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Copied

Report on

TIGER GOLD GROUP

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Maps Accompanying Report

Property Map.

Section - Along Gray Eagle Vein.

Section - Tiger Gold Workings on Gray Eagle Vein.

Section - Savoy Workings on Gray Eagle Vein.

TIGER GOLD GROUP

April 13, 1931

The properties of the Tiger Gold Group consist of the Oro Belle and Gray Eagle Mines. The Oro Belle was operated by the Oro Bella Mining Company until 1903, when it was taken over by the Tiger Gold Company. The Gray Eagle Mine was operated by the Tiger Gold Company until 1913, since which time it has been owned by Richard S. Barnes and his heirs.

LOCATION

The properties are approximately 5 miles southeast of the town of Crown King, Yavapai County, Arizona.

The railroad to Crown King has been discontinued and Middleton, about 18 miles to the north, is the nearest railroad point. In the past all concentrates and materials were hauled from Crown King, but it is quite possible that if the old road following Humbug Creek were to be repaired, the down-hill haul following water grade to the railroad would be far preferable to hauling over the mountain to Crown King and then down to Middleton.

OPERATING CONDITIONS

The camp is at an altitude of 5,300 feet and the climate unusually mild and delightful, both summer and winter.

There is a little snow, but not enough to interfere with operations.

Water is scarce, but Humbug Creek furnishes enough for all needs during six months of the year. A spring on Ash Spring claim flows steadily and by adding to this the water from the mine there would be a sufficient supply for all of the year.

In the past steam power has been used entirely, oil being pumped over the mountain from Crown King by a 3" pipe line. The cost per horse power was very high. The transmission line of the Arizona Power Company is now about two and one-half miles from the property, and electric power probably could be purchased for from 1-1/2¢ to 2¢ per Kilowatt Hour, depending upon the quantity used. This would be a great saving over cost of power in the past.

Pine timber good enough for stulls and posts could be secured from the surrounding mountains for 10¢ to 12¢ per running foot.

HOLDINGS

The group consists of the following patented claims:

Gray Eagle	20.66 acres
Oro Bonito	20.66 acres
Oro Belle	20.66 acres
Ash Spring	16.53 acres
Alley Central	27.33 acres
Pilgrim	14.27 acres
Cleveland	13.31 acres
Total	133.42 acres

The title is in perfect shape and an abstract is in my office.

SURFACE IMPROVEMENTS

About $300,000.00 was spent on surface improvements between 1903 and 1910, and in 1912, when the property was first shut down, the buildings and machinery were in excellent condition, but as the machinery was out of date and would have to be replaced for economical operation, it was sold as far as possible. None of the machinery now remaining has any material value. The property was finally shut down in 1917 on account of the War, and the buildings, having had no care for 14 years, are now in bad shape.

HISTORY AND PAST PRODUCTION

The Oro Belle vein was opened up about 1870 and the rich ore in the oxidized zone treated in arasters. The nearest road was then 100 miles distant. Operations were continued on this vein on a small scale until 1890, when the Oro Bella Mining Company was organized and a stamp mill brought in over the mountains. Richard S. Barnes became president of the company in 1890.

In 1903 George P. Harrington explored the Gray Eagle vein, which is almost barren at the surface, and found ore on the Gray Eagle claim. The Tiger Gold Company was organized the same year and operations commenced under the management of Harrington.

From 1904 to 1908, inclusive, the mill heads averaged $18.00 per ton and about $250,000.00 was paid in dividends. In 1905 the Tiger Gold Company was the leading

gold producer of Arizona. In 1908 Harrington resigned and the mill heads immediately fell to about $8.00 per ton. I visited the property in 1910 and at that time $18.00 to $20.00 ore was being mixed with waste and the mill heads were being diluted at least 50%. The control of the company in 1908 passed into the hands of a group of grocers living in Springfield, Illinois, and they sent out one of their clerks to take charge who had never seen a mine and who never went underground. The costs were high, the extraction extremely low, no adequate developing was done, and the ground, which is quite heavy, caved, so that in 1912 the ore body, which was being worked on the 400' level, was cut off. The ore mined during the 10-year period from 1903 to 1912, inclusive, averaged close to $15.00 per ton.

I visited the mine for the second time in 1913 for Richard S. Barnes, who held a first mortgage, and advised him to foreclose, as the owners were ignorant of mining and also were unreliable in their business methods. The mortgage was foreclosed and the mine is now owned by the Barrod Mining Company, which is controlled by the heirs of Mr. Barnes. I reopened part of the upper workings in 1916 and some ore was milled and a small profit made, but owing to the War, which made it impossible to get adequate labor and raised the cost of supplies, it was impossible to continue, and the property was shut down again.

Following are the records of bullion and concentrate

shipments from 1900 to 1912, inclusive:

Year	Troy Ozs. Bullion	Net Returns	Concentrates
1900	281.99	$ 1,037.06	
1903	728.45	10,576.84	
1904	2914.57	45,734.76	
1905	8658.48	137,569.20	$ 53,656.94
1906	6268.60	100,214.54	81,672.24
1907	3119.97	49,722.95	41,027.04
1908	1393.05	20,722.75	13,330.31
1909	613.83	9,386.08	19,823.38
1910	1777.43	26,432.21	36,390.00
1911	2530.39	36,694.34	48,527.11
1912	552.96	7,636.64	8,015.73
	28839.72	$445,727.37	$302,442.75

Total, $750,169.00.

If the production between 1870 and 1900 were to be added and the production since 1912, the total value of the gold and concentrates actually shipped would total over one million dollars.

The mill made a recovery of about 75 to 80% of the gold values. The concentrates ran from 4 to 5 ozs. Au, 3 to 5 ozs. Ag and 1 to 3% Cu, the balance being almost entirely iron pyrites.

Almost none of the old stopes were completely mined out before caving and I estimate that not 50% of the ore above the 400-foot level was extracted.

GEOLOGY

The geology of the district is covered by Bulletin 782, U. S. Geological Survey, "Ore Deposits of the Jerome and Bradshaw Mountains Quadrangles," by Waldemar Lindgren.

In this bulletin the Gray Eagle vein is described as of the Mesoziac Age and as having been formed by hot ascending solutions from an igneous magma. A short distance west of the property there is an intrusion of grano-diorite, and the veins are undoubtedly connected with this intrusion. The ore on the lower levels is undoubtedly primary and the mineralization can be expected to extend to great depths.

The Gray Eagle vein occurs along or near the contact between Yavapai schist and granite. On the Tiger Gold group the vein is from 3 to 20 feet in width, has a northerly and southerly strike, and dips at an angle of about 50° to the west. A basic dike follows the vein. The outcrop, which can be traced for about 10,000 feet, is leached and stained with iron. The values in the outcrop are very low, but picked samples run over $20.00 per ton. At a depth of from 100 to 200 feet, sulphide ore is encountered, which consists of pyrite with some chalcopyrite and a very little galena in a quartz gangue. The gold values are intimately associated with the pyrite and the free gold cannot be panned out of the sulphide ore. The footwall has a heavy clay gouge and the ore was difficult to hold by open square sets. The mineralization along the outcrop is particularly impressive on the Gray Eagle vein and the Pilgrim, but only the Gray Eagle has been explored and it would seem that the Pilgrim has attractive possibilities.

Parallel to the Gray Eagle vein is the Oro Belle, which is from 6 inches to 3 feet in width. It has produced

from the surface but with depth the values of the sulphide zone are probably not higher than they are in the Gray Eagle vein.

DEVELOPMENT

On the Gray Eagle claim the vein was opened up for over 1,000 feet along the strike and mined to a depth of 700 feet below the highest part of the outcrop. The ore shoot, 600 feet in length and from 3 to 20 feet in width, was partly stoped out. Almost all of the stopes caved in before the ore was extracted and there undoubtedly is a large tonnage of ore remaining in the old stopes. It is, however, so badly mixed with the hanging wall that it is doubtful if it has any practical value. The tunnels are caved at the present time.

The shaft is 400 feet deep. It opened up ore on the Cleveland claim which has been partly stoped to the 400 foot level. The first 200 feet below the surface was leached. The shaft was sunk in the footwall through solid ground and, with the exception of the ground around the collar, should be in good condition.

No work except several short tunnels driven before 1890 has been done on the Second North Extension of the Gray Eagle or Pilgrim claims.

The accompanying maps show the old workings fairly accurately.

ORE RESERVES

No ore is now in sight and the quantity of ore available when the mine was shut down in 1917 was small. There was good ore left in the old tunnels and also on No. 4 level of the shaft.

POSSIBILITIES

The vein is very strong and well mineralized but has been explored to a depth of only 350 feet below Humbug Creek and for less than 20 percent of its length. The outcrop on the Pilgrim, particularly, is very well mineralized but has not been developed.

I consider the possibilities excellent for finding ore along the strike in the unprospected parts of the vein and also in depth below the old workings, as the gold mineralization should continue to great depths.

MINING

By using stull sets and filling as is done in the Coeur d'Alenes, no difficulty should be experienced in mining all of the ore at a fairly low cost. The ore is simple to treat and by amalgamation and cyaniding it should be possible to recover 95 percent of the gold and silver values.

COSTS

The costs in the past have been very high, approximately $10.00 per ton. With modern mining methods and equipment I believe the total cost of mining and milling

should not be above $5.00 per ton.

ADJOINING PROPERTIES

In order to take advantage of the full possibilities of the Gray Eagle vein, all of the claims covering the mineralized outcrop for about 10,000 feet should be worked as a whole. On account of the topography and the water supply the Gray Eagle group forms a logical center from which to mine and mill all the ores on the vein. The Savoy group has a small tonnage of silver-gold ore developed. While it would not be necessary to secure the claims on the outcrop not owned by the Barrod Mining Company, I believe it would be desirable to do so.

CONCLUSIONS

The property in its present condition is a prospect but one which is sufficiently attractive to warrant the cost of development.

Only a small part of the vein has been prospected and although over one million dollars has been taken from the property I believe that far more will be produced than has been taken in the past.

The first work should be in de-watering and sinking the main shaft, followed by exploration of the vein on the Cleveland claim, and also in sinking on the Pilgrim claim on the best mineralization. A relatively small expenditure should prove up enough ore to warrant rebuilding of the mill

and the starting of mining operations.

I consider the property a most attractive speculation.

Foster S. Naething.

(COPY)

ORO BELLE MINE

January 1, 1941

J. D. McClintock

(COPY)

ORO BELLE MINE

January 1, 1941

This report is intended to accompany a report on the Oro Belle Mine by Mr. Foster S. Naething under date of January 1, 1938, and brings up to date all data pertaining to operations at this property, which were carried on since that date under supervision of Mr. Naething and the writer.

The property still consists of those claims mentioned in the Naething report, is owned in fee by the Barrod Mining Company, and is under lease and bond to J. D. McClintock, of Tucson, Arizona.

Early in 1938 rehabilitation was started, and during the following two years those recommendations, set forth in the above mentioned report, were initiated. The Cleveland shaft was dewatered and repaired; a power line was extended from Horse Thief Basin, and complete mine plant installed. A brief resume of work done during this period is outlined below.

On the Cleveland claim, a new headframe was constructed at the Cleveland shaft. A new hoist house and compressor house were built; hoist and compressor installed, and a new warehous constructed. At one side of the shaft a small ore bin was built. The boarding house was repaired and equipped; bunk house repaired and equipped, and several smaller dwellings put in a livable condition.

The power line was run from Horse Thief Basin "take-off", approximately one mile, to a sub-station built advacent to the Cleveland shaft. This line delivers 3-phase power at 11,000 volts, where it is transformed to 440 volts. A 440 volt line was run from

the sub-station to the camp site, a distance of about 1,000 feet, transformed to 110 volt lighting circuit, which serves the boarding house, bunk house, and dwellings. The road to Crown King was repaired, and certain improvements made so that it is now passable to 5-ton trucks.

The Cleveland shaft was dewatered and repaired to the 370 foot level. A ventilation system was installed, employing blowers and galvanized vent pipe. Airline, waterline, and pipe column for pump discharge were installed. Referring to exhibit number 4, the sub-level was driven at the 350 foot level, connected by a cross-cut from the shaft to the vein, through a distance of 80 feet. A drift north was driven for a total length of 280 feet, the face now being slightly more than two sets north of the old raise connecting the 400 foot level with the 300 foot level. From this drift three cross-cuts were driven into the hanging wall, and one into the foot-wall for the purpose of exploration. At a point approximately below the first stope shown on the 300 foot level, a raise was started on the ore. The vein here was 3 feet wide, assaying $39.00 Au-Ag. From this point on north the vein may be considered all commercial ore, although its value in the drift was indicated as being somewhat erratic until the drift crossed the old raise. From that point on, values were rather consistent, and a carload of ore from this development work was shipped, which assayed as follows;

Gold	2.02 ounces
Silver	6.38 ounces

It would appear that this work confirms the existence of commercial mineralization in this area, as shown on exhibit number 4.

The south drift on the 350 foot level was run a total distance of 715 feet, with a total length of cross-cuts into the foot-

wall and hanging wall of 90 feet. Inasmuch as there appears to be a fairly general line of demarcation between commercial and non-commercial mineralization, which follows the surface contour, as shown on longitudinal section, the south drift was run on a traverse line rather than following the vein formation. Hence there are some distances in the face, three or four hundred feet, which are not in the vein itself. The south drift did not encounter ore of commercial value. The face is now at a point below the second raise from the 300 foot level, and, as might be expected, is just entering mineralization showing some value. At this point we encountered a well-defined vein, 13 feet in width, assaying $3.50. It is to be expected that further work to the south will develop a downward extension of the orebody, which was mined above the 300 foot level in this area.

As an indication of what might be expected further to the south, the downward projections of orebodies from above the 300 foot level might be indicated by exhibit number 5, which shows average values encountered on the 400 foot level just below the old underground shaft.

In addition to the work on the Cleveland Claim, reference is made to exhibit number 3, on which are plotted two proposed tunnels on the Pilgrim claim. These tunnels were both driven, and the first indicated raise was started on ore. Preliminary shipments of sorted ore from this development work showed a net value of $67.00 a ton. This tunnel work has been on a sub-leasing basis for the past six months, and occasional shipments of high-grade have been made to the Clarkdale smelter. A tabulation of these shipments is appended to this report. The raise between these two tunnels is now in 4 feet of ore averaging $15.00 a ton.

Following Mr. Naething's death operations ceased, and this property was temporarily shut down with the result that the Cleveland shaft and contiguous workings were allowed to flood, and some of the equipment, including the pump and hoist, were removed. Subsequent to that time the writer has assumed possession of the property under a bond and lease from the owners, and continued in a small way to work on the Pilgrim claim. At the present time the situation exists whereby with a very nominal expenditure this property could be reopened and put on a small producing basis in a reasonably short time, advantage, of course, being taken of a relatively large expenditure of money during the past three years. The power line and sub-station are still intact, and there is still available a 385 cu.ft. compressor. It would be necessary to install a pump, hoist, and certain other equipment. However, there is a 50-ton mill, equipped for flotation, 5 miles distant, the operation of which is under the control of the writer.

I recommend that the Cleveland shaft be dewatered, and development work resumed to the north and south on the 350 foot level. It seems reasonable to expect that a small tonnage of ore, profitable enough to pay for such work, could be mined from the north side alone. Further development to the south would very likely make available sufficient tonnage to justify operation of the mill at Crown King on a full time basis, pending the conclusion of sufficient development work to justify the erection of a mill at Oro Belle.

It may or it may not be advisable at the outset to prosecute further development work on the Pilgrim, although this possibility

ORO BELLE MINE
SHIPMENTS 1940

Lot	Location	Destination	Au. Oz.	Ag. Oz.	Cu. %
4	Pilgrim	Clarkdale	1.05	1.94	0.67
6	Cleveland	Clarkdale	2.03	6.27	0.88
7	Pilgrim	Clarkdale	1.595	3.855	1.08

should not be overlooked. It is quite probable that a very substantial orebody exists on this claim. This can, of course, be connected later to the workings projected from the Cleveland shaft.

By:

J. D. McClintock

JDM:ddd

FOSTER S. NAETHING
MONSANTO POST OFFICE
EAST ST. LOUIS
ILLINOIS

May 20th, 1931.

Mr. George M. Colvocoresses,
1108 Luhrs Tower,
Phoenix, Arizona.

Dear Mr. Colvocoresses:

I will endeavour to explain the questions asked in your letter of May 12th.

The discrepancy as to the number of patented claims was caused by the fact that the mortgage held by Mr. Barnes did not cover all of the claims owned by the Tiger Gold Company. On the plan of the Tiger Gold vein, the Second North Extension of the Gray Eagle and the Gulch Claim are owned by the Bashford & Burmeister Company, of Prescott. The Savoy Group is owned by the Savoy Mining Company and while in the past they have been difficult to deal with, I do not believe it would be difficult to deal with them now.

As you may remember, I spent considerable time in Crown King in 1913-'14-'15-'16 and '17, and I was interested in the operations at the Tiger Gold which were carried on up until the last part of 1916. These operations would not have been discontinued had it not been impossible to secure men, supplies, etc., on a basis which would allow anything approaching normal costs to be reached. I was in the shaft I believe, last, about 1912. It was in the footwall in hard igneous rocks and really did not require timbering except for about the first fifty feet. I believe Anderson, who helped timber the shaft, is still at Crown King.

I am not quite sure when the soft dirt around the collar caved, but it was about 1915. Of course, one cannot be positive, but I believe the cleaning out of a shaft would not be difficult. The figure of 40,000 gallons per day, which is somewhere around 30 gallons per minute, checks closely with the figures which I have. By running, say, a 100-gallon pump plus a bailer I believe the unwatering would not be unduly expensive or difficult.

You are correct, I believe, in assuming that all of the drifts on the vein have caved. There undoubtedly was a very large amount of ore left in the old workings, but it has been my experience that the reopening of old workings in the hope of recovering ore which has been lost seldom pays. The ore is so diluted with waste that when it is recovered the average generally is very disappointing. I would suggest by all means driving new drifts rather than making any attempt to reopen the old ones.

I will look up and see if I have a plan of the mine and if so will forward it to you in a few days.

I believe you could make an estimate as to the cost of reopening the 400-foot level and extending the drift through the ore shoots better than I can, as you are more familiar with the operating cost in Arizona at the present time. I would certainly suggest connecting with the present power line rather than attempting to use gas engines. I believe the Arizona Power Company once offered to supply power for 2¢, which was the reason I used that figure in my report.

While many assays were taken of the property, the assay maps are so incomplete that they are practically of no value. The best information, I believe, to use is that the average of the ore mined for the ten years, 1902-1912, certainly averaged around $15.00 per ton. It can be checked up that the mine was shut down through the caving of the drift on the 400-foot level and not through the playing out of the values in depth. I will send you a photostat of a blue print signed by Cowan, who was superintendent and whom I know personally. His statements regarding the ore left in the mine and the ore in the bottom of the 400-foot level probably are as reliable as any which can be secured. The so-called Cowan stope was the stope on the 400-foot level which was being mined when the cave-in occurred which shut down the property.

The property is owned entirely by my brother-in-law, my sister and myself. We appreciate the speculation connected with resuming the development of the property and the heavy expenditures necessary for providing adequate machinery, buildings, etc.

I would suggest that instead of going over the mountain to Crown King and then down to Middleton, that a road to the south following the water grade be considered as possibly far better under the present conditions than fixing up the road to Crown King. With automobiles the haul down Humbug Creek to the railroad should not be unduly expensive.

The owners of the property would be willing to consider a long-term lease with a low rate of royalty. They would prefer to hold an interest in the property and I feel sure their option price would not be out of line.

I do not think the sampling of the surface will help very much and there are no workings now accessible. A renewed study of the geology, however, I believe would be very helpful.

Very truly yours,

Foster S. Nacelling

FSN/MB

FOSTER S. NAETHING
MONSANTO POST OFFICE
EAST ST. LOUIS
ILLINOIS

May
30th
1931

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

Dear Mr. Colvocoresses:

I am enclosing two photostats of maps giving a plan of some of the workings and also some notes copied from a statement made by C. C. Cowan, the last superintendent of the mines, who was working some of the upper levels with me in 1916.

Map A. Section and plan of workings north of the shaft. The section shows 78 samples, the figures opposite the number of sample being in dollars per ton, figuring gold and silver. For instance, Sample No. 71 assayed $69.96.

Cowan was in charge at the time the property shut down, which was due to a cave very close to the shaft, and says that the map is nearly up to date. My idea would be to sink the shaft another 100 ft. and then the drift north and south, particularly north, as ore should be encountered very close to the shaft if this were done.

Map B. Photostat of blue print showing plan of workings south of the shaft. Most of the drifts were not in ore but I understand some very good ore was encountered. This drift, however, caved some time before the property was shut down. The section shows good ore in Samples 1, 2, 3, 4, 5, 6, 7 and 8 in the face of No. 4 level.

The Savoy group, in my estimation, is not at all essential to the operations of the Tiger Gold, but if it could be secured on a sufficiently attractive basis I believe it would be advisable to do so, as the Savoy ore could be handled in the Tiger mill better than in any other way.

If you wish me to, I believe I could get in touch with the Savoy owners who I think are now in New York.

I trust the enclosed information will be of help.

Sincerely,

Foster S. Naething

March 16, 1948

Mr. Charles M. Heron
465 North Segovia Avenue
San Gabriel, California

RE: Oro Belle

Dear Sir:

At the request of J. D. McClintock, I am forwarding to you a copy of a report by Foster S. Naething on this property made in 1931, also a report by McClintock made in 1941, also a roll of maps all of which were recently sent to me by Mr. McClintock.

I do not have, at present, any clients who would be likely to take an interest in this property and hope that you may be able to assist Mr. McClintock in finding parties who will finance its further development.

Yours very truly,

GMC:IM
Enclosures

March 16, 1948

Mr. J. D. McClintock
4122 3rd Street N.W.
Washington, D. C.

RE: Oro Belle

Dear Mr. McClintock:

I have received your letter from Washington and as requested am sending on data concerning the Oro Belle property to Mr. Heron with a letter of transmission of which a copy is enclosed.

I have in my file extra copies of the report by Naething and have had copies of your report made so that I can take this matter up in future with any parties who might seem to be interested.

I have noted your remarks in respect to the water situation and I agree with you in believing that at sometime in the not far distant future there will be a revival of interest in gold and silver mines, but so far this does not seem to have made much progress.

With personal regards.

Yours very truly,

GMC:IM

Gmc

CARLOTA COPPER CO.

BOX 1745

MIAMI, ARIZONA

C 3/16. '48

At 4122 3rd St., N.W.,
Washington, D.C.

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

Dear Mr. Colvocoresses, Re: Oro Belle Mine

Thanks very much for your letter of February 13th which was forwarded to me in New York, via Denver - hence the delay in replying.

I am in the East on some government business and will probably be here for a couple of weeks longer.

With regard to the water situation at the Oro Belle, Humbug Creek flows all year but the two dry months before the rains start. I have two springs* in two different canyons that have never gone dry. These are ample for domestic and other ordinary purposes with the overflow going to storage. The Cleveland shaft makes a minimum of 33 gallons per minute after it dewatered. I have storage tank capacity of something like 300,000 gallons and have always felt that with such a back-log and the usual constant flow available in normal years, the supply would be sufficient for, say, a 50 ton plant. It would, of course, be necessary to reclaim as much as possible from thickener and tailings overflow. Immediate topography makes this quite practicable.

* piped to tanks

I quite well realize that present conditions are not at all conducive to developing an interest in precious metal properties. However, some situations do exist where acquisition of such and their development might be attractive with an eye to the future trend of monetary values, etc., etc. No use getting into that discussion. My observation is that a lot of "smart" money is drifting towards gold properties.

As soon as the data I sent has served its purpose, I should greatly appreciate your forwarding it to Charlie Heron, whom you may know. He has indicated an interest in it for one of his clients and I promised him an opportunity to look it over. I dislike to impose upon you but thought that you might address it to him as well as to me.

It should be addressed to

Charles M. Heron,
465 North Segovia Avenue,
San Gabriel, California.

If any further interest develops with the people mentioned in your letter of Feb. 13th, I should be glad to get together with you to work out some kind of a deal.

I shall be at the above address for the next couple of weeks and in any event can be reached otherwise in care of Oscar A.Fischer, 911 Midland Savings Building, Denver.

With best regards,

Sincerely yours,

J. D. McClintock

JDMm

February 18, 1948

File
(Ryan Lode)

Mr. J. D. McClintock
C/o T. J. Byrne,
Attorney at Law
Prescott, Arizona

RE: Oro Belle

Dear Mr. McClintock:

I duly received your letter of February 3 with which you enclosed maps and reports on the property. Also I received the roll of maps which you sent at the same time.

I had no opportunity to discuss this mine with the party whom I hoped to interest until yesterday when we went over the matter in a preliminary manner, and he took some of the reports and other data to examine at his leisure. My friend was particularly interested in the water situation in which I could not give him any great amount of information; although I noted that on page 2 of the Naething report, he mentions that there should be sufficient supply but does not indicate whether this would merely be sufficient for domestic purposes or would permit the operation of a small mill. Please, advise me further in this regard.

While my friend was distinctly interested in the Oro Belle, he seemed to doubt if the company which he represents would be disposed to carry on any extensive investigation at the present time since they are now exploring and developing some base metal mines and, of course, gold and silver are not particularly attractive under present conditions. I do not expect that any quick action can be expected from this source but I will advise you at a later date, meanwhile I will keep the data you sent me unless you wish to have it returned.

Personal regards.

Sincerely,

GMC:IM

Gmc

Crown King, Arizona,
January 8,1948

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

Dear Colvo,

Thanks very much for your cordial letter of the 7th.

I will gather together the data mentioned and either send it to you or bring it in.

I am under the impression that you have everything up to 1931 and I will therefor, bring it up to date.

My efforts to connect with a job seem to indicate that the mining business is pretty much in the doldrums or else I have been too much out of circulation the last two years.

Sincerely,

J. D. McClintock

JDMm

January 7, 1948

Mr. J. D. McClintock
Crown King, Arizona

file as Tiger Gold

RE: Oro Belle

Dear McClintock:

I was glad to receive your letter of January 4 in reference to the Oro Belle or Tiger Gold as it was formerly called, and I recollect very well investigations which I made of that property and correspondence in regard to same with Naething and others a number of years ago.

I do not know that there is anything that I can do to help you in developing and operating this property, but it so happens that one of the large mining companies is at present making a number of investigations in Arizona and I have recently negotiated a lease with them covering a property in the southern part of the state whose owners I represent.

I talked this morning by telephone with their agent in Phoenix and he suggests that they would be glad to give the Oro Belle consideration if maps and reports were furnished. I have considerable data concerning this property in my file but none of it is up to date, and if you cared to send me some recent maps and reports covering the work done by Naething and by you or your associates since 1940, I would be glad to bring this to the attention of the party whom I have mentioned and perhaps something would develop which might be to our mutual advantage.

In reference to your desire to obtain a position with some mining concern, I can make no suggestion except to say that I think that nearly all of the actively operating companies are at present short of good technical men and would be likely to give favorable consideration to applications.

I take this opportunity to wish you a very happy and prosperous New Year and if by chance you pass through Phoenix, I shall always be glad to see you.

Yours very truly,

GMC:IM

RE: OROBELLE

Foster S. Naething
Monsanto Post Office
East St. Louis, Ill.

COPY

May 20th, 1931.

Mr. George M. Colvocoresses
1108 Luhrs Tower
Phoenix, Arizona

Dear Mr. Colvocoresses:

I will endeavor to explain the questions asked in your letter of May 12th. The discrepancy as to the number of patented claims was caused by the fact that the mortgage held by Mr. Barnes did not cover all of the claims owned by the Tiger Gold Co. On the plan of the Tiger Gold vein, the Second North Extension of the Gray Eagle and the Gulch Claim are owned by the Bashford and Burmeister Co. of Prescott. The Savoy Group is owned by the Savoy Mining Co. and while in the past they have been difficult to deal with, I do not believe it would be difficult to deal with them now.

As you may remember, I spent considerable time in Crown King in 1913-'14-'15-'16 and '17, and I was interested in the operations at the Tiger Gold which were carried on up until the last part of 1916. These operations would not have been discontinued had it not been impossible to secure men, supplies, etc., on a basis which would allow anything approaching normal costs to be reached. I was in the shaft I believe, last, about 1912. It was in the footwall in hard igneous rocks and really did not require timbering except for about the first fifty feet. I believe, Anderson, who helped Timber the shaft, is still at Crown King.

I am not quite sure when the soft dirt around the collar caved, but it was about 1915. Of course, one cannot be positive, but I believe the cleaning out of a shaft would not be difficult. The figure of 40,000 gallons per day, which is somewhere around 30 gallons per minute, checks closely with the figures which I have. By running, say, a 100 gallon pump plus a bailer I believe the unwatering would not be unduly expensive or difficult.

You are correct, I believe, in assuming that all of the drifts on the vein have caved. There undoubtedly was a very large amount of ore left in the old workings, but it has been my experience that the reopening of old workings in the hope of recovering ore which has been lost seldom pays. The ore is so diluted with waste that when it is recovered the average generally is very disappointing. I would suggest by all means driving new drifts rather than making any attempt to reopen the old ones.

I will look up and see if I have a plan of the mine and if so will forward it to you in a few days.

I believe you could make an estimate as to the cost of reopening the 400 ft. level and extending the drift thru the ore shoots better than I can, as you are more familiar with the operating costs in Arizona at the present time. I would certainly suggest connecting with the present power line rather than attempting to use gas engines. I believe the Arizona Power Co. once offered to supply power for 2¢, which was the reason I used that figufe in my report.

While many assays were taken of the property, the assay maps are so incomplete that they are practically of no value. The best information, I believe, to use is that the average of the ore mined for the ten years, 1902-1912, averaged around $15.00 per ton. It can be checked up that the mine was shut down thru the caving of the drift on the 400 ft. level and not thru the playing out of the values in depth. I will send you a photostat of a blue print signed by Cowan, who was superintendent and whom I know personally. His statements regarding the ore left in the mine and the ore in the bottom of the 400' level probably are as reliable as any which can be secured. The so-called Cowan stope was the stope on the 400 ft. level which was being mined when the cave-in occurred which shut down the property.

The property is owned entirely by my brother-in-law, my sister, and myself. We appreciate the speculation connected with resuming the development of the property and the heavy expenditures necessary for providing adequate machinery, buildings, etc.

I would suggest that instead of going over the mountain to Crown King and then down to Middletone, that a road to the south following the water grade be considered as possibly far better under the present conditions than fixing up the road to Crown King. With automobiles the haul down Humbug Creek to the railroad should not be unduly expensive.

The owners of the property would be willing to consider a long-term lease with a low rate of royalty. They would prefer to hold an interest in the property and I feel sure their option price would not be out of line.

I do not think the sampling of the surface will help very much and there are no workings now accessible. A renewed study of the geology, however, I believe would be very helpful.

Very truly yours,

(signed) Foster S. Naething

Copy

C R

OLD TIGER MINE

Crown King, Arizona.

YAVAPAI CONSOLIDATED GOLD-SILVER-COPPER CO.

1910-1911. 13 cars high-grade ore to Humboldt and 2 cars in 1913.

Au.	0.08 oz.
Ag.	200.0 oz.
Cu.	0.5 %
Insol.	60.0 %
Fe.	3.0 %
Zn.	16.0 %

1911. F. M. Murphy H. J. Meany, Superintendent, proposed to a plan of development to cost $37,000.00.

1916. April Visited by H.G.S. Anderson and E.S.Smith. There is said to be about 10,000 tons of mill tailings. Our sample, a composite of 6 five-foot auger holes ran

Au.	0.02 oz.
Ag.	12.44 oz.
Cu.	0.17 %
Insol.	90.7
Fe.	2.4
S	1.4

Anderson thinks this might look attractive as a cyanide proposition if it could be secured for 50¢ a ton royalty. At present Bumsted and Threlfall are to try to reconcentrate it using tables and Callow flotation cell.

1916. June Sample concentrates (Bumsted)

Au.	0.58 oz.
Ag.	179.0 oz.
Cu.	1.48 %
Insol.	58.4
Fe.	4.3
S	12.6
Zn.	18.7

See also Crown King District.

to recover $150,000.00 to $200,000.00 worth of ore during lease. This being a very conservative estimation.

Oro Belle Mine, which is included in our lease, has about $12,000.00 to $15,000.00 worth of ore in sight. Could be put in shape to extract in about 30 to 40 days.

The surface improvements, 20 stamp, buildings, etc., are valued at $75,000.00.

This property should be worked on a very economical basis, both office end and operations at the mines.

(Signed) C. C. COWAN

1915.

E. H. Davison, Mine Foreman, in four months of 1911 cleared the Co. up $85,000.00.

Cowan last foreman in charge of property at time that mine was closed on account of a mortgage being foreclosed, extracted in 14 months about $200,000.00.

Davison and Cowan mostly in north grounds.

High grade ores left in this country 25 to 30 thousand dollars. These ores range from $2.00 to $175.00 per ton in gold. Both north and south grounds average about the same in values. $1,000,000.00 has been extracted from these grounds.

General Formation:

Contact - Diorite hanging wall, schist footwall, with pegmatite intrusions in vein, ore chutes occur as overlapping lenses, filling between, is either chist or vein matter, ore chutes average from 4 to 30 ft. wide.

Being that I was last foreman who was on this property, know just what ores were left of the explored grounds, while the unexplored might prove out even more valuable than the above levels, however I can say that this is no gamble and willing to put myself on record that with help I will be able to put this property on a paying basis in a few months and big returns for all concerned. I am sure of being able

November 2, 1912.

TIGER GOLD COMPANY.

Victor I. Cummock, Esq:

I have lately obtained from two personal friends, who are familar with the property of the Tiger Gold Company, - one being the present Superintendent, who is contemplating leaving the service of the Company shortly; and the other being the son of a former Superintendent, who worked in the mine some 5 or 6 years ago, - some further information regarding the property which may be of interest to you.

The enclosed crude sketch indicates roughly the locations and arrangements of the principal ore-shoots in the mine, according to the statement of these men, and shows that there are apparantly two systems of ore-shoots, both pitching northward at a steep angle, one lying to the south of the shaft and one to the north of the shaft, and separated by a barren interval several hundred feet in length along the vein. The three large ore-shoots south of the shaft, marked A B & C on the sketch, average, according to the statement of the son of the former Superintendent, who worked in them in the capacity of timber-man, about 300 to 400 feet in length, 200 feet in height and 4 feet in width, and they thus contained approxiamtely 15,000 tons each

of ore, which, as far as can be judged from the incomplete records of the Company, averaged from $15 to $20 per ton. The smaller ore-bodies shown in the same system of ore-shoots, are said to have averaged 100 feet in height and length, and about 2 feet in average While the blueprint, showing the elevation of the mine, which accompanied my report, does not show the individual ore-shoots clearly, the three largest ore-shoots south of the shaft (A B & C) can probably be identified from the enclosed sketch; and it will be noted as a significant fact that, judging from the pitch of this system of ore-shoots, which carries it closer to the shaft with increasing depth, it appears as if it had not been explored below the 400 foot level. If this is true, the drift driven southerly along the vein of the 600 foot level might open up ore between the shaft and the northernmost ore of this level reached by the drift driven from the bottom of the winze from the 400 foot level.

In regard to the systems of ore-bodies north of the shaft, the present Superintendent, while he concurred with my opinion that there were practically no ore-reserves in the mine at the present time, states that in his belief it would not be necessary to sink the shaft an additional 100 feet to open up some ore in the lower system of ore-shoots, expaining that the number 12 ore-shoot, which had been

opened up in the 500 foot level north of the shaft, had continued below this level, and that the streak of ore present in the breast of the 600 north drift, of which I took a sample (the results of which are indicated in my report) was a part of the number 12 ore-body, which the Tiger Gold Company were driving this drift to open up, when the exhaustion of their funds compelled them to suspend operations. It thus appears possible that the advancement of this drift might open up sufficient ore to at least repay the cost of unwatering the mine and possibly of sinking the shaft an additional 100 feet. In this connection please note the grade of the two samples taken by me from this stope, as given in my report.

Very truly yours,

Gen'l Supt.

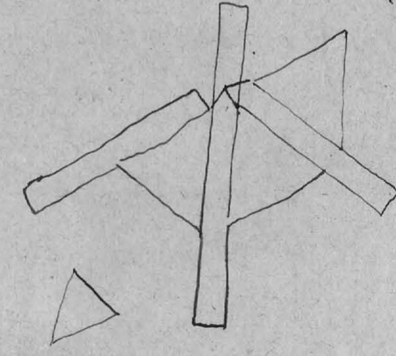
RTW-L

Mining Cost.

	$
Mining & hoist.	2.50
Mill.	1.00
	3.50
Smelter ch.	.20
Cost of Sulton.	.80
	4.50

Val. ~~	$ 10.00
Conc. ch. 15%	1.50
	8.50
	4.50
	4.00

net profit & most adverse condit. from o-a g ~~ body o.



Oct. 18, 1912.

TIGER GOLD CO.

Mr. Victor I. Cumnock:

My commendation of the mine of the Tiger Gold Co. to your attention was occasioned, partly by my belief that the mine will yield a profit in itself, if properly worked, and partly by the fact that the concentrates ontainable from its ore should be of value in the operation of this smelter. The first point has been discussed in my report, although incompletely and only in general terms; but the second point was not demonstrated, and your recent inquiry as to what assistance the property would offer to our smelting operations was, therefore, very pertinent.

In reply to this query, I beg to say that, assuming a sufficient tonnage of ore could be developed in the mine to enable the 20-stamp amalgamating and concentrating mill, owned by the Tiger Gold Co., to be run at full capacity, there should be produced daily between ten and fifteen tons of concentrates, carrying a small percentage of copper (about 2% or 3%), but containing between 35% and 40% iron in excess of the silica content. On account of this high iron excess, these concentrates would possess a considerable fluxing value, which, as it would be available without cost (the mine being presumed to yeild a profit independent of any smalting profit on the concentrates), would enable some of the more basic Bluebell ore to be smelted direct, with greater profit than if it were previously concentrated. This is illustrated in the accompanying statement, on which are shown the comparative profits resulting from treating the ore of the "Blue Coat" ore body in the BlueBell Mine, by direct smelting, with the aid of free flux, and by smelting after previous concentration.

It has been satisfactorily understood, I trust, that the concentration of the Bluebell ore, for which preparations are now in progress, was not initially recommended by me as the cheapest possible method of treating it, but simply as the cheapest method under conditions then and now existing,- namely, the absence of any cheap and certain supply of flux. Should, therefore, a source of cheap flux become available in the near future, my previous recommendations might then have to be modified to some extent, as it might under such conditions become more profitable to smelt some of the Bluebell ore directly, with the aid of this flux, than to eliminate the excess silica by concentration,- the extent to which this could be done depending, of course, upon the abundance and cost of the flux. Naturally, the Bluebell ore must suitable for direct smelting, from an economis standpoint, would be the most basic obtainable in the mine, since it not only requires less flux per ton of ore, but also is less adaptable to concentration than the more silicious ore. As the "Blue Coat" orebody (and particularly its northern half) contains the most basis ore at present developed, this would be the ore to be smelted direct; and, were the mine of the Tiger Gold Cp., operated by this company, and the concentrates produced from its ore shipped to this smelter, the practise here would be to smelt, in addition to these concentrates, Bluebell concentrates produced from the ore of the "410" and other silicious ore-bodies in the BlueBell mine, and as much ore from the "Blue Coat" orebody (or marginal custon ore) as could be fluxed by these concentrates.

I appreciate that, in view of the heavy expense incident to the construction work now being carried on, the present is not a very opportune time for this company to assume an additional burden by undertaking the development of a mine,no matter how promising the outcome may appear; and, as I have stated in a previous letter, my only reason for commending the property to your immediate attention

is that I fear that the present opportunity of obtaining a lease upon it may not long remain open. I would suggest, therefore, as the proposition as a whole is at all attractive (save for the unpropitious time for undertaking such a matter), that, - merely as a temporizing measure, if necessary, - negotiations be entered into with the Tiger Gold Co. for a lease upon the property, contingent upon a satisfactory final examination of the mine, Such an arrangement would not necessarily commit thisbcompany, but would, at least, forestall and delay the conclusion of a similar arrangement by the Tiger Gold Co. with other parties, which I have reason to apprehend may be pending.

Trusting that in this hurried reply to your letter, I have satusfactorily explained the possible value of the Mine of the Tiger Gold Co. to this smelter, I beg to remain,

Very truly yours,

(Signed) R. T. Walker.

Estimate of profit on ore of the "Blue Coat" orebody, by smelting after previous concentration.

Bullion value of ore.

Au: 0.05 oz. x $20.50	-	$1.02
Ag: 1.50 oz. x 63¢	-	.94
Cu: 3.85% - 77# x(17.5¢ - 3¢ -) 14.5¢	-	11.16
Total bullion value:		$13.12
Milling loss (est.) 30%		3.94
		$ 9.18
Smelting loss (est),10%		.92
		$ 8.26
Mining Cost	$1.25	
Tramway & Freight	.50	
Milling Cost,	1.25	
Smelting cost(1/3 of $4.00,-the ratio of concentration being 3.1)	1.33	
		4.33
Estimated net profit,		$3.93

Estimate of profit on ore of the "Blue Coat" orebody, by smelting without previous concentration, providing flux is obtainable without cost.

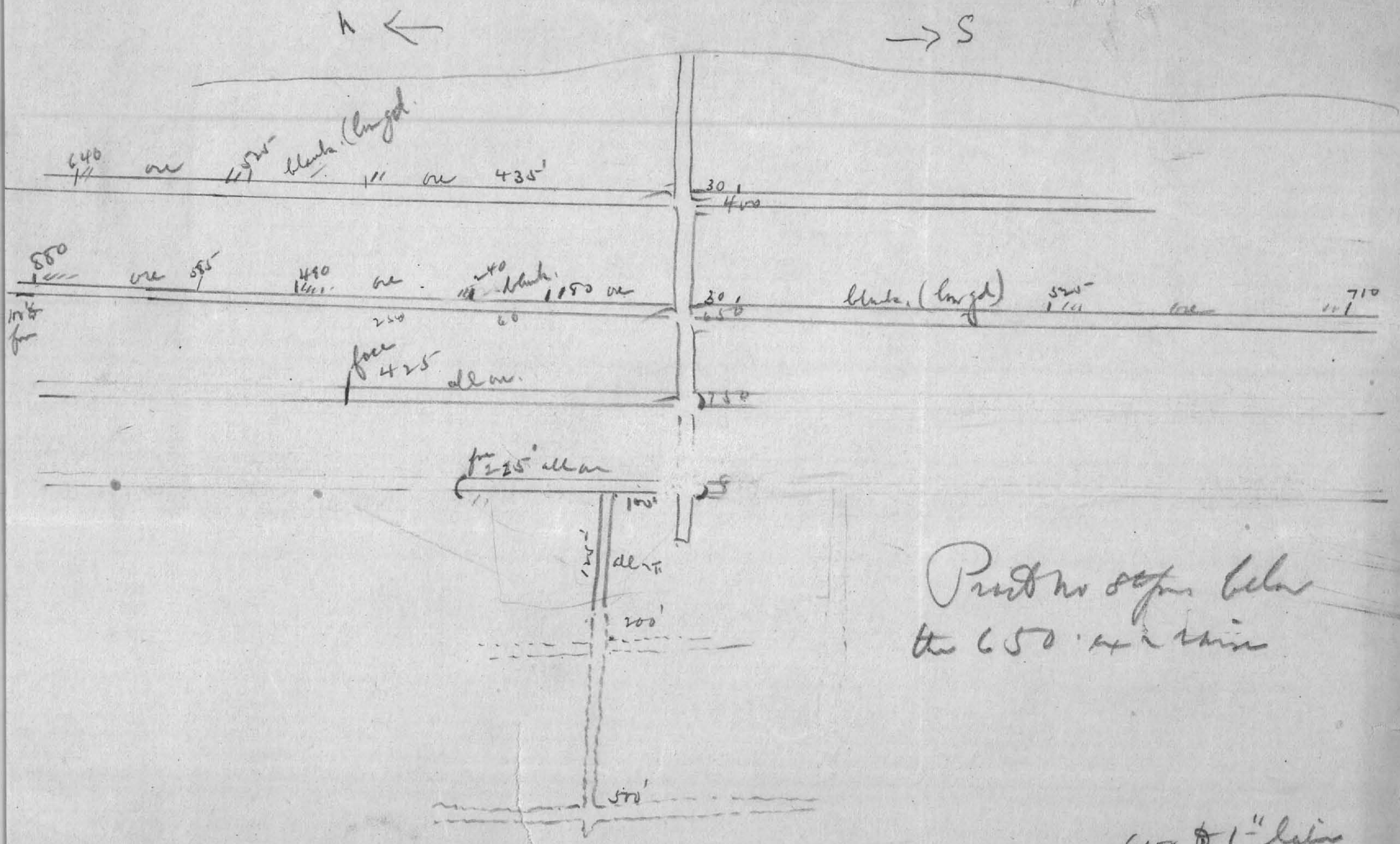
Bullion value of ore.

Au: 0.05 oz. x $20.50	-	$ 1.02
Ag: 1.50 oz. x 63¢	-	.94
Cu: 3.85%-77# x (17.5¢ - 3¢ -) 14.5¢	-	11.16
		$13.12
Smelting loss(est.) 10%		1.31
		$11.81
Mining Cost	$1.25	
Tramway & Freight	.50	
Smelting cost	4.25	
Flux Cost,	0	
		6.00
Estimated net profit		$ 5.81

Owing to the loss of the local copy of the report on the cost of concentrating the Blubell ore, in the recent office fire, I am unable to reproduce the estimated average assay of the "Blue Coat", orebody as therein stated, and the assay here used is to be understood, therefore, to be only an approximation, for purposes of illustration.

The difference between the smelting cost of $4.00 per ton, used in one column, and a similar cost of $4.25 per ton, used in the other, is explainable by the fact that, in concentrating, the cost of crushing the ore (estimated roughly at 25¢ per ton) is included in the milling cost; while, when the ore is treated by direct smelting, this cost must be comprehended in the smelting cost, increasing it, therefore, to $4.25 per ton.

Owing to the fact that the Bluebell ore, in the form of concentrates, possesses some fluxing value, by which profit can be made, the difference between the net profits is not quite so great as is shown here.


N
S
640
ore
435'
30
880
ore
585
440
ore
1150 ore
250
60
650
520
710
face
425
all ore
750
225' all ore
100'
200'
570'
the 650'

8

3,00

10

3. 1/4

1 3/4

LAKE SILVER MINE. About 3 miles south of Crown King, Yavapai Co. Visited Octo. 13, 1916. An old shaft, caved and timbers all gone. A tunnel near the shaft, caved at the mouth. Several shallow pits exposing quartz, mostly very lean in appearance, but occasionally showing a little horn silver and pyrite. Saw few copper indications. The old hoist and boiler are of no value. Mr. Luke asks $40,000.00 for the property, apparently basing the price on having the extension of the Gray Eagle vein on the Apache-Panther claim.

THE ORO BELLE-GRAY EAGLE property. See large blueprint.

Practically no development work has been done since Mr. E. S. Smith visited in April 1916. Saw Mr. Runnels, Octo. 13, 1916, who has been trying to finance an operating company in Kansas City, apparently without success. A few men are waiting around but no work is going on.

The owner is the Barnes Estate of which Mr. Foster C. Haething of Los Angeles is representative. The property is under lease to C. C. Cowan, M. G. Bradshaw, J. D. Shea and R. L. Riggs. The ultimate price is $150,000.00 payable in three years. The lessees estimate that they have benefitted the property about $6000.00 and they are willing (I am informed) to sell out for this amount.

The past production in gold and silver with a little copper has come mainly from the Gray Eagle workings which are now inaccessible. The Gray Eagle shaft is 400 feet deep and would probably cost $2500.00 to unwater for inspection. A big stope which is said to have plenty of good ore in sight, is caved badly, but it is said that it might be top sliced. The main tunnel is caved and it is estimated that it would cost $1000.00 to open.

I am informed that in the Gray Eagle workings, chalcopyrite would sometimes show up in considerable quantities, but that the ore was very variable and spotty as to its mineral contents.

Sec Tiger ✓ Crown King

ORO BELLE MINE

Crown King, Ariz.

This is a smaller vein on the property of the Tiger Gold Company.

1916. It is being worked by four leasers under the leadership of Mark G. Bradshaw.

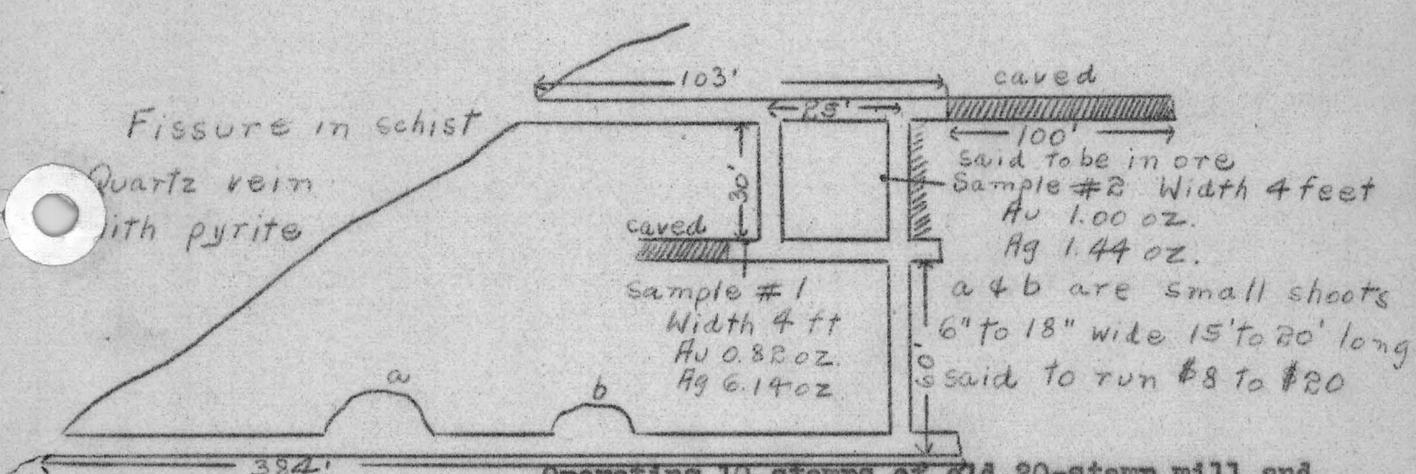
February 1916. Shipped 15-tons of concentrates -

Au.	2.0	oz. per T.
Ag.	6.82	oz. per T.
Cu.	1.11	%
Insol.	22.8	
Fe.	34.3	
CaO	0.6	
S	35.5	

Also shipped 5-tons mill clean-up:

Au.	1.18	oz.
Ag.	2.69	oz.
Cu.	0.38	%
Insol.	78.9	
Fe.	7.1	
CaO	1.2	
S	5.1	

April 6, 1916. Visited by H.G.A. Anderson & E.S.Smith; 11 men employed all told.



Operating 10 stamps of old 20-stamp mill and two Wilfley tables. It is stated mill heads run $12.00 to $15.00; 40 to 50% recovered on the plates.

June 1916. Car of concentrates:

Au.	2.15	oz. per T.
Ag.	7.93	oz.
Cu.	1.70	%
Insol.	22.4	
Fe.	36.0	
CaO	0.6	
S	31.0	

July 1916. 8-tons concentrates

Au.	2.05	oz. per T.
Ag.	6.57	oz.
Cu.	1.18	%
Insol.	18.9	
Fe.	36.5	
CaO	0.4	
S	35.6	

OLD TIGER MINE

Crown King, Arizona.

YAVAPAI CONSOLIDATED GOLD-SILVER-COPPER CO.

1910-1911. 13 cars high-grade ore to Humboldt and 2 cars in 1913.

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Zn.	18.7

See also Crown King District.

COPY

Foster S. Naething
Monsanto Post Office
East St. Louis, Ill.

RE: ORO BELLE

May 30th, 1931

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

Dear Mr. Colvocoresses:

I am enclosing two photostats of maps giving a plan of some of the workings and also some notes copied from a statement made by C. C. Cowan, the last superintendent of the mines, who was working some of the upper levels with me in 1916.

Map A. Section and plan of workings north of the shaft. The section shows 78 samples, the figures opposite the number of sample being in dollars per ton, figuring gold and silver. For instance, Sample No. 71 assayed $69.96.

Cowan was in charge at the time the property shut down, which was due to a cave very close to the shaft, and says that the map is nearly up to date. My idea would be to sink the shaft another 100' and then the drift north and south, particularly north, as ore should be encountered veryclose to the shaft if this were done.

MAP B. Photostat of blue print showing plan of workings south of the shaft. Most of the drifts were not in ore, but I understand some very good ore was encountered. This drift, however, caved some time before the property was shut down. The sections shows good ore in Samples 1, 2, 3, 4, 5, 6, 7, and 8 in the face of No. 4 level.

The Savoy group, in my estimation, is not at all essential to the operations of the Tiger Gold, but if it could be secured on a sufficiently attractive basis I believe it would be advisable to do so, as the Savoy ore could be handled in the Tiger mill better than in any other way.

If you wish me to , I believe I could get in touch with the Savoy owners who I think are now in New York.

I trust the enclosed information will be of help.

(signed) Foster S. Naething

RE: ORO BELLE: 1915

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The surface improvements, 20 stamp, buildings, etc., are valued at $75,000.

This property should be worked on a very economical basis, both office end and operations at the mines.

(signed) C.C. COWAN

Reserves
Nov - 1925.

Date		Tons	Au	Ag	Cu	Pb.	Content Au	Ag	Cu (T x %)	Pb (T x %)
12-31-23	From old report. On hand.	60,000	.23	7.45	2.4	2.4	13 800	447000	144 000	144 000
+	Developed 1924 +	20,000	.22	7.5	2.8	2.3	4 400	150 000	56000	46 000
		80,000					18200	597000	200,000	190000
	Produced 1924 (est.) -	5,000	.22	7.5	2.5	2.4	11 00	37500	12,500	12000
12-31-24	On hand.	75,000					17100	559500	187 500	178000
	Produced 1925 (to 11-1) -	16,225	.14	6.7	2.2	2.5	2300	108800	35 700	40600
		58,775					14800	450700	151 800	137400
	Developed 1925 (to 11-1) (est) +	25,000	.11	7.0	2.2	1.3	2250	175000	55 000	32500
11-1-25	On hand. Rough estimate.	83,775	.20	7.5	2.5	2.0	17050	625700	206,800	169900
										170,000

80,000	.20	7.5	2.5	2.0
	4.00	5.00	4.00	2.00

In Sec. — incl a block of 100 x 100 x 60, x - below 10'

850' or devel by 1 bring. Sp g — 11 ft³ per ton

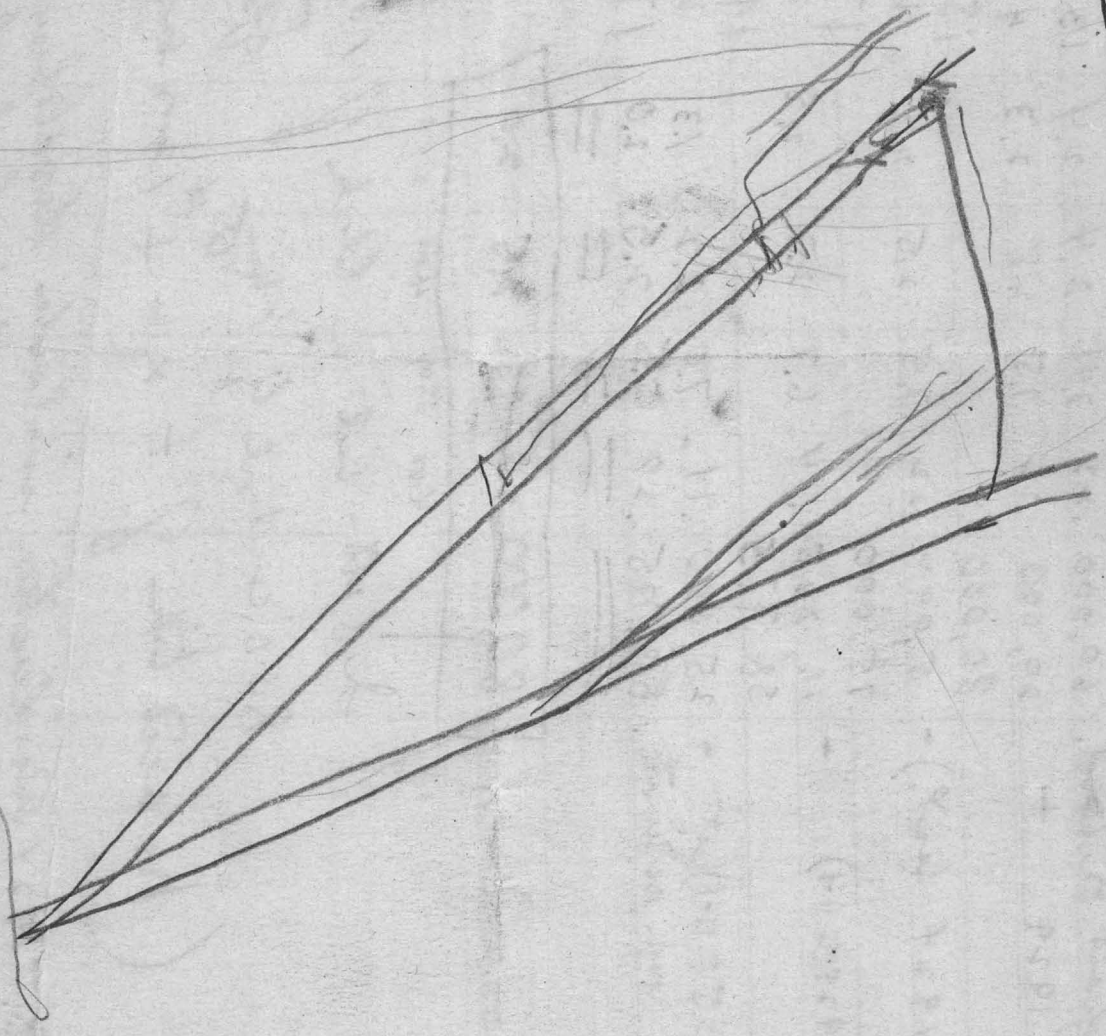
(No acid to of — x — 1st 12.00 ore

N.B. 1924 Production includes development ore,
1925 " does not include development ore.

Probable mill recoveries: 95 % au
90 % ag
90 — cu
68 % — Pb

[illegible] 12.50

12"+



	oz. Au.	oz. Ag.	Total Value (silver @ .70¢)
Heads	0.08	10.60	8.07
Concentrate	1.0	183.2	$ 148.24

Ratio of Conc. Gold 12½ to 1; silver 17.26n to 1.

There were dissentions amongst the lessees and (according to Thelfall) Messrs. Trumbo & Bumsted altered the plant at a cost of $6000.00, after which it would not work or make any concentrates." Mr. Judd, one of the lessees, is stated to have declared that the total amount lost was $21,000.00 when they quit work. -

COPY

May 12, 1931.

Mr. Foster S. Naething,
Monsanto Post Office
East St. Louis, Ill.

RE: TIGER GOLD (ORO BELLE)

Dear Mr. Naething:

"Yours of the 8th inst. just received, together with your report on the Tiger Gold Property, and the accompanying blue-prints all of which I find very interesting.

I have been checking over your statements with those made by other engineers, particularly a report which was written by R. T. Walker in 1912, at which time he was General Superintendent at Humboldt, and I am inclined to agree with you that, as a speculative investment, the reopening of this property might appear entirely justifiable, provided the initial expenditure would not be too great and the terms on which it can be obtained from the owners are reasonable.

There are several points on which I would like some further information:

First, in regard to the property--you list (7) patented claims, whereas Walker listed (13) patented and (1) unpatented claims. I do not quite understand this discrepancy unless the mortgage which Mr. Barnes foreclosed did not cover the other seven claims or possibly some of the property held in 1912 may since have been sold to other parties.

You state that it would be advisable to secure some adjoining property, at least under option, and this would obviously be very advantageous considering the long outcrop of the vein and the possibilities of finding pay shoots at points outside of the holdings of the Barrod Mining Co. Can you give me any further suggestions as to which of these claims would be particularly desirable to secure and concerning the names of the present owners and the terms on which they might be willing to do business? I have always heard the SAVOY GROUP, lying north of the TIGER GOLD, highly spoken of, but understood that it was difficult or impossible to make any satisfactory

deal with the owners.

As to reopening the mine, have you any positive information that the old shaft is still in good condition? You mention that the timbers are caved near the surface and perhaps a similar caving may have occurred for quite a distance below the collar. You do not state to what level the water rises in the shaft but I find in Walker's report a statement to the effect that the mine made about 40,000 gallons of water per day, which means that unwatering to the 400' level would be rather an expensive matter considering the daily inflow and the qnantity of water which has accummulated in the old stopes and workings.

I assume that all of the drifts, including the 400' level were run in the vein or in the fissure of soft material and, if such is the case, these would all be useless and it would probably be cheaper to drive new drifts rather than to attempt to go thru the old ones.

You did not include a plan map of the mine, which would be very informative if one is available, and I would be glad to have your general opinion as to the cost of reopening to the 400' level and extending the drift north thru the ore shoots on the Cleveland Claim (apparently about 500') and south under the main ore shoot on the Grey EagleClaim, apparently about 1,000'. I presume that to carry out such operations it would be economical to connect with the power line rather than to attempt to use gas engines, but such a connection would involve building a line for a distance of 2½ miles, at a cost of probably $4,000 and the rates of the Arizona Power Co. on comparatively small operations run much nearer to 3¢ per K.W. Hour, everything included, than to the 2¢ mentioned in your report.

Walker and others seem to indicate that a dertain amount of high grade oremight be found in some of the adit levels on the Grey Eagle Claim, and I note on your section map that apparently a shoot of ore was stoped between the first and second adit levels, but judge that this did not yield a very good grade of ore since it was neither carried upwards nor downwards. Any reference to the possibilities of mining near the surface would be very interesting.

I assume that you have not available any assay map of the property and the maps which originally accompanied Walker's report appear to have been lost. Walker, however, gives the result of a number of samples which generally speaking are very good, but does not clearly indicate where many of these samples were taken, altho I note thatseveral of them came from the 400' level, and he fefers to theCowan Stope, which is not located by name on your blue-prints.

Now, as to terms, I assume that the owners of this property would appreciate the speculation involved in resuming any development or mining activities and the heavy expenditure which would have to be made not only for reopening the property but for providing mining plant, camp buildings, etc., and doubtless repairing a portion of the road. Generally speaking, conditions at Crown King have become much more unfavorable since the railroad was torn up from Middleton and the Santa Fe will, I understand, make every effort in the future to obtain authority to remove their tracks from Mayer to Middleton in which case the haul from the railroad terminus would be approximately 40 miles, and this is a pretty big handicap, even for a gold mine, and particularly in this case since I assume that it would be advantageous to concentrate some of the ore in order to save the values in silver and copper, as well as in gold.

I presume that the owners of the property would, therefore, be prepared to consider a long time lease and bond with a comparatively low rate of royalty and an option to purchase at a moderate figure.

I note from your letter that several parties have been negotiating for the property but you and I both know from experience that many of the people who negotiate for mines, especially in the Bradshaw district, are wholly irresponsible and merely wish to have a basis for selling stock in a company which generally never gets beyond the stock-selling stage.

Should my friends decide to go further on this matter, we would make every effort to honestly develop the property and be prepared to spend a sufficient amount of money to accomplish that purpose, assuming that the results of the development work progressively

continues to justify additional expenditure. It is my idea that the first procedure would comprise a fairly thorough sampling of the surface and such workings as are now accessible, coupled with a renewed study of the geology and thorough examination of all available records and reports. The next step would doubtless be the unwatering of the shaft and reopening the 400' level which would involve providing power, mining and pumping plant, and certainly require a very substantial expenditure, and no very definite opinion regarding the value of the property could be formed until this work had been completed.

You will see from this letter that I am seriously interested in the Tiger Gold, at least to the extent of wishing to continue my investigation. I am getting in touch with an engineer who worked in the property when it was last operating, and also obtaining some information regarding present conditions from Crown King, and tentatively planning to visit the mine sometime during the next few weeks, provided your reply to this letter and other information which I can obtain continues to be satisfactory. I will, therefore, be very glad to hear from you at your early convenience.

Best personal regards."

Very truly yours,

(signed) G. M. Colvocoresses

ORO BELLE (TIGER GOLD)

NOTE BY G. M. COLVOCORESSES, October, 1937

This property is listed as the Oro Belle by which name it is usually known locally to distinguish it from the Tiger or Old Tiger, on which a brief separate report is sent.

It was undoubtedly a mine of considerable importance and was highly thought of by Walker and several other engineers.

From 1913 to about 1930 the owners would never discuss anything but a sale at a very high price and during most of this period it was idle except for the small operations of lessees near the surface.

The lower workings were inaccessible and could not be sampled by my engineers on the occasions of their frequent visits to the Crown King District.

In 1931 I looked into the situation and received the letters maps and reports from Naething of which copies are enclosed, but the very heavy expense involved in making any thorough examination of the mine prevented me from going any further.

In 1935 the mine was leased to two young men from Los Angeles who seemed to greatly underestimate the magnitude of the venture on which they had embarked and who have tried to finance their work thru the sale of stock with indifferent success. I am told that they are still carrying on a small amount of development but judge that they are in default on their lease.

If the mine is to be properly reopened and efficiently worked a very large preliminary expense will be involved and I have no definite opinion as to whether or not this is justified. But I do think that the property merits further consideration and I believe that Naething would be glad to give information as to its present status.

G.M.C.

Copied

Cpy

9-20-12.

TIGER GOLD COMPANY REPORT.

I beg to report herewith the results of two brief examinations of the mine of the Tiger Gold Company, made by me on September 1st, 2nd and 3rd, 1911, and May 14th and 15th, 1912. On both occasions fully 90% of the total workings of the mine were caved and inaccessible; while, at the time of my last visit the lowest level of the mine was largely under water. Hence no systematic sampling of the mine was possible; my observations of the vein structure were limited to the surface outcrop and to a few underground exposures; while, for information regarding the size and location of the ore shoots, I am indebted cheifly to the mine maps and to the statements of friends familiar with the property.

HISTORY:

The mine was located over 30 years ago and has been worked more less continuously ever since; and the total net value of the bullion produced and the concentrates and ore shipped therefrom, to date, is authoritatively stated to be about $700,000. The organizers of the present Company acquired the property in the '90s., I understand, by purchase from its original owner, Barnes (the schoolbook publisher), for the sum of $100,000. and immediately issued and sold a larhe amount of stock, from whic, through rather extravagant representations of the veins of the mine, they are reported to have realized nearly one million dollars. All of this money, however, in addition to the total proceeds of the ore mines during ths operation of the property by the Tiger Gold Company, has, it is said, been

put back into the mine, with the exception of $98,000. paid to the stockholders in dividends. At the present time, I have been given to understand, the mine is under a $100,000. first mortgage, held by Barnes, the original owner of the property, and a $30,000 second mortgage, held by some of the princupal stock-holders; while, in addition, the Company is indebted to the extent of several thousand dollars to local merchanys, who have protected themselves by attaching all the personal property of the company not covered by mortgages. The mine was closed down in the early part of the present year, and has since remained idle,- the effots of the company to dispose of bonds to an extent sufficient to retire the mortgages and to provide a $50,000 development fund so far not having met with success.

LOCATION.

The mining property of the Tiger Gold Company consists of 13 patented and one unpatented lode claims, which are situated in the Tiger Mining District in the Bradshaw Mountains of southern Yavapai County, Arizona. A good mountain road about 4-1/2 miles in length connects Harrington, which is the camp and Post-Office of the Tiger Gold Company, with the station of Crown King, which is the terminus of the Bradshaw Mountain Division of the Santa Fe, Prescott and Phoenis Ry. Co., and is the nearest railroad shipping point.

GEOLOGY.

(See "Bradshaw Mts" Folio U.S. Geological Survey.)

The geologic formation in which the mine is situated is a schist series of Pre-Cambrian age (Yavapai Schist) which, to the east and west of the mine, at distances of 1/2 mile and 2 miles, respectively, is bounded by granite batholiths, and to the north, at a distance of 1-1/2 miles, terminates against a large intrusive stock of quartz diorite of later age than both the schist and granite. In the immediate vicinity of the mine, the Yavapai schist series consists of grayish, finely micaceous schist, which strikes northerly and

southerly and dips westerly at an angle of between 40° and 50°, and is intruded by dikes of pegmatite and diabase.

VEINS. Several veins are reported to traverse the property of the Tiger Gold Company, only two of which, however, - the Grey Eagle vein and the Ora Bonita vein,- have so far been proved of economic value,- the Grey Eagle vein being by far the more productive of the two.

GREY EAGLE VEIN.

The Grey Eagle vein consists of several roughly parallel fissures, all comprised in a space of from 5 ft. to 30 ft. in width, striking northerly and southerly, in rough parellelism to the strike of the schist which they traverse, but dipping westerly at a somewhat steeper angle (60° to 65°). A dike of pegmatite and one of diabase have been intruded into the schist in close proximity and roughly parellel to the vein, - the pegmatite dike (and possible also the diabeas dike) having in places been cut by the latter.

The several individual fissure forming the vein are, for the greater part of their length, narrow (usually not exceeding 1" in width and contain only barren gouge, but in places they expand and are filled with the quartz, carrying metallic sulphides, forming irregularly lenticular ore-shoots, which vary in width from a few inches to a reported maximum of 25 ft., and in length and depth from a few feet to 300 ft. or 400 ft. These ore-shoots apparently occur in two systems or groups, one lying to the north and the other to the couth of the shaft, and separated from each other by a barren or poorly mineralized interval several hundred feet in length.Both of these groups apparently pitch at a steep angle to the north. The metallic sulphides in these ore-shoots are distributed throughout the quartz gangue, in bands, crystalline aggregates, and scattered cyrstals, and consist chiefly of pyrite with a subordinate amount of chalcopyrite and a very

small percentage of galena. The metals of marketable value, are, in the order of their imporatnce, gold, silver and copper. The gold and silver are not found in the quartx gangue, but occur almost exclusively with the metallic sulphidesm the proportionate abundance of which in consequence, is roughly indicative of the relative value of the ore The Gold appears to be associated chiefly with the pyrite, being present in it in amount as high as 20 oz. per ton, while the chalcopyrite rarely contains more than 3 oz. of this metal per ton. The silver, which is probably associated cheiefly with the galena, is present in relatively small amount and does not usually exceed the proportion of 5 oz. of silver to 1 oz. of gold. The amount of copper present in the ore is also low, commonly not exceeding 1%. The accompanying report of the assays of the ore samples taken by me will afford further information regarding the character and richness of the ore. Since the formation of the vein system and the deposition of the ore, movement along the zone of fissuring has been renewed, producing new fissures, which sometimes follow the older fissures and sometimes traverse the adjacent schist. The principal one of these later fissures is more strongly defined than any of the earlier fissures, as it possesses strong slickensided walls, carries abundant gouge, and is usually accompanied on the foot-wall side by a zone of friction breccia that sometimes attains a width of several feet. This friction breccis,- the composition of which varies according to the nature of the rock traversed,- has been cemented to some extent by silica and iron salts, but apparently no mineralization by valuable metals has taken place, either in it or in any of the other later fissures, and it is undoubtedly fragments of the original ore occurring in the breccia which give it, in places, a sufficient gold, silver and copper content to be of commercial value. The strength of this main later fissure, the fact that the breccia zone accompanying

it is sometimes valuable, and the circumstance that, as it often follows the original fissure, it has led to ore-shoots, have caused it to be considered the main vein, and practically all of the drifts in the mine have been run along it. Owing to the softness of the breccia zone, which is enhanced by the fact that, owing to its porosity, it is the principal water channel of the mine, drifts driven along it are difficult to keep open, and unless considerable attention is given to relieving the pressure on the timbers, caving results, for which reason practically all of the old wotkings of themine are at present caved and inaccessible. A second and perhaps more costly consequence of mistakenly identifying this fissure as the main vein has been that undoubtedly in some places the ore has been passed by and left undiscovered ~~xyxxhxxfxxxxhxx~~ in the hanging and foot-walls. This probability is evidences by the fact that last year a large and valuable ore-body was accidently discovered lying behind the hanging-wall of this main later fissure, which, until then, had been considered the hanging-wall of the vein. The relationship of the earlier and later fissures is shown in the accompanying ideal cross-section of the fissured zone.

The Grey Eagle Vein has been developed by eight adit levels, about 100 ft. apart vertically; by a winze from the lowest adit level (Cleveland Tunnel) 300 ft. deep, from which drifts have been run; and by a 600 ft. incline shaft, whosr collar is nearly on a level with the Cleveland Tunnel, and from which drifts have been run south along the vein on the 300 ft. and 400 ft. levels, and north along the vein on the 300, 400, 500 and 600 ft. levels. In addition to a 200 ft. winze has been sunk from the 400 ft. south level, and drifts run therefrom. These workings explore the Grey Eagle vein for a maximum depth of 1300 ft. below the highest point of its outcrop, and for a maximum length of nearly 3,000 ft., and aggregate altogether several miles in length; but with the exception of the first 800 fT/ of the Cleveland Tunnel, all of the workings south of the shaft are at the present time caved and inaccessable, while, at the time of my last visit to the mine, part of the 300 ft. and 400 ft. levels north of the shaft wete also caved, and if, as I understamd, the mine has been under water continuously since that beginning of the present year, it is possible, in view of the soft and caving nature of the vein, that all the levels north of the shaft, with the possible exception of the lowest level, are now inaccessable. The shaft itself, being sunk in the hard rock of the foot wall at a safe distance from the vein, with which it is connected by crosscuts at the several levels, will undoubtedly remain intact. This shaft, which affords the only opening available for the future development of the mine, is sunk at an angle of 72° to the west, and has two compartments, each 4 x 4 in the clear, one of this is equipped with a cage and the other a small skip. The equipment of the engine room at the shaft consists of an oil fired 180 H. P. Heine water tube boiler, which is reported to be in good condition, save for some tubes which require replacing; a large steam

driven Sullivan Air Compressor, said to be 120 H. P. and to be in good condition; a large double drum steam hoist, reported to be in poor condition, one drum of which carries about 1,000 ft. of 1-1/2" cable and the other about 700 ft. of 7/8" cable. The shaft is said to make from 35,000 to 45,000 gals. of water daily, according to the season of the year, which circumstance, together wtih the fact that the water enters cheifly on the upper levels indicates that it is largely of surface origin, Most of the water is handled by a steam station pump, in poor condition, on the 300 ft. level, while such water as enters below that level is pumped to it by a sinker pump, which is said to be in good condition.

ORA BONITA VEIN.

The Ora Bonite vein is a true fissure vein, so similar in its general characteristics to the Grey Eagle vein, which it parallels roughly both in strike and dip, at a distance of about 600 fT/ or 700 ft. west of the latter, that a detailed description of it does not appear necessary, especially in view of its prospective small economic imporatnce. The chief point of differnce between it and the Grey Eagle vein is that the Ora Bonita vein traverses schist alone, with no igneous dike in its immediate vicinity. As in the Grey Eagle vein, the ore-shoots consist of irregular quartz lenses containing metallic sulphides, of which pyrite is the most prominent; while gold is the cheif metal of value, although it does not appear to be so abundant in proportion to the amount of sulphides present as in the ore of the Grey Eagle vein. The Ora Bonita vein has been worked intermediately, principally by lenses, and it is reported that no inconsiderable amount of high-grade ore has been extracted. At the time of my visit, however, all of the several adit tunnels, by which the vein has been explored, (it being very similar in profile to the Grey Eagle vein) were, with one exception, caved and inaccessible, and it probable

that practically all of the ore had been exhausted down to the bottom of the gulch, below which, I understand, exploration of the vein has not been conducted. No satisfactory data being available to the extent, course and richness of the Ora Bonita ore-shoots, it is impossible to make any positive statement regarding them, although such evidence as there is at hand indicates that the production therefrom has been considerably less than from the Grey Eagle vein. Such results as might attend the further exploration of the vein with depth are therefore entirely problematical.

The accompanying report of the assays of the samples taken by me, in the second tunnel above the mill level, which is at present open, will indicate the character and value of the ore.

MILL.

For the treatment of the ore of the Grey Eagle and Ora Bonita veins, the property is equipped with a 20-stamp mill, which is situated in the bottom of the gulch below and at a distance of several hundred feet from thecollar of the shaft, and almost over the outcrop of the Ora Bonita vein. The ore of the Ora Bonita vein must be packed to the mill; but the ore from the Grey Eagle vein, after being hoisted in mine cars on the cage from the various levels to the surface, is hauled by a mule, in trains of eight to ten cars, for a distance of about 1,000 ft. to the head-bins of the mill. The ore, after being weighed on a small track scale, is dumped upon a grizzly with 1-1/2" spaces, the over size going to a 9" x 16" Blake Crusker driven by an 8" x 12" Atlas engine, (old, but reported still to give good service), and the crushed rock, together with the under-size from the grizzly, being delivered by a 14" conveyor belt, about 150 ft. long, into two storage bins, each of 500 tons capacity. From these bins the ore is fed by Challenge feeders to four 5 stamp gravity batteries, the stamps weighing about 750# each. Each battery is provided

with an amalgamated copper plate, stepped in three 4 ft. sections; but there is no inside amalgamation. The pulp of two of the batteries, after passing the apron plates, is delivered without previous classification to two Wilfley tables; while the pulp from the other two batteries is delivered similarly to two standard tables. The stamps and tables are driven by a 75 H.P. Corliss engine, which is reported to be in good condition. Steam is supplied by two oil-fired 80 H.P. Frost firs tube boilers, only one of which, however, is required at one time, the other being kept in reserve. A third fire tube boiler of about 40 H.P. is on hand, but, owing to poor condition, is never used. The exhause steam is passed beneath a drying plate upon which the concentrates are fried. The equipment of the mill as a whole is in poor condition, which is explainable by its age, most of it, I understand being nearly 20 years old; the ore bins are so insecure that it is unsafe to utilize their full capacity; the mortar blocks of two of the batteries are continually sinking and requiring resetting of the mortar boxes; the tables give very inefficient service and require constant attention and repairs; while, owing to the bad condition of the boiler tubes, it is considered unsafe to carry a greater steam pressure than 75#.

The daily consumption of water at the mill when running at full capacity is 50,000 gals., which is obtained partly from the mine and partly from surface springs, the latter being drawn upon also for domestic purposes. During the dry season of the year, the total water supply thus obtained is usually insufficient, and it is necessary at such time to use a considerable proportion of the water a second time. Whenever it is necessary for this to be done, the effluent water from the mill is ponded behind a temporary dam of tailings, and is pumped back into the tanks for re-use: The water storage tanks have a combined capacity of 190,000 gals. - 150,000 gals? for mine use, 18,000

gals. for the boiler, and 22,000 gals. for domestic supply.

Battery screens of 16 to 20 mesh have customarily been used, and the capacity of the mill for crushing to such mesh is stated to be between 60 and 75 tons oer 24 hours, depending on the hardness and coarseness of the ore? The ore as a whole is not difficult to crush, the quartz gangue being brittle and parting readily from the sulphides, which are soft and friable. 50% of the pulp is said to be fine enough to pass through a 100 mesh screen, the sliming of the sulphides this indicated being doubtless responsible for the relatively low percentage of total extraction obtained. The ratio of concentrating is reported to vary from 8:1 to 12:1, according to the proportion of sulphides in the ore; and as there is no providion for retreating the middlings, it has been the practice to divert then into the concentrates box, in order to save the finely divided sulphides which are found therein. This results in a quite silicious concentrate, as is indicated by the following average assay of 10 consecutive cars shipped about the middle of 1911:

Gold:	Silver:	Copper:	Iron.	Insoluble.
2.46	13.03	1.73	37.34	19.8

Notwithstanding the inclusion of the middlings in the concentrates, the total extraction is reported to have averaged only between 80% and 85%, which, if one-third of the value of the ore is recovered on the apron plated, as is reported, would indicate a saving on the tables of only 70% to 75% of the value in the pulp treated by them.

ADDITIONAL PROPERTY:

In addition to the returns from the ore mines and treated the Tiger Gold Company had other sources of revenue, as it owns not only a number of cottages and the only general merchandise store at the camp of Harrington, but also a considerable part of the ground upon which the hamlet pfCrown King is built. The net profit derived from

rentals at Harrington and Crown King, and from the monopoly of trade at Harrington, probably was not less than $500 per month; when the mine and mill was working at full capacity.

In addition to the buildings at Harrington the Company owns a warehouse and oil pumping plant at Crown King. The crude oil, which is used for fuel both at the mine and mill; is delivered from tank cars at Crown Kind into two 50,000 gal. tanks and is pumped thence by a three mile pipe line to the oil storage tanks at Crown King, which have a total capacity of 134,000 gals. All other supplies used, however, (with the exception of mining timbers, which are cut on the surrounding hills and delivered at the mine) must be hauled from Crown King, while similarily the concentrates produced must be hauled to Crown Kind for shipment to a smelter. The hauling rate is customarily $4.00 per ton for a load one way, or $3.00 per ton when a return haul is possible. Undoubtedly the use of a motor truck,- one of which has been in successful operation for severak months by a neighboring mine over most of the same road, - would reduce the handling cost to $1.00 per ton.

GENERAL.

So far as can be ascertained from the imcomplete and inaccurate records of the Tiger Gold Company, the monthly average of the ore mined by the company during its existence, has fluctuated between $10 and $20 per ton, although during the last two or three years, some monthly averages of less than $10 per ton are said to have occurred. The circumstances that, in spite of the fact that the ore is usually of good grade, frequently occur in good sized ore-shoots, and is of a nature very amenable to treatment by amalgamtion and concentration, the operations of the company have been profitable is attributed in part to adverse local conditions, but chiefly to ignorance, carelessness and extravagance of management, which have affected injuriously the cost

and efficiency of both mining and milling operations. Until 1902, when the railroad was constructed to Crown King, the cost of hauling supplies in and concentrates out was naturally very heavy; while, before the Humboldt smelter was constructed, the railroad freight and smalter treatment charges on the concentrates, which were then shipped to El Paso, were excessive. Shortage of water during the summer months also at times, necessitated curtailment of the scope of operations. The inability of the local management of the company, however, to keep the costs down to the economic minimum, and the grade of the ore up, are chiefly responsible for the lack of success. Thus, as a result of the practice of drifting along the main later fissure, the expense of timbering the drifts heavily, to sustain the ground, and of catching up the frequent caves, which ensued, caused the development costs to be much higher than if the drifts had been run in the firm wall rock of the vein, alongside and a few feet from it, where no timbering would have been required, - short crosscuts being run to the vein at regular intervals, to explore it. In stoping the ore, it is said, sufficient attention was not given to keeping it free from waste. The ore usually parts cleanly from the wall-rock, andthe exercise of a little care would enable it to be kept clean of waste, but owing , it is said, to unnecessarily heavy blasting, a considerable portion of the wall-rock usually accompanied the ore to the mill, thereby decreasing the average value of the ore milled (see sample No. 11) lessening the percentage of extraction, and diminishing the capacity of the mill for ore,

Shortsightedness has been equally evident in the construction and operation of the mill. The installation of a few water reclaiming tanks of proper design at small expense would have permitted the recovery of a considerably larger amount of water, which would probably have been sufficient to have rendered a curtailment of milling opera-

tion through lack of water unnecessary. The practice of using a 16 to 20 mesh screen and a deep discharge mortar, in order to secure as great an extraction on the plates as possible, has proved to be wasteful, since by increasing the sliming of the auriferous sulphides in the ore, it unquestionably diminished the recivery of the tables and consequently the total extraction. The sulphides occurin relatively lasrhe srystals, which part rather readily from the gangue, and coarse crushing, therefore, is sufficient to release them. With a screen of larger mesh and a low discharge lip on the mortats, the capacity of the mill would have been much increased, with no increased expenditure for labor or power, while probably also the total extraction would have been larger, as there woulf have been less sliming of the sulphides; while the classification of the pulp, after passing the apron plates, and the installation of a vanner for the treatment of the slimes, andoff an auxiliary table for the re-treatment of the table middlings, would not only have effected an additional recovery, which would have repaid the cost of the equipment in a short time, but would have effected a further large saving through making unnecessary the present practice of combining the middlings with the concentrates. The freight and smelter treatment charges and penalties on the barren silica in the concentrates, total about $20 per ton of silica, which, as there are about 15 units of silica per ton introduced into the concentrates through combining the middlings with them, indicates that this practice has cost the Tiger Gold Company about $3.00 for every ton of concentrates shipped by them.

At the time of my examination of the mine in 1911, the evidence of unncesssarily high costs were conspicious. The miners union was allowed to dominate in the camp and to dictate what men should be employed and what sho81d constitute a days work, with the inevitable result of increasing very largely the cost of mining; while the

dilapidated condition of the mine and mill equipment/ which the poor financial condition of the company would not oermit them to remedy by replacing with new equipment, not only required the maintenance of an excessively large repair gang (7men) but caused frequent shutdowns, which, by decreasing the output, relatively increased the expense. A concrete illustration of the effects of these conditions is afforded by the results of the operations dyring the months of July and August, 1911, as follows:

JULY PRODUCTION.

10 Bars Bullion, net value	$4,860.66
4 Cars Concentrates, net value	6,873.61
	$11,734.27

Mill running time (on basis of 480 stamped-hours per day) 17 14/24 days.
Estimated tonnage milled, approximately 1320 tons.
Eetimated recivery per ton, approximately $9.00.
Estimated value of ore milled per ton, approximately $10.50 to $11.00.

AUGUST PRODUCTION

7 Bars Bullion, net value	$4,281.65
4 cars Concentrates, net value	4,706.38

Mill running time 15 1/2 days.
Estimated tonnage milled, approximately 1160 tons.
Estimated recivery per ton, approximately $7.75
Estimated value of ore milled per ton, approximately $9.00 to $9.50.

Inasmuch as the bullion and concentrates produced during this period did not dover operating expenses, it is obvious that that the latter were at least between $8.00 ar $9.00 per ton, or just about double what they should have been; as the cost of milling ore, under proper conditions, should not exceed $1.00 per ton, while the total mining conditions, (comprising exploration, development and stoping with a propostion of over-head expenses) should not exceed $3. per ton where the width of the vein is in full width of the stope, or $4.00 per ton where the width of the vein is less than the width of the stope.

CONCLUSION AND RECOMMENDATIONS.

With the exception of a negligibly small tonnage of ore remaining in the crown of some of the stopes and below the levels above, north of the shaft, the mine is at present practically without developed ore reserves, and the problem of major importance, to which all other considerations are subordinate, therefore, is that of the development of ore. I conclude, after careful consideration of all of the conditions, that there are strong reasons to believe that the ore-shoots continue below the present lowest level of the mine. This conclusion is based partly of the fact of the frequent persistende of gold to a much greater depth in veins, than has been reached on the Grey Eagle vein, and partyly to the circumstance that there is no evidence in the lowest level of the mine of any approaching improverishment of the vein/- the deepest ore-body discovered ("D" stope, between the 400 ft. and the 600 ft. levels, north of the shaft) being of considerable size and as good average grade, I am assured, as any in the mine, while, in the lowest level, an ore-body of good grade (see sample No. 6) although small in width as there exposed, has been cut,

There is also reason to expect, from the past practice of following the main later fissure, in the mistaken belief that is was the principal vein, that ore-bodies may have been left undiscovered in the developed parts of the mine, as exemplified by the rich "D" stope, which recently was discovered by accident lying behind what until then had been considered to be the hanging-wall of the vein, some time after the levels north of the shaft has been abandoned in the belief that they were worked out. It must, however, be considered in this connection, that the expense of re-opening the old caved portions of the mine, for the proper investigation of this matter/ might exceed the value of any ore there discovered. I would recommend, therefore,

that attention first be given to ecploring the vein below the present lowest level,- the prospects of success warranting, in my opinion, the expense necessary. The installation of new pumps, and probably of a ne hoise, before commencing operations, would probably be advisable, but the re-installation of the Mill has probably best await the results of the mine development work, as the nature and extent of the repairs and changes, that might be desirable, could be most intelligently considered after a sufficient tonnage of ore to pay for them has been blocked out.

Respectfully submitted,

(Signed) R. T. Walker.

Assays of Samples.

Gray Eagle Vein.

		Au. oz.	Ag. oz.	Cu. %	SiO_2 %	Fe. %	S. %
No.1.	Sample across quartz vein, 4" wide, containing small amount of sulphides, back of Cowan stope, top ofNo.1 chute, 400 N.Level:	0.34	7.4	0.1		13.3	14.6
" 2.	Sample across same vein, 4" wide, containing sulphides, 40 ft. S. from top of No. 2 chute, 400 N. level, (From this point north, vein is barren until it runs into caved ground)	3.24	9.7	0.1		15.3	14.0
" 3.	Sample across quartz vein, 13" wide, containing sulphides, back of stope, 10 ft. S. of top of 3rd chute N. of by-pass, 500 N. Level:	2.92	12.3	3.5		16.7	17.1
" 4.	Sample across same vein, 15" wide, containing sulphides, takenbon level with and 15 ft. S. of sample No. 3 (Ore-shoot ends 20 ft. S. and 30 ft. N. from this point, being at this level about 50 ft. long)	2.00	8.3	1.0		20.9	24.0
" 5.	Sample across parallel vein, 13" wide, containing abundant sulphides, 10 ft. east, taken on level with an opposite sample No.4:	3.64	8.6	2.3		27.9	30.5
" 6.	Sample across quartz vein, 3" wide, containing sulphides, 600 N.level 350 ft. N. of shaft:	1.58	5.5	0.1		19.8	22.1
" 7	Specimen sample from vein (D ore-shoot(?) containing coarse pyrite crystals, 400 N. level, 300 ft. N. of shaft:	2.12	6.3	0.4	56.4	19.5	
" 8.	Specimen sample, containing heavy sulphides, from S. end of "D" stope, between 400 N/ level and 500 N. Level:	18.20	20.0	1.0	33.2	29.8	
" 9.	Speciemn sample, quartz containing small amount of sulphides, from middle of "D" stope, between 400 N. level and 500 N. level:	0.18	1.8	0.4	67.4	14.0	
" 10.	Grab sample from car of ore from S. end of "D" stope, 55 ft. above 600 N. level (ore-shoot here 5 ft. wide):	0.76	4.2	0.4	80.8	7.1	

		Au. oz.	Ag. oz.	Cu. %	SiO_2 %	Fe. %	S. %
No.11.	Grab sample from car of ore from N. end of "D" stope, 55 ft. above 600 N. level (ore-shoot here 10 ft. wide:	0.08	0.6	0.2	86.8	4.0	
" 12.	Specimen sample, honey-combed quartz (showing pyrite casts), outcrop of vein on top of ridge, S. of shaft:	1.28	2.9				
" 13.	Grab sample, mill tailings:	0.10	0.7	0.4	88.4	3.3	

Ora Bonita Vein.

No. 1.	Sample across quarts vein, 4" wide, containing suplhides, face of 2nd tunnel above tramway level:	0.86	4.0	0.15		16.6	18.8
" 2.	Sample across same vein, 6 in. wide, containing sulphides, 40 ft. from face of same tunnel:	0.56	7.6	0.1		13.6	14.5
" 3.	Sample across same vein, 2 ft. 4 in. wide, partially oxidized, in small underhand stope below same tunnel:	0.80	2.3	0.8		11.4	3.4

(COPY)

ORO BELLE MINE

January 1, 1941

J. D. McClintock

(COPY)

ORO BELLE MINE

January 1, 1941

This report is intended to accompany a report on the Oro Belle Mine by Mr. Foster S. Naething under date of January 1, 1938, and brings up to date all data pertaining to operations at this property, which were carried on since that date under supervision of Mr. Naething and the writer.

The property still consists of those claims mentioned in the Naething report, is owned in fee by the Barrod Mining Company, and is under lease and bond to J. D. McClintock, of Tucson, Arizona.

Early in 1938 rehabilitation was started, and during the following two years those recommendations, set forth in the above mentioned report, were initiated. The Cleveland shaft was dewatered and repaired; a power line was extended from Horse Thief Basin, and complete mine plant installed. A brief resume of work done during this period is outlined below.

On the Cleveland claim, a new headframe was constructed at the Cleveland shaft. A new hoist house and compressor house were built; hoist and compressor installed, and a new warehous constructed. At one side of the shaft a small ore bin was built. The boarding house was repaired and equipped; bunk house repaired and equipped, and several smaller dwellings put in a livable condition.

The power line was run from Horse Thief Basin "take-off", approximately one mile, to a sub-station built advacent to the Cleveland shaft. This line delivers 3-phase power at 11,000 volts, where it is transformed to 440 volts. A 440 volt line was run from

the sub-station to the camp site, a distance of about 1,000 feet, transformed to 110 volt lighting circuit, which serves the boarding house, bunk house, and dwellings. The road to Crown King was repaired, and certain improvements made so that it is now passable to 5-ton trucks.

The Cleveland shaft was dewatered and repaired to the 370 foot level. A ventilation system was installed, employing blowers and galvanized vent pipe. Airline, waterline, and pipe column for pump discharge were installed. Referring to exhibit number 4, the sub-level was driven at the 350 foot level, connected by a cross-cut from the shaft to the vein, through a distance of 80 feet. A drift north was driven for a total length of 280 feet, the face now being slightly more than two sets north of the old raise connecting the 400 foot level with the 300 foot level. From this drift three cross-cuts were driven into the hanging wall, and one into the foot-wall for the purpose of exploration. At a point approximately below the first stope shown on the 300 foot level, a raise was started on the ore. The vein here was 3 feet wide, assaying $39.00 Au-Ag. From this point on north the vein may be considered all commercial ore, although its value in the drift was indicated as being somewhat erratic until the drift crossed the old raise. From that point on, values were rather consistent, and a carload of ore from this development work was shipped, which assayed as follows;

Gold	2.02 ounces
Silver	6.38 ounces

It would appear that this work confirms the existence of commercial mineralization in this area, as shown on exhibit number 4.

The south drift on the 350 foot level was run a total distance of 715 feet, with a total length of cross-cuts into the foot-

wall and hanging wall of 90 feet. Inasmuch as there appears to be a fairly general line of demarcation between commercial and non-commercial mineralization, which follows the surface contour, as shown on longitudinal section, the south drift was run on a traverse line rather than following the vein formation. Hence there are some distances in the face, three or four hundred feet, which are not in the vein itself. The south drift did not encounter ore of commercial value. The face is now at a point below the second raise from the 300 foot level, and, as might be expected, is just entering mineralization showing some value. At this point we encountered a well-defined vein, 13 feet in width, assaying $3.50. It is to be expected that further work to the south will develop a downward extension of the orebody, which was mined above the 300 foot level in this area.

As an indication of what might be expected further to the south, the downward projections of orebodies from above the 300 foot level might be indicated by exhibit number 5, which shows average values encountered on the 400 foot level just below the old underground shaft.

In addition to the work on the Cleveland Claim, reference is made to exhibit number 3, on which are plotted two proposed tunnels on the Pilgrim claim. These tunnels were both driven, and the first indicated raise was started on ore. Preliminary shipments of sorted ore from this development work showed a net value of $67.00 a ton. This tunnel work has been on a sub-leasing basis for the past six months, and occasional shipments of high-grade have been made to the Clarkdale smelter. A tabulation of these shipments is appended to this report. The raise between these two tunnels is now in 4 feet of ore averaging $15.00 a ton.

Following Mr. Naething's death operations ceased, and this property was temporarily shut down with the result that the Cleveland shaft and contiguous workings were allowed to flood, and some of the equipment, including the pump and hoist, were removed. Subsequent to that time the writer has assumed possession of the property under a bond and lease from the owners, and continued in a small way to work on the Pilgrim claim. At the present time the situation exists whereby with a very nominal expenditure this property could be reopened and put on a small producing basis in a reasonably short time, advantage, of course, being taken of a relatively large expenditure of money during the past three years. The power line and sub-station are still intact, and there is still available a 385 cu.ft. compressor. It would be necessary to install a pump, hoist, and certain other equipment. However, there is a 50-ton mill, equipped for flotation, 5 miles distant, the operation of which is under the control of the writer.

I recommend that the Cleveland shaft be dewatered, and development work resumed to the north and south on the 350 foot level. It seems reasonable to expect that a small tonnage of ore, profitable enough to pay for such work, could be mined from the north side alone. Further development to the south would very likely make available sufficient tonnage to justify operation of the mill at Crown King on a full time basis, pending the conclusion of sufficient development work to justify the erection of a mill at Oro Belle.

It may or it may not be advisable at the outset to prosecute further development work on the Pilgrim, although this possibility

should not be overlooked. It is quite probable that a very substantial orebody exists on this claim. This can, of course, be connected later to the workings projected from the Cleveland shaft.

By:

J. D. McClintock

JDM:ddd

ORO BELLE MINE
SHIPMENTS 1940

Lot	Location	Destination	Au. Oz.	Ag. Oz.	Cu. %
4	Pilgrim	Clarkdale	1.05	1.94	0.67
6	Cleveland	Clarkdale	2.03	6.27	0.88
7	Pilgrim	Clarkdale	1.595	3.855	1.08

Old Tiger Dump

H. GEORGE S. ANDERSON
MINING AND METALLURGICAL ENGINEER

PRESENT ADDRESS KINGMAN, ARIZONA,

MAY 15, 1916.

MY DEAR MR. SMITH;-

I BEG TO ACKNOWLEDGE RECEIPT OF YOUR LETTER OF THE 12TH INSTANT AND HAVE CAREFULLY NOTED WHAT YOU HAVE SAID. I ALSO NOTE THAT OUR PREDICTIONS WERE TRUE; IT WASN'T REALLY PREDICTIONS, BUT HAND-WRITING ON THE WALL.

I WILL ENDEAVOR TO GIVE YOU AN ESTIMATE OF WHAT CAN BE DONE IN THIS CASE, THE ESTIMATE BEING---SINCE I HAVE NOT DONE ANY EXPERIMEINTAL WORK ON THE TAILINGS---WHAT I CONSIDER TO BE ON THE SAFE SIDE IN ALL RESPECTS, WITH THE EXCEPTION THAT ON SHORT NOTICE I WILL NOT BE ABLE TO ESTIMATE COSTS OF MATERIAL AND CONSTRUCTION VERY CLOSELY AS I DO NOT HAVE SUCH COSTS AT MY FINGERS ENDS AT THIS TIME; BUT I WILL NOT BE FAR OFF.

EXTRACTION.

FROM THE NATURE OF THE ANALYSIS OF THE TAILINGS AS SUBMITTED, I DO NOT THINK THAT THERE WOULD BE MUCH TROUBLE IN GETTING FROM 85% TO 90% OF THE SILVER INTO SOLUTION AND 90% OF THE GOLD. THE "EXTRACTION" OR RECOVERY WILL DEPEND UPON THE EFFICIENCY OF THE METHOD USED FOR RECOVERING THE PREGNANT SOLUTIONS AND WILL VARY; THE MORE EXPENSIVE FILTER INSTALLATIONS WILL MAKE A HIGHER RECOVERY THAN WILL BE THE CASE WHEN FILTERING BY GRAVITY AS IN SAND LEACHING, BUT I THINK THAT AN 80% RECOVERY OF THE TOTAL METAL CONTENT IN GOLD AND SILVER WILL BE A SAFE ESTIMATE. THEREFORE, THE TOTAL RECOVERABLE VALUES PER TON OF TAILINGS TREATED SHOULD APPROXIMATE CLOSELY,-

.80 × 12.44 OUNCES = 9.952 OUNCES SILVER

.80 × 0.02 × $20 = $0.32 GOLD.

FIGURING SILVER AT 65¢ PER OUNCE THE TOTAL RECOVERABLE VALUES IN GOLD AND SILVER WILL BE,-

9.952 × $0.65 = $6.468 (SILVER)
0.320 (GOLD)
TOTAL..... $6.788

MR. ELWOOD S. SMITH (2)
PROBABLE FLOW-SHEET.

(1) SAND LEACHING.

ASSUMING 50 TONS DAILY CAPACITY AND A FOUR (4) DAY LEACH.

THIS WILL NECESSITATE FOUR (4) WOOD TANKS 16' DIAM. × 6' STAVE TO HOLD THE 50 TONS OF SAND FOR THE FOUR DAY LEACH.
THIS WILL NECESSITATE ONE (1) TANK 16' DIAM. × 8' STAVE FOR BARREN SOLUTION STORAGE TANK.
THIS WILL NECESSITATE ONE (1) WOOD TANK 6' DIAM. × 6' STAVE TO ACT AS A "SUMP" TANK AT THE FOOT OF THE ZINC BOX WHEN DRAINING A SAND-LEACHING TANK AFTER FOUR DAYS LEACH, AT THE SAME TIME USING A TWO (2") CENTRIFUGAL PUMP BELTED TO A FIVE HORSE-POWER GASOLINE ENGINE TO PUMP THE BARREN SOLUTION FROM THE SUMP TANK TO THE STORAGE TANK.
THIS WILL NECESSITATE A ZINC BOX WITH FROM SIX TO EIGHT COMPARTMENTS; BARRELS CAN BE USED FOR THE ZINC BOX, BUT THEY ARE NOT QUITE AS SATISFACTORY AS A WOODEN BOX THAT MAY BE COVERED AND LOCKED SO THAT THERE IS LESS OPPORTUNITY FOR ANYONE TO STEAL THE PRECIPITATES.

OVER THE TOP OF THE FOUR SAND-LEACHING TANKS A TRESTLE-WORK MUST BE ERECTED TO ALLOW A TEAM AND SCRAPER TO CARRY SAND FROM THE TAILINGS PILE TO BE DUMPED INTO WHATEVER TANK IS TO BE FILLED.

ONE TEAM CAN EASILY SCRAPE AND FILL A 50 TON TANK PER DAY OF 9 HOURS. (I ASSUME THAT THE PLANT IS ERECTED BELOW THE TAILINGS PILE IN THE HOLLOW SO THAT THERE WILL BE NO HOISTING).

I ESTIMATE THE COST OF SUCH A PLANT ERECTED AS FOLLOWS;-

FIVE (5) 16' DIAM. × 6' WOOD STAVE TANKS. . .@($350 EACH)	$1750.00
ONE (1) 6' " × 6' " " " . . .@($80 ")	80.00
ONE (1) ZINC BOX (WOOD)	75.00
ONE (1) 2" CENTRIFUGAL PUMP	60.00
ONE (1) 5 H.P. GASOLINE ENGINE	175.000
PIPING AND OTHER ACCESSORIES	150.00
TRESTLE-WORK AND APPROACHES	300.00
	$2590.00
10% FOR ANY EXTRAS	260.00
TOTAL NECESSARY. . .	$2850.00

IF THIS TAILINGS IS AMENABLE TO SAND-LEACHING, WHICH I BELEIVE WILL BE THE CASE SINCE THE INSOLUBLE CONTENT IS SO HIGH AND FROM WHAT I REMEMBER OF THE PHYSICAL CHARACTERISTICS OF THE TAILINGS, THIS WILL

BE THE MOST ADVISABLE METHOD TO FOLLOW IN POINT OF ORIGINAL OUTLAY; BUT THE EXTRACTION WILL NOT BE AS GOOD.

THE AMOUNT OF AVAILABLE OPERATING CAPITAL NECESSARY TO RUN ON FOR THE FIRST MONTH, OR UNTIL A "CLEAN-UP" COULD BE MADE WILL BE AS FOLLOWS,-

ONE MAN & TEAM AT $7.00 PER DAY FOR 30 DAYS.	$210.00
TWO MEN (SOLUTIONS) @ $5.00 PER DAY " "	300.00
CYANIDE FOR 30 DAYS (ASSUMING 2 LBS. LOSS) @ 30¢/LB. . . .	900.00
ZINC " " " " 0.2 " " @ 40¢/LB. . . .	120.00
GASOLINE, OIL, ETC.	100.00
TOTAL WORKING CAPITAL FOR 1 MO.	$1630.00
COST OF PLANT	2850.00
TOTAL AVAILABLE CAPITAL NEEDED	$4480.00

SAY IT WILL NECESSITATE $5,000.00 DOLLARS TO PUT THE PLANT UP AND OPERATE FOR ONE MONTH, WHEN A CLEAN-UP SHOULD FURNISH SUFFICIENT FUNDS TO OPERATE ON AND AT THE END OF THE SECOND MONTH WHEN EVERYTHING IS WORKING SMOOTHLY, THE WHOLE CAPITAL OUTLAY SHOULD HAVE BEEN RETURNED.

AS A CHECK ON SUCH A PLANT, I WATCHED THE OPERATIONS OF ONE VERY NEARLY THE SAME AS I HAVE OUTLINED AT AUSTIN, NEVADA LAST YEAR; THEY WERE WORKING UPON THE SAME HEAD, VIZ:- 12 OUNCES SILVER. THEY MADE AN 85% RECOVERY AND WERE TREATING 50 TONS PER DAY. THE TAILINGS WERE FINER THAN THOSE OF THE TIGER AND WERE RATHER HARD TO LEACH. I AM MENTIONING THIS MERELY AS AN EXAMPLE.

THE WORKING COSTS AS I HAVE ESTIMATED THEM ABOVE WOULD BE,- A LITTLE OVER A DOLLAR ($1630 ÷ 1500 = $1.08). BUT FOR SAKE OF SAFETY ESTIMATE AS FOLLOWS;-

COST PER TON FOR TREATMENT.	$1.50
INTEREST ON $5,000.00 @ 10% FOR (1) YEAR. (PER TON). .	0.05
REPAIRS AND RENEWALS	0.10
FOR ADDITIONAL UNFORSEEN EXPENSES.	0.20
TOTAL.	$1.85

CHARGING THE COST OF THE PLANT ON A "PER TON" BASIS AND PUTTING A ROYALTY OF $1.00 PER TON, THE WORKING COSTS, THUS AUGMENTED, WILL AMOUNT TO

$1.50
1.85
$3.35

THERE WILL BE $1500.00 SALVAGE IN THE PLANT, BUT I WILL NOT TAKE

THAT ITEM INTO CONSIDERATION HERE. IF A LESS ROYALTY CAN BE OBTAINED, SO MUCH THE BETTER.

IN ROUND NUMBERS AND TO BE ON THE SAFE SIDE, I THINK THAT UNDER THE FOREGOING CONDITIONS A PROFIT OF $3.50 PER TON MIGHT BE OBTAINED. THE ONLY THING THAT WILL ALTER THIS AMOUNT WILL BE THE EXACT AMOUNT OF EXTRACTION---I AM NOT FAR OFF---THE ROYALTY, WHICH IS ABOUT WHAT MR. COLVOCORESSES ESTIMATES MR. MURPHY WOULD ASK, AND THE COST OF THE PLANT ERECTED; THE LATTER IS VERY CLOSE TO WHAT I HAVE ESTIMATED BEFORE.

(2) AGITATION & FILTERING.

BY AGITATING THE TAILINGS WOULD PROBABLY BE ABLE TO TREATED IN FROM 36 TO 48 HOURS AND THEN FILTERED. SUCH A PLANT WOULD COST CONSIDERABLY MORE, BUT THE LABOR COST OF OPERATING AND THE EXTRACTION WOULD FAVOR THIS MTHOD. THE DECIDING FACTOR IN THIS CASE, THE ECONOMICAL ONE, CAN ONLY BE DECIDED BY SOME CLOSE FIGURING WHICH I HAVE NOT THE NECESSARY INFORMATION NOR THE TIME TO DO AT THIS TIME; IT IS MERELY A POSSIBILITY TO BE ASCERTAINED BY CALCULATION AT THE SAME TIME HAVING DEFINITE DATA AT HAND REGARDING EXTRACTION BY SAND LEACHING AND BY AGITATION AND FILTERING. BUT FOR THE PURPOSE OF A ROUGH ESTIMATE, I WILL GIVE A FIGURE OF $10,000.00 FOR THIS INSTALLATION ERECTED WITH A 50 TON OLIVER FILTER. THERE MIGHT BE SOME ADVANTAGE IN THIS KIND OF A PLANT BUT I CAN NOT SAY WHAT IT WOULD BE IN DOLLARS AND CENTS NOW.

I CAN SAY THAT, REGARDLESS OF THE KIND OF THE PLANT, IT WOULD BE ADVANTAGEOUS TO INSTALL A LARGER PLANT BECAUSE 10,000 TONS IS A SMALL TONNAGE AND AS IT IS A GREAT ADVANTAGE TO CLEAN UP THE WHOLE PILE DURING WARM WEATHER AS WARM SOLUTIONS MAKE CONSIDERABLY BETTER EXTRACTIONS THAN DO COLD ONES; THERE WOULD NOT NEED BE ANY COVERING DURING THE SUMMER TIME AND THE MONEY BE OBTAINED MUCH QUICKER. HOWEVER, THE FOREGOING OUTLINE WILL SUFFICE FOR THE TIME BEING TO GIVE A CLOSE ENOUGH ESTIMATE OF WHAT MAY HOPE TO BE OBTAINED AND ONLY TESTING AND ESTIMATION FROM PREPARED PLANS WILL GIVE THE TRUE AMOUNTS FOR OUTLAY AND PROBABLE PROFITS. WITH A 50 TON PLANT THE PILE SHOULD BE WORKED OVER BY THE FIRST OF THE YEAR, IF OBTAINED BY JUNE FIRST. WITH A 100 TON PLANT, IN HALF THAT TIME. COUNTING A PROFIT OF ONLY $2.00 PER TON, ON THE FACE OF IT NOW AND WITH WHAT INFORMATION I HAVE ON THE DUMP, I THINK THAT IT WOULD BE A GOOD THING; BUT, OF COURSE, THE PRESENT PARTIES WILL HAVE TO GET OUT AS SOON AS POSSIBLE SO THAT OPERATIONS CAN BE BEGUN AT ONCE. IT WOULD NOT TAKE OVER A MONTH OR SIX WEEKS TO PUT THE FIRST KIND OF A PLANT UP AND I THINK IN THIS INSTANCE IT WOULD BE THE

PROPER KIND TO ERECT.

I DO NOT THINK THAT I AM "TALKING THRU MY HAT" ON SUCH A PROPOSITION AS IT HAPPENS TO BE A LINE THAT I HAVE HAD CONSIDERABLE EXPERIENCE IN, AND WHILE I DO NOT COMMIT MYSELF ENTHUSIASTICALLY TO SAYING THAT IT CAN BE PROFITABLY DONE, I DO SAY THAT ON THE FACE OF IF THERE IS NO DOUBT IN MY MIND BUT WHAT A PROFIT OF APPROXIMATELY $20,000.00 CAN BE OBTAINED FROM SUCH A DUMP IF THE VALUES AND TONNAGE IS AS STATED, WHICH I THINK IS NOT FAR OFF.

I WOULD CERTAINLY BE GLAD TO ENTER INTO SUCH A PROJECT TO TREAT THIS PILE, BUT WILL STATE HERE THAT MY OWN FINANCIAL CONDITION IS SUCH THAT I WOULD NOT BE ABLE TO PUT UP ONE THIRD OF THE NECESSARY CAPITAL OUTLAY IF THE SAME WERE TO BE EQUALLY DISTRUBTED AMONGST THREE. HOWEVER, SOME ARRANGEMMENT MIGHT BE WORKED WHERE THE NECESSARY AMOUNT COULD BE BORROWED.

I HOPE THAT I HAVE GIVEN YOU SUFFICIENT INFORMATION AT THIS TIME FOR YOUR ENLIGHTENMENT ON THE SUBJECT. I KNOW THAT I AM NOT FAR OFF BUT THE FIGURES ARE NOT TO BE TAKEN AS ABSOLUTLEY FINAL, BUT CLOSE.

LET ME HEAR FROM YOU AT YOUR EARLIEST CONVENIENCE CONCERNING WHAT THE OUTLOOK MIGHT BE IN THIS DIRECTION SO THAT, IN CASE IT DOES LOOK FAVORABLE, I CAN GOVERN MYSELF ACCORDINGLY.

WITH BEST WISHES, I BEG TO REMAIN,

SINCERELY YOURS,

P. K. S. Anderson.

LAKE SILVER MINE. About 3 miles south of Crown King, Yavapai Co. Visited Octo. 13, 1916. An old shaft, caved and timbers all gone. A tunnel near the shaft, caved at the mouth. Several shallow pits exposing quartz, mostly very lean in appearance, but occasionally showing a little horn silver and pyrite. Saw few copper indications. The old hoist and boiler are of no value. Mr. Lube asks $40,000.00 for the property, apparently basing the price on having the extension of the Gray Eagle vein on the Apache-Panther claim.

THE ORO BELLE-GRAY EAGLE property. *See large blue-print.*

Practically no development work has been done since Mr. E. S. Smith visited in April 1916. Saw Mr. Runnels, Octo. 13, 1916, who has been trying to finance an operating company in Kansas City, apparently without success. A few men are waiting around but no work is going on.

The owner is the Barnes Estate of which Mr. Foster C. Naething of Los Angeles is representative. The property is under lease to C. C. Cowan, M. G. Bradshaw, J. D. Shea and R. L. Riggs. The ultimate price is $150,000.00 payable in three years. The lessees estimate that they have benefitted the property about $6000.00 and they are willing (I am informed) to sell out for this amount.

The past production in gold and silver with a little copper has come mainly from the Gray Eagle workings which are now inaccessible. The Gray Eagle shaft is 600 feet deep and would probably cost $2500.00 to unwater for inspection. A big stope which is said to have plenty of good ore in sight, is caved badly, but it is said that it might be top sliced. The main tunnel is caved and it is estimated that it would cost $1000.00 to open.

I am informed that in the Gray Eagle workings, chalcopyrite would sometimes show up in considerable quantities, but that the ore was very variable and spotty as to its mineral contents.

Cafe.
Anderson & Smith 1916

ORO BELLE MINE

Crown King,
Ariz.

This is a smaller vein on the property of the Tiger Gold Company.

1916. It is being worked by four leasers under the leadership of Mark G. Bradshaw.

February 1916.

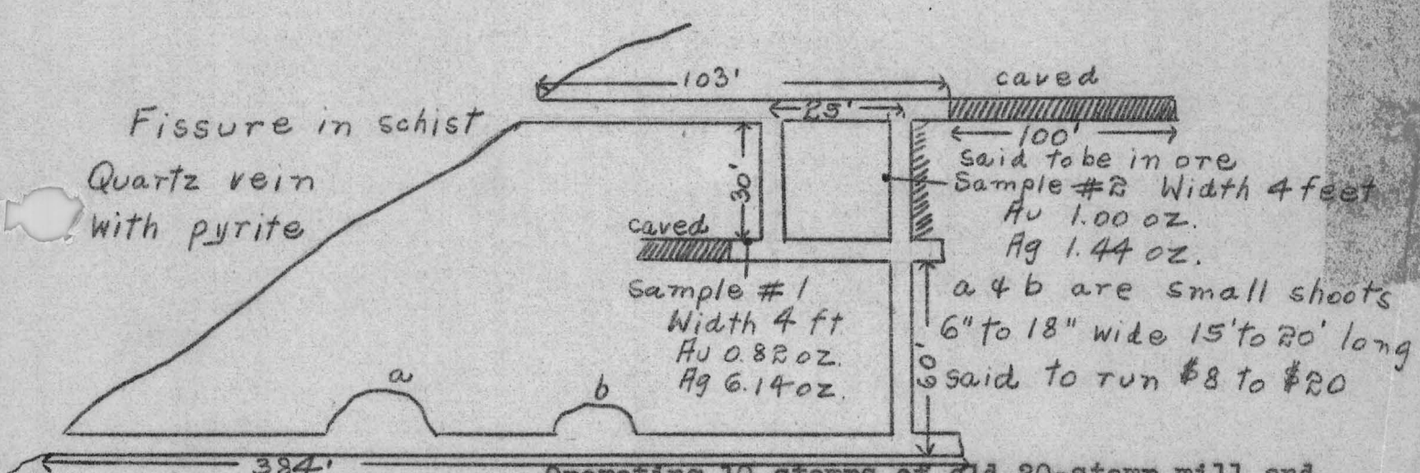
Shipped 15-tons of concentrates -

Au.	2.0	oz. per T.
Ag.	6.82	oz. per T.
Cu.	1.11	%
Insol.	22.8	
Fe.	34.3	
CaO	0.6	
S	35.5	

Also shipped 5-tons mill clean-up:

Au.	1.18	oz.
Ag.	2.69	oz.
Cu.	0.38	%
Insol.	78.9	
Fe.	7.1	
CaO	1.2	
S	5.1	

April 6, 1916. Visited by H.G.S. Anderson & E.S.Smith; 11 men employed all told.



Operating 10 stamps of old 20-stamp mill and two Wilfley tables. It is stated mill heads run $12.00 to $15.00; 40 to 50% recovered on the plates.

June 1916. Car of concentrates:

Au.	2.15	oz. per T.
Ag.	7.93	oz.
Cu.	1.70	%
Insol.	22.4	
Fe.	36.0	
CaO	0.6	
S	31.0	

July 1916. 8-tons concentrates

Au.	2.05	oz. per T.
Ag.	6.57	oz.
Cu.	1.18	%
Insol.	18.9	
Fe.	36.5	
CaO	0.4	
S	35.6	

ORO BELLE (TIGER GOLD)

NOTE BY G. M. COLVOCORESSES, October, 1937

This property is listed as the Oro Belle by which name it is usually known locally to distinguish it from the Tiger or Old Tiger, on which a brief separate report is sent.

It was undoubtedly a mine of considerable importance and was highly thought of by Walker and several other engineers.

From 1913 to about 1930 the owners would never discuss anything but a sale at a very high price and during most of this period it was idle except for the small operations of lessees near the surface.

The lower workings were inaccessible and could not be sampled by my engineers on the occasions of their frequent visits to the Crown King District.

In 1931 I looked into the situation and received the letters maps and reports from Naething of which copies are enclosed, but the very heavy expense involved in making any thorough examination of the mine prevented me from going any further.

In 1935 the mine was leased to two young men from Los Angeles who seemed to greatly underestimate the magnitude of the venture on which they had embarked and who have tried to finance their work thru the sale of stock with indifferent success. I am told that they are still carrying on a small amount of development but judge that they are in default on their lease.

If the mine is to be properly reopened and efficiently worked a very large preliminary expense will be involved and I have no definite opinion as to whether or not this is justified. But I do think that the property merits further consideration and I believe that Naething would be glad to give information as to its present status.

G.M.C.

CM

Copied

May 12, 1931.

Mr. Foster S. Naething,
Monsanto Post Office,
East St. Louis, Ill.

TIGER GOLD

Dear Mr. Naething:

Yours of the 8th inst. just received, together with your report on the TIGER GOLD PROPERTY, and the accompanying blue-prints, all of which I find very interesting.

I have been checking over your statements with those made by other engineers, particularly a report which was written by R. T. Walker in 1912, at which time he was General Superintendent at Humboldt, and I am inclined to agree with you that, as a speculative investment, the re-opening of this property might appear entirely justifiable, provided the initial expenditure would not be too great and the terms on which it can be obtained from the owners are reasonable.

There are several points on which I would like some further information:

First, in regard to the property - you list (7) patented claims, whereas Walker listed (13) patented and (1) unpatented claims. I do not quite understand this discrepancy unless the mortgage which Mr. Barnes foreclosed did not cover the other seven claims or possibly some of the property held in 1912 may since have been sold to other parties.

You state that it would be advisable to secure some adjoining property, at least under option, and this would obviously be very advantageous considering the long outcrop of the vein and the possibilities of finding pay shoots at points outside of the holdings of the Barrod Mining Company. Can you give me any further suggestions as to which of these claims would be particularly desirable to secure and concerning the names of the present owners and the terms on which they might be willing to do business? I have always heard the SAVOY GROUP, lying north of the TIGER GOLD, highly spoken of, but understood that it was difficult or impossible to make any satisfactory deal with the owners.

As to reopening the mine, have you any positive information that the old shaft is still in good condition? You mention that the timbers are caved near the surface and perhaps a similar caving may have occurred for quite a distance below the collar. You do not state to what level the water rises in the shaft but I find in Walker's report a statement to the effect that the mine made about 40,000 gallons of water per day, which means that unwatering to the 400' level would be rather an expensive matter considering the daily inflow and the quantity of water which has accumulated in the old stopes and workings.

I assume that all of the drifts, including the

400' level were run in the vein or in the fissure of soft material and, if such is the case, these would all be useless and it would probably be cheaper to drive new drifts rather than to attempt to go through the old ones.

You did not include a plan map of the mine which would be very informative if one is available, and I would be glad to have your general opinion as to the cost of reopening to the 400' level and extending the drift north through the ore shoots on the CLEVELAND CLAIM (apparently about 500') and south under the main ore shoot on the GREY EAGLE CLAIM, apparently about 1,000'. I presume that to carry out such operations it would be economical to connect with the power line rather than to attempt to use gas engines, but such a connection would involve building a line for a distance of 2½ miles, at a cost of probably $4,000, and the rates of the Arizona Power Company on comparatively small operations run much nearer to 3¢ per KW Hour, everything included, than to the 2¢ mentioned in your report.

Walker and others seem to indicate that a certain amount of high grade ore might be found in some of the adit levels on the GREY EAGLE CLAIM, and I note on your section map that apparently a shoot of ore was stoped

between the first and second adit levels, but, judge that this did not yield a very good grade of ore since it was neither carried upwards nor downwards. Any reference to the possibilities of mining near the surface would be very interesting.

I assume that you have not available any assay map of the property and the maps which originally accompanied Walker's report appear to have been lost. Walker, however, gives the results of a number of samples which generally speaking are very good, but does not clearly indicate where many of these samples were taken, although I note that several of them came from the 400' level, and he refers to the Cowan Stope, which is not located by name on your blue-prints.

Now, as to terms, I assume that the owners of this property would appreciate the speculation involved in resuming any development or mining activities and the heavy expenditure which would have to be made not only for reopening the property but for providing mining plant, camp buildings, etc., and doubtless repairing a portion of the road. Generally speaking, conditions at Crown King have become much more unfavorable since the railroad was torn up from Middleton and the Santa Fe will, I understand, make every effort in the future to obtain

authority to remove their tracks from Mayer to Middleton in which case the haul from the railroad terminus would be approximately 40 miles and this is a pretty big handicap, even for a gold mine, and particularly in this case since I assume that it would be advantageous to concentrate some of the ore in order to save the values in silver and copper, as well as in gold.

I presume that the owners of the property would, therefore, be prepared to consider a long time lease and bond with a comparatively low rate of royalty and an option to purchase at a moderate figure.

I note from your letter that several parties have been negotiating for the property but you and I both know from experience that many of the people who negotiate for mines, especially in the Bradshaw District, are wholly irresponsible and merely wish to have a basis for selling stock in a company which generally never gets beyond the stock-selling stage.

Should my friends decide to go further on this matter, we would make every effort to honestly develop the property and be prepared to spend a sufficient amount of money to accomplish that purpose, assuming that the results of the development work progressively continues to justify additional expenditure. It is my idea that the first pro-

cedure would comprise a fairly thorough sampling of the surface and such workings as are now accessible, coupled with a renewed study of the geology and thorough examination of all available records and reports. The next step would doubtless be the unwatering of the shaft and reopening the 400' level which would involve providing power, mining and pumping plant, and certainly require a very substantial expenditure, and no very definite opinion regarding the value of the property could be formed until this work had been completed.

You will see from this letter that I am seriously interested in the TIGER GOLD, at least to the extent of wishing to continue my investigation. I am getting in touch with an engineer who worked in the property when it was last operating, and also obtaining some information regarding present conditions from Crown King, and tentatively planning to visit the mine sometime during the next few weeks, provided your reply to this letter and other information which I can obtain continues to be satisfactory. I will, therefore, be very glad to hear from you at your early convenience.

Best personal regards.

Very truly yours,

G. M. Colvocoresses

GMC:EBH.

Allen Co

Crown King, Arizona,
January 4,1948

A 1/6. 48

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

Dear Colvo,

Some years ago I took over the old Oro Belle property south from here. It was inactive during the war beyond the efforts of a watchman and one or two others whom I permitted to "high-grade" in return for their services. Something less than 1,000 tons produced about $75,000. They, of course, did very little development work.

At the conclusion of the war I got partially financed and came up here to rehabilitate things. My program was to do enough development work to open sufficient tonnage for a small mill. Got a lot of work done and shipped a few cars of smelting ore but before accomplishing the objective I ran out of money. I fell back upon high grade to try to keep the ball rolling. As you know high grade comes out pretty slowly and present costs are an added limit on tonnage which will stand shipping from that district. Result is, under existing circumstances, I can't cover expenses, overhead and my grocery bills too.

There are two things I have got to do. First is too arrange for refinancing and rustle myself a job. (perhaps I had better reverse that order). Meantime, I have set up a leasing system which I think will keep things in shape and provide a few men with beans.

I thought you might know of a job where I could fit in and, if so, could put a word in for me. I should greatly appreciate any help in that direction you could give me.

In my files I find some correspondence you had with Foster Naething in 1931 when this property was referred to as the Tiger Gold. I have more complete data than was apparently available to you at that time and, of course, the results of work done since 1938. This includes information about the Cleveland shaft which I dewatered to the 400' level and drifted north and south on the 350' level. Incidentally, I shipped a carload from the north side that ran $62.oo.

Since 1940 I have done considerable work in the tunnels on the north end of this group, immediately adjoining the Savoy on the south. It is my guess that practically all the area north of the Cleveland shaft to the Savoy south end line is virgin ground of a potential value greater than the total past production figures of the mine. This doesn't take into consideration the tonnage mentioned by Cowan, most of which lies to the south of the Cleveland shaft.

If you believe that now is a proper time to do something about financing the proposition, I should be very glad to go over it with you. I am certainly in a position to make a good deal.

Since returning from Canada and prior to undertaking this job, I was mining copper in the Miami district and doing some examination work. Being so far back in the stix here such assignments for the latter are too infrequent to afford a living. Under the circumstances mentioned above I can now ill afford to hang out my shingle elsewhere.

With best regards and wishes of the Season,

Sincerely,

J. D. McClintock

JDMm

NICKOLAS PELLETTIER
MILLIE PELLETTIER
MANAGERS

The
HASSAYAMPA HOTEL
PRESCOTT, ARIZONA

a 2/19/48

February 3,1948

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

Dear Colvo,

Following our conversation on the phone this afternoon, I am sending you one roll of maps and an envelope of reports on the Oro Belle property.

These maps and reports bring the data up to date in a more or less rough manner.

The production record of the period from 1940 to 1945 is approximately $75,000, represented by about 1,000 tons.

Currently, I have left Vic Carlson, whom you know, in charge at the mine and I am taking off for Denver to attned the meeting starting there this coming week-end.

My immediate income is based entirely upon incidental jobs that I get hold of and consequently my comings and goings are unpredictable.

Please address me in care of Mr. T.J.Byrne, Prescott.

Upon return from Denver, I will contact you.

Sincerely yours,

J. D. McClintock

JDMm

9-20-12

TIGER GOLD COMPANY REPORT (ORO BELLE)

I beg to report herewith the results of two brief examinations of the mine of the Tiger Gold Co., made by me on Sept. 1st, 2nd, and 3rd, 1911, and May 14th and 15th, 1912. On both occasions fully 90% of the total workings of the mine were caved and inaccessible; while, at the time of my last visit the lowest level of the mine was largely under water. Hence no systematic sampling of the mine was possible; my observations of the vein structure were limited to the surface outcrop and to a few underground exposures; while, for information regarding the size and location of the ore shoots, I am indebted chiefly to the mine maps and to the statements of friends familiar with the property:

HISTORY:

The mine was located over 30 years ago and has been worked more or less continuously ever since; and the total net value of the bullion produced and the concentrates and ore shipped therefrom to date, is authoritatively stated to be about $700,000. The organizers of the present Company acquired the property in the '90s., I understand, by purchase from its original owners (Barnes) (the schoolbook publisher) for the sum of $100,000 and immediately issued and sold a large amount of stock, from which, through rather extravagant representations of the veins of the mine, they are reported to have realized nearly One Million Dollars. All of this money, however, in addition to the total proceeds of the ore mines during the operation of the property by the Tiger Gold Co., has, it is said, been put back into the mine, with the exception of $98,000, paid to the stockholders in dividends. At the present time, I have been given to understand, the mine is under a $100,000 first mortgage, held by Barnes, the original owner of the property, and a $30,000 second mortgage, held by some of the principal stockholders; while in addition, the company is indebted to the extent of several thousand dollars to

local merchants, who have protected themselves by attaching all the personal property of the company not covered by mortgages. The mine was closed down in the early part of the present year and has since remained idle, the efforts of the company to dispose of bonds to an extent sufficient to retire the mortgages and to provide a $50,000 development fund so far not having met with success.

LOCATION:

The mining property of the Tiger Gold Co. consists of 13 patented and one unpatented lode claims, which are situated in the Tiger Mining District in the Bradshaw Mountains of southern Yavapai County, Arizona. A good mountain road about 4½ miles in length connects Harrington, which is the camp and Postoffice of the Tiger Gold Co., with the station of Crown King, which is the terminus of the Bradshaw Mountain Division of the Santa Fe, Prescott, and Phoenix Ry. Co., and is the nearest railroad shipping point.

GEOLOGY:(See"Bradshaw Mountains" Folio U. S. Geological Survey)

The geologic formation in which the mine is situated is a schist series of Pre-Cambrian age (Yavapai schist) which to the east and west of the mine, at distances of ½ mile and 2 miles, respectively, is bounded by granite batholiths, and to the north, at a distance of 1½ miles, terminates against a large intrusive stock of quartz diorite of later age than both the schist and granite. In the immediate vicinity of the mine, the Yavapai schist series consists of grayish, finely micaceous schist, which strikes northerly and southerly and dips westerly at an angle of between 40° and 50°, and is intruded by dikes of pegmatite and diabase.

VEINS:

Several veins are reported to traverse the property of the Tiger Gold Co., only two of which, however,--the Gray Eagle vein and the Ora Bonita Vein--have so far been proved of economic value--the Gray Eagle vein being by far the more productive of the two.

GREY EAGLE VEIN:

The Grey Eagle vein consists of several roughly parallel fissures, all comprised in a space of from 5 ft. to 30 ft. in width, striking northerly and southerly, in rough parallelism to the strike of the schist which they traverse, but dipping westerly at a somewhat steeper angle (60 deg. to 65 deg). A dike of pegmatite and one of diabase have been intruded into the schist in close proximity and roughly parallel to the vein--the pegmatite dike (and possibly also the diabase dike) having in places been cut by the latter.

The several individual fissuresforming the vein are, for the greater part of their length, narrow (usually not exceeding 1" in width and contain only barren gouge, but in places they expand and are filled with the quartz, carrying metallic sulphides, forming irregularly lenticular ore shoots, which vary in width from a few inches to a reported maximum of 25', and in length and depth from a few feet to 300 ft. or 400 ft. These ore shoots apparently occur in two systems or groups, one lying to the north and the other to the south of the shaft, and separated from each other by a barren or poorly mineralized interval several hundred feet in length. Both of these groups apparently pitch at a steep angle to the north. The metallic sulphides in these ore shoots are distributed throughout the quartz gangue, in bands, crystalline aggregates, and scattered crystals and consist chiefly of pyrite with a subordinate amount of chalcopyrite and a very small percentage of galena. The metals of marketable value, are, in the order of their importance, gold, silver, and copper. The gold and silver are not found in the quartz gangue, but occur almost exclusively with the metallic sulphidesm the proportionate abundance of which in consequence, is roughly indicative of the relative value of the ore. The gold appears to be associated chiefly with the pyrite, being present in it in amount as high as 20 oz. per ton, while the chalcopyrite rarely contains more than 3 oz. of this metal per ton. The silver, which is probably asscciated chiefly with the galena,is present in relatively small amount and does not usually exceed the proportion of 5 oz. of silver to 1 oz. of gold. The amount of copper present in the ore is also low, commonly not exceeding 1%. The

accompanying report of the assays of the ore samples taken by me will afford further information regarding the character and richness of the ore. Since the formation of the vein system and the deposition of the ore, movement along the zone of fissuring has been renewed, producing new fissures, which sometimes follow the older fissures and sometimes traverse the adjacent schist. The principal one of these later fissures is more strongly defined than any of the earlier fissures, as it possesses strong slickensided walls, carries abundant gouge, and is usually accompanied on the footwall side by a zone of friction breccia, that sometimes attains a width of several feet. The friction breccia--the composition of which varies according to the nature of the rock traversed--has been cemented to some extent by silica and iron salts, but apparently no mineralization by valuable metals has taken place, either in it or in any of the other later fissures, and it is undoubtedly fragments of the original ore occurring in the breccia which give it, in places, a sufficient gold, silver, and copper content to be of commercial value. The strength of this main later fissure, the fact that the breccia zone accompanying it is sometimes valuable, and the circumstance that, as it often follows the original fissure, it has led to ore-shoots, have caused it to be considered the main vein, and practically all of the drifts in the mine have been run along it. Owing to the softness of the breccia zone, which is enhanced by the fact that, owing to its porosity it is the principal water channel of the mine, drifts driven along it are difficult to keep open, and unless considerable attention is given to relieving the pressure on the timbers, caving results, for which reason practically all of the old workings of the mine are at present caved and inaccessible. A second and perhaps more costly consequence of mistakenly identifying this fissure as the main vein has been that undoubtedly in some places the ore has been passed by and left undiscovered in the hanging and footwalls. This probability is evidenced by the fact that last year a large and valuable ore body was accidently discovered lying behind the hanging wall of this main fissure, which, until then, had been considered the hanging wall of the vein. The relationship of the earlier and later fissures is shown in the accompanying

ideal cross-section of the fissured zone.

The Grey Eagle Vein has been developed by eight adit levels, about 100' apart vertically; by a winze from the lowest adit level (Cleveland Tunnel) 300' deep, from which drifts have been run; and by a 600' incline shaft, whose collar is nearly on a level with the Cleveland Tunnel, and from which drifts have been run south along the vein on the 300' and 400' levels and north along the vein on the 300 400, 500, and 600 ft. levels. In addition, a 200' winze has been sunk from the 400' south level, and drifts run therefrom. These workings explore the Grey Eagle vein for a maximum depth of 1300' below the highest point of its outcrop and for a maximum length of nearly 3,000 ft. and aggregate altogether several miles in length; but with the exception of the first 800 fT/ of the Cleveland Tunnel all of the workings south of the shaft are at the present time caved and inaccessible, while, at the time of my last visit to the mine, part of the 300 ft. and 400 ft. levels north of the shaft were also caved, and if, as I understand, the mine has been under water continuously since that beginning of the present year, it is possible, in view of the soft and caving nature of the vein, that all the levels north of the shaft, with the possible exception of the lowest level, are now inaccessible. The shaft itself, being sunk in the hard rock of the footwall at a safe distance from the vein, with which it is connected by crosscuts at the several levels, will undoubtedly remain intact. This shaft, which affords the only opening available for the future development of the mine, is sunk at an angle of 72° to the west and has two compartments, each 4 x 4 in the clear, one of these is equipped with a cage and the other a small skip. The equipment of the engine room at the shaft consists of an oil fired 180 H. P. Heine water tube boiler, which is reported to be in good condition, save for some tubes which require replacing; a large steam driven Sullivan Air Compressor, said to be 120 H. P. and to be in good condition; a large double drum steam hoist, reported to be in poor

condition; one drum of which carries about 1,000 ft. of 1½" cable and the other about 700' of 7/8" cable. The shaft is said to make from 35,000 to 45,000 gals. of water daily, according to the season of the year, which circumstance, together with the fact that the water enters chiefly on the upper levels indicates that it is largely of surface origin. Most of the water is handled by a steam station pump, in poor condition, on the 300' level, while such water as enters below that level is pumped to it by a sinker pump, which is said to be in good condition.

ORA BONITA VEIN.

The Ora Bonita vein is a true fissure vein, so similar in its general characteristics to the Grey Eagle Vein, which it parallels roughly both in strike and dip, at a distance of about 600 ft. or 700 ft. west of the latter, that a detailed description of it does not appearly necessary, especially in view of its prospective small economic importance. The chief point of difference between it and the Grey Eagle vein is that the Ora Bonita vein traverses schist alone, with no igneous dike in its immediate vicinity. As in the Grey Eagle vein, the ore shoots consist of irregular quartz lenses containing metallic sulphides, of which pyrite is the most prominent; while gold is the chief metal of value, although it does not appear to be so abundant in proportion to the amount of sulphides present as in the ore of the Grey Eagle vein. The Ora Bonita vein has been worked intermediately, principally by lenses, and it is reported that no inconsiderable amount of high grade ore has been extracted. At the time of my visit, however, all of the several adit tunnels, by which the vein has been explored (it being very similar in profile to the Grey Eagle vein) were, with one exception, caved and inaccessible, and it is probable that practically all of the ore had been exhausted down to the bottom of the gulch, below which, I understand, exploration of the vein has not been conducted. No satisfactory data being available to

the extent, course and richness of the Ora Bonita ore shoots, it is impossible to make any positive statement regarding them, although such evidence as there is at hand indicates that the production therefrom has been considerably less than from the Grey Eagle vein. Such results as might attend the further exploration of the vein with depth are therefore entirely problematical.

The accompanying report of the assays of the samples taken by me, in the second tunnel above the mill level, which is at present open, will indicate the character and value of the ore.

MILL:

For the treatment of the ore of the Grey Eagle and Ora Bonita veins, the property is eequipped with a 20 stamp mill, which is situated at the bottom of the gulch below and ata distance of several hundred feet from the collar of the shaft, and almost over the outcrop of the Ora Bonita vein. The ore of the OraBonita vein must be packed to the mill; but the ore from the Grey Eagle vein, after being hoisted in mine cars on the cage from the various levels to the surface, is hauled by a mule, in trains of eight to ten cars, for a distance of about 1,000 ft. to the head bins of the mill. The ore, after being weighed on a small track scale, is dumped upon a grizzly with 1½" spaces, the over size going to a 9" x 16" Blake Crusher driven by an 8" x 12Atlas engine (old but reported still to give good serviee, and the crushed rock, together with the under-size from the grizzly, being delivered by a 14" conveyor belt, about 150' long into two storage bins, each of 500 tons capacity. From these bins the ore is fed by Challenge feeders to four 5 stamp gravity batteries, the stamps weighing about 750# each. Each battery is provided with an amalgamated copper plate, stepped in three 4 ft. sections; but there is no inside amalgamation. The pulp of two of the batteries, after passing the apron plates, is delivered without previous classification to two Wilfley tables; while the pulp from the other two batteries is delivered similarly to two standard tables. The stamps and tables are driven by a 75 H. P. Corliss engine, which is reported to be in good condition. Steam is supplied by two oil-fired 80 H.P.

Frost fire tube boilers, only one of which, however, is required at one time, the other being kept in reserve. A third fire tube boiler of about 40 H. P. is on hand, but owing to poor condition, is never used. The exhaust steam is passed beneath a drying plate upon which the concentrates are fried. The equipment of the mill as a whole is in poor condition, which is explainable by its age, most of it, I understand, being nearly 20 years old; the ore bins are so insecure that it is unsafe to utilize their full capacity; the mortar blocks of two of the batteries are continually sinking and requiring resetting of the mortar boxes; the tables give very inefficient service and require constant attention and repairs; while owing to the bad condition of the boiler tubes, it is considered unsafe to carry a greater steam pressure than 75#.

The daily consumption of water at the mill when running at full capacity is 50,000 gals., which is obtained partly from the mine and partly from surface springs, the latter being drawn upon also for domestic purposes. During the dry season of the year, the total water/thus supply obtained is usually insufficient and it is necessary at such time to use a considerable proportion of the water a second time. Whenever it is necessary for this to be done, the effluent water from the mill is ponded behind a temporary dam of tailings, and is pumped back into the tanks for re-use; the Water storage tanks have a combined capacity of 190,000 gals.--150,000 gals?? for mine use, 18,000 gals. for the boiler, and 22,00 gals. for domestic supply.

Battery sdreens of 16 to 20 mesh have customarily been used, and the capacity of the mill for crushing to such mesh is stated to be between 60 and 70 tons ever 24 hours, depening on the hardness and coarseness of the ore. The ore as a whole is not difficult to crush, the quartz gangue being brittle and parting readily from the sulphides, which are soft and friable. 50% of the pulp is said to be fine enough topass through a 100 mesh screen, the sliming of the sulphides this indicated being doubtless responsible for the relatively low percentage of total extraction obtained. The ratio of concentrating is reported to vary from 8:1 to 12:1, according to the proportion of sulphides in the ore; and as there is no provision

for retreating the middlings, it has been the practice to divert them into the concentrates box, in order to save the finely divided sulphides which are found therein. This results in a quite silicious concentrate, as is indicated by the following average assay of 10 consecutive cars shipped about the middle of 1911:

Gold:	Silver:	Copper:	Iron:	Insol.
2.46	13.03	1.73	37.34	19.8

Notwithstanding the inclusion of the middlings in the concentrates, the total extraction is reported to have averaged only between 80% and 85%, which, if one-third of the value of the ore is recovered, on the apron plated, as is reported, would indicate a saving on the tables of only 70% to 75% of the value in the pulp treated by them.

ADDITIONAL PROPERTY:

In addition to the returns from the ore mined and treated the Tiger Gold Co. has other sources of revenue, as it owns not only a number of cottages and the only general merchandise store at the camp of Harrington, but also a considerable part of the ground upon which the hamelt Crown King is built. The net profit derived from rentals at Harrington and Crown King and from the monopoly of trade at Harrington, probably was not less than $500 per month when the mine and mill were working at full capacity.

In addition to the buildings at Harrington the Company owns a warehouse and oil pumping plant at Crown King. The crude oil, which is used for fuel both at the mine and mill; is delivered from tank cars at Crown King into two 50,000 gal. tanks and is pumped thence by a three mill pipe line to the oil storage tanks at Crown King, which have a total capacity of 134,000 gals. All other supplies used, however, (with the exception of mining timbers, which are cut on the surrounding hills and delivered at the mine) must be hauled from Crown King for shipment to a smelter. The hauling rate is customarily $4.00 per ton for a load one way, or $3.00 per ton when a return haul is possible. Undoubtedly the use of a motor truck, one of which has been in successful operation for several months by a neighboring mine over most of the same road, would reduce the handling cost to $1.00 per ton.

GENERAL:

So far as can be ascertained from the incomplete and inaccurate records of the Tiger Gold Co. the monthly average of the ore mined by the company during its existence, has fluctuated between $10 and $20 per ton, altho during the last two or three years, some monthly averages of less than $10 per ton are said to have occurred. The circumstances that, in spite of the fact that the ore is usually of good grade, frequently occur in good sized ore-shoots, and is of a nature very amenable to treatment by amalgamation and concentration, the operations of the company have not been profitable is attributed in part to adverse local conditions, but chiefly to ignorance, carelessness and extravagance of management, which have affected injuriously the cost and efficiency of both mining and milling operations. Until 1902, when the railroad was constructed to Crown King, the cost of hauling supplies in and concentrates out was naturally very heavy; while, before the Humboldt smelter was constructed, the railroad freight and smelter treatment charges on the concentrates, which were then shipped to El Paso, were excessive. Shortage of water during the summer months also at times, necessitated curtailment of the scope of operations. The inability of the local management of the company, however, to keep the costs down to the economic minimum, and the grade of the ore up, are chiefly responsible for the lack of success. Thus, as a result of the practice of drifting along the main later fissure, the expense of timbering the drifts heavily, to sustain the ground, and of catching up the frequent caves, which ensued, daused the development costs to be much higher than if the drifts had been run in the firm wall rock of the vein, alongside and a few feet from it, where no timbering would have been required--short crosscuts being run to the vein at regular intervals to explore.it. In stoping the ore, it is said, sufficient attention was not given to keeping it free from waste. The ore usually parts cleanly from the wallrock and the exercise of a little

care would enable it to be kept clean of waste, but owing, it is said, to unnecessarily heavy blasting, a considerable portion of the wall rock usually accompanied the ore to the mill, thereby decreasing the average value of the ore milled (see sample No. 11) lessening the percentage of extraction, and diminishing the capacity of the mill for ore.

Shortsightedness has been equally evident in the construction and operation of the mill. The installation of a few water reclaiming tanks of proper design at small expense would have permitted the recovery of a considerably larger amount of water, which would probably have been sufficient to have rendered a curtailment of milling operation thru lack of water unnecessary. The practice of using a 16 to 20 mesh screen and a deep discharge mortar, in order to secure as great an extraction on the plates as possible, has proved to be wasteful, since by increasing the sliming of the auriferous sulphides in the ore, it unquestionably diminished the recovery on the tables and consequently the total extraction. The sulphides occur in relatively large crystals, which part rather readily from the gangue, and coarse crushing, therefore, is sufficient to release them. With a screen of larger mesh and a low discharge lip on the mortats, the capacity of the mill would have been much increased, with no increased expenditure for labor or power, while probably also the total extraction would have been larger, as there would have been less sliming of the sulphides; while the classification of the pulp, after passing the apron plates, and the installation of a vanner for the treatment of the slimes, and of an auxiliary table for the retreatment of the table middlings, would not only have effected an additional recovery, which would have repaid the cost of the equipment in a short time, but would have effected a further large saving thru making unnecessary the present practice of combining the middlings with the concentrates. The freight and smelter treatment charges and penalties on the barren silica in the concentrates, total about $20 per ton of silica, which as there are about 15 units of silica per ton introduced into the concentrates thru combining the middlings with them, indicates that

this practice has cost the Tiger Gold Co. about $3. for every ton of concentrates shipped by them.

At the time of my examination of the mine in 1911, the evidence of unnecessarily high costs were conspicuous. The miners union was allowed to dominate in the camp and to dictate what men should be employed and what should constitute a day's work, with the inevitable result of increasing very largely the cost of mining; while the dilapidated condition of the mine and mill equipment, which the poor financial condition of the company would not permit them to remedy by replacing with new equipment, not only required the maintenance of an excessively large repair gang (7 men) but caused frequent shut-downs which, by decreasing the output, relatively increased the expense. A concrete illustration of the effects of these conditions is afforded by the results of the operations during the months of July and August, 1911 as follows:

JULY PRODUCTION

10 Bars Bullion, net value	$4,860.66
4 Cars Concentrates, netvalue	6,873.61
	$11,734.27

Mill running time (on basis of 480 stamped-hours per day) 17/14/24 days.

Estimated tonnage milled, approximately	1320 tons.
" recovery per ton, "	$9.00
" value of ore milled per ton approximately	9.00 to $9.50

Inasmuch as the bullion and concentrates producing during this period did not cover operating expenses, it is obvious that the latter were at least between $8.00 or $9.00 per ton, or just about double what they should have been; as the cost of milling ore, under proper conditions, should not exceed $1.00 per ton, while the total mining conditions (comprising exploration, development and stoping with a proposition of over-head expenses) should not exceed $3.00 per ton where the width of the vein is in full width of the stope, or $4.00 per ton where the width of the vein is less than the width of the stope.

CONCLUSION AND RECOMMENDATIONS:

With the exception of a negligibly small tonnage of ore remaining in the crown of some of the stopes and below the levels above, north of the shaft, the mine is at present practically without developed ore reserves, and the problem of major importance, to which all other considerations are subordinate, therefore, is that of the development of ore. I conclude, after careful consideration of all of the conditions that there are strong reasons to believe that the oreshoots continue below the present lowest level of the mine. This conclusion is based partly on the fact of the frequent persistence of gold to a much greater depth in veins, than has been reached on the Grey Eagle vein, and partly to the circumstance that there is no evidence in the lowest level of the mine of any approaching impoverishment of the vein--the deepest ore-body discovered ("D" stope, between the 400' and the 600' levels, north of the shaft) being of considerable size and as good average grade, I am assured, as any in the mine, while, in the lowest level, an ore-body of good grade (see sample No. 6) altho small in widthas there exposed,has been cut.

There is also reason to expect, from the past practice of following the main later fissure, in the mistaken belief that it was the principal vein, that ore bodies may have been left undiscovered in the developed parts of the mine, as exemplified by the rich "D" stope, which recently was discovered by accident lying behind what until then had been considered to be the hanging wall of the vein, some time after the levels north of the shaft had been abandoned in the in the belief that they were worked out. It must, however, be considered in this connection, that the expense of reopening the old caved portions of the mine, for the proper investigation of this matter might exceed the value of any ore there discovered. I would recommend, therefore, that attention first be given to exploring the vein below the present lowest level--the prospects of success warranting, in my opinion, the expense necessary. The installation of new pumps, and probably of a new hoist, before commencing operations would probably be advisable, but the re-installation of the mill had

14.probably best await the results of the mine development work, as the nature and extent of the repairs and changes that might be desirable, could be most intelligently considered after a sufficient tonnage of ore to pay for them has been blocked out.

Respectfully submitted,

(signed) R. T. Walker.

ASSAYS OF SAMPLES GREY EAGLE VEIN.

	Au. oz.	Ag. oz.	Cu. %	SiO_2 %	Fe %	S. %
No. 1 Sample across quartz vein, 4" wide, containing small amount of sulphides, back of Cowan stope, top of No. 1 chute, 400 N.Level	0.34	7.4	0.1		13.3	14.6
No. 2 Sample across same vein, 4" wide, containing sulphides, 40' S. from top of No. 2 chute, 400 N. Level. (from this point north, vein is barren until it runs into caved ground)	3.24	9.7	0.1		15.3	14.0
No. 3 Sample across quartz vein, 12" widecontaining sulphides, back of stope, 10' S. of top of 3rd chute N. of by-pass, 500N. Level	2.92	12.3	3.5		16.7	17.1
No. 4 Sample across same vein, 15" wide, containing sulphides, taken on level with and 15' S. of sample No. 3 (Ore shoot ends 20' S. and 30' N. from this point, being at this level about 50' long.)	2.00	8.3	1.0		20.9	24.0
No. 5 Sample across parallel vein, 13" wide, containing abundant sulphides, 10' east, taken on level with an opposite sample No.4	3.64	8.6	2.3		27.9	30.5
No. 6 Sample across quartz vein, 3" wide, containing sulphides, 600 N. level 350' N. of shaft:	1.58	5.5	0.1		19.8	22.1
No. 7 Specimen sample from vein (D ore shoot (?) containing coarse pyrite crystals, 400'N. Level, 300' north of shaft:	2.12	6.3	0.4	56.4	19.5	
No. 8 Specimen sample, containing heavy sulphides, from S. end of "D" stope, between 400 N. level and 500 N. level	18.20	20.0	1.0	33.2	29.8	
No. 9 Specimen sample, quartz containing small amount of sulphides from middle of "D" stope, between 400 N. Level and 500 N. Level	0.18	1.8	0.4	67.4	14.0	
No. 10. Grab sample from car of ore from S. End of "D" stope, 55' above 600 N. level (ore shoot here 5 ft. wide):	0.76	4.2	0.4	80.8	7.1	

	Au. oz.	Ag. oz.	Cu. %	SiO_2 %	Fe %	S %
11. Grab sample from car of ore from N. end of "D" stope, 55' above 600 N. level (ore shoot here 10' wide)	0.08	0.6	0.2	86.8	4.0	
12. Specimen sample, honey-combed quartz (showing pyrite casts) outcrop of vein on top of ridge S. of shaft:	1.28	2.9				
13 Grab sample, mill tailings:	0.10	0.7	0.4	88.4	3.3	

ORA BONITA VEIN

No. 1 Sample across quartz vein, 4" wide, containing sulphides, face of 2nd tunnel above tramway level.	0.86	4.0	0.15		16.6	18.8.
No. 2 Sample across same vein, 6" wide, containing sulphides 40' from face of tunnel:	0.56	7.6	0.1		13.6	14.5
No. 3 Sample across same vein, 2'4" wide, partially oxidized, in small underhand stope below same tunnel.	0.80	2.3	0.8		11.4	3.4