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Little Jessie
wine



ADIT RESOURCES

September 23, 1981

Dr. Antone L. Aguilar
4021 Fairmount
San Diego CA 92105

Dear Dr. Aguilar:

Thank you for your comprehensive compendium on the Little Jessie and related properties which has been received and reviewed. This is typical of just about all of the mines in the Bradshaw Mountains Region and, as you indicate, there has been considerable new activity recently in "dusting off" many of these old mines for a new look. So far, regrettably, no real success of any substantial magnitude or permanency has been reported.

I am curious regarding the results of more recent examinations, contacts and inquiries you may have had, if any. Peer consensus is not the only criterion we follow but, it is one of the considerations - especially in scheduling an examination. Otherwise we must await someone being in the vicinity enroute on some other mission. The main reason for this right now is that we are involved to our capacity and any new lead must appear superior to what we are already working on.

Meanwhile, with your permission, we would like to retain your submittal for further possible reference in the future. If you would prefer to have us return it, please let us know, and we will send it immediately.

Your consideration of us regarding this matter is most appreciated. Should we manage an examination, we will contact you regarding any potential interest we might develop.

Sincerely,

Adit Resources Corporation

W. E. Heinrichs, Jr., Pres.
Geol. Engineer - Geophysicist
P. E. & C. P. G.

ANTONE L. AGUIAR, D. D. S.
4021 FAIRMOUNT
SAN DIEGO, CALIFORNIA 92105
TELEPHONE (714) 284-9217

Home phone 714-469-4435

Please find enclosed historical information re the famous Little Jessie mine, one of Arizona's most productive lode gold properties.

The historical information outlines the geology, production, assays and history of this mine.

Recently Jerome mining has done extensive core drilling a half mile away on the gladstone and McCabe which are in the same formation as the Little Jessie.

The Jessie, Dividend, Ella and Little Grace are four patented claims, which I have. I also have seven unpatented claims.

Walt Statler, at Iron King Assay office, phone # 602-632-7410, Humboldt Arizona, has repeatedly sampled the 40,000 ton dump and indicates the grade to be in excess of .15 oz/ton gold

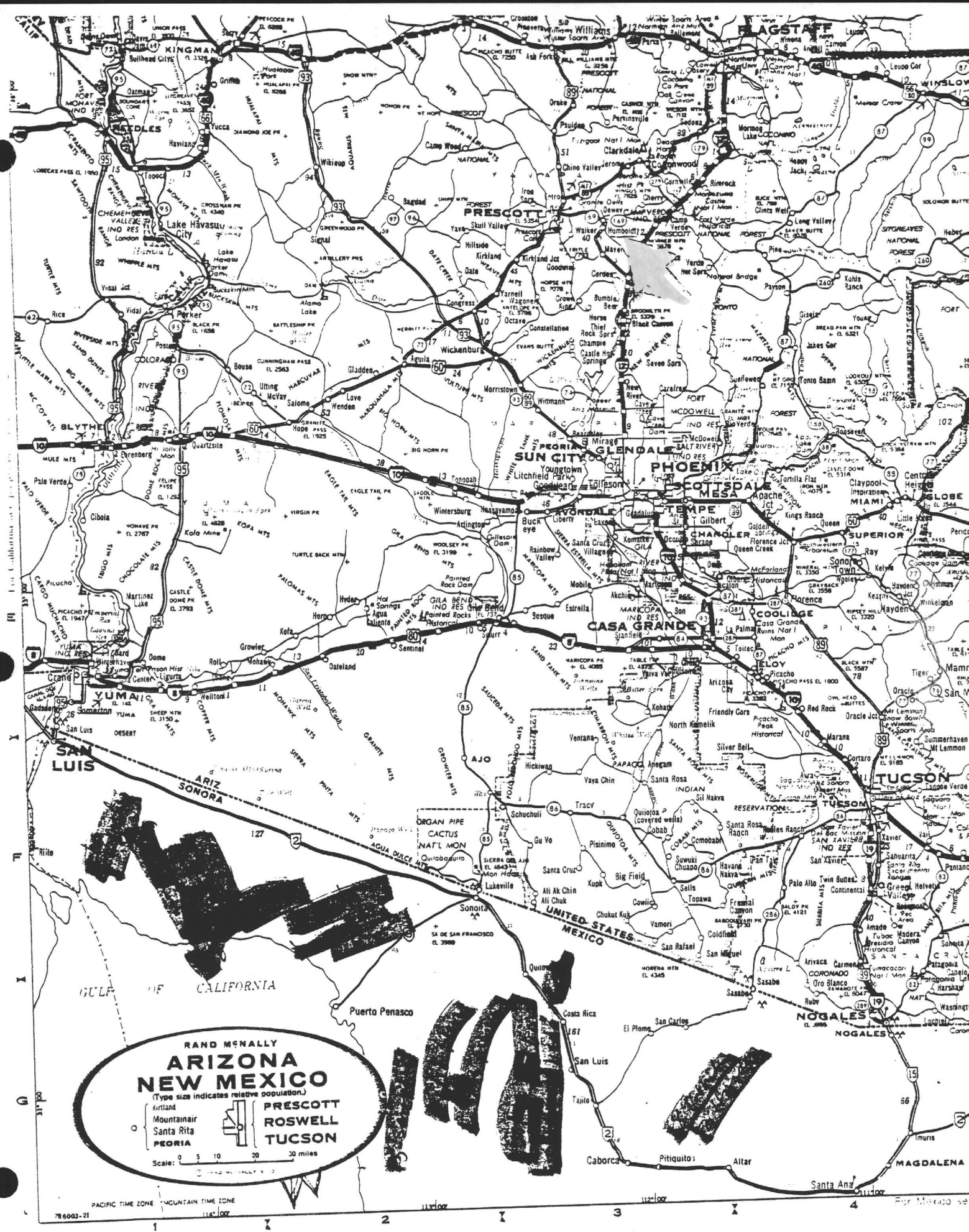
Historical records that I have included indicate "gob" and backfill in the tunnels similar to the dump grade in excess of 100,000 tons.

Also there are strong indications that the depth of the ore zones was never reached. The mine appears to have last been worked in the late 1920's. The potential of this mine is great.

Sincerely,

Tony Aguiar

Tony Aguiar



RAND McNALLY
ARIZONA
NEW MEXICO
 (Type size indicates relative population.)

o City
 o Town
 o Mountain
 o Santa Rita
 o PEORIA

PRESCOTT
ROSSELL
TUCSON

Scale: 0 5 10 20 30 miles

PACIFIC TIME ZONE MOUNTAIN TIME ZONE

786003-21

For Mexico 22

Vol. V, No. 6

August 15, 1934



University of Arizona Bulletin

ARIZONA BUREAU OF MINES
G. M. BUTLER, *Director*

ARIZONA LODE GOLD MINES AND GOLD MINING

by

ELDRED D. WILSON, J. B. CUNNINGHAM, AND G. M. BUTLER

ARIZONA BUREAU OF MINES, MINERAL TECHNOLOGY SERIES
No 37, BULLETIN No. 137.

UNIVERSITY OF ARIZONA
ARIZONA BUREAU OF MINES
TUCSON, ARIZONA

PUBLISHED BY
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TUCSON, ARIZONA

LITTLE JESSIE MINE

The Little Jessie mine is about 1,700 feet south of the Union. This deposit was discovered in 1867. From about 1890 to the end of 1898, it was worked by J. S. Jones and lessees. Their mill is reported to have produced about \$750,000 worth of bullion and concentrates, chiefly from the Little Jessie. From about 1909 to 1916, considerable development work was done and a little ore was shipped, mainly by the Chaparral Mining Company. Early in 1934, the Arizona Consolidated Mining Company was reported to be carrying on development work and installing new mill machinery at the Union-Jessie property.³³

Lindgren states that, in 1922, the shaft was 659 feet deep, and that much high-grade auriferous pyrite was encountered between the 500- and 600-foot levels. He adds that the ore contains from one-half to one ounce of gold per ton and very little silver.³⁴

LELAN-DIVIDEND PROPERTY

The Lelan mine is on a ridge southwest of the Jessie.

This deposit was discovered during the sixties. Browne's report for 1868 states that 60 tons of ore from the Dividend mine, treated in the Big Bug (Henrietta) mill, yielded \$20 per ton in free gold.³⁵ At that time however, it was not of commercial grade. According to Lindgren, the Lelan and Dividend were worked more or less from 1900 to 1914, and during part of that time were equipped with a 10-stamp mill. He states that their ore production prior to 1923 was probably at least 10,000 tons which contained from a half to 3 ounces of gold per ton, together with a little silver, copper, and lead.³⁶ In 1932 and 1933, the property was operated by the Southern Exploration Company with a force of about twenty-five men. This company erected a 100-ton flotation-concentration plant and produced concentrates during part of 1933. Operations were suspended at the end of the year.

The vein, which is a continuation of the Union, strikes north-eastward and dips steeply southeastward. It is opened by a 500-foot shaft inclined at 80°, with development on five levels. Most of the recent production is reported to have come from the fourth level. The vein is rather lenticular and ranges up to several feet in width. Its filling consists of massive, shiny white quartz with irregular masses, seams, and disseminations of pyrite, chalcopyrite, sphalerite, and galena. The gold occurs in the sulphides.

³³ History compiled by J. B. Tenney.

³⁴ Work cited, pp. 132-33.

³⁵ Brown, J. Ross. Mineral resources of the states and territories west of the Rocky Mountains. 1868.

³⁶ Work cited, p. 133.

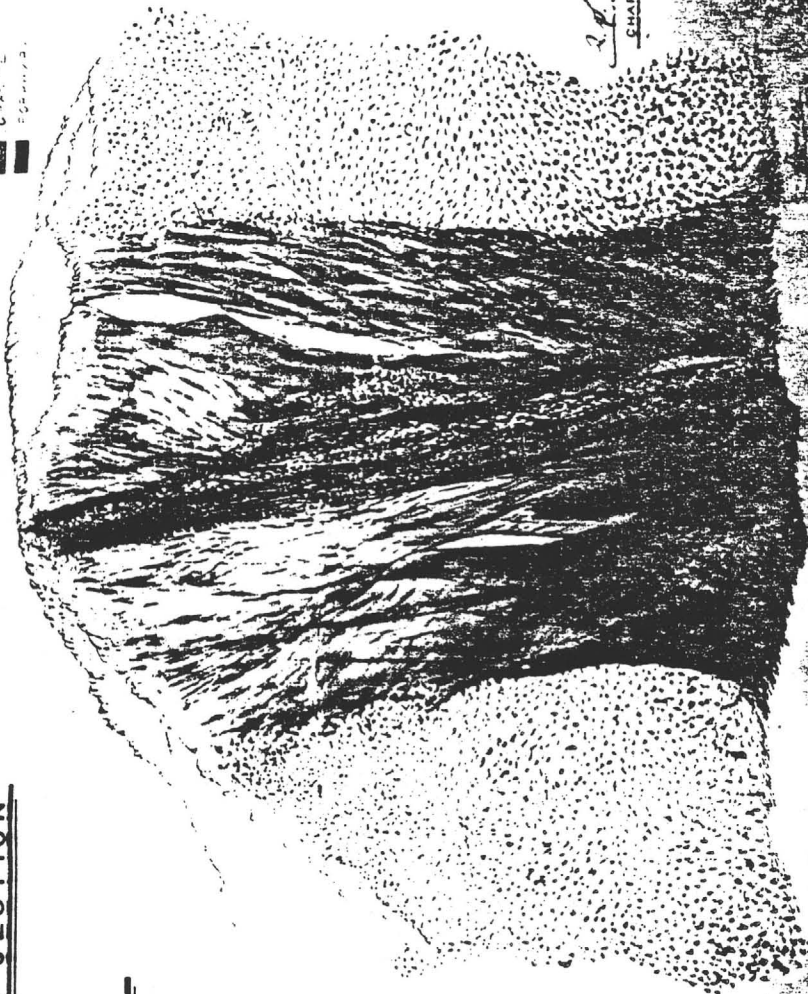
GEOLOGICAL FORMATION

LITTLE JESSIE MINE

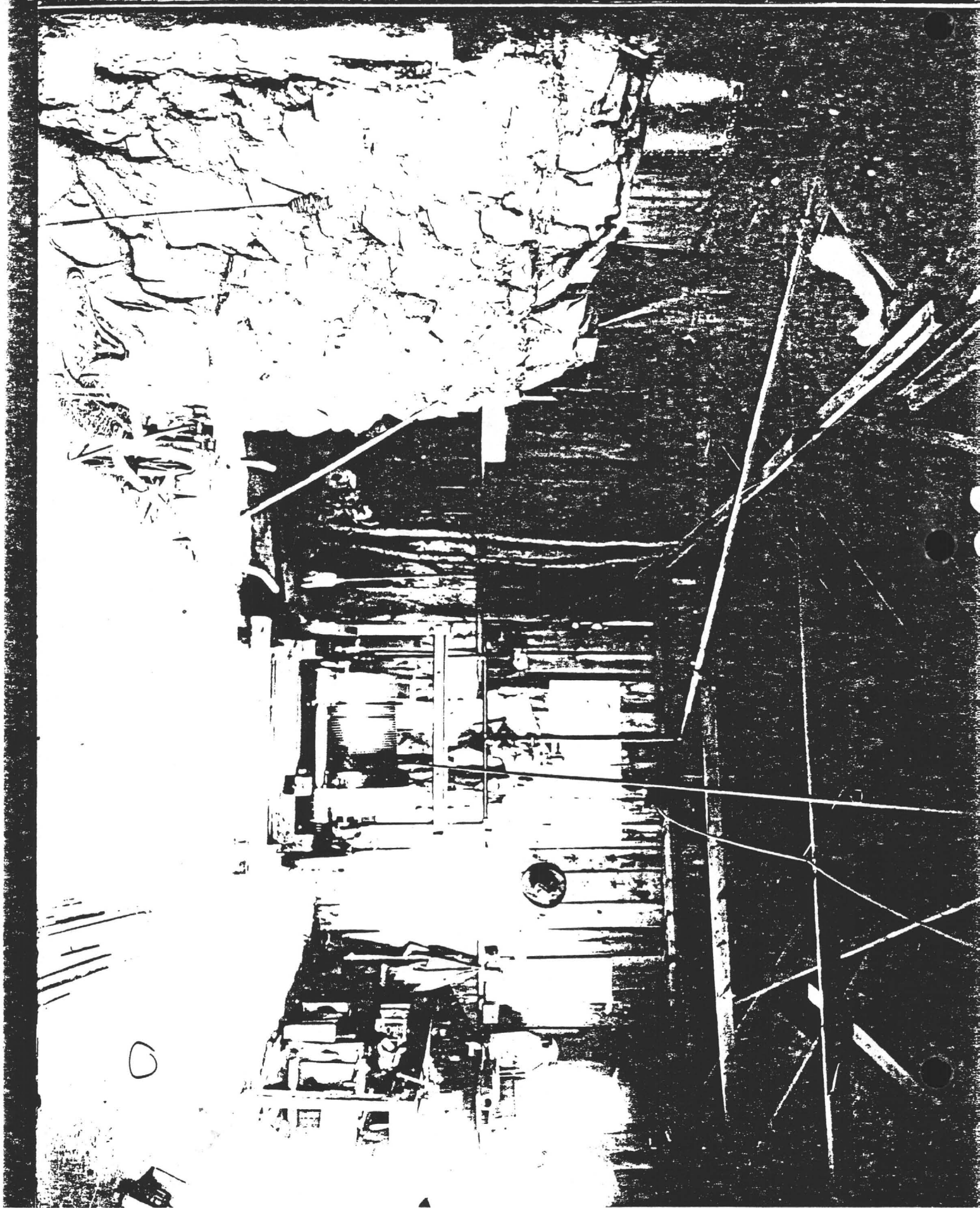
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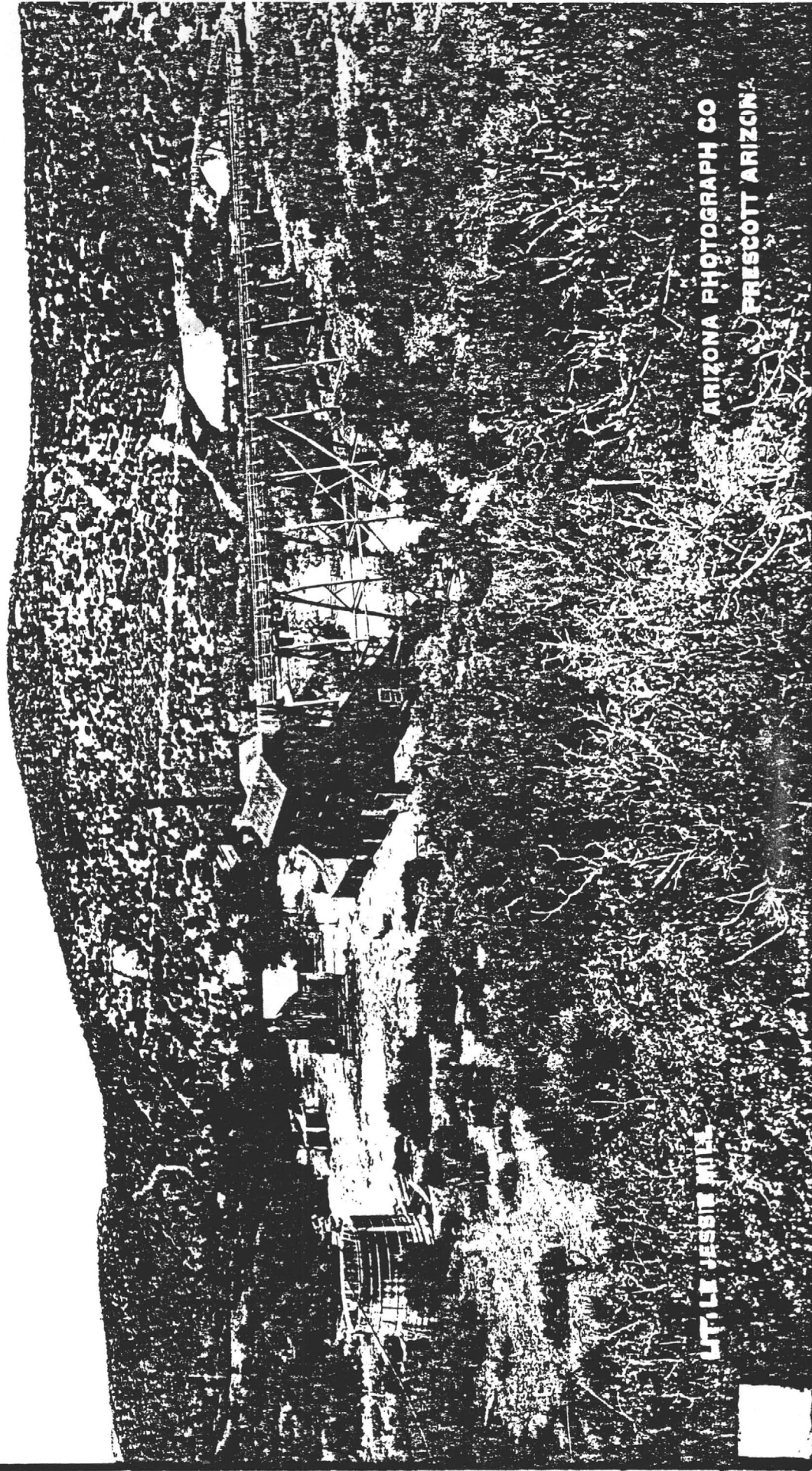
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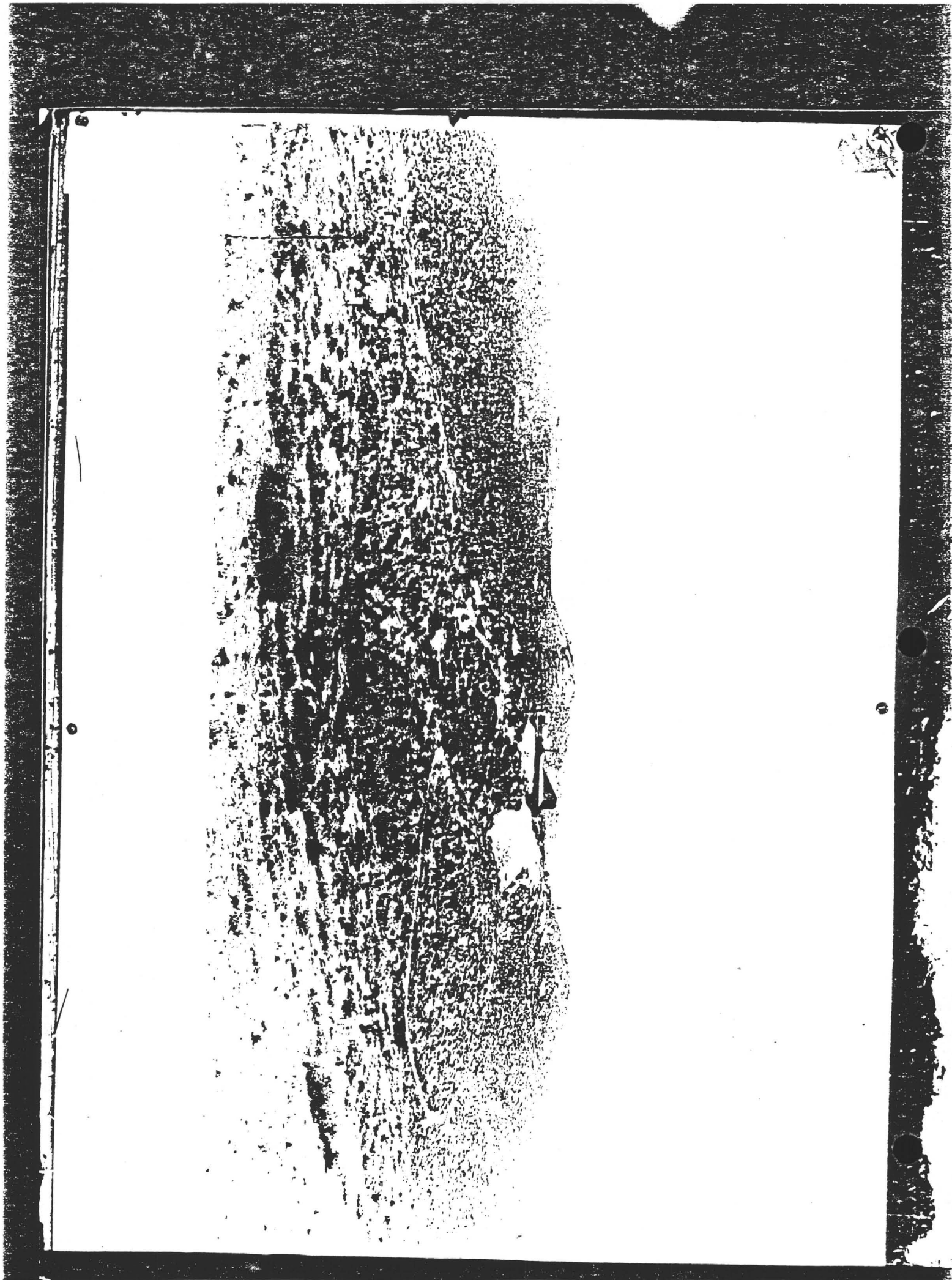


LT. LE JESSIE MILL

ARIZONA PHOTOGRAPH CO
PRESCOTT ARIZONA

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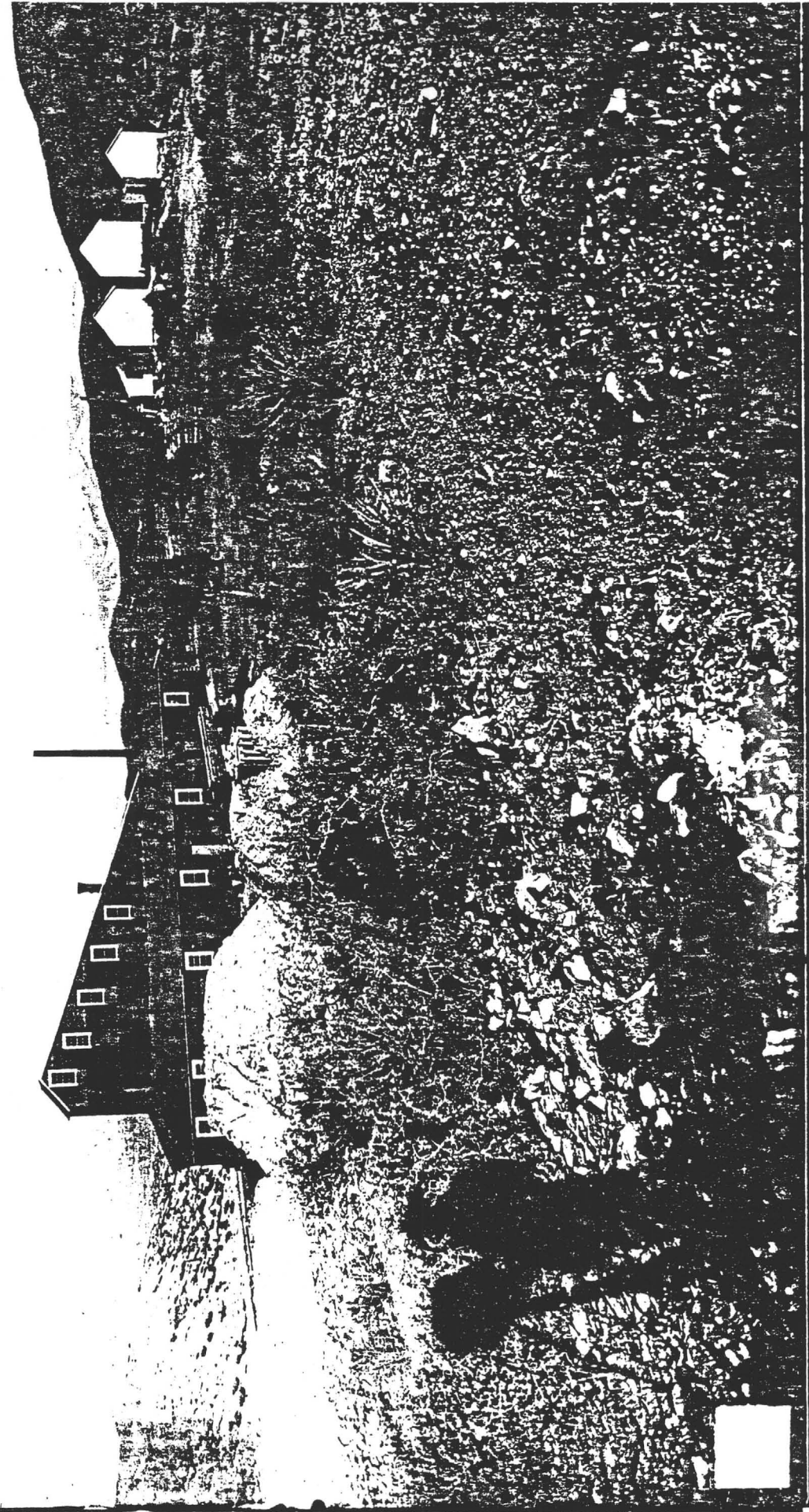
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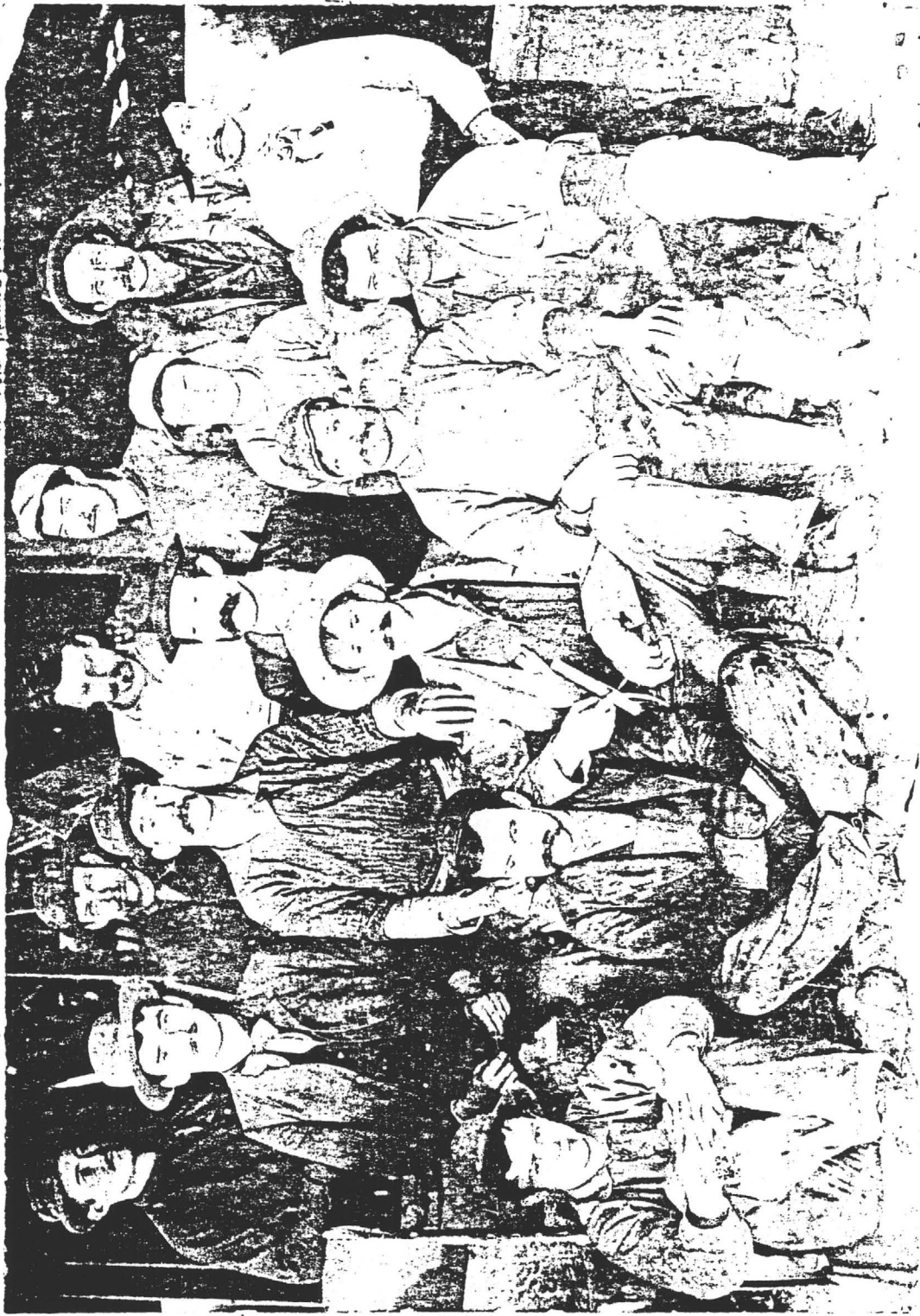


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At the Hardy Hotel

White Sulphur Springs

Miners at Little Jessi 11:00 - 1880

John W. Brown



HEINEN-LINDSTROM
ASSOCIATES, INC.

June 9, 1981

Dr. Anthony Aquire
2552 Katherine Ct.
El Cajon, CA 92020

Dear Tony,

Enclosed is our report on results of the bottle agitation cyanide leach test conducted on a sample of dump ore from Arizona. The extraction of gold from 1/4 inch feed was 67 percent which is promising for a small heap leach operation.

As per our telephone conversation on June 8th, we would be willing to evaluate an electrophoresis process being developed at Hawthorne, Nevada for concentrating colloidal gold from placers.

Thank you for the opportunity of serving you.

Sincerely,

Harold Heinen
Metallurgist

HL

HEINEN-LINDSTROM
ASSOCIATES, INC.

REPORT

on

PRELIMINARY CYANIDE LEACH AND AGGLOMERATION TESTS
(Laboratory No. HLA-24)

for

Dr. Anthony Aquire
2552 Katherine Ct.
El Cajon, CA 92020

SUMMARY

Bench-scale agitation leach tests was conducted on a sample of ore to determine if the gold values could be recovered by straight cyanidation treatment. The ore sample contained 0.11 ounces of gold per ton. Silver values were insignificant. The cyanide leach was made on feed crushed to a nominal 1/4 inch using an alkaline cyanide solution containing 2.0 pounds of sodium cyanide per ton. Recovery was 67 percent of the total gold, equivalent to 0.076 ounce of gold per ton of ore.

The crushed ore responded exceptionally well to the agglomeration pretreatment using a lime-portland cement binder. The agglomerated feed withstood leaching with no visible break-down or migration of fines.

ORE SAMPLE PREPARATION

The ore sample as submitted was crushed to 90 percent minus 1/4 inch in size. A 2-pound sample was split out of the 46-pound charge, using a riffle-type ore sampler. This fraction was pulverized to minus 100 mesh, mixed by rolling on a plastic cloth, and served as the head sample for assay.

ASSAY OF HEAD SAMPLE

The gold and silver contents were determined by the conventional fire-assay method. Results were:

Gold	<u>0.124 Ounces per ton of ore.</u>
Silver	0.22 Ounces per ton of ore.

CYANIDE LEACH TEST

A small-scale cyanidation test was made to obtain preliminary information regarding gold extraction and cyanide consumption. The test procedure was as follows: A 400 gram portion of the crushed ore sample, as received, was pulped with 600 grams of solution containing 2.0 pounds of sodium cyanide per ton. Enough lime was added to the pulp to adjust the pH to 11. Cyanidation was carried out by bottle agitation on the laboratory rolls for a period of 48 hours. Leaching was interrupted briefly at the end of 24 hours to permit sampling of the pregnant solution.

Upon completion of the 48-hour leach period, the pulp was filtered. The leach solution and residue were both analyzed for gold and silver. Results are summarized in Table 1.

TABLE 1
GOLD RECOVERY BY CYANIDE LEACHING

Results	Gold
Extraction Percent of Total Based on Solution and Residue Assays	67.3
Extraction Ounce per Ton of Ore	0.076
Assay of Leached Residue Ounce per Ton of Ore	0.037
Calculated Heads Ounce per Ton of Ore	0.113

Analysis of the cyanide leach solutions at the end of the 24 and 48 hour treatment were identical, indicating that the dissolution of leachable gold occurred within 24 hours. Silver extraction was equivalent to 0.035 ounce per ton of ore. Cyanide consumption was minimal, 0.15 pound of sodium cyanide per ton of ore. Amount of lime required was 5 pounds per ton of ore.

A wet screen analysis test was conducted on the leached residue to determine the distribution of the residual gold values. Results are shown in Table 2.

TABLE 2
SCREEN ANALYSIS OF CYANIDE TAILS

Product Size	Weight Percent	Gold		Silver
		Assay oz/T	Percent Distribution	Assay oz/T
+ 1/4 inch	9.0	0.026	6.3	nil
- 1/4 inch + 10 mesh	25.3	0.072	30.8	0.04
- 10 mesh	65.2	0.024	42.9	nil
Composite	100.0	0.037	100.0	0.01

The screen analysis results show that half of the unleached gold occurred in the minus 1/4 inch plus 10 mesh size fraction of the cyanide tailings. Crushing the ore to minus 10 mesh very likely would expose or liberate more gold to increase the overall gold extraction. Based on the above data (table 2) crushing the ore to minus 10 mesh instead of 1/4 inch should improve the gold extraction by about 0.01 ounce per ton. However this improved recovery would be off-set by the increase in cost of crushing and agglomeration.

AGGLOMERATION PRETREATMENT OF MINUS 1/4 FEED

The remainder of the submitted sample of ore (42.5 pounds) was subjected to an agglomeration pretreatment which is employed to enhance percolation flow in heap leaching. The charge of ore was mixed dry with 43.2 grams of lime (\approx 5.0 pounds/ton of ore) and 96.5 grams of portland cement (\approx 10.0 pounds /ton of ore) using a small concrete mixer. After a couple minutes of mixing, the charge - while revolving - was moistened with 1.63 liters of water (\approx 3.5 weight-percent). The whole pretreatment required about 5 minutes. This treatment sequence produced random size pellets up to 1/2 inch in size. The agglomerates or pellets were cured piled on the floor

for 72 hours. Resulting feed resembled pea gravel, since all the fines were held firmly as porous balls or pellets. This technique as applied to your ore produced the best or most stable porous pellets that I have seen in my three years of experimentation with the agglomeration process. The cured pellets were flooded with water. No slumping or disintegration of the pellets was observed during one week of contact.

CONCLUSIONS

The initial cyanide leach test indicates that your gold-bearing dump ore is amenable to cyanidation. Recovery was 67 percent of the contained gold from a nominal 1/4 inch feed containing 0.11 ounce of gold per ton. The ore responds exceptionally well to the agglomeration pretreatment using a lime-portland cement mixture for a binder.

RECOMMENDATIONS

It has been shown that the agglomeration pretreatment of the dump ore appears very promising for heap leaching this material. However, it is questionable whether or not this dump ore crushed to 1/4 inch, requires the agglomeration pretreatment to render the ore amenable to heap leaching. Therefore, it is suggested that column leach tests be conducted on the raw ore and agglomerated feed to determine if agglomeration treatment step is essential.

Sincerely,

Harold Heinen

Harold Heinen
Metallurgist

HL

HEINEN-LINDSTROM
ASSOCIATES, INC.

ORE TESTING • RESEARCH • CONSULTING

RESUME

Roald E. Lindstrom

Education

B.S. in Chemical Engineering. Montana State University, 1951. Numerous courses in management, supervision, math, and related subjects at University of Nevada, Reno, and various government training seminars.

Experience

U.S. Bureau of Mines, 1951 to 1980.

Four years Bureau of Mines Oil Shale Demonstration Plant, refining shale oil and process evaluation.

Twenty-five years Reno Research Center. Ion exchange and solvent extraction technology for separating the lanthanide elements.

Development of electrolytic oxidation systems for processing of carbonaceous gold ores, mercury ores, silver ores, molybdenite ores and concentrates.

Development of heap leach-carbon adsorption-desorption methods for processing gold-silver ores. Related development of agglomeration methods for pretreatment of clayey precious metal and uranium ores.

Publications-Presentations

Approximately 90 publications and presentations related to above developments.

Patents

Approximately 26 patents related to above developments.

Most Recent Position and Professional Accomplishments

United States Bureau of Mines Research Supervisor for 21 personnel engaged in complex basic and applied research in the areas of hydrometallurgy, extractive chemistry, aqueous electrolytic oxidation, roast-leach processing and solvent extraction-ion exchange separation and concentration methods. Responsible for guidance and technical supervision for research in advanced areas of developing new and novel concepts to permit extraction of metal values from low-grade, refractory, and sulfide concentrates and ores. Conceptual formulation of new research ideas and projects consistent with national goals and agency program objectives is an integral part of the work. Minimizing degrad-

RESUME

Roald E. Lindstrom

ation of the environment and energy requirements are important factors in developing economical process sequences. Promising developments are demonstrated on a pilot or miniplant scale for technology transfer to industry.

Accomplishments may be typified by success in developing solvent extraction, ion exchange, and fractional precipitation separation procedures for extraction and purification of the rare-earth elements that have been adopted by industry. Parallel development of methods for recovery of expensive amino acid chelating agents from ion exchange solutions were also patented and adopted by industry.

Development of concepts in the areas of chemical and electrolytic oxidation enabled the treatment of a range of refractory and low-grade source materials including refractory carbonaceous gold ores, low-grade mercury ores, silver ores, and molybdenite concentrates. Development of the patented process resulted in adoption by the Carlin Gold Mines and granting of the largest special achievement award ever granted by the Bureau of Mines. More recently, pilot scale tests on the electro-oxidation of molybdenite were conducted in cooperation with a major copper producer to evaluate the feasibility of adopting the process.

Process developments on heap leaching of gold and silver ores, new methods for desorption of gold and silver from precious metal-laden carbon, and precipitation-carbon adsorption methods for gold-silver separation have been adopted by industry. Recently developed particle agglomeration techniques for processing clayey gold-silver ores by percolation leaching are rapidly being adopted by the industry and show promise for being an important addition to the technology for processing precious metal ores.

HL

HEINEN-LINDSTROM
ASSOCIATES, INC.

ORE TESTING • RESEARCH • CONSULTING

RESUME

Harold J. Heinen

Education

B.S. in Chemistry. Hope College, 1937.

M.S. in Chemistry. University of Nevada, 1939.

Experience

1979 - Present, Consulting.

Metallurgical consulting on heap leaching gold-silver ore in the United States and Australia.

1942 to 1979, Research Metallurgist. U.S. Bureau of Mines, Reno, Nevada.

Conducted the basic research which led to the development of the commercial process for the recovery of gold and silver from activated carbon and the electrowinning of the precious metals from the strip solution. This process is being used world-wide by the major gold producers.

Did extensive research in fused salt electrolysis. Developed a technique for electrowinning molybdenum metal from MoO_3 .

Initiated research in the feasibility of heap leaching gold-silver ores. Developed an integrated heap leach-carbon adsorption-desorption process for recovering gold and silver from low-grade mine resources which is being exploited world-wide.

Developed an agglomeration technique, for treating gold-silver ores containing excessive amounts of clays or/and ore fines, which greatly enhanced the percolation flow of the leach solution. This improved technology has broaden the applicability of heap leaching in the gold-silver industry.

Registration

Professional Metallurgist, California.

Publications

Approximately 40 publications and presentations related to above research and developments.

Patents

Approximately 20 United States and foreign patents related to above developments.

A. L. MCCARTY, E. M., PRESCOTT, ARIZONA

The Ohio Mines Company
Columbus, Ohio

Gentlemen:

At your request I have made a thorough investigation of your property in Arizona, and report the following:

LOCATION: The property of The Ohio Mines Company is located in Yavapai County, two miles west of McCabe and eighteen miles east of Prescott.

The nearest railway station is Humboldt, Arizona. A good wagon road connects the mines and the town of Humboldt, $4\frac{1}{2}$ miles distant.

PROPERTY: Consists of the following patented mining claims. Jessie, Little Grace, Divident and Ella. Unpatented: The Marion C, Antelope, Bertha, Lucilla, and John Gill. Also the Little Ore millsite, and a ranch of one hundred and sixty acres.

In addition to the above, the Company owns a group of unpatented claims on and adjacent to Mr. Elliott: El Caney, Teddy, Roosevelt, and El Terra. These claims are located about one and one-quarter miles west of the Jessie group, and are known as the Mr. Elliott' group.

GEOLOGY: The country is made up of precambrian schists and enormous areas of granite. The intrusion of the granite gave the necessary pressure and heat to metamorphose all sedimentary deposits. At a later period this granite was cut by intrusions of Porphyry. These are the mineral bearing dykes and have a general east and west trend cutting a large part of the western part of the territory and in points of weakness of the earth's crust breaking through in many places often in parallel dykes not fifty feet apart. At a still later period the country was cut by dolerite intrusions which crossed the porphyry at an angle northwest and southeast. There was a period of mineralization with and immediately after both these intrusions. The dykes of porphyry were agents that opened up fissures for the mineral bearing solutions which were heavily charged with silica and carried the gold values. The hot saturated solutions penetrated all crevices and openings made by the dykes. The large fissures offering the least resistance produced an ideal condition for the formation of shoots of ore. In many points throughout the dykes the quartz has a width of two to five feet and in such points the adjacent porphyry is highly silicified and assays nearly as high as the quartz, showing clearly that the origin of the metal was not by the dyke but by the solutions which came at the same period and later.

The dolerite intrusions cut the country around the Jessie mine in many places. Following these was another period of ore making in shoots and lenses. At the intersection of the porphyry by the dolerite dykes there is always ore. The solutions following the dolerite intrusions were not as rich in gold and carried more iron and copper, and in some cases lead.

HISTORY: The property (~~now owned by the Ohio Mines Company~~) contains the famous Jessie Mine. This property produced over one-half million dollars and is mined to a depth of five hundred feet. This production was made from one shoot of high grade gold ore.

The first work of any importance was done under a lease by Mr. Wright of Prescott. During the term of his lease Mr. Wright mined over \$150,000.00 in high grade gold ore from one shoot of ore on the Jessie claim. His work was extended to a depth of 200 feet and shows the shoot of ore to be 225 feet long with a width of 6 to 8 feet. This shoot of ore dips to the east at the rate of 25 feet in 100 feet and at the 500 foot level is entirely east of the Jessie shaft.

After the expiration of the lease the property was operated by the owner, Mr. J. S. Jones. During a period of several years he continued mining and milling ore. Both the mining and milling was very poorly done. A knowledge of the occurrence of the ore and the best method of mining and milling was clearly lacking. Even under these conditions the smelter receipts and bullion returns show a production of \$750,000.00 from the Jessie and Dividend Claims.

DEVELOPMENTS: On the Jessie Claim there is an inclined shaft about 600 feet on the vein, 285 feet of this shaft is two compartments well timbered 5 feet by 5 feet in the clear. From this point to the sump there is but one compartment not timbered and in poor condition for hoisting. Levels are driven both east and west from the shaft at approximately every hundred feet. There is about 6,000 feet of development work in shafts, drifts, and raises. Much of this work is open and in good shape even though the timbers used were small and placed in a scattered manner.

The Dividend Claim has two shafts both on the vein and both shafts show the ore continuous for a depth of approximately 300 feet. Several hundred feet of drifting was done on the 100 foot and 200 foot levels and all ore stoped out to the 200 foot level. The vein is about 400 feet north of the Jessie vein and runs at an angle to it, so they will intersect about 600 feet east of the Jessie shaft. Throughout the present development the ore in the Dividend claim has been continuous and found in a body of from 2 feet to six feet wide. See assays. Various pits and openings show the Jessie and Dividend Veins continuous for the full length of the Company's ground.

EQUIPMENT: At the Jessie shaft there is a fine structure 120 feet by 60 feet covering the hoist, head-frame, compressor, boiler, etc. Ample buildings for accommodations of men are provided--1-6 inch by 8 inch gear-el hoist, 600 feet 7/8 inch cable, 1 cross compound air compressor in good condition and sufficiently large for present requirements. The head frame of 12 inch by 12 inch Oregon pine is well built and will be suitable for handling a large tonnage from great depth.

Two boilers, 1 40 H. P. and 1 80 H. P. Both need some repairs. A good supply of air drills is at hand--both large machines suitable for drifting and sinking and also a number of small stoping drills. And a rather complete supply of tools for general mining work.

The equipment of the Dividend Claim consists of:

omit {
One 6 inch by 8 inch friction hoist in good order.
One 30 H.P. boiler locomotive type.
A very strong substantial head frame.
Both joist and boiler well housed in one building.

ORE: The ore exists in shoots and is high grade. These shoots are large and go to great depth. The ore may be divided into two classes; high grade, which exists as an iron sulphide carrying gold. This class will run from \$60.00 to \$1000.00 per ton. (2)

~~And~~ A milling grade consisting of quartz and highly silicified porphyry. This means that the entire dyke from granite to granite is of milling grade when mined from around the high grade shoots.

omit {
POWER: Coal costs \$9.00 per ton delivered at the mine. Oil \$2.00 per barrel. Electric power can be bought for about \$75.00 to \$85.00 per horse power year. This is about one-half what power from coal or oil will cost. A material reduction in the price of electric power may be expected within a year, as a new power company is now preparing to install a plant on the Verde River to deliver 15,000 H.P. Inasmuch as electric power is sold in other sections for \$55.00 to \$65.00 per H.P. year, a reduction to \$65.00 may be looked for here.

WATER: With what water the mine makes and will make with increased depth, together with what now exists in Big Bug and Chapparral Creeks, there will be ample water to supply a 500 ton concentration and cyanide plant.

OTHER PROPERTIES: South and east of the Jessie group about three-quarters of a mile is the McCabe and Gladstone mines. They are located on a parallel dyke of porphyry and have been operated for several years. Their production exceeds \$3,000,000.00 gross. All the ore has been mined out to the 1000 foot level. The ore shoots are still strong and rich on the 1000 foot level.

The production from these two mines in 1907 totaled \$480,000.00 -- gold and copper. All mined from below the 900 foot level. These figures were given for tax valuation and are probably under the true production.

It is interesting to note that one-quarter of this output was copper. It serves as an indicator of what may be expected from the Jessie at and below the 1000 foot level.

The Lelan and Mt. Elliott Mining Companies are both operating the properties north and west of the Jessie. Their ground is adjacent to yours. They have large bodies of commercial ore.

omit {
At Humboldt there is a good smelter rapidly undergoing a small amount of remodeling. Mr. Bennetts, the manager, is a smelting man of ability and he says his rates will be such as to permit the mining of a ten-dollar ore. The opening of this plant for custom ore means much to the mines of that camp and adds materially to the value of your mines.

TREATMENT: Your ore is chiefly of a milling grade. One-half of the value can be saved by amalgamation and concentration. The remaining gold exists in such a finely divided state that it floats away on the water and can only be saved by cyaniding. But this is an ideal condition in cyaniding and your fine gold can be completely extracted in a few hours treatment by agitation in a cyanide solution.

Treatment test:

Heads crushed to pass 100 mesh screen assayed \$18.00 gold. Agitated for eight hours in a solution of three-tenths of one per cent potassium cyanide gave after careful washing a tailing assaying only 20 cents per ton. This is very rapid work and done with a consumption of only $2\frac{1}{2}$ pounds of cyanide per ton of ore.

Crush in stamps followed by amalgamation and concentration, grind the tails in tube mills, crushing in cyanide solution, agitate the slimes in high steel tanks and filter press. This will give you the last dollar in your ore and if done at a capacity of 150 tons per 24 hours, can be done at a cost of mining and milling of \$4.00 per ton.

ASSAYS: General sample from waste dump 40,000 tons:

Gold -- .24 oz. \$4.80

Sample of ore and fines in dump left at Wright shaft, mined from top of big ore shoot:

Gold -- 3.85 oz. \$76.80

Sample of soft unsilicified porphyry:

Gold -- .10 oz. \$2.00

Sample taken 40 feet west on 140 feet level in the big shoot of ore which we will call the Wright shoot due to its history:

No quartz in sight other than 2 inch stringer, but the porohyry is highly silicified. Four feet wide:

Gold -- 4.02 oz. \$80.40

Sample taken 200 feet west in same shoot--2 feet wide silicified porphyry:

Gold -- 3.40 oz. \$68.00

Sample taken from quartz 12 inches wide and opened for over 200 feet on second level. This is an undeveloped shoot directly south and within 35 feet of the Wright shoot and is near the hanging wall of the porphyry dyke:

Gold -- 2.14 oz. \$42.80

Sample taken in face of 200 foot level west taken across 6 feet of soft vein matter near a dolerite dyke with cuts across the porphyry at this point:

Gold -- .92 oz. \$18.40

Sample of tailing pile which Mr. Jones leached with cyanide:

Gold -- Trace

Sample of sulphides from the Dividend Claim:

Gold -- 4.28 oz. \$85.60

Sample of clean white quartz from the Dividend Claim:

Gold -- .20 oz. \$4.00

Several samples taken from the dyke not near ore shoots showed from a trace to \$4.00

Three samples taken from the Mt. Elliott group assayed:

Gold -- \$8.40, \$8.80 and a trace

ESTIMATED EARNINGS: 150 tons at \$20 per ton equals \$3000.00, (\$3000.00 gross output per day). \$4.00 cost of producing X 150 tons, daily output equals \$600.00 total expense per day. (\$2,400.00 daily profit.) 300 days X \$2,400.00 equals \$720,000.00 profit per year.

RESUME AND OPINION: Your ore exists in shoots and lenses found at any position in the porphyry dyke with a rather regular occurrence along the foot and hanging wall. These shoots are large and especially so on the Jessie ground. They have uniformity of value and are easily followed. This width often reaches 20 ft. of ore of a milling grade. Development in adjoining property shows uniformity of value in gold for 800 feet, after that the same gold value for an additional 300 feet and a rapid increase in copper. With greater depth the mines of this camp will be copper mines with unusually high gold value.

Your ore shoots are all dipping east about 25 feet to the 100 feet of depth. The Wright shoot crops just west of the Jessie shaft and is entirely east of the shaft at the 500-foot level. Two smaller shoots crop east of the shaft. Their dip east has thrown them entirely out of your development.

Most all of your development work has been to the west, which shows some ore. Had the same work been done east, large ore bodies would have been opened. The mine has an indisputable production of between \$600,000 and \$800,000 in high grade ore and bullion. It would be difficult to show where over \$150,000 was spent in equipping and developing the mine.

Equip the mine with electric power at once, using the power for both hoisting and pumping.

As soon as the shaft reaches the 300 foot level some shipping ore can be mined and help carry further development work, and as soon as the 600 foot level is opened shipping ore can be mined to develop the property systematically and produce money enough to build the necessary milling plant. It is very unusual to find a mine that will develop itself. None but the high grade gold mines have done it.

The Wright shoot is the longest, widest and richest shoot of ore in the camp. If there were no other ore bodies, this alone would be sufficient to justify the proposed work.

The Dividend Claim is very valuable and lies close enough to the Jessie so they may both be worked from the one shaft.

\$100,000.00 will be ample to put the property on a producing basis and add the needed equipment.

Six months time will be required to put the shaft in first-class shape and to get the ore opened up ready for mining.

There is no gamble on this mine, it is sure to pay and pay well when worked in a systematic and intelligent manner.

Respectfully submitted,

A. L. MCCARTY, E. M.

REFERENCE: Silver City National Bank, Silver City, New Mexico; Prescott National Bank, Prescott, Arizona.

PROSPECTUS

The

**JESSIE
MINES
COMPANY**

PRODUCTION
TO DATE
\$750,000



PRINCIPAL
OFFICE
PRESCOTT
ARIZONA
U.S.A.

DEPOSITORY
BANK OF ARIZONA
PRESCOTT, ARIZONA

Mines and Reduction Works, 10 Miles
from Prescott, Yavapai County, Ariz.

INCORPORATED UNDER
THE LAWS OF ARIZONA

Capitalization, \$2,500,000
No. of Shares, 2,500,000

Of a par value of \$1.00 each,
fully paid and non-assessable

OFFICERS

Hon. John S. Jones, Prescott, Ariz.	PRESIDENT
HARRY BRISLEY, Prescott, Ariz.	VICE-PRESIDENT
WM. T. BROWN, Prescott, Ariz.	TREASURER
W. M. CLAYPOOL , Prescott, Ariz.	SECRETARY

Allen Hill,

DIRECTORS

Hon. John S. Jones	Prescott, Arizona
Wm. H. Fisher	Columbus, Ohio
Edward B. Sperry	New York City, N. Y.
David A. Jones	Cheyenne, Wyoming
W. M. Claypool	Prescott, Arizona
Wm. T. Brown	Prescott, Arizona
Harry Brisley	Prescott, Arizona

Bank of Arizona, Prescott, Ariz., Depository.

PRESCOTT, ARIZONA
LIT. PROSPECT PRESS
1901

A Golden Opportunity

About Incorporation

THE Jessie Mines Company is incorporated under the laws of Arizona with a capitalization of \$2,500,000 in 2,500,000 shares of a par value of \$1.00 each, fully paid and non-assessable. Five hundred thousand shares of the company stock have been set aside as preferred stock to be sold as the money may be required for necessary expenditures and to provide a working capital to pay for the equipment of the company's properties with larger and more economical mining and reduction plants, and to open its mines on a much more extensive scale; thus insuring much larger returns than have been possible hitherto

It is the purpose and intention of the company to sink an entirely new working shaft to a depth of 1000 feet at once, and this shaft will be of dimensions sufficiently large to permit the hoisting of, at least, 500 tons of ore daily. The hoisting machinery and the milling plant, (200 tons daily capacity at first), will be of the most modern type and the best that money can procure.

The five hundred thousand shares set aside for sale have been preferred upon the following conditions:

After all contemplated improvements have been made, and the properties placed on a larger profit producing basis, 10 per cent. of the net earnings will be placed in a sinking fund to reimburse the holders of such preferred stock for the amount actually paid to the Company as the original price of the stock, AND WITHIN THREE MONTHS AFTER THE CONTEMPLATED PLANT IS IN OPERATION, THE COMPANY WILL BE IN A CONDITION TO PAY ITS STOCKHOLDERS A REGULAR DIVIDEND OF AT LEAST THREE PER CENT. FOUR TIMES A YEAR.

The Company has purchased the four mines known as the Mt. Elliot group, has paid the purchase price in



Prescott: Gem City of Arizona

stock and now holds the legal title to the group. It has also arranged to purchase the Little Jessie, Little Grace and Ella mines, upon a stock and money consideration.

Something to be Noted

With the additional underground developments and the substitution of larger and better mining and milling facilities for those in past use, a tremendous saving in labor and of ore values will be made. This saving will not only be possible from ores of the same grade that have heretofore been classed as milling ores, but also from the many thousands of tons of lower grade that could not be profitably handled except when mined and milled on a large scale, and have, in consequence, been thrown on the dumps as waste, though they contain values which will be termed high grade when conditions have been changed to meet the requirements as in the plans now outlined.

Forty thousand tons of so-called "waste," which all carries paying values, have accumulated on the dumps of

these properties and it can all be utilized at a handsome profit, when the contemplated improvements have been made. In addition to this there are in the old stopes, above the 500-foot level and in sight elsewhere within the limited openings in the Little Jessie mine alone, more than 100,000 tons of this same character of ore, making in all, aside from the large bodies of high grade milling and shipping ores standing unbroken in the mine, 150,000 tons of ore that will yield a profit available when the projected new plants are in operation.

Concerning the Mine

In view of the fact that the Little Jessie mine alone has produced more than three-quarters of a million dollars from high grade milling and shipping ores only, it requires no stretch of the imagination to see the immense possibilities of these properties as profit producers when properly equipped and developed.

In all Arizona there is not a gold mine that has produced an equal amount of money from the same

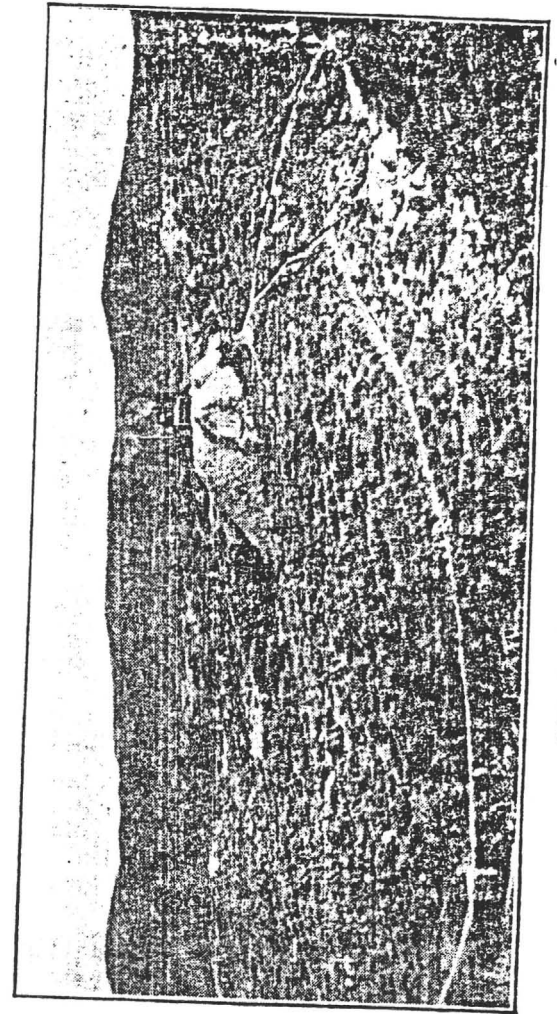
amount of underground openings as the Little Jessie mine. Its splendid record is a proverb among all who are familiar with its history.

When we consider that it is but one of seven claims, through all of which there are more than two miles of a vein system, and all of it mineral bearing, we can have but a slight conception of the immense store of wealth now hidden from view, and its disclosure only awaits the magic touch of the intelligent and practical miner, backed by sufficient capital to carry out the plans in contemplation by the Jessie Mines Company.

Facts on Finance

Confining our calculations and estimates to the Jessie line of mineral, which passes through the full length of the Little Jessie, Ella, and Little Grace claims, we can closely approximate the results of operations in the near future, on a basis of 200 tons daily output.

The estimates given will convey to the reader a fair idea of what those results will be. In giving these esti-



Little Jessie Shaft, Hoist and Dump of Ore

mates we have ignored all the highest grade or shipping ores, leaving them out of our calculation, and will place the average milling grade at much less value per ton than any yet passed through the mill.

Up to the present the milling ores have averaged much more than \$16.00 per ton, 30 per cent of which has been lost by an inferior milling plant, impossible to remodel or improve by any expenditure, as it was adapted neither in design nor construction for the purpose.

We will place the average value at \$12.50 per ton, and safely assume that our larger and more modern plant, when ready for operation, will save 90 per cent of the values instead of 70 per cent as hitherto. With the output at 200 tons daily, instead of 15 tons as has been the case up to the present, our daily operations will appear as follows:

200 tons, carrying \$12.50 per ton.....	\$ 2,500
Less 10 per cent loss in tailings.....	\$250
Less \$2.00 per ton, cost of mining,....	400
Less \$1.50 per ton, cost of milling,....	300
Less \$25 per day for repairs.....	25
Total cost per day.....	\$975
Total daily profit.....	\$ 1,525
Total monthly profit.....	\$45,750

Were it desirable to present a more favorable showing than the above, we could include the shipping grades in our estimates. The output of ore of a shipping grade, running from \$100 to \$300 per ton, has never, so far, been less than 2 per cent of the total tonnage, and if the receipts from this source were added to above statement it is readily seen that those figures would be greatly augmented, and that our estimate is very conservative.

The Little Jessie mine has paid from the very grass roots to its present greatest depth. A most significant feature of this mine is that not a foot of the vein so far opened has proved barren, and the very best ores yet encountered were in the lowest workings.

The Mt. Elliot Group

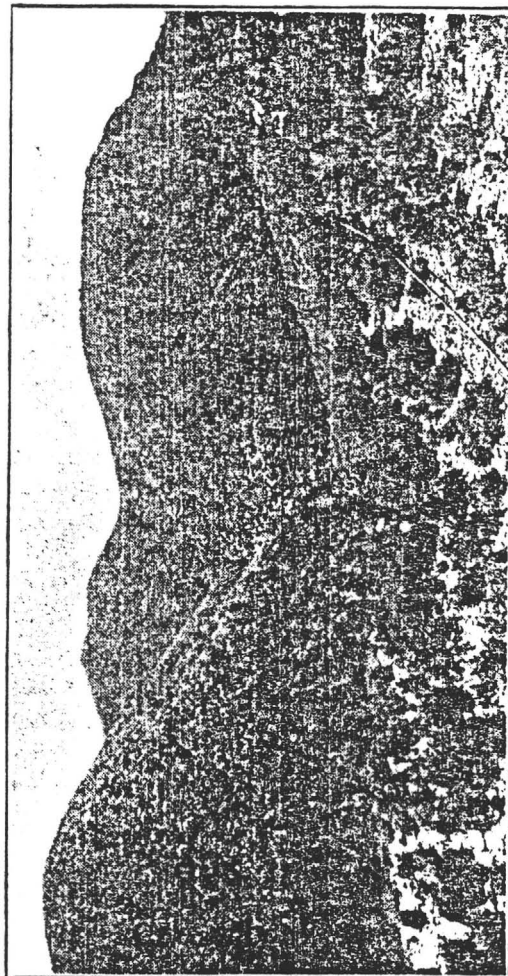
The Mt. Elliot group covers a very large and promising vein, carrying copper and gold in paying quantities. The vein outcrop and general surface indications are such as to convince any practical mining man, that

with sufficient development it will prove a splendid property.

Transportation

The mining district in which the properties belonging to the Jessie Mines Company are located, is one of the most prominent in Arizona and the most easy of access. A railroad (the Prescott & Eastern railroad) passes within four miles of the company's mines, and an extension of this road, now constructed, passes within one and one-half miles of the main works of this company. The beautiful city of Prescott is but eighteen miles from our mines. It is the source from which all mining supplies for the entire district are obtained, and is, in fact, the best market in the territory for such supplies. Transportation facilities between the two points are of the very best, as in addition to the railway there are several first-class wagon roads which afford ingress and egress to all the other mining districts in Yavapai county as well as Prescott.

There are no desert lands in any direction, nearer than seventy-five miles from these mines, as the Big



Mt. Elliot Group, of Jessie Mines Company

Bug district lies just on the western fringe of the largest belt of pine timber in the whole United States, and in the matter of climate northern Arizona stands unrivaled.

Officers and Directors

As now constituted both the official staff and directory board of the Jessie Mines Company are filled by men of the highest character and business ability.

Our president, the Hon. John S. Jones, is well known all over the territory and has a personal and business record without a stain.

The vice president, Mr. Harry Brisley, is the president of the Brisley Drug Co. of Prescott and Phoenix, who has by twelve years residence in the territory and by his business sagacity and unswerving honesty accumulated the wealth he so richly deserves and the respect and confidence of all who know him.

The company's treasurer is Mr. Wm. T. Brown of Prescott, of the old and reliable firm of Brown Bros., who carry on one of the largest merchan-

dising enterprises in Arizona, and which is the most intimately associated with the business of mining, viz.: hardware and mining machinery and supplies. Mr. Brown is a man of substance and stands among the highest for business ability, integrity and fair dealing.

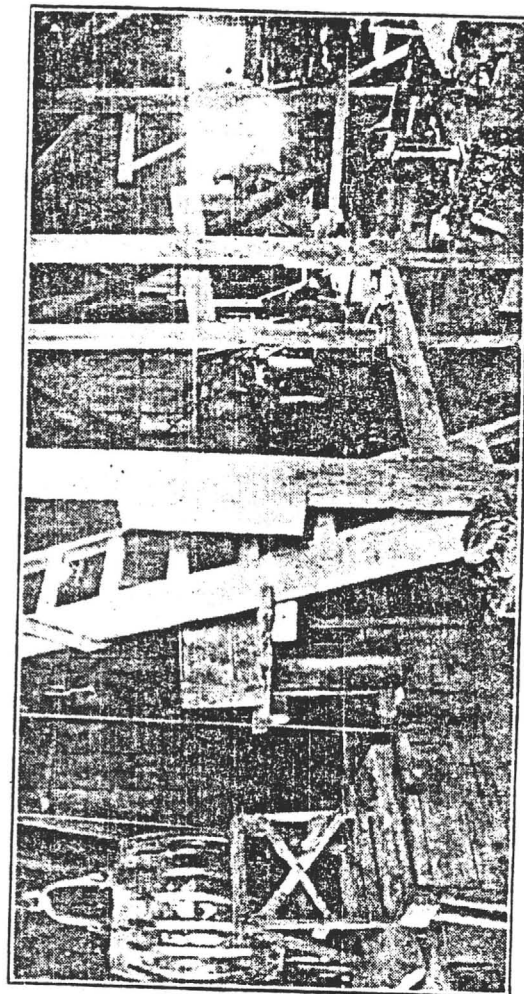
The secretary of the company, Mr. W. M. Claypool, is exceptionally well fitted for his position, being the Arizona agent of the American Smelting and Refining Company and having, perhaps, bought and sold more ore than any other three men in the territory. Mr. Claypool is a technical graduate in mining and metallurgy. He has done business in Arizona twenty years, and in that time has built up a reputation beyond criticism; due altogether to innate honesty, technical and business ability and dogged determination.

Mr. David A. Jones of Cheyenne, Wyo., is one of our directors. Mr. Jones is a brother of the company's president and is chief clerk of the motive power and car department of the Union Pacific railroad, with headquarters at Cheyenne, Wyo. With the exception of a brief period spent as chief clerk of the quartermaster's

department in Cuba during the Spanish-American war, Mr. Jones has been twenty years with the U. P. railroad company. He is held in the highest respect by all who know him, both for his good business qualifications and the many other qualities that go to make up the man we all admire and respect.

Mr. Wm. H. Fish of Columbus, O., is another director of the Jessie Mines Company. He is a member of the Fish Stone Co. of Columbus, O., and a man of large means and wide business acquaintance. Mr. Fish has been so successful and extensive a contractor of large public and other buildings in the east, and so well known as an honorable and conspicuous man of affairs, that the mention of his name as an interested party in, and a director of, the Jessie Mines Company is sufficient guarantee of his faith and confidence in the promises held out by the company and his belief in the great value of its properties.

Mr. Edward B. Sperry of New York city is also a director of our company. He is a man of means and prominence in business circles in the east, being connected with one of its leading in-



Interior Little Jessie Hoist

dustries. Possessing a high sense of honor and integrity as well as being considered a business man of more than ordinary ability, no assurance from us is necessary to prove to the reader and contemplating investor that Mr. Sperry has thoroughly satisfied himself of the value of our properties and of the certainty of great profits in the future from our mines before becoming a stockholder and director of the company.

Eminent Opinions on the Mines

During the early part of 1899 Mr. A. W. Warwick, F. C. S., London, Member American Institute Mining Engineers, and Montana Society of Engineers, made an exhaustive examination and report on the condition of the Little Jessie mines, and we will quote extracts from that report, which are as follows:

"During the time the property has been operated very large sums have been realized from the workings. The shipping returns have been gone through and from them it can be seen that \$615,000 have been realized, partly in bullion and partly in ore shipments. When the plans are examined and the small amount of

ore extracted is considered, it will be realized that the ore is very rich. By far the greatest portions of the values received have come from the Little Jessie."

"The stopes which have been worked are packed with the filling of the vein, and this packing consists of ore broken down and ready for milling."

"Taking the mine level by level, the outlook at the bottom of the shaft is better than at the upper levels."

"The total amount of ore in sight is 153,410 tons."

Prof. John F. Blandy, ex-territorial geologist, in commenting on Mr. Warwick's report says:

"I fully endorse all he has said, and consider his estimates rather conservative."

A matter worthy of attention is the fact that the Little Jessie gold mines have always been open for the instruction of students in mining, or for the matter of that to the public generally, expert or otherwise, if curiosity prompted them to view so celebrated a mine; no fears being ever entertained by the owner that any visitor might discover conditions in the ore bodies and their values upon which an adverse report might be based.

Mr. W. M. Claypool, who handled part of the shipping ore and concentrates, writes as follows:

"Gentlemen—In reply to your request for copies of shipments made from your Little Jessie mine through our sampling works here, I will state that approximately \$100,000 has been paid for that product.

"The ores and concentrates have ranged in value from \$60 to \$250 per ton, although several small shipments have gone from \$50 to \$1,000 per ton."

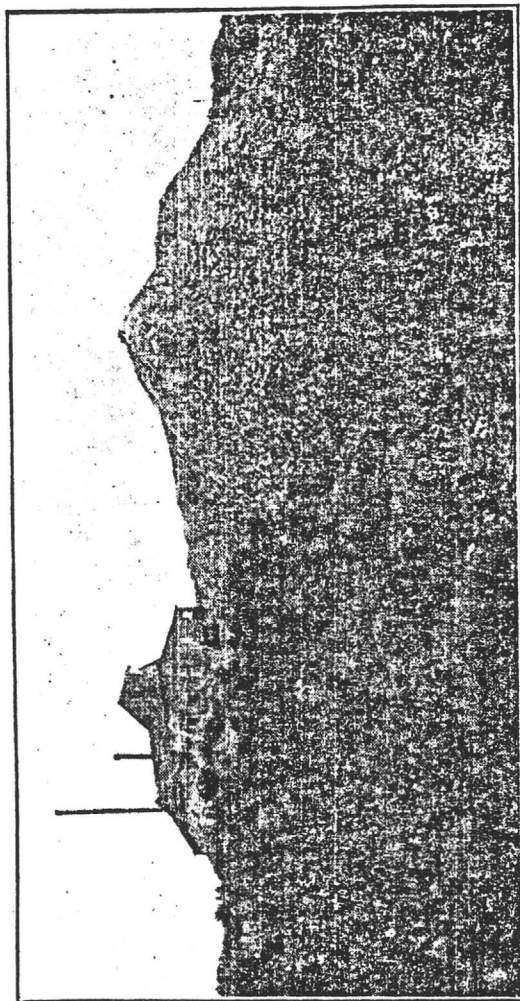
Mr. F. L. Wright, who at one time had a lease on a part of the Little Jessie mine, (from which he made a fortune), and who now is principal owner of the Prescott Electric Light and Power system, furnishes us with the following data regarding the values of ores extracted during his lease, which we quote:

November 14, 1901.

Jessie Mines Company:

Gentlemen—In answer to your inquiry as to the value and amount of ore taken out of the Little Jessie mine while working it under lease, will say:

In August, 1891, Mr. A. L. Butler and myself took a lease on the above mentioned property; at that time very little development work had been done. We worked on a small scale for about one year, taking out approximately \$40,000. At the expiration of this lease I renewed the same for one year longer. In that time I took out 1,100 tons, the average being \$99 per ton. Two hundred tons of this ore was assorted and shipped to Denver, Colo., and other smelters. The value of this shipping ore



Showing Ore, Little Jessie Mine

ranged from 15 to 20 ounces gold per ton, the balance of ore being worked by mill near the property. Yours respectfully,

F. L. WRIGHT.

The Bank of Arizona has the following to say in regard to the business and moneys that have passed through their hands to credit of the Little Jessie mine:

BANK OF ARIZONA,
Prescott, Arizona, Nov. 22, 1901. }

Hon. John S. Jones, Chaparral, Arizona:

My Dear Sir:—As per your request of recent date, we have overhauled our books to discover the amount of bullion and proceeds of concentrates that passed through our hands, coming from the Little Jessie mines.

We are not able to tell from our records whether all the sums credited to the mines were from bullion or concentrates, but we do know that the sum of \$321,939.84 was from such a source. This was previous to May 23, 1898.

Are inclined to think that this is much below the total handled, but it is as near as we can come to it. Very truly yours,

M. B. HAZELTINE, Cashier.

Investors' Opportunity

In view of the foregoing statements of facts devoid of all fancy, we are now offering for sale a portion (100,000 shares) of the preferred stock.

When these are exhausted another block of 100,000 shares will be put on the market. It will require \$250,000 to pay for all the expenditures planned, and we believe that less than 400,000 shares of the preferred stock will realize that sum of money, as it is more than probable that the third block of 100,000 shares to be offered for sale will sell above par value.

Applications for stock or requests for information should be addressed to

JESSIE MINES COMPANY,
Chaparral P. O.,
Yavapai County,
Arizona, U. S. A

*Home Lake Mining
Sand Lake M.
I.C. Mest*

METALLURGICAL REPORT

on

UNION - JESSIE ORES

by

H.H. Montgomery, E.M.
Metallurgist.

PRELIMINARY REPORT 18/7
ON
MILLING BY FLOTATION CONCENTRATION 20/11
AT

THE UNION MILL OF THE SOUTHWEST MINES DEVELOPMENT COMPANY
HUMBOLT-----ARIZONA

57/29
12/18

The purpose of the following tests is to determine the best group of combinations of flotation reagents for use on the dump ores of the Jessie Mine and to extract the greatest possible amount of the values in gold at the least possible cost per ton of ore.

TEST NO. 1

The purpose of this test is to show in which sizes the lost values occur.

TAILINGS ASSAY GOLD .046 oz.

WEIGHT OF SAMPLE 566 Grams. Containing 26.1788 mgs. gold

SCREEN	PERCENT	ASSAY GOLD OZ.	MGS GOLD
On 80 mesh	12.06	0.10	6.830
On 100 mesh	11.58	0.05	3.375
On 150 mesh	20.49	0.145	5.216
On 200 mesh	7.69	0.08	2.682
Thru 200 mesh	48.18	0.03	8.175

Flotation reagents used.

5% Amyl Xanthate, 60 cc per minute.

Soda Ash, $\frac{1}{2}$ lb. per ton ore.

Pine oil, 0.02 lbs per ton ore

Ratio of concentration 21.15 tons to one
recovery % 78.00

Head assay oz. gold 0.20

Concentrates 3.555

Tails 0.046

Remarks:- From the above it will be noted that 59% of the lost values are in the material that will not pass thru 150 mesh and 69% of the values lost are in the material that will not pass 200 mesh. Therefor I conclude that finer grinding must be practiced.

TEST No. 2

Flotation Reagents Used:-

5% Amyl Xanthate, 60 ccs per minute

Soda Ash, $\frac{1}{2}$ lb per ton ore

Copper Sulphate 60 cc Sat Sol per min.

Pine Oil 0.02 lbs per ton ore

ASSAYS;

Heads ----- 0.20 oz gold -- Ratio of concentration 33:1
 Concentrates 5.96 oz gold -- Recovery % 89.3
 Tails ----- 0.022 oz gold -- Screen analysis 77% thru 200 mesh

REMARKS; This test with finer grinding and the addition of Copper Sulphate as an activator shows a decided improvement over test #1. This test was run for a period of three hours when I increased the amount of Amyl Xanthate to 120 cc per min and continued the test with the other reagents the same as above for another period of three hours with the following results;

TEST #3

Flotation reagents used:

5% Amyl Xanthate, 120 cc per min.
 Soda Ash, 1/2# per ton ore.
 Copper Sulphate 60 ccs sat. sol. per min.
 Pine oil, 0.02 per ton ore.

Assays; on sample used;

Heads ---- 0.18 oz gold -- Ratio of Concentration 33.9 : 1
 Coantrates 6.44 oz gold -- Recovery percent 91.8
 Tailings 0.015 oz gold -- Screen analysis 77% thru 200 mesh

REMARKS:- This test indicates that better results are obtained by feeding about 0.40 lbs per ton ore of Amyl Xanthate, or approx. 7¢ per ton of ore for this reagent.

The following tests were run with the idea in view to better the recovery with coarser grinding.

TEST # 4

FLOTATION REAGENTS used:

5% Amyl Xanthate, 60 cc per min.
 Soda Ash, just pink to phenolphthalene.
 Copper Sulphate, 60 cc sat. sol. per min.

ASSAYS:-

Heads 0.26 oz gold -- Ratio of concentration 27.4 : 1
 Concentrates 6.34 oz gold -- Recovery % 88.8
 Tailings 0.03 oz gold -- Screen analysis 73% thru 200 mesh

Remarks:- This test is practically a duplicate of test #1, with the addition of Copper Sulphate as an activator which increased the recovery 10.8% on a 4% coarser grind. Indications are that if the Xanthate is increased to 120 cc per min., that the recovery will be greater than 91.8% as shown in test #3.

RECOMMENDATIONS:-

That the above tests #3,4,5,& 6 be repeated, and that they be run for periods of not less than six or eight hours each and that the grind be kept as near as possible to 75% thru 200 mesh screen. Special attention should be given to test #6, as it promises to give the best results at the lowest cost for reagents.

RESULTS OF FINAL TESTS
ON
MILLING BY FLOTATION CONCENTRATION
AT
THE UNION MILL OF THE SOUTHWEST MINES DEVELOPMENT COMPANY
HUMBOLT, ARIZONA

The following tests were made for the purpose of checking the results obtained in the preliminary test work. The preliminary test covered a period of only two hours each mill run, while these tests, which are the combinations of those flotation reagents which gave the most promising results in the preliminary test work, were carried over a period of six hours each, as an actual mill run under local conditions.

FINAL TEST #1

Flotation reagents used;

5% sol. Amyl Xanthate, 60 cc per min.
Soda ash, $\frac{1}{2}$ # per ton ore
Copper sulphate, 60 cc sat. sol. per min
Pine oil, 0.02 # per ton ore

ASSAYS;

Heads;	0.13 oz gold	Ratio of concentration	63.15 : 1
Concentrates	8.36 oz gold	Recovery %	87.69
Tailings	0.02 oz gold	Screen analysis	86% thru 200 mesh

FINAL TEST #2

Flotation reagents used;

5% Solution Amyl Xanthate, 60 cc per min
Soda Ash $\frac{1}{2}$ # per ton ore
Copper Sulphate 60 cc per min sat. sol.
301 reagent, 5% sol 60 cc per min
Pine oil 0.02 # per ton ore

Assays;

Heads;	0.17 oz gold	Ratio of Concentration	46.15 : 1
Concentrates	6.04 oz gold	Recovery percent	73.98
Tailings	0.04 oz gold	Screen analysis	85.5 thru 200 mesh

FINAL TEST #3

Flotation reagents used;

5% sol Amyl Xanthate 30 cc per min
 5% sol Aeroflot 60 cc per min
 Soda ash $\frac{1}{2}$ # per ton ore
 Copper sulphate sat sol per min
 Pine oil 0.03 # per ton ore

ASSAYS;

Heads 0.235 oz gold Ratio of concentration 39.45 : 1
 Concentrates 8.040 oz gold Recovery % 95.78
 Tailings 0.0125 oz gold Screen analysis 84.8 % thru 200 mesh

SPECIAL TEST # 4

The purpose of this test was to determine the action of reagent #301 in the circuit while using the final test #3 combination of reagents. 30 cc per minute, 5% sol reagent 301 was added to the circuit. The test covered a period of 2hrs only.

Reagents used; same as 3# plus 30 cc 301 per min.

ASSAYS;

Heads 0.285 oz gold Ratio concentration 21.6 : 1
 Concentrates 5.900 oz gold Recovery % 95.78
 Tailings 0.0125 oz gold Screen analysis 84.8 thru 200 mesh

Remarks; The addition of 301 reagent to the circuit as shown in all tests, lowers the grade of concentrate, without increasing the recovery percent.

CONCLUSIONS

Final test #3, confirming the preliminary test, using amyl xanthate and aeroflot combination with the other conditioning and frothing reagents, seems to be the ideal for use on this ore.

SUMMARY

The following data was taken from the engineering report and examination of the underground workings of the Jessie Mine, by A.W. Warwick, member of the Montana Society of Engineers, which shows the ore that is "Blocked Out" and contained in the "stope fills" and "dumps" of the mine as follows;

KIND	TONS	VAL PER TON	TOTAL VALUES
Porphyry	111,275	6.80	757,225.00
Quartz	2,135	37.30	79,675.00
Dump	40,000	6.80	272,000.00
Total	153,410		\$ 1,108,900.00

RECOVERY PERCENT 90%
TOTAL RECOVERED VALUE

\$ 998,010.00

ESTIMATED RATIO OF CONCENTRATION ----- 30 to 1

COSTS

Estimated cost of mining per ton	-----	\$2.00
" " " milling " "	-----	1.00
" " " marketing " "	-----	0.30
" " " overhead " "	-----	0.20

Total cost mine ore per ton	-----	\$ 3.50
RIMK Less cost of mining	-----	2.00

Total cost dump ore per ton	-----	1.50
plus delivery to mill	-----	.35

OR \$ 1.75

Mine ore: Total , 113,410 tons at \$3.50 per ton--	\$398,935.00
Dump ore: Total, 40,000 tons at 1.75 per ton--	70,000.00

TOTAL COST OF PRODUCTION	\$ 466,935.00
--------------------------	---------------

TOTAL PROFITS OR BALANCE	\$ 532,075.00
--------------------------	---------------

That there are 40,000 tons of ore on the surface, in the Jessie dump, available for milling purposes. The average assays of the material milled during the test periods, shows it to carry gold values of at least \$4.28 per ton, and that over 90% of this value is recovered by flotation concentration. This material, alone, should yield a total of over 80,000 dollars clear profit.

Undoubtedly there are many thousands of tons of ore in the mine of higher values than this dump material and it will present a problem of recovery of the values that will be much more easily solved than that of the dump material owing to the highly oxidized condition of the latter. The mine ore freshly broken will be much more easily treated and much better recovery can be expected.

More power is needed in the mill so that it can be loaded up to capacity. It is running slow at the present time. With larger power plant installed, it will easily handle 50 tons to 60 tons of ore per 24 hrs.

With the addition of proper handling equipment for the dump material, and a good, reliable power plant for the mill, at a very small outlay of additional capital, it should be made to pay at least \$100 per day net profit from the operation.

CONCLUSIONS :

When one considers the possible and probable ore in the mine that is available and can be made available, figures assume a staggering proportion.

I consider that the metallurgical problem is solved and that when the mill is put in proper running order it can be made to pay a very handsome profit in addition to the costs of repairs to the mine, so that it can be opened up.

I consider this a proven mining venture that will continue to pay large dividends for many years to come.

Respectfully submitted

(signed)

H. H. Montgomery
METALLURGIST

COPY

Vol. VII, No. 2

February 15, 1936



University of Arizona Bulletin

ARIZONA BUREAU OF MINES

ARIZONA METAL PRODUCTION

By

MORRIS J. ELSING AND ROBERT E. S. HEINEMAN

ARIZONA BUREAU OF MINES, ECONOMIC SERIES NO. 19
BULLETIN NO. 140

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3,687
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6,592,445

APPROXIMATE PRODUCTION OF YAVAPAI COUNTY BY MINES					
	Copper (pounds)	Lead (pounds)	Gold (value)	Silver (value)	Total value
Verde (Jerome) District					\$360,000,000
United Verde, 1883-1933	1,980,000,000	---	\$20,330,000	\$21,500,000	125,000,000
United Verde Ext., 1915-33	730,000,000	---	2,735,000	4,050,000	1,338,000
Verde Central, 1929-30	8,600,000	---	---	18,000	902,000
Copper Chief, 1916-23	---	---	530,000	372,000	345,000
Jerome Verde, 1900-1920	1,500,000	---	10,000	14,000	185,000
Equator, 1904-5	1,300,000	---	---	---	---
Total	2,721,400,000	---	\$23,605,000	\$25,954,000	\$487,770,000
Big Bug District					\$14,000,000
Blue Bell, 1896-1926	87,000,000	---	\$1,000,000	\$1,200,000	700,000
Lelan-Dividend, 1900-1931	400,000	600,000	500,000	100,000	225,000
Butternut	1,200,000	---	60,000	10,000	1,250,000
Henrietta (Big Bug)	---	---	1,200,000	50,000	3,000,000
McCabe-Gladstone, 1880-1926	1,200,000	500,000	2,200,000	600,000	1,000,000
Little Jessie, 1867-1915	---	---	950,000	50,000	750,000
Poland, 1900-1912	---	1,000,000	300,000	400,000	350,000
Silver Belt, 1870-80	5,000	1,000,000	50,000	300,000	100,000
Iron King	---	---	---	50,000	115,000
Arizona National, 1921-26	---	---	150,000	60,000	150,000
Union	---	---	100,000	---	100,000
Sterling, 1900-1920	---	400,000	---	50,000	70,000
Merchants Home	---	---	40,000	---	40,000
Mesa, 1900-1910	100,000	150,000	8,000	20,000	50,000
Pocahontas, 1906-21	100,000	---	5,000	---	20,000
Hackberry (Boggs), 1930-31	---	---	---	---	---
Total	70,005,000	4,650,000	\$6,563,000	\$2,890,000	\$21,920,000
Hassayampa District					\$40,000
Howard (Harlan), 1900	---	---	\$40,000	---	200,000
Blue Dick	---	---	25,000	\$175,000	25,000
Buzzard	---	---	20,000	25,000	220,000
Dos Oris	---	---	150,000	200,000	200,000
Davis Dunkirk, 1874-1930	---	---	500,000	30,000	530,000
Senator, 1883-99	---	---	200,000	---	200,000
Cash, 1900-1925	---	500,000	200,000	25,000	250,000
Crook, 1902-25	---	---	125,000	25,000	150,000
Mt. Union	---	---	200,000	---	200,000
Oro Flame-Sterling	---	---	10,000	---	10,000
Jersey Lily	---	---	100,000	---	100,000
Venezia	---	500,000	75,000	---	100,000
Starlight	---	500,000	---	50,000	75,000
Consolidated Bodie	---	---	100,000	---	100,000
United Gold	---	---	75,000	25,000	100,000
Storm Cloud	---	---	---	100,000	100,000
N. C. 4	---	---	---	---	---
Total	---	1,500,000	\$1,820,000	\$705,000	\$2,600,000
Pine Grove District					\$104,000
Wildflower, 1917-19	400,000	---	\$15,000	\$30,000	1,200,000
Crown King, 1893-1922	---	---	1,100,000	100,000	135,000
Lincoln, 1902-8	---	---	100,000	35,000	200,000
Del Pasco	---	---	200,000	---	100,000
Philadelphia	---	---	100,000	---	---
Total	400,000	---	\$1,515,000	\$165,000	\$1,739,000

Hubert Work, Secretary

U. S. GEOLOGICAL SURVEY
George Otis Smith, Director

Bulletin 782

ARIZONA
BUREAU OF
ORE DEPOSITS
JEROME AND BRADSHAW MOUNTAINS
QUADRANGLES, ARIZONA MINES

BY

WALDEMAR LINDGREN

WITH STATISTICAL NOTES BY

V. C. HEIKES



WASHINGTON
GOVERNMENT PRINTING OFFICE

1926

the south by the dike, but where they pass through this dike the ore seems to be, in part at least, of normal grade.

There are five ore shoots along the vein, each of which has a slope length of 200 to 500 feet. At least two of the shoots appear to reach the 1,100-foot level in the Gladstone mine. These shoots pitch steeply toward the west. The average width of the ore is somewhat less than 1 foot; the vein averages $3\frac{1}{2}$ feet in total thickness.

The ore contains quartz, which is rather massive but is drusy in places. Jaggur and Palache say that it is distinctly banded, the sulphides occupying the central part of the fissure. There are considerable amounts of sulphides, mainly pyrite and arsenopyrite, with a little sphalerite, galena, and chalcopryrite. The presence of tetrahedrite is suggested by the analysis. The analyses of the shipping ore and the concentrates are about alike and run somewhat as follows:

Average analysis of shipping ore and concentrates from McCabe-Gladstone mine

Silica	per cent	31.4
Copper	do	2.0
Lead	do	2.1
Zinc	do	4.7
Iron	do	24.6
Arsenic	do	3.9
Antimony	do	1.0
Sulphur	do	20.4
Gold	ounces per ton	1.6
Silver	do	10.2

The mill concentrates contained in 1907, for instance, 1.1 ounces of gold and 4.1 ounces of silver to the ton. The ore is said to contain also some bismuth.

PROPERTIES NEAR THE GLADSTONE

The Gladstone is adjoined on the southwest by three claims—the Gladstone Western Extension, Little Kicker, and Rebel. These lie in a wedge of schist included in quartz diorite and have not been worked for many years. Jaggur and Palache say that the Rebel vein occupies a zone of brecciation in quartz diorite or alkali granite and contains largely gold in sphalerite, galena, and pyrite; quartz and dolomite form the cementing matrix.

There are many other properties on the divide between Galena Gulch and Chaparral Creek. Among them the Little Jessie, Dividend, and Lelan are the best known. The Jessie, which at one time was consolidated with the Union, was worked more or less continuously from 1903 to 1915. Up to 1903 it is said to have had a total production of \$750,000. Between the 500 and 600 foot levels

much high-grade auriferous pyrite was encountered. The shaft is 639 feet deep. The ore contains from \$10 to \$20 in gold to the ton and very little silver.

The Dividend and the Lelan were worked more or less from 1900 to 1914. They are provided with a 10-stamp mill, which is reported to be dismantled. The ore production is probably at least 10,000 tons, containing from half an ounce to 3 ounces of gold to the ton. The ore contains also a little silver and some copper and lead.

All the veins mentioned above have an east-northeasterly strike. Going north from the McCabe one crosses successively the Little Jessie, Dividend, Paymaster, and Lelan or Union veins. The Little Jessie is about 1,700 feet south of the Union vein. The Lelan and Dividend properties are owned by Judge Wells, of Prescott.

UNION MINE

The Union mine was in active operation in 1922 by the Union Consolidated Mines Co., R. C. Kaiser, in charge. It is claimed that the Little Jessie and Union properties when consolidated had a total production of \$800,000. The present workings are in the upper part of Chaparral Gulch at an altitude of about 5,000 feet. There is a 50-ton flotation mill on the property.

From McCabe up to the Union mine the country rock is a fissile amphibolite. At the Union mine the principal rock is sheared Bradshaw granite, but the Yavapai schist is not far away.

The property is developed by a 1,200-foot tunnel that penetrates the ridge. The main portal and the mill are on the north side. The Union vein, which is the northeast continuation of the Lelan vein, is cut about 200 feet from the north portal, and drifts have been run upon it for 800 feet toward the southwest and a shorter distance toward the east. A shaft has been sunk from the tunnel level at a point 500 feet west of the crosscut to a depth of 200 feet, but so far only one level, 77 feet below the tunnel, has been opened from this shaft.

The vein strikes about N. 70° E. and dips steeply southeast. In places the quartz is 10 feet thick. It is followed by a basic dike about 4 feet wide; evidently the dike is intruded in the vein and it may be found on either side of the vein. It is fresh and nonmineralized except for some films of pyrite on the contacts.

The ore consists mainly of massive glassy quartz, as much as 10 feet thick, with irregularly disseminated pyrite, arsenopyrite, sphalerite, and galena; the quartz is not drusy and not banded. The gold is not free except in the oxidized zone. On the tunnel level and on the 77-foot level the ore shoot is cut and is said to be 250 feet long and to pitch about 30° SW.; ore has also been found in the northeast

face of the 77-foot level. The lower limit of ore is said to be about \$10 a ton.

Near the north portal the Blaine vein has been intersected; here it is close to the Union vein but toward the east it diverges. It strikes N. 50° E. and has a steep northwest dip. This is a narrow vein with dolomitic gangue; in places it carries a 6-inch streak on the footwall with partly oxidized tetrahedrite, said to contain 150 ounces of silver to the ton. Evidently the Blaine vein differs in age from the Union vein, and probably it is much younger.

PROPERTIES ON BIGBUG CREEK NEAR PROVIDENCE AND POLAND

The general southwest strike of the McCabe and Chaparral vein systems carries them toward the headwaters of Bigbug Creek. At Providence and Poland there has been considerable activity in the past. Very little work was done in 1922. Repairs were made on the old track from Poland Junction to Poland and on the 11,000-foot tunnel that traverses the ridge to Walker to form an outlet for the ores of that district. The wagon road up Bigbug Creek to Poland had been allowed to go to ruin, and Poland was accessible only by trail. This is a striking example of the decay of the district.

Up Bigbug Creek a small area of quartz diorite is crossed about a mile below Providence; here the rock is darker than elsewhere and shows uneven grains. Near the east contact is a dike of "quartz porphyry" mineralized to some extent and showing copper stains. The ore is of low grade, and there are few developments. On the west side of the quartz diorite the country rock is a blocky greenstone, showing agglomerate structure in places and only slight schistosity where exposed in the creek bed. On the slopes the rocks show much more clearly the inherent schistosity.

Providence has the sad aspect of a practically defunct mining town, though at one time it evidently presented a scene of great activity.

A number of claims on veins striking east-northeast lie on the south side of the gulch. Among them are the Sterling and the Seventy-nine. The Sterling vein is stated to have yielded a considerable amount in bunches of gold-silver-copper ores, and is developed to a depth of 400 feet. It is mentioned in the Mint report of 1886, when a gold mill was erected. The oxidized ores of many of these veins have been worked by arrastres, and this species of reduction plant is not wholly extinct in the vicinity. At present the most productive veins near Providence are the Mammoth-Belcher-Red Rock vein and the Fortuna vein.

The Fortuna, now the property of the Boone County Mining & Milling Co., strikes east-northeast and is about half a mile northeast of Providence, on the north side of the creek. It is parallel to the Red Rock vein and lies about a quarter of a mile east of it. The

Fortuna is developed by a shaft and several tunnels and has a 10-stamp mill erected about 1915. The vein is 2 to 3 feet wide and shows much drusy quartz and pyrite in good crystals. The center of the vein is in places filled by calcite, and the quartz is brecciated by it. This vein continues west-southwest down to a point near Bigbug Creek.

The Red Rock vein, on the slope above Providence, is contained in fissile weathered amphibolite schist. The vein, which follows the schist, strikes N. 35° E. and dips steeply southeast. It was worked about 1906 and is developed by several tunnels, all now more or less caved. On the Belcher claim, farther northeast, is a shaft 235 feet deep, which is tapped by the lowest Red Rock tunnel along the railroad track. Where seen the vein was 2 feet wide, was partly oxidized, and contained veinlets of drusy comb quartz with well-crystallized pyrite and some zinc blende. Most of the ore mined came from the oxidized zone, which is richer in free gold. It was reduced in an amalgamating mill with tables, still visible on the property. The primary ore is probably of low grade. It is reported to contain from \$4 to \$5 to the ton in gold.

From Providence to Poland, a distance of 2 miles, not much mineralization is seen. However, half a mile above Providence the road crosses a 30-foot dike of normal rhyolite porphyry, and a few feet away, in the schist, is a prospect on a silver vein, with manganese and barite.

On the slopes north of the road are two veins, the Postmaster and the Merchants Home, both striking northeast, which have been worked to some extent. Ore from the Postmaster was still lying on the platform of the Oriental custom mill, close by the road. This ore shows crusts of quartz crystals on which are deposited dark sphalerite, galena, and pyrite. Mr. Ed. Block, of Prescott, who operated the Merchants Home as the Merchants Mining Co., states that the shaft is 300 feet deep, with levels at 100, 165, and 240 feet. The ore carries mainly silver, and in places 2 feet of massive galena showed. On the 300-foot level the vein is said to have been 20 feet wide. In all, I am informed by Mr. Block, 1,000 tons of crude ore was shipped from the property. The Taylor property, close to the road, is of the same general type. The Lottie is another vein in this vicinity on which much shallow work has been done.

The Copper Dike property lies 2,000 feet west of the Merchants Home. According to Mr. Block this property is located on a copper-bearing schist belt 75 to 100 feet wide. Specimens show coarse amphibole, with some quartz, chalcocopyrite, azurite, malachite, native copper, and bornite. The property is developed by a 250-foot tunnel and a crosscut.

Near Poland the appearance of the country becomes attractive and picturesque. The forested slopes rise boldly on the south to the Bigbug basalt mesa, which attains an altitude of 7,000 feet; the summers are cool, and there are several little clearings with alfalfa and fruit. A switchback carries the railroad track up to the south portal of the 11,000-foot tunnel. Here the amphibolite borders against the somewhat schistose Bradshaw granite, through which the tunnel is driven. Just west of the portal a 75-foot dike of rhyolite porphyry crops out (p. 23), striking N. 30° E. The tunnel intersected several veins, which have been somewhat extensively worked.

The Poland vein was cut 800 feet from the south portal, and the Poland, Hamilton, and Belle claims are located on it. The Poland property is owned by the Murphy estate. Quartzose ore from this vein still lies on the dump. It shows drusy quartz crusts with pyrite and some sphalerite and galena. The vein strikes northeast and dips steeply northwest. A 20-stamp mill on the property was started in 1900 and worked intermittently until about 1912. In 1905 the output was about 75 tons of ore a day. In 1907 it is recorded as producing \$130,465 in gold and 16,609 ounces of silver. There has been a great production, probably mostly in silver; the value of the output is estimated at \$750,000. A shaft was sunk, it is said, to a depth of 325 feet below the tunnel level.

The Accidental vein, carrying gold, silver, and lead, is said to have been cut 500 feet from the north or Walker portal; from accounts this was similar to the Poland vein and was followed to a depth of 200 feet below the tunnel level. It had some production.

The old Mesa mine is on the slopes south of Poland. There is little to see there now, but it is stated that the ore worked in rastres yielded a considerable production of gold in the early days. It is now owned by Ed. Block, of Prescott. A 700-foot tunnel was driven by Mr. Block in 1904 and showed the vein 4 to 6 feet wide disturbed by basaltic dikes. The quartz was spotted but free milling, and the total yield from the deposits is said to have been about \$40,000. The gold was of high grade, \$19 to \$20 an ounce, and placer gravel was found below the vein. Evidently this vein is of pre-Cambrian age.

In the canyon above Poland are several veins, which have been prospected at intervals. They were not visited. The Blue Rock and Money Metals veins are 1 mile above Poland; the Express, a parallel vein, is half a mile above the town. Several of these veins have some ore production to their credit.

HENRIETTA MINE

The Henrietta mine, now belonging to the Big Ledge Copper Co., is an old-time property on the north slope of Bigbug Creek, where the stream turns from an easterly to a southerly direction. (See pl. 12, B.) It is about 4 miles north-northwest of Mayer. The old workings show on the upper slopes on the ridge, and much ore was extracted from them. This mine is the same that in the old Mint reports of 1883 and 1884 is referred to as the Big Bug mine, then the most prominent producing property in the country. The total production, mainly from the oxidized gold ores from the upper levels, is high. The vein, unlike most of the others in this district, strikes north, and dips about 70° W. There is also a spur striking north-northeast, called the Invincible. The Henrietta claim is continued northward by the Gopher, and these are the two principal claims.

The old developments consist of a shaft 500 feet deep sunk from the summit of the ridge at an altitude of 5,700 feet. The upper tunnel, at 5,480 feet, is about 1,800 feet long and traverses the ridge. The lower tunnel, at 5,150 feet, is 2,200 feet long, and near its end a vertical shaft is sunk to a depth of 600 feet, with levels extending a few hundred feet northward (fig. 9).

The northern extension on the Gopher claim is developed by several shafts, each a few hundred feet in depth, and these workings are almost entirely in the oxidized zone. The ore shoots appear to dip steeply northward. The main shaft at the end of the lower tunnel penetrates primary ore, and there are said to be stopes on the several levels (fig. 9) down to the 450-foot level.

The mine was worked extensively in early days, when the deep oxidized zone provided gold ore. It was also in operation from 1914 to 1919.

There is a 100-ton flotation mill on the property, consisting of a crushing plant, tube mills, and flotation cells, but this mill is reported to be dismantled since 1922.

In 1922 the property was idle. The present company has done most of the deeper development work.

To the manager of the company, Mr. W. W. Lytzen, I am indebted for much information.

The rock containing the vein is, according to Jaggar and Palache, a hornblende variety of the Yavapai schist, on the east side of a small area of quartz diorite. There seems to be much complication, however. Most of the rock is a dark fine-grained diorite or amphibolite, and massive rather than schistose. One specimen proved to consist of abundant quartz mosaic with irregularly distributed diop-

Box 27
Humboldt, Arizona.

June 1, 1932.

Mr. Homer P. Elliott,
906 Security Bank Building,
Charleston, West Virginia.

Dear Mr. Elliott:

Yours of May 28th came today. The only claims shown on the itemized list which do not appear on the map are the Ohio, ElCaney, Roosevelt, Teddy and El Tena. All of these claims are separate from the group shown on the map. The Ohio was not considered of sufficient value to keep and the others are held only for their value as a possible source of water. Two claims appear on the map that are not owned by us. They are the Independence and Columbia. The Little' Ore Mill Site, Atlantic, Pacific and Union Water Rights do not appear on the map for the reason that the above mentioned ones do not. A water right does not have boundaries, hence cannot be mapped.

Now as to the valuation I place on the property of \$250,000.00. My method of valuing this property is exceedingly conservative for the following reasons: First, a purchaser would not be paying out of his funds the full amount. After an amount not to exceed \$50,000.00 had been expended, the mine should pay its way and make all payments on the purchase price. The purchaser would have an investment of \$50,000.00 from which he should win earnings of not less than five times that amount in not to exceed four years time, from ores known to exist. This would not exhaust the future possibilities of the mine which would all belong to the purchaser.

In arriving at tonnage I have not considered any tonnage from any of the other claims and have confined myself to the Jessie alone. All the reports I have show more tonnage than I have shown which is 125,000 tons gross value \$8.00 per ton, or gross value of \$1,000,000.00. Mr. Warwick shows a gross value of \$1,555,000.00.

In reducing the ore I show to cash value I follow the general formula used by all engineers, and the Department of Internal Revenue in valuing mines. This general method is known as the Hoskold Method and is somewhat complicated. It presumes first that there is a willing buyer and seller. The gross value of the ore is first found, then the cost of mining, milling and marketing is found. This reduces the ore to a net value, from which is deducted taxes, county, state and Federal. After these items are determined the amount of return the buyer should expect is considered.

Amortization of Capital is its return with interest, at or before the time of exhaustion or death of the property. If there is to be a genuine profit, total operating profits must include an ultimate profit over and above amortization.

Amortization of property is usually affected by distribution of dividends, without discrimination between amortization of capital and ultimate profits. It is then the stockholders' responsibility to reinvest a sufficient proportion of the dividends to amortize the investment cost. On capital investment it is reasonable to allow 8% and in reinvestment of capital earnings 4%. Deduction of these items from net worth bring us the cash value of a mine and this is, in brief, the exact method used by the government in Washington in valuing mines. It is universally used by engineers, and if you care to submit this to any well informed Mining Engineers, you will find that I am correct.

Were I to use this method in valuing this property, the purchase price would be higher than it now is.

In arriving at cost my figures are as follows:

125,000 tons @ \$8.00 gross	\$1,000,000.00
\$1.50 per ton for mining	\$187,500.00
\$1.50 per ton for milling and marketing	137,500.00
\$0.50 per ton for additional equipment & development	62,500.00
\$0.50 per ton for taxes and unexpected contingents	<u>62,500.00</u>
	\$500,000.00

Leaving a profit of \$500,000.00 from which the purchase price of the property would be charged, and the net profit would be \$250,000.00 from an investment of not to exceed \$40,000.00. This from only one claim of the group.

The equipment and improvements are surely valuable as an adjunct to an operating mine and it would not be unreasonable to include them in any valuation.

In your letter you mention a probable life of the mine at from ten to fifteen years with the ore now available. On an average annual extraction of 30,000 tons of ore I can only see four years with the ore I show. It must be remembered that the extraction of these ores would not exhaust the mine's future. In my opinion the mine has not been touched as yet.

I have done my best to explain my position and hope that I have managed to make it clear.

We are going right ahead with the shaft at the Jessie. Yesterday and today we have been getting the compressor engine in shape to unwater the Union, and we started the water out this afternoon. We will keep right after it until the first level is unwatered which should take two more days.

My family is home now for the summer and it is a great joy to me to have them home.

Developments at the mine will determine whether or not we will be able to represent this State at the dedication of your State Capitol.

Please remember me to your boys, and with best wishes, I am,

Very truly yours,

WM. ALLEN NICKERSON.

The following pages are submitted
as representing the true conditions
of the property of the
UNION CONSOLIDATED MINES CO.,
Chaparral, Yavapai Co.,
Arizona.

April 18, 1924.

CONCLUSIONS

THE MINES and the undeveloped veins of Chaparal and contiguous gulches are true fissures.

THE MINERALIZED QUARTZ will be found at depth carrying higher values in silver, gold and copper than were mined from the upper levels.

THE ORE ZONE, or system of veins, extends through and beyond the claims.

THE ORE BODIES are in lenses of quartz. The lenses are due to a longitudinal faulting of the fissure walls. This indicates great depth.

THE ORE is found wherever the metal solutions found a channel way and the main channels were in the shattered primary quartz and schistose vein-filling.

THE QUARTZ LENSES HAVE PAY ORE ON ONE OR BOTH WALLS OF THE VEIN, and in all fractures or interstices of the primary quartz.

THE METALS are in gold, silver, lead and copper. The gold-copper ores will increase with depth and particularly in the veins that extend into the schists. It is reported that the pay ores have values from \$5.00 to over \$20.00 per ton with pay streaks of high grade rock.

THE LEAD ORE will have no value as lead. The silver will be recovered in the smelting but the lead will be lost.

THE TREATMENT OF THE ORE will be concentration from 10 or 15 to 1. The value of these concentrates has been proven to be \$75.00 to \$150.00 per ton.

MINING AND MILLING COSTS should not be more than \$6.00 per ton with 50 ton capacity.

THE EXTRACTION OF THE METALS should be above 85% of the total assay, less the lead.

There is available ore in the Chaparal District from the three developed properties to operate a mill of not less than 300 tons per day.

These properties should be operated under one competent management.

The water from each gulch should be conserved so that the above capacity may be attained the entire year.

The profits--judging from the past history--should be over \$4.00 per ton.

When a 300 ton mill is in operation the transportation of twenty-five tons of concentrates would warrant the consideration of the most economical means to get it to the smelter.

Future development should be done on each vein to open ore bodies--at which time the ways and means for mining and hauling can be determined.

The survey of the geological structure should be continued until the primary causes of ore deposition have all been mapped--as indicated under the heading "Geology".

When these steps of constructive progress and understanding have been considered and the ways and means decided on, and then carried out, this District will take its place as one of the prosperous mining centers.

But it will have to be under the guidance of men who have the ability to see large results from efficient business and engineering experience properly applied. It is altogether possible that such ability will find the great ore deposits outside of the Quartz Diorite intrusive.

It may be added that the Jessie and Lelan Mines are part of this ore zone and are, therefore, necessarily included in the geological summary of this report.

DATA RE THE UNION MINES

LOCATION of the Mines is at Chaparal, five miles west from Humboldt, Arizona, and four and one-half miles from the railroad siding.

ROADS are fairly good in dry weather. A new road of uniform grade is being built to avoid the steep grades of the old road.

CLIMATE. Operation of mine and mill may be carried on the entire year unless an unusual winter freezes all water, or an unusual drought should occur in summer.

CLAIMS are 18 in number, covering 325 acres.

TITLE. The claims are not patented but are held under the mining laws of location and subject to the annual assessment work which has more than been covered each year.

The title to all these claims is in the UNION CONSOLIDATED MINES CO., subject only to the payment of the balance of the purchase price.

THE PLANT EQUIPMENT. The equipment of the plant, when finished, will constitute a modern milling and concentration plant of over 50 tons capacity per 24 hours.

It can be doubled with a comparatively small increase in investment.

The equipment now on the ground or in place consists of the following:

- One sub-station with complete power connections from high voltage power line to three 50 K.W. transformers, with lightning arresters--all properly housed.
- One two-stage Sullivan Air Compressor.
- One blacksmith shop and tools.
- One 15 H.P. Electric Hoist.
- One double compartment shaft, heavily and well-timbered.
- Over a mile of narrow-gauge tracks from mine to mill.
- One gasoline locomotive with all-steel, roller bearing mine cars to haul ore.
- One 3" water main $1\frac{1}{2}$ miles long.
- One #5 Austin crusher.
- One five foot Ball mill.
- One Dorr duplex classifier.
- Two Butchart roughing tables.
- Two Frenier sand pumps.
- One K & K flotation machine.
- One automatic oil feed.
- Two Wilfley concentrating pilot tables, settling tanks and clear water tank with pump.
- Electric motors for individual drive of each machine.
- One central switchboard, controlling all operations with one mill man per shift.
- One up-to-date assay office with laboratory equipment.
- One modern boarding house, kitchen and full equipment; also ice-box.
- Bunk-houses, residence and office.
- Telephone connection to Prescott with Humboldt.
- Gasoline truck and runabout auto.

DEVELOPMENT. The development of the veins has been largely confined to the Union vein, and to the upper oxidized stopes as shown on the map of underground work.

Recent development has been on the two lower levels, where the ore bodies have been found in both of these drifts, and at the bottom of the shaft which has been sunk to a depth of 165 feet.

THE VEINS. There are at least four well defined veins, the outcrops of which are exposed at intervals but are generally covered by the debris of erosive weathering. There is at least one--and probably under the geological events there are more than one--cross-vein, which may be co-incident with cross fractures of large displacement.

THE GENERAL DIP of the veins varies and, so far as development discloses, the dip may be vertical or 30 degrees or more from the vertical.

It is probable that all parallel veins have a general dip toward the center of action of the uplifting force that caused the fissures.

THE DISPLACEMENT or throw of the longitudinal faulting was great enough to bring the concave curves of each wall nearly opposite and thus form lenses--which pinch out where the convex curves met and crushed and sheared the walls.

THE THICKNESS OF THE VEINS. The faulting would result in wide but shorter lenses, and in less width but longer lenses. The distance between the lenses depends on the local angle of deviation of the fissure from the direction of fault movement, and does not appear to be dependent on the length of the lenses. The widths of the developed lenses vary from four to twenty feet at their widest points.

THE LENGTH OF LENS in the Union has been determined by the ore stoped out, and shows a length of 200 feet on the level of the main drift.

This may be the horizontal length of the shoot of pay ore that extends upward to the surface and downward to an unknown depth. Within this shoot there are areas of vein filling without the massive quartz, and these areas may be large fragments of the walls sheared from the convex bends of the fissure by the throw of the faulting movement. The development does not clearly show the exact fact.

- THE DEPTH OF THE VEINS is discussed under "Geology."

THE PAY ORE. All lenses so far developed show pay ore. Where lenses are very wide the pay ore occurs where the massive primary quartz has been shattered by the faulting of the fissure. This shattered, re-crystallized and cemented condition may be one side of the massive quartz or on both sides, or in the central part, or it may reach from wall to wall.

Between the lenses there is a condition of schistose material which is the sheared and pulverized wall rock. In this schistose or talc material there are in places several streaks of very high grade ore.

Pay ore will be found wherever the metal solutions percolated, and the indicator for these pay-streaks is generally small veinlets of quartz, provided the deposition was contemporary with the cementation of the shattered massive quartz. But where later leaching has occurred,

then the sulphides will be found without quartz.

ORE TREATMENT. The flow sheet may be outlined as follows:

The ore is crushed and stored in 100 ton bins; thence to Ball mill--pulverized to 60 mesh; thence to Classifier; thence to Butchart tables--recovering about 50% of the ore.

The tailings back to Ball mill for final grinding;

To Classifier: the fines to flotation;
the sands to the tables;
the slimes to disc filter.

The tailings from the flotation to Wilfley tables; concentrates to bags--and the water with the tailings to settling tank, the water to reservoir, the tailings to waste.

All concentrates to the smelter.

Smelter cost \$6.00 per ton Concentrates, or about 50¢ per ton of ore.

ORE TREATMENT NOTES. The treatment of these sulphide ores is simply that of concentration. Until the ores have been tried out in a practical way, the most efficient and economical way to concentrate can not be known, but a systematic study when in actual operation will very soon determine the best method of concentration, which means only the best method of operating the concentrating tables--their most efficient capacity--the volume of water, etc.

In the flotation apparatus the same study will have to be followed by an experienced observer.

It is known that a clean concentrate of sulphide of copper handles easily in the flotation process with a mineral oil, but a complex ore of copper, lead and zinc gives trouble and requires several flotations and with different oils.

Or, again, where a copper ore is made up of different sulphides of copper, there will be a selective concentration.

The combination of conditions in flotation are many, but in the hands of one who has had wide experience (not with success, but with trouble) the way is always found to smooth operation.

POWER. Electric power lines are now connected to mine and mill.

WATER. The average flow of water in the gulch has not been determined but it appears ample to operate the mill to double its capacity.

The conservation of water is being studied. Covered storage tanks appear the best.

CONCENTRATES. The losses in smelting concentrates may appear to be the sole business of the Smelter, but when concentrates are sold on the assay values and the net returns to the Smelting Company cause a loss, they will refuse to pay the values indicated by the assay of the samples from the mechanical sampler. The loss then becomes of interest to the shipper of the concentrates.

In such a case a one hundred per cent control analysis of many samples is a necessity to determine wherein or what is the constituent or condition that causes a loss.

LOSSES IN MILLING. It is often taken for granted that all the values in an ore are recovered either on the tables or by flota-

tion or other form of concentration.

The analysis of an ore for values only, does not always tell the needed story. There are ores that cannot be milled and concentrated economically.

Ores containing soluble salts of any of the metals or alkaline products may analyze high in value and give low returns in the concentrates.

Concentrates that will calcine in the smelter or reverbatory frequently disappear up the stack.

Ores that contain a volatile constituent may disappoint the shipper of concentrates.

Enough has been indicated to show the necessity of knowing all about the ores before milling, as well as about the concentrates before shipping.

This property and others in the district demand, and are worthy of, the direction of men of large calibre.

Up to date, the work accomplished on the ground, the first-class equipment purchased, and the general improvement everywhere, exhibit careful thought and remarkable ability to purchase at bargain prices. There is evidence on every hand that shows watchful economy and the writer is pleased to take this occasion to contrast this project with many others.

GEOLOGY. The geological history of the immediate district at Chaparal is not complex, but is obscured by weathering and surface disintegration.

The only point of interest in the general geological formations of the region is that of the Yavapai schists which will be considered later. The structural history of the formations at Chaparal so far as it affects ore deposition is important to this case.

To grasp the significance of cause and effect a very brief statement of the general geology seems necessary:-

THE PRIMARY ROCKS underlying the entire region are granite, the Archean granite. These were mountainous.

These Archaean mountains extended from Alaska to the Gulf, from the North Sea to the Great Lakes, from Eastern Canada and New England States to Alabama, etc.

Centuries of erosion filled the shores and the bottom of the inland seas with the muds and debris washed from the disintegrating mountain chains prior to the Cambrian period. These muds, sands and rock debris constitute the oldest sediments of geological time, and are named in Arizona the Yavapai schists.

During their deposition, mountain chains of Archaean Granite projected from an ocean. A thousand centuries of erosion and gradual uplift with volcanic eruptions; with continental outpouring of later lavas, which broke through and pushed aside the partly indurated sedimentary strata which made up the former bottom and shores of the inland seas, and corrugated them into anticlinal and synclinal folds.

Thus the vast extent of these stratified muds, sands and conglomerates of the ancient seas were laid unconformably on the primary granites and then through the eras that followed they were buried beneath the formations of all the later geological ages.

These same slates or schists are found at the base of the Grand Canyon five thousand feet below the rim rock.

Centuries of erosion have worn away the formations that covered these schists at Chaparal.

One of the greatest known periods of ore deposition occurred during their deep submergence beneath the younger formations.

THE YAVAPAI SCHISTS are of the same age and formation as the slates that are now being mined for gold at the Homestake mine in the Black Hills of South Dakota--one of the greatest gold mines on this continent.

The Yavapai Schists are the same that have been converted into ore at Jerome where they appear mostly as green-stone schists.

The Yavapai schists are contemporaneous with silicified schists of the Coeur d'Alene region in northern Idaho, where the richest lead mines are being operated.

There are other great mineral deposits that were found in the formations of the pre-Cambrian age, and these citations are made only to impress the fact that the Yavapai schists at Chaparal have all the known conditions and history that the great ore deposits cited have also.

At this point of history we find the Chaparal district as it is today.

The FIRST rock intrusive that we find is a great stock of massive Quartz Diorite--two miles wide, east and west, by four miles long north and south. This is but one of the tremendous intrusions that broke through the schists and it is stated by the Geological Survey to be the latest, or the youngest, of the great volcanic mass formations. We have, therefore, to consider this massive Diorite and its relation to the schists and to the dikes that have fractured it, and their effect on the ore deposits.

THE FIRST PROBABLY CAUSE of ore that has been noted is a series of north-south faults that are seen by their effects in the tunnels and other developed openings, and particularly in one case on the surface where the faulting of the contact between the Massive Quartz-Diorite and the Yavapai Schists shows a displacement of about 150 feet. These primary faults appear to be factors in the genesis of the ores.

THE SECOND VOLCANIC MOVEMENT noted was the southwest and northeast line of uplift and faulting, which caused a series of fissures that followed an irregular line along the direction of the uplift.

The Throw or displacement by faulting was both horizontally and vertically. This movement of the walls resulted in bringing the concave curves of the fissure more or less together, forming lenses which were later filled with the silicic acid waters from which the primary quartz was precipitated.

In like manner, the convex curves of the walls were brought into contact; the walls were sheared and crushed, forming the schistose condition of the pulverized wall rock in the fissure.

This displacement or throw of the walls indicates a fracture that extends downward to the plastic condition of the Quartz-Diorite mass and this depth is beyond man's ability to excavate.

Such a displacement or fault movement of sedimentaries might be due to a lava flow into the bedding planes at moderate depth but in a massive primary formation of uniform igneous magma such horizontal intrusions do not occur. The series of parallel and over-lapping quartz filled fissures that cut through the Chaparal district a mile or more in length and less than a mile between the outer veins or fissures, clearly indicate (in this Quartz-Diorite massive magma) that the uplifting force was far below the zone of induration and that such movement could only occur where rock flowage takes place.

Therefore, it is believed that these quartz filled fissures descent to the base of the zone of cementation, at which depth all fissures close by rock flowage or by crumbling under a weight too great for the strength of the rock to sustain.

It appears probable from the observed conditions that the uplift, which caused the several parallel fissures, occurred prior to the general subsidence below sea level at the beginning of the Cambrian period. This deduction is made to accord with the primary deposition of pure silica in all of the parallel veins.

This white quartz, when in the form of dissolved or colloidal silica, was not mingled with ascending waters which usually contain, or have in solution, the salts of various minerals either alkaline or acid.

It is evident that surface waters carrying carbon dioxide descended into these fissures and the carbon dioxide replaced the silica of the soda-lime feldspars of the Quartz-Diorite, liberating the silica as a colloidal solution which crystallized and filled these primary fissures.

THE THIRD VOLCANIC MOVEMENT fissured the diorite mass in an east-west course. Except for minor movements, this was the last that affected the deposition of ore.

The volcanic force that ruptured the Quartz-Diorite mass at this time was profound in its depth, for the fissures were filled from an unknown depth by molten lava and formed dikes that cut across the lines of the former fissures. These dikes, in meeting the older quartz filled fissures, deviated from their strike and followed the quartz veins for a distance.

The dike that entered the Union vein split the quartz filling for a few hundred feet and thus formed two veins. The faulting caused by the entrance of these later dikes fractured the primary quartz and reopened the channels for the flow of the underground metallized waters.

THE YAVAPAI SCHISTS. The geological history has been briefly outlined.

The depth of these schists or slates has been determined by the surveys to be from 5,000 to 7,000 feet and prior to erosion the depth was over 10,000 feet.

While buried beneath the later formations the schists were silicified and recrystallized, indurated and at some period they were mineralized with the sulphides. Cementation was complete. They were subjected to the general uplifting movement, fractured by cross fissures, and ruptured by the various dikes of Diorite-Diabase, Olivine Basalt and other igneous intrusives. They were subject to creeping faults and were schistosed and metamorphosed.

Erosion removed all the later sedimentaries and more than 2,000 feet of the schists. Weathering has disintegrated the lime-soda compounds and oxidized the iron salts, disclosing the schistose structure.

The foregoing pages give a brief review of the geological history of the district.

THE MINERALOGICAL DATA OF THE ORE DEPOSITS.

1. The primary quartz found in the lenses show massive structure and the deposit of a white quartz free from metal sulphides. It is, therefore, believed that this quartz was mostly derived from the decomposed feldspars of the wall rock and, as previously stated:-
2. At some later period another volcanic action caused a second series of fractures that have a nearly east and west strike. These fractures or fissures extended to a depth that opened the way for lava flows, which filled the fractures, and now show as dikes.
3. One of these dikes enters the Union vein and follows for several hundred feet and in cutting through one large lens it split the primary quartz filling, forming two veins of this quartz.
4. The primary quartz was shattered and faulted not only on both sides of the dike but also where the dike material is not in evidence, indicating a fault movement of considerable importance in the later deposition of the ores.
5. The fracturing of the primary quartz and the shrinkage of the lava dike opened new channels for the underground flow of mineral solutions.
6. It is evident that the period of the dike intrusions was later than the great orogenic volcanicism that built up the post Algonkian mountains in pre-Cambrian time, as these dikes do not show disturbance of that upheaval. This situation also includes the Quartz-Diorite stock in which the veins occur.
7. It is also evident that there was a long period of quiet deposition prior to submergence of the region in the Cambrian sea. During this period the deposition of ores was made.
8. The fractured primary quartz was cemented by the deposition of the later quartz and the sulphides. The geology of northern Arizona indicates that the Cambrian formations are unconformable to the pre-Cambrian series--this means a long period of land exposure and erosion.
9. Inspection of the property today reveals data in support of the above statements.
10. It is noted that the sulphides and oxides of the metals are found in the cracks and joints of the primary quartz, and also in the foliated schistose material within the vein walls.
11. The schistose or pulverized material of the vein between the lenses has been silicified and impregnated with the precipitated salts of the metals.
12. Veinlets of the secondary quartz are found in the schistose parts of the fissure vein, and these are highly mineralized with the precipitated metals.
13. In places where large openings were formed in the primary quartz-filling, the sulphide ore is found in mass and disseminated through it is the distinctive secondary quartz of the metallized solutions.
14. In the dike rock, where shrink cracks occur, it is noted that both quartz and calcite filaments have been precipitated.
15. Today the leaching waters percolating downwards through the vein material deposit calcite on the walls. The iron sulphates are

leaching also and are being oxidized.

16. The Quartz-Diorite does not show primary sulphides. This taken with primary quartz-filling of the vein lenses, which also do not show the sulphides, indicates that the source of the metals was another rock formation.

17. The observed fact that when sulphides are found in the primary quartz it proves to be a cementation by the later deposition of quartz from a solution or with a solution that carried the metal salts.

There are cases noted wherein it was difficult to separate the older and the younger quartz, particularly when the older quartz had been crushed fine and then re-crystallized in part with the later silica.

18. In addition; in the contact between the schists and the Quartz-Diorite there are mines that have produced profitable ore.

19. There are operating and producing mines in the Schist area that are far from the intrusive stocks.

20. It is therefore believed that the ore found in the veins of the Quartz-Diorite have had their immediate origin in the Schist formation.

21.- Therefore, wherever a cross fracture or fault crosses the contact, at any angle that will cut the fissure veins, it is probable that there the ore has been deposited.

22. This does not exclude the very probable case of descending solutions or lateral migration from the rock formations that covered the present topography prior to the extensive erosion.

23. It will be noted that the quartz filled fissures did not extend downward to the plastic or molten magma or these fissures would have been closed by dikes. It is therefore believed that the solutions, from which the sulphides of the metals were precipitated, were descending or lateral moving and that they filled the fissures to the depth that the fracture extended.

24. The system of dikes that cut the Quartz-Diorite stock, and those that have intruded the schists, are not faulted so far as observed. They have not been subject to metamorphism, although they are weathered, and insofar as this exposure may have caused alterations they are apparently in their original state.

But it is certain that the extensive faulting which gave rise to these dikes has caused a schistose condition of the rocks cut by the dikes and they were the immediate cause of the open channel ways through which the metal solutions flowed.

25. In the recent but incomplete survey of the ground the contact between the Diorite and Schist was marked out.

It will be seen on the map that this contact has a throw or displacement of about 150 feet and that the fault extended will show a junction with the Union vein at the lens of highest values and largest deposit developed.

26. A volcanic movement that would cause a displacement of 150 feet would necessarily create a system or series of like fractures and faults.

27. This is the important point and factor in the present situation, for it is wholly probable that through these faults, which cut and displaced both formations, the circulation of the solutions was maintained--

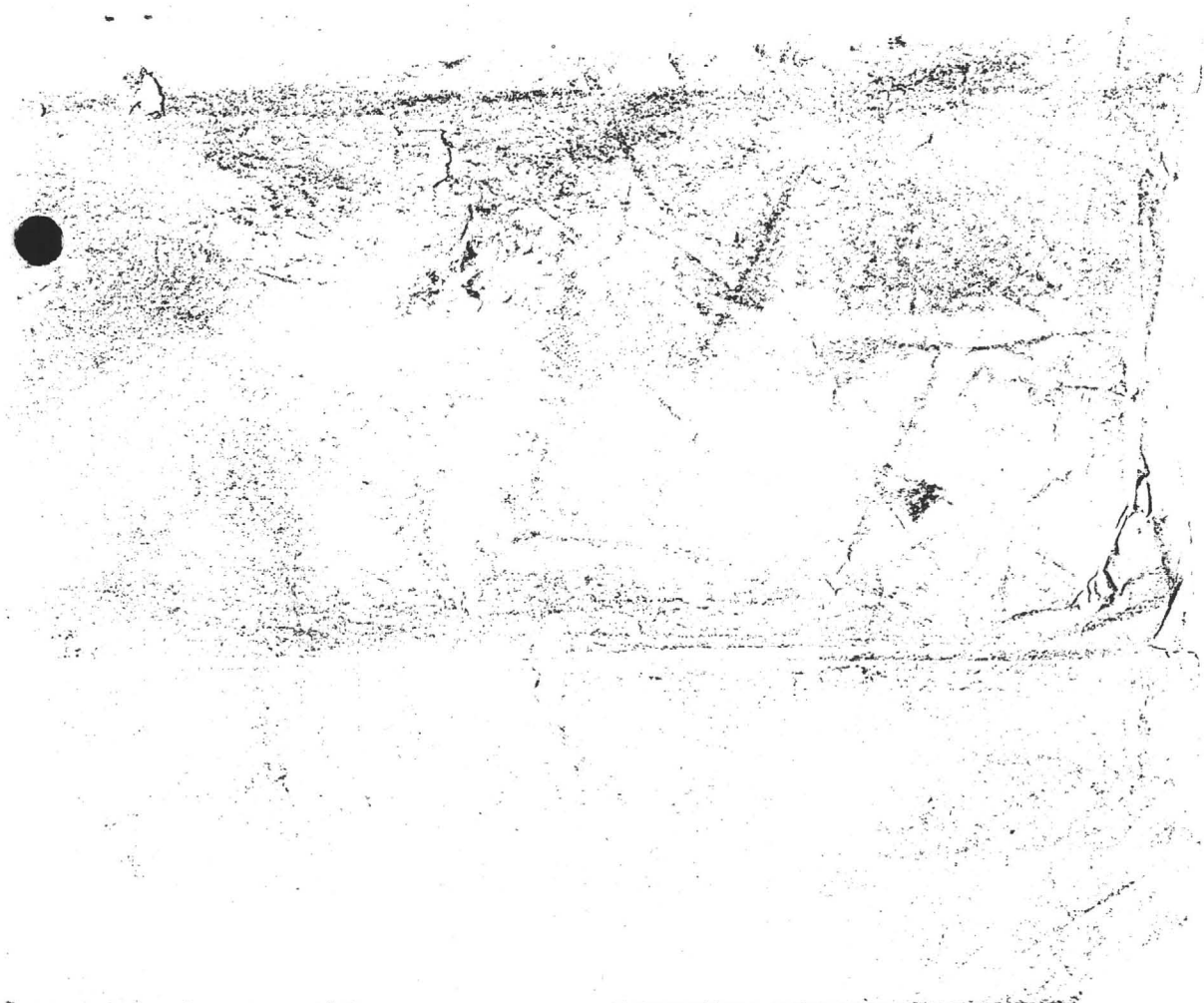
and by the fact that these faults displaced both formations the circulation would reach the bottom of the primary fissures.

28. Erosion has been extensive. As the surface was worn down, the level of the underground water descended, and oxidation and carbonation would take place. The ferric solutions would form, and both gold and silver would be dissolved and carried in the descending waters.

The sulphates and carbonates of copper and lead, leaching from the zone of oxidation, would be precipitated as sulphide by the pyrite in the zone of cementation below the level of ground water.

The preceding pages will make clear the present situation as regards the ore bodies, their prospective size and values, and point the way to their exploration.

(Signed) W. F. BRADLEY.



SOUTHWEST MINES DEVELOPMENT CO.

P. O. Box 27
Humboldt, Arizona

SUBMITTED BY

FRANCIS H. CLARK, E. M.

The mines of the Union-Jessie-Dividend property, now controlled by the SOUTHWEST MINES DEVELOPMENT COMPANY, are located in the Big Bug Mining District, Yavapai County, Arizona, four miles northwest of Humboldt, Arizona. This property is about 24 miles from Prescott, Arizona, and about 80 miles north from Phoenix, Arizona, on good highways. Railroad connections, electric power lines, telephone lines are in close or direct connection with the property.

The property holdings cover a ground area of approximately 637 acres, patented and unpatented lode mining claims. In addition is 160 acres of patented ranch land, owning valuable water rights. The Union mine has patented water rights and a 20 acre mill-site. The property is well equipped with buildings of several kinds delegated to the various mine operating departments.

The deepest mine workings is the main Jessie shaft, 660 feet deep. When this shaft was sunk, no water of note was encountered even the last 50 feet, not furnishing water sufficient for drill uses. For a detailed description of the various workings, reference can be made to the reports of A. W. Warwick, E. M., of London, England; A. L. McCarty, E. M., of New York, N. Y.; W. A. Bradley, E. M., Professor of Applied Geology, Colorado State School of Mines, Golden, Colorado; W. Allen Nickerson, E. M., who has been in charge of the property for several years. All these Engineers are of World-wide reputation and their statements can be vouched for as accurate.

The history of the property dates back to the early 80's when the ores were worked by arasta and later by amalgamation and concentration, not as high an extraction was made of the values as could have been made by modern methods. In later years a cyanide plant was used in recovering values from old tailings dumps. Incomplete recovery records and smelter statements, show an approximate production to date of over \$800,000.00. This production came mostly from above the 300-foot level of the workings. It is proposed to install an up-to-date flotation system in the present 75-ton mill, thus, making a much higher saving of values.

From W. A. Warwick report: "A range of high granite hills running northerly and southerly bursts up through a highly metamorphosed and ancient slate. At or near the junction of the granite and slate there is found a great system of veins with a

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strike of N.E. and S.W. These veins are of great size and accompany dykes of Elvan, commonly called in this district, porphyry. Such a geological state of affairs is highly favorable to the formation of orebearing veins. The main ore reserves have not been drawn upon. The mine workings are well laid out and are in pretty fair shape. A small expenditure would place them in first class condition."

From report by A. L. McCarty: "Throughout the present development, the ore has been continuous and found in a body of from 4 to 11 feet wide. The veins are continuous the full length of the company ground. The ore exists in shoots and is high-grade, these shoots are large and go to great depth. The ore may be divided into two classes: i.e., high-grade, which exists as an iron sulphide carrying gold. This class of ore will run from \$60.00 to \$1,000.00 per ton. And a milling grade ore consisting of quartz and highly silicified porphyry. Your ore is chiefly of a milling grade, averaging better than \$11.00 per ton. A gold mine that will develop itself is unusual. There is no gamble on this mine, it is sure to pay well when worked in a systematic and intelligent manner."

Both Messrs. Warwick and McCarty practically concur in the gross ore tonnage and total gross value of the ore, viz.: 161,275 tons of a gross value of \$1,555,900.00.

From report by W. A. Bradley: "The developed and undeveloped veins of the property are true fissures. The mineralized quartz will be found at depths carrying a higher value in gold and silver, than was mined from the upper levels. The ore zone, or system of veins, extends through and beyond the claims. The ore bodies are in lenses of quartz. The lenses are due to longitudinal faulting of the fissure walls. This indicates great depths. The mill ores have values from \$6.00 to over \$20.00 per ton, with streaks of high-grade rock. The extraction of the metal content should be above 85% of the assay value. The property should be operated under a competent management. The profits--judging from past operations--should be above \$4.00 per ton. The geological history of the property is not complex. The survey of the geological structure should be continued until the primary causes of the ore deposition have all been mapped."

From statements from W. Allen Nickerson: "I have made a thorough study of the conditions of the property and done much sampling, as well as making a number of mill-runs of dump and underground ores and can vouch for the accuracy of the values as given in reports by Messrs. McCarty and Bradley. Also I have demonstrated that the metallurgical problems are very simple and a high recovery of the assay values should be made. The property

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can be put under operation in a reasonably short time. Unwatering the Union shaft will require not to exceed four days. A body of excellent milling grade ore can be stoped from the 70-foot level immediately, this ore mixed in proportions with the dump ores from the Wright and Jessie shaft dumps will furnish a mill tonnage for continuous operation and should pay in excess of \$4.50 per ton, over cost of handling, transfer to mill and milling costs. The development has been by means of shafts, drifts, tunnels, raises and winzes and will total approximately 10,275 feet. Stoping for the high-grade lenses has been carried forward to a considerable extent above the 300-foot levels, leaving the low-grade mill ores as stope filling and gob. Unwatering operations carried forward through the Wright shaft connections will open a valuable shoot of ore extending toward the west from the shaft, this ore should be made available with a small expenditure of money."

The writer has been familiar with this property over a period of 25 years. The mine is equipped for limited operations with hoists, compressors, cars, rails, tools of all kinds and a mill. Pumping plant, capacity sufficient for a 200-ton mill. Assay office, Auto-motive truck and passenger cars. The mill should have added grinding machinery of the ball-mill type, impact amalgamators of approved design and added flotation equipment. With some improvement in the method of ore handling and the additions to the mill, it is my opinion that, the entire mining and milling cost should not be more than \$6.00 per ton. Gold mines, such as owned by the SOUTHWEST MINES DEVELOPMENT COMPANY, are limited in number. It is my opinion that, upwards of 75% of the mill ore values will be a direct mint product, possibly a well worked out metallurgical program, will raise even this high bullion percentage. From numerous inspections I have made of the property it impresses me as a good one and there is no reason in the world why it should not be a prolific producer under highly trained Engineering management. The total production has been around \$800,000.00. There is left in the present workings of the property, double that amount in recoverable values. Just what lower development will produce no one can tell, but lower workings should be far better than any of the upper workings, judging from the formation and character of the ores. I believe the ores will go to a depth of at least 2,000 feet. In any event the property when under full operation will be one of the big gold producers of Arizona.

Yours very sincerely,

FRANCIS H. CLARK.

Mining Engineer
Prescott, Ariz.

UNION HOLDINGS.

THE LITTLE JACK: This is a full sized location of 1500 feet long by 600 feet wide. Considerable prospecting has been done upon it. Without doubt it is a very good looking prospect, and some very good ore has been taken from the workings. A number of shafts have been sunk upon the main quartz vein, all of which show the continuity of the vein throughout the whole length of the claim. The deepest shaft is seventy-five (75) feet. At the bottom of this shaft is a ten (10) inch streak which assayed forty dollars (\$40.00) per ton. A sample from four feet across the shaft gave a value of twelve dollars (\$12.00) per ton. An average from all the shafts gave a value of eight dollars and twenty-five cents (\$8.25) per ton. This claim is situated near the main zone of disturbance, being close to the junction of the granitic and slate rocks. Accompanying the veins and parallel to them is a system of porphyry dykes. The country rock is of schistose character, and is doubtless a highly metamorphosed slate. There are three main parallel veins; the largest is four feet wide. There is every possibility of these coming together at depth. The veins dip northwest and have a strike of northeast and southwest. Only the center vein has been prospected, and should the other veins open up as well as it, this one claim alone would be capable of keeping a comparatively large mill going with ore. Ore has been milled and shipped from this property. The shipments have yielded 26.00 and 34.18 ozs. gold per ton respectively. Ore that was milled gave a high extraction on the plates, and the concentrates ran 5 ounces gold per ton.

This claim is certainly a most promising prospect. Figures can hardly be given as to ore in sight. Hard and fast rules governing the question of "ore in sight" cannot be applied. It is however, quite safe to figure out that there is 1500 long and 3 wide and 20 feet deep or ore ready for mining, or about 5600 tons which averages \$8.25 per ton, showing a gross value of \$46,200.00.

Very little stoping has been done upon this property.

THE OMAHA: This claim is located upon the same vein as the Little Jack, and the vein does not change in character. Pits have been sunk on the vein at frequent intervals, but no extensive or deep prospecting has been performed. Samples taken from all of the pits averaged \$7.50 per ton and showed remarkable uniformity of grade. The veins, both on "The Omaha" and "Little Jack" are nearly vertical, having a dip of 85° to the northwest.

This is only a prospect and much cannot be said of it. It is safe to say however, that it is valuable according as the "Little Jack" turns out.

"THE YAVAPAI": This claim is situated south and west from "The Omaha" and "Little Jack", and is very near the junction of the slate and granites. The vein outcrops about 800 feet in length and is strong and wide. It is far more quartzzy than the veins already described. The quartz is white but mineralized with iron pyrites and near the surface is much iron stained. A shaft 100 feet deep has been sunk on the vein and shows that the character of the vein is better at bottom than at the top. A good block of ground is opened up. The vein averaged \$12.00 per ton from top to bottom of the shaft, and the surface ore of the outcropping averaged \$10.50 per ton. Here again hard and fast rules for "ore in sight" can hardly apply. It is certain however, that considerable ore can be obtained for milling purposes, and my judgment is that at least 6000 tons can be obtained absolutely, and there is much virgin ground to be yet opened up. This shows a gross valuation of \$60,000. Everything is admirably arranged for economic handling of the ore. A chute leads from the mouth of the main shaft down to the car track running direct to the mill. It is hardly fair to this claim to class it as a prospect, and yet it can hardly be termed a mine. It shows up too strong to be a mere prospect, and it is not sufficiently worked to be put in the category of a mine with big ore reserves. Some specimens were obtained that ran \$75.50 and \$125.25 per ton, showing promise of high grade shipping ore. The hanging wall of the ore is porphyry, and the foot wall is of highly metamorphosed slate. The vein dips sixty-five (65) degrees to the southeast and strikes northeast and southwest.

"THE INDEPENDENCE:" #2. This is a very fine looking claim with at least one very strong vein. The character of the vein is white quartz with eyes of pyrites and zinc blended. A number of pits show a vein of at least four (4) feet wide, and at places six (6) feet. The ore from the surface assayed on the average \$13.20 per ton and the ore from the shafts went higher. The deepest shaft is seventy-five feet deep, and numerous assays gave results from \$4.00 to \$68.80 per ton with a safe average of \$18.00. A drift near the collar of the shaft gave a large amount of ore of good milling grade.

The vein dips 85° to the northwest and strikes northeast and southwest. There is a tram line which runs from the main workings to the mill, insuring cheap handling of material. The property can be safely be called a mine, although future work must determine how big or how rich. I would estimate that 10,000 tons of ore can be obtained which would safely average \$15.00 per ton or a gross valuation of \$150,000. Next to the Little Jessie it is the most promising and best developed claim.

"THE UNION." This claim and the Blaine are on the same vein. This property is being worked by leasers at the present time who are sinking a shaft, with very slow and inadequate appliances, for the ore that is being taken out. As the shaft is 105 feet deep and only 4 feet by 6 feet, it can readily be seen that the ore must be very rich. The vein is of a greyish white porphyry with seams of quartz, and pyrites lenses of pyrites from 8 to 18 inches wide are found and these run as high as from \$200 to \$400 per ton. Practically no stoping has been done. At the bottom of the shaft an 8 streak of pyrites gave an assay of \$150.00 per ton and two feet six inches (2' 6") of quartz porphyry gave an assay of \$7.25. A good body of milling ore is exposed all the way up the shaft. The outcroppings nearly their entire length have been scarped and worked either in the present stamp mill or in the old Ticonderoga arrastras. There are several veins in this claim, but only one has been prospected to any extent. This claim makes a splendid showing, and will undoubtedly make a very good remuneration for any work expended. I dare hardly state my opinion of this property, but my impression is most favorable. It might turn out to be as good as the Little Jessie. The dip of the vein is similar to the Little Jessie, i.e., southeast, and has about the same incline, viz: 75°. I would estimate that 10,000 to 12,000 tons of ore can be readily obtained averaging about \$15.00, this not inclusive of any shipping ore. A gross valuation of \$150,000 to \$180,000 may be assigned to this claim.

"THE BLAINE." This property abuts the Union, and the vein is of the same character. A great deal of work has been done, but all the ore has been milled. The workings were not in shape for sampling, but the outcroppings gave an average assay of \$8.25 per ton. Here again a great deal of ore can be obtained, and in order to be very conservative, I have placed the amount at 5,000 tons of ore as immediately available. A gross valuation of 41,000 is thereby shown.

A point not alluded to and one of great importance is the existence of a cross cut tunnel through the "Union" and "Paymaster" claims. This tunnel cuts all the veins, and the "Union" and the "Blaine" have been drifted upon for several hundred feet. The showing made, quite confirms the good opinion already expressed. The veins keep their value, and eyes or lenses of quite high grade ore are met with, although the main ore shoots discovered at surface are not yet reached by these drifts. The tunnel and drifts are comparatively dry, and are well equipped with steel rail for cars. The material can therefore be handled very economically.

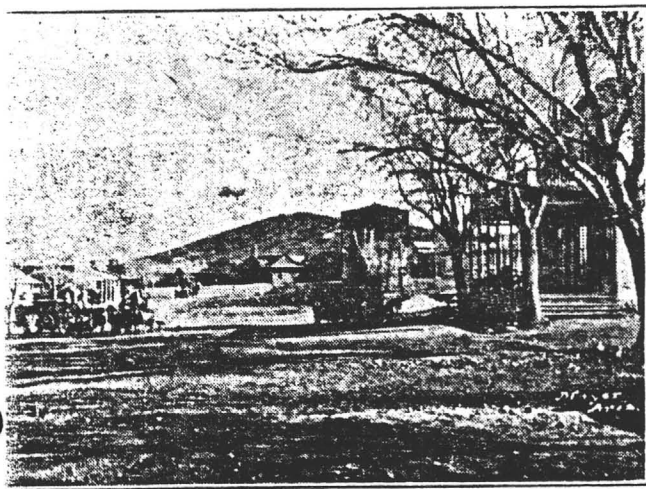
"THE PAYMASTER": This claim adjoins the Union, and is in a highly mineralized country. The veins are strong and of fair value, averaging at least \$8.75 per ton. The veins are from 2 feet to 6 feet wide; but very little work has been done upon them. The claim however, is well worth developing, as it is a goodlooking prospect.

"THE MIZPAH & ARIZONA": These claims may be dismissed with the statement that practically no work has been done upon them, and have evidently been located more for the purposes of mill sites, etc., than anything else. Good "float" has however, been found upon them and as the claims are in good mineralized country eventually something may be found upon them.

7
Report By
A. W. Warwick E.M.

the Mayer District

Active Properties Being Developed and a Number of Prospects To Be Worked



MAYER'S MAIN BUSINESS STREET.

ual—Is owned by a man headed by Sydney Anderson. It is a property and it is expected that development as a valuable mine. The owners installed a mill. A considerable delay in the necessity of changing to secure more effective of the ore. The property to be in a particularly shape and earning

This property was as the Lone Pine. It was taken over by his associates. It had been worked since a time it became the had produced about as originally worked. The new owners are to develop it as a copper mine. This includes 100, 185 and 165 feet. The mine is shut down until the arrival of a Chicago prospector. As soon as it, work will be re-equipment on the property. A steam hoist and a shop, a cook house, a boarding house. The at three and one-half of Humboldt.

—This property was producers of the Mayer

now being placed in position where it can be handled. The Swindler is located near Huron.

Henrietta and Butternut—Both these properties are owned and operated by the Big Ledge Development Company. During the latter part of 1917 operations were resumed on both properties. Three shifts are now being worked. The Henrietta is worked through an adit and a winze. The winze is down 300 feet giving a surface depth of approximately 1300 feet. Both the Henrietta and Butternut have encountered ore bodies of sufficient size and grade to place them among the really big mines of the Mayer district. Of the two properties, the Butternut carries the bigger ore bodies and better values.

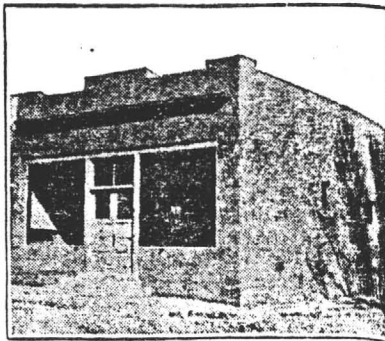
Gladstone-McCabe—These properties have produced between two and three million dollars in gold from workings down to the 900 level. About 40,000 tons of ore were shipped, averaging \$30 in gold and silver and from one to two per cent in copper. On the Gladstone, the shaft is down 1100 feet and on the McCabe the shaft is down 900 feet. The vein of ore at the 1100 level of the Gladstone is from 3½ to 5 feet wide. The McCabe vein is from 15 to 20 feet wide on the 900 level. No ore has been stopped on the lower levels of the Gladstone. There are about 80,000 tons of tailings and milling ore on the dumps of both properties. When the properties were being operated some ore was milled on the property and

three miles southeast of Humboldt. The properties have been closed down for several years.

Little Jessie—Produced nearly a million dollars worth of bullion, chiefly gold, while under the direction of John S. Jones. It is in close proximity to the McCabe-Gladstone, Henrietta, Union and Lelan. Work has been stopped for some time and the 650 foot main shaft will have to be unwatered before development can be resumed. Mining men of experience consider this one of the most valuable properties of the district.

Lelan—This property has been worked continuously for the past ten years. Several thousand feet of development work has been done to date. There are now about 20,000 tons of milling and shipping ore in reserve. The property has always been worked as a gold proposition but some indications of copper have been found. The main shaft is down 500 feet. The property is completely equipped with machinery and there are camp accommodations for 100 men. About 6,000 tons of ore have been milled and shipped to date. The property is southwest of Humboldt and adjoins the Union and Little Jessie.

Locey-Pabst—In December, 1917 operations on the Union Mine were resumed by the Locey-Pabst Company after a period of 60 days inactivity. There are now about 25 men working. It is planned by the management to erect a new 100 ton mill of the Marcy type for treating ore. There is now sufficient tonnage at



MAYER'S NEW POSTOFFICE

the mine blocked out to keep the mill in operation for months ahead.

Mudhole—This property consists of three claims located in what is known as the Walker district. The principal values found on the property are gold and silver. There are two shafts on the property. No. 1 shaft is down 500 feet and a new shaft is down 765 feet. In the No. 1 shaft from the surface to the fifth level, \$322,621 in ore were taken from a vein which extends between the two shafts. The ore was taken out of the property by the last owners who operated this property. Considerable other development work has been done consisting of drifts, cuts and various shallow shafts.

Boggs and Hackberry—These properties were worked 20 years ago. The Boggs was again worked temporarily eight years ago at which time

Arizona City which is located about 10 miles north of Mayer. This smelter has since been abandoned and entirely removed. The principal values of the Boggs and Hackberry are gold and copper. Recently the Phelps-Dodge people have shown some interest in reviving these properties. The Boggs lies about a mile southeast of Poland Junction and the Hackberry about two miles southwest of Poland Junction.

Iron Queen—This property was developed about the same time as the Boggs and Hackberry. It also furnished ore for the old smelter at Arizona City. It is now closed down and has been for a number of years. About eight years ago, however, both the Iron Queen and the Boggs were temporarily revived and some ore was shipped to the Treadwell Mining Company's smelter at Mayer.

Arizona Copper—On this property development work is being prosecuted energetically. The property consists of eight claims lying about three miles northwest of Mayer. The shaft is down about 400 feet and good showings of chalcopryite ore are being encountered. Three shifts are now working and 20 men are employed. As soon as the property gets on a producing basis, an aerial tramway will be built from the mine to the railroad which is about three-fourths of a mile distant.

Moscow—This property is southwest of the Arizona-Binghamton and adjoins it. Though the property is active at present, it has produced some high grade copper. Development work consists of a shaft down 100 feet, a tunnel and a number of all cuts.

Binghamton—This property is located at Stoddard five miles east of Mayer district. The shaft is down 100 feet. About 700 feet of development work are being done every month. The property is equipped with machinery to carry on development work indefinitely and the camp at Stoddard is fast assuming the proportions of a thriving town. All ore produced at the mine is at present being treated at the company's flotation mill. About 200 tons are now being milled daily. Approximately 30 tons of concentrates averaging 23½ per cent copper are being shipped daily to the smelter at Humboldt.

Copper Queen which adjoins the Binghamton is one of the producing mines in the Mayer district. A total of 1729 feet of development work has been done on the property during the year 1917—development work consisting of sinking, drifting, raising and crosscutting. The shaft is down 100 feet. At the beginning of the year ore reserves totaled 20,000 tons. During 1917, 18,239 tons were developed and 4,627 tons were delivered to the mill, leaving 33,612 tons in reserve on January 1st, 1918.

Rio Tonto—This property adjoins the Copper Queen on the south. Little development work has been done on this property outside of a shaft down 100 feet. There is no equipment on the property. The showings encountered from limited workings are good and the management expects to have some of the active properties in the district in the near future.

Copper Mountain Mines Co.—This property many years ago was owned

solidated Mining Company are the following: President, W. E. Paige, Oakland, Cal.; vice-president, John J. Mahoney, Jr., San Francisco; secretary-treasurer, P. H. Osborne. Directors: J. B. Dudley, San Francisco; G. L. Prentiss, Los Angeles; Ben Rybon, Prescott; Harry Mahoney, San Francisco.

LITTLE JESSIE

Superintendent W. H. Jones reports:

"The Little Jessie produced over three quarters of a million dollars while under the ownership of John S. Jones. This property is located eighteen miles in an easterly direction from Prescott and six miles westerly from Humboldt, and is in close proximity to the McCabe, Gladstone, Henrietta, Union and Leland Mines, all of which are properties of deserving merit. It is now operated by the Chaparral Mining company.

"The mine is equipped with a cross compound compressor having a capacity of 350 cubic feet of air per minute, one 75 k.w. motor and one electrically driven hoist, machine drills including sullys, jack hammers and stopers. We are now driving the compressor by electrical power, but have two horizontal boilers 'hooked up' in tandem, to be used as an auxiliary source of power.

"Work at present is confined to shaft work and we are now down 400 feet. The old shaft, which we are timbering, is 650 feet, making 250 feet for us to go yet. Work in the past, owing to the condition of the ground, has been very expensive, but the conditions have now changed and from now on we are insured of a low expense and faster time.

"The levels already opened up show good ore and it is the intention of this company to first reach the bottom of the old shaft and open up the famous 'Little Jessie ore-shoot' and then develop other parts.

"Mr. L. W. Smith of Cleveland, Ohio, is the manager of the company, and a man who does things thoroughly.

"Past work has been very satisfactory to all and every one can look

to the Little Jessie as being a 'producer' again within the very near future, for this property has hardly been touched."

MILDRED GOLD MINING COMPANY

Mine Superintendent Dan B. Genung Reports:

"The development on the Mildred Gold Mining Company's property consists of over 3500 feet of openings on their fourteen claims. One shaft is 150 feet with 70 feet cross cuts. Another shaft is 400 feet with 300 feet of drifts on the ledge. There is a cross-cut tunnel of 1050 feet and numerous lesser openings. A complete up-to-date 40-stamp mill with plates and concentrators, air compressor, machine drills and two hoists, dynamo and wire for lighting plant, make up the equipment. We have produced some shipping ore and expect to tap a large ledge of milling ore any day in the cross-cut tunnel."

ARIZONA'S COPPER

Arizona's production of copper in 1916 reached the staggering figure of 675,000,000 pounds, representing approximately a value of \$190,000,000. This is over 50,000,000 pounds more than the total production of the two next largest producing states, Montana and Michigan.

The progress of Arizona in the production of copper is without a parallel. The first available record of production was in 1883, and ten years ago the production was 117,000 pounds. With the rapid development now under way it is difficult to forecast what the production will be a few years hence.

Love Tokens In Spain.

Spanish lovers present their fiancées with fans on which they have written the most impassioned poetry, embroidered garters with love mottoes woven in silk and innumerable boxes of sweets. Engagement rings are not given, the bride elect receiving instead a gold medal, which she wears suspended from a chain around her neck.

FRED H. BOWLER

MINING ENGINEER

FULLY EQUIPPED TO SUPPLY INFORMATION AND DATA CONCERNING MINING PROPERTIES IN ANY PART OF ARIZONA.

AT PRESENT SPECIALIZING IN YAVAPAI COUNTY MINES.

WILL BE PLEASED TO ADVISE WITH PROBABLE PARTIES SEEKING DESIRABLE PROPERTIES OF ANY SORT IN THIS STATE.

MINES EXAMINED AND REPORTED ON

Address

FRED H. BOWLER, E. M., Prescott, Ariz.

References: Yavapai County Chamber of Commerce; C. H. Bolan, State Inspector, Phoenix, Ariz.; Bancroft, Ariz., and Prescott State Bank, Prescott, Ariz.



Spring Days

Are Coming

ARE YOU PREPARED



We have on hand a complete stock of material and tools for your repair work. Lay your plans now for a satisfactory water supply for the cattle.

Geo. Rohpeter has taken position as foreman of the Little Jessie mine.

Yavapai Magazine

April 15, 1914 page 13, c. 3

NEWS OF THE MINES-Items of Interest From the Mineral Fields of Northern Arizona

...Little Jessie. C.H. Blacker in charge for the Chaparral Mining Company, reports that work of extending the levels from the old shaft has already made available a large tonnage of ore in new ground.

MINING PROGRESS IN 1913

May 15, 1914 page 14, c. 3

Brief Review of Accomplishments Throughout Yavapai County by Active Properties

...The Little Jessie started upon a campaign of improvement which will cost a fortune and take months to complete.

NEWS OF THE MINES

August 15, 1914 page 13, c. 1

...Little Jessie- John S. Jones reports that the newly installed electric plant at the Little Jessie is working satisfactorily. The work under ground continues to open up ore of excellent grade. A portion of the ore is of shipping grade, and good returns were received from a carload.

NEWS OF THE MINES

June 15, 1914 page 16, c. 2

...Little Jessie- will continue extending the various levels as a result of the uncovering of shipping ore at the 300-foot level.

NEWS OF THE MINES

December 15, 1914 page 13, c. 1

...Little Jessie reports that shipments to the Humboldt smelter and to R.H. Hetherington of Prescott of batches of ore from the 300-foot level both gave returns of \$300 to the ton.

NEWS OF THE MINES

April 15, 1915 page 12, c. 1

...Little Jessie, in Chaparral, is remodeling the 10-stamp mill of John S. Jones in order to increase the possible tonnage.

YAVAPAI'S ACTIVE MINES

June 15, 1915 page 7, c. 2

...The Little Jessie has re-equipped the old Jones mill and it is now being run on ore furnished from the Little Jessie by parties who are getting it out on lease under the direction of the owners.

YAVAPAI'S ACTIVE MINES

June 15, 1915 page 5, c. 2

WHERE RICHES REWARD PIONEERS-The Little Jessie

John S. Jones opened up his gold mine at Chaparral in the Big Bug district. While it produced largely, Mr. Jones was a very generous spender in development work. For several years this mine was worked under lease by Frank Wright, who not only gained a fortune for himself but also for Mr. Jones. This property is now being worked by a corporation which has spent a great deal of money in the past few years in getting the property into shape. There is every indication that it will once more be listed among our heavy producers.

OF THE MINES

January 15, 1916 page 14, c. 1

Little Jessie has been taken over by the Ohio Mines Company. The Chaparral Company, which held a lease, has retired.

OF THE MINES

October 15, 1916 page 15, c. 1

Little Jessie- In Chaparral district is being reopened. The shaft is being retimbered. L.W. Smith is general manager and John Jones, Jr., is superintendent. The shaft, which is 667 feet deep, is now unwatered to 300 level.

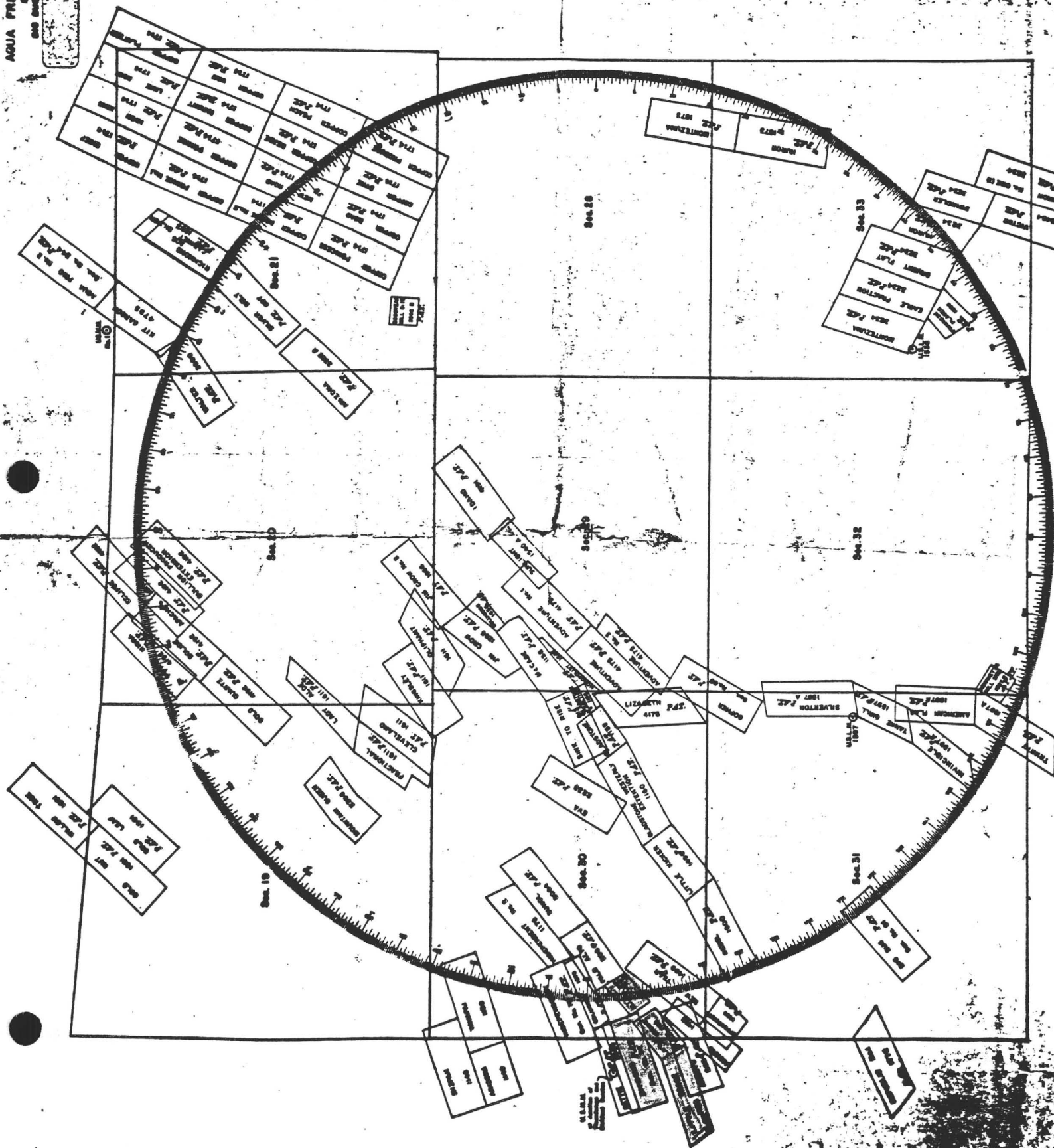
...Little Jessie in Chaparral, which is owned by the Ohio Mines Co., is to have a reduction plant of its own. The mine has been opened to the 300 level and the shaft will be dropped to the 600 level. Three shifts of miners are to be worked.

Gold Leaf Mines, Inc.

August, 1926 page 8, c. 4

The Little Jessie and the Dividend veins pass through this company's ground, and the company is sinking a vertical shaft about 2,000 feet from the Little Jessie shaft. When 250 feet of depth is gained, a cross-cut will be made to the Little Jessie vein - one of the richest gold veins ever found in this country. Nine men employed, under supervision of A.E. Swain.

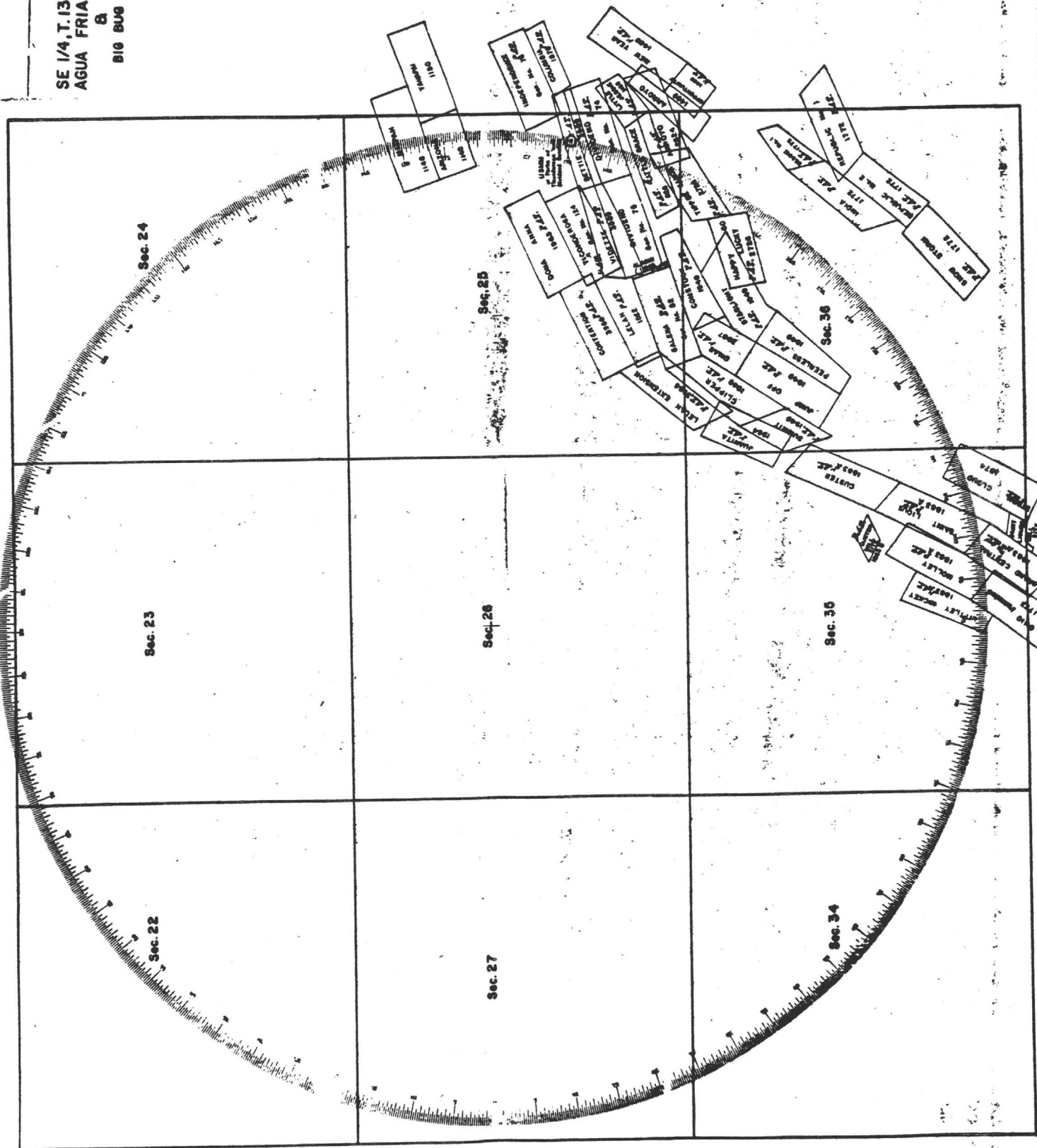
SW 1/4, T.13N, R.12E
AQUA PRIA DIST.



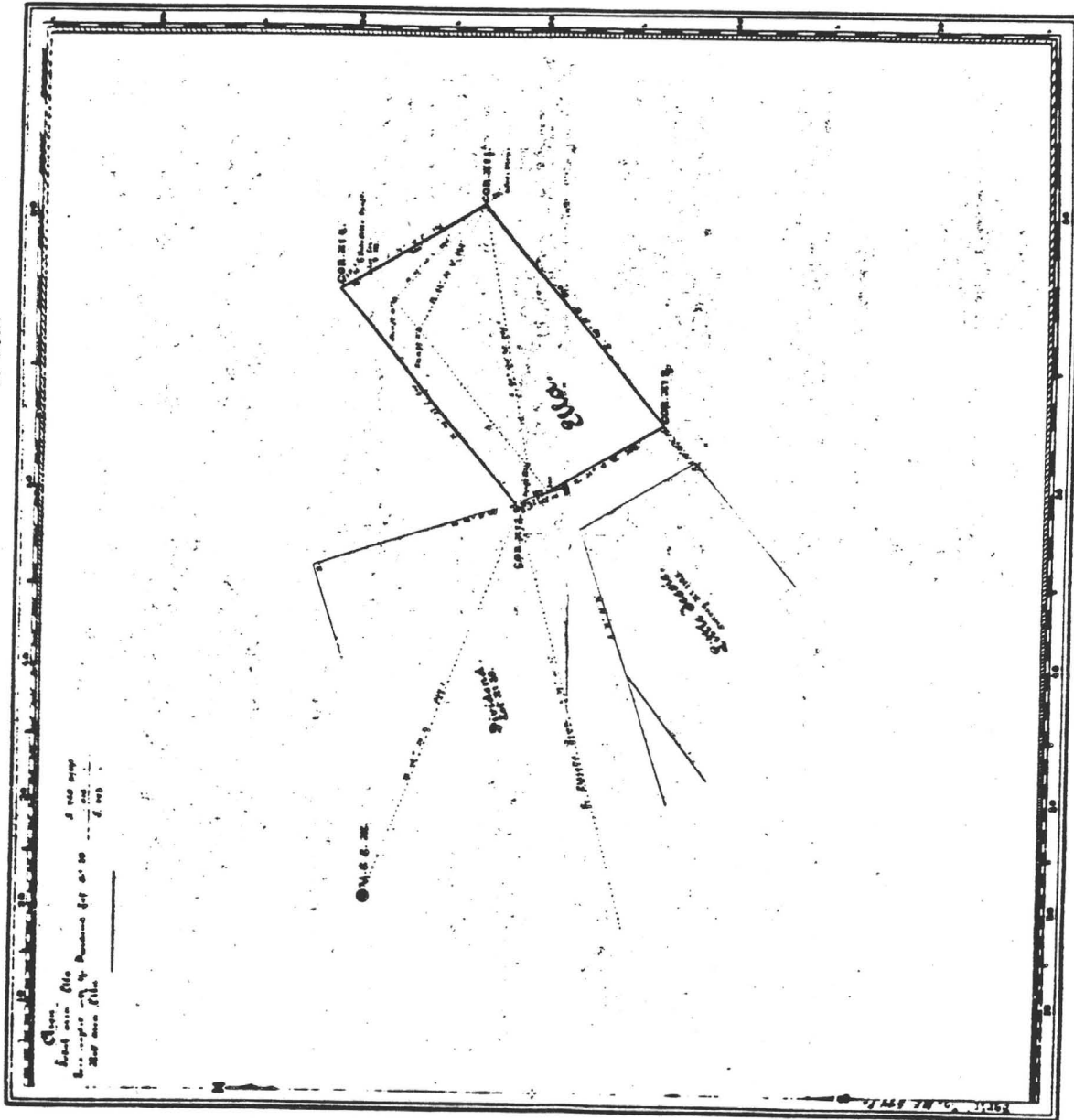
SE 1/4, T.13N., R.1W.
AGUA FRIA DIST.

a

BIG BUG DIST.



100-00000



Chas. H. Jones
Land Surveyor
Bismarck, N.D.
May 21st, 1904

Chas. H. Jones
Land Surveyor
Bismarck, N.D.
May 21st, 1904

Lot 17 N
Section 17
PLAT
OF THE CLAIM OF
John S. Jones
KNOWN AS THE
"Elva"

Big Dry
Yavapai, Arizona
Containing one acre of
land of 2000 feet in the north
boundary 12' 40' feet
J. S. Jones
J. S. Jones, Land Surveyor

The Original Plat, being the Survey of the Mining Claim of
John S. Jones
Elva

from which this plat has been made under my direction
have been examined and approved, and are on file in this office
and I hereby certify that they contain such an accurate description
that if used in the future as a title, if incorporated into a patent,
they will be subject to the provisions, and that such reference
to make therein to natural objects or permanent monuments
as well as to the land and to the survey
I further certify that the boundary shown on this plat has
been extended to the original plat made upon said Mining
Claim in the year 1904, and that the same is hereby approved
and incorporated into the plat

that the location of said improvements, as correctly shown
upon this plat, and that no portion of said land or any
improvements has been included in the estimate of expense
there upon any other claim.
I further certify that this is a correct plat of said Mining
Claim made in conformity with and original plat made of the
survey thereof, and the same is hereby approved.

Chas. H. Jones
Surveyor, Arizona
May 21st, 1904
Elva, Arizona.

PROSPECTUS

850,000 shares

Stan West Mining Corp.

Common Stock, par value \$.01 per share

THESE SECURITIES ARE SPECULATIVE, INVOLVE A HIGH DEGREE OF RISK, INVOLVE IMMEDIATE SUBSTANTIAL DILUTION OF THE BOOK VALUE OF THE COMMON STOCK FROM THE PUBLIC OFFERING PRICE, AND SHOULD NOT BE PURCHASED BY ANYONE WHO CANNOT RISK HIS INVESTMENT. SEE "RISK FACTORS" AND "DILUTION".

Prior to this offering there has been no market for the Common Stock of the Company and there is no assurance that a regular trading market will develop at its conclusion. The initial offering price has been fixed arbitrarily by negotiation between the Company and the Representative of the Underwriters, is not an indication of the actual value of the Company and bears no relationship to its assets, earnings or book value.

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION NOR HAS THE COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

	Price to Public	Underwriters Discounts and Commissions (1)	Proceeds to Company (2)
Per Share	\$7.00	\$.70	\$6.30
Total Minimum (3)	\$5,950,000	\$595,000	\$5,355,000
Total Maximum (3)	\$6,545,000	\$654,500	\$5,890,500

- (1) See "Underwriting" for significant additional underwriting compensation through the sale to the Representative of warrants to purchase 85,000 shares of the Common Stock, reimbursement of out-of-pocket expenses up to \$100,000 and indemnification of the Underwriters.
- (2) Before deducting expenses payable by the Company estimated at \$265,000.
- (3) See "Underwriting" for a description of Underwriters' option to purchase up to 85,000 shares to cover over-allotments.

The Common Stock is offered by the Underwriters when, as, and if issued by the Company and accepted by the Underwriters, all subject to prior sale, withdrawal, cancellation or modification of the offer without notice, and subject to approval of certain legal matters by counsel to the Company and counsel to the Underwriters.

James J. Duane & Co., Inc.

The date of this Prospectus is

A registration statement relating to these securities has been filed with the Securities and Exchange Commission but has not yet become effective. Information contained herein is subject to completion or amendment. These securities may not be sold nor may offers to buy be accepted prior to the time the registration statement becomes effective. This prospectus shall not constitute an offer to sell or the solicitation of an offer to buy nor shall there be any sale of these securities in any State in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such State.

*This is right
next to the
Little Jessie*



ADIT RESOURCES CORPORATION

P. O. BOX 5964, TUCSON, ARIZONA, 85703, 810 WEST GRANT ROAD. TELEPHONE: (602) 623-0578



September 23, 1981

Dr. Antone L. Aguiar
4021 Fairmount
San Diego CA 92105

Dear Dr. Aguiar:

Thank you for your comprehensive compendium on the Little Jessie and related properties which has been received and reviewed. This is typical of just about all of the mines in the Bradshaw Mountains Region and, as you indicate, there has been considerable new activity recently in "dusting off" many of these old mines for a new look. So far, regrettably, no real success of any substantial magnitude or permanency has been reported.

Please find enclosed { I am curious regarding the results of more recent examinations, contacts and inquiries you may have had, if any. Peer consensus is not the only criterion we follow but, it is one of the considerations - especially in scheduling an examination. Otherwise we must await someone being in the vicinity enroute on some other mission. The main reason for this right now is that we are involved to our capacity and any new lead must appear superior to what we are already working on.

Meanwhile, with your permission, we would like to retain your submittal for further possible reference in the future. If you would prefer to have us return it, please let us know, and we will send it immediately.

Your consideration of us regarding this matter is most appreciated. Should we manage an examination, we will contact you regarding any potential interest we might develop.

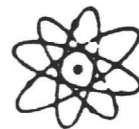
Sincerely,

Adit Resources Corporation

W. E. Heinrichs, Jr., Pres.
Geol. Engineer - Geophysicist
P. E. & C. P. G.



Fischer-Watt Mining Co. Inc.



ADMINISTRATIVE OFFICE: 114 TUCKER, SUITE 2

KINGMAN, ARIZONA 86401

PHONE: (602) 753-1622

10/5

Tony ;

Here's a list of my samples
from my first visit.

Pete Drobek

Sample	Description	g/T Au	g/T Ag
JES-1	4' thick chip from vein 250' NW of Little Jessie	.18	.52
-2	7' thick chip from same structure 300' further SW	.24	.35
-3	grab off dumps of p.p. 500' SW of Little Jessie shaft on Little Jessie structure	.004	.06
-4	grab of tuffs (?) in FW of Jessie Vein at shaft	.001	.05
-5	grab of bull quartz from dumps	.36	.38
-6	pyritic quartz from dumps w/ minor sphalerite	1.47	.85
-7	grab of pyritic bull qtz from p.p. - same structure as #1	.02	.41
-8	6' chip on another structure	.006	nil
-9	representative grab off dump by 50' deep shaft - extension of Little Jessie vein (2000' from shaft)	.58	1.36
-10	grab off p.p. - NE extension of Little Jessie	.16	.35
-11	from structure SE of and parallel to Little Jessie - 6' chip	.011	.41



FMC MINERALS, INC.

SUBSIDIARY OF FIRST MISSISSIPPI CORPORATION
SILVER HILL 1 BLDG - SUITE 300 / 575 UNION BOULEVARD
TELEPHONE (303) 989-5800 / LAKEWOOD, COLORADO 80228

August 28, 1981

Antone L. Aguiar, D.D.S.
4021 Fairmount
San Diego, CA 92105

Dear Tony:

Enclosed is a map locating the samples collected and corresponding assays. As I had mentioned, the prospect looks interesting however, our manpower will be tied-up for the next few months. If the ground is still available in January, we can discuss a lease-option at that time. If you have any questions, feel free to contact me.

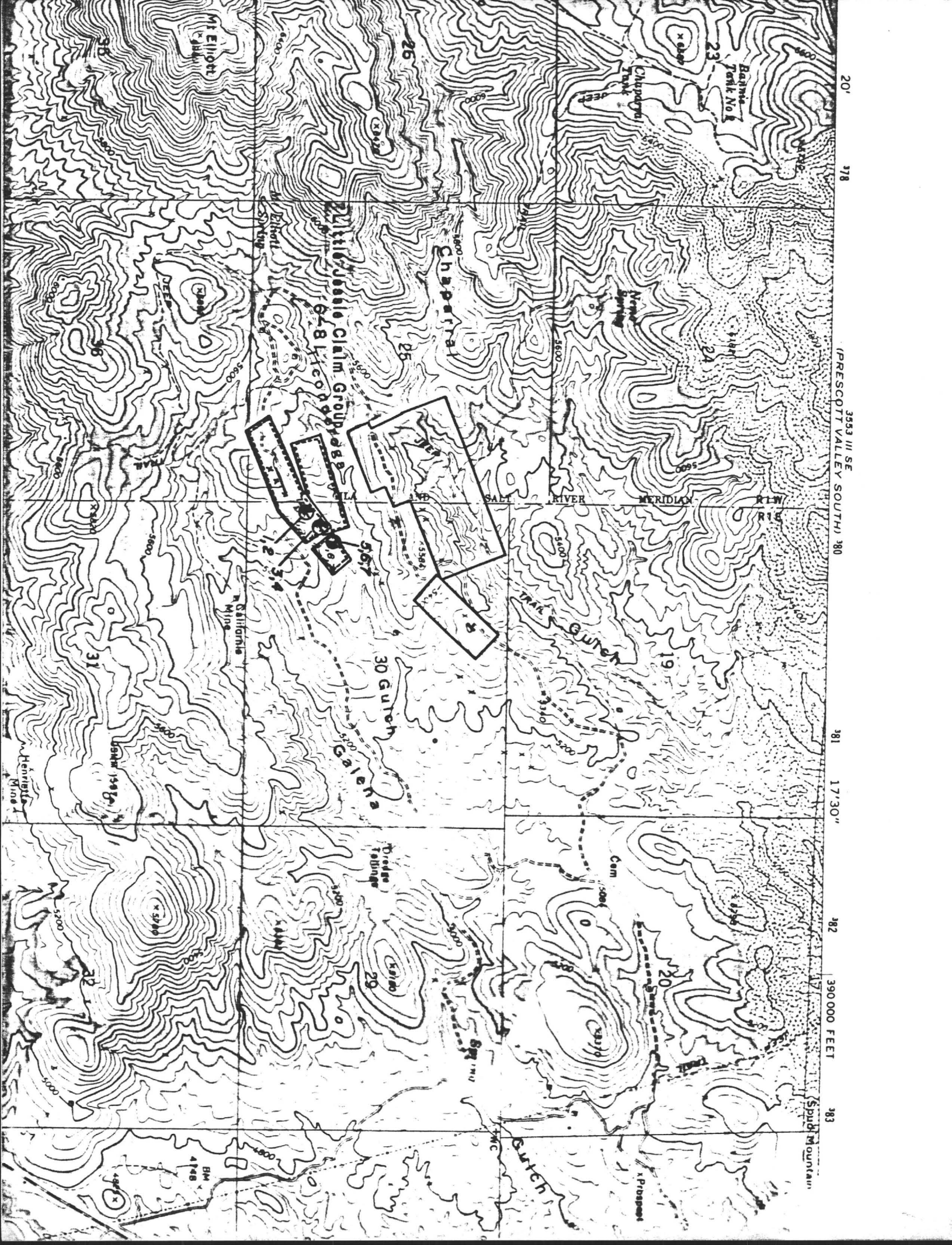
Sincerely,

FMC MINERALS, INC.

Michael C. Baumann

Michael C. Baumann
Senior Geologist

MCB/rj
Enc.



QUADRANGLE NAME: POLAND JUNCTION - 7.5'QUAD SAMPLE # 1

STATE	SAMPLE #	T	R	SEC	ELEV	X	Y	DATE	C.B.
<u>AZ</u>	<u>1258</u>	<u>13N</u>	<u>1E</u>	<u>30</u>				<u>6/17/81</u>	<u>mcg-ps</u>

SAMPLE TYPE: <input checked="" type="checkbox"/>	Rock Chip <input checked="" type="checkbox"/>	Channel <input type="checkbox"/>	Prospect Pit <input type="checkbox"/>	Dump <input checked="" type="checkbox"/>
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ORE MIN:

GANGUE MIN: Qtz

ROCK TYPE: <u>GRANITE</u>	Equigr <input type="checkbox"/>	Porphy <input type="checkbox"/>	Aphanitic <input type="checkbox"/>
Mafic _____%	Quartz <u>100</u> %	K-Feld _____%	Plag _____%
Alt. _____%	Sericite _____%	Silif. _____%	Argillization _____%
			Chloritization _____%
			Pyrite _____%
	Au <u>(oz/tn)</u>	Ag <u>oz/tn</u>	Pb
			Zn
			Cu
			Mo
ASSAY	<u>.008</u>	<u>N.I.</u>	<u>.049%</u>
FOR:			<u>40 ppm</u>
			<u>31 ppm</u>

REMARKS qtz Vein high GRADED SAMPLE FROM DUMP by SHAFTS
MOUTH.

QUADRANGLE NAME: POLAND JUNCT - 7.5'QUAD SAMPLE # 2

STATE	SAMPLE #	T	R	SEC	ELEV	X	Y	DATE	C.B.
<u>AZ</u>	<u>1259</u>	<u>13N</u>	<u>1E</u>	<u>30</u>				<u>6/17/81</u>	<u>mcg-ps</u>

LITTLE JESSIE

SAMPLE TYPE: <input type="checkbox"/>	Rock Chip <input type="checkbox"/>	Channel <u>3'3"</u>	Prospect Pit <input type="checkbox"/>	Dump <input type="checkbox"/>
---------------------------------------	------------------------------------	---------------------	---------------------------------------	-------------------------------

ORE MIN:

GANGUE MIN:

ROCK TYPE: <u>GRANITE</u>	Equigr <input type="checkbox"/>	Porphy <input type="checkbox"/>	Aphanitic <input type="checkbox"/>
Mafic _____%	Quartz _____%	K-Feld _____%	Plag _____%
Alt. _____%	Sericite _____%	Silif. _____%	Argillization _____%
			Chloritization _____%
			Pyrite _____%
	Au <u>(oz/tn)</u>	Ag <u>(oz/tn)</u>	Pb
			Zn
			Cu
			Mo
ASSAY	<u>.016</u>	<u>.398</u>	<u>.039%</u>
FOR:			<u>.023%</u>
			<u>30 ppm</u>

REMARKS Sample ACROSS SHEAR ZONE & ONE SIDE VEIN 10' ACROSS
SAMPLE ONLY OF CONTACT AT ONE WALL.

QUADRANGLE NAME: POLAND Junction - 7.5' QUAD SAMPLE # 3

STATE	SAMPLE #	T	R	SEC	ELEV	X	Y	DATE	C.B.
AZ	1260	13N	1W	25				6/17/81	MCB-PS

SAMPLE TYPE: ☐ Rock Chip ☐ Channel ☐ Prospect Pit ☐ Dump ☒

ORE MIN:

GANGUE MIN:

ROCK TYPE:	<u>GRANITE</u>				<input type="checkbox"/> Equigr <input type="checkbox"/> Porphy <input type="checkbox"/> Aphanitic <input type="checkbox"/>	
Mafic _____%	Quartz _____%	K-Feld _____%	Plag _____%	Biotite _____%		
Alt. _____%	Sericite _____%	Silif. _____%	Argillization _____%	Chloritization _____%		Pyrite _____%
Au <u>(oz/tn)</u>	Ag <u>(oz/tn)</u>	Pb	Zn	Cu	Mo	
ASSAY .227	.295	.054%	.088%	38 ppm		
FOR:						

REMARKS SULFIDE material - High GRADE From Dump of mine
Along gte vein shear.

QUADRANGLE NAME: POLAND Junction - 7.5' QUAD SAMPLE # 4

STATE	SAMPLE #	T	R	SEC	ELEV	X	Y	DATE	C.B.
AZ	1261	13N	1W	25				6/17/81	MCB-PS

LITTLE JESSIE

SAMPLE TYPE: ☒ Rock Chip ☒ Channel ☐ Prospect Pit ☐ Dump ☐

ORE MIN:

GANGUE MIN:

ROCK TYPE:	<u>GRANITE</u>				<input type="checkbox"/> Equigr <input type="checkbox"/> Porphy <input type="checkbox"/> Aphanitic <input type="checkbox"/>	
Mafic _____%	Quartz _____%	K-Feld _____%	Plag _____%	Biotite _____%		
Alt. _____%	Sericite _____%	Silif. _____%	Argillization _____%	Chloritization _____%		Pyrite _____%
Au <u>(oz/tn)</u>	Ag <u>(oz/tn)</u>	Pb	Zn	Cu	Mo	
ASSAY .330	.272	.064%	.071%	41 ppm		
FOR:						

REMARKS SAMPLE ACROSS SHEAR ZONE IN VEIN.

QUADRANGLE NAME: POLAND JUNCTIONQUAD SAMPLE # 5

STATE	SAMPLE #	T	R	SEC	ELEV	X	Y	DATE	C.B.
AZ	1262	13N	1W	25				6/17/81	MLB-PS

SAMPLE TYPE:	Rock Chip <input checked="" type="checkbox"/>	Channel <input checked="" type="checkbox"/> 7'6"	Prospect Pit <input type="checkbox"/>	Dump <input type="checkbox"/>
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ORE MIN:

GANGUE MIN:

ROCK TYPE:	GRANITE				Equigr <input type="checkbox"/>	Porphy <input type="checkbox"/>	Aphanitic <input type="checkbox"/>
Mafic _____%	Quartz _____%		K-Feld _____%		Plag _____%		Biotite _____%
Alt. _____%	Sericite _____%		Silif. 4-100%		Argillization _____%		Pyrite _____%
	Au oz/tn	Ag oz/tn	Pb	Zn	Cu	Mo	
ASSAY	.002	.088	.041%	.026%	30ppm		
FOR:							

REMARKS ACROSS SILICIFIED ZONE OF VEINQUADRANGLE NAME: POLAND JUNCTION - 7.5'QUAD SAMPLE # 6

STATE	SAMPLE #	T	R	SEC	ELEV	X	Y	DATE	C.B.
AZ	1263	13N	1W	25				6/17/81	MLB-PS

LITTLE JESSIE

SAMPLE TYPE:	Rock Chip <input type="checkbox"/>	Channel <input checked="" type="checkbox"/> 3'10"	Prospect Pit <input type="checkbox"/>	Dump <input type="checkbox"/>
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ORE MIN:

GANGUE MIN:

ROCK TYPE:	GRANITE				Equigr <input type="checkbox"/>	Porphy <input type="checkbox"/>	Aphanitic <input type="checkbox"/>
Mafic _____%	Quartz _____%		K-Feld _____%		Plag _____%		Biotite _____%
Alt. _____%	Sericite _____%		Silif. 4-100%		Argillization _____%		Pyrite _____%
	Au <u>oz/tn</u>	Ag <u>oz/tn</u>	Pb	Zn	Cu	Mo	
ASSAY	.009	.403	.077%	.043%	57ppm		
FOR:							

REMARKS ACROSS SILICIFIED ZONE.

QUADRANGLE NAME: Poland Junction -7.5'QUAD SAMPLE # 7

STATE	SAMPLE #	T	R	SEC	ELEV	X	Y	DATE	C.B.
AZ	1264	13N	1W	25				6/17/81	MCB-PS

LITTLE JESSIE

SAMPLE TYPE:	Rock Chip <input checked="" type="checkbox"/>	Channel <input type="checkbox"/> 10"	Prospect Pit <input type="checkbox"/>	Dump <input type="checkbox"/>
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ORE MIN:

GANGUE MIN:

ROCK TYPE:	<u>GRANITE</u>				Equigr <input type="checkbox"/>	Porphy <input type="checkbox"/>	Aphanitic <input type="checkbox"/>
Mafic _____%	Quartz _____%		K-Feld _____%		Plag _____%		Biotite _____%
Alt. _____%	Sericite _____%		Silif. _____%		Argillization _____%		Pyrite _____%
	Au oz/tn	Ag oz/tn	Pb	Zn	Cu	Mo	
ASSAY	.100	.064	.056	.039	91ppm		
FOR:							

REMARKS Across Shear Zone in Granite

Dr. Antone L. Aguiar
2552 Katherine Ct.
El Cajon, CA 92020

SAN DIEGO, CA. 921

PM

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Competition

Competition for the acquisition of mineral interests is increasing in the Prescott-Jerome area. Recently a property for which the Company was negotiating was acquired by other interests. Management is aware of at least two competitors bidding for properties presently under consideration by the Company. Companies with greater financial resources, personnel and equipment are in a better position than the Company to compete for the available mineral interests. The Company is at present an insignificant factor in the industry.

Company Office

The Company's office is located at 2701 East Camelback Road, Phoenix, Arizona 85016.

PROPERTIES OF THE COMPANY

In General

The Company owns mining properties at five sites in the Prescott-Jerome mining area of Yavapai County in central Arizona. (See map 1 on page 46.) In addition, the Company leases with an option to purchase one mining property and tailings in Blaine County, Idaho and leases with an option to purchase one mining property in Custer County Idaho. None of these properties have been purchased or leased from affiliates of the Company. Most of the properties are readily accessible from state highways by unpaved roads, being near the sites of former mining operations. Although the Company's properties have been mined in the past, no estimate of ore reserves or commercial viability is possible at the present time as the properties are still in the exploratory stage.

Management believes that the Company has good title to its 39 patented claims which are owned (19 patented claims) and leased (20 patented claims) and that the Company's agreements regarding the purchase, exploration and development of those claims are enforceable. In addition, the Company owns 653, and has a leasehold interest in 37, unpatented mining claims on which only possessory title is held. Other than one minor exception there are no known disputes concerning title to any of such claims. (See "Characteristics of Mineral Properties—Title to Mining Properties".) In order to retain title, the Company will be required to perform specific assessment work of \$100 per claim each year. If assessment work is not done in a timely manner, unpatented mining claims may be over-staked by others, subjecting them to adverse claims. In general, title to unpatented claims depends upon a number of factors, some unrecorded, and therefore, although the Company has received an opinion of special counsel with respect to those claims, validity of title may be open to contest.

Stan McCabe Properties

The Stan McCabe properties are located in the former Big Bug Mining District, accessible by an unpaved road from Highway 69 in the vicinity of Humboldt. (See Maps 1 and 2 on pages 46 and 47.) The exploration venture consisting of RI Mining Corporation and Stan West Associates, an Arizona limited partnership either leases or has the right of first refusal on all of the Stan McCabe properties. (See "Exploration Partnerships and Co-Tenancies"). The Company regards the area as its most important and promising acquisition. It encompasses a zone almost 10,000 feet long and consists of at least four different mines which have produced, as well as a number of claims indicating the possible mineralization of silver, gold, lead, zinc and copper.

The most productive mine and only mine operating until 1960 in the Big Bug Mining District was the Iron King gold-silver-lead-zinc-copper mine. This is located a short distance to the north and east of the property holdings of the Company. (See Map 2, page 47.) Production records from the *Geological Survey Professional Paper No. 308* state that the Iron King produced about 211,486 ounces of gold, 6,624,101 ounces of silver, 75,573,620 pounds of lead, 209,199,140 pounds of zinc and 6,345,740 pounds of copper. The Silver Belt Mines were important early producers of gold and silver as well. The *Geological Survey Professional Paper No. 308* states that the Big Bug Mining District had produced (1952) approximately 321,500 ounces of gold, about 8,500,000 ounces of silver, 3,773 tons of copper, 37,537 tons of lead and 104,599 tons of zinc.

Map 2 on page 47 shows the relative location of the Company's patented and unpatented claims to the above mines that were past producers. Geological mapping, supplemented by geological studies, geochemistry and geophysics, indicate that the Iron King and Arizona-McCabe-Gladstone-Rebel trend all occur within the favorable Spud Mountain volcanic (tuff) rocks. Most of the numerous mineral prospects and other workings with indications of mineral in the area occur within this rock sequence. There is a geological similarity between the Iron King area and the McCabe-Gladstone area. Historical records indicate that Iron King was developed to a depth of approximately 4,000 feet while the McCabe-Gladstone zone was mined to approximately 1,000 feet. The geological structure suggests that the McCabe-Gladstone mineralized zone may extend deeper than the old workings and this possibility will be tested by deep core drilling. The Rebel and Little Kicker mines are reported to have been worked to depths of 900 feet. The Arizona and Lookout mines have been worked to depths from 150 to 300 feet. The other prospects, such as the Idaho and Adventure mines have only been superficially sampled. There is evidence on the surface that mineralization exists in the numerous old workings and prospects for about 14,000 feet starting from a point about 1,500 feet northwest of the Iron King mine, southwest to the Rebel and Little Kicker mines. (See Map 2, page 47). These features give the Company the basis for the belief that extensive core drilling may discover commercially viable ore bodies at depth or extension of known past producers.

Exploration Program To Date

All of the past producers, prospects and other mineral showings within the Stan McCabe area occur within a continuous geological belt in which all of the claims, both patented and unpatented, are contiguous. For this reason the entire belt was treated as a unit with respect to the proposed programs of topographic and geological mapping, geochemical and geophysical surveys. The method and field techniques in which this work was carried out are described in general below along with the approximate costs. The results of the different surveys are discussed in detail under the individual property descriptions.

Geological Mapping

Prior to the initiation of geological mapping it was necessary to have the area covered by air photography so that base topographic maps could be compiled for accurate control. These maps not only served for the geological mapping but also for control in the geochemical and the geophysical surveys.

Geological mapping was carried out by a field party consisting of two geologists. A baseline was surveyed through the property and control lines were cut at 200 foot intervals over the entire length (15,000 feet) along the trend of the known mineralized zones. Mapping of the various rock units was carried out on a scale of 1 inch equals 200 feet. The purpose of the mapping was to determine the relationship of the known mineralization with respect to the volcanic formations that underlie most of the region. In most cases it was found that the mineralization was associated with the Spud Mountain volcanic tuffaceous unit. It would appear that the presence of this tuffaceous unit is critical to the localization of copper, lead and zinc sulphides, and gold and silver mineralization.

Geochemical Surveys

Geochemical surveying was carried out over the geological formations that are host to all of the known mines and mineral prospects. Samples were taken along lines 200 feet apart at 25 foot intervals across the geological trend. These were taken in the soil mantle at a depth of approximately 6-10 inches. Samples were sent to the Rocky Mountain Geochemical Laboratory in Tucson for atomic absorption analyses of copper, lead and zinc. Upon receipt of the analyses, the results (reported in parts per million) were plotted on the base sheets and contoured. The average background for copper in the area was in the order of 40-50 parts per million. The anomalous high areas were in the order of 5-10 times background. Lead and zinc showed a background of 60-70 parts per million and the areas that were underlain by the Spud Mountain tuffs showed anomalies 10-15 times background. The numerous dumps and tailing ponds in the area showed appreciable contamination; however, these were taken into account and adjusted with respect to the contouring of the values. The results of the broad geochemical survey are as follows:

1) Copper appears to be widely dispersed throughout the volcanic sequence with moderate buildup in areas of known mineralization.

2) Lead and zinc are more specifically defined and the anomalies show close association with the Spud Mountain tuffaceous unit. Not only did the high zinc anomalies show close association with known areas of mineralization but also extended for 1,000-2,000 feet to the northeast and southwest where the favorable Spud Mountain tuffaceous horizon is present.

In general, one can conclude that the geochemistry shows sharply defined areas that merit future follow-up in geophysical work as well as diamond drill target location. One could state with little reservation that the application of the geochemical work in this area has been most successful in delimiting target areas. In total 5,240 samples were taken which involved a cost of \$35,000.

Geophysical Surveys

Following the completion of the geological and geochemical programs a geophysical survey was designed to test those areas which had shown favorable geology and geochemistry. The survey was carried out by the Scintrex Corporation of Denver using a TURAM M-2 modified instrument. The principle of this instrument which works on electrical input into the ground is based on differences in conductivity and resistivity of the subsurface formation which might contain mineralization. Lines are run at 200 foot intervals across the areas of interest. Readings are taken at various intervals across the zones in order to determine the relationship between resistivity and conductivity. The system works on the assumption that zones of mineralization, open fault structures, water filled fissures, and other similar conductive bodies will respond in such a manner that they show lower resistivities and higher conductivity. The data is compiled and plotted on maps the same scale as the geological-geochemical maps and comparative studies are made so as to define areas that merit testing by drilling.

The TURAM survey was carried out over all the McCabe-Gladstone properties. The results were encouraging since conductive zones or anomalous readings were recorded over almost all of the areas of favorable geology and associated high geochemical readings. In general, coincidence was obtained on all of the known mineralized zones as well as other zones where mineralization has not yet been observed. In all, 34 different anomalies were reported by the Scintrex Geophysical Group. Twenty of these were recommended to be tested by diamond drilling. Perhaps the most significant part of the survey was an area such as the McCabe Mine where two long north-east trending parallel conductors were indicated over the area previously mined, indicating that there could be more than one mineralized zone. Strong anomalous readings were observed over the Lookout Mine, Arizona Mine, The Idaho, Adventure, Rebel and Little Kicker areas. In general, the results of the geophysical survey were encouraging. Specific areas will be discussed in more detail under the section on property descriptions. The cost of the geophysical program was \$51,240.

Diamond Drilling Program

A contract for diamond drilling involving some 30,000 feet of core was signed with the Longyear Diamond Drilling Company of Phoenix. Four Longyear rigs (#44 model) are currently drilling on the Stan McCabe group of properties. The average cost per foot of drilling to date is \$30. A series of short holes (500 feet-800 feet) to test the McCabe-Gladstone vein system at shallow depths and within the areas of ancient mining was proposed. These total approximately 10,000 feet. The geochemical and geophysical work had indicated presence of possibly more than one mineralized zone. The results of the shallow diamond drilling suggests this fact. This is discussed in more detail under the McCabe-Gladstone Property. The remainder of the drilling (15,000-20,000 feet) is being used to drill deep holes (1,200-1,500 feet) to test for the possible extension of the McCabe-Gladstone mineralized zone at depth. Several other drilling targets involving shallow drilling will also be carried out on the Idaho, Lookout and Arizona claims. The core is shipped to the company warehouse in Mayer where it is logged, mineralized sections split and sent out for analyses. Analyses are made for copper, lead, zinc, gold and silver. In cases where gold and silver assays have an assayed content of over 0.1 oz/ton they are reassayed at two other laboratories for verification.

Acquisition

The Company's McCabe-Gladstone area (inclusive of those properties for which contracts of purchase have been signed but the closings of title of which have not yet occurred) covers an area approximately 12,000 feet long by 5,000 feet wide and stretches from the Iron King mine in the northeast to the Rebel mine in the southwest. (See Map 2, page 47.) This area lies approximately 3 miles west of U. S. Highway #69 near the Town of Humbolt. Access is by all weather gravel road. The elevation averages 5,000 feet with local relief of 250 to 500 feet. The climate is temperate and allows work to continue throughout the year. Water supply is adequate.

The Company purchased the Gladstone Westerly Extension, Gladstone, Sink to Rise, McCabe and Monopolistic patented claims, the Northeast one half of the Arizona Claim described below, the patented Goodyear Millsite as well as the Blue Sky 1, 2 and 3 and Silver Link unpatented claims, for an aggregate of \$6,000,000 (inclusive of royalties), of which \$175,000 has been paid. The sum of \$75,000 is payable in January, 1982, and is intended to be made available from funds provided by lessees of the property. The balance of the purchase price (\$5,750,000) is payable by (a) the assumption of a \$27,000 mortgage and (b) commencing in 1985, a minimum payment of \$500,000 per year if the area is in production or \$100,000 per year if the area is not in production. A royalty equal to 10% of net smelter returns (applicable against the minimum annual payments of \$500,000) is payable when the area is in production.

The Company purchased the southwest one-half of the Arizona patented claim for \$90,000 of which \$30,000 has been paid. The balance of the purchase price is payable \$5,000 each in December 1981 and June 1982; \$15,000 each in December 1982 and June 1983; and \$20,000 in December 1983. It is intended that the lessees of the claim will provide the funds for these payments.

The Company has purchased the Idaho patented claim for \$250,000 of which \$25,000 has been paid. The balance of the purchase price is payable \$10,000 in October 1981; \$35,000 in January 1982; \$75,000 in July 1982; and \$105,000 in January 1983. A royalty equal to 10% of net smelter returns (applicable against the aforesaid payments) is payable when there is production from the claim. It is intended that the lessees of the claims will provide the funds for these payments.

The Company has purchased the Lookout unpatented claim for \$200,000, of which \$35,000 has been paid. The balance of the purchase price is payable \$25,000 each in July 1981, January 1982 and July 1982; and \$90,000 in July 1983. It is intended that the lessees of the claim will provide the funds for these payments.

The Company has contracted to purchase the Adventure, Adventure No. 1, Adventure No. 3 and Lizabeth patented claims for \$165,000, payable \$25,000 at the Closing; \$15,000, 12 months after the Closing; \$25,000, 24 months and 36 months after the Closing; and \$75,000, 39 months after the Closing. It is intended that the lessees of these claims will provide the funds for these payments.

The Company has contracted to purchase the T & B unpatented claim for \$15,000 payable in full at the Closing. The Company has purchased the Hattie Queen unpatented claim (which conflicts with the T & B claim), \$7,500 of which has been paid and the balance of which is payable when the prior owner of the Hattie Queen claim secures a judgment of quiet title against the owner of the T & B claim. (See "Characteristics of Mineral Properties—Title to Mining Properties".)

The Company has purchased the Little Kicker and Rebel patented claims for an aggregate of \$1,615,000 of which \$35,000 has been paid. The balance of the purchase price is payable \$10,000 in December 1981; \$15,000 in June 1982; \$25,000 in December 1982; \$30,000 in June 1983; and through monthly payments of \$1,000 each commencing in July 1983 if the area is not in production. If the area is in production payments equal to 3% of the net smelter returns will be paid in lieu of the \$1,000 monthly payments, until the purchase price is paid in full. It is intended that the lessees of these claims will provide the funds for these payments.

The Company has contracted to purchase the Gopher and Silverton patented claims for \$99,840, payable \$8,000 at the Closing; \$9,000, 6 months, 12 months, 18 months, 24 months, 30 months and 36 months after

the Closing; and \$37,840, 38 months after the Closing but only if the Company makes an affirmative production decision concerning the claims. It is intended that the lessees of the claims will provide the funds for these payments.

McCABE—GLADSTONE MINE

Geological Description

The McCabe-Gladstone mine was developed on a mineralized zone approximately 3,000 feet long, lying within the Spud Mountain volcanics. The workings are serviced by several shafts and are joined at depth. The McCabe was developed by a shaft 900 feet deep, and the Gladstone by a shaft 1,100 feet deep (U. S. Geological Survey Paper 308, p. 171). Average analyses of shipping ore and concentrates from the McCabe-Gladstone mine were as follows: copper 2%, lead 2.1%, zinc 4.7%, 1.6 oz/ton gold, 10.2 oz/ton silver (U. S. Geological Survey Bulletin 782, p. 174). The approximate production of the McCabe-Gladstone mine from 1880-1926 was 62,800 ounces of gold, 779,000 ounces of silver, 1,200,000 pounds of copper, 500,000 pounds of lead (Arizona Bureau of Mines Bulletin 140, "Arizona Metal Production", 1936, M. J. Elsing and R. E. S. Heineman). There has been little activity on the property since 1913. Some activity took place in the 1930's when dump and backfill material were processed for their precious metal content. The old shafts and underground workings are at present flooded. U. S. G. S. Survey Paper 308 reports there were five different mineralized shoots in the McCabe-Gladstone mineral zone and that all of the various mine workings on the bottom levels were still in mineralized ground. The objective of Stan West exploration program is to test for the possible extension of these mineral zones at depth by deep drilling. If sufficient grade and tonnage can be shown to exist, the Company's intentions would be to dewater the old mine, sink a new shaft and bring the property into production. This is discussed in detail below in the proposed exploration program.

Exploration Program To Date

The purpose and objectives of the drill program on McCabe are basically fourfold: (1) To test for the extension of the mineralized ore shoots below the 1,000 foot level; (2) To test for extensions along strike to the northeast and southwest; (3) To test for the possible existence of parallel mineral shoots; and (4) To test for unmined mineralization in the old workings.

The exploration program consisted of detailed geological mapping of the surface, study of all underground maps and sections, as well as production records, geochemical studies, and geophysical studies. Following this, the diamond drilling program was initiated.

Geological Studies

Detailed geological studies and mapping of the McCabe-Gladstone mineralized zone showed that the mineralization varied from 1 to 10 feet in width and averaged approximately 5 feet.

The zone followed the contact of the Spud Mountain volcanic tuffs with the Spud Mountain volcanic breccias for its entire length. The sulphide mineralization is irregular, sporadic and extremely variable not only in width but also in grade. In places it shows a crude banding and fine-grained characteristics suggestive of volcanogenic-type deposits. Deposits of this type are extremely common throughout the world and constitute some of the major mining districts, i.e., Kidd Creek, Noranda, Rio Tinto, Japanese Kuroko-type deposits and the nearby Iron King and United Verde mines. Detailed surface geological mapping of the McCabe and Gladstone mineral zones indicated the possible presence of other parallel mineralized zones. This possibility was also substantiated by the presence of old pits and diggings in zones parallel to McCabe-Gladstone. A study of the underground assay plans and maps indicated that mineralization was present on the lower levels (1,000 feet) and that the ore zone consisted of five shoots 200-400 feet in length plunging to the southwest. The probability of the ore shoots continuing at depth appears to be good. This is especially true when considering the fact the Iron King mine located a short distance to the northeast on the same formation was mined to a depth of 3,600 feet. Longitudinal sections of the working show they extend over a length of 3,000 feet.

Geochemical Program

A geochemical survey was completed over the McCabe-Gladstone claim group. This survey was conducted on lines 200 feet apart across the zone, samples being collected at 25 foot intervals. Samples were analyzed for copper, lead and zinc and the results plotted on the base topographic map. The results of the geochemical survey for all three metals indicated strong linear trends along the mineralized zone that was known as the McCabe. Dumps and tailings showed extensive contamination, however, zones in areas with no workings or dumps were strongly anomalous. An interesting feature of the survey was a broad zone which was strongly defined, especially with respect to zinc and lead over the McCabe-Gladstone trend. This zone was 300 feet in width and 5,000 feet long. The wide trend suggested there was possibly more than one mineralized zone present. A ground check of these broad geochemical zones indicated the presence of pits of other old workings parallel to the main zone. Following the geochemical work a decision was made to carry out a TURAM geophysical survey over the highly anomalous McCabe-Gladstone trend.

Geophysical Survey

A geophysical survey using the TURAM method was carried out over the strongly anomalous geochemical trends that paralleled the McCabe-Gladstone trend. The results of this survey showed that two parallel anomalous conductors were present over the McCabe part of the property. This suggested two or more mineralized zones paralleling the McCabe zone that had been exploited in the past. The Gladstone zone was strongly outlined by a single conductor. Between the Gladstone and the McCabe there appears to be a fault that is occupied by a mineralized vein system known as the Henrietta. This fault displaces the McCabe-Gladstone trend approximately 200 feet. The geophysical conductors swing sharply along the Henrietta trend before continuing again over the Gladstone area. The conductors over the Henrietta are equally as strong as those over the McCabe zone and the Gladstone extension. Mining took place on the Henrietta zone some 10,000 feet east of the McCabe-Gladstone area. In summary, the geophysical survey indicates:

1. Strong northeasterly trending conductors over the previously mined McCabe-Gladstone zone;
2. Strong parallel conductors along the zone and extending past the areas of mining;
3. Strong conductors along the Henrietta zone that transgresses the McCabe-Gladstone zone in a northerly direction.

In addition to this, strong conductors exist on the extensions of the McCabe to the northeast as well as over the Gladstone and Idaho claims that lie adjacent 1,000 feet east of the McCabe-Gladstone zone. The geophysical contractor, Scintrex, recommended that all of these zones be tested by diamond drilling.

Diamond Drilling Program

The diamond drilling program on the McCabe-Gladstone area is designed to test for the following:

1. The downward extension of the mineralized shoots that were mined to the 1,000 foot level and along strike for a distance of 3,000 feet.
2. The presence of the mineralized zones parallel to the McCabe zone that had been suggested by the geophysical and geochemical program.
3. Extensions of the McCabe-Gladstone mineral zones to the northeast and to the southwest.
4. To drill through the old working on the McCabe-Gladstone to determine as to whether or not mineralization of economic value had been left on the hanging and footwall sides of the zone that had been selectively mined in the past.

It was estimated that approximately 25,000-35,000 feet of core drilling would be necessary to test the above assumptions. The initial program was to test the surface anomalies parallel to the McCabe zone and at the same time commence deep drilling. To date approximately ten steeply inclined holes have been drilled to shallow depths and six steeply inclined holes have been completed to depths of 1,500 feet. All of these have been surveyed with a down-hole camera. The cost of the drilling has averaged \$30 per foot. The holes to date with related assays are reviewed below.

McCabe-Gladstone System—Shallow Holes

The shallow holes above the 400 foot level showed the possible existence of two additional mineralized zones paralleling the McCabe-Gladstone system. These have been termed:

(1) east of McCabe-Monopolist zone

(2) west of McCabe-Sink to Rise

Hole No.	Interval (Ft.)	Core Length (Ft.)	Gold-Oz/Ton	Silver-Oz/Ton	Copper-%/Ton	Lead-%/Ton	Zinc-%/Ton
1. McCabe Vein							
S-58A	295.0-302.0	(7 ft.)	0.132	.05	365 PPM	200 PPM	0.20%
2. H.W. McCabe Vein							
T-62	260.0-262.0	(2.0 ft.)	0.106	0.80	.15%	320 PPM	0.32%
3. Sink to Rise Vein							
T-62	364.5-368.0	(3.5 ft.)	0.332	1.15	90 PPM	275 PPM	.40%
4. McCabe Vein							
S-68A	171.0-172.2	(1.2 ft.)	0.468	3.40	.46%	.41%	.34%
5. Monopolist Zone							
V-52	520.3-520.5	(0.2 ft.)	.674	1.46	.39%	360 PPM	295 PPM
	537.0-537.8	(0.8 ft.)	.284	1.46	.38%	.10%	230 PPM
	691.4-692.0	(0.6 ft.)	.184	0.20	.14%	200 PPM	390 PPM
6. F.W. McCabe Vein							
P-51 B	418.0-418.8	(0.8 ft.)	.550	6.0	2.14%	.60%	.43%
7. Sink to Rise Zone							
P-51 B	432.7-435.0	(2.3 ft.)	.380	1.84	.49%	.09%	.81%
8. Monopolistic Zone* Q-52	163.2-167.0	(3.8 ft.)	.28	.584	.16%	370 PPM	825 PPM
	169.0-170.0	(1.0 ft.)	.012	.05	100 PPM	30 PPM	525 PPM
	186.0-189.8	(3.8 ft.)	.792	.42	600 PPM	675 PPM	.10%
9. H.W. McCabe Vein**							
Q-52	267.0-269.0	(2.0 ft.)	.216	1.02	.29%	.13%	725 PPM
	269.0-271.0	(2.0 ft.)	.032	.05	165 PPM	370 PPM	.17%
	271.0-273.0	(2.0 ft.)	.608	2.92	.60%	.17%	.21%
10. Monopolist Zone							
P-51A	294.0-298.4	(4.4 ft.)	.255	.65	.29%	.21%	.19%
11. McCabe Vein							
P-51A	335.0-340.0	(5.0 ft.)	.156	.15	.10%	.07%	.11%
	340.0-345.0	(5.0 ft.)	.023	-.05	.09%	.21%	.53%
	345.0-348.6	(3.6 ft.)	.018	-.05	.06%	.05%	.17%
	348.6-351.3	(2.7 ft.)	.006	.10	.10%	.04%	.20%
	351.3-352.7	(1.4 ft.)	.142	3.65	2.60%	.10%	.20%
12. Sink to Rise Vein							
068A	772.8-774.2	(1.4 ft.)	.103	.47	995 PPM	.66%	14.0%
	774.2-778.0	(3.8 ft.)	.003	.02	135 PPM	100 PPM	.44%
	778.0-782.4	(4.4 ft.)	.002	.02	66 PPM	15 PPM	294 PPM
	782.4-784.5	(2.10 ft.)	.027	.17	395 PPM	.34%	6.9%
13. McCabe Zone							
0-68B	940.4-942.1	(1.7 ft.)					
	942.1-945.4	(3.3 ft.)					
	961.3-965.0	(3.7 ft.)					
	965.0-968.0	(3.0 ft.)					
	968.0-973.0	(5.0 ft.)					
	973.0-977.0	(4.0 ft.)					
	977.0-980.0	(3.0 ft.)					
	980.0-981.2	(1.2 ft.)					
	981.2-981.9	(.7 ft.)					
	981.9-982.6	(.7 ft.)					
	982.6-982.9	(.3 ft.)					

(Assays Pending)

* Section 163.2-189.8 (26.6 ft. - 0.154 oz. Gold/ton - weighted average)

** Section 267.0-273.0 (6.0 ft. - 0.284 oz. Gold/ton - weighted average.)

The shallow surface drilling to date has indicated the presence of at least two mineralized zones parallel to the McCabe vein. These are the Monopolistic and Sink to Rise zones. The Monopolistic zone was cut by holes V-52, Q-52 and P-51A. The Sink to Rise has been cut by hole T-62 and P-51 where good values were returned. It is of interest that these intercepts line up with the geophysical anomalies. D.D. Holes S-68A, O-68A and O-68B have intersected the northeasterly extension of the McCabe vein indicating that the zone is open and possibly extends to the northeast. Other drill holes such as S-58A, T-62, Q-52 and P-51A indicate that the old workings of the McCabe-Gladstone system contain mineralized ground left behind on the hanging and footwall sides. It would appear that the early mining was restricted to the center of the vein.

In conclusion it can be said the shallow drilling program to date indicates the probable presence of two parallel mineralized zones to a depth of at least 300 feet and that mineralized vein material has been left on the hanging wall and footwall sides of the McCabe vein. The fact that holes S-68A, O-68A and O-68B cut mineralization past the area of mining on the northeast end of the McCabe zone indicates a potential in that direction. This will be tested by later drilling.

McCabe-Gladstone System—Deep Drilling Program

The deep drilling program has been programmed so as to test for the downward extension of the mineralized zone at the McCabe-Gladstone mine below the 1,000 foot level. To date seven holes have been completed. In most of the deep holes wedges were set 400-500 feet back from the vein intersection. This allowed another cut at the mineralized zone. In most cases the distance between the intercepts was 25 to 30 feet. These are shown below:

Hole No.	Interval (Ft.)	Core Length (Ft.)	Gold-Oz/Ton	Silver-Oz/Ton	Copper-%/Ton	Lead-%/Ton	Zinc-%/Ton
L-62	1402.0-1405.0	(3.0 ft.)	.070	.17	.04%	.08%	.06%
	1405.0-1409.0	(4.0 ft.)	1.572	5.60	.83%	.60%	1.70%
	1409.0-1409.9	(0.9 ft.)	.058	.10	.06%	.24%	.12%
L-62 (Wedge #1)	1410.1-1411.8	(1.7 ft.)	.816	2.25	1.45%	.48%	1.05%
	1411.8-1414.0	(2.2 ft.)	.100	.42	.07%	.05%	.11%
	1414.0-1416.9	(2.9 ft.)	.206	.43	.05%	.03%	.05%
I-62 (Wedge #2)	1424.8-1425.7	(0.9 ft.)	.009	.17	.18%	.03%	.05%
	1425.7-1426.2	(0.5 ft.)	.828	3.05	.75%	.17%	.85%
	1426.2-1427.0	(0.8 ft.)	.282	.36	.14%	.03%	.04%
I-42	1543.6-1544.2	(0.6 ft.)	.010	.10	.05%	.02%	.04%
	1544.2-1545.8	(1.6 ft.)	.038	.10	.03%	.07%	.15%
	1545.8-1547.4	(1.6 ft.)	.005	.15	.01%	.20%	.70%
I-42 (Wedge)	1520.8-1523.3	(2.5 ft.)	trace	.05	trace	.07%	.13%
	1523.3-1523.7	(0.4 ft.)	trace	.15	.01%	.26%	3.0%
	1523.7-1527.0	(3.3 ft.)	.026	.05	.03%	.08%	.04%
	1527.0-1530.0	(3.0 ft.)	.008	.10	.03%	.09%	.15%
	1530.0-1532.0	(2.0 ft.)	trace	.05	.01%	.02%	.14%
	1532.0-1535.0	(3.0 ft.)	.014	.15	.01%	.07%	.22%
I-43	1815.0-1820.1	(5.1 ft.)	.005	.10	145 PPM	30 PPM	85 PPM
	1820.1-1820.8	(0.7 ft.)	.005	.33	255 PPM	165 PPM	925 PPM
	1820.8-1822.0	(1.2 ft.)	.180	4.54	.49%	.78%	2.70%
	1822.0-1823.0	(1.0 ft.)	.005	.15	165 PPM	720 PPM	.33%
K-59	1641.1-1642.0	(.90 ft.)	.742	.42	780 PPM	350 PPM	410 PPM
	1642.0-1644.0	(2.0 ft.)	.024	.05	250 PPM	100 PPM	105 PPM
	1644.0-1644.7	(0.7 ft.)	.164	.10	95 PPM	145 PPM	220 PPM
	1644.7-1647.3	(2.6 ft.)	.094	.10	645 PPM	110 PPM	75 PPM
J-55	1466.0-1469.0	(3.0 ft.)	.044	.18	286 PPM	136 PPM	298 PPM
	1469.0-1472.0	(3.0 ft.)	.013	.08	335 PPM	60 PPM	327 PPM
	1472.0-1474.0	(2.0 ft.)	.038	.08	325 PPM	102 PPM	910 PPM
	1474.0-1476.8	(2.8 ft.)	.20	2.69	0.69%	1.21%	3.25%
J-53	1583.0-1585.5	(2.5 ft.)	.002	.01	.02%	.15%	.33%
	1585.5-1586.8	(1.3 ft.)	.098	20.47	.44%	22.0%	27.40%
	1586.8-1587.8	(1.0 ft.)	.478	34.64	2.13%	7.20%	23.60%
	1587.8-1590.5	(2.7 ft.)	.004	0.23	.01%	0.17%	0.33%

Hole No.	Interval (Ft.)	Core Length (Ft.)	Gold-Oz/Ton	Silver-Oz/Ton	Copper-%/Ton	Lead-%/Ton	Zinc-%/Ton
L-64	1545.0-1550.0	(5.0 ft.)	.066.	.11	136 PPM	76 PPM	347 PPM
	1550.0-1551.0	(1.0 ft.)	.008	.18	263 PPM	.17%	.19%
	1551.0-1552.4	(1.4 ft.)	.071	.22	600 PPM	.13%	30 PPM
	1552.4-1554.1	(1.7 ft.)	.012	.21	97 PPM	.11%	224 PPM
L-64 (Wedge)	1513.8-1515.9	(2.1 ft.)	.73	.70	.012%	.01%	.05%
	1515.9-1516.1	(0.2 ft.)	.20	.40	.05 %	.02%	.11%
	1516.1-1516.6	(0.5 ft.)	.56	2.4	.13 %	.19%	.18%
	1531.6-1532.4	(0.8 ft.)	1.42	3.1	.32 %	1.52%	.40%
H-51 (Henrietta Vein)	1428.9-1429.5	(0.6 ft.)	.87	6.82	.88%	1.95%	.54%
	1438.5-1442.4	(3.9 ft.)	.06	.20	—	—	—
	1442.4-1445.6	(3.2 ft.)	.78	1.0	—	—	—
(Mc- Cabe Vein)	1754.9-1756.7	(1.8 ft.)	1.17	5.7	—	—	—

The above drill holes indicate that the mineralization at the McCabe mine probably extends to at least 700 feet below the old workings. It consists of sulphides of copper, lead and zinc with accompanying gold and silver.

In summary, the diamond drilling program to date at McCabe suggests that the property has potential viable tonnage of gold mineralization at depth, as well as close to the surface and probably on its extensions to the northeasterly part of the property.

The diamond drill program is still in progress and it is intended that a minimum of 10-12 inclined deep holes will be put down at depths from 1,200-1,500 feet to test the McCabe-Gladstone zones. If the results of this drilling are considered to show economic potential, a program of drilling and underground work to block out mineralization to a depth of at least 2,000 feet will be carried out. This will in part be carried out by surface drilling but for the greater part by underground drilling. The old workings at McCabe will be pumped out and the shaft rehabilitated. Four drill stations will be established on the 1,000 foot level. Diamond drill holes will be fanned out from the stations to cut the mineralized zone in such a manner that an accurate estimate of grade and tonnage can be made. Following this work a feasibility study will be carried out on which a production decision could be made. The mine dewatering, shaft rehabilitation, underground work and diamond drilling will cost approximately \$3.5 million. These funds will be solicited from the co-tenants.

If the above program is successful and viable tonnages of mineralization is blocked out to the 2,000 foot level, the Company would endeavor to bring the property into production. This would involve sinking a production shaft to a depth of 2,000 feet, carrying out underground development and the construction of a mill and ancillary plants to recover the gold and base metals. It is estimated that the capital costs to treat 500 tons per day (150,000 tons per year) including shaft, underground development head frame and milling capacities would cost in the order of \$15 million. It is intended that the monies would be secured by loans and to the extent necessary by equity financing.

LOOKOUT MINE

Geological Description

The Lookout mine, comprising 20 acres contained in one unpatented claim and located 5,000 feet northeast of the McCabe-Gladstone mine (see Map 2, page 47), was mined to a limited extent for silver, lead and zinc ores. The mine is on the Silver Belt-McCabe trend and little is known about the history, development and production of this property. Anderson and Creasy in their report (Geological Survey Professional Paper No. 308) state that the mine was in operation in 1922 when Waldemar Lindgren visited the area but was presumably closed thereafter. It is reported that the property was reopened for a short period during 1948 and 1949. At that time a few tons of high grade ore consisting chiefly of galena, sphalerite, pyrite was piled in the dump. Professor Lindgren (U.S.G.S. Bulletin 782, page 130) stated that a shaft 200 feet deep was present during his visit and that similar ore to that in the Arizona mine was present. At the present time

only the upper portion of the shaft is accessible. He also stated that the high grade ores contained silver with minor amounts of gold and that the Lookout vein can be traced 1,500 feet southwest toward the McCabe mine.

Exploration Program To Date

The Company has staked claims in the area around this property and has completed geological mapping, geochemical sampling, followed by a TURAM electromagnetic survey. Limited diamond drilling was also carried out. This is described below.

Geological Mapping

The area is underlain by the Spud Mountain volcanic series. The host rock for the mineralization is the Spud Mountain tuffaceous formation which traverses the property from southwest to northeast. The mineralization consists of argentiferous galena with minor sphalerite and pyrite. The mineralization is disseminated to massive and is localized in the tuff horizon with associated "chert". The formations are dipping steeply (80°) to the northeast. The surface exposure of the mineralized zone is highly leached and oxidized with the formation of secondary sulphides of silver and lead.

Geochemical Survey

The property was covered by a geochemical survey on lines 200 feet apart across the trend of the mineralized zone. Samples were taken at 25 foot intervals. These were analyzed for copper, lead and zinc. Plotting of the results revealed a large anomaly several thousand feet long and several hundred feet wide that covers the Lookout mine area. The copper gives a broad anomaly while the lead and zinc anomalies are specifically high along linear trends. These trends parallel and follow the Spud Mountain tuffaceous formation. The values of the lead and zinc anomalies are 10 to 15 times background. In general, one can conclude that the anomalous areas coincide not only with the known mineralized zones but also infer parallel trends that coincide with favourable volcanic horizons.

Geophysical Program

A program of TURAM geophysical survey utilizing differences in conductivity and resistivity was carried out over the area. Four lines were extended across the areas of known mineralization and favorable geochemistry. The geophysical program indicated a strong conductor along the known mineralized zone and three other conductors parallel to the mineralized zone. The geophysical characteristics of the conductors in all cases are similar. The distance between them is in the order of 200-300 feet.

Diamond Drilling Program

Three shallow (150-400 feet) inclined diamond drill holes were put down on the Lookout zone on which shallow (200 feet) workings are located. This zone has favorable geology with coincident geochemistry and geophysics. The results of preliminary diamond drilling are as follows:

Hole No.	Interval (Ft.)	Core Length (Ft.)	Gold- Oz/Ton	Silver- Oz/Ton	Copper- %/Ton	Lead- %/Ton	Zinc- %/Ton
L-1A							
(Main Vein)	306.9-311.1	(4.2 ft.)	.035	10.8	.05%	10.2 %	5.5 %
L-1B	268.8-270.5	(1.70 ft.)	.017	1.58	.01%	1.61%	0.84%
L-2							
(Main Vein)	305.8-309.6	(3.8 ft.)	.01	0.45	trace	.62%	.08%
L-3							
(Possibly same vein as L-1B) ...	175.4-176.3	(.90 ft.)	.012	4.10	.22%	3.9 %	9.60%

The preliminary drilling carried out to date on the main Lookout zone strongly infers that one or more mineral zones carrying significant silver, lead, copper and zinc values exist on the property. Minor gold is also present. The configuration of the initial drilling pattern would indicate that the ore zones are irregular in

shape and will require a closely spaced (100' x 100') grid of drilling in order to delimit and to determine the grade and tonnage. This pattern is not unusual if one studies the stoping plans from the adjoining Arizona mine. High grade ore shoots on this property were mined to a depth of approximately 600 feet. The plans show that the ore shoots carrying silver and lead values were irregular in their shape and distribution.

Future Plans

The Company intends to carry out an extensive drilling program on the Lookout mine. This will entail approximately 25,000 to 30,000 feet of drilling. The cost will be \$1 million. The holes will be spaced in a 100' x 100' grid so as to define the mineralized zones.

The cost of distribution will be as follows:

Core Drilling—25,000 @ \$30/ft.	\$ 750,000
Site Preparation	25,000
Supervision—10 months @ \$5,000	50,000
Assaying	75,000
Drilling supplies	50,000
Contingencies	50,000
TOTAL	<u>\$1,000,000</u>

It is intended that lessees of the Lookout claim will provide the funds for this program. It is estimated that the program will take six to nine months to complete using two core drills.

The property has not been mined to any extent, and it would not be possible to estimate mineralization down to a depth of 500 feet without deduction for stoped areas. Following this program of close-spaced drilling a feasibility study will be made with respect to bringing the property into production. If the results of this study are favorable the Company will proceed to construct a plant (250-500 tons per day) and bring the property into production. The cost of sinking a shaft, building a flotation plant and other ancillary installations will cost \$7-\$10 million. It is intended that the monies would be secured by loans and to the extent necessary by equity financing.

ARIZONA MINE

Geological Description

The Company owns the Arizona patented claim which comprises approximately 20 acres and is located approximately 3,000 feet northeast of the McCabe mine. (See Map 2, page 47.) At the time of Professor Lindgren's visit in the Jerome area in 1922 the Arizona mine was reported to be operating and had been since 1915. The mine at present is inaccessible. The deposit was developed by two shafts, approximately 500 feet deep and by seven levels extending off the shaft. The vein is reported to strike north 20° east, dip 70° east and ranges in width from a few inches to several feet. The vein extends over a distance of approximately 1,500 feet. The following data on the production of the Arizona mine was reported by *Geological Survey Professional Paper No. 308* by Anderson and Creasy:

"It was reported that between 1921 and 1926 the deposit yielded 1,000 pounds of lead and silver, valued at \$60,000. The following production data was furnished by Fred Gibbs, Prescott, Arizona. From October 1915 to June 1923 F. M. Anderson recovered 2,068 tons of concentrate that averaged 103 ounces of silver per ton, 26.9% lead, 11.9% zinc and about 0.3% copper and about 0.02 ounces of gold per ton. Production from October 1922 to January 1925 was about 3,600 tons of ore that yielded 70,850 ounces of silver and 228,713 pounds of lead. The grade of this ore was about 20.0 ounces of silver per ton and about 3.0% lead. From October 1928 to February 1931 the Double O Metals Company produced 377 tons of concentrate that averaged 114 ounces of silver per ton, 32% lead and 10% zinc and 0.5 to 1.0% copper and about 0.3 ounces of gold per ton."

Historical reports state that the bottom levels of the mine are still in mineralized rock.

The exploration venture has mapped the property and conducted geochemical and geophysical surveys. It is planned to test the extension of the mineralization on strike and at depth through a diamond drilling program sponsored by the Company.

Exploration Program To Date

The Company has staked claims in the area around this property and has completed geological mapping, geochemical sampling and a geophysical survey (TURAM) over the area. The results of these studies indicate good correlation between known vein structures and field surveys.

Geological Mapping

The area was mapped at a scale of 1 inch = 200 feet. Geological mapping showed the known mineralization to be closely associated with the Spud Mountain volcanic formations. In particular the zone of silver mineralization followed the Spud Mountain tuffaceous formation. The vein structure is approximately 3-4 feet wide and dips steeply to the east. At the surface the vein is highly leached and oxidized and appears to contain various secondary sulphides of silver and lead.

Geochemical Program

A geochemical survey consisting of lines 200 feet apart were run over the Arizona property. Soil samples were taken at 25 foot intervals along these lines. These were analyzed for copper, lead and zinc. The area (contamination was high) showed a very large anomaly of copper on which were superimposed higher values (10 times background) of lead and zinc. In general, the lead and zinc anomalies parallel the mineralized Spud Mountain tuffaceous formation. Several anomalous areas existed outside of the area of mining suggesting parallel zones of mineralization. In general, one can conclude that the geochemical anomalies over the Arizona mine area parallel favorable formations and were coincident with the trend of known mineralization in the area.

Geophysical Survey

A geophysical survey was carried out over this area. This consisted of a TURAM (electromagnetic) study with lines at right angles to the known zones of mineralization and mining. While the results could be interpreted as being favorable because of the general coincidence with the known zone of mineralization and mining, a finite interpretation is difficult because of electrical power lines that cross the property. These caused the interpretation of the survey to be ambiguous.

Diamond Drilling

No diamond drilling of the property is planned at the present time. When it is carried out it will consist of drilling to test the possible down dip extension of ore shoots that have been mined in the past as well as their possible extension to the southeast.

GOPHER-SILVERTON CLAIMS

Geological Description

The Gopher-Silverton property consists of two patented claims covering approximately 41 acres in the McCabe-Gladstone area. The Gopher-Silverton claims are contiguous with the south end of the Company's Adventure patented claims. (See Map 2, page 47). They lie to the north of the Henrietta mine and along the same trend of mineralization. The Henrietta vein system intersects the central area of the McCabe-Gladstone vein system. The Gopher-Silverton claims cover approximately 2,400 feet of the Henrietta zone of mineralization.

Several short shafts (200-450 feet deep) occur along the Gopher claim, and it is reported that the workings were in the oxidized zone which contained gold. The primary ore has not been worked to any extent (U. S. Geological Survey Bulletin 782, pages 137-139). Mineralization along the Henrietta trend is confined

to a quartz vein 2-6 feet wide. Ore from the stopes on the 450-600 foot levels of the Henrietta mine are reported to average 3.2% copper, 14.0% iron, 0.2 oz/ton gold and 2.7 oz/ton silver. Crandall-Chazan Inc. of Nevada is currently reopening the old workings on the Henrietta mine.

Future Exploration Program

No exploration is proposed on the Gopher-Silverton claims at the present time. However, during the deep drill program of the McCabe-Gladstone vein, Drill Hole H-51 cut the Henrietta vein (See "McCabe-Gladstone System—Deep Drilling Program" on page 32).

ADVENTURE CLAIMS

Geological Description

The Adventure claims—Adventure No. 1, Adventure No. 3 and Lizabeth are located approximately 1,000 feet to the south and east of the McCabe-Gladstone zone. (See Map 2, page 47.) They cover an area 3,000 feet long which contains 610 acres. The claims are patented. Little information is available on the property as no production was carried out. Several old pits and trenches are present which contain vein outcroppings that show highly oxidized sulphides. As these claims occur within the McCabe area, they were mapped and surveyed during the overall program.

Geological Mapping

Geological mapping showed that the old pits and trenches with associated mineralization in vein structures were located within the favorable Spud Mountain tuffaceous volcanic unit. The formations strike to the northeast and dip 80° to the east. Mineralization exposed at the surface consists of high oxidized sulphides of copper, lead and zinc.

Geochemical Program

The claim group showed high anomalies in copper, lead and zinc over the Spud Mountain tuffaceous unit. The principal anomaly was 1,000-1,500 feet long and paralleled the trend (northeast) of the formations.

Geophysical Survey

The area was covered by the TURAM geophysical survey. Several well defined anomalous (conductive) zones were outlined that coincided with the geochemical highs.

Diamond Drilling

Five drill holes were drilled on the central part of the anomalies. These cut a significant altered vein zone that contained trace amounts of copper, lead, zinc, gold and silver mineralization. The drill was moved to the northeastern end of the zone and drill hole L-64 which was testing the McCabe zone at depth cut the Adventure zone at a shallow depth (350.0) with favorable mineralization being encountered. This was as follows:

Hole No.	Interval (Ft.)	Core Length (Ft.)	Gold Oz/Ton	Silver Oz/Ton	Copper-Oz/Ton	Lead-%/Ton	Zinc %/Ton
L-64	351.0-356.8	5.8 ft.	.002	0.04	26 PPM	6 PPM	.13%
	356.8-359.2	2.4 ft.	1.154	8.59	1.4%	146 PPM	525 PPM
	359.2-360.0	.8 ft.	0.785	10.23	0.82%	.24%	.16%

Weighted Average — 356.8-360.0 (3.20 ft.) — 1.07 Gold oz/ton. — 9.0 Silver oz/ton.

The presence of 1.07 ounces of gold per ton and 9.0 ounces per ton of silver over a core length of 3.20 feet is significant. The copper values are also of importance. These metals associated with the favorable rock unit and delimited by strong geophysical and geochemical anomalies strongly infer that the Adventure zone could have much potential. Further drilling is planned at a later date.

IDAHO MINE

Geological Description

The Idaho property is located approximately 800 feet to the northeast of the McCabe area. Little information is available on the property. The mouths of two shafts which are caved in can be observed on the surface. The deepest shaft extended to a depth of 145 feet. No production was carried out on this property. The only reports that exist on this property are several old engineering studies which report values in gold and silver. As these claims occur within the McCabe area they were mapped and surveyed during the overall program.

Geological Mapping

Geological mapping indicated that the shafts, old workings and associated mineralization were located within the favorable Spud Mountain tuffaceous volcanic unit. Formations strike northeasterly and have a dip of 80° to the east. Mineralization is exposed at the surface and is highly leached and oxidized. It consists of sulphides of copper, lead and zinc.

Geochemical Survey

The area was included within the geochemical coverage. The area showed high anomalies in lead and zinc over the favorable Spud Mountain tuffaceous unit. These were approximately several thousand feet long and were well defined with respect to being localized within the important Spud Mountain volcanic horizon.

Geophysical Survey

The area was also within the coverage of the geophysical survey. The TURAM survey outlined several well-defined anomalous (conductive) zones that coincided with the geochemical highs.

Diamond Drilling

Two diamond drill holes were drilled on the property to test the anomalous geophysical and geochemical zones. They were drilled at an angle of 60° and to a depth of 400-500 feet. Both these holes cut a significant altered zone that contained minor amounts of copper, lead, zinc, gold and silver mineralization. The assays did not show that these metals were contained in significant amounts. The presence of these, however, associated with a favorable rock unit and delimited by geochemistry and geophysics is strongly suggestive that the zone could be important at depth. In view of this deeper drilling is planned at a later date.

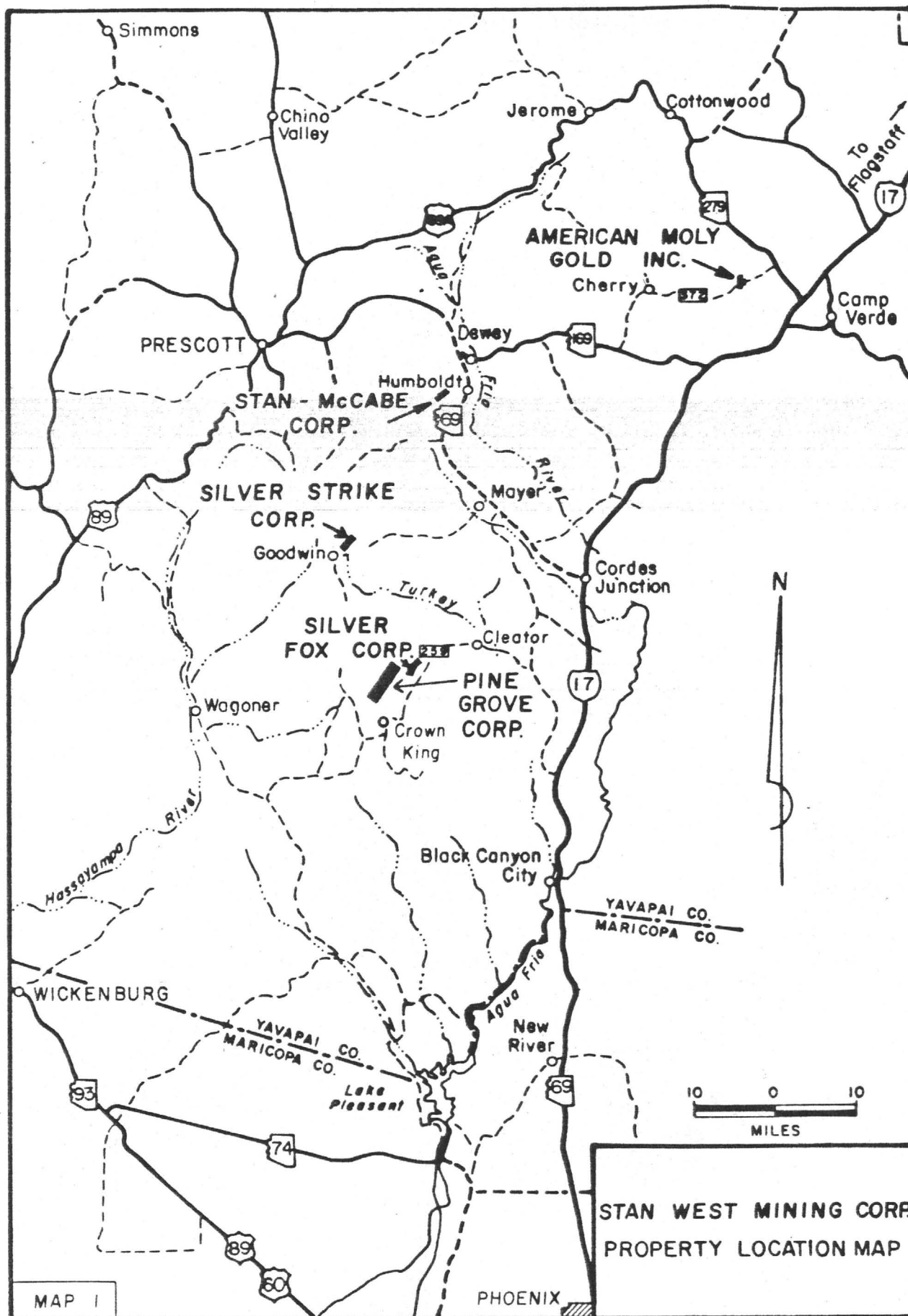
REBEL MINE

The Rebel mine is situated on two contiguous patented claims, the Rebel and the Little Kicker, covering approximately 41 acres. The Rebel Mine is reported to be on the same structure as the McCabe mine (U. S. Geological Survey Paper 308, p. 169). No accurate records of production are available for the Rebel Mine. The collars of two shafts are located on the property, one of which is still accessible near the surface. Exploration work is not planned to commence on these claims until some time in the latter part of 1981.

Silver Fox Property

Geological Description

The Silver Fox property consists of 597 acres containing 4 patented and 34 unpatented lode claims. (See Map 3, page 48). The property is located in the Peck mining district of Yavapai County, Arizona, 22 miles south of Mayer, and is accessible by an unpaved road from Forest Route 259 and State Highway 69. The Company has a contract to acquire the Silver Fox property for \$340,000, of which \$65,000 has been paid and the balance is payable \$25,000 each in October 1981, April 1982 and October 1982; and through monthly payments of \$1,000 each commencing in November 1982 if the area is not in production. If the area is in production 10% of the net smelter returns will be paid in lieu of the \$1,000 monthly payments until the



MAP 1

SY:(3)52498K(60.

