but he believes that the claim may still produce ore from the western portion which could be worked through the King shaft.

The long section map of this group looking north (Ex. B) shows the general relation of the various mine workings all of which are strung out along one of the main contacts between the hanging wall of the limestone and the footwall of intrusive granite. The general strike of this contact is east-west and the dip is to the south at varying degree in different sections.

In some of the principal bays or bulges along this contact ore bodies have been mined while other shoots were found in branch veins or fractures. A study of the geology and surface outcrops indicates that other ore bodies, probably smaller but of similar character, are likely to lie along the intervening and more or less unexplored sections

of the contact.

Since all of the deep shafts in this area were caved or otherwise impossible to safely inspect my physical examination was of necessity confined to the surface outcrops and shallow surface pits and to the dump material at the shafts in addition to which I obtained much information from several parties who were familiar with the old mine workings and although all of their statements were indefinite and many were contradictory I have tried to draw from them such conclusions as seemed reasonably justifiable.

The lack of assay maps of any of the mines and the inaccessibility of their workings makes it quite impossible for anyone to accurately estimate the tonnage or value of the remaining ore. Apparently such assay maps were never prepared while the mines were operating nor could I find any reports by the management or their engineers which contained an estimate of ore reserves at any time, but all opinions expressed to me regarding the remaining ore were given careful consideration.

Starting from the eastern end of this group I shall refer to each claim and to the underground workings in detail.

Bullion No. 2

No outcrops were noted on this claim the surface of which is largely covered by detritus and elsewhere is barren limestone or granite.

Copper Bullion

The eastern section showed some outcrops of iron oxide without copper, but a few copper stains were noted in pits in the south-central section.

The Bullion Shaft was sunk vertically to a depth of 520 feet

well in the hanging wall of the contact which at this point appears to have been largely composed of quartzite and very siliceous limestone showing some jasper and stringers of iron oxide.

It is reliably reported that a strong vein but practically barren of copper values was struck at 300 feet but this shaft never reached the true contact with the granite. Some good ore must have been found in the hanging wall fractures for my grab sample of picked specimens from the dump assayed 11.56% copper.

Working to the west along what appeared to be the outcrop of the fracture vein there are a number of shallow pits extending north 55° west to intersect the main contact on the Glance Claim and narrow seams of rich copper carbonate ore were noted in several of these. The showings were more promising after crossing the west end line to the Glance Claim.

It is my opinion that there is promising prospecting ground on the Bullion along the contact which seems to have been largely unexplored. The one or more branch veins or fractures which strike to the southeast are probably too small to be mined with profit and there is no reason at present to recondition the Bullion shaft since future development could best be carried on by drifting eastward from the Glance workings.

Copper Glance

For some distance from the east end line of this claim the outcrop of the contact is not well defined but the fracture vein crosses from the Bullion and becomes more prominent as it approaches the Glance shaft.

The carbonate ore in this vein is narrow and irregular but rich. a Grab sample from fragments on the dumps of the pits within 400 feet of the shaft carried 17.10% copper. Apparently the narrow and erratic

occurrence of such high grade ore discouraged any attempts to explore or mine at depth but it appears to me that underground explorations should be carried eastward from the Gience Shaft and this is also the opinion of Foy and Simonton, both of whom were well acquainted with the old workings.

The Gience B compartment and 1½ compartment shaft was sunk in the footwall of the contact near the west end line of the Claim to a vertical depth of 625 feet with five levels and a 60 foot winze sunk below the 525 foot level.

Ample and efficient mining equipment was formerly located here and while the remaining machinery itself is probably unusable except for a small compressor and a Cameron pump, which do not belong to the Twin Buttes Company, it appears that the head frame, trestle and ore bins could all be repaired at moderate expense.

The underground workings in this mine were quite extensive as it was for a time the principal producer and it is credited with an output from 1908 through 1919 of 113,066 dry tons averaging 4.72% copper and 2.3 oz. silver. Most of the ore occurred in fissures in the limestone and garnet rock close to the granite contact which dips to the south. The largest ore bodies were found between the 300 and 525 foot levels, some of the stopes being 50 feet in width. Below the 525 foot level both the size and grade of the ore bodies decreased and stoping ceased in 1919 (except for a little subsequent work by leasers) although the shaft was used for several years thereafter to hoist ore mined in the Copper Queen with which mine it was connected by a 1400 foot long drift on the 525 foot level, as shown in Exhibit B.

Opinions as to the quantity and quality of ore now remaining in

this mine are somewhat contradictory but giving due weight to each one of these and especially to the fact that the Midland Company did not find it advantageous to attempt to work the mine at any time subsequent to 1919,--although the equipment was then complete and in good condition and the price of copper ore was satisfactory in '22 and '23-- I am convinced that very little accessible ore containing better than 3% copper was left in this mine except in small pillars around the shaft and drifts such as may now be seen at the surface.

The ore developed along the 625 foot level and in the winze is reported to have been in narrow lenses and low in grade and gave little encouragement to development at greater depth.

Much of the ore taken from the upper stopes was extremely rich, sometimes carrying 10-15% copper and since it was the intention of the management to maintain a shipping average of about 6% copper a lot of 4% and even 5% ore from other sections of the mine were broken and mixed with the high grade material.

The gob or fill which was put into the larger stopes is partly waste and partly low-grade ore but probably would not average 2% copper.

Much of the ore as noted near the surface and on the dump contains a high percentage of iron-pyrites and my sample of larger pieces of what appeared to be the higher grade material found on the dump showed Copper 5.43% while the fines carried 3.32% copper.

Foy has estimated that the cost of unwatering and reopening the Glance shaft to the lowest level, purchasing and installing the necessary equipment and carrying on a certain amount of development to prove up some new ore bodies whose location he claims to know, will be around \$20,000 which seems to be a reasonable figure but I could not recommend that this money should be spent in order to recover such ore as is likely

to be found in the old workings themselves. I am obviously in no position to pass judgment on Foy's ability to find additional ore in other sheets of which he will not divulge the location nor the evidence on which he places confidence in his ability to find them, but I agree with his belief that such ore exists and should be sought after.

Since the flow of water in the lower workings of the mine is said to amount to nearly 100 gallons per minute a heavy pumping expense would be continuously involved while the mine was kept open to the bottom and the initial cost of unwatering the extensive openings in the Glimco, as well as openings in the Queen Mine down to the connection on the 525 foot level, will be very considerable.

A less ambitious and less expensive program would be to recondition the shaft only down to the water level (which Foy places at 385 feet) and then to carry on some drifting to the east on the 300 foot level to explore the area under the favorable showings in the fracture vein which has been described above.

While it is always difficult to estimate the expense of reopening any long shut-down mine, where timbers are apt to have rotted and ground may be caved, I believe that this procedure would not be likely to involve any outlay of more than \$12,000 including the purchase or rental of adequate equipment and drifting east as far as the first attractive outcrops. Additional drifting need only be undertaken if this work has given favorable results and some small tonnage of good grade ore could certainly be recovered from the pillars near the shaft and thus reduce the net outlay.

If Foy does not himself proceed as he proposed and proper arrangements can be made in respect to his lease, I should recommend this

latter program as a legitimate and promising mining venture.

West of the Glance Shaft the contact outcrop is partly covered by the dump and there are no further showings of importance on the Glance Claim. The main road crosses the claims between the Glance and the Queen Shafts.

COPPER QUEEN MINE

Since this property does not belong to the Twin Buttes Company I merely made a casual examination of the surface and inquiries which lead me to conclude, as previously mentioned, that the mine had been pretty well cleaned out of all pay ore when it was shut down by the Midland Company in 1925. Foy has no thought of reopening this mine or attempting further exploration on the claim except near the west end where work can be carried on from the King Shaft.

The outcrop of the contact can be noted at intervals throughout the length of the claim/ but it is covered over near the shaft where undoubtedly it was the strongest and I did not observe any very promising showings on the surface or in the test pits.

The collar of the 700 foot inclined shaft has caved in and the surface buildings, trestle and ore bins are in bad shape and would hardly pay to reconstruction even if the remaining ore justified reopening the mine, whose connection with the Glance is through the 572 foot (7th) level.

The Queen is credited with a total production of 75,166 tons of ore averaging close to 3% copper. Future work, if any, in this claim should be done from either the Glance or the King Shafts.

COPPER KING CLAIM

Crossing the east end line from the Queen there is a vein or

fracture branching from the contact from which ore has been mined in an open-cut on both of the claims and some of this same ore is now being mined by Foy at a depth of about 30 feet below the surface and 100 feet west of the King Shaft which is only 15 feet from the east end line of the claim.

My sample of this ore ran 3.75% copper. The vein is narrow, varying from 1 to 2 feet in width but as long as it continues to hold up in grade the returns from shipments should serve to pay the wages of the three men who are laboriously mining it with hand steel until they reach a depth where mechanical bolting equipment will be necessary.

The King Shaft inclining 72° to the south is reported to have a depth of 330 feet and looking down from the surface it seems to be in fair condition.

According to both Foy and Simenton the only work done here consisted in stopping out one shoot of ore from the fracture vein in the immediate vicinity of the shaft, but it is said that this ore averaged 3% copper and 2 oz. silver per ton and had a gross value of \$150,000.

^AThe body of oxidized ore (zinc) was also reported to have been found in depth averaging 25% zinc and 2 oz. silver but of this I could see no evidence.

I was most favorably impressed with the surface showing at the King and this is my first choice for further exploration and development. I feel confident that additional ore will be found in the fracture vein going west and there would also be an excellent chance of finding ore along the contact between the limestone and the granite which appears to be virgin ground and should certainly be investigated.

The cost of equipping and reconditioning the King Shaft, drifting

200 feet to the west under the surface workings and cross-cutting to the contact should certainly not exceed \$10,000 and this work I can definitely recommend subject to the proper adjustment of the Foy Lease.

Throughout the balance of the King Claim going west the surface is limestone and the contact cannot be seen but there are fracture veins which show iron outcrops and in some of the pits a little copper stain is noted but I saw nothing to encourage any exploration.

COPPER BUTTE

Conditions described just above apply to the eastern section of this claim near the north center of which a 500 foot shaft was sunk on an incline of some 70°, the same being now entirely caved and useless. Little or no copper was found here although the shaft passed through the contact and into the granite.

Going west from the shaft the first promising surface showing was noted at some distance and about 500 feet from the end line which is common to the Minnie Claim owned by Foy.

The Minnie shaft inclining 75° to the south is located only a short distance from the end line of the Butte and reached a depth of 325 feet. The ore shoot in this mine is reported to have pitched sharply to the east on the 200 foot level it crossed into the Butte Claim so that at greater depth the production would come largely from that property. Foy believes that it will be worth while to reopen the shaft which seems to be in pretty good shape and to work to the east and also develop to greater depth but in view of the comparatively low grade of the ore mined here to date and the lack of any evidence to show that it will improve with depth, I should not advise any work here at present. My sample of ore found on the dump carried 3.22% copper and

the total production from the mine, --62,477 tons from 1914 to 1918, averaged 4.71% copper.

There are two shafts and several pits near the western end of the Butte Claim in which some fair ore is seen in fracture veins and one or both of the shafts are said to connect with the Minnie workings. Some further prospecting on or near the surface might improve the picture but otherwise I should not advise any underground work at the Butte Claim unless evidence could be produced to show that one would be likely to find ore averaging better than 5% copper.

Some zinc was found in the Butte Shaft but apparently it had no commercial importance.

The Copper Eagle and Standard Copper Claims which lie respectively north of the Butte and the King are largely covered with top soil and no ore showings were noted nor could I learn that any mining work had been conducted.

Many of the camp buildings were constructed on these claims and several of these structures are still in fair condition and could be made serviceable. But they would require substantial repairs for which purpose a fund of about \$5,000 should be provided.

It may be that, aside from providing a good camp site, these two claims were originally located with the thought that they might hold the apex rights to some veins that would be found in the workings but I saw no reason to believe that such has been, or ^{is} ~~was~~ likely ^{to} ~~and~~ prove to be a fact.

No prospecting or development work seems called for on either of these claims.

SOUTHERN GROUP

These claims are at present held by Charles M. Taylor of Tucson

by virtue of a 5 year lease dated April 7, 1941. However Mr. Taylor expresses himself as ready to cooperate in every way with any program of reopening and operating that may be decided on and financed by the Twin Butte Company or other associates and therefore for all practical purposes they form a part of the holdings of your company.

The group comprises the following claims:

Summit Fraction
Gladstone
Margarita
Senator Morgan
Senator Morgan No. 2
Hellie
Daily News
Pandora

These claims are located one mile to the south and extending one-half mile to the west of the Central Group (See Exhibit A.) They are on a different contact from the Central Group.

All of the Mining work has been done on the Gladstone and Morgan Claims to which my examination was largely confined since the surface of the others appeared to show nothing but barren limestone, granite, quartzite and top soil.

SENATOR MORGAN

This was the only mine of which I was able to obtain any of the detailed maps of the underground workings (Ex. D, E, and F.) and also the only one in which I could personally make an inspection of the same and that only down as far as the 165 (2nd) level.

It is said that the original outcrop of this mine was more prominent

than any of the others and therefore this was the first one that was worked by the Twin Buttes Company. Its total production from 1908 to 1913 being recorded as 138,508 dry tons of ore averaging 5.92% copper and 2 oz. silver per ton.

Subsequent to 1913 some mining was continued by leases until 1919 since when no mining has been done and the new shaft and head-frame were destroyed by fire.

In 1921 Mr. Taylor and his associates repaired the old three compartment shaft (which will hereafter be referred to as "the shaft") down the 165 foot level and drifted to the southwest 250 feet seeking to cut in depth the quartz veins in whose outcrops some scheelite had been found and hoping to thus develop a tungsten rather than a copper mine. The value of this property as a possible producer of tungsten ore will be discussed below.

The workings of the Morgan Mine are graphically and presumably accurately shown on the accompanying maps (Ex. D, E, and F.)

The shaft (old shaft) is vertical and was sunk in limestone and garnet schist quite close to the contact with the granite which it intersects at the 2nd level.

On the surface this contact is marked by a strong gossan outcrop with copper carbonate showing in many places for a length of over 200 feet and a width of 10 feet or more with stringers branching off into both the foot and hanging walls.

Much of the surface ore has been mined out from open cuts but there are still some small showings from which I took a sample that carried 4.12% copper. Some ore of this grade could still be mined from near the surface but it would be a task for leasers rather than for a company.

Between the showings in the surface cuts and those on the 100 foot level from the shaft the mine is inaccessible and the workings are caved. This mining was done from the "Whim shaft" sunk in the footwall of the vein and while neither written records nor the recollection of old time miners throw much light on the question it is a reasonable presumption that all of the better grade of ore has been worked out except for the pillars which would be difficult to reach and contain a problematical quantity of ore.

Inspection of the 100 foot level from the old to the new shaft, where the station has caved, failed to indicate that any commercial ore had ever been found except in the one shoot on which the big stopes was located. The line of contact east of this stope as far as the new shaft was almost barren of values and several cross cuts run both to the north and south had failed to find ore in any of the fractures which they intersected. The maps of the lower levels and statements of men who worked in the mine are conclusive evidence that neither by drifts, crosscuts or diamond drilling were any other large shoots of ore discovered and the entire contact area east of this shaft was very thoroughly explored. To the west it appears that only one long drift was run out 500 feet on the 300 foot level where it passed through much garnet rock and quartzite with veins of quartz and iron oxide but found no copper ore at all. On the 400 foot level a 200 foot long cross cut was run from near the shaft in a southwesterly direction with no result.

The reason why crosscutting and drilling, which was so extensively done to the east of the shaft, should have been limited to these two workings on the west is not at all clear but I have no doubt that the operators who were thoroughly familiar with the underground conditions

and geology had good grounds for believing that further work in any direction would be a waste of energy and money when they finally closed down this mine and it would be folly for anyone else less familiar with the situation to dispute their judgment.

As to the one main shoot of ore this was doubtless worked out from top to bottom as completely as was economically feasible.

On the 165 foot level the length of the stope is about 120 feet and the width up to 15 feet in the center and tapering toward each end. The ore seems to have been confined to two veins along the foot and hanging wall with a horse of waste or low grade ore between.

No systematic sampling of the small remnants of the ore shoot was possible but I was able to cut two very unsatisfactory samples from the footwall or south stringer and two more from the hanging wall or north stringer. The first two ran 4.82% and 7.04% copper while the copper in the latter was only 1.50% and 2.71% which explained why only sections of the hanging wall stringer had been mined.

These samples confirmed my impressions that the remaining ore was spotty and erratic in value and that only the very small quantity of ore remaining in the footwall vein could possibly be mined with any profit.

Other samples which I took on the dumps gave the following results:

Grab sample from pile of ore near Main Shaft

Cu 4.18%

Grab sample from small pile of ore on main dump

Cu 3.72%, Zinc 0.40%

The silver content in my underground dump samples was 0.8 oz. per ton so that the silver in this low grade material seems to bear a relation to the copper similar to that which maintained in the higher

grade shipping ore.

From physical examinations and geological maps prepared by others it seems that the footwall rock of the ore bearing fissures is soft siliceous limestone while the hanging wall is hard siliceous lime much of which might be termed a quartzite, garnet rock and iron. The strike of the vein is nearly east-west and the dip varies but averages about 60° to the south.

It is entirely possible as Charles Taylor, James Peanington, and others believe that some 3% or even 4% ore could still be mined from the ends and pillars of this old stope but it would be an expensive procedure and all in all I can see no reason for attempting to reopen the Morgan Mine as a producer of copper ore.

TUNGSTEN POSSIBILITIES IN MORGAN MINE

It has been the theory of Mr. Taylor that all of the ore in this mine carried some values in tungsten and he expressed the opinion that the average content in SO₃ (tungstic acid) would be as much as 0.5% equal to 10% per ton which might have justified the mining of this ore and erection of a treatment plant for concentrating the tungsten.

Since an analysis of a composite of my samples taken underground showed the content of these in SO₃ to be only .04% and my sample from the dump which carried 3.72% copper showed only a trace of tungsten I feel satisfied that the tungsten content of the ore is in no way proportionate to the copper content and that the very minute percentage of that metal associated in the copper ore would give it no additional value. The same may be said in respect to the zinc content which was less than 10% per ton in the samples which I had tested for that metal.

The presence of tungsten in quartz ledges outcropping to the south and southwest of the shaft had led Mr. Taylor and his associates to

drift a distance of 250 feet to the southwest in order to cut these veins in depth, but the ledges dip to the west and only one of them appears to have been cut by the drift on the 165 foot level some 50 feet back from the breast where my sample (in two sections) over a width of 12 feet showed this quartz vein to carry only $2.4 \times 50_2$ (0.12%) per ton which is insufficient ~~in~~ ^{to} making it commercial ore.

The grade of surface ore as developed in numerous trenches and pits sunk to varying depths (maximum 35') has been carefully determined by the Engineer of the U. S. Bureau of Mines who has sent some four tons of large samples to be analyzed at Reno, Nevada.

A copy of the report of this engineer has been promised to Mr. Taylor before June 15th and will no doubt be transmitted to your company and this should conclusively establish the value of this deposit which in my own judgment, if it is worth working at all, can best be operated with Government money as a war industry rather than by any private capital with the expectation of financial gain. A copy of a memorandum presented to the Government is included in the appendix to this report.

GLADSTONE CLAIM

Passing west from the Morgan to the Gladstone the surface alters to granite in the northern part of the claim but on or near the contact with the limestone a number of pits have been sunk, mostly in fracture veins, and in several of these narrow stringers of high grade copper ore were noted and sampled, the copper content being 10.00%.

The Gladstone shaft was sunk vertically to a depth of 450 feet but it appears to be entirely in the intrusive granite and no ore is to be found on the dump. It is the opinion of Foy that drifting to the east

and crosscutting to the south from the bottom of this shaft might result in picking up the downward extension of the veins which are noted in the surface pits but since none of these veins appear to be very strong or persistent I do not feel that the expense involved in this procedure would be justified.

A substantial flow of very excellent water was found in this shaft which would be ample for all camp requirements and probably sufficient for a small or medium sized mill. The shaft itself appeared to be in good shape and could be reconditioned for pumping at small expense.

As previously mentioned none of the other claims of this group appeared to have any importance for mining operations.

METALLURGY OF ORE

Practically all of the copper ore produced from the Twin Buttes Mines was oxidized with the exception of a certain quantity of copper-glance (chalcocite) which seems to have occurred only in pockets.

The balance of the production and practically all of the ore which I found in any of the showings or on the dumps was green carbonate (malachite) or brown oxide plus a little copper silicate all intimately associated with hematite iron and iron pyrites.

Such an ore will not concentrate by gravity and is not easily concentrated by flotation and therefore it cannot be compared from a commercial standpoint with a sulphide ore of similar grade. Nor would leaching be likely to effect a satisfactory recovery except at prohibitive expense.

It has been suggested that leaching in place might result in a certain recovery of copper ore from the fills in the Glance and perhaps in the other mines since the solutions could readily percolate through such a mass of broken up material but the pumping of the acid solutions would involve special equipment and the preliminary expense involved

in properly conducting the water to points of dispersion would seem to me to be entirely prohibitive.

Therefore I cannot suggest any method of treating the output of these mines which would be more economical and efficient than the former practice of direct shipment to a smelter and I give below an approximate complete analysis of the shipments as taken from smelter record.

	per ton oz.	per ton %
Au	0.05	
Ag	2.00	
Cu		64.5
Pb		0.7
Zn		0.8
Mn		0.3
Fe		32.0
S		25.0
SiO ₂		20.0
CaO		5.0
Al ₂ O ₃		1.5
	TOTAL	100.0
	Combined moisture, oxygen and undetermined	10.2
		100.0

Handwritten notes: 3000, 1000000

OPERATING COSTS AND CRITICAL VALUE

The custom smelters, particularly the Hayden Smelter of the A. S. & S. will gladly accept this ore with usual treatment charges and the

payments would be based upon the present government price of 17¢ per pound for new copper and 71.1¢ per ounce for silver.

The following table will show the value and net returns per ton of ore of various grades.

	'2 oz. Ag 'a 6% Cu	'2 oz. Ag 'a 5% Cu	'2 oz. Ag 'a 4% Cu	'2 oz. Ag 'a 3% Cu
Payment for metals contained	\$ 16.70	14.07	11.48	9.58
Deduct for smelter toll charge, railway freight and trucking (estimated at 50% per ton)	6.00	5.60	5.60	5.60
Net return to shipper	\$ 10.70	8.47	5.88	2.98

There will be some slight variation from these figures due to moisture content and changing freight classification for value.

In view of the conditions under which your ore occurs it is my opinion that neither such ore as you may hope to find in any of the old workings or in any new shoots that might be found by further exploration and development could be mined and hoisted for an average working cost of less than \$3.50 per ton to which the general and overhead expenses would add another 50% thus making the total cost for mining etc. closely approach a \$4.00 figure and an additional charge of at least \$1.00 per ton should be made for the repayment of the initial capital which will have to be invested for reconditioning and developing the mines thus making it useless to attempt to find or mine any ore body that will not return at least \$5.00 per ton.

On these assumptions any ore containing less than 3.75% copper could only be produced at a loss and the ore which is to be mined would have to average at least 4% in order to yield even a small margin of profit while the venture involved in reopening these properties would not seem to be attractive unless there was good reason to expect that one would find and mine a substantial tonnage of ore averaging better than 5%.

Aside from small and often inaccessible pillars and ends of old shoots I could find no evidence that ore of such grade had been left in any of the old mine workings and I cannot recommend any further work on your property based on the expectation of finding pay ore in the old mines.

On the other hand there are several partially explored sections of the claims where the chance of finding new and similar ore bodies appear to be good and considering these portions of your property as partially developed prospects I feel that their further development is a legitimate and reasonably attractive mining venture and from that standpoint, but from that standpoint only, I recommend the reconditioning of the King Shaft and exploration to the west along and near the contact in the King Claim and, subject to making a satisfactory deal with the owner, eastward in the Queen Claim.

I also recommend a similar procedure in the upper portion of the Glance Shaft and further development to the east on the upper levels to prove up the conditions under the attractive showings of ore which are noted along that section of the surface.

For these two projects plus camp repairs and proper working capital I believe that a fund of at least \$25,000 would be required and it would be safer to make this \$30,000 to provide for contingencies. I believe

that through both of these operations there is a fair chance of finding new ore that will run 6% or better in copper as did the former productions which according to the records was very profitable to the operators. Since the net surplus or operating profit over working costs for every ton of ore of 6% grade should be in the order to be ~~worth~~^{of} \$5.70 per ton it would require less than 4,000 tons of such material to repay the money which would have been risked at the outset.

It is my opinion that the chances of finding far more than 4,000 tons of 6% or higher grade ore are distinctly good.

Respectfully submitted,

J. H. Colverman,

Claims of Twin Buttes Company

Northern Group Tp 17 S R. 12 E.

Section 25 and Tp 17 S. R. 13 E. Section 30

- > Copper Prince
- > Senator Stewart
- > James G. Blaine
- > Garfield
- > McKinley Copper
- > Admiral Dewey
- > Holson Copper
- > Copper Hill
- ~~Twin Peaks~~

Glance Group Tp 17S. R. 12E. Section 36 and R. 13 E. Section 31
and Tp 18S R. 12 E. 1 and R. 13E. Section 6.

- > Copper Eagle
- > Copper Butte
- > Standard Copper
- > Copper King
- > Copper Glance
- > Copper Bullion
- > Copper Bullion No. 2
- > (~~Copper Queen sold to Foy~~)

Foy
Gain

Foy has been

Senator Morgan Group Tp 18 S. R. 12 E. Section 2, 6, 12.

- ~~Calcutta (?)~~
- > Summit Fraction
- > Gladstone
- > Margarita or Margaret
- > Senator Morgan

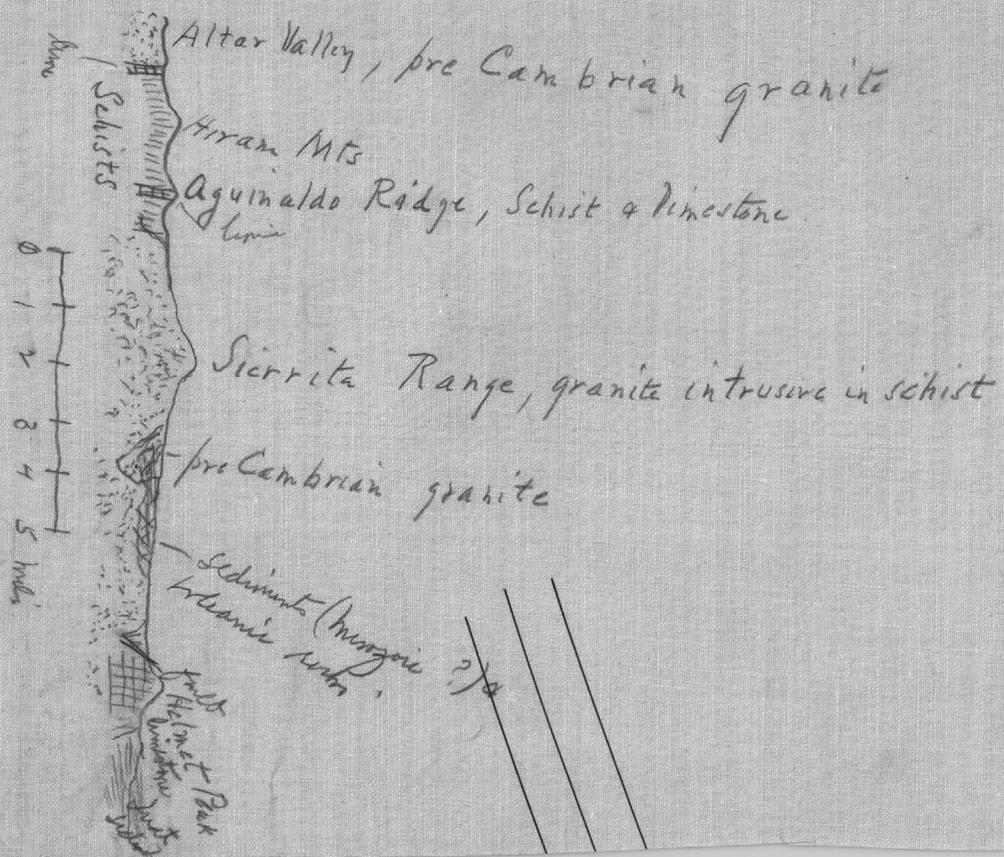
Senator Morgan Group of Claims

Nellie

Senator Morgan No. 2

Daily News P.

Pandora



Oct. 22, 1940

Location: Mines are ^{Smith} 2 1/2 miles south of Tucson and 8 miles ^{Smith} west of Sahuarita
(Tp etc and check).

History: Operated 1908-1929. Geology described by Ransone. Q.V and production in Arizona B. F. M. Bulletin 140 p. q.v. (also quoted on rough page). Total production given as 347,380 tons. Senator Morgan said to be worked out as a lot of development and diamond drilling failed to disclose any additional ore.

✓ ANALYSIS X

Total part shipments as above	Midland Co. output. 15-26. 63394 tons.	Midland output 29, 963 tons (Arizona)	Queen ship. 6/1/24 to 1/1/25 9068 tons	Glance ship. from above 400' level 124032 tons
Au. oz. 0.05			.005	
Ag. oz. 2.25	2.2	0.5	2.38	2.25
Cu. % 6.72	6.5	2.9	7.27	6.00
Pb. 0.70			0.7	
Zn. 0.80	1.2	0.8	0.8	
Fe. 32.0	33.6	34.0	31.8	25.0
Insul	23.	21.		
SiO2 21.0	20.	19.	20.6	35.0
CaO 5.0			4.8	5.0
S. 23.0	24	26.	23.3	16.0
Al2O3	1.5	2.0	1.5	
Mn			0.3.	

Smelter Payments

Au. ⁿMil

Ag. 95% (minimum deduction 0.5 oz) @ market less 1.5¢

breast of drift where vein was 8' wide in primary sulphide another cut 5' wide gave Au. . 02, Ag. 1.0, and Cu. 2.78%, Fe. 37.1, Ins. 12.4, CaO 6.3 and S. 40.4.

Evidently K. did not sample the pay ore in vein but he offered to take a lease on Glance and Morgan and spend 2500 dollars per month in development work with option and purchase at end of 9 months for \$300,00.

Morgan
The Morgan Mine had produced about 100000 tons of high grade ore but was worked out clean from 400 to 600' level (?) and diamond drilling failed to show any new shoots or extensions of the ore so that it is probably not so promising as the Glance but many think that a lot of low grade ore (largely carbonate) was left in the upper levels of the mine and was never properly explored.

Ore in Glance largely in the limestone close to the granite.

Recently Foy has tried to get the A. S. & R. to reopen the Glance and employ him as manager and Richard has made thorough study and advised that this proposal (probably eliminating Foy) is worthy of consideration but A. S. & R. not likely to spend money to unwater etc.

Ore in the Minnie is heading toward the Copper Butte Claim.

Other Mines

Mineral Hill owned by Barnsdall Corporation and including Plumed Knight Group.

Shipments ran Ag. 1.25 oz, Cu. 6.20%, Fe. 22%, S. 15, CaO 8, Al₂O₃ 2, Si O₂ 35.

This ore was higher than any grade of which according to Minard over 500,000 tons were developed carrying between 3 and 4% in '18 at which time it was planned to build a 300 ton mill with additional units later and Minard estimated that the profit would be 250,000 per annum at the prevailing price of copper which was probably figured at 18¢ per

Note re Esperanza Mine

(Twin Butte File)

Has a 700' shaft and made shipments of lead carbonate ore and at depth reported that sulphides were coming in.

Analysis given as follows:

	<u>Carbonates</u>	<u>Sulphides</u>
Au oz.	0.01	0.09
Ag oz.	9.6	13.9
Pb %	28.83	15.8
Tn %	32.57	little
Cu %	2.48	1.7

Notes Re: Twin Buttes

W

Twin Buttes Company own all of the three patented claims shown on the map but the south group including the Senator Morgan Mine as under lease to Taylor who is particularly interested in developing the scheelite. Taylor's lease has about 4 years yet to run, that is, until April 7th, 1946. The claims which he has are known as the Margaret, Nellie, Daily News, Summit, Senator Morgan No. 1, Senator Morgan No. 2. These are all included in mineral survey No. 2030 and are located in section 36, Township 16 south Range 12 east.

✓

William Foy holds a lease on the following claims: Copper Glance, Copper Bullion, Copper King and Copper Butte. This was a five year lease executed on January 16, 1935, but since he has not lived up to the terms, the owners have notified him on April 20, 1942, that the lease will be cancelled in 15 days and he is supposed to vacate the property before May 15th. There is a chance that he may resist this action and take the case into court.

All of the claims are in the Pima Mining District, Pima County. The above mentioned leases provide for 10% royalty and the lessee must perform at least 100 shifts of mining work per month. There are the usual non-liability clauses and taxes are all paid to date. The shaft at Bullion No. 2 was diamond drilled from the bottom at 525' depth without favorable result. The Glance Shaft was sunk to a depth of 625' and ore was being shipped from the workings up to the time that operations ceased. This shaft was connected with the Queen Shaft which has a depth of 725' ~~but~~ ^{with} a tunnel 1400' long. The King Shaft was sunk ~~400 to 2500'~~ ^{270'} and ore was mostly high in zinc but too low grade to pay. The Butte Shaft had a depth of ~~400'~~ ^{300'} but no shipping ore. In the Morgan Group the Gladstone Shaft was sunk 500' and showed no ore but a strong flow of excellent water good for drinking or for milling if the ore

(?)

for a time trammed through to the Glance and hoisted up the Glance Shaft. It will pay to look for scheelite in the western part of the mineral zone close to the Minnie and around the Copper King shaft near the Minnie. At the Senator Morgan there is copper and zinc ore outcropping near the shaft and to the south and west there are a number of quartz blowouts and in these veins pits have been sunk and scheelite is to be noted with the lamp. The government is at present sampling in this section.

Among the men to be contacted for information are Mike Serasio who should be very familiar with the old workings and may be found at the Venice Gardens near Tucson. Also Gavin who lives near the property and Tony Blank working for the government. Property might be interesting to the Hecla Mining company one of whose directors Mr. Myers is also the director of the Twin Buttes Company and has discussed this matter with Hackett. The Queen Mine last shipped ore in '26 and the last work at the Glance was in '28 when only a couple of cars were taken out. In the office there are plans and section maps of both the Glance and Queen showing the stopes but no assay maps were found. A geological report and maps were prepared by Tovote and Foy may be able to find these or at least the maps and promised to let me look them over. Foy says that the only work at the King was on a small fracture plan where there were copper carbonates and some zinc below. Tovote's report was made in 1918. The Glance Shaft is in the foot wall of the ore body and all of the ore shoots are found along the contacts between the limestone and granite or garnet rock and they dip to the south and rake to the east. The ore seems to make at the point where the contacts curve and apparently bays of fractured ground were left along the curves. Foy claims that all of the maps in the office belong to the Glance Company or to him personally and that none to the Twin Buttes Company, ~~he~~ whose only maps referred to the

3-Morgan and those were turned over to Taylor who probably sent them to Milwaukee. Hackett promised to have a thorough search of all files made after he reaches Milwaukee about May 7th and he will send me all of these that can be discovered.

Foy and others have stated at times that several hundred thousand tons of low grade copper ore was left in the Glance but Foy now pretends that he shipped a lot of 3% copper ore and did not leave any great quantity behind. His statements are contradictory and probably not reliable. There is also a record of some low grade ore in the Minnie and some of the shoots in the Glance were as much as 60' wide.

In the Morgan shaft I climbed down to the 165' level accompanied by Gavin. Ladders are in pretty bad shape but do not appear to be really dangerous. Taylor has run out a drift south 45 degrees west for about 150' and then almost due west for another 100' and about 50' from the breast he cut a quartz vein 12' wide which may be the east quartz vein found to contain scheelite on the surface. ^{his} May samples No 1. and 2 were cut across this vein but Gavin and others do not believe that it is the main vein which still lies further to the west and would only be cut if the drift was extended. Gavin claims that the main vein was cut on the 400' level but no one else seems to know about this. Gavin thinks that the main quartz vein split up as it approached the surface and therefore occurs in three or four different veins along the outcrop. Taylor claims that the violet light shows tungsten on the 165' level both in the quartz and in the garnet rock and also in the copper ore. Weber, the government engineer confirms ^{his} to some extent but says that the showing of the light is very erratic and only low grade ore is indicated and that the color may be due in part to the calcite and powellite (a calcium tungstate mixed with calcium molybdate).

4-

It is reported that on the 400' level the quartz vein or dyke had a width of 125' with a strike slightly to the east of north and a dip of 55 to 60' degrees to the west. This does not sound reasonable.

My sample SM No. 1 was from the western 6' section of the quartz vein on the 165' level but for a width of 6' and sample No. 2 was cut for the next 6' to the east. The total width of the quartz vein at this point being about 12'. Assays of these samples were as follows:

Handwritten: #1, W. @.3 = 0.08% #2 = 0.16 W O₃

Handwritten: The North Star zinc mine belonging to Foy is said to have a showing of 25% zinc ore for a width of ^{vt 18} 30' on the first level and the ore seems to be increasing in width as depth is gained. Foy thinks that he will get a government loan to permit him to develop this property.

Records of the shipment from the Queen Mine indicate that the ore ran from 6 to 12% copper with about 2 ozs. of silver per ton.

There is another showing of scheelite on the Twin Buttes Claim on ore near the northern group of claims belonging to the Twin Buttes Company. Perhaps this refers to the Twin Peakes Claim.

An ample supply of water was found in the Gladstone Shaft and it was of excellent quality for domestic purposes. The water in the other shafts is only suitable for milling.

Handwritten: ho
It would seem likely that a mill could be erected to treat the large tonnage of low grade copper ore remaining in the Glance, Queen, and Morgan Mines. There is not much zinc in the Glance or Queen although it seems to be coming in on the lower levels but there is a lot of zinc in the King and in the North Star and the zinc showing from the North Star seems to run to the south~~west~~ east and to intersect the Morgan ore shoot a short distance to the east of the shaft. So far the tungsten has only been ~~noted~~ noted in the Morgan Mine and some is believed to

Weber, the government engineer is not enthusiastic concerning the result of his work and says that the areas with the quartz veins were with tungsten are likely to occur as limited to a length of about 650' being bounded on the south by the granite and on the north by the contact in which the Morgan ore shoot occurs. He thinks that there are two main quartz veins each of which have a width of about 12' and there are also several smaller veins. All of these veins are cut by cross faults and cross veins in which there is a showing of tungsten. The tonnage of tungsten ore is not likely to be large and he does not think that the government will continue to investigate nor carry on any work underground unless the assays of the samples which he is sending to Reno should be surprisingly good. Weber has used a violet ray lamp underground and has gotten some reaction from the copper ores but he cannot be sure that this was caused by scheelite and in any event he thinks that the occurrence of scheelite is very erratic.

pound. (possibly 26¢).

Foy thinks that an additional 200,000 tons were developed later. All agree that this is the largest body of ore in the district and should be the back log for a mill but must get more information re. mining costs, ore occurrence, metallurgy, etc.

✓ North Star (Contention Claim)

Owned by Foy who claims to have developed an ore body 28' wide in places carrying Ag. 3.00oz, Cu. 3.00%, Zn. 18%. Mine was sampled by government engineer who are said to have recommended a development loan which Foy expects to get very soon and if enough ore can be developed government may later loan money for a mill.

Twin Buttes Company had an authorized capital of \$1,250,000 shares at \$1.00 per and some \$50,000 of bonds. In '15 the A. S. & R. offered to take nine months option to purchase for \$350,000 and to spend for development an average of \$2500 per month but could quit on 30 day notice.

As an alternative to purchase the A. S. & R. were willing to equip and operate at their expense and under their management with 50-50 division of profits. Deal fell through because bond holders would not cooperate.

✓ Power

Line passes about 6 miles from property and power could be purchased but don't know rate.

✓ Water

Gladstone Shaft also probably another near to the Mineral Hill.

Mike Serano (5/7/42) (Venice Gardens or Swan Drive) was foreman at the Glance until went to war in 1918. Mined to 600' level and mined in a lot of 3% and 4% ore with better grade to keep shipments at about 6% copper. Much low grade ore was not mined and he thinks that there

may be 200,000 tons of 3% ore above the 600' level.

As to high grade there are a few patches left here and there especially on the 400' level and around a big stope between the 400 and 500' from which a lot of 10' ore was mined and there should be lower grade material in the back-filling. This stope is about 200' from the shaft.

All through the mine the rich copper oxide ore broke very fine and sifted down to the levels so that there is much high grade left along the tracks.

The copper ore occurred in lenses which extended out into the garnet rock. Hard to guess the tonnage of high grade which might be recovered from the old workings, it was his policy to mine all ore that would average up to 6% in a systematic manner but after he left Foy gutted out as much of the high grade as possible and followed a similar policy at the Queen.

Simonton at Nogales was surveyor and clerk and might have a lot of useful information.

Foy contradicts statements made to the A. S. & R. and others by now saying that there is no low grade ore and no high grade ore left in the old workings but if the mine were reopened he knows just how to quickly find new bodies of high grade ore and he would soon expect to be able to ship at rate of 1000 tons per month @ 5.5% Cu.

Glance ore body was partly drilled in 18 and some ore was mined which was afterwards found by drifts and mined.

Foy says that outside of Mineral Hill there is no basis for any big mill in the district either for copper or zinc ore.

Gladstone Shaft (visited 5/9)

Vertical depth 420' in foot wall of contact and ran into granite in which there was a fine flow of excellent water. Shaft is in

fair condition with pipe lines etc. No ore on dump but Foy says that it was ^{sunk} ~~such~~ to permit crosscutting through formation to the north but no ore was found in the crosscuts.

Glance Ore Body

According to Foy this may apex on claim to north of the Glance and therefore if the vein dipped out with depth under the south claim Foy says that there might be trouble and apex suits (which seems absurd)

Samples

T. B. #1 grab from pile of sorted high grade ore on dump at Glance Shaft. Largely sulphide and coarse lumps .

Cu = 5.43%

~~Zn~~

T. B. #2 same as #1 except that it was taken from pile of fines and is much oxidized.

Cu = 3.52%

~~Zn~~

About 80' east of shaft a raise comes to surface from old stope and good looking carbonate ore shows in the pillar about 3' wide. A similar raise and showing 150' east of shaft but vein not more than 1 to 1.5' wide.

On these raises the vein seems to be nearly vertical but it is probably a split from the main vein which occurs in the limestone (to the north) and dips to the south. Some high grade ore could be mined from this pillar near the surface.

At the shaft there is a good head frame with timber still sound and equipped with a sheave, cable and cage. Timbers look good as far as one can see down the shaft but ladders not safe.

Pipe lines, 2 @ 4"
 1 @ 3½"
 1 @ 2"

Should serve to dewater which would not be expensive unless flow is more than 100 g. p. m. or shaft timbers are in bad shape at depth.

San Xavier mine belongs to Empire Zinc Co. and is now being dewatered and examined by these with Brown, Engineer in charge. Results said to be favorable and may soon be reopened, work now down below 3rd level. They may build a mill.

Jim Pemberton does not think that much ore has been left in the Glance but believes that we should find a lot of low grade in the upper levels of the Morgan which was not worked in the old days. Taylor agrees.

Pemberton thinks that the average grade of ore left in the Mineral Hill would not carry much more than 2% copper and 1 oz. Ag. Was last worked in 1920 and ore occurs in layers in the limestone and there is some zinc ore in one part of the Plumed Knight Group.

Paymaster Mine is near the Mineral Hill and it carries some zinc. The Vuleon Mine near Mineral Hill once shipped about 10,000 tons of 7% copper ore.

Esperanze Mine was worked out to 600' level except for a little ore left in one vein. The old shipments were rich and a new shaft recently sunk may have developed some ore. The dump might pay to sort over. Miller is now the owner or operator. *Very little*

Pioneer Smelter, slag dumps is near road from Sahuarita to Twin Buttes and might be worth looking over, *was hunted & shipped*

Conference with Judge Jones of Conner and Jones 5/9/42 and with Foy re Legal matters.

Notice to Foy ordered him to vacate the property by May 20th but if he refuses Co. will have to start suit to get him off and if he swears that he performed the 30 shifts of work per month as required by