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GEOLOGIC AND ENGINEERING
REPORT

of the

SILVER BELL-MARTINEZ MINES

in

Pioneer Mining District
(Mineral Creek Mining District)

PINAL COUNTY, ARIZONA

by

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October 24, 1957

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COTTON CONTENT

EXEMPT

WIPERS

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INTRODUCTION

At the request of Mr. A. H. Mackenzie, Phoenix, Ariz., a field examination of the Silver Bell-Martinez lead-silver mine was made by the writer to ascertain the merit of the property which is located in the Pioneer (Mineral Creek) Mining District, Pinal County, Arizona.

This report contains the writers unbiased evaluation of the property with particular reference to existing geological conditions, present and future potentials of the property and equipment considerations.

The surface and underground examination was completed at intervals during the early weeks of October, 1957. All available records, etc, were reviewed which included a report by Mr. H. B. Starbird, May 1920, and much correspondence from 1943 to 1955 between Mr. T. S. O'Brien, Consulting Engineer and Mr. G. F. Bont of California Iron Products Co., Richmond, California.

Some of the maps herein included have wholly or in part been traced from older maps.

The writer has also made an impartial check of the early report which delimited ore reserves and grade and has also checked information as late as January, 1955.

CONCLUSIONS

The following are conclusions resulting from the examination and study of the property by the writer.

- 1- Neither of the two mines, the Martinez nor the Columbia-Silver Bell, can be called immediate potential producers. The Martinez lacks sufficient

"indicated" or "measured" ore (3000 tons "inferred") as contrasted to the Columbia-Silver Bell which has ample reserves but of sub-marginal grade (\$13.00 value per ton) at present day metal prices and production costs.

- 2- The future of the Martinez Mine lies in the geologic potential the mine exhibits by its existing development. A well planned exploration and sampling program must be adopted and exercised to transpose "inferred" ore to "indicated" or "measured" ore before mining operations can be considered.
- 3- Any "ore" from the Martinez Mine which has a combined lead-silver value in excess of \$18.00 (estimated mining, milling, marketing costs including losses) will show a profit before royalty and taxes.
- 4- Metallurgically, the lead-silver mineralization of the Martinez Mine is amenable to concentration by jigs, flotation and gravity tables.

PROPERTY

The Silver Bell-Martinez lead-silver property is currently owned by Mr. G. F. Bont, Richmond, California. Twenty seven claims, approximately 500 acres, include three patented claims.

These claims are located in Section 18, Twp. 3 S., Rge. 12 E., Gila and Salt River Base and Meridian, Pinal County, Arizona. Though no personal check was made in the County Recorder's office, the claims appear valid and clear of any liens.

Claims included in the property are as follows:

Patented Claims

Silver Bell--Survey 314--April 18, 1890
Columbia --Survey 315--April 18, 1890
Martinez --Survey 799--January 10, 1891

Unpatented Claims

Aspen	Flunk Out	Lorado No.3
Aspen No.2	Good Luck	Over Sight
Aspen No.3	Good Luck No.2	Over Sight No.2

Cave	Good Luck No.3	Silver Bell West Ext.
Cave No.2	Good Luck No.4	Silver Pick
Cave No.3	Good Luck No.5	Silver Pick No.2
Columbia West Ext.	House	Silver Pick No.3
Copper King	Lorado	Silver Pick No.4

The property is located approximately 20 miles north-east of Florence, Arizona. Access to the area is over 20 miles of County maintained road, 10 miles of which parallels a branch of the Southern Pacific Railroad to Price, the railroad ore loading ramp servicing the area. The last 10 miles for the most part utilizes the bed of several washes. Unfortunately such road locations can be extremely expensive as to maintenance and particularly when destroyed by flash flood conditions.

PHYSICAL FEATURES

Rugged topographic features abound in the immediate mine vicinity. Recent erosion of the rhyolite flows creates steep near vertical pinnacles of great relief. A mean elevation for mining activity can be considered as 2700 feet above sea level with a range of elevation from 2400 feet down wash from the Martinez Mine to 3450 feet up slope above the Columbia-Silver Bell Mine.

Climate wise, the property is ideally situated to permit an uninterrupted ^{annual} yearly operation. The one jeopardizing act of nature that could cause damage is flash flood conditions because the wash traversing the property is the only escape for rain waters precipitated north, east and south of the property. ~~The writer had been advised that~~ flash flood conditions did exist in 1955 and had for the most part obliterated ^{Several} ~~approximately six~~ miles of road. Since destruc-

tion is possibly by this means, precautions and preventive measures must therefore be considered for any new road alignment and construction, also for placement, installation and construction of new machinery and/or buildings.

FACILITIES

The property is too remote for any modern day utility excepting a source of water. Gas ^(propane-butane) for heating and domestic purposes must be in ~~bottled form and~~ trucked from Florence ^{or Spacke get.} Electricity for mine, mill and camp operation must be developed on the property. Timber for mining and construction purposes in carload lots must ^{Phoenix or Florence} be trucked from ~~Price~~ ^{if brought by rail}.

An existing well located near the camp at the wash bottom can possibly supply the domestic requirements of a small camp. Water for mine and mill operation may have to be developed. A possible limited and unreliable (?) supply might be the water from below the 200 level of the Martinez Mine. A previous operators correspondence in 1948 indicated the shaft sump could provide 160 gpm. Another more recent source of information places the capacity at 15 gpm, continuous pumping. The latter figure is about ample to operate the ^a present mill at its ^a 50 ton per day capacity.

HISTORY AND PRODUCTION

The property was well known for its silver production, the majority of which had been mined from enriched, near surface, chloride zones in the Columbia-Silver Bell Mine. Production dates back to 1880. Demonetization of silver took its toll here also. The property no doubt changed

Mrs. F. Bonte

ownership several times until the present owner, Mr. Bont purchased same ^{many} several years ago.

^{Several} Two lessors, besides Mr. Bont, have operated the property intermittently under options to purchase. All options have been canceled.

The writer obtained the following shipment records from the Smelting Company to which the ore and concentrates had been shipped.

Producer	Type	Tons	Ounces Silver	Percent Lead	Lead Price
Calif. Steel Prod.					
Year 1943	Ore	345	1.2	14.4-24.3	6.5¢
1944	"	424	.4-19.8	8.0-26.0	6.5¢
1945	"	280	.7- 4.6	11.6-20.8	6.5¢
"	Conc.	34	1.7	54.0	6.5¢
1946	Ore	52	1.0	20.0	8.109¢
"	Conc.	30	2.0	53.6	8.109¢
Martinez-Bell Mining					
Year 1948	Ore	21	1.5	23.5	18.04¢
United Ariz. Mines					
Year 1951	Ore	243	2.0	19.3-34.7	17.50¢
"	Conc.	66	2.5	42.9-58.3	17.50¢
1952	Ore	42	2.3	27.0-37.7	16.467¢
1952	Conc.	30	1.9- 4.1	47.7-57.3	16.467¢
<i>BOW Mining</i>	<i>ore</i>	<i>2,500</i>		<i>(OPEN CUT - FLUX)</i>	
Totals	Ore	1407	1.0-19.8	8.0-37.7	
	Conc.	160	1.7- 4.1	42.9-58.3	

The above production record is not overly impressive but it does provide an indication of what had been shipped through hand sorting and milling of the ore.

GEOLOGY

The property is situated in an area of Tertiary Volcanic flows which have been uplifted and distorted to some extent. Rhyolite and its many phases of mineralogical composition and physical textures is the principal country rock. Into this rock there has been intruded some later rhyolite and basalt-dabase series dikes. These dikes could have in-

fluenced the metallic mineralization.

Since metallic mineralization is associated with fractures and zones rather than with rock types or phases, no attempt has been made by the writer to differentiate the rhyolite phases. Surface mapping in the area was completed in a general way using physical characteristics such as erosional features, color, texture etc, as a criteria for classification and separation. Obvious rock types as dikes were mapped as observed.

MINERALIZATION

Metallic mineralization, lead, silver, some copper and a small amount of zinc, occurs as lenses within wide parallel zones of weakness in the rhyolite series. These zones are identified on the surface by the greater amount of iron oxide and quartz present in the zone as contrasted to the lesser degree in content in the various rhyolite phases.

The general trend of the zones of weakness is north-south and their dip is westerly at a moderate angle. Local strike and dip changes vary from N. 15 W. to N. 15 E. and 35 to 50 W. These changes apparently control "pay" mineral deposition. This criteria must be further studied and used in development of future ore reserves.

Lead and silver mineralization at both mines (Martinez and Columbia-Silver Bell) is contained in the minerals galena, a sulphide; cerrusite, a carbonate; anglesite, a sulphate; pyromorphite, a chloride and phosphate and the silver mineral cerargyrite.

Lead mineral distribution is somewhat sporadic, being moderately localized in areas of sufficient dimensions to spearhead and justify exploitation as stopes. The mineralization also shows a greater vertical tendency than horizontally, the control of which may be the changes or rolling of strike and dip directions combined with the cross-fracturing observed during the examination.

Copper mineralization as oxides and sulphides were observed in the south drift of the Martinez 200 level. The appearance of copper here may will be significant as to possibilities of same at depth. Lack of adequate information will not permit a definite conclusion.

Gangue minerals include quartz, iron oxide, fluorite and minor barite. Fluorite is more prominent in the lower level.

DEVELOPMENT

Two mines have been developed on the property. The Columbia-Silver Bell mine is primarily a high silver-low lead ratio ore on the order of 6 to 1 with the lead seldom exceeding 2%. The combined monetary value of the reserve blocked out by Mr. Starbird would not exceed \$13.00 in place and therefore can not be considered as "ore" since it cannot be mined, milled and marketed for a profit on a scale which we are concerned with.

The Martinez mine on the other hand has a high lead-low silver ratio of approximately 6 or better to one. The monetary value of this ore at present day metal prices is

approximately \$20.00 in place. The ore reserves of the mine are, however, quite limited.

UNDERGROUND DEVELOPMENT OF EACH MINE

The Columbia-Silver Bell Mine is developed by various adit levels, interior shafts, winzes and drifts over a 500 foot strike length and a vertical depth of 300 feet measured from the discovery in the saddle through which this zone passes. High grade silver ore had been mined above the No. 3 Adit level (see Plate 4). Apparently some enrichment occurred in the two veins within the zone, the footwall and hanging wall. The two veins became one at a short distance above the No. 3 Adit level. Below this junction the silver values remained but in amounts which will not satisfy dollar-wise the present day costs involved to mine and mill the material.

The writer did not enter the mine to examine same. Records indicate this mine has not been worked since 1920 and that the workings as shown in Mr. Starbird's report (plate 4) are essentially correct. From 1943 to 1946, Mr. T. S. O'Brien obtained some ore for metallurgical tests. It would therefore appear that many of the workings should be accessible.

The Martinez Mine which we are more concerned with, was entered and most of the underground workings examined but mapped geologically because of the time factor. This mine is developed approximately 900 feet along the strike and to a depth of 200 feet by an inclined shaft, an adit level and three intermediate levels including the long 200 level. (See Plate 3).

A moderate lead-silver tonnage has been mined from four stopes above the 200 level. The previous mentioned production record indicates the tenor of hand sorted crude ore and the milled concentrates marketed by the operators.

ORE RESERVES

Columbia-Silver Bell

Starbird, in his 1920 report, calculated approximately 60,000 tons of measured and indicated ore available using the existing development as limits. This tonnage has been substantiated by the writer. The writer also weighted the grade of each block of ore and obtained an average grade of 8.3 ounces of silver and 1.4% lead. The unfortunate circumstance however, is the fact that mining, trucking, milling and marketing costs will equal or exceed the monetary value of the ore after a 10% mill loss and a 5% smelter deduction of current metal prices.

In a letter dated August 19, 1946, Mr. T. S. O'Brien indicated that some 1600 tons were mined from various parts of the old workings and shipped to the smelter. The average grade of this material was 7.5% lead and 18 ounces of silver. Plate 4 of this report does not indicate that ore of this tenor is available any place in the mine. The wide variation therefore infers two thoughts, (1) that the ore obtained was to some degree hand sorted and (2) that the sampling completed by Mr. Starbird is unreliable and not representative of the material. The writer is of the opinion the sampling is within the realm of its own right for res-

son of the consistent distribution of the lead and silver values from sample to sample and level to level. A check sampling program on a limited basis would be very helpful.

We must therefore assume that the tonnage of concern was removed from higher grade areas and hand sorted.

Martinez

The measured and indicated ore reserves of the Martinez Mine as delimited by existing workings are quite meager at this writing. Lack of adequate sampling, lack of correct and up to date maps and the limited field examination time, requires the authors' ore calculations be classified as inferred.

Much mining has been done since Mr. Starbird sampled and calculated a 6000 ton reserve of 8.8% lead and 2.5 ounces of silver. Additional development indicated other ore shoots which since have been mined also.

Five ore blocks have been indicated on Plate 3, blocks "A" to "E". The dimensions used and tonnage of each block is given below:

Block "A"	30'L x 60'H x 4'T	equals	620 tons
Block "B"	70'L x 20'H x 4'T	equals	480 tons
Block "C"	50'L x 55'H x 4'T	equals	940 tons
Block "D"	50'L x 30'H x 4'T	equals	510 tons
Block "E"	50'L x 30'H x 4'T	equals	<u>510 tons</u>
Total "inferred" ore			3060 tons

"L" is length along strike of zone

"H" is height on slope of zone

"T" is thickness or width of zone

A cubic foot factor of 11.6 was used or a factor of

.345 times the length and height.

The assumed average grade of this tonnage is 8% lead and 2 ounces of silver.

Approximately 800 tons of ore exists as pillars on both sides of the Martinez Shaft, however, the writer can not justify the robbing of these pillars for the sake of the small tonnage involved. The shaft in place and in good condition has more value to an operation than the monetary value which would be received from the extraction of the ore.

EXPLORATION

There is not sufficient ore available in the Martinez Mine at this time to justify a mill operation for any great length of time. Monies must therefore be expended in exploration and development of additional reserves to assure a feed to the 50 ton capacity mill for at least a year ahead of itself. The future of this mine and the justification for purchase lies in its ability to provide adequate additional reserves laterally, vertically in depth below the present bottom level and horizontally in breath along the strike and normal to it.

A well planned, professionally supervised surface and underground drilling programs are a prerequisite to any decision to purchase. This program must be designed to test the known ore shoots at depths below the bottom level and to test the horizontal breath of the zone to intercept hidden paralleling footwall mineralization. Some twenty to forty thousand tons might be developed by this work.

A prerequisite to the drilling program is a detailed surface and underground survey, underground geological mapping and sampling program. The writer found many discrep-

ancies while reviewing early data and compositing the Martinez underground map in this report from early maps.

EQUIPMENT

To say the least, the property is well equipped with the necessary tools and machinery to start operations in a very short period of time. Some renovation and cleaning of machinery and tools would be required since little to any item has been used for several years.

The present owner can no doubt provide an inventory and to duplicate same in this report would be without point except to evaluate same. All tools, equipment, machinery and buildings on the ground represents, in the writers opinion, an expenditure of approximately \$100,000. To purchase these items on the used market, excepting buildings and installation, something like \$40,000 might be required.

The mine is equipped with electric hoist, cable, skip, cars drilling machines, sump pump, rail, etc. The mill and power house is equipped as shown in Plate 5.

Such necessary but unusual items on the ground include laboratory sample pulverizer, pulp balance, gold-silver balance, acetylene hoses, nozzles and tips.

Office, Bunk house and Superintendents house are well equipped with bunks, tables, desks, chairs, gas refrigerator, stoves, cooking utensils, etc.

METALLURGY

The ore tenor of both mines is such that the success of the property lies in the amendability of the ore to concen-

tration. Mr. T. S. O'Brien conducted many metallurgical tests on both the Martinez and Columbia-Silver Bell ores. Subsequent lessors took advantage of the findings and the last operator used the mill flow sheet as indicated on Plate 5.

Concentrates from the present circuit were obtained as three products, two from the tables and one from the float section. The present flow sheet is somewhat congested by the multiple handling of the material in closed circuits between the classification, float and table circuits. Although recoveries may have been 85 to 90 % with this flow, the writer believes much improvement can be made by eliminating the inefficient material handling without materially reducing the recovery factor.

In October, 1947, Denver Equipment Company of Denver, Colorado, completed a mill test on the Martinez ore at the request of Martinez-Bell Mining Co., Superior, Arizona. The resulting flow sheet, Plate 6, was recommended. The sample tested contained the following percentage of elements.

Gold (ounces)	.01	Silver (ounces)	0.69
Total Lead	10.40%	Iron	4.20%
Oxide Lead	5.25%	Sulphur	0.33%
Zinc	0.65%	Insoluble	68.12%
Copper	0.12%		

Calculated head assay was; Total lead, 9.58%, Oxide Lead, 4.90%.

Five test were completed, four using flotation and gravity tabling while the other used jigs, flotation and gravity tables. Lead recoveries ranged from 59% to 87% for concentrates which contained 36% to 62% lead. The carbonate,

sulphate and in particular the chloride-phosphate of lead presented the greatest problem for recovery.

The two most successful and accepted tests had the following results using the identified methods of recovery.

	<u>% lead Recovered</u>	<u>Grade % lead</u>	<u>Concentration Ratio</u>
Jigs	45.05	50.9	12.2 to 1
Flotation	27.54	52.3	20.4 to 1
Tables	11.33	38.0	36.2 to 1
Total	<u>83.92</u>	<u>49.6</u>	<u>6.25 to 1</u>

100 tons ore would produce 16 tons concentrate of 49.6 % lead. Concentration ratio of 6.25 to 1.

Flotation	63.99	46.2	7.5 to 1
Table	22.81	45.8	20.9 to 1
	<u>86.80</u>	<u>46.1</u>	<u>5.55 to 1</u>

100 tons ore would produce 18 tons concentrate of 46.1 % lead. Concentration ratio of 5.55 to 1.

Denver Equipment recommended the flow sheet employing jigs, flotation and table concentration even though the recovery was 3 % lower. Their recommendation was based on the production of a better product, simplicity in design and without much recirculating along with a slightly higher concentration ratio which in effect provides a substantial saving in rail freight to the smelter.

ESTIMATED EXPENDITURES

The following is an estimated itemized schedule of expenditures necessary to accomplish the individual phases required to properly initiate and execute an operation of the property. These initial expenditures, solely related to the Martinez Mine, do not include purchase of tools, supplies, etc, unless so mentioned in the item.

Access Road

Approximately six miles of access road must be re-aligned and rebuilt to eliminate as much erosion damage as possible caused by the intermittent cloud bursts common to the area. The necessity of this much reconstruction is laid to the fact that concentrates would be trucked over the road and any improvement made now will effect a saving in haulage expense.

Drilling

Since a relatively small reserve, based on present development, exists in the Martinez Mine, the future of any operation is dependent on what additional ore reserves can be developed above and below the bottom level of the mine. Mineralization, mill grade rock of about \$20.00 value, tends toward rectangular shaped lenses, the vertical length of which is greater than the horizontal dimension. A years reserve should always be maintained in advance of mining operations. An exploration program is therefore a requirement which must be considered. A minimum program would include surface drilling and underground sampling. A later program of underground drilling would also be advised only however after a mining operation was considered. The necessary expense involved in a mine "cleanup" operation could not be justified for the small amount of short hole drilling that would be recommended.

A minimum surface drilling program should consists of six to eight holes totaling approximately 1500 feet. The 200 level should be adequately sampled as well as the stope end walls where accessible.

Mining

Much rehabilitation and "cleanup" will be required to make the mine safe and provide for efficient operation. A general clean up must be made, rotten timber replaced, rail laid in shaft, air and water lines installed, vent lines provided, electrical equipment checked along with any other equipment which will be required in mine operation.

Milling

A general mill "cleanup" will be required along with a general equipment check.

The writer can only provide but a rough estimate for such items as "cleanup" and equipment repairs. Other expenditures can be reasonably estimated.

Access Roads

Rehabilitate and align 6 miles of 12 foot wide road with turn outs. (blasting required, Cat, compressor rental, 1 mo.)	\$ 5,000.00
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Exploration

Mine survey, Geol. Mapping,	\$ 1,750.00
Drill. Supervision, logging, Exp.	\$ 100.00
Water supply, Check electrical equipment for shaft pump	\$ 7,500.00
Drilling 1500 feet. @ \$5.00/ft.	\$ 1,500.00
20% for extras, cementing, etc.	\$ 150.00
Sampling and assaying 10¢/ft.	\$ 11,000.00
Total	\$ 11,000.00

Mining

Mine cleanup 800 ft @ \$1.75/ft	\$ 1,400.00
Timber	300.00
Equipment check and repair,	\$ 500.00
Labor and parts	\$ 200.00
Installation of shaft rails etc.	\$ 2,400.00
Total	\$ 2,400.00

Milling

Mill cleanup and rehabilitation	\$ 300.00
Equipment check and repair.	\$ 800.00
Total	\$ 1,100.00

	<u>Recapitulation</u>	<u>Total</u>
Access roads	\$ 5,000.00	\$ 5,000.00
Exploration	\$ 11,000.00	\$ 16,000.00

		<u>Total</u>
Mining	\$ 2,400.00	\$ 18,400.00
Milling	\$ 1,100.00	\$ 19,500.00

ESTIMATED OUTCOME

The estimated outcome can best be projected on a one ton crude ore basis. Certain provisions must be assumed such as average grade, mill recovery and mill capacity. For convenience, the writer will assume an average mill feed comparable to the sample tested by Denver Equipment. The calculated head of this sample was 9.29% lead and 0.75 ounces of silver. The mill recoveries assumed are those obtained by Denver Equipment in their recommended flow sheet and the mill capacity is assumed as 50 tons per 24 hour operation.

A smelter schedule by American Smelting and Refining Co. stipulates the following charges and credits.

Payments

Silver "Pay 95% at average silver quotation for calendar week less $1\frac{1}{2}\%$ per ounce. Minimum deduction one troy ounce."
Lead "Deduct 1.5 units of wet assay and pay 90% or remaining at New York common quotation less a deduction of 2.2¢ per pound."

Deductions

Base Charge-Concentrates \$13.50/ton
 Credit- 10¢ per unit per ton over 30% lead
 Charge- 10¢ per unit per ton under 30% lead

Value of Concentrate

Lead- 48.7% -1.5% equals 47.2% x 20lbs equals	
944 lbs x (14.0¢-2.2¢) equals	\$ 111.39
Lead credit-17.2 units x 10¢ equals	1.72
Silver 2 ounces x 95%--min. deduct.	
1 oz x (90.6¢ -1.5¢) equals	.89
	<u>\$ 114.00</u>
concentration ratio 6.25 to 1	
Value per ton of crude ore	\$ 18.24

ESTIMATED PRODUCTION COSTS

The following production costs are based on providing the 50 ton capacity mill with its daily requirement for a seven day per week operation. Mining has been assumed on a six day per week basis with a production of 60 tons per day or 360 tons per week.

Mining--360 tons per week, 6 day operation

1 Hoistman @ \$20.00 per day	\$ 130.00
3 Miners \$18.00 " "	\$ 351.00
1 Miners Helper \$16.00 " "	\$ 104.00
3 Trammers \$16.00 " "	\$ 312.00
1 Comp./mill man 1/2 time @ \$20.00	\$ 65.00
1 Mine/Mill Foreman @ \$600.00/mo	\$ 75.00
Total	\$1037.00
14% insurance, etc.	\$ 145.18
Professional Services	\$ 50.00
Total Labor	\$1232.18
Supplies, Powder, rail, timber, diesel oil, gasolene, oil	\$ 700.00
Total Mining 360 tons.	\$1932.18
Initial Capital Exp. 2% \$18,400.00	\$ 368.00
	\$2300.18
Mining Cost per ton Crude Ore	\$ 6.39

Milling

1 Mine/mill Foreman \$600.00/mo	\$ 75.00
3 Mill men @ \$20.00 per day	\$ 390.00
1 Trammer \$16.00 " "	\$ 104.00
1 Comp./mill man 1/2 time @ \$20.00	\$ 65.00
Total	\$ 634.00
14% Insurance, etc.	\$ 88.76
Professional Services	\$ 50.00
Total Labor	\$ 772.76
Supplies, reagents, gasolene, diesel oil, oil, etc.	\$ 550.00
Initial Capital Exp. 2% \$1100.00	\$ 22.00
Additional Equipment, repairs	\$ 180.00
Total milling 360 tons	\$1524.76
Milling Cost per ton Crude Ore	\$ 4.24

Trucking to Price, Arizona

1 Truck Driver @ \$16.00 per day	\$ 104.00
14% Insurance, etc.	\$ 14.56
Total Labor	\$ 114.56
Truck operation and repair	\$ 125.00
Total Trucking Charge	\$ 239.56
Trucking charge per ton Crude Ore	\$ 0.67

Rail Freight to El Paso, Texas
Freight rate for concentrates between \$100.00 and \$125.00

is \$11.59 plus tax of 3% which brings the total to \$11.94. With a 6.25 to 1 ratio, Cost per ton of Crude Ore is \$1.91
Smelter Charge

Base rate for one ton of concentrate is \$13.50 and with a 6.25 to 1 ratio, Cost per Ton of Crude Ore is \$2.16

Recapitulation

Mining	\$ 6.39
Milling	\$ 4.24
Trucking	\$ 0.67
Freight	\$ 1.91
Smelting	\$ 2.16
Total production cost	\$15.37
Value of assumed ore(after Conc.)	\$18.24
Production Costs	\$15.37
 Profit-Per Ton of Crude Ore before royalty and taxes	 \$ 2.87

A 1% lead decrease in the mill feed will reduce the margin of profit by \$2.36 per ton and will therefore be about the breaking point between a profit and a non-profit operation. The minimum mill feed must not be lower than 8% lead and 1 ounce of silver. Similarly, any increase in grade above the 9.2% lead content will add that much to the profit figure.

RECOMMENDATIONS

The writer, having completed a brief field examination and an office study of the property and circumstances, can recommend the following:

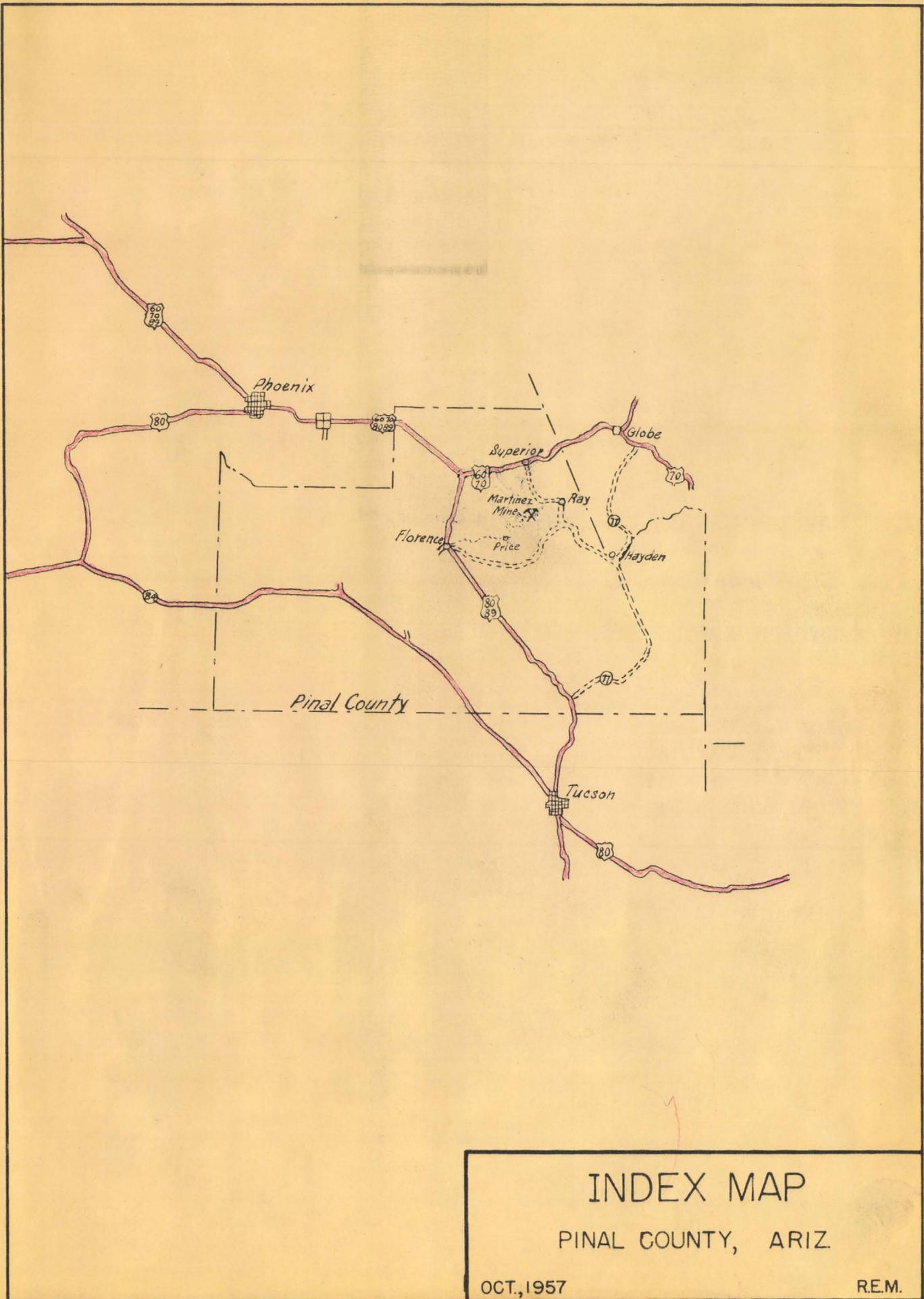
- 1.- That the property be optioned for no money down and with an exploration period grant of four months but not more than six months,
- 2.- that an estimated expenditure of some \$13,000 be made for limited access road repair, mine survey and geological mapping, surface drilling and an underground sampling program,
- 3.- contingent on the results of recommendation two, the option be continued or canceled as the case may be, and
- 4.- if results of recommendation two are favorable, continue access road rehabilitation and initiate mining and milling operations, milling operations as herein

- described, and also,
5.- that the amendability and economics of the copper and fluorite mineralization should be determined as possible by products in the milling schedule. These minerals could provide extra revenue at a minimum of expense.

Respectfully submitted,

R. E. Mieritz, P. E.
Mining Consultant
Phoenix, Arizona

October 24, 1957

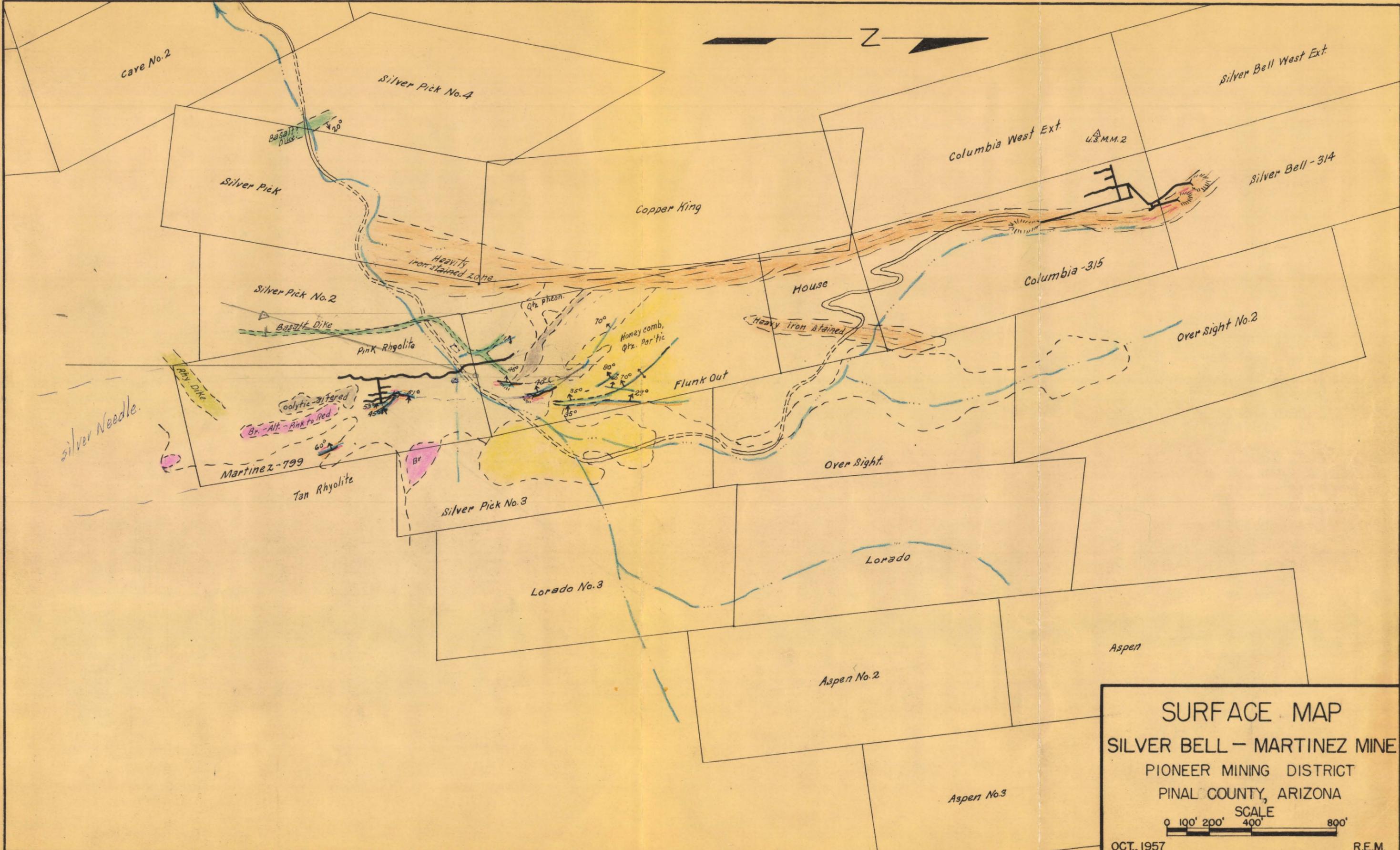
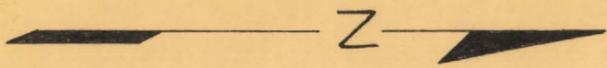


INDEX MAP

PINAL COUNTY, ARIZ.

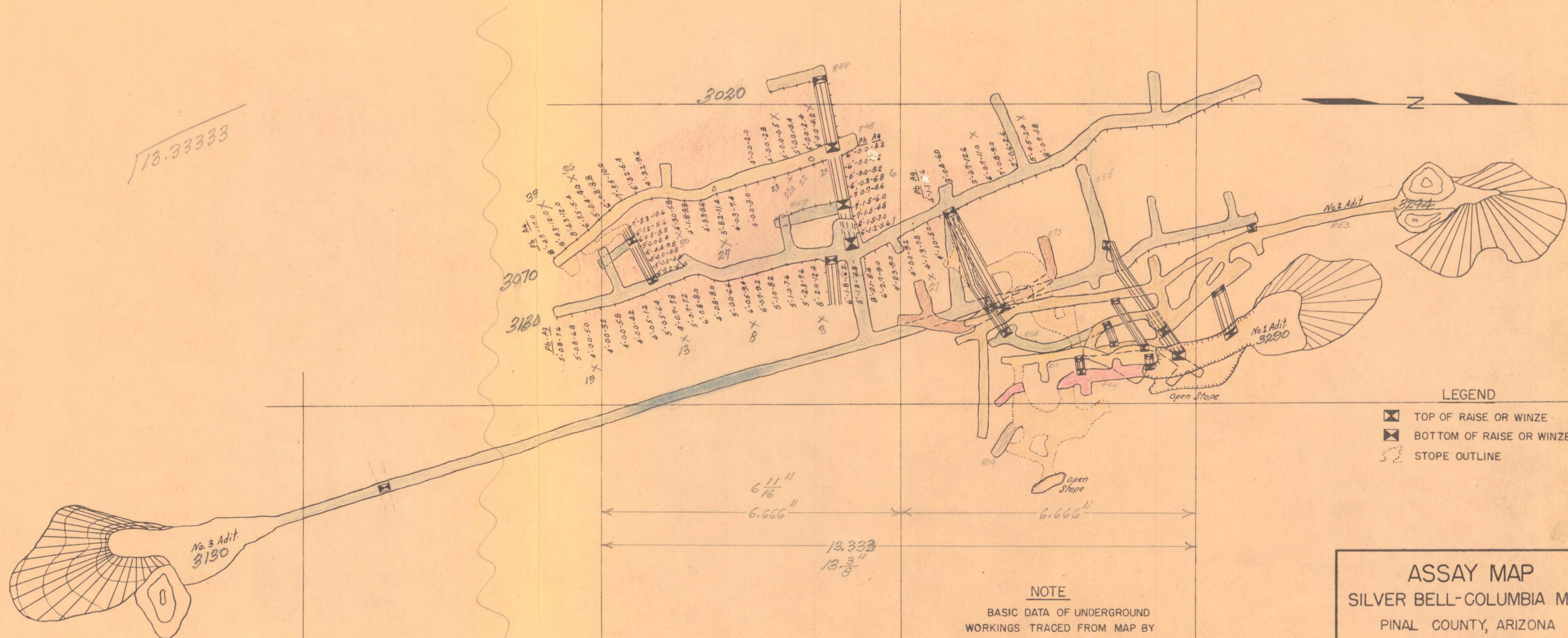
OCT., 1957

R.E.M.

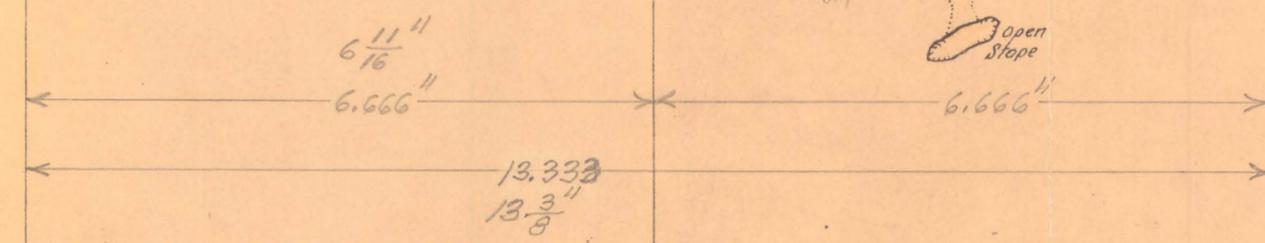


SURFACE MAP
 SILVER BELL - MARTINEZ MINE
 PIONEER MINING DISTRICT
 PINAL COUNTY, ARIZONA
 SCALE
 0 100' 200' 400' 800'
 OCT, 1957 R.E.M.

13.33333



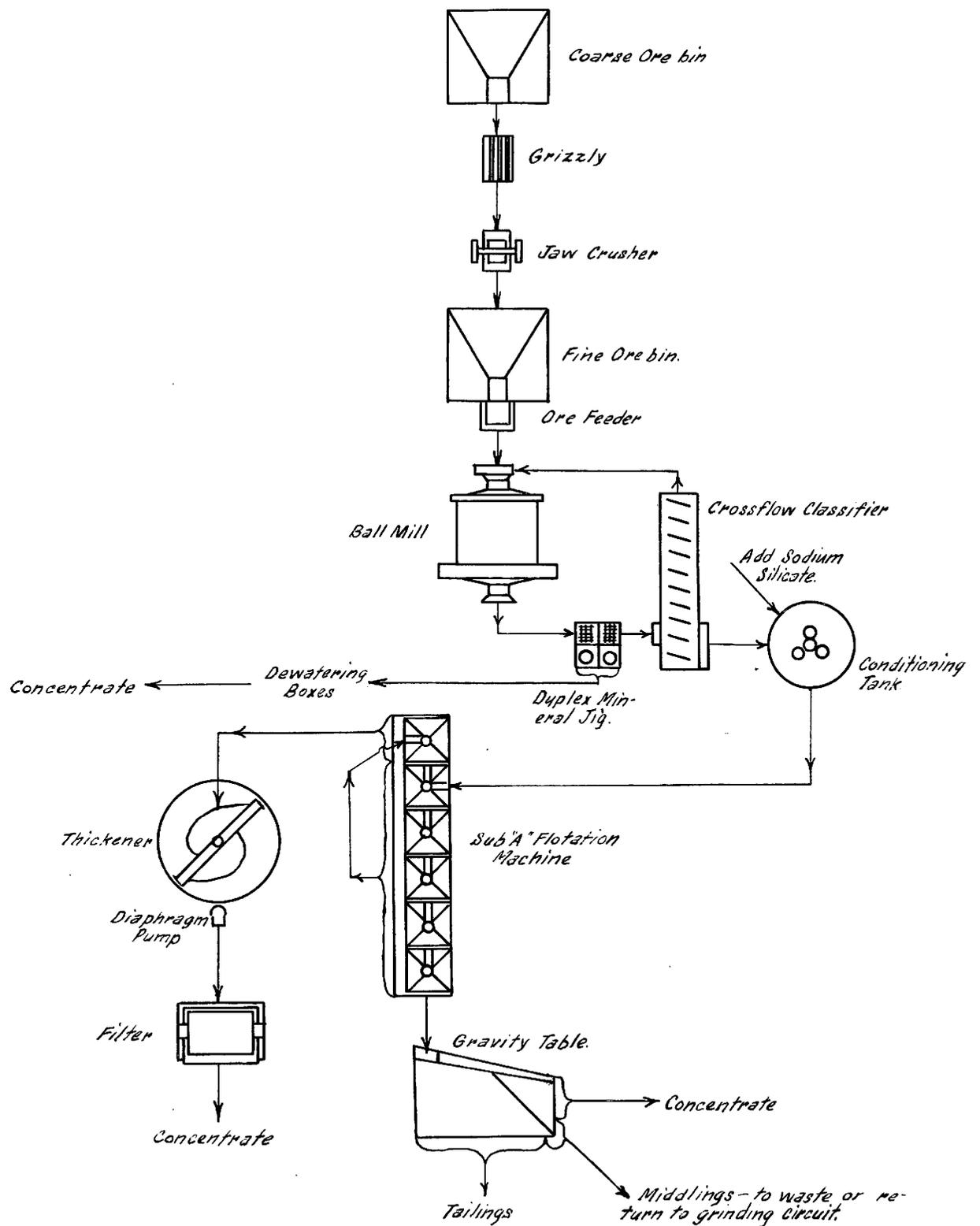
- LEGEND
- ▣ TOP OF RAISE OR WINZE
 - ▣ BOTTOM OF RAISE OR WINZE
 - STOPE OUTLINE



NOTE
 BASIC DATA OF UNDERGROUND
 WORKINGS TRACED FROM MAP BY
 H.B. STARBIRD DATED MAY 25, 1920.

ASSAY MAP
 SILVER BELL-COLUMBIA MINE
 PINAL COUNTY, ARIZONA
 SCALE
 0 10' 20' 50' 100' 150'

OCT., 1957 R.E.M.



MARTINEZ ORE FLOW SHEET
 as recommended by
 DENVER EQUIPMENT CO.
 OCT., 1947