



CONTACT INFORMATION

Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

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Report on White Metal Mining Co.

Property at Pioneer, Gila County,
Arizona.

BY

J. S. Coupal, Mining Engineer

Property

The property of the White Metal Mining Company, consists of 15 Mining Claims, two of which are patented. The total area is approximately 270 acres. The claims all adjoin and form a compact group, covering 4,000 feet in length along the strike of the major veins, and 2,600 feet in width, which covers three more or less parallel vein systems.

The claims are located as shown on the attached plan and are known and recorded as follows:

Great Republic Lode Survey	#370
Pioneer South Lode	" #374
Fairview	Delinquent
Quartet	East Pioneer
Jewel	Challenge
West Republic	California
West Republic No. 2	Lucky Boy
Junior Republic	Rough Neck
North Pioneer	

Location- Physical Conditions

The property is located on the south slope of the Pinal Mountains, about twelve miles in an air line south of Globe. It is reached by a mountain road, about fourteen miles in length, which connects with the branch road of the Arizona Eastern Railroad at Christmas. The recently built State Highway from Globe to Winkelman passes within three miles of the property. A road has been surveyed from Pioneer to connect with the Globe Highway, which, when made, will greatly facilitate hauling to and from the mine.

The camp and mine are at an elevation of about 4,500 feet above sea level. This gives a fine working climate as the nights are cool in the heat of the summer, and the winters are very mild. Climate conditions are most favorable for year round operations.

There are several mountain springs on the property which furnish abundant water year round, both for domestic purposes and for supply for mill use. Water is piped from two of the springs to supply tanks, and the supply is sufficient for all needs. Additional water can be developed and stored, as needed, for increased operations. On the east Pioneer is an old well--145 feet deep

and a 100 foot cross-cut at the bottom, which can supply any added water needed.

The surrounding mountains are heavily timbered, the property being right at the edge of the Crook National Forest reserve. This timber is available for general mine use, as stulls, etc. and at very low cost. As fuel for domestic use, the claims and the immediate surroundings furnish sufficient scrub oak--a supply for many years.

The location and living conditions at the camp are exceptionally good. Sufficient buildings are available for housing all the workmen needed. Telephone connections are maintained with the main telephone exchange at Ray. Supplies can be hauled in daily, if needed, either over the Globe road or from Winkelman by automobile or truck. These features make it to keep a good class of men on the job, contented and comfortable, which is an item of importance in operations of this size.

History

The district was opened up in the early seventies, when the high-grade ores were mined near the surface and hauled by wagon to the Gulf of California, a distance of 300 miles and then shipped to the Smelters at San Francisco.

Later, stamp mills were installed and the high-grade, oxidized ores, down to water level, were mined and treated by amalgamation, crushing and settling.

The production has been estimated from what records are available at about \$1,000,000 from old company operations, and an additional \$300,000 from various leasors, who have worked on the narrow high-grade veins.

A new mill was erected in the eighties and was in operation for a short while when destroyed by fire. At about that time Silver was demonetized and the price dropped. Operations in the camp ceased, as in many other mining districts at that time and the property remained idle for many years.

The three major ore bodies in the camp were owned and operated by different individuals. Litigation resulted from conflictions to the underground limits of the ore bodies.

The claims were all consolidated into one Company, The White Metal Company; the old workings were opened up and the property equipped with hoist, compressors, camp buildings and a fifty ton flotation mill in 1920 and 1921.

Geology

The Pinal Mountains are essentially a highly metamorphosed sedimentary, called the Pinal schist, which has been altered by an intrusion of diorite. In the Pioneer camp, the main intrusion is diorite porphyry, which is closely associated with the veins and ore bodies.

The veins are roughly parallel with a strike of about North 30° east. They dip 70 degrees to 85 degrees to the west.

The vein filling is mainly quartz with the silver occurring as sulphides, associated with varying amounts of lead, zinc and copper sulphide. The main value is in silver with a small amount of gold.

The veins follow the porphyry dykes, either on the hanging or the foot wall.

The veins vary from three to ten feet in width and are clearly defined. The walls are firm and solid and hold with little or no timbering outside of occasional stulls.

Ore Development

There are three major veins on these claims, namely, the Howard Vein, the Pioneer or Challenge vein and the East Pioneer. In addition to these major veins, there are several minor veins and cross fractures which are narrow and high grade and from which most of the ore produced by lessors was mined.

The main production was obtained from the Pioneer vein. The shaft is down 450 feet. Across the gully and to the north, the vein was opened up by an adit level, which was extended to cut the Howard vein. Above the level, most of the oxidized ores have been mined. From the shaft, drifts on the ore from the two hundred and three hundred foot levels were driven. Above the two hundred foot level, the ore has been stoped for a distance of seven hundred feet in length. Little or no stoping has been done on the lower levels or from the bottom of the shaft as the sulphide of lead and zinc made this ore difficult to treat.

The Howard shaft is three hundred and fifty feet deep. Drifts on the one hundred, two hundred, and three hundred foot levels were driven. Most of the production came from above the two hundred foot level. The ore shoot showed a length of 750 feet, as indicated by the stopes from the adit level.

The East Pioneer vein is practically all virgin ground. Open cuts show from eight to ten feet in width of ore. There is little or no high grade on this vein, which accounts for its lack of development. The vein is of commercial milling value, however, and warrants active development.

The various shafts were inaccessible at the time of my examination so that it was impossible to get at the deeper workings and make any estimate on ore actually in sight.

Equipment

The property is fully equipped and ready for immediate operations recommendations for additions and certain changes will follow:

The Pioneer shaft is equipped with a 125 H.P. engine driving the Hoist and a 600 Cu-ft. compressor. There is a full equipment of machine drills, steel, small tools, blacksmith shop, track, mine cars, etc. Sufficient for a crew of from 30 to 50 men.

The mill is in first class operating condition, and was in operation during my visit to the property on ore which had accumulated during certain development.

Present equipment and the flow sheet of the mills are as follows:

- Crude ore from mine
- Crude ore bin
- Telsmith crusher, 150 ton daily capacity
- Crushed ore bin, circular, 100 ton capacity
- Challenge ore feeder
- Automatic sampler
- Conveyor feed belt
- Hardinge Ball Mill-5' 6" diameter
- Dorr classifier - 4' 6" by 14' 6"
 - Oversize; in close circuit with ball mill
 - Undersize; to
- K & K Roughing flotation cell- 12' long
 - Underflow to concentrating tables
 - Froth; to
- K & K finishing flotation cell-7' long
 - Underflow; in close circuit with roughing cell
 - Froth; to Dorrr thickener ten ft diameter
- Settling tank
- Filter
- Dryer-and sacked for shipment
- Two Plato Concentrate Tables
- Feed: Underflow from roughing cell
- Tailings to waste
- Concentrates to dryer and for shipment

The capacity of the mill as it now stands is fifty tons per day.
The recovery made by it is from ninety to ninety five percent of the values.

Comments

During the spring of 1926, changes were made in the flow sheet of the mill. The concentrates shipped averaged \$154.00 per ton, with silver about 65¢ per ounce. Crude ore shipped at the same time averaged \$20.84 per ton.

The mill and mine operations were originally based on the value of one dollar per ounce for silver, which held for several years, during which time the mine was being opened up and the mill erected. In 1923, the price of silver dropped to 65¢ per ounce and it is now about 55¢ per ounce.

This drop in the price of silver cut out the profits on the stope fills above the tunnel level, on which it was figured a good profit could be made.

The change in the price of silver has made it necessary to adopt a new policy as far as the mine and mill are concerned.

Recommendations

The following recommendations are made in order to meet the present conditions of a low price in silver and relatively high prices of lead and zinc.

First: New ore should be opened up and developed on the lower levels of the mine. Lead and zinc have both come in stronger at depth and their recover will in a large degree offset the drop in the price of silver.

Second: The capacity of the mill should be stepped up to one hundred tons per day and additional flotation cells installed to make a separation of the lead and zinc.

Third: A central power plant, full Diesel Engine, with direct connected generator, to develop electric power, and motor drives on the various equipment.

Fourth: A new road and connection made to the Globe highway.

There two main developments advised: First, extending the crosscut on the two hundred foot level of the Pioneer Shaft, west, a distance, of 380 ft. at which point it should cut the Howard vein and shaft, three hundred fifty feet below the surface; Second, the 300 foot level on the Pioneer shaft should be driven north along the vein and open up the downward extension of the main Pioneer ore shoot.

The Pioneer shaft is down to a depth of 450 feet. The old timbers are in bad shape below the 100 foot level and will have to be replaced and the shaft retimbered before active mining can be safely carried on. The shaft has been unwatered to the three hundred foot level and good ore is now in the breast of the drift at that point.

From the two hundred foot level on the Pioneer vein, a crosscut and raise should be driven to connect with the 75 foot shaft sunk on an intermediate vein; this new prospecting shaft has been sunk on ore, and from it, most of the crude ore shipped during the past year was mined.

These three developments will open up three proven ore shoots from which a tonnage of at least 100 tons per day can be had and maintained.

The East Pioneer vein should furnish a large tonnage of good mill ore. The surface shows a wide, firm vein. Development work can be done by means of a prospecting shaft from the surface. After a depth of three hundred feet is made, a cross-cut can be driven from the Pioneer shaft, a distance of 600 feet to connect with the new work on the East Pioneer vein.

Levels on the 100 foot and 200 foot level from the east Pioneer vein can be started and mining of ore carried on from the shaft until the connection is made. The development shaft would have to be driven in order to provide an emergency exit and air connection and to comply with the Arizona mining law, even tho the ore was first opened up by a cross-cut tunnel, so that it is most advisable to sink first and stay with the ore until sufficient depth is obtained before cross-cutting.

It would probably be possible to start milling on a 100 ton basis within six months time. The development work should then continue and as four separate and distinct ore bodies will be under development the property should be able to supply at least 200 tons per day, within a year's time, when the milling capacity should be increased. The mill is so erected that another 100 ton unit can be added at small cost.

The mill is driven by a 60 H. P. gas engine and the crusher by a 20 H. P. The mill is efficiently layed out and in first class operating condition. It has a daily capacity of fifty tons per twenty-four hours. By the addition of a fine grinder, a ball or a pebble mill to take the over-size from the classifier instead of returning the oversize to the Hardinge mill to be reground and by putting the classifier in close circuit with the fine grinding mill, the capacity can be brought up to 100 tons per day. The balance of the equipment in the mill has capacity to handle additional tonnage.

The present power consists of several independent oil and gas engines. New power will have to be added to bring the capacity of the mill up to 100 tons per day. The fuel cost, maintenance and attendance on the various engines are high and must be reduced.

The power required is about 350 H.P. and the installation recommended can be made, including motors, for approximately \$30,000 . The saving in cost of fuel will soon repay for this investment and is another item which will offset the drop in silver as figured on the original mill installation.

The present road is rough and has many steep grades in it. The upkeep of the road is high and hauling is difficult and expensive. As the new Globe Highway is completed, it is most advisable to make the three-mile connection with it. The County will aid in about one-half the expense of a new road. This road should be started and completed as early as possible.

The present equipment is sufficient to handle the development pending the road connection with the Globe highway and the installation of the new power plant.

Operating Procedure

The recommendations called for the following approximate distribution of expenditures:

Development	\$40,000	
Power Plant	30,000	
Road	10,000	
Ball Mill	5,000	
Freight, Hauling & Installation	4,500	\$89,500
<hr/>		
Margin and working capital		10,500
		<hr/>
Total		\$100,000

This amount should be provided to place the mine and equipment in first class operating condition in order to maintain a steady production of one hundred tons per day.

It is not necessary to make the entire expenditure at the start nor to hold up starting work until the whole amount is available or reasonably assured.

I advise the following:

- Retimber the Pioneer Shaft to the 300 foot level
- Complete cross-cut on 200 foot level to Howard vein
- Raise on ore from 200 foot level to Intermediate Shaft
- Drift on ore exposed on 300 foot level
- Start stopes on Howard Pioneer and Intermediate ore bodies
- Operate present mill

This work can be completed and the mill placed in operation in from sixty to ninety days. No changes will be required in the mill and a steady production of fifty tons per day can be maintained.

The cost of this first stage of the full recommendations will be approximately \$25,000.

With production operations resumed, the balance of the money required to complete the recommendations can be raised on much more favorable terms, both for the company and its present stock-holders.

All of the work outlined in the plan to start milling on a fifty-ton basis is work that is required under the larger plan. The delay in cheaper power, better road connections and increased mill capacity will be offset by the ease of raising the additional money required after the present plant is in operation.

Summary

The management is in the hands of capable and efficient mining men. The recommendations made herein have been submitted and discussed with them and have met with their entire approval.

The work as outlined will cost approximately \$100,000.00 and will take from five to six months to complete and put in full operation. The property will then be in position to mine and mill a tonnage of at least 100 tons per day.

The two major veins have produced a large tonnage of high-grade ore from above the 200 foot levels and the ore has been cut and proven at depth of 300 feet in the Howard, and 450 feet on the Pioneer. From the old records and the returns from ore already mined and milled an average of over 25 ounces per ton in Silver can be reasonably expected.

By the addition of one or two new flotation cells to the present flow sheet, a selective flotation of the zinc and lead can be made. In depth both lead and zinc are coming in stronger than in the upper levels. The separation of the two metals can be made and a substantial profit made on the zinc and lead, in addition to the silver values.

The saving in the cost of power, the added capacity of the mill and the separation and pay for the lead and zinc in the ores from the lower levels, will in a large degree offset the drop in the price of silver.

With the above recommendations carried out and active development continued along with the production, the property should soon be among the many prominent producing mines of Arizona.

Respectfully submitted,

(Signed) J. S. Coupal, M. E.

Boston, Mass.
Oct. 10, 1927

REPORT ON THE PROPERTY OF
THE WHITE METAL MINING COMPANY

Mines Pioneer P. O. Kelvin, Arizona

The property of this company consists of fifteen contiguous mining claims, situated on the south slope of the Pinal Mountains, in Gila County, and in the Pioneer Mining District.

The mineral belt in which these mines are located has been productive of much wealth in the past, and within its confines today are some of the largest producing mines in Arizona.

HISTORY: The early history of these mines dates back to the seventies, at which time they were operated for the richer ores only. Shipments were made by wagon three hundred miles to Yuma, thence to the Gulf by way of the Colorado River, and from there by boat to San Francisco, where the ore was sold.

Evidences that only the high grade ore was mined in those days exist all about the property. Large dumps of commercial ore today, and also stopes filled with good milling ore are available for treatment under present day methods

GEOLOGY: The fundamental rocks of the region are those designated Pinal Shist, a thinly laminated sericitic variety, and certain granetic and porphyritic rocks that have been intruded into the shist. Remnants of conglomerate overlain conformably by Pioneer shale are visible in many places, as well as fragments of quartzite. In the immediate vicinity of this mine, are found very much metamorphosed sedimentary rocks, cut by eruptive dykes of a later geological period. The general trend of the veins is mainly parallel to the mountain chain, and following either on one wall or the other of the porphyry dykes. Marked divergences,

however, are noted, and some of the richest ores are found in cross fissures intersecting the porphyry intrusions.

DEVELOPMENT: The mines are developed through two adit tunnels cross-cutting the Pioneer and Howard veins at a depth sufficient to guarantee stoping of high grade ore to a depth of 175 feet. The main working shaft, concreted for some distance from the collar, is in readiness for deeper exploration, and ultimately all ores down to the one thousand foot level will find their outlet through this shaft.

At least three high grade veins lying in virgin ground between the Pioneer and Howard veins can be developed from this shaft. Shallow prospecting on these veins so far indicate high grade values and gradual increase in size of veins with depth.

The Pioneer vein is opened and prospected over a length of seven hundred feet and runs in width from four feet to twenty feet at its widest place. Values in silver run from twenty ounces to one hundred ounces per ton.

The Howard vein has also been developed for approximately seven hundred feet in length and is three to four feet wide, running over fifty ounces silver per ton. Both veins have shown substantial increase in size as depth is gained.

The East Pioneer vein eight to twelve feet wide on the surface, assays around twenty ounces where developed, and when fully developed from the shaft, should be a large producer of good average milling ore. Considering the size and number of veins on the property preparation should be made for milling capacity of at least two hundred tons per day.

PRESENT EQUIPMENT: The mine is equipped with a 40 H.P. Western Hoist, 600 cu. ft. air compressor, engines, machine drills, complete list of mine tools, everything properly housed in, sufficient for a crew of fifty men.

Cottages and accommodations for above size crew are on the property, with boarding house and commissary.

Modern milling and flotation plant rated at fifty to seventy-five tons daily capacity, consists of Tel-smith crusher, Hardinge ball mill, Dorr Classifier, K. and K. Flotation machines, Plate -O- Diester concentrating tables, Dorr Thickner and American Filter. This plant is all under one roof and in readiness to operate.

This is the first unit of previously contemplated two hundred tons daily capacity and provision for the increase in capacity has been made in this structure.

ROAD: A good mountain road connects the mine with the railroad, a distance of about fifteen miles, and transportation by motor trucks offers ready delivery of ore and concentrates to the railroad, as well as truck haulage of supplies to the camp. Up-to-date telephone connection is maintained with the nearest telegraph station, affording efficient service in the transaction of business.

A plentiful supply of good spring water is already piped into camp and distributing system installed. Ample water for milling purposes is available on the property of the company.

Within a few miles of the mine, the mountains are covered with timber and suitable for general mine uses.

RECOMMENDATION: The writer would recommend resumption of operation as early as possible by placing in commission the present milling plant and starting development towards increasing the mine output to a maximum capacity of two hundred tons per day. Enlargement of plant equipment to go forward at the same time.

The property is in shape at this time to operate at a profit up to the capacity of present equipment, and when the maximum capacity heretofore indicated is reached the proposition shows earning possibilities in keeping with the volume of ore treated.

The average grade ore that the property is capable of producing on a two hundred ton per day basis would be twenty-five ounces silver per ton, and the costs would be as follows, assuming silver to be worth 64¢ per ounce:

25 oz. ore

Value per ton,	@	64¢	per oz	\$	16.00
Mining and milling,		20¢	" "		5.00
Value per ton, net,				\$	11.00
200 tons per day	@	11.00		\$2,200.00	per day
" " " "	"	11.00		66,000.00	per month
" " " "	"	11.00		792,000.00	per year
					\$792,000.00

Deductions

10% Mill losses)			
4% Smelting and hauling,)	19% of \$792,000.00		<u>150,480.00</u>
5% Smelter deductions)			
NET PROFIT PER ANNUM				<u>\$641,520.00</u>

It will be noted that ample deductions have been made for all losses and possible contingencies, and this estimate is based on the silver content of the ore only. Both gold and lead values should be a source of considerable revenue in the final analysis, and, besides this, the recovery of direct high grade smelting ore during the course of mining, would tend to increase the net returns.

Conclusions would therefore seem definite in that the mine is proven beyond the doubtful stage of a prospect, and is already a mine capable of producing satisfactory results at any stage of future operations, from its present equipment capacity up to the maximum capacity recommended in this report.

Respectfully submitted,

Dated, January 7, 1924.

J. C. D.

JCD LHB

(Signed) J C. Devine

REPORT ON THE PROPERTY OF "WHITE METAL MINING CO."

HISTORY AND PRELIMINARY REMARKS

The physical conditions of this property make it impossible for me to make a personal examination of the underground developments but I have gathered information from different reliable sources, chiefly from personal friends who worked in the mines during its period of operation and it is my opinion, after a careful study of geological conditions, that the information I have obtained is accurate.

The history of this property dates back to the early seventies when Silver was at its high mark and the various individuals and corporations who owned and operated these claims mined and realized about three quarters of a million dollars and subsequent owners and leasers mined approximately \$250,000, principally from ore extracted from above the water level.

The property is developed by three vertical shafts, viz: the "Great Republic", "Challenge" and "California".

The Great Republic vertical shaft is a double compartment shaft 380' in depth and is under water about 300', the collar of the shaft being caved for about 50'. This shaft was started on the hanging-wall side of an ore-body discovered on the southeast corner of this claim and the veins cut between the 100' and 200' levels were found to be 3' in width and were driven on about 15' each way only. The mine-run on this vein is said to have been about 6000 ounces in Antimonial Silver and Native. As near as can be learned, it was this same ore-body from which a leaser afterwards took out over \$40,000 above the water level but did not go down on the ore on account of too much water. It is also said that the main shaft intersected other ore-bodies below the level spoken of but did not drift on them and the whole of the bottom is said to be in good concentrating ore, consisting of zinc-blende and Native Silver.

On the Challenge claim, there is a vertical double compartment shaft at a depth of 450' and under water within thirty feet of the collar, the upper part of the timbering having rotted away, thus allowing the collar of the shaft to cave down for about thirty feet. This shaft was also started on the hanging-wall side of the ore-body previously discovered on the California. At the 100' level a station was cut from which a cross-cut was run north to intercept the vein referred to and found to be about 4' wide consisting of Native and Glance Silver, which was sorted down to 600 or 700 ounces and shipped to the Selby works at San Francisco. This vein was drifted on to the east and still richer ore mined near the gulch dividing two claims at that time owned by different parties. This part of the property has not been touched since the mines closed down principally on account of the fact that the drift is under water and the leasers have made no effort to unwater the shaft in order to stope out the ore that remains.

On the California claim there is a double compartment shaft 8 x 8, 300' in depth. A station was cut at the 100', 200' and 300' levels. On the 200' level a cross-cut drift was run to intersect big veins of high grade ore from which a good deal of metal was taken out. From the level of the road on this claim, a cross-cut tunnel was run and considerable high-grade ore mined. This tunnel running west towards the gulch encountered a talc slip which apparently cut off the ore. The drift was abandoned. Subsequently, long after these mines had been shut down, some prospectors happened in this drift and found that the talc had caved, exposing another body of high-grade ore. The ground was reclaimed and the new owners took out over \$40,000 in a few weeks' time (all above the water level).

A five stamp mill was erected on the California and it paid so handsomely that a larger one was erected on the Challenge claim, consisting of ten stamps with power and battery-frame for twenty stamps, the cost of the same complete being over \$70,000.00. This mill caught fire and was burned to the ground while yet almost new.

These mines belonged to eastern parties and it was notorious that the superintendent had no previous experience in mining, having been engaged in a settler's store near Prescott, Arizona. The property was exploited in a haphazard and extravagant manner and when Silver depreciated in value and the mill was burned, the operations of the mines were discontinued and they were allowed to flood, remaining in that condition up to the present time. These mines have been shut down for more than twenty-five years and have filled with water; however, the amount of water to be handled in operation of the property is not a serious proposition as the entire flow was handled at the time the mine was in operation by a #7 Cameron Pump.

Inasmuch as the shafts and stations were all timbered in a first-class manner and the ground traversed was firm shooting rock, except at the immediate surface, and the fact that the water has never been removed, it is my opinion that the timbers are still sound and the old workings in good condition.

The Challenge shaft is the natural drainage point for unwatering the whole group and affords the easiest access to the old workings and the un-stoped ore-bodies. All my informants agree in the statement that the greater portion of the ground between the Great Republic and the Challenge claims is virgin, tho known to be traversed by several veins which have never been exploited.

LOCATION

The property of the White Metal Mining Company consists of ten contiguous claims, one of which, the Great Republic, is patented. This group is located on the south slope of the Pinal Range, County of Gila, State of Arizona, being about ten miles from Globe and fifteen miles southeast of Ray. The Arizona Eastern Railroad is fifteen miles south and would be the natural shipping point. A good mountain road leads from the mine to the railroad terminus.

GEOLOGY

The ore bodies as far as understood do not course uniformly; the upper portions are in Quartz-Conglomerate and are succeeded downward by Quartzite, below which occurs what has been classified as fine-grained dark Grey-wacke, beneath which is an eruptive rock called Porphyry or Felsite. The last named is the lowest traversed by any of the workings. A portion of the Great Republic is traversed by what appears to be still a later intrusive diorite dyke. The immediate surface of this group consists of very much metamorphosed sedimentary rocks and granite is the basal rock of the district. It is believed that the genesis of the ores is decisively related to the diorite dyke and the felsite or porphyry intercalated intrusive, although the development of the property has not been directed upon this hypothesis.

ORE DEPOSITION

The most valuable ore bodies are of course under water and it will necessitate unwatering the property to reopen these portions. Aside from the high grade ores which can only be reached by unwatering, there is considerable tonnage of low-grade or concentrating ores, both in the old workings above water and now in sight as well as under water. Several dumps also contain many tons of workable ores by concentration. Assays of ore in the old workings give Ag 235 oz., Au .34, pb 14.4% (galena) Zn 24.6% (blende) in quartz with no other gangue.

WATER

A sufficient supply of water could be obtained from the mine workings for all present milling needs. A supply for domestic needs can be obtained from near-by springs.

TIMBER

An abundant supply of good timber can be had within a few miles of the property where large forests of pine and spruce are growing.

CONCLUSIONS

In conclusion I would say that the White Metal property has every advantage to make exceptional returns, in the immediate future, on the capital required to open and properly equip with modern machinery. Preliminary development has already been done which saves expense and time and the property is in shape to be rapidly put on a producing basis.

The history of the mine dates back to the early seventies and considerable bullion was extracted, as previously indicated, the haul being over 100 miles to the nearest railroad station. Of course, nothing under 300 ounces of Silver could then be profitably shipped and consequently there is a big tonnage, running from 20 to 300 ounces on the property ready to be handled. Today, the haulage is reduced to 12 miles and advanced mining and treating methods enable immense profits to be made where the same ore was not commercial in the past.

There is no doubt that this property will develop into a wonderful producer of high grade Silver ore and I am convinced that with the expenditure of \$50,000, the property can rapidly be put on a substantial producing basis, and will unquestionably make one of the big Silver producers of the country.

Respectfully submitted,

(Signed) J. C. Devine

Globe, Arizona
July 28, 1917

March 28th, 1922.

Commonwealth of Massachusetts,
Department of Public Utilities,
Boston, Mass.

Attn., Mr. A. A. Highlands, Secretary.

Gentlemen:

The following report on the White Metal Mining Company, and its affairs is in reply to your request for same, addressed to this company of March 2nd, and referred to in my letter to you of March 15th.

In the absence of your supplying any specified form or blank, I am of necessity making this report to you in the form of a general letter, answering all questions so far as possible in sequence as they are asked in the questionnaire.

The stock of this corporation is fully paid and non-assessable, the entire authorized capital stock was issued at par, in full payment for the property hereinafter described, with the exception of twenty five shares which were subscribed for at par and paid for in cash by the incorporators.

The properties of this corporation consist of a contiguous group of fifteen claims, one of which is patented and the remainder having been surveyed for patent, the process of which is now under consideration.

This property is a combination of what is known as the Old Pioneer, Pioneer Extension, and Howard Mines, being in close proximity to some of the largest mines in the southwest, in the same general mineral zone, and in an area that promises great activity in the near future.

These mines were operated in the early seventies, and according to information available produced several millions of dollars in silver, and most of which production was high grade ore running over three hundred dollars to the ton, which had to be transported long distances by wagon to market. As a

result large tonnages of excellent milling ore not high grade enough to stand the heavy transportation charges at that time, remain on the property in the form of large dumps and veins, which under present modern metallurgical methods can be worked to advantage and made to yield large and profitable returns. Development in the past year has opened up extensive new reserves amenable to the flotation process as well as high grade ore suitable for direct shipping to nearby smelter.

In anticipation of the smelters re-opening within the near future we are accumulating shipping ore for market, and upon starting our mill we expect to maintain an average around twenty dollars per ton, based on present milling facilities, and any increase in production equipment would naturally allow somewhat lower grade ore to be handled.

Shipping ore will average well over \$150.00 per ton.

So far as supplying information as to what the cost of this property has been to the original owners, cannot even estimate it or give an opinion.

All shares owned by the officers and directors are part of the original issue, their entire holdings being pooled, and cannot be distributed until May 1923.

Approximation of costs are given in the report herewith attached with the exception of costs of transporting concentrates and high grade ore to smelter, which is \$4.00 per ton and the cost of smelting same would amount to \$5.50 per ton.

The analysis or flow sheet test conducted by the Engineering firm of Kennard & Bierce of Los Angeles, Cal. is herewith given which explains the process of recovery of values, and illustrates what results may be expected from the treatment of our ore by flotation.

Description of Process: Flotation followed by table.

Results: The following report is of the final run.

Numerous preliminary tests were made, with different oils and reagents. It was seen that much of the lead was present in an oxidized form and that sulphidization would be necessary for best extraction.

In this run we made a lead concentrate first which we kept separate and cleaned. The results below under "Pb Concentrate" are on this cleaned concentrate that was actually run thru a flotation machine and not cleaned by panning, as is sometimes done. Similarly the "Zn" concentrates is a cleaned product.

The tailings from flotation were all put over a small concentrating table and the tails from the table were separated into sands and slimes.

Heads Wt. 1360 Grams

Gold Ozs.	Silver Ozs.	Lead %	Zinc %
.02	28.40	1.50	1.30

Flotation Concentrates

Pb Concentrate Wt. 31Gms.

Gold Ozs.	Silver Ozs.	Lead %	Zinc %
.28	917.6	39.10	4.90

Zinc Concentrate Wt. 15 Grms

.08	250.80	5.70	14.50
-----	--------	------	-------

Table Concentrates

.08	23.6	1.10	5.20
-----	------	------	------

Inasmuch as the property is now completely equipped with modern mining and concentrating machinery, and there being no debts or incumbrances of

any nature, cash on hand and bills receivable exhibited in our balance sheet we believe ample guarantee to place the property on substantial production basis soon after smelters in this district are re-opened.

To date the capacity of our milling plant is between fifty and seventy five tons per day, depending on the coarseness of ore mined from day to day, when running part dump ore of which we have an abundance, due to its fineness, production usually reaches the maximum of 75 tons per day.

Capacity of hoisting plant and mining machinery is rated at 500 tons per day, provision in this respect having been made at the outset for anticipated increase in milling capacity. In regard to new construction and development, is our plan to double the present milling capacity within six months after smelters resume operation, and to continue this expansion as fast as the mining of ore will justify.

The probable life of this mine or of any similar mine in the country could not be estimated by any engineer. Vein mines in this mineral section under similar geological conditions go to profound depth, and there is no reason why this property should be any exception to the Magma, Old Lominion, and other deep vein mines that are now and have been producing for many years, with new ore bodies being discovered as the development progresses. The very extensive veins and large area of virgin ground on this property tend to establish the fact that this mine will not be worked out for many years.

Total expenditures made for mining and development are \$104,407.50 and for surface improvements, buildings, mill, and etc. \$97,607.01.

Provision for concentration and flotation of mill grade ore is made on the property, our plant consists of Hardinge Ball Mill, K & K Flotation machines, Deister Concentrating tables, Classifiers, Filters, and in general a modern concentrating plant. Provision for handling our concentrates and crude ore are

made with the Hayden Smelting Plant, which we understand is to resume operations at an early date.

No dividends having been paid as yet an estimate of possible dividends for year 1922 cannot be made until the smelters are available, and for the same reason no estimate can be made for current year as to output. It is our plan however to begin the shipment of high grade ore immediately after the smelters are available and soon thereafter the shipment of concentrates. Regarding number of employees will state that with mill operating fifty men are required.

There being no earnings and no income these statements cannot be furnished. We are offering no stock for sale and have no fiscal agents.

The Commonwealth Trust Company, of Boston, Mass. is our transfer agent. Reference The Valley Bank, Phoenix, Arizona.

White Metal Mining Company

By _____ Pres.

H. Clyde Davis

GEOLOGIC AND MINING CONSULTANTS

RESIDENTIAL

2454 N. Timpview Dr.
Provo, Utah 84601

BUSINESS

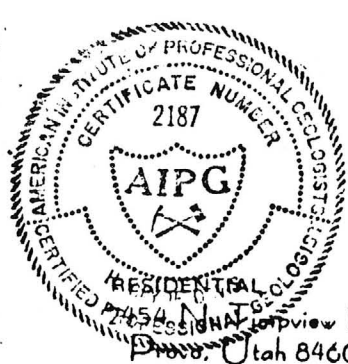
916 South State Street
Orem, Utah 84057
Phone: 225-1818

GEOLOGIC REPORT

PIONEER MINE AREA GILA COUNTY

ARIZONA

By: H. Clyde Davis



W. Clyde Davis
GEOLOGIC AND MINING CONSULTANTS

BUSINESS
916 South State Street
Orem, Utah 84057
Phone: 225-1818

June 8, 1983

Pioneer Limited Partnership
4241 Winfield Scott Plaza
Scottsdale, AZ 85281

Dear Sir:

I have been asked to write a report on the Pioneer Mine area which is located in the southern part of Gila County, Arizona. This property is located in a mineralized area of the state surrounded by many of the large open pit mines found in the Globe-Miami area, which is about 12 miles to the north. Superior Magna underground mine is to the west, Ray open pit copper mine about 12 miles west, and the Christmas Mine is located to the southwest. The El Capitan, the Silver Dime, and the Cowboy mines are within three miles of the property and many other small mines nearby as indicated on the geologic Topo map of El Capitan and Sonorra.

This mining area is located in the north edge area of the Basin Range province where structure is important pertaining to faulting and thrusting. This is important because mineralization has followed the fractured area. Precious and base metals have been intruded in the faulting as indicated on the following maps. The mine is in a good mineralogical geology province. (Map).

Introduction

The Pioneer Silver property consists of 17 unpatented mining claims and one patented claim with six additional claims, enlarging the area to the southeast. In addition, there are fractions of six school sections in the area of the Pioneer Mines.

The property is located on the south slope of Pinal Mountains about 12 miles south of Globe, Arizona, and 14 miles east of Ray, Arizona. It has several reports of the general geology in the area and is located on the El Capitan 7-1/2 minute quadrangle in which the USGS has also completed a geological map. Property is located in sections 29 and 32 of Township 2 south Range 15 east in the pioneer mining district, Gila County, Arizona. Access is gained by a secondary road which connects Highway 77 about 14 miles to the southeast of Globe. From Highway 77 it is three

miles west on a new road which connects the property with other roads. The camp is at an elevation of about 4,500 feet above sea level, giving a fine working climate as the nights are cool in the heat of the summer and the winter are fairly mild. Climate conditions are favorable for year-round operation.

There are mountain springs near the property which can furnish water year-round for domestic purposes and for supply of a mill. Water has been piped from two of the springs to supply tanks, but additional water can easily be supplied.

History

The district was first opened in the early 1870's when highgrade ore near the surface was mined and hauled by wagon to the Gulf of California, over 300 miles, then shipped to smelters in San Francisco and also Wales of Great Britain. Later, stamp mills were installed to treat the highgrade ore or oxide ore to the water level. The ore hauled from the mine was hand-cobbed and had to keep at least over 200 ounces of silver to make the costly transportation haul.

The production was estimated at \$1 million from the old company operation and an additional \$300,000 from various lessors working from the highgrade vein up to 1927. Attached are personal interviews and reports pertaining to the early history. Property became inactive because the recovery grade values dropped when they hit the sulfide ore in depth. About the same time, a new mill was destroyed by fire, and the drop in silver suspended all operations.

Property

The 17 unpatented mining claims are known as following: Fairview, the Quarter, Jewel, West Republic, Delinquent, Challenge, East Pioneer, Junior Republic, California, Lucky Boy, Roughneck, Ringneck, Quail, Argenta, Silverado, West Republic #2, and Florence. The one patented claim is known as Great Republic. They cover approximately 4,800 feet along the strike of the major veins and 2,600 feet in width, covering the four main parallel veins. However, additional claims and state leases have enlarged the property for the Orotex Mining Company.

General Geology at Mine

The Pinal Mountain is essentially a highly metamorphose-sedimentary unit called the Apache Salient consisting primarily of quartzite and the Barnes Conglomerate of the Dripping Springs

formation. Sediments have been altered by intrusions of diabase which seems to be prevalent with the Dripping Springs quartzite. To the north of the property is an intrusive mass which is a coarse-grained Ruin granite porphery which covers most of the area. The mine is closely associated with mineralized veins which have been fed by probably an underlying monzonite or quartz monzonite stock, intruding into the vein system which has moved along zones of weakness for faulting or in the bedding of the Dripping Springs Quartzite and other metamorphose formations of older age. However, the veins have intruded the diabase as well as the Apache Group of metamorphazed sediments.

Geologic History of Area

The earliest events regarded in the rocks of the Pioneer area is one of widespread sedimentation that resulted in thousands of feet of clastic sediments. These were primarily of shale, conglomerate, and sandstone, but during the Mazatzal Revolution which marks the end of early pre-Cambrian, the sediments were folded and recrystallized to form extensive igneous rocks comprising of a variety of granetic material which intruded the area represented by the Ruin granite which covers the large area in the northern part of the quadrangle. As you drive to the mine, this is the granitic rock that is in the east part of the Pioneer area. It is a coarse-grained granitic rock, mottled orange, yellow, white and gray and ranges in composition from quartz monzonite to granite diorite.

Towards the end of the orogney, the topography of the region was characterized by rugged mountains made up of folded and faulted blocks of the granite. Then it followed a time of erosion, and the area was reduced to a low-lying topography.

In late pre-Cambrian time, a shallow arm of the sea spread over the area, forming a basin in which sedimentary sequence of the Apache Group was deposited. At the bottom of this group moving upward is the following: Scanlan Conglomerate member is basal formation. It is about six feet thick and composed of angular and subrounded fragments of vein quartz, small chips of shist, and granite rocks in the matrix. It underlies the Pioneer formation, which is medium- to fine-grained, generally thin band arcasic quartzite. The beds, as noted, are six feet thick and are separated by shaly partings of silt stone that are commonly ripple marked. Its color ranges from purple to pale red, light brown to light brownish grey, and there are abundant greenish spots in the pioneer formation. It is exposed at the Pioneer Mine where it received its name, and it ranges in thickness from

200 feet to 500 feet. It has tuffaceous siltstone, arkosic sandstone member and has the greyish-red to purple, partly mottled, with bleach spots.

The Barnes Conglomerate, which sits above the Pioneer Formation, ranges in thickness from six inches to 50 feet but is commonly about 10 to 20 feet thick in the area of the mine. It is composed of smooth ellipsoidal pebbles in a matrix of coarse arkosic and firmly cemented by silicone. Most of the pebbles are light grade, a brownish-grey, hard quartzite. A smaller proportion is white-gray glassy vein quartz. The Barnes Conglomerate probably marks a disconformity that represents a time interval of considerable duration. It is also noted that the matrix sets thin, cross-bedded movement, it's massive forms, cliffs, and ledges, and it is at the base of the Dripping Springs quartzite. The Dripping Springs Quartzite, the lower one-half to one-third of the formation, is a light to grey-brown colorish, coarse- to medium-grain quartzite. Although the formation contains feldspar, no part of it is arkosic as a pioneer formation. The lower part shows distinct separation into beds and are highly laminated and cross-bedded, and the quartzite becomes more massic in appearance. In many places the upper part of the unit grades into massive beds of white nearly pure quartzite. The upper one-half to two-thirds of the formation is thin-bedded and flaggy. Vitri-colored quartzite an inch to twelve inches thick alternating with thin beds of soft fissile arenaceous shale. The total thickness in the area would be about 300 feet.

The arkosic member is the fine-grain, well-sorted, laminated and sits just above the Barnes Conglomerate and is noted at the Pioneer Mine and also at the Howard Mine. The upper silt stone member is eroded in many of the areas in the mine quadrangle.

Above the Dripping Springs quartzite and to the south of the mine, it was noticed an exposure of Mescal Limestone which has a thickness of about 250 feet. It is composed of distinct beds ranging from a few inches to two feet in thickness that have great diversity and character in composition. A few beds are relatively pure crystal and limestone. Most are cherty and dolomitic. Some of the beds are silicic and fine-grained aggregate of calcite. Some beds are composed largely of irregular segregations of chert. Viewed from a distant outcrop, the mescale limestone are a distinctive chalky white, but at close range the beds are white, light greenish grey to grey. Formation has been metamorphosed by diabase to marble and clastic silicates in many places and have been replaced locally by magnetite tremolite and serpentine.

Sitting above the limestone is a paleozoic rock known as the Troy quartzite. It's bounded at both top and bottom by an erosional disconformity. Its thickness differs greatly from place to place. The Troy quartzite is noted to the east of the Pioneer Mine and also south approximately one mile from the mine. It is sometimes confusing and was called dripping springs quartzite in early reports. The maximum thickness is about 300 feet. At the base is a conglomerate in places as much as 30- to 40- feet thick and composed of small fragments derived of older formations. Above the conglomerate, the typical brownish-grey, medium to coarse-grain, cross-bedded sandstone are quartzite composed of rounded grains of glassic quartz. It probably correlates with the Chedski sandstone member as suggested by early authors. Sandstone and quartzite range in color from greyish pink to white to brown to greyish orange and consist of medium to very coarse, subangular to rounded quartz grains. Thin layers and lens of poorly to well-sorted pebbles are interbedded in the sandstone and quartzite. The predominate quartzite of the troy forms cliffs with intervening slopes underlain by more friable sandstone. The next area that sits on top or intruded in was a diabase sill or stock which is exposed in the area more than other rocks. This diabase sill is approximately 800 or 900 feet thick. Cross cutting is abundant in all pre-Cambrian rocks, particularly to the south in the Mescale limes and the Dripping Springs quartzite. Rocks are grey to dark grey and brownish grey, diabasic and somewhat pegmatic. It is composed primarily of plagioclase of the potassium nature. Minerals in the diabase is fresh but locally altered to serate and kaolinite.

The diabase intruded as a sill and is cut in the Howard shaft at surface to approximately 140 feet thick before the Dripping Springs quartzite was hit. Diabase is prevalent as flow in the low areas or in the low structural or topographic areas at the time it came in above the Troy quartzite. It is probably of early Cambrian or late pre-Cambrian age.

In tertiary time or late cretaceous time when the mineralization probably was injected into the district, it is noted north of the mine a Rhyodacite Porphyry which usually forms a dike or occurs silt-like bodies as in the pioneer formation. It is light to medium grey and brownish gray to fine grey. However, no mineralization was noted with this dike in the quartzite. Later in geologic history, there is an additional rhyodacite porphyry which is located south of the mine by about three-fourths of a mile. It is light brownish to medium grey and prominently can see quartz phenocrysts. This probably brought in some of the mineralization to the copper-uranium because copper mineraliza-

tion was noted in the adjoining Troy quartzite. These distinctive dikes are also common in nearby quadrangles to the west and to the south. It is the type of dike that cut the teacup granite diorite and is probably of paleocene in age. This gives detail to the rock geologic history within the area of the mining claims (note geologic map).

Mineralization

There are four major veins on the claims. The Pioneer or (Challenge) vein, the East Pioneer vein, the Howard vein and the West Howard vein. All of these veins were noted in the Dripping Springs quartzite. The Pioneer vein which is the most pronounced and the vein where there is the greatest amount of new working is in the Dripping Springs quartzite and in sheers and bedding along the Barns Conglomerate and the basal Dripping Springs member. All of these veins represent main fault zones through the area, striking from North 25° to 35° East and dipping from 70° to 85° to the west. The strike of the Pioneer vein is North 28° East dipping west. The East Pioneer vein is parallel and has about the same strike. However, the Howard vein has a strike of North 40° East, and the West Howard vein strikes North 80° East. The Howard vein surfaces in the dibase and the dibase is cut approximately 140 feet before the Drippings Springs quartzite formation made contact. However, the extension of the Howard vein is noted to the northeast and southwest in the Dripping Springs outcrop. The West Howard vein is smaller; however, it was also noted in the Dripping Springs quartzite to the southwest but also covered by the dibase in canyon. However, as it strikes to the northeast, it is a sheer or fault in the Dripping Springs quartzite and makes an intercept with the main Howard vein at the slope of Pioneer Mountain which is near the Pioneer vein.

The Pioneer vein and the East Pioneer vein have the same general strike. However, the metamorphosed sediments are perpendicular at the Pioneer mine; but at the East Pioneer vein they dip to the south at 23°.

Main production was obtained from the Pioneer vein where the shaft goes to a depth of 450 feet. However, there was an adit cross-cut on level of the Pioneer vein which extended to the Howard vein. The Pioneer vein from the shaft drifted on ore on the 200- and 300-foot level had been stoped to the surface having a strike distance of 700 feet. Little or no stoping has been done at the lower levels of this continuous vein as it contacts the sulfide area.

The Howard shaft is 350 feet deep, and drifts on the 100-, 200- and 300-foot level were driven; they were stoped to the

surface in the Dripping Springs quartzite to the northeast of the shaft. Most of the production came from the 200-foot level; however, the ore shoot showed a length of over 750 feet as indicated from the stopes at the adit level.

The East Pioneer zone which seems to be fairly persistent from the surface and altered outcrop in the Dripping Springs quartzite of over 5,000 feet. At the south end it appears to be over 150 feet in width, narrowing to 50 feet where it crosses the ridge on the diabase and disappears into the covered sill area. Altered zone again appears to the north and east of the Pioneer shaft and widens to 100 feet. This is covered by gravel, and it follows along the fault of the river bottom. At the present time, there has been a bulldozer cut and open cuts and a short adit which indicates 8 to 10 feet width of ore lying in the altered zone. All of these veins are mainly quartz with silver oxides associated in various amount of lead, zinc and gold. The main value is silver with some gold values. The high-grade vein in the Pioneer is from 3 to 10 feet in width or clearly defined in the main workings by the shaft. The altered mineral area having values is from 15 to 30 feet wide. The quartz and conglomerate is usually barren between the parallel veins; however, at depth the cross-cut could indicate that these have been filled by a mineralized source. In the area of the four veins and the quartzite is the most favorable area.

Conclusions

The tonnage in the Pioneer vein between the surface and the 200-foot level gave about 1,250,000 tons of approximately 20 to 25 ounces in silver with other values of gold, lead and zinc. It is important to determine the values in depth below the 450-foot level. The East Pioneer vein did not have the surface high grade as the Pioneer, however, it had a greater area of alteration. This also should be explored along the strike of a 4,500 feet.

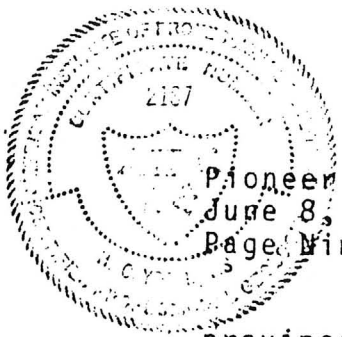
The smaller veins between the Howard and the Pioneer have only partly been mined and should be considered for tonnage. This, again, should be drilled to determine what the tonnage and mineralization would indicate.

The Howard vein is a strong vein; however, from the surface it has not been opened up and, again, this should be drilled. Also, the West Howard vein or the intersection area should be studied more closely, noting extension to northeast and southwest.

Recommendations

1. Dewater the Pioneer and the Howard veins to the 400-foot level. This would expose the old drifts and workings which were completed for the flotation mill in earlier reports which was burned and never operated. This would indicate a considerable reserve on these two veins because it, at that time, justified mining the sulfide ore.
2. Drill the ore reserves below the 400-foot level to the 600-foot level on the Pioneer and Howard veins which would increase the tonnage and give the values of these veins at greater depth.
3. To run an EM electromagnetic survey on the properties to trace the highgrade veins and the disseminated ore in depth. This would show primary mineralization where iron is in the ore and a dominant percentage. I believe you would find dissemination in greater depth along the vein system and especially to the south.
4. An IP survey should be run to cover the four major mine areas and their extensions in the altered zone to the southwest and also northeast. This would also help target a disseminated mineralization.
5. To make a more complete study of the landsat maps for structure and infra-red photos which may show heat areas which indicates mineralization.
6. Use government USGS surveys of gravimetric and aerial magnetometer maps to determine if there is any correlation of mineralization to the southwest.
7. To continue the open-pit method being used at the present time in opening up the Pioneer vein which has a width of approximately 20 feet of values from 20 ounces of silver or better per ton. This ore, with the high grade intermixed, will make enough ore for a pilot survey or study of the metallurgy to determine the feasibility of a flotation mill plus leaching.

I am impressed with the main mine area in which your company is open pitting the highly mineralized Pioneer vein, and it could be extended to the Howard vein. This area is in a good geologic




Pioneer Limited Partnership
June 8, 1983
Page Nine

province for precious and base metals as indicated by the structure maps which I have attached to the report.

This is an excellent property and should be developed fully with a mill and a refining system.

Sincerely,


Clyde Davis
ts/T8a
Attachments

Telephone 363-3302

Hatch Sample Serial 3016-3018

UNION ASSAY OFFICE, Inc.

BRYANT L. LARSEN, President

JAMES G. STRATTON, Vice President

A. S. JOLLIFFE, Treasurer

JAMES W. GARRETT, Secretary

P.O. Box 1528

Salt Lake City, Utah 84110

(801) 363-3302

Mine H. Clyde Davis
Abraham Smoot Bldg
Provo, UT

RESULTS PER TON OF 2000 POUNDS

June 6, 1983

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. Per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
1 20' Face	Trace	15.0	-	Pioneer vein							
2 Select Vein Pioneer-EAST	0.040	89.7	-	Select. oxide							
3 20' Pioneer Vein	none	259.7	-	Select oxide							

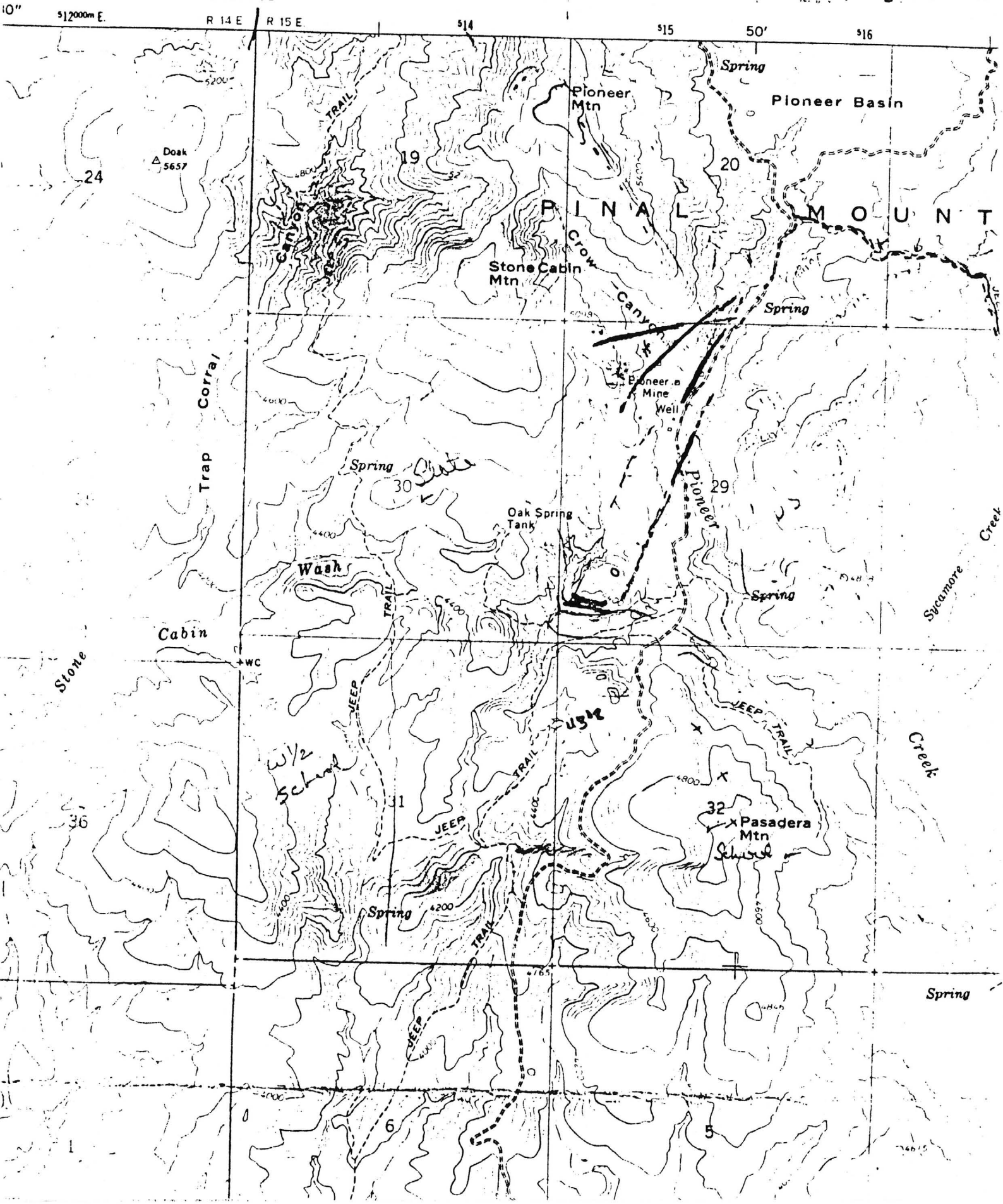
Remarks

Charges \$ 30.00

MAPS

1. Location of the property
2. Geology
3. Structural history
4. Map of Basin and Range Mountains
5. Map showing the structure providence of the area
6. Tektonic map of Arizona showing folding and faulting
7. Cross sections

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



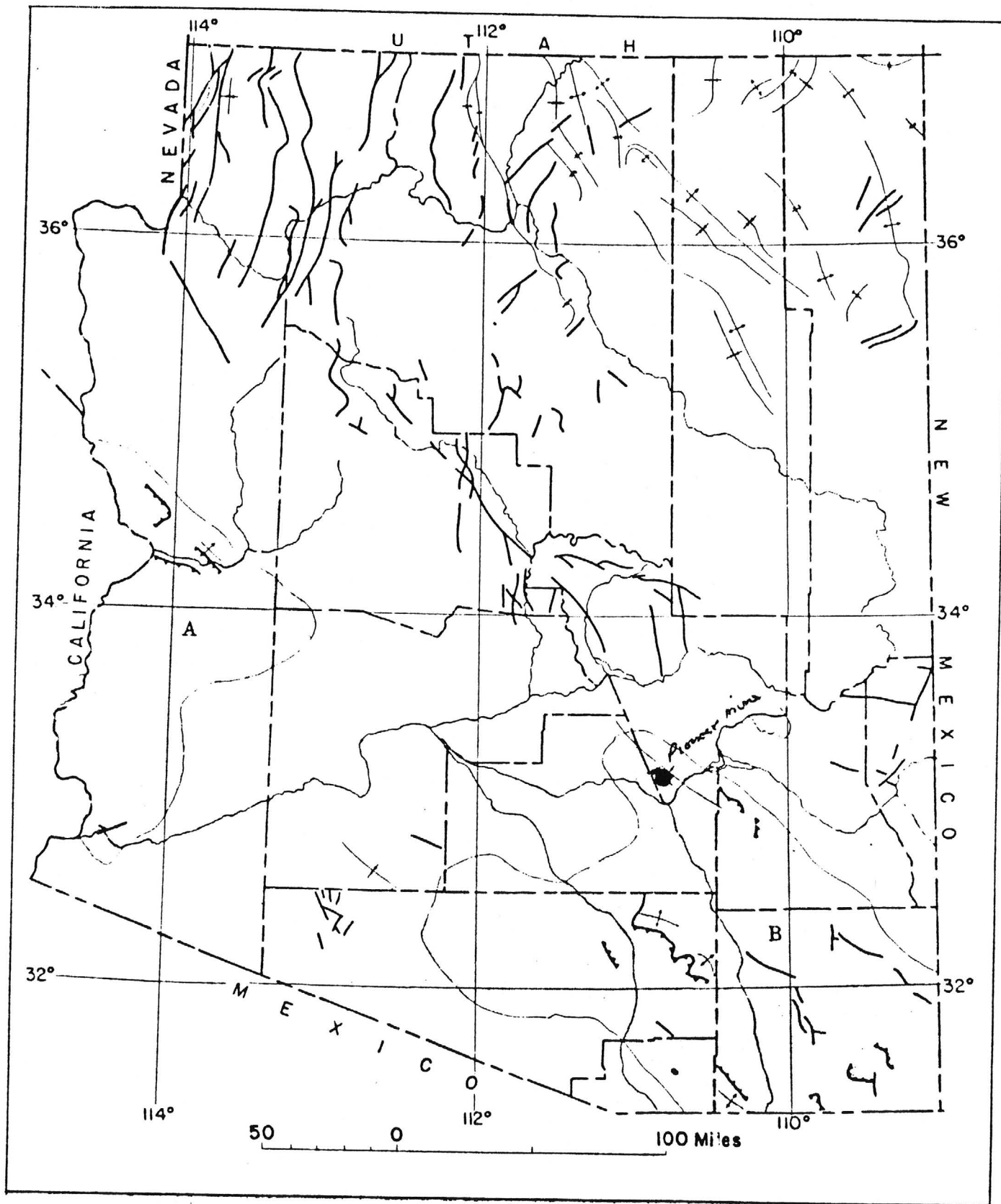
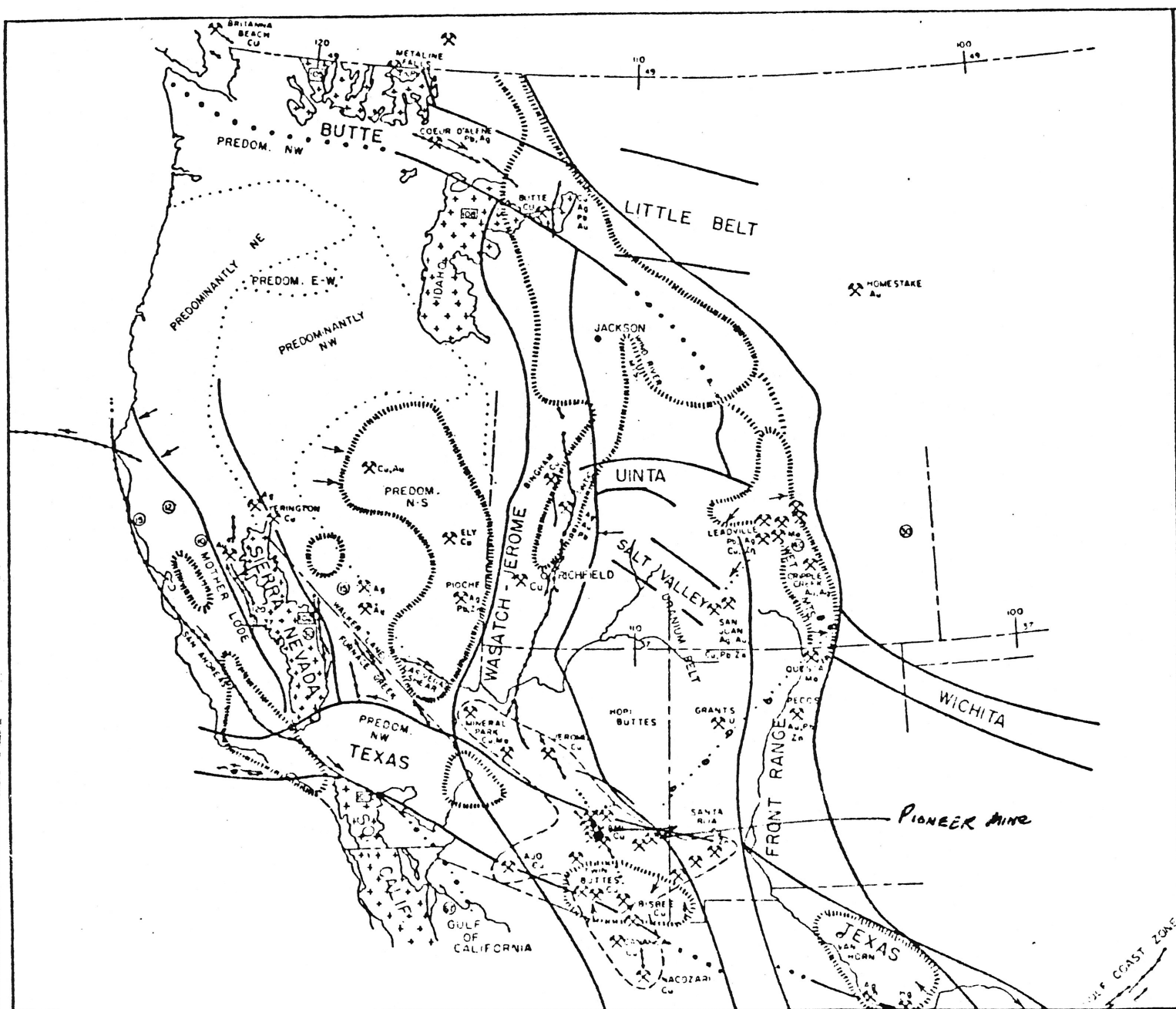


FIGURE 12. Tectonic map of Arizona showing known folding and faulting as described in published literature. Areas A and B are areas of strong deformation characterized by folding and thrusting of younger than Precambrian age.



N

0 MILES 100

- HIGH-ANGLE FAULTS
- BOUNDARY OF HIGH-ANGLE FAULTS
- BOUNDARY OF THRUST FAULTS
- BOUNDARY OF COPPER PROVINCE
- ◻ MESOZOIC INTRUSIVE AREA
- DIRECTION OF THRUST WRENCH
- 105 LEAD-ALPHA AGE IN MY (LARSEN, et al.)
- 120 THICKNESS OF CRUST IN MILES (USGS)
- VOLCANIC CENTER

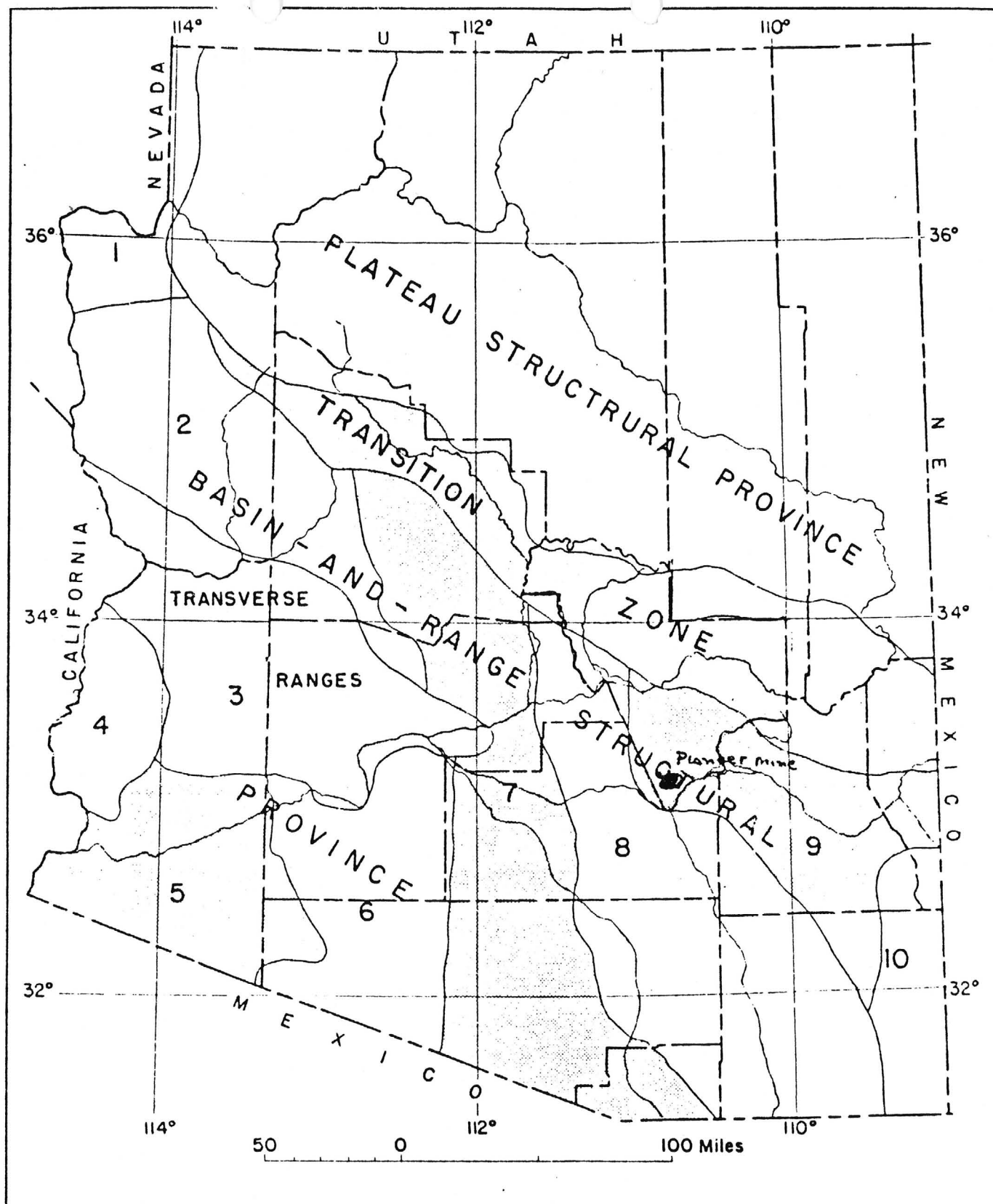


FIGURE 11. Map of Arizona showing areas of similar topographic trends of Basin and Range mountains. Area 1, north-south to N. 15° E. trends; Area 2, north-south to N. 15° W. trends; Area 3, area of transverse ranges trending north-south, east-west, N. 60° W., N. 60° E.; Areas 4, 7, and 10, north-south trends; Area 5, N. 30° - 40° W. trends; Area 6, north-south, east-west, and N. 30° - 35° W. trends; Area 8, N. 30° - 45° W. trends; Area 9, N. 50° - 60° W. trends.

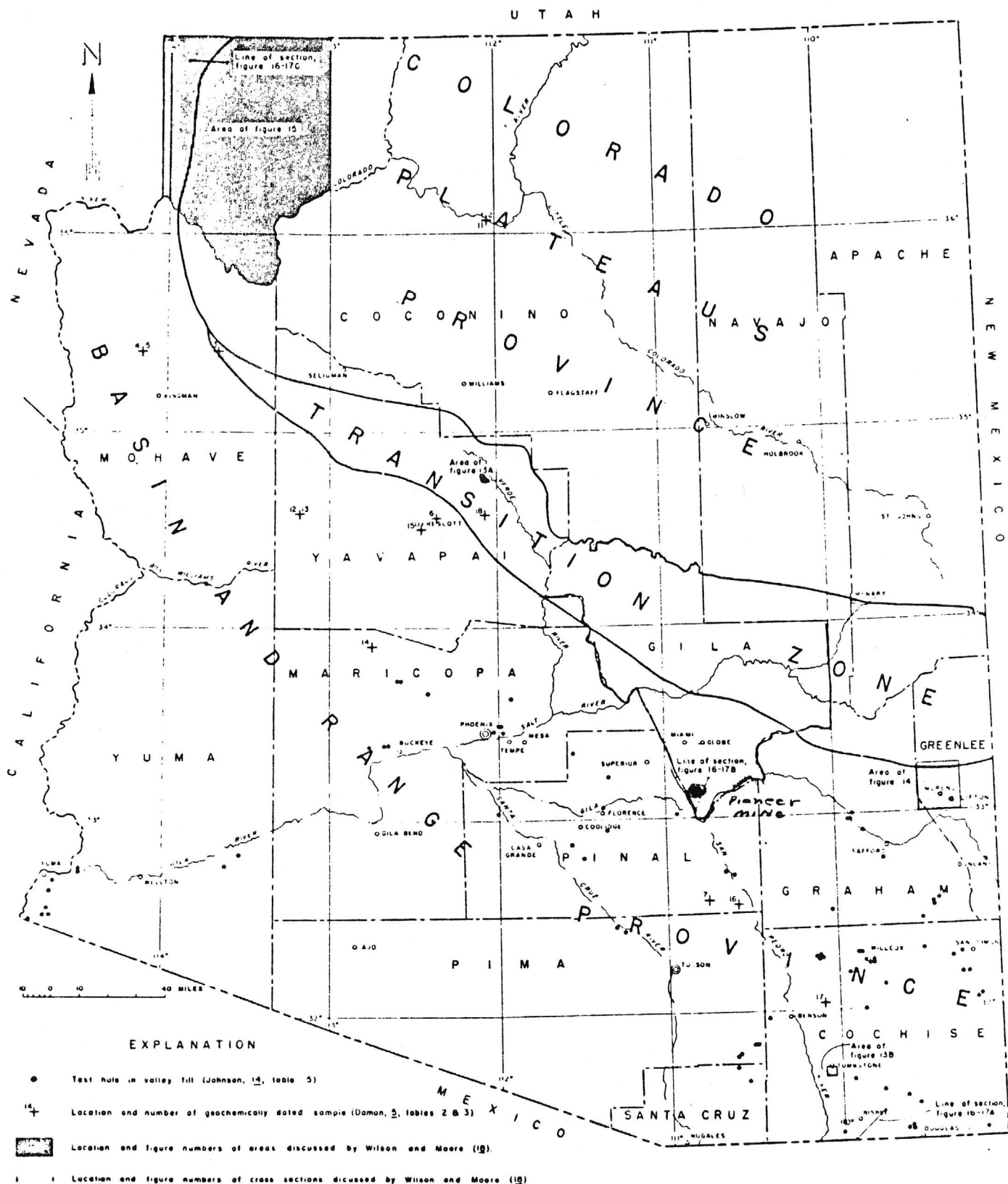
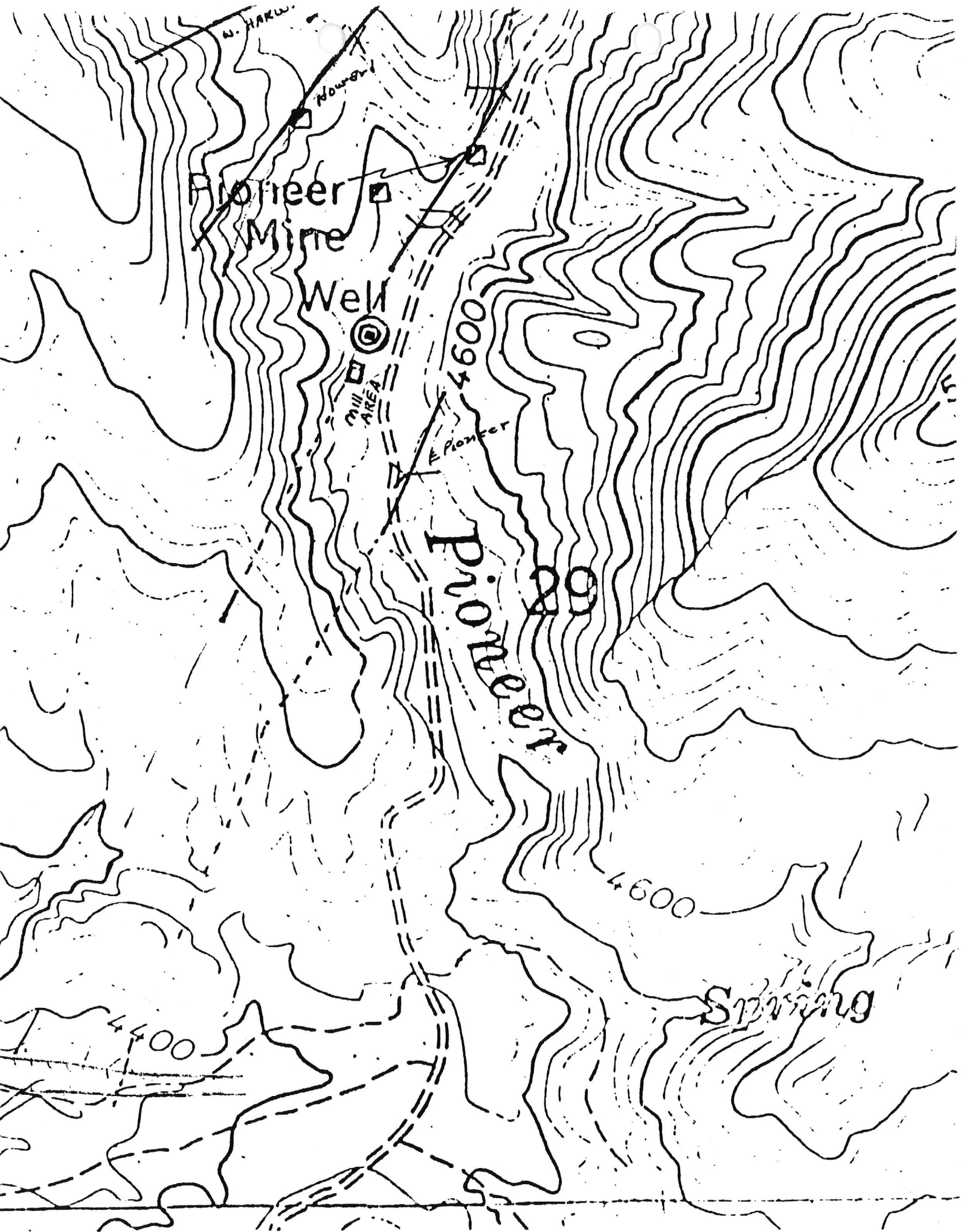


FIGURE 10. Map of Arizona showing structural provinces and location and figure numbers of areas and cross sections discussed by Wilson and Moore (18), location and number of geochemically dated samples (Damon, 5), and locations of test holes (Johnson, 14).



Vertical	+
Trench	—X—
Adit	Y—
Pit	x
Diamond drill hole	⊙
Shaft	■

Note: Commonly used geologic symbols are printed on the map jacket; a separately printed list is available on request from the U.S. Geological Survey

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- ✓ Ransome, F. L., 1903, Geology of the Globe copper district, Arizona: U.S. Geol. Survey Prof. Paper 12, 168 p.
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- Ross, C. P., 1925, Ore deposits of the Saddle Mountain and Banner mining districts, Arizona: U.S. Geol. Survey Bull. 771, 72 p.
- ✓ Shride, A. F., 1967, Younger Precambrian geology in southern Arizona: U.S. Geol. Survey Prof. Paper 566, 89 p.

APPENDIX

Attached are reports by the following:

1. Tom Clary, April 1982
2. John D. Peterson - Metalurgical report, Miltex Corporation, April 1983
3. Report by R. G. Hawley, August 1, 1968
4. Report by J. S. Coupal, September 1927
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6. Arizona Mining Journal, December 15, 190_, announcing the discovery of the East Pioneer Vein
7. Letter from Mr. Roy Hicks to Mr. Gene DeVine
8. Interview with Mr. Herman Sidow by W. S. Crows, June 17, 1920

PERSONAL RESUME

Clyde Davis

PERSONAL DATA

Home Address: 2454 North 650 East
Provo, UT 84601
Telephone: (801) 374-5389

Brigham Young University - Graduated in 1948 with a B.S. degree with a major in Economic Geology and a minor in Chemistry. Completed a degree in Education Administration Certification for High School and Junior College.

Brigham Young University - Completed an M.S. degree in Economic and Structural Geology in 1952. Was doing consulting work for the Castlepeak Gilsonite Mining Company and others at the time of graduation.

University of Arizona - 1958 completed an Engineering Geologic (M.E.) degree while doing consulting work in the areas of uranium, copper, gold, silver, and base metals.

University of Arizona - 1963-1965. Completed classwork for Ed.D. Education Administration and Administrative Procedures.

WORK EXPERIENCE

Prior to graduation from Brigham Young University, worked for the Castlepeak Gilsonite Mining Company doing consulting work, mapping and making projections of their mining operations.

1948-51 - Geologist for the Castlepeak Gilsonite Mining Company in Provo and Duchesne, Utah. Abstraction and land specialist, Carbon-Emery Abstract Company at Price, Utah.

1952-53 - Engineering Geologist for the U.S. Atomic Energy Commission Exploration Branch, Salt Lake City, Utah, and teaching part-time at the ~~University~~ ^{University}. This office administered the eight western states in the U.S.

1953-54 - In charge of technical services of airborne operations in ten western states for U.S. Atomic Energy Commission Exploration Branch in Salt Lake City, Utah, and Grand Junction, Colorado.

1954-66 - Consulting geologist for a number of various firms on a retainer basis. They were: Amber Oil Company, Fort Worth, Texas; Roberta Mining Company, Phoenix, Arizona; Southwest Mining Industries, Tucson, Arizona; Brauchla Foundry, Freemont, Ohio; Standard Tugston Company, New York City, New York; G. B. Williams El Oro Mines, Geneva, New York and Arivoca, Arizona; Guy Anderson Properties, Safford, Arizona; U.S. Lime and Mining Company, Silver City, New Mexico; Kelley Mines, Ft. Lauderdale, Florida and Beatty, Nevada; United Equities, Phoenix, Arizona; Sea Gull Mineral Corporation, Los Angeles, California; The James Stewart, Tombstone, Arizona Mining Company, Phoenix, Arizona; Geo Energy Resources, New York, New York; Western Resources, Inc., New York, New York; Mineral Energy Inc., Orem, Utah; Geo Energy Resources, Greenwich, Connecticut.

1952-78 - Publications:

"Geology of Culmen Vein" BYU Campus

"Uranium Occurrences of Nevada" U.S. Atomic Energy Commission

"Airborne Anomalies of W. Utah" U.S. Atomic Energy Commission

"Airborne Anomalies of Nevada" U.S. Atomic Energy Commission

"Charleston Clays of Hyerothermal Origin" U. of Arizona

"Sertization of Markee Mountain Clays" U. of Arizona

"Gold Placers of Southern Arizona" U. of Arizona

Other special reports

1955-66 - Director of the Tucson Institute of Religion, University of Arizona, the Church of Jesus Christ of Latter-day Saints.

1955-64 - Part-time teaching two classes at University of Arizona in Tucson, Arizona, in Geology and Engineering.

1966-present - Director of Mineral Development, Brigham Young University, Provo, Utah, and enlarged to Church Development Program for the Church of Jesus Christ of Latter-day Saints, evaluating all types of mineral properties in the world.

1966-present - Consulting for Geo. Energy Corporation, Salt Lake City, Utah; B.L. Hat Mining Company, South Salt Lake City, Utah; F. Fily Mining Corporation, Grand Junction, Colorado; U.S. Barite Corporation, Salt Lake City, Utah; Kelly Mining Corporation, Las Vegas, Nevada; Gold Earth Gold Corporation, Ely, Nevada; Continental Oil and Gas Corporation, Independence, Kansas; Newport Oil and Gas Corporation, Spokane, Washington; Coal Facts Corporation, Lindon, Utah.

CIVIC AFFILIATION AND ACTIVITIES

Executive Committee, Utah National Parks Council of Boy Scouts of America. Executive Committee of the Catalina Scout Council of Tucson, Arizona. A member of the Rotary Club, Chamber of Commerce in Provo and Orem, Utah. Had been active in the Lions Organization. Chairman of the enlistment for the National Parks Council; Board member on the surface mining of the U.S. Geological Survey of Washington, D.C.; Executive Committee of S.M.E. of the American Institute of Mining Engineers.

Geologic Honorarian Societies - American Institute of Professional Geologists (AIPG), American Institute of Mining Engineers (AIME), Geological Survey of America (GSA), Utah Geological Society (UGS), Arizona Geological Society (AGS), American Association of Petroleum Geologists (AAPG), the Geographic Society of America, Sigma Gamma Epsilon Fraternity, The American Mining Congress, Professional Seal 1 (AIPG) 2187 of the United States; a member of Utah State Natural Resource Committee Open Pit Mining; Committee member for Utah Energy Commission.

MILITARY SERVICE

Served during World War II, Army Air Force from 1944-46. Pilot training and a cryptographic officer serving primarily in training areas in the states and Alaska.

REFERENCES

Dwane Frandsen - Attorney, Professional Building, Price, Utah.

Dean Lael Woodbury - Dean of Fine Arts College, Brigham Young University, Provo, Utah.

Dr. Bill Pope - Chairman of Chemical Engineering Department, Brigham Young University, Provo, Utah.

Dr. Bill Lacy - Chariman of the Geology and Engineering Department, University of Arizona, Tucson, Arizona.

Ben E. Lewis - Past Vice President of Brigham Young University, Provo, Utah.

Sidney Horman, Businessman, 1760 South State Street, Salt Lake City, Utah.

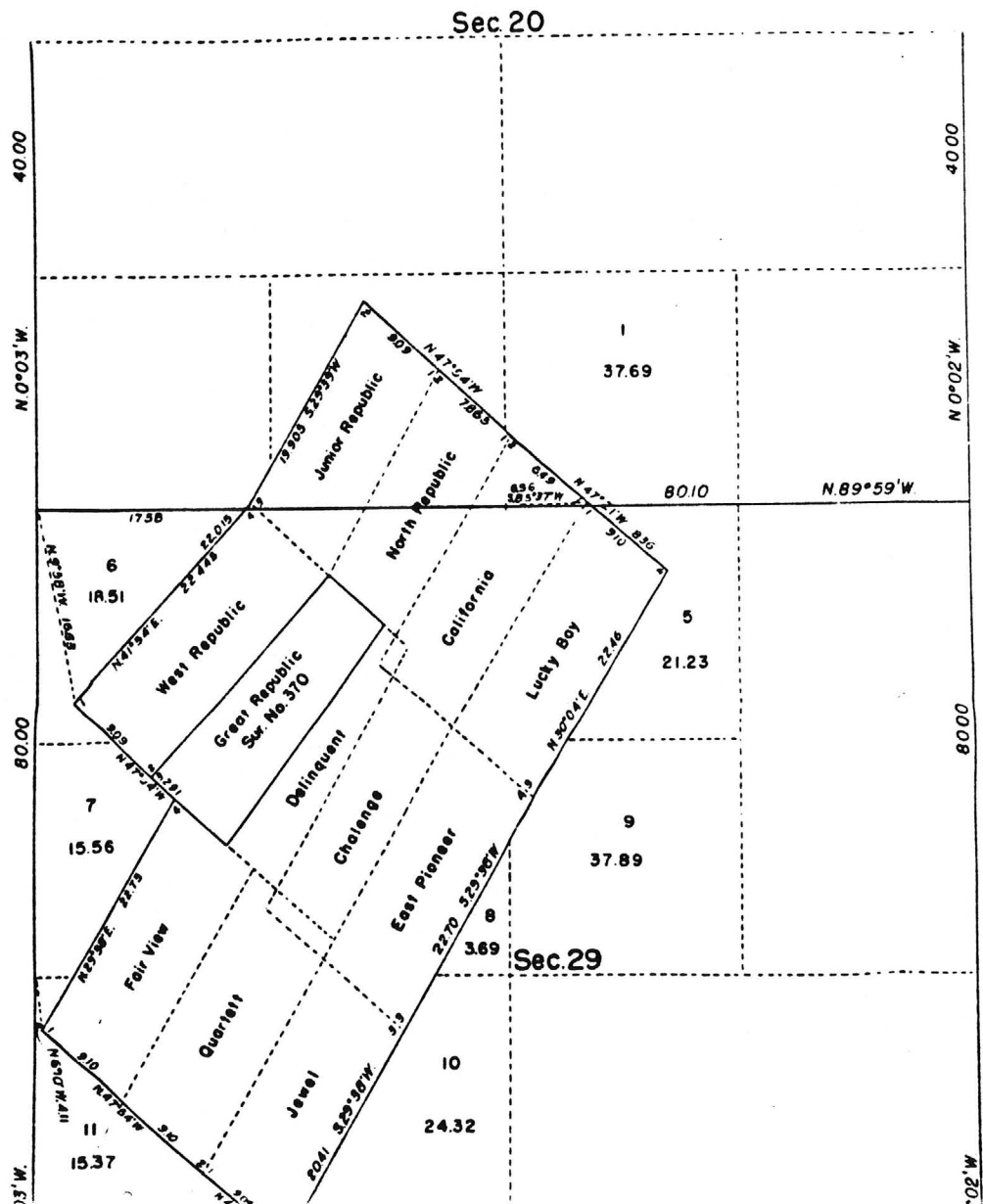
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Attached are reports by the following:

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7. Letter from Mr. Roy Hicks to Mr. Gene DeVine
8. Interview with Mr. Herman Sidow by W. S. Crows, June 17, 1920

TOWNSHIP No.2 SOUTH, RANGE No.15 EAST OF THE GILA AND SALT RIVER

Plat showing Mineral Segregations in Sections 20 and 29



LETTER FROM MR. ROY HICKS TO MR. GENE DEVINE

HICKS MOTOR COMPANY
527 Main Street
Safford 2, Arizona

April 9, 1948

Mr. Gene Devine
1228 N. 4th St.
Tucson, Arizona

Dear Mr. Devine:

In regards to our telephone conversation about what we found when I was Superintendent for Mr. John Devine, your father, at Pioneer Mine, when we got the shaft unwatered to 200 ft. we cleaned the old tunnels out and found that they had stolped out we started to tunnel to the Howard shaft and the same time started to unwater to the 400 ft. level. We reached the 300, we found everything in good shape and found plenty of ore but run so high in Zinc that was worthless to us then as we were already having trouble with too much Zinc in our concentrates.

As I remember the Essay run from 24 to 30% Zinc and 10 to 12% lead. I don't remember the exact on silver but quite a few ounces. I think the reason you have never found any of these Essay sheets was because Mr. Devine didn't want the officials to know the mine was so heavy in Zinc which was not desired at that time. We brought some high grade ore go the surface from the 300. Mr. John Devine ordered us to burry it in the dump, and not to go any further with the unwatering. In the meantime we were taking out some high-grade and milling ore from No. 1 tunnel on the Howard Vein and we discovered we could get in the Howard shaft from No. 1 tunnel and went down what we figured was the 200 level and found plenty of ore and it also run in to too much Zinc and Mr. Devine ordered me to stop the tunnel on the 200 ft. main shaft that was going to the Howard as he said there would still be too much Zinc at this depth.

Gene, I feel sure that if we would have had the flow sheets in 26 that we have now, that would be a big mine in Arizona today.

I think your father was one of the smartest mining men that this state ever had because he was sincere in his belief and he really believed he had a bigger mine at Pioneer that they have in Superior, Arizona. For the way the veins were laying they were bound to all come together and there is where your copper would begin.

LETTER FROM MR. ROY HICKS TO MR. GENE DEVINE (Cont'd)

Page 2

If there is any way I can help in explaining I will be glad to do it as you can't appraise this mine too highly.

Gene, if you will take and unwater to 300 you can start your mill on high grade Zinc, lead and silver ore you could start it from the Howard on Zinc; lead & silver ore but it would be cheaper to unwater to the 300 and finish your tunnel on the 200 to the Howard shaft and bring your ore out from the Howard that way.

I am sorry I can't remember exactly how far you would have to go to finish the tunnel to the Howard, but I know it is not very far, for I know there was one set of steel made up for a feeler. 15 ft. long just in case the Howard shaft still had water in it at that level. I don't believe they were every used.

Yours very truly,

By (Signed) Roy Hicks

Roy Hicks

RH:ma/ch

EXPLORATION - DEVELOPMENT PROPOSAL

FOR

THE PIONEER MINE

GILA COUNTY, ARIZONA

PROPERTY OF: LYNN SHEPPARD

P.O. BOX 2657

GLOBE, AZ 85502

PH: 602-425-3812

PREPARED BY:

EBASCO SERVICES, INC.

OCTOBER, 1983

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	- OSO Exploration Services Ltd., Report on The Pioneer Silver Property, Globe, Arizona, by R. G. Hawley, August 1, 1968	
	- Newspaper Article, Ray--Arizona Mining Journal--Hayden, dated June 15, 1922	
	- Letter from Mr. Roy Hicks to Mr. Gene Devine, dated April 9, 1948	
	- Interview with Mr. Herman Sidow by W. S. Crows, June 17, 1920	

SECTION I

Introduction

Location

History

I INTRODUCTION

Orotex Corporation, 4241 Winfield Scott Plaza, Scottsdale, Arizona, has invited Ebasco Services, Ltd. to prepare a proposal for exploration and development of the Pioneer Mine.

Present activities at the mine consist of mining outcropping veins with heavy equipment and transporting the ore to a flotation processing facility near Globe. The owners recognize that their present activities require more planning and that the mining operation needs to be optimized.

A. Location

The Pioneer Mine is located on the Pioneer Pass Road approximately 12 air miles south of Globe, Arizona. Access can be gained to the property via the Pioneer Pass Road from Globe or from the Dripping Springs Road which connects the Pioneer Pass Road with State Route 77 which runs between Globe and Hayden. Orotex is presently gaining access via the Sheppard Ranch Road which connects with State Route 77 at El Capitan Summit. The Sheppard Ranch Road is the shortest route; however, it is a private road and permission is required prior to using this access.

B. History

Mining of high grade silver ore commenced at the Pioneer Mine in the early 1870's and continued intermittently until about 1927. There has been very little mining activity on the property from 1927 until Orotex, et. al., acquired the property in 1982.

For the purpose of this proposal, the following historical data is attached as Exhibit A.

- Report by J. S. Coupal, September 1927.
- Report by R. G. Hawley, August 1968.
- Newspaper Articles dated June 15, 1922.
- Personal letter from Roy Hicks to Gene Devine, April 9, 1948.
- Interview with Herman Sidow by W. S. Crows, June 17, 1920.

Some of the above data has been retyped due to difficulty in reading poor copies.

SECTION II

OBJECTIVES

II OBJECTIVES

Objectives for the Pioneer Mine are to evaluate the mineral potential, continue mining and developing the oxide zone, and do exploration and development of the lower levels of the mine. The primary objective is to optimize the operation by:

- mapping the surface and existing workings and making surface and subsurface geologic interpretations,
- doing geophysical surveys to aid in determining mineral location, quantity, quality, continuity, and spacial configuration,
- continuing mine development and production near the Pioneer Creek adit level while doing mine planning, exploration and development of deeper mineralization on the property,
- rehabilitating the Pioneer shaft to gain access to the lower working and to reported developed ore reserves,
- continuing milling and flotation of sulfide ores, and
- investigate the feasibility of cyaniding the flotation tails and heap leach cyaniding of oxidized ore.

SECTION III

SCOPE

- A. Project Planning
- B. Aerial Photography
- C. Geological Mapping
- D. Geophysical Surveys
- E. Mine Planning
- F. Exploration Shaft
- G. Dewatering Mine Workings
- H. Underground Drift Cleanup
- I. Underground Development
- J. Adit Level Development and Mining
- K. Percussion Drilling
- L. Metallurgical Testing
- M. Heap Leaching System and Tailings Disposal System

III SCOPE

The scope of activities planned for the Pioneer Mine include:

- Project Planning
- Aerial Photography
- Geological Mapping
- Geophysical Surveys
- Mine Planning
- Exploration Shaft
- Dewater Mine Workings
- Underground Drift Cleanup
- Underground Development
- Adit Level Development and Mining
- Percussion Drilling
- Metallurgical Testing
- Heap Leaching System and Tailings Disposal System

A. Project Planning

Approximately two weeks are usually required to do reconnaissance work, organize subcontractors, evaluate existing data, and to make final project plans. Figure 1, Preliminary Activities Schedule, shows that during this period preparations will be made to start geological mapping, geophysics and coordinating with the shaft rehabilitation contractor.

B. Aerial Photography

Plans are to fly the area immediately after obtaining project approval. This work will include taking colored contact prints from vertical and from oblique positions. The aerial photos will be used to make a stereoscopic study of the geomorphology, structure, lithology, alterations and to prepare topographic maps.

Plans are to fly approximately one square mile and make 100 scale topographic maps with a 5 foot contour interval in the area of interest. The 100 scale maps will be enlarged to 40 or 50 scale for mine planning and for layouts of surface installation, such as, waste rock dumps, plant site, heap leach pads, roads and tailings disposal.

C. Geological Mapping

Mapping of the Pioneer property will include structure, lithology, mineralization, alteration, geophysical anomalies and existing mine workings. Approximately 30 or 40 cross-sections and planar sections will be prepared from the geologic map. These sections will show projected subsurface geologic interpretations which will serve as the basis for future mine development and minerals exploration.

Figure 1 shows geological mapping continuing throughout the mine life. This work will include mapping and sampling of all mine workings, ore reserve calculations, grade control and percent of mine extraction.

D. Geophysical Surveys

The Pioneer property has potential for vein type, massive sulfide and disseminated mineral deposits. Therefore, both I.P. and E.M. geophysics will be utilized in conjunction with geological mapping for delineating mineral targets.

Geophysics will be of value in determining locations for surface installations and possible shaft sites.

This type of geophysical program will provide information on the depth of oxidation and mineralization, provide information on the possibility of a disseminated porphyry type copper deposit, possible massive sulfides in the Mescal limestone and possible open pit type mineralization in closely spaced veinlets or stock working in other geological environments.

E. Mine Planning

Figure 1 shows mine planning commencing at the onset of the program and continuing throughout the mine life. Initially it is important to determine the optimum shaft location. It is equally important to prepare mine designs and study the feasibility of developing both the oxide zone and developing the deeper ore between the 200 and 400 foot levels of the Pioneer shaft.

Initial mine planning is imperative for surface layouts, for connecting existing working and for dewatering and ventilation. Listing the needs for mine planning and optimizing the entire operation are beyond the scope of this proposal.

F. Exploration Shaft

It is possible that the most economical means of gaining access to the lower workings is by rehabilitating the Pioneer shaft. However, this will not be decided until after consultation with the shaft sinking contractor. One of the problems with retimbering the Pioneer shaft is the difficulty in dewatering. This may be circumvented by gaining pumping access from the 100 foot level.

Factors which must be considered in locating a new shaft site are the amount of drifting required to develop known ore, amount of work required to dewater and establish an escapeway and ventilation.

An order of magnitude cost for sinking a 6' x 9' timbered shaft is \$600 per foot plus \$226,000 for mobilization, headframe and hoist, or \$526,000 for a 500 foot deep shaft.

A 16' x 9' shaft with 2 skips and steel sets will cost approximately \$979 per foot plus \$226,000, or \$715,000 for a 500 foot deep shaft.

G. Dewatering Mine Workings

Plans will be made for dewatering the mine after it is determined if a new shaft will be sunk or if the Pioneer shaft will be retimbered. The quantity of water in the workings is unknown, as is, the amount of water the mine is making.

It would be ideal if access could be gained to the lower workings or to the Pioneer shaft from a raise connecting to the adit level workings. This possibility will be investigated during the initial phase of this program.

H. Underground Drift Cleanup

A certain amount of drift and station cleanup should be anticipated prior to development and mining from the lower levels.

Figure 1 shows cleanup starting prior to completion of the shaft. This may not be possible and will depend on several factors.

I. Underground Development

This proposal calls for a minimum amount of new development. Plans are to extend existing drifts approximately 500 feet to develop ore for mining and to establish ventilation.

The amount of drifting required to get into production is an unknown; however, according to old reports the drifts are in ore and should pay for development.

J. Adit Level Development and Mining

Drifts above the Pioneer Creek level should be opened to develop ore in the oxide zone and to possibly gain access to the lower workings.

If access can be gained to the lower workings, it will facilitate dewatering and mining. It is possible that new drifts can be started from the surface or winzes can be cleaned from underground to provide initial production.

For the purpose of this proposal, \$100,000 is budgeted for this work; however, this work should pay for itself or be charged to the existing operating costs.

K. Percussion Drilling

Fifty thousand dollars have been budgeted for drilling. It is anticipated that geological mapping and geophysics will delineate target areas which will have potential for supplying heap leach ore and ore amenable to the flotation facility.

Percussion drilling may be done to delineate open cut mineable reserves for heap leaching or may be done to delineate higher grade underground mineable reserves.

L. Metallurgical Testing

Metallurgical testing will be initiated at the beginning of the program. This testing will be done on various size grades of various types of ore. It will be of interest to determine the leachability of mixed oxide-sulfide ore when cyanide is added to the milling circuit. It is also important to determine which ore is amenable to heap leaching and important to know the cyanide leachability of tailings from the flotation circuit.

Detailed specifications for metallurgical testing will be written during the Project Planning Phase of this program.

M. Heap leaching System and Tailings Disposal System

Heap leach pads and tailings disposal requirements will be determined after adequate metallurgical testing. However, it is envisioned that minimum requirements will be the equivalent of an area 300 feet square.

PIONEER MINE PROJECT
PRELIMINARY ACTIVITIES SCHEDULE

Month	1	2	3	4	5	6
Project Planning	_____					
Aerial Photography	-----	_____				
Geological Mapping	_____	_____	_____	_____	-----	
Geophysics	_____	_____				
Mine Planning	_____	_____			-----	
Exploration Shaft	Pioneer Shaft					
Dewater Mine Workings	-----	-----	-----	-----		
Underground Cleanup			50 T/dy	50 T/dy	-----	
Underground Development				50 T/dy	100 t/dy	200 T/dy
Adit Level Development	100 T/dy	100 T/dy	100 T/dy	100 T/dy	150 T/dy	200 T/dy
Percussion Drilling		_____	_____			
Metallurgical Testing	-----	-----	-----	-----		
Leap Leach System, Tailing Disposal System		_____	_____	_____		
PRODUCTION RATE	100 T/dy	100 T/dy	150 T/dy	200 T/dy	250 T/dy	400 T/dy

Figure 1

SECTION IV

ORGANIZATION

Figure 2, Organization Chart

IV ORGANIZATION

Organization for this program is very simple. The Ebasco Project Manager will coordinate all the work and report directly to the client's management representative.

Ebasco will provide a project manager, an exploration geologist and a mine geologist. A geophysical crew will be provided by Ebasco to conduct the geophysical program.

Ebasco's project manager will have the flexibility to use on an "as needed" basis personnel from Ebasco's professional staff.

It is envisioned that some assistance will be needed in civil engineering, metallurgical engineering, environmental planning, computers and administrative.

Figure 2 is an organization chart which shows project responsibilities.

PIONEER MINE PROJECT
ORGANIZATION CHART

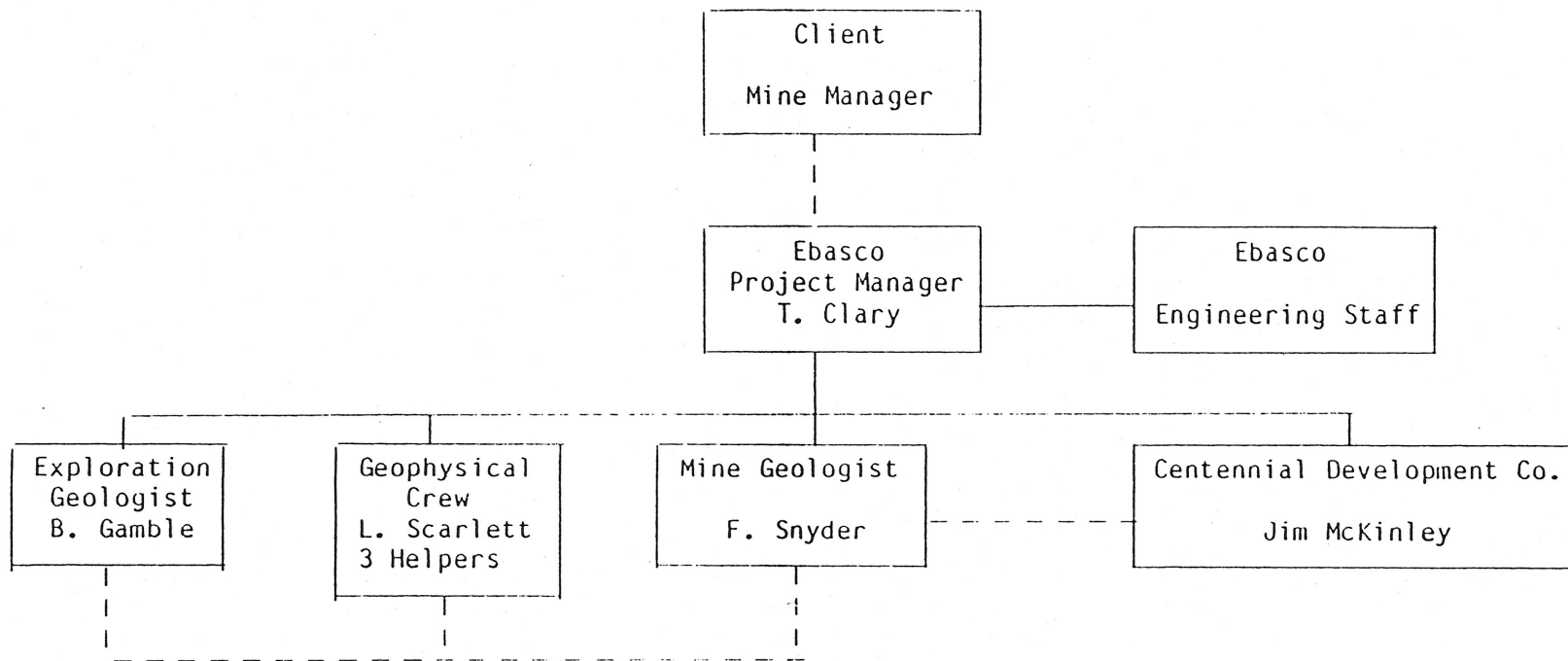


Figure 2

SECTION V

PROPOSED BUDGET FORECAST

Table 1, Estimated Cost Schedule

V. PROPOSED BUDGET FORECAST

Table 1 shows an order of magnitude cost schedule for the work outlined in this proposal.

Depending on the extent of work Orotex chooses to do at this time, these cost estimates can change. For example, if it can be demonstrated that heap leaching is feasible, Orotex may choose to have Ebasco proceed with construction of the heap leaching system.

SECTION VI

EXHIBIT A - HISTORICAL DATA

Report on White Metal Mining Company property at Pioneer (Pioneer Mine) Gila County, by J. S. Coupal - Mining Engineer, September 1927.

OSO Exploration Services, Ltd., Report on The Pioneer Silver Property, Globe, Arizona, by R. G. Hawley, August 1, 1968.

Newspaper Article, Ray--Arizona Mining Journal--Hayden, Dated June 15, 1922.

Letter from Mr. Roy Hicks to Mr. Gene Devine, dated April 9, 1948.

Interview with Mr. Herman Sidow by W. S. Crows, June 17, 1920.

OSO EXPLORATION SERVICES LTD.

REPORT ON

THE PIONEER SILVER PROPERTY

Globe, Arizona

By

R. G. Hawley

Aug. 1, 1968

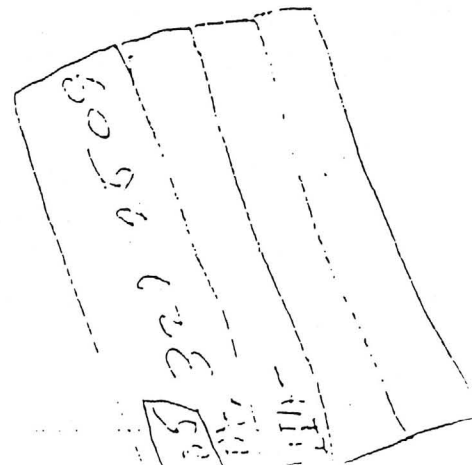


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OSO EXPLORATION SERVICES LTD.

The Pioneer Silver Property, Globe, Arizona

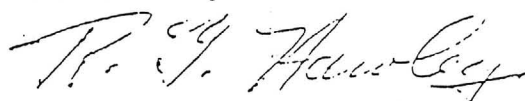
CONCLUSIONS

- 1 - A tonnage on the Howard and Pioneer veins between the 200' and 450' levels of about 250,000 tons grading 25 oz. in silver with values in copper zinc, lead, and gold can reasonably be expected. Salvage ore from old stopes and ore from below the 450' level should add to this.
- 2 - Smaller veins between the Howard and the Pioneer have only partially been mined and should return considerable tonnage.
- 3 - The East Pioneer vein showed little high grade at surface and was thus ignored for the Howard and Pioneer which were more clearly defined, were more easily mined, and had high grade at or near surface. The East Pioneer however, shows much more alteration and much more potential for greater widths of ore along a greater strike length of nearly 6,000 ft.
- 4 - The disseminated sulphides in the underlying monzonite indicate the possibility of a large low grade body of porphyry copper to depth, possibly amenable to open pit mining. Inspiration's interest in the adjoining ground makes this supposition stronger.

RECOMMENDATIONS

- 1 - An IP survey (induced potential) of at least 20 line miles should be carried out along the 6,000 ft. of the alteration zone to search for disseminated sulphide bodies.
- 2 - An EM survey (Electromagnetic) with the Ronka EM 16 instrument could be conducted to trace the high grade vein ores.
- 3 - Any target anomalies should be further tested after the surveys by diamond drilling, as well as testing below the present workings for ore to depth there. At least 10,000 ft. would probably be required.
- 4 - The surveys may indicate open pit mining, in which case underground development would be unnecessary. If underground mining is contemplated then the old workings should be cleaned out, dewatered, put in safe condition and mapped and sampled to determine the best place to begin mining the remnant ore.
- 5 - The East Pioneer vein should be explored with drilling and open cuts and/or adits to determine its value near surface.

Submitted by -



R. G. Hawley
For Oso Exploration Services Ltd.

INTRODUCTION

The Pioneer silver property consists of 17 unpatented and one patented mining claim, located 12 miles south of Globe, Arizona. The area around Globe and that south of the property are noted for extensive large scale mining. One of the major mining companies, Inspiration, has claimed the ground along the south, east, and west of the Pioneer group, has cut drill sites and begun drilling, (reported-ly on the basis of IP(induced potential) and other surveys.

Due to the fact of Inspiration's interest and the fact that many of the old mines are becoming productive again because of modern mining methods and higher metal prices, this mine was examined to decide its potential in silver ore and also the possibility of an economic underlying porphyry copper deposit.

Information in this report is based on several trips to the property by the writer and on a report by J. S. Compal dated September, 1927.

LOCATION AND ACCESS

The Pioneer property, consisting of 18 claims, covering about 370 acres, is located about 12 miles south of Globe, Arizona, on the south slope of the Pinal mountains, in Section 29, Range 15 East, Pioneer Mining District, Gila County.

Access is gained by a secondary road which connects with highway 77 about 14 miles to the southeast and with Globe about the same distance to the North.

About three miles of new road to the East would connect the property to State Highway 77 between Globe and Tucson.

CLIMATE AND TOPOGRAPHY

The Pioneer mine is at an elevation of about 4500 ft. above sea level, the valleys surrounded by steep ridges with a relief of several hundred feet. The slopes are covered in most places with brush, with frequent timber in the valleys.

Water is sufficiently available from springs, streams and flooded workings for drilling, milling and domestic use. The climate is good with mild winters and cool summers.

HISTORY

The district was opened in the early 1870's when the high grade ores near surface were mined and hauled by wagon to the Gulf of California, over 300 miles, then shipped to the smelter at San Francisco. Later stamp mills were installed to treat the high grade oxides down to water level.

The production was estimated at \$1,000,000.00 from old company operations and an additional \$300,000.00 from various lessors working the high grade veins up to 1927.

With the methods in use at that time recovery of values dropped when sulphides were met at depth. Lowering of the price of silver apparently suspended operations after 1927.

PROPERTY - CLAIM STATUS

The property consists of 17 unpatented claims known as the Fairview, Quartet, Jewel, West Republic, Delinquent, Challenge, East Pioneer, Junior Republic, California, Lucky Boy, Rough Neck, Ringneck, Quail, Argenta, Silverado, West Republic #2, and Florence; and one patented claim known as the Great Republic.

These claims adjoin, forming a compact group covering 4800 ft. along the strike of the major veins and 2600 ft. in width, covering the 3 parallel veins.

The claims are held in good standing by Lynn Sheppard of Globe, Arizona, presently under option to Lebern Cox of Tucson.

GEOLOGY - GENERAL

The Pinal Mountains are essentially a highly metamorphosed sedimentary unit called the Pinal Salient, consisting in this area mainly of quartzite and quartz pebble conglomerate of the Dripping Springs formation. The sediments have been altered by the intrusion of granite, diorite (or monzonite), and diabase.

The main intrusive mass is the coarse diorite or granite porphyry covering most of the area to the north. At the mine and closely associated with the mineralized veins is an underlying monzonite stock. At the south end of the property a large mass of diabase intrudes along the east side of the hydrothermal alteration zone of the East Pioneer vein.

ECONOMIC GEOLOGY AND MINERALIZATION

There are three major veins on these claims, the Howard vein, the Pioneer (or Challenge) vein, and the East Pioneer. These veins, particularly the East Pioneer, follow generally a zone of strong shearing which probably represents a main fault zone through the area, striking $N20^{\circ} E$ and dipping 60° to 80° to the West. The zone is indicated at surface along the strike of the East Pioneer by strongly sheared and weathered rock, and at the south end shows very strong hydrothermal alteration with limonite boxwork. Values are usually very low in the leached out surface material along the East Pioneer though silver values of up to 20 oz.'s have been reported from several points.

This East Pioneer zone, which seems to be the most persistent, was traced by altered surface outcrops for over 6,000 ft. At the South end it appears to be over 150 ft. in width, narrowing to about 50 ft. where it crosses the ridge to the north and disappears in overburden. Where the altered zone appears again to the North, east of the Pioneer shaft it widens to over 150 ft. again. Much of the length of this zone is covered by gravels where it follows the river bottom.

This appears to be the main zone of faulting or shearing through this area. There has been practically no development along it except for a few open cuts and short adits which indicated an 8' to 10' width of ore in a vein lying within the alteration zone near the main camp. The fact that little or no high grade ore was found in the highly-altered surface accounts for its lack of development.

The Howard and the Pioneer veins to the NW were the most developed. Here the vein filling is mainly quartz with silver sulphides associated with varying amounts of lead, zinc and copper. The main value is in silver with sizeable gold values.

These veins vary from 3' to 10' in width and are clearly defined. They have both been traced for about 500' NE of the Pioneer and the Howard shafts to where they meet the East Pioneer zone. Some development work has indicated their extension beyond this point. They have apparently never been traced far SW of the shafts. Several narrow high grade veins are said to occur between the Howard and the Pioneer.

The quartzite and conglomerate is usually barren between the veins. However, at depth in the crosscuts, the underlying monzonite shows disseminated sulphides and gives assays for considerable widths between the veins of from 1/2 oz. to several ounces per ton.

NEWSPAPER ARTICLE

RAY--ARIZONA MINING JOURNAL--HAYDEN, Dated June 15, 1922.

WHITE METALS CO. READY FOR SILVER PRODUCTION—One of the oldest mines in the state and one of the pioneer producers of silver is now ready to handle property on a substantial scale.

One does not have to be long around the old-timers on the south slope of the Pinal Mountains to hear plenty of tales of long ago, when, between Indian attacks and in the midst of untold difficulties, they searched for and found veins of high-grade silver running from 1000 to 1500 ounces to the ton, and every story in that section centers around the old Pioneer mine, for that was one of the very first ones; was on the old stage road from Globe; and was, in itself, a very large producer of high-grade silver sulphides, chlorides and bromides. The fact that the old Pioneer mine was one of the oldest and one of the largest producers in that section led to that camp being the place from which the activity radiated and the point from which the silver ore and bullion was shipped.

While the early records on the Pioneer mine, covering the production during the latter part of the seventies and the early eighties, is not complete, it is known that considerably over a million dollars' worth of the high-grade ore has been shipped from shallow workings, and the evidence is still on the property which shows the amount of ground that was stoped by the early-day miners in getting out that value. But they were only after very high-grade material. They could not use rock that ran only a hundred ounces, or even more, for it would not pay the cost of wagon transportation to Yuma and shipment to Wales for treatment. So that it was necessary in the early-day work to cob the ore closely, with the result that thousands of tons of ore running from 15 to 100 ounces per ton was left for future generations and improved metallurgical processes to handle.

While today the high-grade streaks are just as much in evidence in the old Pioneer mine as they ever were, it is possible to handle all of the ore; for anything above 12 ounces can be handled at a profit. It was not unusual in the old work to find a vein running 20 to 25 feet wide and the stope from which the high-grade ore was extracted just wide enough to work in, and leaving large quantities of ore broken down on one side and ready to strip, ore that should now pay a good profit but which would pay no profit forty years ago.

Stope after stope is open to the surface, two to four feet wide, all of them above the level that could be worked by an adit tunnel and in each and every one of the stopes there is still the high-grade yellowish seam that the miners of two decades ago were working but still with thousands and thousands of dollars' worth of what is today high-grade ore laying on the walls ready to be extracted and milled.

It was twenty years ago, even when this section of the country was still in an isolated state and when the advancement of the science

of mining and milling had not yet reached the state where the cobblings of the old days could be handled profitably, that J. C. Devine first examined the property and determined that some day he would be the one to take hold of that old mine and realize on the ore that the early-day miners left behind, as well as to continue the work on the high-grade at a depth which they, with their lack of machinery, could not handle.

It was not until 1917, however, that the White Metals Mining Company was organized by J. C. Devine and associates for the purpose of handling the old Pioneer mine, the large producer of Arizona Indian days, and today the White Metals Mining Company is on the eve of production in its second era, when 50 and 100 ounce silver ore will yield practically as great a profit as did the high-grade ore of the early eighties.

The property of the White Metals Mining Company is situated directly at the old stage camp on the Pioneer highway from Globe to the south, and, until but a few years ago, was the only method of going south from Globe. It is about 20 miles from Kelvin and a slightly lessor distance from Christmas, either of which points may be used for rail connections. While it is probably less in mileage from Globe, this requires the crossing of the Pinal range or the connection with the El Capitan highway, thus the outlet to the south is an economic preference. A new road is being built, however, that cuts off about five miles to Kelvin and greatly eases the grades necessary to get from the mine at 4500 feet elevation to the railroad at about 2000 feet.

Probably one of the greatest factors in delaying this second era of production of the old Pioneer mine has been its inaccessibility, although today, due to improvements in metallurgical processes, it is possible to profitably work ore that could not be handled even ten years ago so that it is now possible to handle a greater amount of ore that can make a profit than could have been handled if the property had been more accessible. Today, however, with motor truck transportation and improved roads, the \$20.00 a ton hauling charge to the railroad has been reduced to about \$4.00 a ton when handled by one of the White Metals 2-1/2 or 3-ton trucks.

Geologically, the property of the White Metals Mining Company is situated in the midst of the uptilted sedimentaries of the southern slope of the Pinal mountains, the structure forming characteristic topographic features consisting of pointed mountains, one side being a gentle slope along the bedding of the limestones and quartzites and the other side being sharp cliffs where the blocks have slipped below probably 300 feet and started another gentle slope and another hill pointing to the north.

Underlying the sedimentaries is a sill of diabase, this being capped by Troy quartzite, then Martin and Tornado limestones. The

saddle between these hills consists of the diabase, which ordinarily overlaps to some extent the lowered blocks of sedimentaries as they again start their up slopes.

Cutting across these sedimentaries on the fifteen claims of the White Metals Company are two approximately parallel veins, these veins cutting all of the formations and running about 300 to 350 feet apart. In the early-day mining it was thought that these veins did not extend into the diabase but were cut off at that horizon, but recent work has disproven that theory and the veins have been found to extend into the diabase, which makes them promising for considerable depths. They are both strong leads, extending for a known distance across the country of about a mile, and both show the same characteristics in so far as their mineral-bearing proclivities are concerned. In the area between the two major veins are numerous smaller mineralized veins evidently sympathetic in nature and of little value commercially. These veins, however, are persistent and extend for considerable lengths, but their width does not permit of economical mining.

The two veins were both worked extensively during the early days and are known as the Pioneer and Howard veins, the former having been worked in the seventies and eighties by the Pioneer Mining Company and the latter by the Howard Mining Company. They are similar in every way, in mineralization and in all essential characteristics except that the Pioneer vein shows a considerably greater width of ore. Both veins show the same type of high-grade paystreak with about the same widths and values.

The veins themselves are quartz veins, porous or honeycombed to a considerable extent, and contain the sulphides, chlorides, and bromides of silver, the sulphides predominating. Some lead is in evidence; also a little zinc, but no copper. The mineralization extends into the bedding planes of the quartzite, where the veins pass through that rock and thus produce a greater width of mineralization at that place.

The high-grade portions of the vein, from which large quantities of ore have been removed above the tunnel levels, generally stick close to the footwall and are continuous over all of the vein that has as yet been worked, although it varies greatly in widths sometimes being workable to a width of two feet and sometimes reducing to only a knife blade width, but always present. However, for the greater part of the 600-foot length that both of the veins have been worked, the high-grade pay streak has been of sufficient width to be profitably handled.

The Howard vein has been opened for a length of 600 feet and a depth of 170 feet, or from the tunnel level to the surface, all of which has been worked for high-grade shipping ore during the early days and all of which contains large quantities of milling ore above the tunnel level, to say nothing of the possibilities of high-grade ore that lay beneath the level at which the work has been stopped. The Pioneer vein is lower down on the hill, and has,

therefore, a less stoping height above the level of the tunnels. It also is opened for a length of about 600 feet and for a vertical height of about 100 feet.

The width of the Pioneer vein that can be worked for commercial ore is about 20 feet above the tunnel level, although from 2 to 3 feet has already been extracted to the surface along the high-grade streak. Both of the veins have been extensively developed by two cross-cut tunnels about 250 feet apart, each of them cutting across the veins with a large amount of drifting on the veins. Considerable length of stoping ground is now ready, with chutes installed, for stoping operations.

In addition to the tunnel development, there are a considerable number of shafts on the property, none of which are open, however, except as they have been raised from the tunnels in order to form chutes for handling the ore from the upper workings to the tunnel levels and thence to the mill.

A feature of the workings on the old Pioneer and Howard properties is the extensive silver-bearing dumps, the results of the old-time development along the veins in the development of the high-grade ore and the results of cobbing the high-grade and making it ready for shipping. A cobbing dump was recently uncovered, having been covered for many years by a wind-blown sand, and this dump has been rough sorted and a considerable quantity is now ready for shipment to the Hayden smelter and runs about 100 ounces of silver to the ton.

It is characteristic of all of the work that large quantities, literally thousands of tons of ore that is good milling ore today, are on the dumps and as fill in certain stopes and running from 15 to 60 ounces in silver to the ton. The varying values of the different dumps depends largely upon the care with which the ore was put upon the dump and the intermixing with waste coming from the cross-cutting to the veins.

As further evidence of the values that were left behind from the work of the early-day miners, the tailings dump from an old milling plant of many years ago showed a value of 29 ounces of silver. It is not known just when the plant was operated or the character of the plant, as nothing but the tailings dumps and the remnants of the foundations of the machinery remain to tell the story of 29 ounce tailings.

However, the fact that thousands of tons of mill ore lay on the dumps and that blocks of 600x170x7 in the Howard vein and 600x100x20 in the Pioneer vein led to the construction of a small milling plant just before the period of financial and mining depression and this mill was completed and run for about thirty days on tests prior to stopping the work on the closing of the mining industry of the southwest and the stopping of the smelters.

While the mill is designed primarily to handle and save the sulphide values, there are some little chloride values present; however, it was found that close to 80 per cent extraction could be obtained. The mill has a capacity of 50 tons daily, and was so built that the capacity could be easily doubled. It was designed primarily to handle the dumps and the ore that could be extracted above the tunnel workings and from the proceeds of the mill to develop at greater depth and ascertain from the deeper development the plant changes that might be necessary to handle the ores of a lower horizon. The large quantities of ores that were already available assured the mill of continuous operation for a long while.

The testing for the mill was done by the Southwestern Engineering Company of Los Angeles and the construction of the plant was by Kennard & Bierce of Los Angeles. The milling plant consists of a coarse crushing plant from which the ore goes to a bin. This ore is fed by belt conveyor to a six-foot Hardinge mill, which operates in closed circuit with a simplex Dorr Classifier, the overflow going to a K. and K. Rougher flotation machine, followed by a K. and K. cleaner machine, and then by two Plato-Deister tables. The dewatering is done in a Dorr thickener. The mill building is frame and covered with galvanized iron, and all floors and foundations are concrete. An electric lighting plant furnished the illumination for the night operation. Power for the plant is supplied by a 20 H.P. Western engine running the crusher and a 60 H.P. Western engine running the balance of the plant and the generator. The milling plant is simple and efficient, well designed and capable of satisfactorily and adequately handling its part of the work.

The whole plant of the White Metals Company is well equipped to handle their work. A main shaft is proposed to be sunk vertical to a depth of 500 feet. This shaft is now down about 100 feet, and it is planned to resume operations on the shaft with the resumption of work. The shaft has a concrete collar and is well timbered throughout. It is located between the Pioneer and Howard veins and drifting will be done to and on the veins when a depth is reached below that that can be reached through the two tunnels. The surface equipment on the shaft consists of a 40 H.P. Western hoist, a 120 H.P. duplex Western engine attached to a 600 cubic foot Laidlaw Dunn Gordon compressor. Ingersoll Rand drills are used throughout the property. In addition, all of the necessary shops are grouped around the shaft, which will eventually be the main operating base.

The camp is well equipped in every manner and is capable of comfortably accommodating fifty men, the houses for employees are well built and the camp is most conveniently arranged for maximum comfort. An excellent supply of water for both domestic and mill purposes is at hand. Transportation is taken care of by two 2½-ton trucks and one 3-ton truck.

The White Metals Mining Company was about to get on to a producing basis at the time when the post-war financial depression came on, and this, combined with the stopping of the smelters, the low price of silver and other factors, stopped their work, which is now about to be resumed. The resumption of the work at this time is under the most auspicious circumstances, as the whole plant is "ready to go," the mill completed, ample ore already mined to last until such a time as the new shaft can take care of all the needs of the mill.

They use and A, B, C and D classification of ore. The A ore runs over 600 ounces and is to be shipped direct to the smelter. The B ore runs from 200 to 600 ounces in silver and is sorted and shipped to the mill. The C ore runs from 100 to 200 ounces and is more closely sorted with the cobbings going to the mill and the balance direct to the smelter, while the D ore, under 100 ounces, goes directly to the mill.

The work in the mine is such that it is possible to classify this ore largely underground and mine the different classes separately, thus permitting of a considerably greater production in silver than can come from the mill alone, for the higher grade ores are everywhere encountered while mill ore is being extracted, and it is anticipated that, even with the 50-ton mill it will be possible to handle a gross product of \$25,000 a month, this figure being based upon the work that was done just prior to shutting down and during the 30 days that the mill was in operation.

The starting of the work at this time has the advantage of the increasing price of silver as well as the large demand for silver and the shortage of the metal. While silver is protected in price for a limited amount under the Pittman act, it is believed by those that are following the silver market that it will be a great many years before the amount authorized under the Pittman act will ever be purchased by the government, as it is likely that the price on silver will be greater than that offered by the government, \$1.00 per ounce.

The condition of the silver market at the present time makes the interest in silver mining greater, for it is felt that, throughout the world, silver must be used as a metal reserve, there not being enough gold for that purpose. Probably two-thirds of the silver comes as a by-product of copper, lead, zinc and other base metals, and with the decline in production of these metals there has been a consequent decline in the amount of silver available. The price of silver sloughed off in 1920 from \$1.37 to about 65 cents an ounce, largely due to the fact that normal coinage was neglected during that time, but this condition is righting itself with a consequent rise in the price of that metal and with a complete righting of the situation it will not be surprising to see a price higher than \$1.00 for the metal.

Early day Arizona was known for its silver mining, and the history of the state revolves about the Pioneer, the Silver King, the Old Dominion, the United Verde, El Capitan and others, but the development of the big copper mines has rather obscured the possibilities of silver and it is believed that the revival of production in some of these old-time silver bonanza mines will again cause an interest in the white metal. The White Metals Mining Company is about the only one of the old silver mines that is again ready to produce, and it is believed that its regular production will do much to stimulate that interest.

LETTER FROM MR. ROY HICKS TO MR. GENE DEVINE

HICKS MOTOR COMPANY
527 Main Street
Safford 2, Arizona

April 9, 1948

Mr. Gene Devine
1228 N. 4th St.
Tucson, Arizona

Dear Mr. Devine:

In regards to our telephone conversation about what we found when I was Superintendent for Mr. John Devine, your father, at Pioneer Mine, when we got the shaft unwatered to 200 ft. we cleaned the old tunnels out and found that they had stolped out we started to tunnel to the Howard shaft and the same time started to unwater to the 400 ft. level. We reached the 300, we found everything in good shape and found plenty of ore but run so high in Zinc that was worthless to us then as we were already having trouble with too much Zinc in our concentrates.

As I remember the Essay run from 24 to 30% Zinc and 10 to 12% lead. I don't remember the exact on silver but quite a few ounces. I think the reason you have never found any of these Essay sheets was because Mr. Devine didn't want the officials to know the mine was so heavy in Zinc which was not desired at that time. We brought some high grade ore go the surface from the 300. Mr. John Devine ordered us to burry it in the dump, and not to go any further with the unwatering. In the meantime we were taking out some high-grade and milling ore from No. 1 tunnel on the Howard Vein and we discovered we could get in the Howard shaft from No. 1 tunnel and went down what we figured was the 200 level and found plenty of ore and it also run in to too much Zinc and Mr. Devine ordered me to stop the tunnel on the 200 ft. main shaft that was going to the Howard as he said there would still be too much Zinc at this depth.

Gene, I feel sure that if we would have had the flow sheets in 26 that we have now, that would be a big mine in Arizona today.

I think your father was one of the smartest mining men that this state ever had because he was sincere in his belief and he really believed he had a bigger mine at Pioneer that they have in Superior, Arizona. For the way the veins were laying they were bound to all come together and there is where your copper would begin.

LETTER FROM MR. ROY HICKS TO MR. GENE DEVINE (Cont'd)

Page 2

If there is any way I can help in explaining I will be glad to do it as you can't appraise this mine too highly.

Gene, if you will take and unwater to 300 you can start your mill on high grade Zinc, lead and silver ore you could start it from the Howard on Zinc; lead & silver ore but it would be cheaper to unwater to the 300 and finish your tunnel on the 200 to the Howard shaft and bring your ore out from the Howard that way.

I am sorry I can't remember exactly how far you would have to go to finish the tunnel to the Howard, but I know it is not very far, for I know there was one set of steel made up for a feeler. 15 ft. long just in case the Howard shaft still had water in it at that level. I don't believe they were every used.

Yours very truly,

By (Signed) Roy Hicks

Roy Hicks

RH:ma/ch

INTERVIEW WITH MR. HERMAN SIDOW BY W.S. CROWS, June 17, 1920

Personal interview by W. S. Crows - June 17th, 1920.

Mr. Herman Sidow of Globe, Arizona, when interviewed with reference to the Pioneer Group of Mines stated as follows:

"I worked for the Pioneer Mining Company in 1882 in the shaft that they were sinking and continued in their employ until the shaft was put down to the 300 ft. level. The claim upon which this Co. operated is now called the California. I think the first drift was driven out at the 150 level and one at 100 ft. deeper. After I quit the shaft was sunk down I think to the 400 ft. level and a crosscut run to the vein, but I do not know what ore showings were there, but I do know that there was good ore showings on the two levels above. The last named work was done just a short time before the shutdown and there could not have been much work done on the lower level. There was three different companies operating there at the time on the claims now owned by the White Metal Mining Co. - The Pioneer Mining Co., the South Pioneer Mining Co., and the Howard Mining Co., but all three companies were under one management. A man by the name of Hellings was the manager of all three companies. The Pioneer Co. was working the claim on an option but paid out the property shortly before the close down. There was also a small strip of ground between the South Pioneer and the Pioneer property which was owned by the original owners of the Pioneer property. This ground is now known as the Delinquent claim and has never been explored.

All pumping for the three companies was done at the South Pioneer - that is that company's workings drained all the ground so the others could work without being hampered with water. A 4 inch water column kept the mines unwatered which I think was only used a part of the time, that is it was necessary to pump but a part of the time. There was several causes for the mines being closed down, silver had been demonitized and down to near its lowest point, it was 90 miles to Case Grande the nearest RR point and the roads would be considered impassable today, that is, they followed along the gulches and sand washes, dynamite cost sixty cents per pound and everything else in proportion, the formation, or ground at the mines was very hard and the machine drills was unknown in those days, all work was necessarily very very expensive, but probably the greatest cause was the sudden death of Maj. Baldwin in San Francisco a capitalist who had looked after the financial end of things. His death left financial matters up in the air. When once the mines were closed down they soon got in such shape that reopening them meant the expenditure of a large sum of money, that is, the workings caved and filled with water, besides leasers gutted everything above water level afterwards, filling up most of the openings. I think the

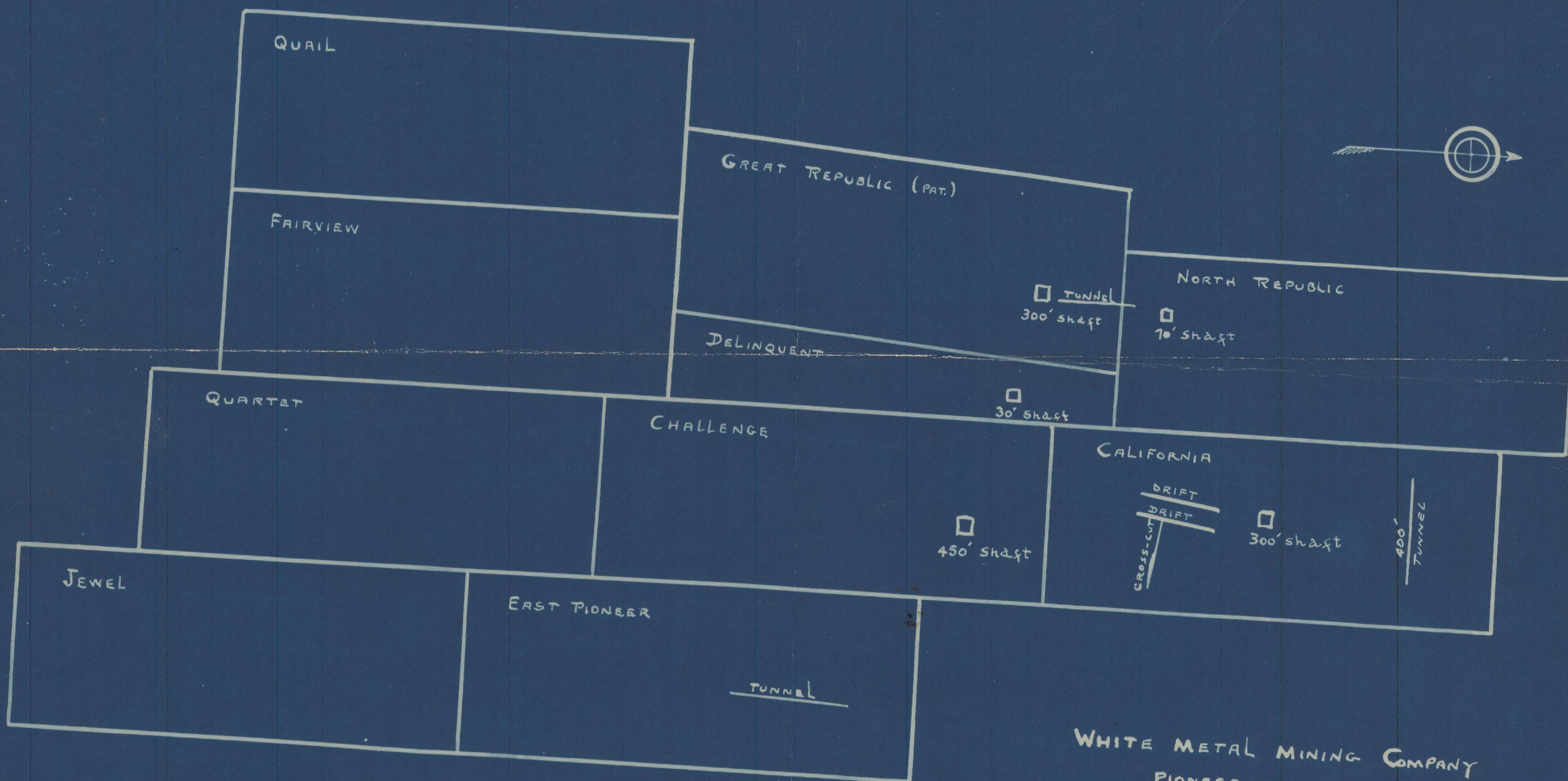
Howard Co. had the Great Republic surveyed and patented after the shutdown. Leasers got in on the ground after the close down and all made big money even at the low price of silver. They would only work down about 50 feet to the water level as the workings were full of water at this time. They worked on the California and the north extension of the Great Republic. Their ores were hauled by wagon to Casa Grande and shipped to San Francisco and Socoro N.M. where a large smelter was in operation at that time. A great amount of ore was taken out by these lessers on the property in the gulch between the Pioneer and South Pioneer Companies. This ore was richer than the common run of the ores, some of it showing native wine silver.

When asked if he had worked in the South Pioneer Mine, Mr. Sidow stated that he had not and all he knew about that mine was from what he had learned from statements of men working there at the time. From what I was able to learn from men working in this claim, the ores showing on the surface of the California extend northward beyond the South Pioneer shaft, but are deeper and trend downward toward the south, or southwest. But southwest of the shaft the ores were said to be very base, that is, they carried a great amount of sulphur and zinc and they said to be such ores as could not be worked in those days, as very little was known of treating ores except by amalgamation with quicksilver and this process would not extract the values from sulphide ores.

I think drifts were run to the southwest on the 200 and the 300 levels and the ores carried something like 35 ozs. silver and heavy in zinc and sulphur.

These mines have never been explored and even the ores that could not be handled in 1892 should be handled profitably today with the cheaper methods of working and better methods of extracting the values. Everybody that ever worked in these claims agree that there is a mine there and all that is needed is to properly develop the claims.

I leased on this ground after the shutdown and was well paid for all the work I done on the ground. My ores averaged about 135 ozs. per ton and my highest shipment carried 550 ozs. silver.²"



WHITE METAL MINING COMPANY
PIONEER MINING DIST.
GILA COUNTY ARIZ.