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Item 22
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REPORT
on the
BUCKSKIN MINE
Douglas County, Nevada
December 2, 1986

TABLE OF CONTENTS

SUMMARY AND CONCLUSIONS

The Buckskin mine, located in Douglas County Nevada, has yielded about 20,000 ounces of gold along with some by-product copper and silver from a vein system enclosed by Mesozoic-age metavolcanic rocks. About 80 percent of this metal was produced by Pacific Silver Corporation from early 1985 to late 1986 when they milled 160,000 tons of ore grading about 0.10 ounces per ton gold, 0.60 percent copper and 0.20 ounces per ton silver from nearly equal amounts of underground and open pit material. Pacific Silver went ahead with production on calculated proven reserves of 260,000 tons of material grading nearly 0.20 opt gold. The considerable grade discrepancy can only be attributed to a sampling problem, i.e., the inability to predict the grade of the entire deposit from drill, muck and channel samples.

Based upon an analysis of the property data and records provided by Pacific Silver Corporation, it is concluded that essentially all the recoverable, presently known, economic mineralization has been removed from the mine.

Some high-risk exploration targets remain on the property though. These being the deeper portions of the vein system (below the 400 level) and the eastern strike extension. Also the placer gold potential in front of the deposit should be looked at in some detail.

RECOMMENDATIONS

Further work on the property is recommended only for risk-minded explorers. This would involve the drilling of 3 angle reverse-circulation percussion holes (each ± 400'deep) along the eastern strike extension of the main lode and one deep angle r-c hole (± 800') into the deeper portion of the central part of the lode. Drilling reverse-circulation holes would be quicker, cheaper and provide a larger sample for assay than core holes, possibly alleviating some of the sampling problems encountered in the earlier work. Also the r-c holes drilled through the alluvium would give a preliminary test of the gravels for the placer gold. A more thorough test of the placer potential would require trenching with a heavy duty track-mounted back-hoe. Estimated costs for the above mentioned program are as follows:

1.	Drilling: 2000' @ $10.00/ft. (includes assays).....	$20,000.00
2.	Trenching and dozer work.....	5,000.00
3.	Technical and supervision.....	5,000.00
4.	Miscellaneous and contingency.....	2,000.00
	Total Estimated Costs.....	$32,000.00

INTRODUCTION

This report on the Buckskin mine was prepared at the request of Mr. Adolph Schoepe, 1800 Via Burton, Anaheim, California 92805. It represents a summary compilation of written and verbal information provided to me by Pacific Silver Corporation personnel during a two day visit to their office in Ely, Nevada. A one day visit to the mine was made on November 24 but only the surface could be examined as the underground openings are rapidly becoming inacessible due to flooding and caving.

PROPERTY AND ACCESS

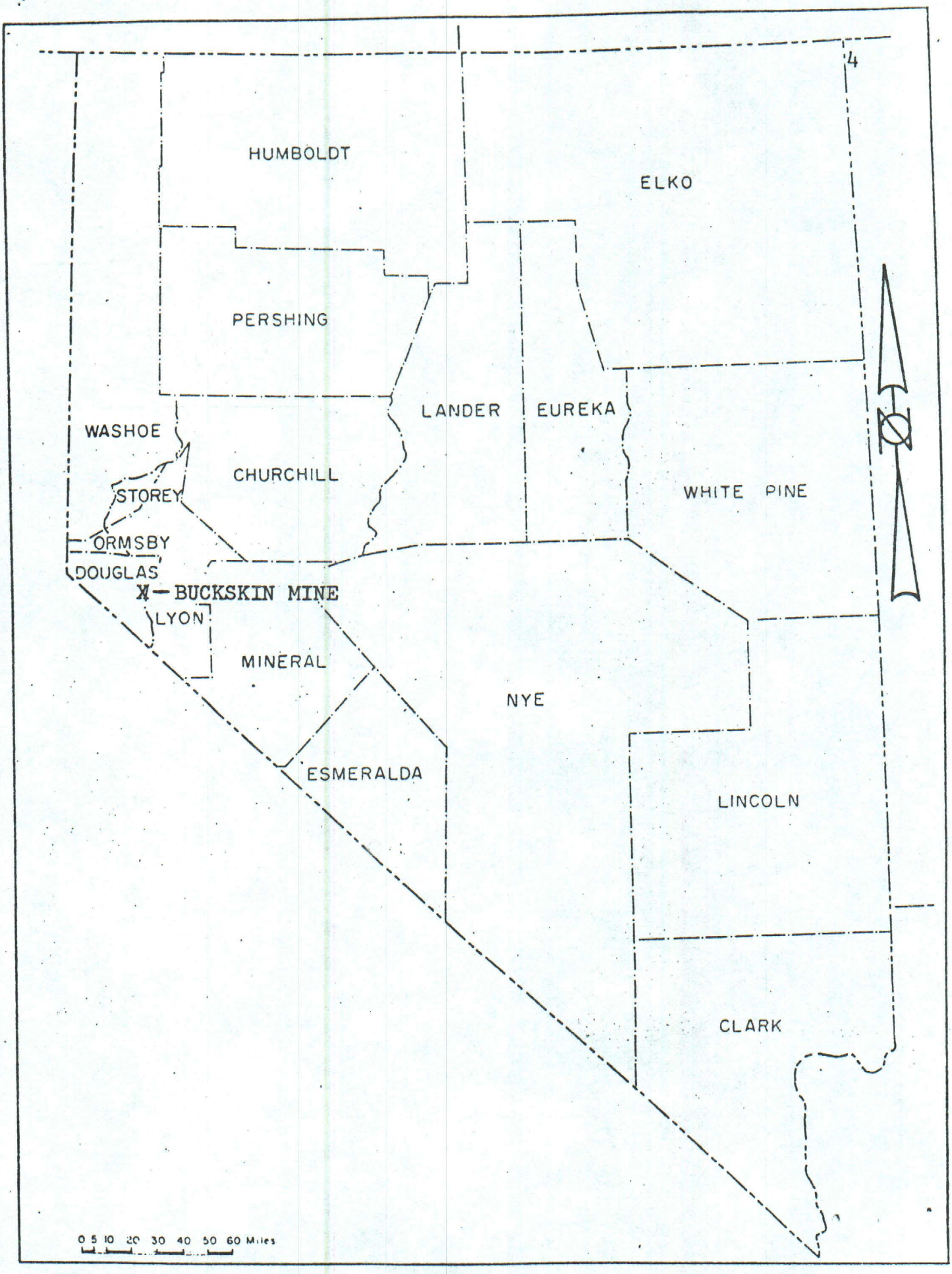
The Buckskin property consists of seven patented lode mining claims totaling about 150 acres located in Section 13, T13N-R23E, Buckskin mining district, Douglas County, Nevada.

Access from Yerington, Nevada is very good via 17 miles of paved and good gravel roads.

GEOGRAPHY

The property is situated at the southern edge of the Buckskin range at an elevation of about 5000 feet in an area of moderate relief.

The climate is typical of west-central Nevada with warm summers and a short (3 months), chilly but dry winter season. Mining operations can be carried out with little delay through the winter as significant snowfall is rarely a problem in this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locality.

HISTORY AND DEVELOPMENT

The Buckskin has a long history of desultory development following it's discovery in 1904. Gold-bearing oxide ores were worked by numerous small lessees to 1907 when mining was suspended due to the depressed metal market.

The next significant work occurred in 1916 when International Smelting sank the No. 1 shaft to 260 feet and explored the 130 level for several hundred feet. A small amount of gold and copper sulfide? ore was reportedly shipped to the smelter at Wabuska(18 miles NE) during this period.

In the early 1930's, the Moore Mining Company, Jackson, California, optioned the property, developed some oxide ore and in early 1936 built a small flotation mill to treat this material. The poor recoveries from the oxides led them to develop a sulfide zone just below the 90 level. At this time(early 1936), the Moore Company was succeeded by Ambassador Mines Company who enlarged the mill to 50 TPD and began treating ores containing 0.25 opt(ounces per ton) gold and 0.75 percent copper with about 75 percent recoveries. Seventy-three thousand dollars of production were reported for 1937. Operations were suspended in 1938.

The property was mostly idle until 1955 when a small Nevada company, the Nev-Tah Oil and Mining Company optioned the property to investigate the copper potential. They

dewatered and rehabilitated the main shaft to the 130 level and sampled the copper-rich zones on the adit, 90 and 130 levels. They started to dewater to the 230 level but ran out of money and abandoned the project.

In 1963, Paramaque Mines Ltd. of Canada optioned the property and drilled six holes, five of which intersected the vein system but evidently didn't follow-up on the results.

From 1971-73, twelve diamond drill holes totaling 5665 feet were drilled by Lion Hill Mines(James Williams and Assoc.) which had acquired the property in 1970. These surface holes were drilled into the main vein system and extended the vertical dimension of the lode down to 400 feet. Based upon their drilling and underground sampling, they calculated reserves of 516,500 tons of material grading 0.18 opt gold, 0.50 opt silver and 1.30 percent copper from the surface to a depth of 400 feet.

Pacific Silver Work

On October 1, 1980, Pacific Silver Corporation of Salt Lake City, Utah optioned the property and immediately commenced an exploration and development program. During the next few years PSC completed an intensive surface and underground exploration program that included thousands of feet of surface and underground drilling (jack-leg, long hole and core), mine rehabilitation and thousands of underground samples. Based upon this work, PSC quoted (Progress Report to Shareholders, April 5, 1983) measured, indicated and inferred reserves of about 400,000 tons grading about 0.2 opt gold, 0.4 opt silver

and 0.9 percent copper. They felt the limits of the deposit were unknown with an ultimate potential of possibly 1.5 million tons.

With this reserve, PSC built a 400 TPD mill, drove a 12' X 12', 1200 foot decline that spiraled downward at -12% to the 340 level and developed the mine for production.

The mill contained a typical sulfide (chalcopyrite) flotation circuit with a CIP (Carbon in Pulp) unit to accept the float tails so that the highest possible recoveries could be achieved. PSC stated that approximately seven to eight percent of the total precious metals produced were recovered as bullion through this process. The sulfide concentrate, shipped to Onsan, Korea for refining, assayed about 20 percent copper, 3.0 opt gold and 7.0 opt silver.

Heap leaching of the lower grade material was thought to be unprofitable due to high cyanide consumption caused by the inherent copper content.

According to PSC, underground mining (sublevel shrink stoping, top slicing and drift) was completed under very difficult conditions because the heavy ground required much support and spiling was not uncommon. Local high influxes of water in combination with heavy clay zones along the vein contributed to the problems. During the shut down phase many pillars were robbed, the mine openings allowed to cave and fill with water.

Surface mining was accomplished by simply ripping and dozing the muck to loading points to be hauled by truck to the

stock pile. The pit or cut was opened at the deepest point to about 80 feet with a final waste to ore ratio of about 6:1. The pit was left in a very ragged condition.

The mill operated from the Spring of 1985 to September, 1986 when it was closed down for economic reasons. During this time they processed 160,000 tons of ore grading 0.10 opt gold, 0.20 opt silver and 0.6 percent copper of which nearly equal amounts came from the surface and underground mines. Recoveries were in the 85 to 90 percent range. According to PSC, this tonnage represents 60 percent of the known mineralization with the remaining amounts (80,000-100,000 tons @ 0.07-0.08 opt Au) not recoverable under present economic conditions.

The Pacific Silver operating costs were as follows: mining $25.00, milling $13.00, smelter $6.00 and administration $3.00 per ton of ore produced.

GEOLOGY

The Buckskin geologic terrane consists of an intermediate metavolcanic package-probably the Artesia volcanics of Jurassic age-that is cut by many small Jurassic-Tertiary intrusives and dikes. Andesite appears to be the dominate flow rocks while the intrusives range from acidic to basic in composition.

Within this intrusive-flow complex is found the Buckskin gold-copper deposit, a shear related replacement vein that strikes N72°W and dips an average of 52° south. The vein has a known length of about 1000 feet. Locally, the vein pinches and swells (inches to tens of feet), steepens and flattens and is

further complicated by many shallow dipping faults with offsets up to 20 feet. The end result is a vein system that has poor vertical continuity over relatively short distances (tens of feet). See enclosed cross-section 3950 as an example.

The vein is composed of about 60 percent silica, 30 percent chlorite, 5 percent pyrite, 2.5 percent magnetite and 2.5 percent chalcopyrite with the precious metals tied up in the sulfides. It is oxidized to about 90 feet below the surface. Sometimes a thin gouge zone (post ore faulting?) separates the vein cleanly from the wall rock while in other instances the lode is defined by assay walls as was the case in the open pit. According to Payne (1974), local breccia zones consisting of strongly altered rock fragments and vein quartz contained in a clayey matrix are common, especially in the deeper parts of the system. The economic concentrations of the gold is found in typical shoots that are separated by zones depleted in that metal while the silver and copper contents remain relatively constant.

Enveloping the vein and penetrating the wall rock for distances of five to fifty feet is an alteration suite composed of silica, chlorite, sericite, pyrite and magnetite.

SAMPLING

The true grade of the gold mineralization was extremely difficult to predict by conventional drill and sampling techniques. This discrepancy between the projected grade of about 0.20 opt gold and the actual mill heads of 0.10 opt gold was a

cause of consternation by the Pacific Silver personnel and was evidently a factor in the shut down of the operation. They thought they had taken great care in the handling, preparation and analysis of all their samples. They ran internal and external checks on their laboratory results. They conducted fine and coarse fraction studies to determine the nature of the metal.

Pacific Silver estimated that 5000 muck samples weighing 50 pounds each were taken in a representative fashion from each 20 ton muck pile. In addition, thousands of drill and underground channel and round samples were analyzed. Muck samples checked reasonably well with previously drilled core samples when pulled from corresponding sites in the mine. The net result of all this work showed a projected average grade of about 0.20 opt gold.

One conclusion reached by PSC was that the finer the sample grind, the truer the analysis. Only at about 100 mesh can a sample be representative in grade of a much larger amount.

The following table, supplied by PSC, demonstrates the bias of the mineralization towards the larger fractions:

Size Fraction	Weight (lbs)	Gold (opt)	Silver (opt)	Copper (%)
+3 inch	32.87	0.31	0.31	1.37
-3 to +2 inch	22.94	0.23	0.24	0.81
-2 to +1 inch	54.49	0.20	0.20	0.86
-1 to +3/8 in	36.54	0.15	0.13	0.53
-3/8in-+6mesh	21.74	0.14	0.18	0.53
-6 to +12mesh	6.22	0.12	0.22	0.56
-12mesh	12.60	0.16	0.32	0.69
Average	187.40	0.20	0.21	0.82
Average of Round Samples		0.18		0.77

(Samples from a 300 ton ore pile; 3/4/83)

The fact that the larger fractions carry the best grade is not surprising since the mineralization is mostly in a hard, siliceous gangue that when broken would create the largest fragments. Natural sampling tendency to select the larger pieces would high grade the specimen. Sampling of the core during one drill program was very lax. Cramer (May, 1973) states that the Lion Hill core was sampled by taking alternate four-inch pieces; no continuous split was made. Larger fragments might be emphasized using this procedure. Also if core recovery was a problem, the soft fines would tend to grind up and be lost leaving only the value-laden competent pieces for assay.

Also aggravating the grade problem would be dilution during mining but it doesn't explain the sampling problem since the stock piled ore sampled much higher than the actual mill head turned out to be.

To help alleviate this problem, future operators should take the largest sample possible, drill the system with a reverse-circulation rotary rig and then cut all the high assays back. To my knowledge, no assay cutting (disregarding statistically high assay results) was done on any of the reserve studies.

Possibly the erratic production history of the Buckskin is evidence that the earlier workers experienced similar problems. Many times the mine was opened up only to be closed a short time later.

EXPLORATION POTENTIAL

Lode

The Buckskin vein system is evidently intact beneath the lowest mined portion but where intersected by drill holes the gold values were low (see enclosed Long Section). Five holes have been drilled below the 340 level along a strike length of 700 feet with only one (DH 5-1) having a gold intercept greater than 0.10 opt. The hole penetrated five feet of mineralization grading 0.17 opt gold, 0.15 opt silver and 0.90 percent copper. To my knowledge, the vein system has not been tested below the 400 level.

Anaconda drilled some very high grade gold intercepts in a similar geologic environment (Artesia volcanics) at their Buckskin project located two miles to the north. At about 1000 feet in depth, they drilled several narrow (1'-3') intercepts grading from 0.5 to greater than 15.0 opt gold. At nearly 1800 feet in depth, they encountered 0.35 opt gold in a 12-inch intercept. Vein mineralogy is very similar to the Buckskin mine as it is composed of quartz, pyrite, chalcopyrite, chlorite, magnetite and gypsum.

The Anaconda occurrence in a similar geologic setting is positive evidence that the Buckskin lode could be economic at much greater depths.

The eastern strike extension of the vein system has not been adequately tested either. Only three holes east of the limits of the open cut have been drilled. DDH-6, collared 80 feet east of the open cut, intersected the vein system at

the 340 level with only trace amounts of gold encountered but three copper intercepts from one to five feet thick that assayed from 2.50 to 3.15 percent were drilled. DDH-7 was drilled 235 feet east of DDH-6 and should have intersected the vein about 200 vertical feet below the surface. No assay records of the hole were found so evidently significant mineralization was lacking. Cramer (May, 1973) states the "lode" (main vein system?) in this hole was a series of gouge streaks, some quartz and traces of chalcopyrite. This indicates that the vein was still alive, albeit lacking in precious metals. Also of possible interest is his mention of an iron-oxide, gossan-type deposit that was drilled just below the gravels. This probably is a barren ferrocrete bed similar to the spring-deposited iron lens located just north of the claims. Thinking more optimistically, it could be an oxidized capping of another lode similar to the Buckskin.

Pacific Silver uncovered some vein-like material in a trench just north of the mill on the projected strike of the lode. They drilled it with one hole and intersected two feet of mineralization grading 0.03 opt gold.

On the western end of the system, the shallower part appears to have been closed off by a fence of air-track holes drilled across the structure immediately west of the open cut. Very little deep drilling has been done here though; probably because PSC felt a couple of northerly-striking intersecting faults cut off the lode. They have placed a 45 westerly-dipping structure (AL-3), that if correct, would cut off the

shallow portion. They have also mapped a low angle, easterly-dipping fault (No. 13) at the bottom of the lode that apparently cuts it off (see enclosed longitudinal section dated 9/31/86).

Outside Exploration

A satellite vein system located a few hundred feet north of the main lode, straddling the northern claim boundary, was drilled by Pacific Silver with negative results. Eight rotary holes were counted in an area of alteration and staining that was originally prospected by many old workings.

A few other localities showing zones of alteration (silicification, sericite, FeOx, etc.) sometimes containing low grade gold mineralization remain untested but drilling these would be a very high risk endeavor.

Placer Potential

The present topography suggests some potential for the formation of placer gold concentrations immediately in front of the mine. Present drainage patterns indicate the most favorable locality would be just north of the mill complex and downstream as far as the tailings pond.

The thickness of the alluvial cover is unknown but close to the mine it shouldn't be prohibitive. Placer concentrations wouldn't necessarily have to be on bedrock; they could be perched on a impermeable horizon within the alluvium. No range front faults were noted on the published maps but the

Pacific Silver geologists believe that a northerly-striking fault traces through the mill area and drops the basin side down. If correct, this would greatly hamper placer exploration in front of the mine. When PSC constructed their mill, none of their excavations reached bedrock which were probably in the ten foot deep range. They also stated that they tested these gravels for gold (with placers in mind) with negative results.

On the positive side, the Buckskin district has a history of placer deposits at the head of Smith Valley. The Guild-Bovard placer property lies only two miles east of the Buckskin on the general strike of the lode. Possibly the source of the gold in the Guild-Bovard has some relationship to the easterly-striking Buckskin deposit. Some further evidence for the possible development of placers is in a 1910 ME thesis by Frank Goodale published in an early edition of the Colorado School of Mines Magazine. He writes, "The croppings are considerably leached and altered and contain in places much free gold. There has been very little secondary concentration, due to the shallow depth to which oxidization has taken place." The following conclusions can be reached from those statements:

a. Ample free gold is available from the lode for placer development.
b. Erosion was active enough to keep pace with the weathering proceses (oxidization and leaching). This kept the oxidized layer relatively thin (90').

It is logical to assume that some part of the vein was removed and the gold present washed downstream and deposited

somewhere as a placer. Possibly the early workers arrived at the same conclusion as a shallow prospect pit was observed just west of the tailings pond. About 1200 feet of length is open for placer exploration between the mine dumps and the head of the tailings pond.

Respectfully submitted,

Michael R. Sauvola

Michael R. Sauvola
Reno, Nevada

December 2, 1986

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APPENDICES

Williams Report, 1978
Pacific Silver Corporation Report, 1983
Payne Report, 1974
Cramer Report, 1973
Goodale Report, 1910 (Buckskin portion only)
Example of Refinery Settlement Sheet
Example of Daily Operating Report
Example of Daily Flotation Summary

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MARCH 1978

BUCKSKIN MINE

LOCATION

The Buckskin Mine is situate in Section 13, Township 13 North, Range 23 East and Section 18, Township 13 North, Range 24 East, Mt. Diablo Base and Meridian, in the extreme easterly portion of Douglas County, Nevada, six miles due West from the Yerington copper pit of the Anaconda Company. The town of Yerington is some 13 miles Easterly via a gravel road.

The mine workings are in the South end of the Buckskin Range at elevation 5,000 feet just above the pediment area of Smith Valley. The topography at the mine rises gently to the West and North.

Three miles to the East of the mine is a large commercial sand and gravel operation and a 23,000 volt three phase power line runs within about one and one half miles to the East. The valley is a good aquifer as indicated by Artesia Lake, a few miles to the South, which is fed by underground springs.

Weather conditions are fairly mild and permit all year operations. Very little snow falls upon the lower Buckskin Range and winter temperatures are usually above freezing. Rainfall is generally light.

The property consists of six patented mining claims and a patented fraction.

HISTORY AND PRODUCTION

The original mining claims were located around the turn of the century as gold prospects and were patented in 1913. No records exist as to production but it is known that gold-copper crude ore was shipped to the Wabuska smelter during World War I, and that gold ore was milled at various times during the period 1930-1950, as indicated by mill foundations remaining at the mine.

It is not possible to estimate with any degree of certainty the total tonnage of ore which may have been produced, but from stoping indication in the surface tunnel and on the 90' and 130' shaft levels, it would appear that any such production was probably less than 5,000 tons, plus a possible additional 5,000 tons from development drifts on the three levels.

The gold stope or 'glory hole' which was stoped from the surface tunnel level to the surface, having a section of 60' along strike by 20' in width, suggests ore of high gold content was produced. This assumption has been well confirmed by diamond drill holes cutting vertically below this stope area.

UNDERGROUND WORKINGS

A two compartment vertical shaft; 4½'x4' hoisting compartment and 3½'x4' manway, opens the underground levels. A total of approximately 2,500 feet of drifting has been done in the mine; 1,500 feet in the surface level, 230 feet in the 90' level, 670 feet in the 130' level and possibly 200 feet in the 250' level. Well over 50% of this development work has been done along and within the Buckskin Lode and in good ore as is amply demonstrated by the assay map of the levels. The 250' level has not been visited by the writer, nor is a map of it available, however, a report by an 'old timer' who worked there during World War 1, represented that the highest grade ore in the mine was being developed. This is confirmed by publication in the Mines Handbook for the years 1919 through 1923. Our recent diamond drill holes below this level also confirm these estimates.

Water stands in the shaft at about the 90' point. When the 130' level was unwatered in 1955 for the purpose of sampling, the mine was making about 20 gallons per minute. Later, unwatering was reported to have reached about 50' above the 250' level at which point the flow approximated 50 gallons per minute. From all evidence available, we think the flow from the 250' level will be somewhat less than 100 gallons per minute - sufficient for a milling operation. At that time, all underground workings were in good condition; the ground holds well and should present no unusual mining problems. The shaft timber is in splendid condition to the 130' level and is reported good as far as unwatering went.

PRESENT OPERATOR

The Buckskin was first examined by the writer in 1955 while it was being unwatered and sampled by third parties.

Check sampling was permitted and a copy of the completed assay map was obtained. Efforts were made during the ensuing years to acquire the property and in 1970 a purchase agreement was negotiated with the owner by Lion Hill Mines, a mining partnership of James D. and Ruth T. Williams, stipulating yearly payments to 1976. Final payment was made December 10, 1975, and title was conveyed to Lion Hill Mines by deed.

During the Fall of 1970, Lion Hill Mines re-established the corners of the patented mining claims which had been obliterated over the years, found and set the Section corners and plotted surface geology; all with plane table control. The surface tunnel was also mapped and sampled.

During 1971, 1972 and 1973, twelve diamond drill holes were drilled from the surface at various angles into the Buckskin Lode extending the vertical depth of the Lode to a point 400 feet below the surface; no effort being made to extend this deeper since our private funds were limited. The drilling extended over a strike length of some 1,000 feet, but was concentrated along a section of the lode 450' in length which we have designated as the Central Ore Zone. Expenditures by Lion Hill Mines since 1970 has amounted to $155,216 cash. This covers only acquisition and exploration.

All pertinent data covering the mine and drilling is represented by comprehensive 40-scale plan and section maps, assays and underground assay maps, assay certificates and engineering and geological reports; the metallurgy of the ore, based upon drill core rejects, showing good recovery of metal values in a high grade gold-copper concentrate, is available for inspection and study in our Salt Lake office.

TONNAGE AND GRADE

The attached engineering report by Louis W. Cramer, Consulting Geologist and Engineer, Salt Lake City, Utah, well states the grade and tonnage of ore delineated within the Central Block from the surface tunnel to the depth of 400 feet based upon underground assays and drill core samples, showing 391,300 tons assaying 0.20 oz. gold and 1.30% copper, plus 125,200 tons assaying 0.12 oz. gold and 1.30% copper.

So far as we have been able to determine, the Buckskin Lode continues Westerly from this Central Block approximately 1,000 feet to the end line of the claims and some 1,500 feet Easterly to the end line of the claims and there is absolutely no suggestion that limits its vertical extent. As a matter

of fact, the highly brecciated character of the ore cores from this Central Block strongly suggests we may be in a breccia pipe situation which has always been considered most favorable for deep seated ore zones.

FUTURE EXPLORATION

The property affords a number of additional exploration targets once the mine is in operation and a more complete understanding of the geological framework of the Buckskin Lode is adduced. The East-West extension of the Lode has been mentioned as has also the vertical continuation below the 400' point. Some 700' North from the Buckskin Lode is another well mineralized fissure zone with an East-West strike and a steep South dip. It was probably mined for gold in the past since random dump samples assayed 0.07 oz. gold and remnants of an arrastre remain nearby. The shaft appears to be open sufficiently to permit underground examination.

Active deeper drilling by a major copper company on adjacent mining claims owned by it has been in progress for three years. The apparent target seems to be a basement situation corresponding to a Yerington type ore body. Field reports suggest that results to date have been encouraging.

ECONOMICS

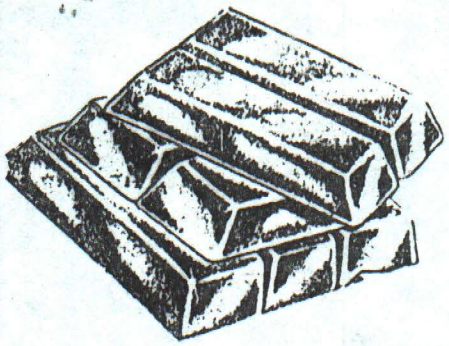
The Buckskin Mine was originally evaluated on the basis of the 516,500 tons of ore in the Central Block from the surface tunnel to the depth of 400 feet having a weighted assay of 1.30% copper, 0.18 oz. gold and 0.50 oz. silver per ton at metal prices of $0.60 per pound for copper, $100 per ounce for gold and $2.50 per ounce for silver, resulting in a gross metal value of $35 per ton of crude ore. At current metal prices the gross value per ton would be $50 and with the estimated near future prices for gold and copper, we may anticipate a gross ore value of $60 per ton. Metallurgical testing indicates an economic recovery of plus 90% of the metals in the crude ore. Current indicated ore reserves will support a 200 ton per day mining and milling operation for a minimum period of ten years. Additional exploration and development should increase this term substantially.

March, 1978

JDW:s
Encl.

James D. Williams
Managing Partner
Lion Hill Mines.

N.B. In 1974 grading was completed for a 150 ton mill, about one-third of the reinforced steel concrete foundations poured and a 65' high fabricated steel two compartment headframe was installed, at an additional cost of approximately $45,000.



Pacific Silver Corporation

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PROGRESS REPORT

April 5, 1983

Dear Pacific Silver Stockholder:

Since our last progress report of November 26, 1982, the measured, indicated and inferred ore reserves at the Buckskin Gold Property has been increased from about 300,000 tons to about 400,000 tons. The average of the reserve is about .2 ounce gold; .4 ounce silver; and .9 percent copper, having a gross value of $122.00 per ton (gold at $500.00 an ounce; silver at $10.00 an ounce; and copper at $1.00 a pound). Recent drilling and development work on the 230 ft. level demonstrates the consistency in depth of the gold values in the sulphide zone. The width and continuity of the Buckskin vein in lenth and depth has also been indicated by recent drilling. The limits of the ore-bodies are unknown. Considerable drilling will be required to determine the potential of this gold deposit (we presently believe the potential could be at least 1.5 million tons). Over 1,500 tons of ore have been produced and stockpiled from development work on the 230 ft. level during the past two months. This production will continue as some of the future development work will be done in the ore-bodies. By the time the milling plant is ready for processing the ore, we should have over 10,000 tons stockpiled with a gross value in excess of one million dollars.

The maximum production capacity of our Buckskin shaft is about 200 tons per 24 hours of hoisting. With the increase in ore reserves, the Company resolved to build a milling plant of 300 tons per day operating 24 hours per day, 7 days per week. (The mine operates 5 days a week and will, therefore, have to produce over 400 tons of ore each day to keep the 300 ton mill operating at capacity.) Consequently, the Company has elected to sink a decline tunnel (about -10 percent downward) for the transportation of the ore from underground to the mill using rubber-tired, trackless equipment. This will allow the mine to produce and transport sufficient ore in 5 days to keep the mill operating 7 days a week. Should ore production justify a future increase in the mill capacity, the decline would adequately handle the increase. Work on the decline will start in June or July of this year. The construction of the mill should commence in July or August and start processing late 1984.

Mention is made above whereby the mill capacity can be increased if needed with a reasonable additional capital investment. The Company plans to continue the underground diamond core drilling work to probe for the extension of the ore-bodies to the east and west as well as at lower depths. The success of this core drilling program and the price of metals will determine whether or not, and if so, when we should increase the 300 ton mill capacity.

The Buckskin concentrating plant will process about 70,000 tons of ore each year. Based on the metal prices mentioned above, Pacific Silver should recover its investment of about 5 million dollars in two years after production starts.

Funds for the projects discussed above are being secured from bank financing and the private placement of restricted stock to knowledgeable investors.

The Tybo Silver Property is on hold until the Buckskin Gold Property is in production.

The Buckskin and the Tybo properties could give Pacific Silver significant profits if gold and silver prices perform as many analysts are predicting.

Sincerely yours,

K. L. Stoker

K. L. STOKER, PRESIDENT

BUCKSKIN MINE
PROGRESS REPORT
March 14, 1983

Since our last progress report dated November 30, 1982, several significant developments have taken place at the Buckskin Mine.

The drilling program from the tunnel level, which was instituted in August, 1982, was completed successfully in February, 1983. The purpose of the program was to explore the "west orebody", which was exposed in mine workings on the tunnel level but which had not been traced downward by drilling as had the east orebody. The drilling program was carried to the far west end of the tunnel level and was terminated because we could reach no further west with the drilling from the existing workings. The vein system is still continuing westward and will be explored by other means.

Fifteen holes were completed, of which ten penetrated ore. The vein identified by this drilling averages 10 feet thick and averages in grade .29 ounce per ton gold, .4 ounce per ton silver, and one percent copper, for a gross value per ton of $170 when gold is selling at $500 per ounce, silver at $10 per ounce, and copper at $1 per pound. This western segment of the Buckskin vein is substantially higher in grade than is the eastern segment.

The drilling extended the known reserves about 400 feet further west than had been calculated previously, and increased the ore reserves from 200,000 tons to approximately 300,000 tons.

Mine shaft rehabilitation was completed to the 230 foot level in December, 1982. The old mine workings on that level were found to be caved shut about 40 feet west of the station. Rather than attempt to rehabilitate these workings, we started a new access drift west to intersect and follow the Buckskin vein on the 230 level. The vein was first penetrated in early February, 250 feet west of the shaft. The next 25 feet of drift, as we gradually passed into the vein on an angle, was sampled as low grade ore and was stacked in the low grade ore pile. The next 75 feet of drift was driven entirely within the ore vein; 540 tons of this ore assayed .26 ounce per ton gold and .9 percent copper, and was stacked in the new high grade ore pile.* The individual thirty-ton drift rounds which make up the high grade ore pile varied in grade from .15 to .78 ounces per ton gold. (Each of these drift rounds represents five feet of advance in the drift.)

The vein, as explored to date, is somewhat wider than was indicated from the core holes drilled from the surface (the five core holes in the area averaged a 13 foot width; the vein as defined so far by drift round samples and shore percussion test holes from the mine drift averages more than 20 feet wide. The gold content also seems to be slightly higher; predicted non-diluted grade was .22 ounce per ton, while actual grade calculated from the mine round samples (which include dilution) and from the short test holes is about .23 ounce per ton gold.

*As of March 11, the drift has been advanced an additional 50 feet in ore; assays are pending.

Plans are to continue to drive the mine drift on the 230 level to the west. About 150 feet west of the March 3 face, we expect the ore vein to be cut by a fault which separates the east orebody from the west orebody, and which is expected to offset the west orebody northward; this is inferred from the data obtained from the tunnel level. This westward continuation of the Buckskin vein will be located and followed westward, guided by drilling from the 230 level. Drill stations will also be cut from the drift which follows the east orebody; holes from these stations will explore the downward extension of the vein below its presently known extent of 170 feet below the 230 level.

Since we have increased the ore reserve to 300,000 tons, and since we believe that we may ultimately discover one million tons of ore within the Buckskin vein system, the scale of planned mine and mill development has increased somewhat. We are currently contemplating a milling production rate of 200 to 300 tons per day, seven days per week, which will require the mine to produce 400 to 500 tons of ore and waste five days per week. The existing mine shaft is too small to permit this level of production, so a declined adit entry into the ore is being designed. This entry will be started later this year.

Mill feasibility studies are underway, with ground-breaking scheduled for later this year.

TABLE I

BUCKSKIN MINE - PRE-PACIFIC SILVER SURFACE CORE DRILLING

Hole #	Category	Total Thickness and Grade of Mineralization				True Vein Thickness Indicated	Best Intercepts Within Zone			
		Thick	Au	Ag	Cu		Thick	Au	Ag	Cu
41(1963)	Mineral	18'	.01	.09	.84	17.5'	(East of Known Deposit)			
42(1963)	"						(East of Known Deposit)			
43(1963)	Ore	12'	.17	.14	1.25	11'	6'	.21	.23	1.50
		or 20.5'	.11	.15	.93	18.5'				
44(1963)	Ore	11'	.39	.41	1.14	10'	2.5'	.54	.47	1.33
		or 26'	.17	.18	.58	24'				
45(1963)	Ore	6.5'	.13	.08	.70	6'				
46(1963)	Ore	15'	.20	.20	1.40	14'	5'	.34	.24	2.50
1(1974)	Min.	18'	Tr.	.30	.90	17'	(East of Known Deposit)			
2(1974)	"						(East of Known Deposit)			
3(1974)	Ore	26'	.19	.28	.61	23'	6'	.46	.50	.75
4(1974)		West Orebody - Not Drilled Deep Enough								
5(1974)	Min.	9'	.01	1.00	1.26	8'				
5-1	Min.	14'	.09	.10	.64	12'	4'	.16	.20	1.10
6	Min.	15'	Tr.	.30	.53	12'	(East of Known Deposit)			
7	Min.						(East of Known Deposit)			
8(1974)	Ore	37'	.24	.47	.91	34.5'	5'	.42	.30	1.79
9(1974)	Ore	14.5'	.26	.36	.96	12.5'	10'	.29	.30	.98
10(1974)		West Orebody - Not Drilled Deep Enough								
"C" (1974)		West Orebody - Not Drilled Deep Enough								
		PACIFIC SILVER SURFACE CORE DRILLING								
1(1981)	Ore	17'	.19	.41	1.19	15.5'	2'	.97	1.81	5.23
2(1981)	Ore	18'	.30	.26	.75	15.5'	4'	.72	.32	1.32
3(1981)	Ore Grade Sub-Ore Thickness	2'	.34	.40	.39	2'				
4(1981)	Min.	17'	Tr.	.07	.13	14'	(East of Known Vein)			
		PACIFIC SILVER SURFACE CHIP DRILLING								
5(1981)	Min.	5'	.04	.24	.91	5'				
6(1981)	Min.	5'	.14	.42	.83	5'				
17		West Orebody - Not Drilled Deep Enough								

PACIFIC SILVER UNDERGROUND CHIP DRILLING - TUNNEL LE[illegible] - EAST OREBODY

Hole No.	Category	Total Thickness and Grade of Mineralization				True Vein Thickness	Best Intercepts Within Zone			
		Thick	Au	Ag	Cu		Thick	Au	Ag	Cu
BL-1	Ore	12'	.19	.75	Oxidized	11'	2'	.27	.60	Oxidized
		or 26'	.13	.60	"	24'				
BL-2	Ore	28'	.19	.90	"	26'	4'	.34	2.10	"
BL-5	Ore	18'	.16	.32	"	17'	4'	.27	.40	"
BL-6	Min.	14'	.06	.40	"	13'				
BL-11	Min.	6'	.14	.20	"	6'				
BL-13	Ore	4'	.20	.20	"	3.5'				
		or 8'	.15	.15	"	7'				

TABLE 3

PACIFIC SILVER UNDERGROUND CHIP DRILLING - TUNNEL LEVEL - WEST OREBODY

BL-25	Min.	10'	.05	.20	.20	10'				
BL-26	Ore	6'	.17	.20	.60	5'				
BL-27	Min.	10'	.10	.40	.76	10'				
BL-33	Ore	8'	.22	.30	.20	8'	4'	.13	.20	.40
BL-34	Ore	8'	.19	.35	.40	8'				
BL-37	Ore	6'	.20	.50	.40		4'	.23	.50	.50
BL-[illegible]	Ore	10'	.26	.30	.20	7'				
BL-[illegible]	Ore	4'	.19	.50	.40	4'				

TABLE 4

1982&

PACIFIC SILVER - 1983 UNDERGROUND CORE DRILLING - TUNNEL LEVEL - WEST OREBODY

Hole #	Category	Total Thickness and Grade of Mineralization				True Vein Thickness	Best Interceipts Within Zone			
		Thick	Au	Ag	Cu		Thick	Au	Ag	Cu
18	Ore	13'	.25	.14	.27	12'	5'	.33	.12	.18
		or 24'	.17	.13	.24	22'				
19	Ore	7.5'	.44	1.14	2.34	5'	3'	.88	1.74	3.28
		or 19.5'	.20	.52	.93	12.5'				
20	Ore	Fragmentary core recovery only; core recovered assayed .49 Gold, .23 Silver, .38 Copper.								
21	Ore	15'	.56	.19	.46	12'	5'	1.17	.20	.41
22	Ore	6'	.40	.77	1.82	6'	3'	.54	.95	2.18
		or 12'	.25	.50	1.00	12'				
23	Ore Grade Sub-ore Thickness	2.5'	.40	1.25	1.68	2'				
24	Ore	10'	.25	.64	2.04	6'	2'	.95	.94	7.62
25	Ore	13.5'	.26	.44	1.64	9'	3.5'	.42	.40	2.39
		or 27.5'	.20	.30	1.10	18'				
26	Mineralized	(Ore zone cut out by dike)								
27	Ore	13'	.23	.40	.69	8.5'	4'	.45	.34	.78
28	Barren									
29	Ore	20'	.31	.46	1.00	10'?	4.5'	.42	.48	1.73
30	Barren									
31	Low Grade Ore	8'	.09	.31	1.12	6'?	2'	.24	.27	1.78
32	Barren									

BUCKSKIN MINE
GEOLOGY NOTES
April 1974
John G. Payne

A: From Drill Core in Salt Lake City

All core containing significant chalcopyrite was taken to Jim Williams' office in Salt Lake City. It was examined between March 26 and March 28, and several sections were re-assayed because the original assays appeared not to be representative for the section. (Original assays were made on samples composed of a small piece of core every 4 inches along the hole; present assays were made on half the remaining core split lengthwise.)

1) The main ore host is a fine grained intermediate intrusive rock. In places, especially where it is altered, the rock is difficult to distinguish from andesite flows and tuffs elsewhere in the cores.

2) The ore is mainly quartz-chalcopyrite-pyrite "veins" and breccia zones. Generally chalcopyrite is as abundant as pyrite in the ore zones. The host is commonly altered to dark green chlorite and magnetite on the borders of veins and in fragments in the ore breccia. Magnetite is particularly abundant in some fragments, and locally forms veins with pyrite and/or chalcopyrite near the main quartz-sulfide zones. Fine grained magnetite is common in some quartz veins, and gives the quartz a light purplish hue. A broader zone of rock (up to a few tens of feet wide) surrounding the ore zones contains fine disseminated magnetite and pyrite; these rocks are dark green to black in color. In general magnetite may be an earlier alteration product than the main ore veins.

3) Breccia zones composed of strongly altered fragments of various rock types in a clayey, gougy matrix are common, especially in deeper holes. Fragments consist of quartz veins (with fine disseminated magnetite), feldspar porphyry, and various types of andesite and fine grained intermediate intrusive rocks. The presence of a wide variety of rock types is typical of explosive

breccia pipes. This type of breccia grades along its borders to a "crackle" breccia, in which the rock is fractured and altered, especially along fractures, but the rock fragments have not been moved much from their original pre-breccia position. This type of breccia is typical of weaker activity associated with explosive breccia pipes. Two small pebble dikes with rounded fragments of various rock types in a sericitic-clayey matrix were seen.

4) It was concluded at the end of the drill core examination that the ore bodies were most likely formed in a near surface intrusive environment. Alteration patterns suggested a similarity to the Yerington porphyry copper deposit in the Singatse Range a few miles southeast.

B: General Comments on Buckskin Property

1) Drill core for holes #8, 9, and 10 is scattered in piles and rows on the ground at the drill sites, and some core is missing. Core for the other holes was not seen, despite Jim Williams' comment that "the cores are at the property". Some information can be gained from this scattered core regarding gross lithology and alteration patterns.

2) Dumps appear to contain generally low grade ore; little quartz-chalcopyrite was seen in many of the dumps.

3) Numerous shafts were sunk along the main Buckskin vein and elsewhere; most are between 50 and 100 feet deep, but some are up to 250 feet deep. Most timbers and ladders are in very poor condition, but the walls appear to hold up well. Several drifts were cut in the quartz-sericite altered dacite away from the mine; these hold up very well despite the incompetent appearance of the rocks.

C: Regional Geology (based on geology of Singatse Range to the southeast)

Triassic andesite with local limestone and clastic rocks near the top form a broad arcuate belt trending northeast. Rocks were strongly deformed during the Nevadan orogeny (mid Jurassic to Upper Cretaceous). Jurassic (160 m.y.) granodiorite, quartz monzonite, and related porphyry dikes were intruded in the Yerington region. The area was deeply eroded (up to 5 miles)

from Upper Cretaceous to early Tertiary. Thick layers of Ol Miocene ignimbritic dacitic volcanic rocks overlie the eros surface. From Upper Pliocene to present the rocks have been many north-trending, east-dipping normal faults, whose dips with depth. This produced tilting of the pre-Pliocene rocks to 90 degrees. The Yerington ore body is tilted on its side the original top now being to the west and the original roo to the east. A similar style of major faulting may exist in Buckskin Range, because it is thought to be a major feature part of the Basin and Range province.

D: Notes from visit to Buckskin Property

1) In the mine area, rocks are mainly andesite and fin grained granodiorite as in the drill cores; andesite predom to the north and granodiorite to the south. Several feldspa porphyry dikes cut the older rocks. These rocks are most pr Triassic in age for the andesite, and Jurassic for the intr rocks. Because of the extent of outcrop and near-outcrop ru a surface map would provide valuable data.

2) Surrounding the mine area on south, west, and north a thick sequence of quartz-sericite-pyrite altered dacite f or ignimbrites. The rocks are slightly banded locally and c feldspar phenocrysts. On surface they are strongly leached a contain abundant brown iron oxide stain. Scattered through dacite are lenses up to 15 feet thick and several tens of f long of slightly banded, locally vuggy, locally strongly br ated, white quartzite which stand out as knobs on the weath surface. Their surface distribution suggests that they have strongly contorted. Those rocks are cut by a porphyritic an dike rock; plagioclase phenocrysts are strongly altered to epidote. Several shafts and drifts have been cut in these r probably because of the strong alteration and iron staining nothing was found other than rocks similar to those on surf

3) The altered dacite and associated rocks appear to b sharp contact with the older andesite and granodiorite, and be part of the Oligocene-Miocene ignimbritic complex. The c is exposed in one locality along the road at the south side

the workings. There, a strong fault striking north and dipping 35 degrees west separates altered dacite above and fresh quartz-rich granodiorite (very fine grained) below. The fault resembles some of the breccia zones seen in the drill cores. A west dip on the fault is not inconsistent with the regional east dip on the major normal faults in the Yerington district; it could result from successive faulting and rotation on several fault planes, where an originally east-dipping fault would be rotated towards the horizontal and eventually to a west dip by successive periods of faulting.

4) Several shallow west-dipping faults were mapped underground they show minor displacement of the Buckskin vein in the Tunnel level. Most faults contain abundant copper sulfate, indicating leaching and downward transport of copper from near surface.

5) Several types of alteration assemblages were mapped on-surface and underground, with gradations between types.

i) sericite (white, soft)
ii) sericite-quartz-albite? (white-hard)
iii) sericite-pyrite-quartz (light green, soft)
iv) pyrite-quartz (medium green, hard)
v) quartz-magnetite-pyrite (dark green, hard)

Very roughly, the order from i) to v) indicates a pattern from furthest from the ore to nearest to the ore. Type v) is found only near ore, while type i) may be found both near and away from ore. Perhaps retrogressive alteration to sericite occurred after the primary alteration assemblage had formed; this would be particularly apparent near faults and breccia zones.

6) The ore is mainly quartz-chalcopyrite-pyrite-(magnetite) veins and breccia zones. Veins are up to 6 feet wide and most have a general east-west strike and moderate to steep dip to the south. They are very continuous over the length of the mine workings, and from the position of old stopes, deeper levels, and drill holes, appear to have vertical continuity over at least 250 feet.

7) On surface near the road south of the workings is a zone of fine grained granodiorite with abundant magnetite. One outcrop contains a very leached quartz vein with fine grained disseminate

magnetite; its texture is identical to that of some of the veins seen in the drill cores and underground. The area below this outcrop has not been tested, but could readily be tested by drilling from surface, and could yield a zone as large as that already outlined.

Conclusions

Most of the evidence is compatible with the hypothesis that the quartz-chalcopyrite-gold veins are related in origin to a porphyry Cu type intrusive and hydrothermal system such as that at Yerington. The veins are related in space to fine grained granodiorite and feldspar porphyry dikes, alteration patterns are somewhat similar to those at Yerington especially the fact that magnetite occurs in and near the high grade ore, and the presence of breccia pipes and pebble dikes is common in this type of environment.

The sericite-quartz-pyrite altered dacite flows above the fault are probably much younger. This would confine the area of economic interest to below the fault; because the fault dips gently to the west, it is probable that it will have little effect on the size of the ore body. Other faults of considerable magnitude may cut the ore body elsewhere, and faulted offsets of the veins may be found.

Recommendations for Geological Work

1) Surface mapping of older rocks at 1" to 40'.

2) Drilling of a few holes (2 or 3) into the vein to the south of the main workings.

3) Underground mapping to continue as levels become accessible

Telephone 363-3302

Hand
Sample Serial 11022-11041

ASSAY REPORT

LION ASSAY OFFICE, Inc.

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M

Lion Hill Mines
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Salt Lake City, UT

RESULTS PER TON OF 2000 POUNDS

Apr. 1, 1974

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Pe
Buckskin Mine											
3-1 403-408	Trace	0.3		0.623							
408-4155	0.010	0.3		0.415							
DH-5 321-324	0.010	0.2		0.535							
324-329	0.015	0.4		0.888							
355-361	0.010	0.3		0.793							
5-1 394.5-399	0.040	0.4		0.491							
399-403	0.040	0.3		0.403							
417-421	0.155	0.2		1.102							
L-6 257-261	0.010	0.2		0.743							
261-265	Trace	0.1		0.793							
281-285	Trace	0.5		0.308							
285-290	Trace	0.2		0.598							
290-293	Trace	None		0.793							
8 268-273	0.280	0.9		1.386							
~~272 Rock Sample~~	~~0.010~~	~~0.1~~		~~0.075~~							
293-295	0.150	0.2		0.945							
295-300	0.460	0.6		1.915							
DH-9 221-225	0.165	0.3		0.604							
225-229	0.360	0.5		0.869							
229-235.5	0.260	0.3		1.134							

Resample of cores by splitting - Payne

BUCKSKIN MINE

ORE POTENTIAL ABOVE TUNNEL LEVEL

April 1974

John G. Payne

Three main areas provide ore potential above the Tunnel level. The main Buckskin vein appears relatively continuous along much of the footwall drift, but locally is offset on shallow west-dipping faults with only minor displacement. Several parts of the vein, generally those with high grade Au assays, have been stoped upwards to surface in the east end and for fifty to seventy feet upwards in the west end. Stopes are inclined from 70 to 80 degrees to the south except for a shallow stope in the east end of the area which is inclined at about 45 degrees. Between the stoped areas on the footwall drift the vein is available for mining in two regions: from 3640E to 3670E (Area T-1) and from 3740E to 3850E (Area T-2). A lower grade zone towards the hanging wall is available for mining between 3850E and 3880E (Area 3). (see Figure 1).

The following calculations are based on old assays from the floor of the drifts. It is assumed that the veins are continuous and of uniform grade and width for at least 50 feet above the Tunnel level (based on the height of the old stopes). Ore may extend above this height, especially towards the west, but no reserves are calculated above 50 feet above the Tunnel level. Metal values are taken as $1.00 per lb. for Cu and $170 per ounce for Au. No values are assigned for Ag, because of the generally low assays. No estimates have been made for dilution, which would raise tonnage and lower grade, but not change total metal values. A minimum and a maximum estimate are made for each zone based on subjective estimates of the possible sizes of the zones which could be stoped. Because the grade of the ore body varies widely from sample to sample in the same zone, and because sporadic very high values for Au have been reported, the average assays used for each zone must be considered to represent a fairly wide range of possible values, and the value of the ore must be treated likewise

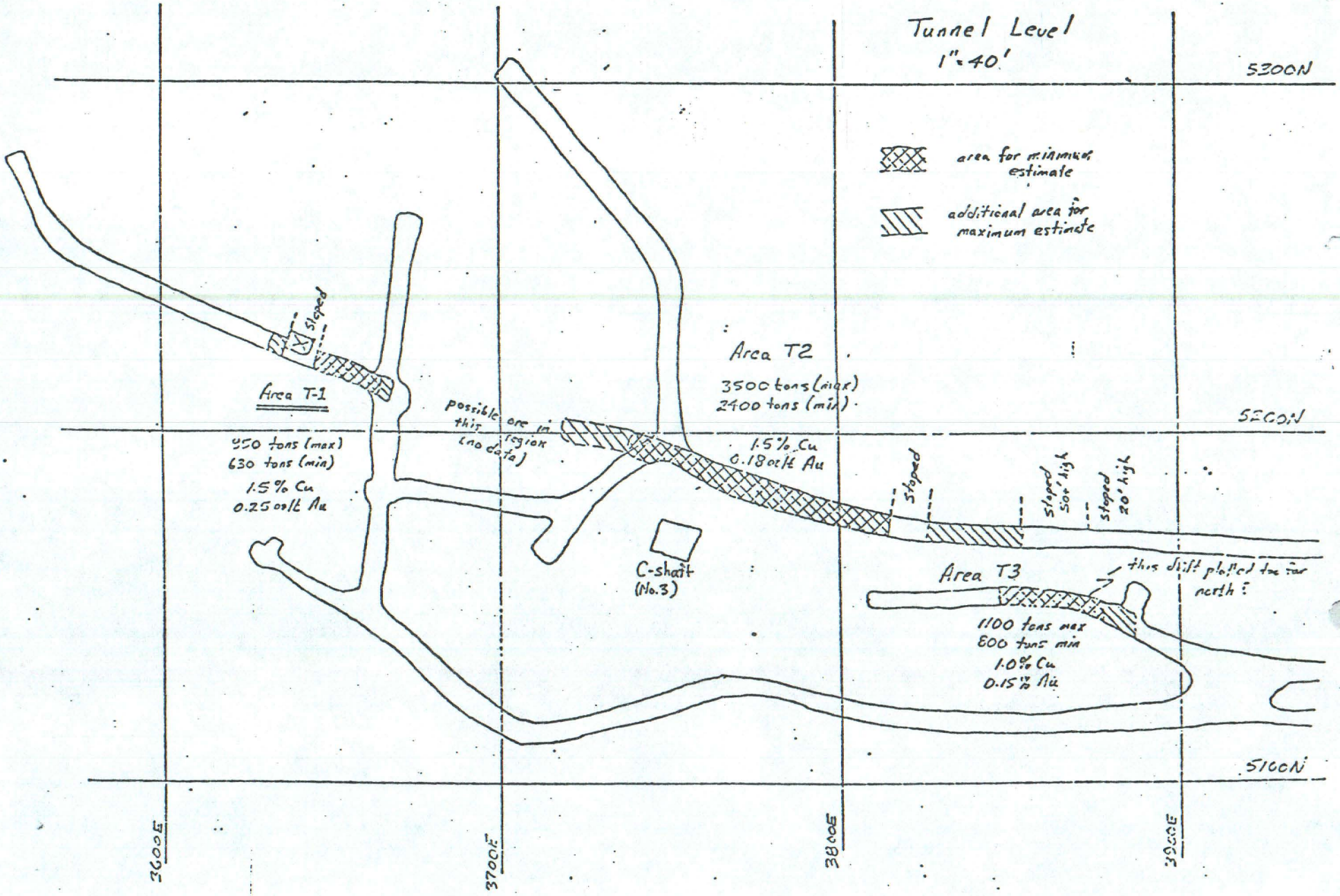

Figure 1. Ore Potential above Tunnel Level

Zone	Length (ft)	Width (ft)	Tons	Grade Cu%	Grade Au o/t	Value per ton Cu	Value per ton Au	Total Value per ton	Total Value per ore body
T-1	max 30 min 20	7.0	950 630	1.5	0.25	30	42	72	$ 68,000 $ 45,000
T-2	max 120 min 80	6.5	3500 2400	1.5	0.18	30	30	60	$ 213,000 $ 146,000
T-3	max 40 min 30	6.0	1100 800	1.0	0.15	20	25	45	$ 49,000 $ 35,000

Total Value of Potential Ore:

Maximum $ 330,000

Minimum $ 226,000

Table 1. Estimated Sizes and Values of Ore Bodies above Tunnel Level

Calculations are shown in Table 1.

In general, the ore shows a fairly uniform grade of Au, wit local assays much higher than average. There is no apparent geol reason why such high Au values should extend vertically upwards, so it is possible to find high Au values above sections of the drift with only average values. The presence of these would increase the grade in the estimated ore reserves by up to 0.05 oz/ton, an increase in value of about $8.50 per ton.

Without further geological data, any further calculations w be highly speculative. Surface geology suggests another possible vein 350 to 400 feet south of the main Buckskin vein. Such a zone could provide additional tonnage above the Tunnel level.

John Payne

John Payne
April 1974.

REPORT ON
BUCKSKIN MINE
DOUGLAS COUNTY, NEVADA
May 1973

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514 ATLAS BUILDING
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REPORT ON BUCKSKIN MINE DOUGLAS COUNTY, NEVADA

CONCLUSIONS

It is calculated that in the Center Block are 391,300 tons of ore in the hanging wall zone with a grade of Au 0.20 oz. Ag 0.5 oz. Cu 1.3%. A foot-wall zone in this block contains 125,200 tons of ore, having a grade of Au 0.12 oz. Ag 0.5 oz. Cu 1.3%.

Note: The values on the 90 foot level and Tunnel level show much higher values.

There are approximately 162,800 tons of ore in the East Block with an assay value of Au 0.05 oz. Ag 0.3+ oz. Cu 1.3%.

The West Block contains a sizeable tonnage of ore in the upper levels, of a grade similar to the ore in the hanging wall zone of the Center Block.

There is no indication that the ore has been bottomed and deeper ore should develop especiallyin the Center Block area as indicated by the greater amount of brecciation, quartz, silification, and mineralization. Much more magnetite, which is widespread, also indicates better ore conditions. The West Block is open on to the West. Possibilities exist east of the East Block.

LOCATION

The Buckskin Mine is located in Douglas County, Nevada, some 8 miles west of Yerrington, Nevada, (17 miles by road.) It is 6 miles west of Anaconda's open pit mine. The mine is in the south end of the Buckskin Range.

HISTORY

Little is known of the history of the mine. It is known that the area was worked for gold in the early part of the century. During World War I, the main shaft was opened to the 130 foot level and gold-copper ore was trucked to the Wabuska Smelter, some 18 miles northeasterly. During the 'thirties' and 'forties' desultory gold mining and milling operations were conducted on the property.

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MAPS

1 - 40' scale surface map
1 - 40' scale underground map
10 - drill hole and cross-section maps. 40' scale
1 - assay map 25' scale
1 - 100' surface map, showing the property, etc.
1 - set of assay sheets of drill holes.

PROPERTY

The property consists of 6 patented claims and 1 patented fraction.

GEOLOGY

A surface map, plane table control, was made for the Lion Hill Mines, Co. in 1970. Diamond core drilling was done in 1971, 1972, and 1973.

The surface rocks are andesites flows, with a rhyo-dacite flow from the tunnel cut and trending N N E at the base of the Buckskin Range. These rocks are classified as Triassic in age.

Drilling was mostly in the andesite rocks of different types with some tongues (?) of the more porphyritic rhyo-dacite type. The deeper rocks in Hole 3-1 were of the dacite type as was the rock in Hole No. 6 below elevation 4820. Below the gravel in Hole No. 7 an iron oxide gossan type deposit was drilled below which a siliceous dacitic type of flow was cored. The 'Lode' in this Hole was a series of gouge streaks, some quartz and traces of chalcopyrite. The gossan is in line with a series of iron springs trending northeasterly, along the base of the range. Hole No. 10 cut a fault at approximately the position of the hanging wall of the Lode. The structural situation here is not fully known and interpretation would be conjecture.

N W of the East Shaft is exposed a strong E W fault, with an area of Rhyo-dacite in the footwall. It carries quartz and is strongly and favorably altered. It appears to be intrusive.

The surface expression of the Lode is a series of E-W quartz-silica veins with iron oxide, and with considerable alteration. The zone over the East and West Blocks is about 30 feet wide; over the Center Block the Lode is 60-80 feet wide with intense alteration, especially on the footwall. Drilling shows more quartz and silification, also much more brecciation in this block. Holes 3, 5 and 8 reflect these widths at depth. Holes 3 and 8 show ore widths of 50-55 feet.

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DEVELOPMENT

A tunnel is driven westerly at elevation 4990.

A-23 Shaft, elevation 5014 develops the 90 foot level to the west. It is inaccessible.

The Main Shaft, elevation 4985 from which a short level is run west on the 225 level. The 130 Level develops the hanging wall section to the west and some to the east. Water stands in the shaft a short distance above this level. A connection was made to the A23 Shaft from which the footwall segment is developed a short distance to the west, and a raise runs to the A 23 90 foot level.

Other numerous shallow shafts have been dug and many surface prospect holes have been made. An open stope (Glory Hole) exists in the Center Block from which the ore was mined through a short tunnel, elevation 5028. The Stope is 60 feet long and 20 feet wide. The above work must have been done in the earlier period, with gold ore as the objective.

DRILLING DATA

Twelve holes were drilled totaling 5665 feet. The cross-sections show the nature of the rock drilled, and the mineral interscept cored. The Lode has been developed to an elevation of 4640 (Hole 3) in the Center Block and the ore block has been projected to the 4600 level.

ASSAY DATA AND SAMPLING METHOD

A representative sample was taken the length of the core assayed by taking pieces of the core at approximately 4 inches apart. The average sample weighed 6 to 10 pounds depending on the length sampled.

The ore on the Tunnel Level, the only underground workings accessible, was checked by responsible personnel confirming the sampling done in 1955. The assays shown on the 25 scale assay map were in 1955. Mr. Williams and Mr. Earl Young confirmed this work when they check sampled this mine in 1955.

The assay value used in the Tonnage Reserve Section, below, is a weighted average of all the sampling. It is thought to be the minimum value of the ore in these blocks.

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TONNAGE AND GRADE

CENTER BLOCK

Hanging Wall Zone

450 X 400 X 25 ÷ 11.5 = 391,300 tons
Au 0.20 oz. - Ag 0.5 oz. - Cu 1.3%

Footwall Zone

450 X 400 X 8 ÷ 11.5 = 125,200 tons
Au 0.12 oz. - Ag 0.5 oz. - Cu 1.3%
Note: The assays on the 90 level and Tunnel Level show much higher values.

This segment is from 30 feet west of the ore in Hole 3 to 70 feet east of Hole 9.

EAST BLOCK

400 X 350 X 15 ÷ 11.5 = 182,600 tons
Au 0.05 oz. - Ag 0.3 oz. - Cu 1.3%
This segment is from 70 feet east of Hole 9 to 100 feet east of Hole 6.

WEST BLOCK

The assay map shows two segments sampled in this block on the Tunnel Level which averaged 7.0 feet wide, Au 0.22 oz. - Cu 1.8%. It is therefore indicated that considerable ore exists from the Center Block to west of Hole 4, particularly in the upper levels.

Louis W. Cramer
Louis W. Cramer

The

COLORADO SCHOOL OF MINES MAGAZINE

Yerington-Buckskin Copper District*

(By Frank A. Goodale, '10.)

The Yerington-Buckskin Copper District is situated partially in Lyon County and partially in Douglas County, in that western part of Nevada which lies between Reno and Hawthorne.

Virginia City is about thirty miles to the north; and Bodie, California, sixty miles south. A railroad is under construction at the present time by the Nevada Douglas Copper Company which will pass through the middle of the district. The name of it is "The Nevada Copper Belt Railroad." It branches off at Wabuska from the Hazen-Mina branch of the Southern Pacific. The district covers a part of Mason and Smith Valleys, both of which are fertile. The Walker River flows through Mason Valley and the upper end of Smith Valley, the water from which is used mostly for irrigation purposes. The valleys both yield bountiful crops of alfalfa, potatoes, and many other farm products, so that the cost of living is low compared with other parts of Nevada. Both Mason and Smith Valleys are from four to six miles wide, and only a part of each is irrigable with the present available supply of water.

The beauty of the valleys, with their green fields and rows of poplars, is enhanced by contrast with the barren-looking hills dividing them, and within which the large deposits of copper are contained. One writer, in describing the district, has said: "It is the only place where a miner can hit a drill with one hand and pick peaches with the other."

There are several towns in the district, the principal one of which is Yerington. It lies in the center of Mason Valley, in Lyon County, and has a population of about fifteen hundred. Yerington is the principal supply point for the district, and is very prosperous. Mason City is the next city of importance. It lies on the east side at the base of the range which contains the principal mines, and is the nearest supply point on that side. Mason City is modern and up-to-date. Good water works and sewerage systems have been installed, so that it is the ideal mining camp of Nevada. The railroad now building will run through the town.

Morningstar townsite lies on the west side at the foot of the range. It is the nearest supply point on that side and will be the terminus of the railroad. Buckskin is due west of Morningstar, about four miles distant, and is the principal town and supply point for the mines on the west side of Smith Valley.

The principal mines are in the mountain ridge dividing Mason and Smith Valleys, which is called by the Indians, "Singatse," and is also known as the Smith Valley Range. This ridge has an average width of about four miles. The general line of its crest is from 1,600 to 2,000 feet above Mason Valley, and 1,000 to 5,000 feet above Smith Valley. The average altitude of the ridge is about 6,500 feet. West of this range, across Smith Valley, is an arm branching from the Pine Nut Range of Mountains, at the eastern foot of which is the town of Buckskin, in which the principal mines of that section are located. The line dividing Lyon and Douglas counties runs through the center of Buckskin, and causes most of the mines in that part of the district to be located in Douglas county.

History and Distribution of the Mines.

The history of the district dates back thirty or forty years, but up to date only one mine, the Ludwig, has produced abundantly or continuously. Several of the mines on the east side of the Smith Valley Range supplied natural bluestone to the amalgamating mills in Virginia City during its boom days, but until the last three or four years have been idle. A couple of

*Thesis for degree of Mining Engineer, class 1910, Colorado School of Mines.

the mines at the time erected small smelteries and attempted to run on the partially oxidized ores near the surface, but no great production was attained. Later operations have been confined to exploration work and experiments in ore treatment.

The mines on the east slope of the Smith Valley Range make a chain about two miles in length. Running from north to south are the Bluestone, Mason Valley, Malachite, McConnell, and Western Nevada. Those on the west slope are the Intervalley, Martha Washington, Albany Copper Company, Honest Endeavor, Union Blue, Nevada Queen, Yerington Central, Nevada Bonanza, Ludwig and Nevada Douglas mines. East of Yerington and across Mason Valley are the Blue Jay, Bradley, Yerington, and Black Rock mines and prospects. On the Buckskin side lie the Wabuska Copper Company, Nevada Calumet, Burke and McLaughlin, Hardie, Kennedy Consolidated, Ashley Consolidated, and Buckskin Gold Nugget Mining companies.

A number of these have shipped some ore, but at present those that are working are confining their efforts to the development of the sulphide zone, or, as at the Mason Valley, to the zone of mixed oxides and sulphides. The most developed mines are on the east slope of the Smith Valley Range, except the Nevada Douglas and Ludwig on the west slope. The rest are still in the prospect class.

Geology of the District.
(See Foot Note.)

The Smith Valley Range, as has been stated before, is a low, narrow mountain ridge, dividing Mason and Smith Valleys. It merges on the north with the Pine Nut Range, and on the south spreads out broadly into a series of volcanic mesas, which connect farther south with a spur of the Sierras north of Lake Mono.

The range is essentially volcanic, but may be divided into two groups of marked difference in age and structure. The older group, or Pre-Tertiary, is made up of schists and limestones, with intrusive masses of granodiorite and related porphyries. The younger group is of volcanic origin and is non-comformable with the older altered sedimentaries and intrusive rocks.

The schists are mainly on the east side of the Smith Valley Range and are tough, dark gray rocks of dense texture. The minerals recognizable with the naked eye are feldspar, hornblende and epidote, distributed through a finely crystalline ground mass. They probably are a metamorphosed igneous rock, as the original porphyritic texture can still be recognized. The schist is cut in many places by dikes of quartz-monzonite or granodiorite, and is stained in places by salts of copper. South of Mickey Pass, on the western slope of Smith Valley Range, a similar schist occurs.

On both slopes of the range, masses of limestone are folded with the schist. These are small and isolated, as a rule.

There is one fairly continuous band on the eastern slope which contains the Western Nevada, McConnell, Mason Valley and Bluestone mines. It is about 1,000 feet wide and disappears a little north of the Bluestone. A similar band on the west slope, near the base of the range, contains the Ludwig, Nevada Douglas, Yerington Central and Nevada Queen mines.

The majority of the limestone is metamorphosed, although some of it is of the pure crystalline variety. That which has been altered contains garnet, pyroxene, amphibole, epidote and pyrite. The rocks resulting from the metamorphism of the limestone were lime silicate hornfels, and garnetiferous limestone. It is possible that some of the schists are an alteration of the limestone and andesitic rocks which has been folded and metamorphosed at the same period. The cause of the metamorphism was the intrusion of the granodiorite and related porphyries.

The granodiorite occupies, in general, that part of the ridge between the summit and eastern belt of limestone from the Mickey Pass southward. On the summit and west slope the contact is irregular and sends out dikes into the schists and limestones (of which many masses are included by these dikes). On the eastern slope, the line of contact between the limestone and intrusive rock is fairly straight and has a northerly and southerly trend. It appears to be a fault which has dropped the limestone against the intrusive rock.

The granodiorite is a rock of general granitic appearance, the constituent minerals of which are feldspar, quartz, biotite, and hornblende with secondary epidote. The plagioclase feldspar is more abundant than the orthoclase, although the rock is nearer quartz-monzonite than anything else. It is stained in many places with salts of copper, and several hills about one and one-half miles west of Yerington, thus stained, have the appearance of large masses of ore. A smeltery was erected some years ago and an attempt made to mine and smelt the copper-stained rock.

The prevailing rock in the hills east of Yerington, in which are situated the Blue Jay, Yerington and other mines, is a similar granodiorite, which shows that the rock mass was not all intruded at the same time. There is an absence of sedimentary rocks.

Note—From Bul. U. S. G. S. No. 208, Geology of Nevada, South of Fortieth Parallel, by J. E. Spurr, and Bul. U. S. G. S. No. 380, Contributions to Economic Geology, by F. L. Ransome.

On the Buckskin side, the main mass of rock is andesite, porphyry and quartz-porphyry, similar in composition to the granodiorite of the Smith Valley Range. At the extreme northwest part of the district, wherein is located the Wabuska copper mine, the schists and limestones occur. The limestone has not been altered to a great extent and is more of a pure crystalline variety.

The second group is composed principally of Tertiary lavas, which are younger than the ores. The northern part of the Smith Valley Range is composed almost wholly of these lavas. East of the Bluestone mine there is an apparent downfault of these rocks into the older series. The strike of the flows is almost north and south, and they dip to the west. There is a thin flow of rhyolitic glass, overlaid by a thick series of flows of yellow rhyolite. These are overlaid by a coarse andesite-breccia and well bedded grits.

The newer volcanic rocks generally rest on the older schists, limestones and granodiorite, and show that the rocks were much eroded and deformed before the eruption began. On the Buckskin side there are numerous intrusions of andesite and rhyolite.

Ore Deposits.
(See Foot Note.)

There are four classes of ore deposits found in the Yerington-Buckskin district.

First: Irregular bodies formed by metasomatic replacement of limestone. Under this class may be placed the Bluestone, Mason Valley, Malachite, McConnell, Western Nevada and part of the Nevada Douglas mines.

Second: Metasomatic vein deposits and altered limestone. The only important deposits of this class are those of the Ludwig and part of the Nevada Douglas and Yerington Central mines.

Third: Metasomatic vein deposits in granodiorite. The deposits of this class include those of the Intervalley, Martha Washington, Nevada Calumet, Albany, Honest Endeavor, Union Blue, Nevada Queen, Nevada Bonanza, Empire Nevada, Blue Jay, Yerington, Bradley, and Black Rock mines and prospects.

Fourth: Metasomatic replacement in andesite porphyry. This is the class which includes the ore deposits on the Buckskin side.

Ore Deposits of First Class—
Bluestone Mine.

The Bluestone mine lies four miles southeast of Yerington, about the middle of the eastern slope of the Smith Valley Range. It was worked a number of years ago, when a smeltery was built and operated for some time on the partially oxidized ores above the 100-foot level.

The development work consists of three levels, of a total length of nearly 8,000 linear feet, and connected with the surface by adits. The principal drifts and crosscuts are in ore bodies, elliptical in shape, and 400 feet long by 300 feet wide. Between 2,000,000 and 3,000,000 tons of 3 per cent. copper ore are blocked out.

The ore is contained mostly in limestone, near the contact of the rock and granodiorite. This contact is due to faulting and strikes a little east of north. Much shearing and crushing has taken place. There is no sharp separation between the ore and limestone, except a small seam on the footwall side of the ore body. There is a gradation from well mineralized to pure limestone. The ore consists essentially of chalcopyrite, disseminated through the limestone, which has been altered considerably. It is almost free from pyrite, but the sulphide takes the place of the chalcopyrite as the ore grades into country rock. Oxidation has taken place to only about the 100-foot level, while some sulphide is present in its croppings. The oxidation products are malachite, azurite, cuprite, and melachonite.

The experimental process now being used to work the ore is one of magnetic separation. The ore is crushed and slightly roasted, rendering the chalcopyrite magnetic, after which it is passed through magnetic separators.

Mason Valley Mine.

The Mason Valley mine is three-quarters of a mile south of the Bluestone. It also was worked a number of years ago. Most of the development was done by means of four adits, varying in elevation from 60 to 125 feet between each. The recent work, as in the Bluestone, has been that of exploitation.

The ore occurs in an altered limestone, which is of curved and irregular shape. The ore body is about 2,000 feet long and 150 feet wide, and occurs in the limestone in irregular masses, grading into the country rock as in the Bluestone.

The sulphide ore is essentially chalcopyrite, with some garnet, pyoxene and calcite. Pyrite is contained more extensively than in the Bluestone. Oxidation has penetrated several hundred feet and, in one of the lowest levels, there occurs a large body of rich, earthly cuprite, with much disseminated native copper. The ore will run about 20 per cent. copper. Some of the chalcocite occurs in soft, sooty condition. The minerals found in the oxidized zone are malachite, azurite, cuprite, native copper and gypsum.

Foot Note—The above four classes are according to F. L. Ransome, in Bul. U. S. G. S. No. 380.

Malachite.

The Malachite mine is situated one-half a mile south of the Mason Valley mine, on the same general zone of mineralization. There are a number of old tunnels which were worked in the early days of the district, and from which partially oxidized ore was taken, similar to that of the Mason Valley. The recent work done on the property consists of a shaft in the limestone below the old tunnels, designed to reach the ore bodies at considerable depth.

The ore bodies here are similar to those of the Mason Valley.

McConnell.

The McConnell mine is about one-half of a mile southwest of the Malachite and two miles from Mickey Pass.

The ore body, which crops for a considerable distance northerly and southerly, is about 300 yards wide and is composed of mineralized limestone. The western contact and the eastern contact is a schist. The limestone is a fine-grained, gray variety and is not much altered. The ore bodies are at the western edge of the limestone, near the granodiorite and consist essentially of the same minerals as in the previously mentioned properties.

The workings of the McConnell mine comprise a number of short tunnels and open cuts on oxidized ore, with one adit several hundred feet long in the sulphide zone. A shaft 400 feet deep was sunk in limestone near the portal of the main tunnel. The sulphide ores in this property resemble those of the Mason Valley to a considerable extent.

The Western Nevada.

The Western Nevada mine is about one-half of a mile south of the McConnell on the same mineralized belt. The ore bodies lie in a zone of mineralization about one-quarter of a mile wide, and consist of irregular bodies of sulphides and silicates. Some of the ore bodies are close to the granodiorite and some are separated by a gray, unaltered limestone.

The contact between the limestone granodiorite is due to faulting, with a fairly steep dip to the east. A seam of gouge on the footwall and the limestone hanging wall is much broken. The fault fissure is unmineralized. East of this fault there is a zone of crushing in the limestone, with quartz veins carrying pyrite, but no ore of commercial value.

There are cappings of younger lavas over the croppings of the ore bodies of this mine and the ore is practically the same as that found in the Malachite and McConnell. There are a number of old workings, mostly open cuts and prospect holes. The main tunnel is over 1,000 feet long, from which a number of drifts have been run and a winze about 300 feet deep sunk.

The Nevada Douglas Mine.

The Nevada Douglas mine is situated on the crest of a small spur, about two miles west of the Mason Valley mine, and 500 feet above the valley. The country rock consists mainly of limestone, which is extensively and irregularly altered to garnet rock. This garnetiferous limestone zone is about 600 feet wide and strikes northerly and southerly.

The ore formerly shipped was mostly oxidized material, and consisted of malachite, azurite, and chrysocolla. Below the oxidized ores, which extend to a shallow depth, are fine-grained, masses of pyrite, chalcopyrite and garnet. Some secondary enrichment of these minerals has occurred, as chalcocite shows on the surfaces and in the cracks of the older sulphides.

The old workings are rather extensive and consist of a number of tunnels, shafts and open cuts, which expose the various ore bodies over the property. A new tunnel has been started west of the old workings, about 2,000 feet, to cut the ore bodies at greater depth, but little or no work has been done of late.

The ore bodies of the first class are composed of irregular bodies formed by metasomatic replacement of the limestone, and are, in general character, unenriched contact metamorphic deposits, although they are not very closely related to the igneous contacts. They owe their present proximity to the granodiorite to faulting.

The gangue minerals are pyroxene, amphibole, epidote, garnet and calcite. The ore bodies do not, as a rule, average more than 3 per cent. copper where there has been no secondary enrichment.

The ore bodies of this class are partial replacement of the limestone by chalcopyrite, this replacement being accompanied by metamorphism of the limestone to epidote and other silicates, and by formation of disseminated pyrite. The ore deposition seems to have been completed before the limestone was faulted down to its present position. The original copper-bearing solutions presumably penetrated the limestone through small fractures under great heat and pressure. It is probable that the deposition of the ore was closely connected with the intrusion of the granodiorite.

The proofs of the metasomatic action in connection with these ore bodies are found in the general character of the deposits; in the absence of symmetrical banding or of cavities in the veins; in the irregularity in thickness of the bodies; and in the lack of freshness in the appearance of the vein matter. Well defined alterations of the original minerals into secondary ones, and some pseudomorphism, are shown. The

chief alteration products are amphibole, epidote and garnet.

The ore, deposited by ascending waters, should continue to a great depth, and since the primary ores come so close to the surface, the future mining of this part of the district will depend on the handling of low grade ores. With the completion of the railroad and smelter, which are now under construction, the chief difficulties will be overcome and a large production can be expected. The development work which has been done is mostly superficial. However, the commencement of a steady production will stimulate the now inactive properties to sink deeper, and no doubt large bodies of ore extending to a great depth will be developed.

ORE DEPOSITS OF THE SECOND CLASS

Metasomatic Vein Deposits in Altered Limestone.

The Ludwig mine is situated on the western slope of the Smith Valley range at the edge of Smith Valley.

The formation around this mine consists essentially of limestone and intrusive masses of granodiorite and porphyry. Unlike the other deposits on the eastern slope of the range on which it is situated, it is lode-like in form, with a steep dip to the east. The lode is from 50 to 60 feet wide in the upper levels and was widened to 100 feet and more at the 650-foot level. The general trend of the lode is northerly. The footwall is a gray limestone, which has been very much altered to a solid, alabastine gypsum, for at least 50 feet, by acid solutions from the oxidizing sulphides. The hanging wall limestone contains garnet with other metamorphic silicates. This is cut by intruded masses of granodiorite and porphyry; these intrusives even form the hanging wall of the lode just north of the shaft.

The mine has been worked for the last thirty or forty years, more or less continuously, and has shipped, by far, the most of the ore that has been sent from the district. Until recently, it has worked through a vertical shaft 400 feet deep, with an inclined winze from the bottom of the shaft which dips about 45 degrees, to the 650 level. The work is now confined to those levels below 400 feet deep, as the ones above have been practically worked out. Within the last year, the inclined winze has been extended to the surface, through which winze the hoisting is now done.

The ore from the surface to the 500-foot level is mainly oxidized. The surface cropping is a large body of gossan, heavily stained with salts of iron. Some small stringers of azurite and malachite are enclosed within the cropping. From the surface down to the 400-foot level, the limestone is shattered and the interstices and fissures are filled with coarsely crystalline calcite. The vein matter which once contained sulphides, is now oxidized and enriched by downward working waters. The oxidized ores are malachite, azurite, chrysocolla, and earthy oxides. These are formed and concentrated in solution cavities along zones of crushing in the original vein material. The ore thus formed is in bunches distributed through the lode. Some unoxidized ore, which consists of pyrite and chalcopyrite in a gangue of calcite, garnet and quartz, remains in the south end of the 400-foot level, and shows the probable character of the primary ore. These enriched ores were very high grade and form the bulk of what has been produced. The azurite, malachite, and chrysocolla, suitable for cutting into jewelry occurred in considerable quantities, and formed a source of revenue to the original owners.

Origin of Ore in the Ludwig.

The formation of the Ludwig ore body is undoubtedly due to ascending hot waters carrying the metals and gangue matter in solution. The present condition of the deposit, however, is not due to the ascending waters alone, but to a number of stages of concentration, each concentrating the previous stage, thereby causing the ore to grow richer. This mine forms a good example of the different zones of enrichment usually met in a fissure vein.

The surface cropping is due to the combination of repeated chemical and mechanical disintegrations of the original ore body. The iron sulphides contained in the primary ore were transformed by oxidation into iron sulphates, and the copper sulphides to copper sulphates. As such, they were soluble in waters containing carbon dioxide. These downward circulating meteoric waters through various causes deposited part of their burdens as carbonates, oxides and even metallic copper. Part of the minerals in solution were carried down to or near the water level, which is about 500 feet, and were there deposited as a sulphide. There was formed a zone of secondary enrichment composed exclusively of sulphides. The chief mineral in this zone of secondary enrichment is chalcocite. The ore of the Ludwig, near the water level, has its copper content mostly due to that mineral, and the body, which is from 75 to 100 feet wide, will average between 6 per cent. and 7 per cent. copper.

Below the permanent water level the ore is leaner as the mine workings approach the zone of primary deposition.

There are now from 800,000 to 1,000,000 tons of ore developed in the Ludwig. This ore will run between 4 and 7 per cent. copper. The mine is fully equipped with all the necessary machinery for extracting the ore, and when the railroad is completed

to the property it will undoubtedly be one of the largest producers in the district.

There are also many thousands of tons of almost pure gypsum, which can be shipped and will be a source of much revenue to the company.

Part of the Nevada Douglas and Yerington Central may be grouped under this second class of ore deposits. They have not been sufficiently developed to determine the true character of their ore bodies, but it is not improbable that, with depth, they will show the same characteristics as the Ludwig.

Ore Deposits of the Third Class.

The deposits of the third class include those previously mentioned under this heading and none have been sufficiently developed to be called other than prospects. They are characterized by the development of chalcopyrite and pyrite in zones of fissuring cutting the granodiorite. In a number of them there has been some filling of open spaces, and, in others, the sulphides have developed within the rock alongside.

When there has been filling of open spaces, the workings show the ores to be chrysocolla, malachite, azurite, melachonite, bornite and covellite. Mineralization has usually worked metasomatically outward from the contact between the dikes and enclosing walls, which produced low grade sulphide deposits. These have been enriched to some extent by downward working waters. The deposits are believed to represent a stage of mineralization a little later than those of the first and second classes. The economic importance of the deposits of the third class is still unproved. There is every reason to believe, however, that there will be developed some large bodies of low grade ore which can be economically mined.

The third class deposits have also been formed by ascending hot waters, working their way along crevices and fissures, and into the country rock forming the walls, replacing it with ore. The deposition has always taken place along the walls of the channel through which the water passed, and, after filling them, the solutions have eaten their way into the wall rocks and there replaced them.

BUCKSKIN

Ore Deposits of the Fourth Class.

The ore deposits of this class differ from those already mentioned, in that they contain considerable amounts of gold and silver, along with copper, lead and zinc. They occur almost entirely on the Buckskin side of Smith Valley, which is situated on the western slope of a spur from the Pine Nut Range, about 4½ miles west of the Ludwig mine.

The formation is composed essentially of andesites, rhyolites, porphyries and some diorites. Several large bodies of limonite and hematite crop along the foot of the range.

The Kennedy Consolidated is the largest and most developed mine on this side. It was discovered in March, 1906, by a prospector named Kennedy, who located the property and started the townsite, which he named Buckskin, after his buckskin pony.

A number of prospect shafts, from 50 to 200 feet deep have been put down, and those which have reached a depth of 100 feet or more encountered considerable water.

The ore occurs as a metasomatic replacement deposit in an altered andesite. The ore bearing minerals are pyrite, and sulphides of copper, silver, lead and zinc, in a gangue of quartz, gypsum, chlorite and epidote.

The veins are propylitic in type, in that the whole body in which the ore occurs is metasomatically altered. The zone of oxidation is very shallow here as the primary minerals are formed at water level, within 100 feet of the surface. They even come to the surface in places.

The deposit of the Kennedy Consolidated mine has a northerly and southerly trend. There has not been enough development work to show the limits of the ore. Several shafts were put down along the general trend of the ore body and have exposed it for at least a mile in length. Drifts from the main shaft of the Kennedy Consolidated show the body to be at that point, over 100 feet wide. The ore will run about 3½ per cent. copper, with about $2.00 per ton in gold and silver. The lead and zinc occur in small bunches disseminated through the deposits, and are not of much economic importance. It is an excellent ore to concentrate.

The croppings are considerably leached and altered and contain in places much free gold. There has been very little secondary concentration, due to the shallow depth to which oxidization has taken place.

With development large bodies of low grade ore should be exposed, which will be profitable to mine. The natural conditions are very favorable. There is plenty of wood and water within easy access, an electric power transmission line within a short distance, supplies are reasonable, the altitude and climate good, and a railroad now being built within a few miles of Buckskin.

The ore has been deposited from solution by ascending hot waters. There are many small cross veins which run into the main body at nearly right angles to its trend. Some of these are mineralized and some are not.

Conclusion.

The general character of the ore bodies of the district is that of large low grade replacement deposits. As their origin is due to ascending hot waters, they should continue to great depths. They cannot, however, be expected to get richer with depth, but on the contrary, leaner, as the primary ores come so near the surface.

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Silver King Mines, Inc.
2319 Foothill Drive, Suite 140
Salt Lake City, UT 84109

PURCHASE INVOICE: Final
VESSEL: Pacific Express/Bridge
MATERIAL: Buckskin Copper Concentrates
ORIGIN: USA

WEIGHT(S): Estimated - Final

DMT 362.874 - 356.585
WMT 395.360

PRICE(S):	Average of: Sept '85	May '85/Jun '85
Copper (¢):	61.981	- -
Gold ($):	316.381	316.394
Silver ($):	6.24888	6.16568

ASSAY(S): Estimated - Final
Copper (%): 18.00 - 20.121
Gold (oz/MT): 2.866 - 3.2868
Silver (oz/MT): 6.60 - 6.676

PRICING(S): Estimated - Final Over/Under
Copper (MT): 67.826 -
Gold (TR. oz): 1000 - 1125.133 - 125.133
Silver (TR. oz): 2150 - 2142.363 - (7.637)

	$ Value
Copper: 67.826 x 2204.62 x .61981	92,680.53
Less Treatment Charge: 49.00 x 356.585 DMT	(17,472.67)
Less Refining Charge: (.068 x 419.341) x 356.585 DMT	(10,168.09)
	65,039.77
Gold: 1000 x 316.381	316,381.00
May Overage 125.133 x 316.394	39,591.33
Less Refining Charge: 5.00 x 1125.133 ozs.	(5,625.67)
	350,346.66
Silver: 2150 x 6.25888	13,456.59
May Underage 7.637 x 6.16568	(47.09)
Less Refining Charge: .35 x 2142.363 ozs.	(749.83)
	12,659.67
TOTAL VALUE	428,046.10
Less Provisional Payment July 1, 1985	(37,266.70)
Less Interest on Advance	(152.78)
Less Provisional Payment July 15, 1985	(302,745.78)
Less Transportation Costs via Oakland, CA ($62.25 WMT)	(24,611.16)
DUE SILVER KING MINES	$ 63,269.68

Remit to:
Zions 1st Bank
Salt Lake City, UT
In favor Pacific Silver Corp.
Account No. 03-12799-0

BALFOUR, MACLAINE INTERNATIONAL LTD.

By Jerry Bronka

A Subsidiary of Kay Corporation

R4/P/33

Paul

DAILY OPERATING REPORT

BUCKSKIN MINE

Belt		Daily	Monthly	[illegible]
	TONS	442.446	3302.95	
.700	% Cu	.700	.721	.744
	Lbs. Cu	6,193.81	48,210.62	
.102	Oz. Au/T	[illegible]	.103	.107
	Troy Oz Au	45.464	330.770	

CONCENTRATE

	Daily	Monthly
TONS	8.143	65.440
% Cu	27.276	34.875
Lbs. Cu	4441.19	35,811.71
Oz. Au/T	3.912	3.384
Troy Oz Au	32.202	235.166

FLOTATION

	Daily	Monthly
% Rec. Cu	67.26	64.84
% Rec. Au	75.65	66.43

C. I. P.

	Daily	Monthly
TONS	437.317	3243.310
FEED Oz/T	.030	.029
Troy Oz. Au	13.120	94.191
Tail Soln Oz Au/T	.001	
Tail Res. Oz Au/T	.014	
Tail Total Oz Au/T	.015	.013
Tail Troy Oz Au	6.560	42.485
Recovery Troy Oz Au	6.560	51.452
% Recovery C.I.P.	50.00	54.63
% Recovery Total	84.66	84.36

MINE PRODUCTION

	Daily	Monthly
Underground : Tons	0	0
Open Pit : Tons	0	0
Total Tons	0	

CATHODE PULLED

Lot 45

Total Wt. — 68.110 Troy Oz.	
% Au : 35.57	
% Ag : 63.12	
Oz Au	Monthly Total
24.445	24.445
Oz Ag	Monthly Total
42.692	42.692

Paul

DATE: 8-20-86

BUCKSKIN DAILY FLOTATION SUMMARY

SHIFT	PRODUCT	TOTAL Cu(%)	H-S Cu (%)	Au(Oz / Ton)	Fe (%)	% H_2O
A	"A" Belt Feed					
B		.76		.100		
C						
A	"B" Belt Feed					
B						
C						
A	"A" Cyc. O'flow					
B		.73		.105		
C						
A	"B" Cyc. O'flow					
B						
C						
A	Flot. Conc.	25.70		2.948		
B		23.23		2.744		
C		28.21		3.920		
A	"A" Flot. Tail					
B		.21		.028		
C						
A	"B" Flot. Tail					
B						
C						
A	Cl. Feed					
B						
C						
A	Cl. Tail					
B						
C						
A	Other					
B						
C						

SHIFT	TONS WET	TONS DRY	GRIND % – 325 m		REGRIND % – 325 m
A					
B					
C					
TOTAL		445.93	A	B	

SHIFT	Product	Cu(%)	Au	Fe	% H_2O
A	CIP Feed				
B					
C					
A	CIP Tail	.001			
B		.001	.011		
C		.001			
Day	Plant Solution	.56			
Day	Bypass	.035			

35
Item 22
(2 of 8)

REPORT ON
BUCKSKIN MINE
DOUGLAS COUNTY, NEVADA
May 1973

LOUIS W. CRAMER

OFFICE PHONE 322-0841

RES. PHONE 467-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY, UTAH 84101

REPORT ON BUCKSKIN MINE
DOUGLAS COUNTY, NEVADA

CONCLUSIONS

It is calculated that in the Center Block are 391,300 tons of ore in the hanging wall zone with a grade of Au 0.20 oz. Ag 0.5 oz. Cu 1.3%. A foot-wall zone in this block contains 125,200 tons of ore, having a grade of Au 0.12 oz. Ag 0.5 oz. Cu 1.3%.

Note: The values on the 90 foot level and Tunnel level show much higher values.

There are approximately 162,800 tons of ore in the East Block with an assay value of Au 0.05 oz. Ag 0.3+ oz. Cu 1.3%.

The West Block contains a sizeable tonnage of ore in the upper levels, of a grade similar to the ore in the hanging wall zone of the Center Block.

There is no indication that the ore has been bottomed and deeper ore should develop especiallyin the Center Block area as indicated by the greater amount of brecciation, quartz, silification, and mineralization. Much more magnetite, which is widespread, also indicates better ore conditions. The West Block is open on to the West. Possibilities exist east of the East Block.

LOCATION

The Buckskin Mine is located in Douglas County, Nevada, some 8 miles west of Yerrington, Nevada, (17 miles by road.) It is 6 miles west of Anaconda's open pit mine. The mine is in the south end of the Buckskin Range.

HISTORY

Little is known of the history of the mine. It is known that the area was worked for gold in the early part of the century. During World War I, the main shaft was opened to the 130 foot level and gold-copper ore was trucked to the Wabuska Smelter, some 18 miles northeasterly. During the 'thirties' and 'forties' desultory gold mining and milling operations were conducted on the property.

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MAPS

1 - 40' scale surface map
1 - 40' scale underground map
10 - drill hole and cross-section maps. 40' scale
1 - assay map 25' scale
1 - 100' surface map, showing the property, etc.
1 - set of assay sheets of drill holes.

PROPERTY

The property consists of 6 patented claims and 1 patented fraction.

GEOLOGY

A surface map, plane table control, was made for the Lion Hill Mines, Co. in 1970. Diamond core drilling was done in 1971, 1972, and 1973.

The surface rocks are andesites flows, with a rhyo-dacite flow from the tunnel cut and trending N N E at the base of the Buckskin Range. These rocks are classified as Triassic in age.

Drilling was mostly in the andesite rocks of different types with some tongues (?) of the more porphyritic rhyo-dacite type. The deeper rocks in Hole 3-1 were of the dacite type as was the rock in Hole No. 6 below elevation 4820. Below the gravel in Hole No. 7 an iron oxide gossan type deposit was drilled below which a siliceous dacitic type of flow was cored. The 'Lode' in this Hole was a series of gouge streaks, some quartz and traces of chalcopyrite. The gossan is in line with a series of iron springs trending northeasterly, along the base of the range. Hole No. 10 cut a fault at approximately the position of the hanging wall of the Lode. The structural situation here is not fully known and interpretation would be conjecture.

N W of the East Shaft is exposed a strong E W fault, with an area of Rhyo-dacite in the footwall. It carries quartz and is strongly and favorably altered. It appears to be intrusive.

The surface expression of the Lode is a series of E-W quartz-silica veins with iron oxide, and with considerable alteration. The zone over the East and West Blocks is about 30 feet wide; over the Center Block the Lode is 60-80 feet wide with intense alteration, especially on the footwall. Drilling shows more quartz and silification, also much more brecciation in this block. Holes 3,5 and 8 reflect these widths at depth. Holes 3 and 8 show ore widths of 50-55 feet.

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DEVELOPMENT

A tunnel is driven westerly at elevation 4990.

A-23 Shaft, elevation 5014 develops the 90 foot level to the west. It is inaccessible.

The Main Shaft, elevation 4985 from which a short level is run west on the 225 level. The 130 Level develops the hanging wall section to the west and some to the east. Water stands in the shaft a short distance above this level. A connection was made to the A23 Shaft from which the footwall segment is developed a short distance to the west, and a raise runs to the A 23 90 foot level.

Other numerous shallow shafts have been dug and many surface prospect holes have been made. An open stope (Glory Hole) exists in the Center Block from which the ore was mined through a short tunnel, elevation 5028. The Stope is 60 feet long and 20 feet wide. The above work must have been done in the earlier period, with gold ore as the objective.

DRILLING DATA

Twelve holes were drilled totaling 5665 feet. The cross-sections show the nature of the rock drilled, and the mineral interscept cored. The Lode has been developed to an elevation of 4640 (Hole 3) in the Center Block and the ore block has been projected to the 4600 level.

ASSAY DATA AND SAMPLING METHOD

A representative sample was taken the length of the core assayed by taking pieces of the core at approximately 4 inches apart. The average sample weighed 6 to 10 pounds depending on the length sampled.

The ore on the Tunnel Level, the only underground workings accessible, was checked by responsible personnel confirming the sampling done in 1955. The assays shown on the 25 scale assay map were in 1955. Mr. Williams and Mr. Earl Young confirmed this work when they check sampled this mine in 1955.

The assay value used in the Tonnage Reserve Section, below, is a weighted average of all the sampling. It is thought to be the minimum value of the ore in these blocks.

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TONNAGE AND GRADE

CENTER BLOCK

Hanging Wall Zone

450 X 400 X 25 ÷ 11.5 = 391,300 tons
Au 0.20 oz. - Ag 0.5 oz. - Cu 1.3%

Footwall Zone

450 X 400 X 8 ÷ 11.5 = 125,200 tons
Au 0.12 oz. - Ag 0.5 oz. - Cu 1.3%
Note: The assays on the 90 level and Tunnel Level show much higher values.

This segment is from 30 feet west of the ore in Hole 3 to 70 feet east of Hole 9.

EAST BLOCK

400 X 350 X 15 ÷ 11.5 = 182,600 tons
Au 0.05 oz. - Ag 0.3 oz. - Cu 1.3%
This segment is from 70 feet east of Hole 9 to 100 feet east of Hole 6.

WEST BLOCK

The assay map shows two segments sampled in this block on the Tunnel Level which averaged 7.0 feet wide, Au 0.22 oz. - Cu 1.8%. It is therefore indicated that considerable ore exists from the Center Block to west of Hole 4, particularly in the upper levels.

Louis W. Cramer
Louis W. Cramer

THE BOOTH COMPANY
A Division of MCRC

Engineering Division:
333 WEST 1410 SOUTH STREET
SALT LAKE CITY UTAH 84115 • U S A
PHONE 801 487-7845

December 14, 1973

Lion Hill Mines
409 Felt Building
Salt Lake City, Utah 84101

Attention: J.D. Williams

Subject: Preliminary flotation tests on Copper-Gold ore from the Buckskin Mine in Nevada, Booth Lots 1446, 1452.

Gentlemen:

This and the attached data sheets describe a preliminary flotation study on the subject ore.

The purpose of this study was to determine if the ore is amenable to conventional sulfide copper flotation practice employing a xanthate collector in a lime circuit.

The two samples tested represented weighted composites of drill core samples.

Head sample assays, by Union Assay

Lot No.	% Cu	% oxide Cu	Ozs per ton Au	Ag
1446	0.844	0.009	0.220	0.50
1452	0.749	no assay	0.210	0.50
Average calculated head from tests				
1446	0.833	------	0.180	0.31
1452	0.789	------	0.199	0.30

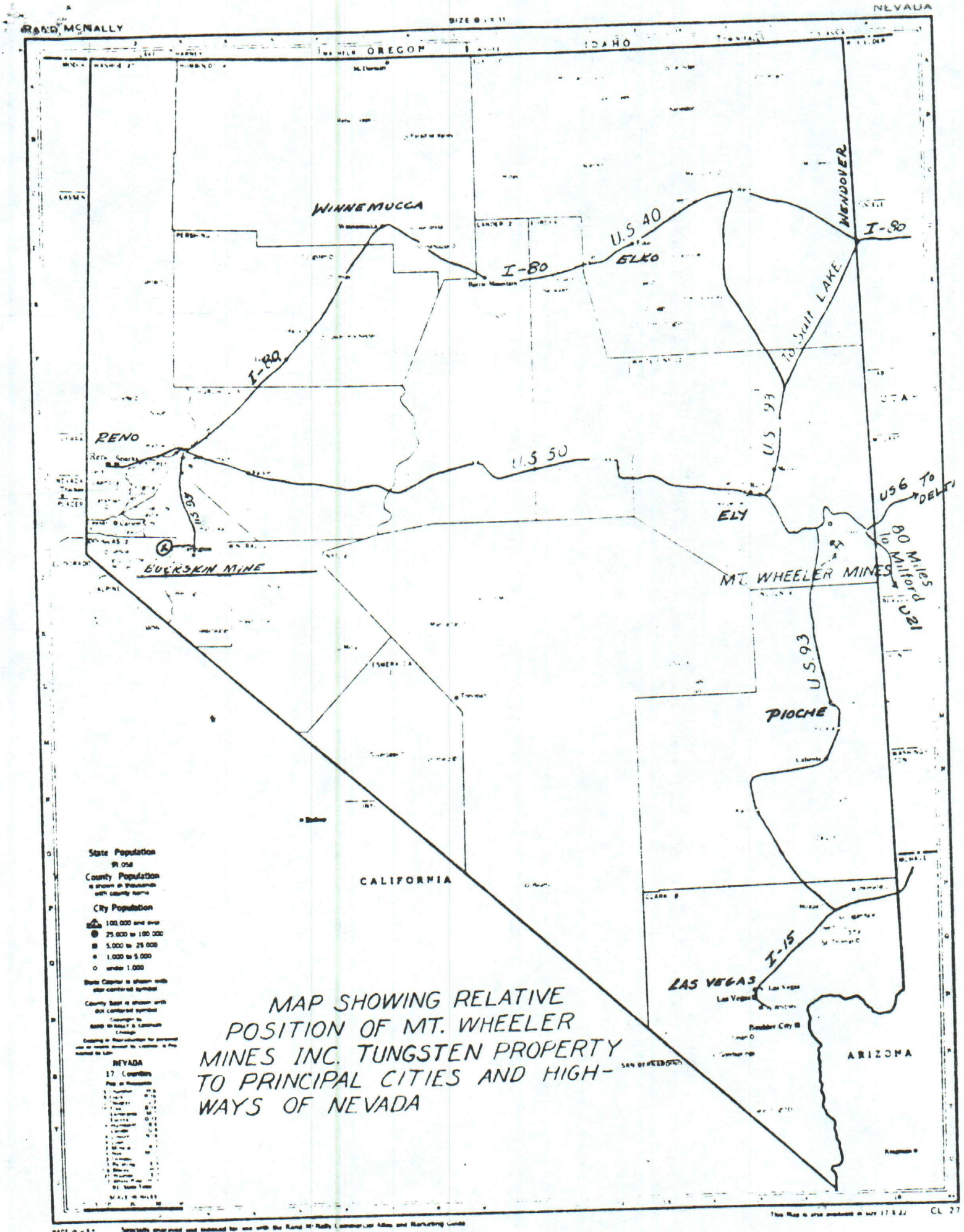
Results shown on the attached data sheets indicate good metallurgy can be expected on both copper and gold using a conventional treatment scheme for sulfide copper.

Respectfully submitted,

THE BOOTH COMPANY

S. S. Mele

SSM:ms



MAP SHOWING RELATIVE POSITION OF MT. WHEELER MINES INC. TUNGSTEN PROPERTY TO PRINCIPAL CITIES AND HIGHWAYS OF NEVADA

000394

1963+ 35 Item 22 (3+8) 9

MILO M. HARCOURT

Mining Engineer :: Nevada License No. 1342

THE BUCKSKIN MINE

LOCATION

The Buckskin Mine is located in the North-East corner of Douglas County, in the E½ Section 13, Township 13N, Range 23 E, MDB&M.

The property is reached by about 20 miles of graded, all weather road, travelling approximately due West of Yerington, county seat of Lyon County and the site of Anaconda Copper Company's Weed open pit mine. Some 85 miles North west is situated Reno, Nevada, the main supply center for the State.

PROPERTY

The property is comprised of seven patented claims, the Eva, Red Top, Red Top #1, #2, #3, Red Top Fraction and Buckskin. At the present time there is open ground adjoining on three sides.

HISTORY

The Buckskin mine was located in 1904 as a gold property and mining of the oxidized surface ore on 100 foot block leases continued until 1907 at which time mining was suspended because of the panic of that time.

The adit level which was mined primarily for gold, was stoped in a rather hit and miss fashion for widths from 5 to 20 feet or more. In the west end of this level, the sulphide copper ore was encountered and little mining was done.

On the 130 foot level, which has not yet been completely explored, some mining was done for sulphide copper. Sampling indicates widths up to 30 feet. The present water level stands at the back of this level, but less than a weeks pumping would completely dry up the workings, in fact it is believed that this time would unwater both the 130 and 230 foot levels. The 230 foot level is the lowest level in the mine. To the best of the writer's knowledge no mining has been done on the 230 or bottom level.

RECENT HISTORY AND EXPLORATION

In 1963 the writer, in charge for a Canadian group which had an option on the property, had six holes drilled, five of which intersected the veins at approximately the 230 level. One hole was lost at a shallow depth. Gold and copper values encountered in these holes were comparable with results as indicated by 173 samples taken on the adit and 130 level and an intersection in one hole approached in grade indicative samples from the 230 foot level which report both higher grade gold and copper.

In 1916, one of the prominent smelting companies optioned the property, sank a shaft and drifted several hundred feet on two levels.

In 1930, another mining company extended the workings in the oxide zone and built a small flotation plant which operated until 1936 at which time the property was acquired by yet another company which enlarged the existing mill and operated off and on for a number of years. It is reported that due to poor management and inadequate pumping facilities, the mine was not opened below the 90 foot level by the most recent operators.

CLIMATE, POWER, WATER SUPPLY

Winters are open, with temperatures rarely below zero and snowfall on the order of a few inches which rarely remains on the ground over several days. Rain is of no consequence. Summers are hot and dry with temperatures to around 100° being normal in July, August and September.

A main transmission line runs within two miles of the mine.

Water for milling and domestic purposes if not sufficient from the mine, may be supplemented by a well, probably artesian, within three miles.

MILO M. HARCOURT
Mining Engineer :: Nevada License No. 1309

GEOLOGY

"Mineral Resources of Douglas County", by Theodore D. Overton, a Nevada State Bureau of Mines publication, has the following to say as regards the Buckskin District: "Triassic sediments...intruded by granitic rocks resulting in intense metamorphism. Near the intrusives, the alteration of the country rock is widespread with silicification and development of sericitic and talcose rocks. Principal deposits are copper containing varying amounts of gold and silver...".

The twin vein structure of the Buckskin mine strikes about N60ØW, dipping steeply South, cutting both diorite (?) and monzonite porphyry. The structure is exposed for 1000 feet on the strike before going under valley fill. Minor mineralization can be seen both North and South of the major structure. Diagonal cross fracturing between the two parallel veins are mineralized giving a so-called "ladder structure".

The zone of oxidization, part of which shows copper sulphate, and some carbonate, is shallow, probably to a depth of around 80 feet maximum. Below this zone the ore consists of chalcopyrite, pyrite and gold and silver in a gangue of quartz and/or siliceous country rock.

000370

MILO M. HARCOURT
Mining Engineer :: Nevada License No. 1309

Under this drilling program, less than 50% of the strike length of the structure was drilled at which time a payment of $10,000 became due and the option was dropped.

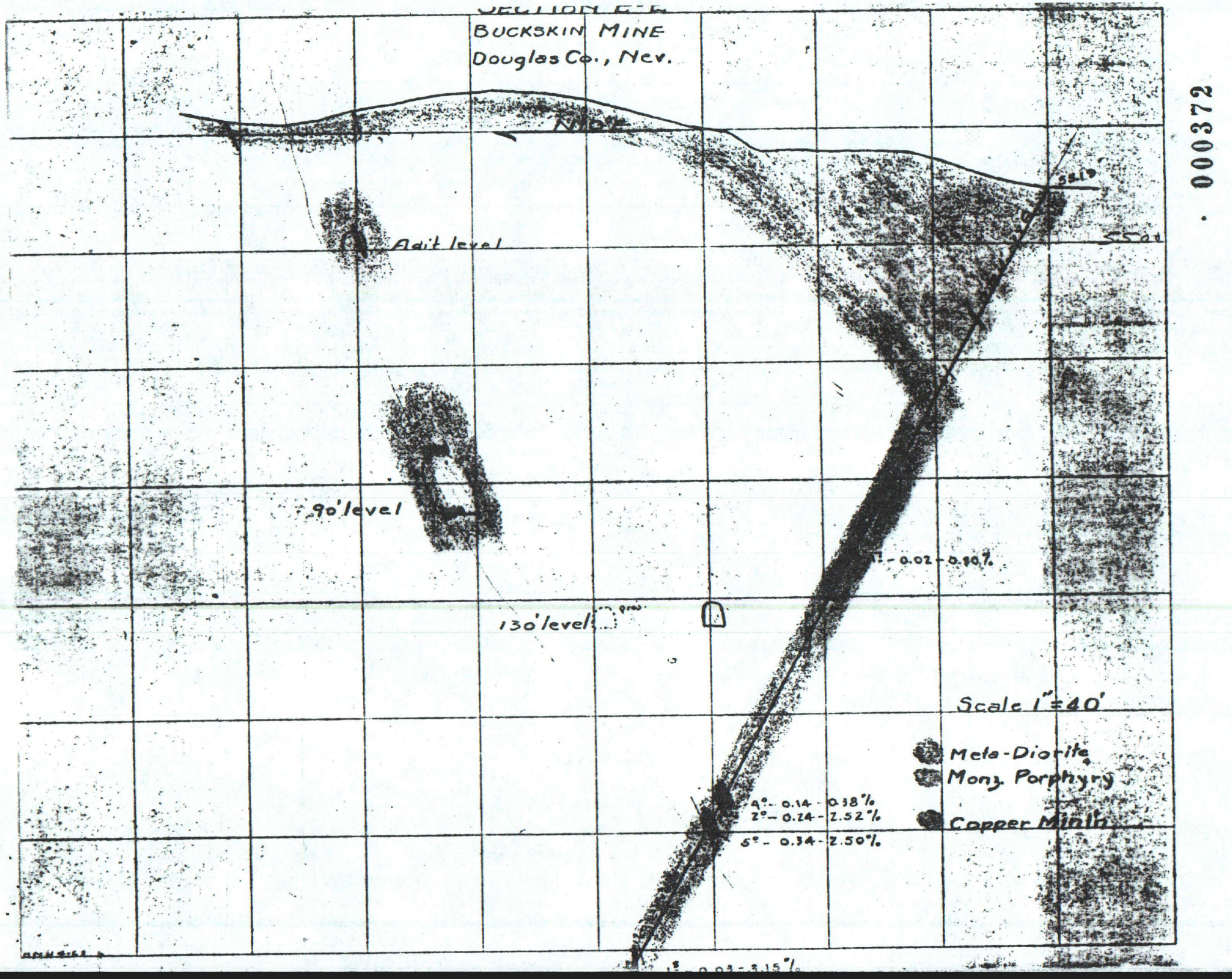
Utilizing results from sampling of the 90 and 130 level and assays of the core from drilling, the writer has arrived at an ore reserve of 100,000 tons of sulphide ore assaying 0.17 ounces gold and 1.57% copper over a width of 7.4 feet. Silver values, less than an ounce in all cases, were not included. These figures check closely with the weighted average of the drill holes alone which gave results of 0.19 ounces gold and 1.43% copper. Indicated values from a map of the 230 level give a weighted average of 0.45 ounces gold and 3.3% copper. This information was not used in calculations as it seemed too high and the map was questionable.

The writer has recently obtained an option on the property under terms which are most reasonable.

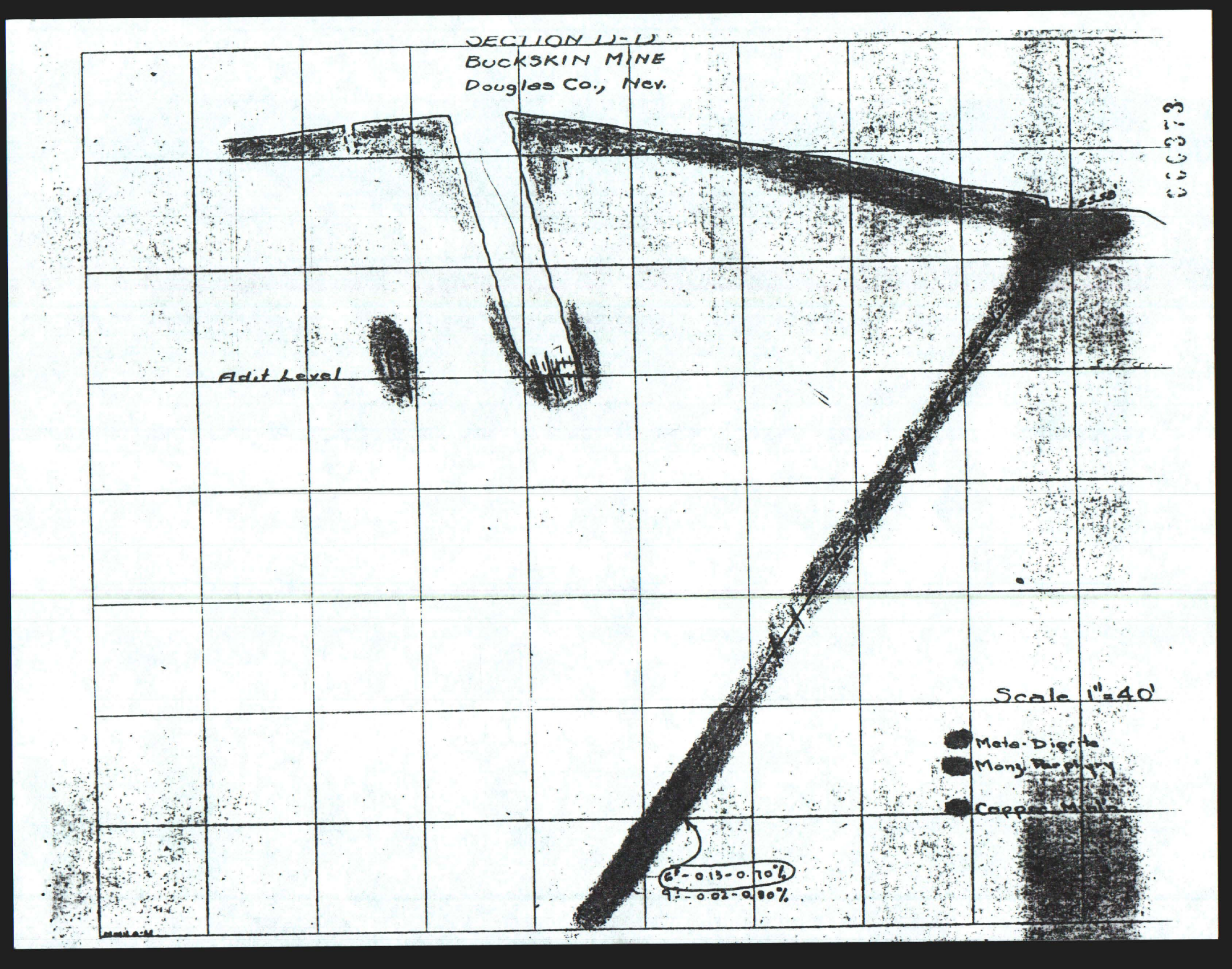
It is the writer's belief that the following project is warranted:

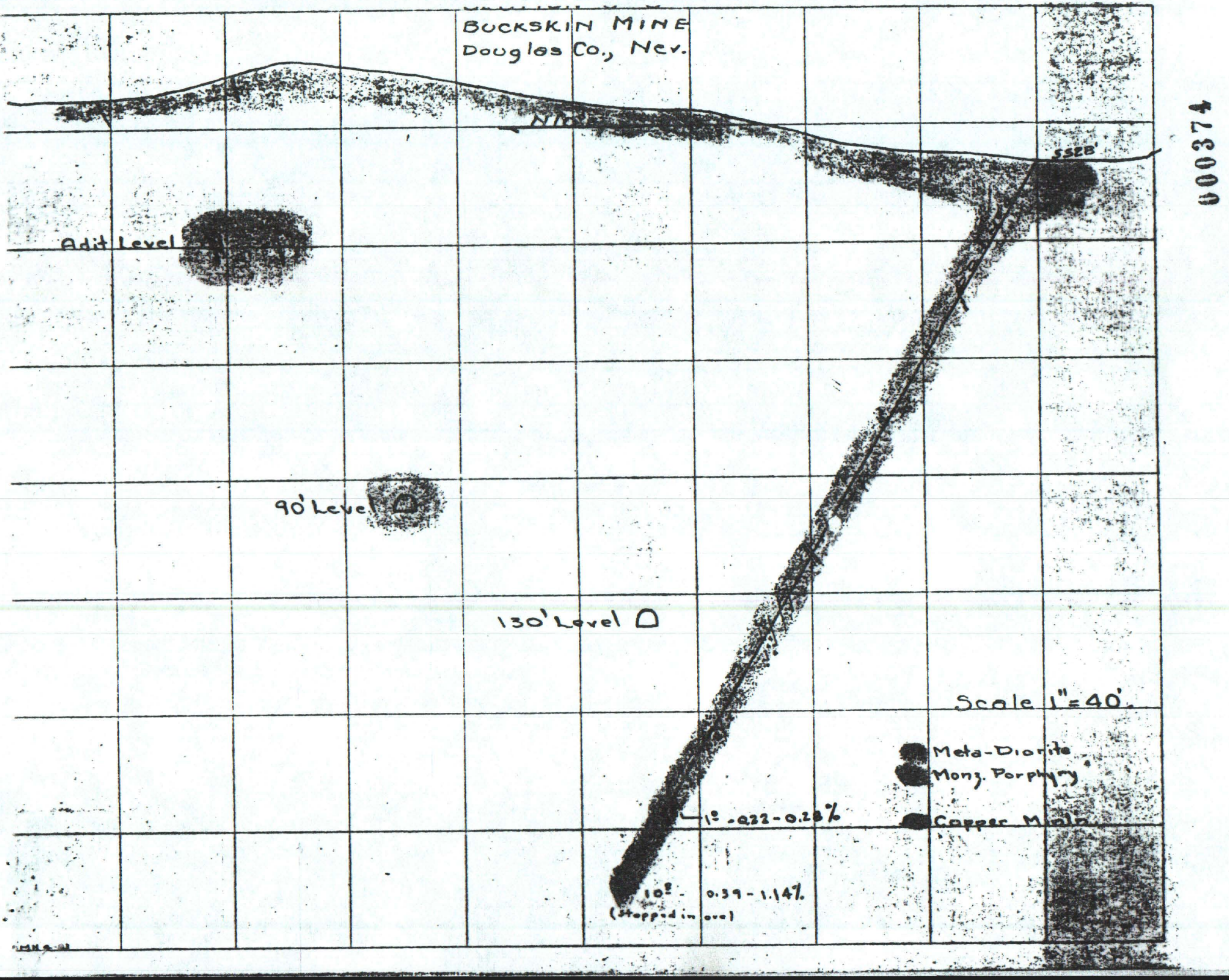
1.	Unwater workings	$1500
2.	Map geology	2000
3.	Check sample	500
4.	2000' diamond drilling	15000
Total cost of project		$19,000

Milo M. Harcourt

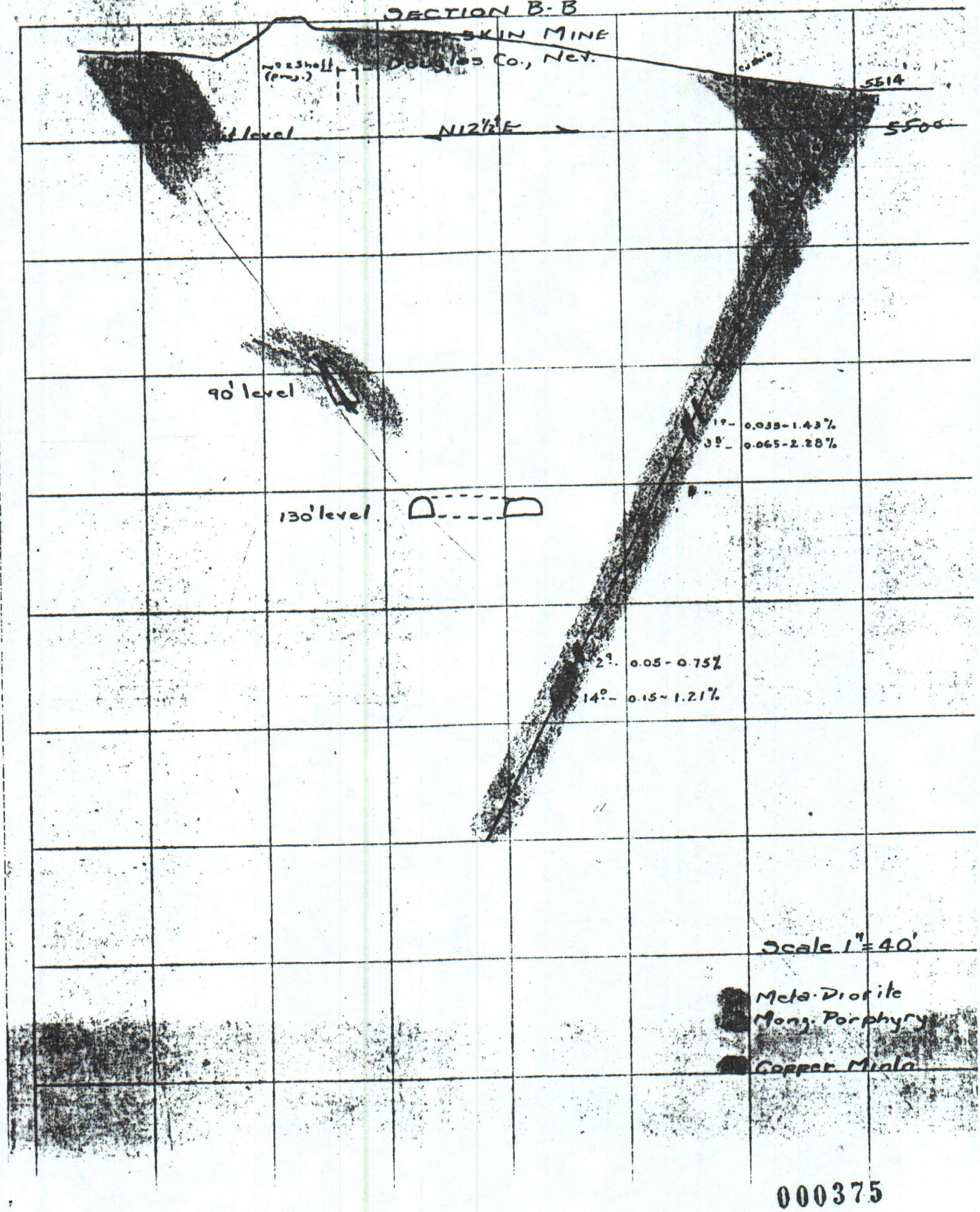

SECTION E-E
BUCKSKIN MINE
Douglas Co., Nev.
N 80°
Adit level
90' level
130' level
0.02 - 0.80%
Scale 1"=40'
Mela-Diorite
Mony. Porphyry
Copper Minth
4° - 0.14 - 0.38%
2° - 0.24 - 2.52%
5° - 0.34 - 2.50%
0.03 - 3.15%

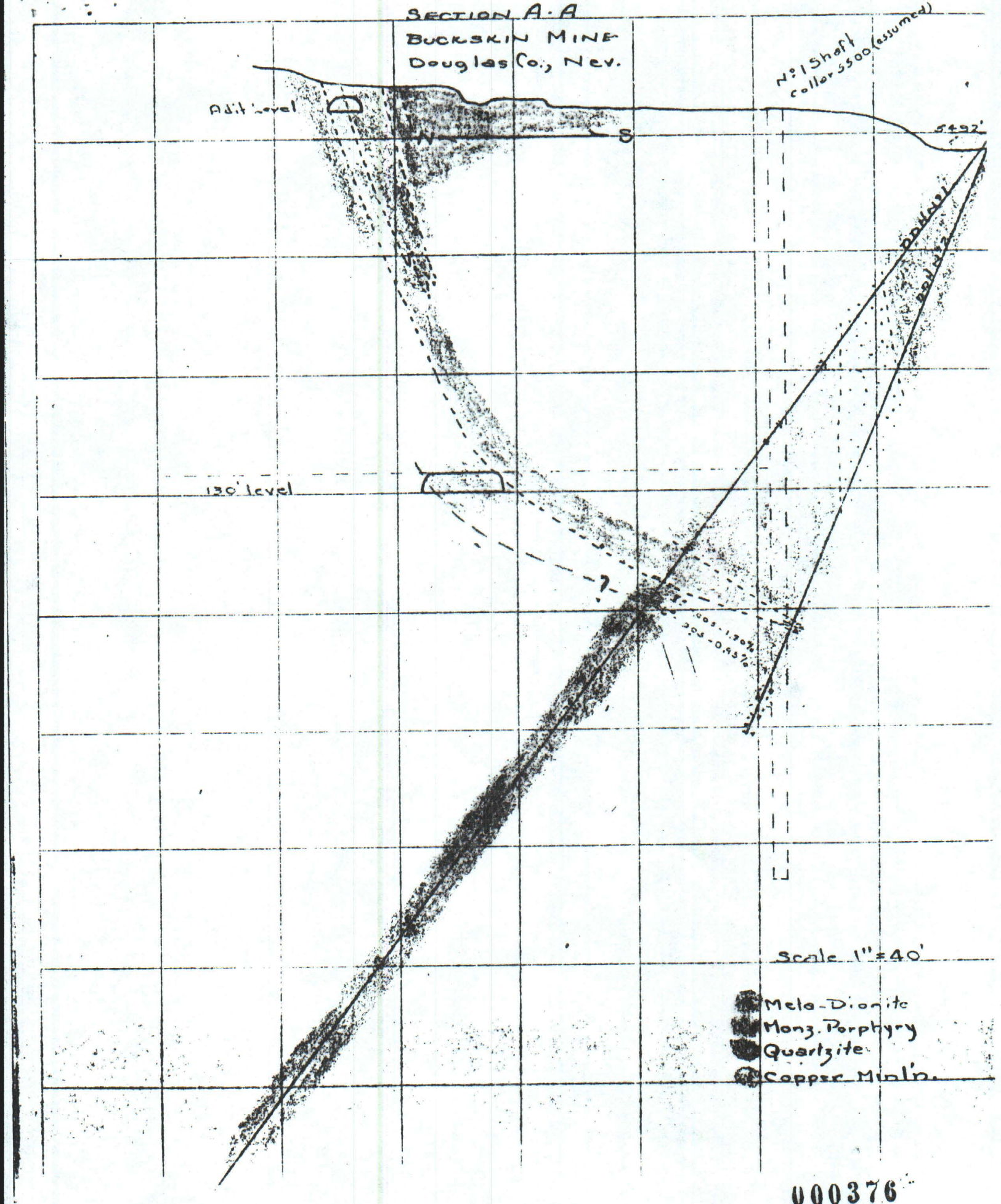
SECTION D-D'
BUCKSKIN MINE
Douglas Co., Nev.




BUCKSKIN MINE
Douglas Co., Nev.
5528'
Adit Level
90' Level
130' Level
Scale 1"=40'
Meta-Diorite
Monz. Porphyry
Copper Mtn.
10' - .022 - 0.28%
10' - 0.39 - 1.14%
(Stopped in ore)

000374


SECTION B-B
SKIN MINE
Douglas Co., Nev.
5514
5500
N12½°E
90' level
130' level
19 - 0.035-1.43%
38 - 0.065-2.28%
2 - 0.05-0.75%
14 - 0.15-1.21%
Scale 1" = 40'
Meta-Diorite
Mong. Porphyry
Copper Meta


SECTION A-A
BUCKSKIN MINE
Douglas Co., Nev.
No. 1 Shaft collar 5500 (assumed)
Adit level
N
S
5492'
130' level
?
Scale 1" = 40'
Mela-Dionite
Monz. Porphyry
Quartzite
Copper Min'n.

000376

A.I.Ch.E.

JAMES D. WILLIAMS
CHEMICAL ENGINEER
MINERALS EXPLORATION & DEVELOPMENT

A.I.M.E.

409 FELT BUILDING
SALT LAKE CITY, UTAH 84111

TELEPHONE

P.O. BOX 1446
SALT LAKE CITY, UTAH 84110

DW Stat

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Item 78 2D
MARC (4 of 8)
9

BUCKSKIN MINE

LOCATION

The Buckskin Mine is situate in Section 13, Township 13 North, Range 23 East and Section 18, Township 13 North, Range 24 East, Mt. Diablo Base and Meridian, in the extreme easterly portion of Douglas County, Nevada, six miles due West from the Yerington copper pit of the Anaconda Company. The town of Yerington is some 13 miles Easterly via a gravel road.

The mine workings are in the South end of the Buckskin Range at elevation 5,000 feet just above the pediment area of Smith Valley. The topography at the mine rises gently to the West and North.

Three miles to the East of the mine is a large commercial sand and gravel operation and a 23,000 volt three phase power line runs within about one and one half miles to the East. The valley is a good aquifer as indicated by Artesia Lake, a few miles to the South, which is fed by underground springs.

Weather conditions are fairly mild and permit all year operations. Very little snow falls upon the lower Buckskin Range and winter temperatures are usually above freezing. Rainfall is generally light.

The property consists of six patented mining claims and a patented fraction.

HISTORY AND PRODUCTION

The original mining claims were located around the turn of the century as gold prospects and were patented in 1913. No records exist as to production but it is known that gold-copper crude ore was shipped to the Wabuska smelter during World War I, and that gold ore was milled at various times during the period 1930-1950, as indicated by mill foundations remaining at the mine.

It is not possible to estimate with any degree of certainty the total tonnage of ore which may have been produced, but from stoping indication in the surface tunnel and on the 90' and 130' shaft levels, it would appear that any such production was probably less than 5,000 tons, plus a possible additional 5,000 tons from development drifts on the three levels.

The gold stope or 'glory hole' which was stoped from the surface tunnel level to the surface, having a section of 60' along strike by 20' in width, suggests ore of high gold content was produced. This assumption has been well confirmed by diamond drill holes cutting vertically below this stope area.

UNDERGROUND WORKINGS

A two compartment vertical shaft; 4½'x4' hoisting compartment and 3½'x4' manway, opens the underground levels. A total of approximately 2,500 feet of drifting has been done in the mine; 1,500 feet in the surface level, 230 feet in the 90' level, 670 feet in the 130' level and possibly 200 feet in the 250' level. Well over 50% of this development work has been done along and within the Buckskin Lode and in good ore as is amply demonstrated by the assay map of the levels. The 250' level has not been visited by the writer, nor is a map of it available, however, a report by an 'old timer' who worked there during World War 1, represented that the highest grade ore in the mine was being developed. This is confirmed by publication in the Mines Handbook for the years 1919 through 1923. Our recent diamond drill holes below this level also confirm these estimates.

Water stands in the shaft at about the 90' point. When the 130' level was unwatered in 1955 for the purpose of sampling, the mine was making about 20 gallons per minute. Later, unwatering was reported to have reached about 50' above the 250' level at which point the flow approximated 50 gallons per minute. From all evidence available, we think the flow from the 250' level will be somewhat less than 100 gallons per minute - sufficient for a milling operation. At that time, all underground workings were in good condition; the ground holds well and should present no unusual mining problems. The shaft timber is in splendid condition to the 130' level and is reported good as far as unwatering went.

PRESENT OPERATOR

The Buckskin was first examined by the writer in 1955 while it was being unwatered and sampled by third parties.

Check sampling was permitted and a copy of the completed assay map was obtained. Efforts were made during the ensuing years to acquire the property and in 1970 a purchase agreement was negotiated with the owner by Lion Hill Mines, a mining partnership of James D. and Ruth T. Williams, stipulating yearly payments to 1976. Final payment was made December 10, 1975, and title was conveyed to Lion Hill Mines by deed.

During the Fall of 1970, Lion Hill Mines re-established the corners of the patented mining claims which had been obliterated over the years, found and set the Section corners and plotted surface geology; all with plane table control. The surface tunnel was also mapped and sampled.

During 1971, 1972 and 1973, twelve diamond drill holes were drilled from the surface at various angles into the Buckskin Lode extending the vertical depth of the Lode to a point 400 feet below the surface; no effort being made to extend this deeper since our private funds were limited. The drilling extended over a strike length of some 1,000 feet, but was concentrated along a section of the lode 450' in length which we have designated as the Central Ore Zone. Expenditures by Lion Hill Mines since 1970 has amounted to $155,216 cash. This covers only acquisition and exploration.

All pertinent data covering the mine and drilling is represented by comprehensive 40-scale plan and section maps, assays and underground assay maps, assay certificates and engineering and geological reports; the metallurgy of the ore, based upon drill core rejects, showing good recovery of metal values in a high grade gold-copper concentrate, is available for inspection and study in our Salt Lake office.

TONNAGE AND GRADE

The attached engineering report by Louis W. Cramer, Consulting Geologist and Engineer, Salt Lake City, Utah, well states the grade and tonnage of ore delineated within the Central Block from the surface tunnel to the depth of 400 feet based upon underground assays and drill core samples, showing 391,300 tons assaying 0.20 oz. gold and 1.30% copper, plus 125,200 tons assaying 0.12 oz. gold and 1.30% copper.

So far as we have been able to determine, the Buckskin Lode continues Westerly from this Central Block approximately 1,000 feet to the end line of the claims and some 1,500 feet Easterly to the end line of the claims and there is absolutely no suggestion that limits its vertical extent. As a matter

of fact, the highly brecciated character of the ore cores from this Central Block strongly suggests we may be in a breccia pipe situation which has always been considered most favorable for deep seated ore zones.

FUTURE EXPLORATION

The property affords a number of additional exploration targets once the mine is in operation and a more complete understanding of the geological framework of the Buckskin Lode is adduced. The East-West extension of the Lode has been mentioned as has also the vertical continuation below the 400' point. Some 700' North from the Buckskin Lode is another well mineralized fissure zone with an East-West strike and a steep South dip. It was probably mined for gold in the past since random dump samples assayed 0.07 oz. gold and remnants of an arrastre remain nearby. The shaft appears to be open sufficiently to permit underground examination.

Active deeper drilling by a major copper company on adjacent mining claims owned by it has been in progress for three years. The apparent target seems to be a basement situation corresponding to a Yerington type ore body. Field reports suggest that results to date have been encouraging.

ECONOMICS

The Buckskin Mine was originally evaluated on the basis of the 516,500 tons of ore in the Central Block from the surface tunnel to the depth of 400 feet having a weighted assay of 1.30% copper, 0.18 oz. gold and 0.50 oz. silver per ton at metal prices of $0.60 per pound for copper, $100 per ounce for gold and $2.50 per ounce for silver, resulting in a gross metal value of $35 per ton of crude ore. At current metal prices the gross value per ton would be $50 and with the estimated near future prices for gold and copper, we may anticipate a gross ore value of $60 per ton. Metallurgical testing indicates an economic recovery of plus 90% of the metals in the crude ore. Current indicated ore reserves will support a 200 ton per day mining and milling operation for a minimum period of ten years. Additional exploration and development should increase this term substantially.

March, 1978

James D. Williams
Managing Partner
Lion Hill Mines.

JDW:s
Encl.

N.B. In 1974 grading was completed for a 150 ton mill, about one-third of the reinforced steel concrete foundations poured and a 65' high fabricated steel two compartment headframe was installed, at an additional cost of approximately $45,000.

(35)

1962 Item 22

(588)

BUCKSKIN MINE

DOUGLAS COUNTY, NEVADA

LOCATION & HISTORY

The Buckskin Mine is located in Douglas County, Nevada 35 air miles South East of Reno. It is comprised of 11 patented claims and can be reached by a good gravel road 15 miles in length from a point on Alternate Highway 95, 2 miles North of Yerington, Nevada.

Not much is known of the past history of the mine. It was evidently discovered in late 1800's and a small mill was constructed. From the tailings dump this mill did not treat much ore possibly 10 to 15,000 tons. The mine was developed as a gold mine but in places it carries an appreciable amount of copper. In 1955 a small Nevada Mining Exploration Company "The Nev-Tah Oil & Mining Company" took an option on the property from the owner Mr. Schultz. This company was interested in the copper portion of the zone. The main shaft No. 1 which is down to the 3rd 230 feet was caved at the collar and the timber in poor condition to the water level at 130 ft. Mr. H. A. Weiler for Nev-Tah Oil & Mining Company built a headframe, replaced the collar and re-timbered the shaft to 130 ft. The timber below the water was in good condition. The mine was dewatered to the 180 ft level. Samples in the copper portions of the zone were taken on the Adit Level, the 90 foot Level and the 130 foot level. The Company started to dewater the mine to the 230 foot level but ran short of funds and had to abandon the property.

GEOLOGY

The rock observed on the property is monzonite porphyry. There are two parallel ore zones occupying faults striking North 100° that are replaced with silica and mineralized by pyrite and chalcopyrite. The surface ore down to the 130 ft level is oxidized to limonite and malchite. From the dump of number 1 shaft the ore below the water level appears to be pyrite and chalcopyrite. In places the ore is more than 30 ft wide and the average in places is 15 to 20 ft.

DEVELOPMENT

The main number 1 shaft is a 2 compartment and is vertical to a 230 foot depth with drifting reported on this level.

On the 130 foot level there is 200 feet of X cuts and 600 feet of drifting has been done on the zone. 500 feet of the drifting has been sampled and shows ore values.

Number 2 shaft is a 2 compartment vertical shaft in good condition to 20 feet above the water level which is at about the 150 foot level. At 70 feet there is a 100 ft Xcut North.

At the 90 foot level there is 225 feet of drifting to the west. Of this 175 feet has been sampled and show widths of 15 to 20 feet of ore.

130 feet below the collar and 20 feet above the water a 20 ft X cut North cuts a vein 5 feet from the shaft which dips North at 60°. A 6 ft sample assayed Au. .04 oz., Ag. .30 oz., Cu. 2.05%. This may be another zone. The other zones dip South.

On the Adit Level there is 225 feet of X cuts and 1450 feet of drifting. Of this 175 ft was sampled. A considerable portion of the drifting has been stoped on for gold. No samples were taken on these areas.

There are also several raises, shallow shafts and open cuts on surface. One cut sampled across 6.0 ft assayed .19 oz. Au.

A check sample by the writer of sample No. 24 which on Nev-Tah Oil & Mining map assayed across 6.0 ft 1.55% Cu., .36 oz. Au., .10 oz. Ag. gave 7.0 ft 1.70% Cu., .43 oz. Au., .25 oz. Ag.

On surface 4 dumps were sampled and returned:

(1)	Au. .17 oz.	Ag. .27 oz.	Cu. 1.20%
(2)	Au. .12 oz.	Ag. .64 oz.	Cu. 2.58%
(3)	Au. .10 oz.	Ag. .22 oz.	Cu. .68%
(4)	Au. .085 oz.	Ag. .36 oz.	Cu. .65%

A sample of Mill Tailings dump assayed Au. .11 oz., Ag. .09 oz., Cu. not assayed.

CONCLUSIONS

From the Nev-Tah sampling there appears to be a fair length of copper gold ore averaging .20 oz. Au. and 2% Cu. over widths of 10 to 30 ft.

Nev-Tah Oil & Mining Company took large samples averaging 35 lbs. The assaying was done by Deason Nickols, a reputable Salt Lake Assay Office. There is no reason to doubt the sampling and assaying on the enclosed map.

To properly assess the property the mine should be dewatered to the 230 ft level and sampled. The estimated cost of this allowing some contingencies for timbering and cleaning up would be about $5000.

Respectfully submitted

Roy A. Martin

ROY A. MARTIN

NORANDEX INC.

Date Submitted 1962

Received By

USGS Map Coverage Walker Lake

PROPERTY SUBMITTAL

Property Name Buckskin Mine

Commodity Cu, Ag, Au

Location: General Statement 35 air miles southeast of Reno

State Nevada County Douglas

Section Township Range

Mining District Elevation

Accessibility good gravel road 15 miles on Alternate Hwy. 95, 2 miles north of Yerington, Nevada

Land Status: (Claims: Name and Number, etc.) 11 patented claims

Ownership: (Names and Addresses of Owners) Roy A. Martin

General Geology: (Type of Deposit) Rock on property is monzonite porphyry.

Assays

Work Done On Property To Date: (History of Development) Discovered in late 1800's and a small mill was constructed.

Owner's Proposed Terms

000379

35
Item 2 a
(6 of 6)

JANUARY 1986

PIT

#1 SHAFT

ADIT

AL-3

ADIT-WEST

130-LEVEL

#16

#10

CAVE

CAVE

190-L

290 STOPE

230-LEVEL

290-LEVEL

CAVED

DECLINE

34DL

65'

LEGEND-

- UN-MINEABLE VEIN
- ORE
- MINED THIS MONTH
- WASTE

PACIFIC SILVER CORP.

BUCKSKIN MINE

SCALE: 1"=100'	11/5/85	RSH

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Item 22 (7 of 8) 9

Buckskin Reports

1

A. Syverson, Feb. 19, 1930, Report on the Moore, South Jackson, and Buckskin Mines, Properties of the Moore Mining Company Jackson, Amador Co., Calif.
(Also called Report on the Moore Mining Company and the Buckskin Consolidated Mines Company (Now the Moore Mining Company)); 15p. plus map (cross section)

Snider, L.E.; a 1929 report - NO copy! (ref. by Carpenter (1937) and unknown (handwritten report re loan ~1937?))
Also Map: Assay map of the Buckskin mine drawn in conjunction with report, Oct. 1934 (gold $20.67/oz) (Have it!)

Carpenter, Jay A, 1937, march 17; Report on the Buckskin mine of the Ambassador Gold Mine, Ltd., for Paul G. Hoffman and E.R. Carpenter; 6p.

?? march 14, 1937, visit; technical data on operations 5p.

???? ~ 1937?; handwritten report 3p. "subject: A $5000 loan to the Buckskin mine to unwater flooded portions of supposed value.

Sharp, Frank, 193(7?); Buckskin mill, Buckskin District, Douglas Co., NV, Operated by Ambassador Gold Mines, Ltd. 8p.

??, post-May 1950; Criticism of Report on Buckskin mine Douglas Co., NV. 4p.

Buckskin Reports.

Goodale, Frank A., 1910, Yerrington-Buckskin Copper District; The Colorado School of Mines magazine, (ME thesis); p. 3-8; Kennedy Cons. on p. 8.

Overton, T.D., 1947 Mineral Resources of Douglas, Ormsby, and Washoe Counties; Univ. Nev. Bull. V. 41, no. 9 pp. 21-22

Harcourt, Milo M., 1963 or later; The Buckskin mine; 5 pp. plus cross sections of 5 D.H.'s

Payne, John G., 1974, Buckskin mine, Geology notes & Ore Potential above Tunnel level; 10p.

Martin, Roy A., 1962, Buckskin mine, Douglas Co., NV; 2p. plus submittal form for NORANDEX, Inc.

Williams, James D., 1978 - 4p. and Cramer, Louis W., 1973, Buckskin mine 4p. Lion Hill mines

35
Item 22
(8/98)

BUCKSKIN GOLD COPPER MINE

PACIFIC SILVER CORPORATION

DOUGLAS COUNTY, NEVADA

By

Peter Joralemon

14 October 1986

BUCKSKIN GOLD COPPER MINE

PACIFIC SILVER CORPORATION

DOUGLAS COUNTY, NEVADA

Summary and Conclusions

Pacific Silver Corporation and earlier companies carried out a 40 hole drilling program to develop ore on the Buckskin vein. This suggested the presence of about 500,000 tons of ore grading 0.20 oz. Au per ton with about 1% Cu. Despite the fact that core drilling is considered more useful in establishing ore structure than ore grade, Pacific Silver accepted these figures and made the decision to put the mine into production. The mine has lost money since start-up.

There are a number of causes for this failure. First, the relatively widespread drill holes did not show the numerous flat faults which had divided the vein into a series of closely spaced but isolated slivers or fault segments (the accessible underground workings did not show this faulting either). Also, the drilling did not emphasize the intense shattering of the vein and enclosing wall rock which was an invitation to uncontrolled wall rock dilution.

Second, there is substantial reason to believe that the best gold values are restricted to softer portions of the vein, and that the drill holes will have a tendency to deflect into the softer seams, thus giving an exaggerated idea of the gold value. As a result, the drill indicated grade was twice the realized grade.

Third, the grab sampling techniques upon which grade control in mining was based depended on bulk samples taken generally from the finer or softer portions of the ore. This again gave an abnormally high gold value, 0.15 opt as compared to the realized 0.10 opt.

Finally, the lack of continuity of ore blocks because of the faulting increased the mining cost to a total of $47 a ton, or $448 per ounce of gold recovered. Without the complex faulting, the cost of mining could have been as low as $35 a ton.

The cost of removing the remaining ore pillars will be substantially higher.

The principal causes of failure, in retrospect, seem to be that: 1.) Pacific Silver was in too much of a hurry to get into production and did not adequately check the figures upon which a profitable operation had been based; and 2.) that Pacific Silver continued the operation long after it should have become clear that the

recovered grade was far below the drill indicated grade.

A shut-down of the operation was inevitable but should have come far sooner.

Yerington Nevada
14 October 1986

Peter Joralemon, PhD

BUCKSKIN GOLD COPPER MINE

PACIFIC SILVER CORPORATION

DOUGLAS COUNTY, NEVADA

Introduction

The Buckskin Mine is in the far eastern part of Douglas County, 6 miles west of the big Anaconda copper pit at Weed Heights (now idle), and 13 miles west of the town of Yerington by way of Mason Pass. It is accessible by passenger car over a fair graded road.

Abundant water and a 23,000 volt three phase power line are a few miles from the property.

History

Early production records are lacking, but it is likely that some high grade copper ore was shipped from the Buckskin Mine to the Wabuska smelter during World War I. Small amounts of additional ore were produced and milled on the property between 1930 and 1950. Total production to 1950 did not exceed 10,000 tons.

At some time prior to 1980, an unnamed company (Anaconda?) drilled twelve core holes on the Buckskin property, probing the ore zone for a strike length of 1500 feet and to a depth of nearly 400 feet. At the time of this work, the price of copper was high, of gold, low, and most of the drilled ore intersections were assayed for copper, not gold.

I first examined the Buckskin Mine in August, 1980, mapping and sampling the accessible old workings. At that time, I recommended that no action was justified, not because of lack of ore but because of unrealistic terms demanded by the underlying property owners.

In the early 1980's, Pacific Silver Corporation optioned the Buckskin Mine, drilled some thirty additional core holes, and reopened the mine. Pacific Silver also drove an extensive decline to reach and develop the 340 level and to serve as an ore haulage way. It also did a substantial amount of underground longhole percussion drilling. The drilling program suggested an ore body of at least 500,000 tons, grading 0.20 oz. Au and about 1% Cu. This compares with an earlier estimate, based on the first dozen drill holes, of 700,000 tons at 0.15 opt Au and 1.3% Cu.

The drilling suggested that a commercial operation was possible and Pacific Silver made the decision to put the mine into production. A moderate sized flotation mill was constructed with

facilities to recover additional gold by cyanidation of the flotation tailings.

The mine was put into production several years ago and produced 160,000 tons of ore with a recovered grade of 0.10 oz. Au and 0.7% Cu. Copper concentrates were shipped to a smelter in Korea which paid for the copper and contained gold. Pacific Silver recovered additional gold by cyanidation of the flotation tailings, refining it on the property.

Falling metal prices, unusually high mining costs, and the fact that the realized grade was only half that suggested by drilling forced the shutdown of the mine during the past summer.

The mine is now largely flooded and most of the workings are probably caved.

I discussed these developments with Pacific Silver geologist Carl Pescio on September 30, 1986. At that time, Pescio turned over to me a complete set of mine sections and plans.

Mine Workings

Earlier underground workings developed the Buckskin ore bodies on the 70, 90, and 130 levels leading from the vertical Main Shaft. A deeper level at 230 foot depth was started before the old operation closed.

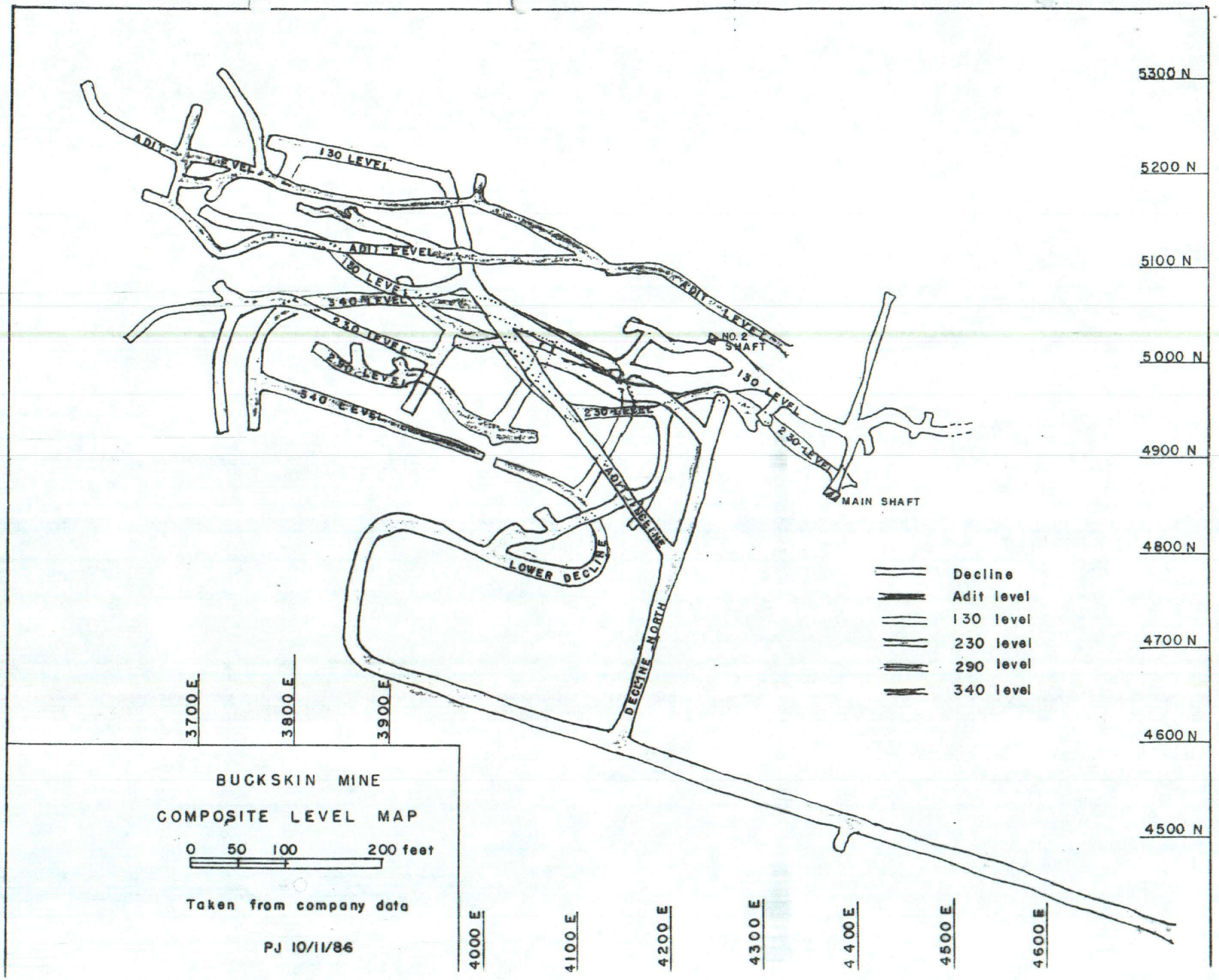
Pacific Silver drove a decline to tap the 130 and 230 levels and to drive a new 340 level. The workings are shown on the accompanying composite map.

Where shallow ore was wide enough, Pacific Silver mined it in an open pit which was stopped when the stripping ratio became prohibitive. Below that level, ore extraction was almost entirely by shrinkage stoping in which ore is broken and removed to leave open stopes which are then allowed to cave. It is an economical mining method but not necessarily the most effective when dilution through wall rock sloughage may start before the ore has been removed.

Geology

The Buckskin claims are underlain by flows of Triassic andesite and dacite, cut by dikes of andesite porphyry. Quartzite beds overlie the volcanics north of the mine and may represent the upper plate of a strong thrust fault.

A N 70°W shear zone, up to 60 feet wide, cuts across the property, dipping at about 60° ~~70~~ the south. This has been mineralized along a strike length of at least 1000 feet and has been traced to a depth of 340 feet.


ADIT LEVEL
130 LEVEL
ADIT LEVEL
130 LEVEL
340 LEVEL
230 LEVEL
290 LEVEL
340 LEVEL
ADIT LEVEL
NO. 2 SHAFT
130 LEVEL
230 LEVEL
MAIN SHAFT
ADIT LEVEL
LOWER DECLINE
DECLINE NORTH
5300 N
5200 N
5100 N
5000 N
4900 N
4800 N
4700 N
4600 N
4500 N
3700 E
3800 E
3900 E
4000 E
4100 E
4200 E
4300 E
4400 E
4500 E
4600 E
Decline
Adit level
130 level
230 level
290 level
340 level
BUCKSKIN MINE
COMPOSITE LEVEL MAP
0 50 100 200 feet
Taken from company data
PJ 10/11/86

The entire shear zone does not constitute ore. Rather, ore shoots from 6 to 15 feet wide lie along the footwall or hanging wall of the zone, or both. The central portion is generally submarginal.

The ore is composed of vuggy quartz and calcite with sections of altered andesite. Minor amounts of pyrite and chalcopyrite apparently contain the bulk of the gold.

The ore zone has been cut and displaced by a complex series of flat lying faults, as shown in the accompanying cross-sections. The result of this faulting has been to break the ore zone into a series of slivers of very limited vertical persistence. Faulting has also shattered the vein walls to the extent that substantial wall rock dilution was encountered.

The accompanying longitudinal section shows the relation of ore to these flat faults. To the west, the limits of ore appear to be controlled by the AL-3 fault. At depth, no ore has been found beneath the No. 13 fault. To the east, the Upper Ore Shoot lies directly above the No. 12 fault, the Lower Ore Shoot above the No. 3 fault. Thus, the ore zone appears as a parallelogram bounded by the AL-3, the No. 13, and the Nos. 3 and 12 faults.

Ore Grade

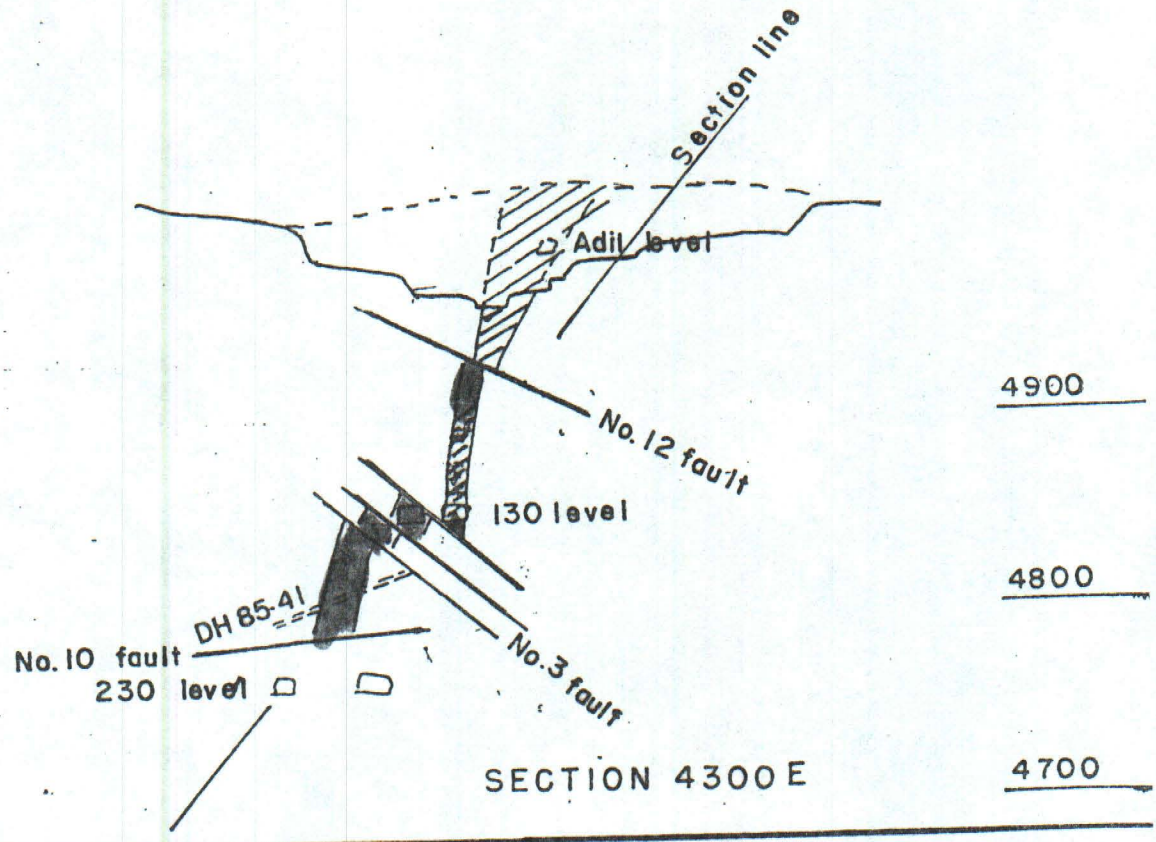
A number of estimates of ore grade have been made, based on various levels of data. Prior to 1980, Salt Lake geologist Louis Cramer estimated the grade of reserves at 0.15 oz. Au with 1.3% Cu. He depended entirely on the results of the first twelve drill holes for his figures.

In 1980, I arrived at an ore grade of 0.17 oz. Au with 2.2% Cu to a depth of 180 feet, using both the earlier drilling and the results of channel sampling on the accessible upper levels.

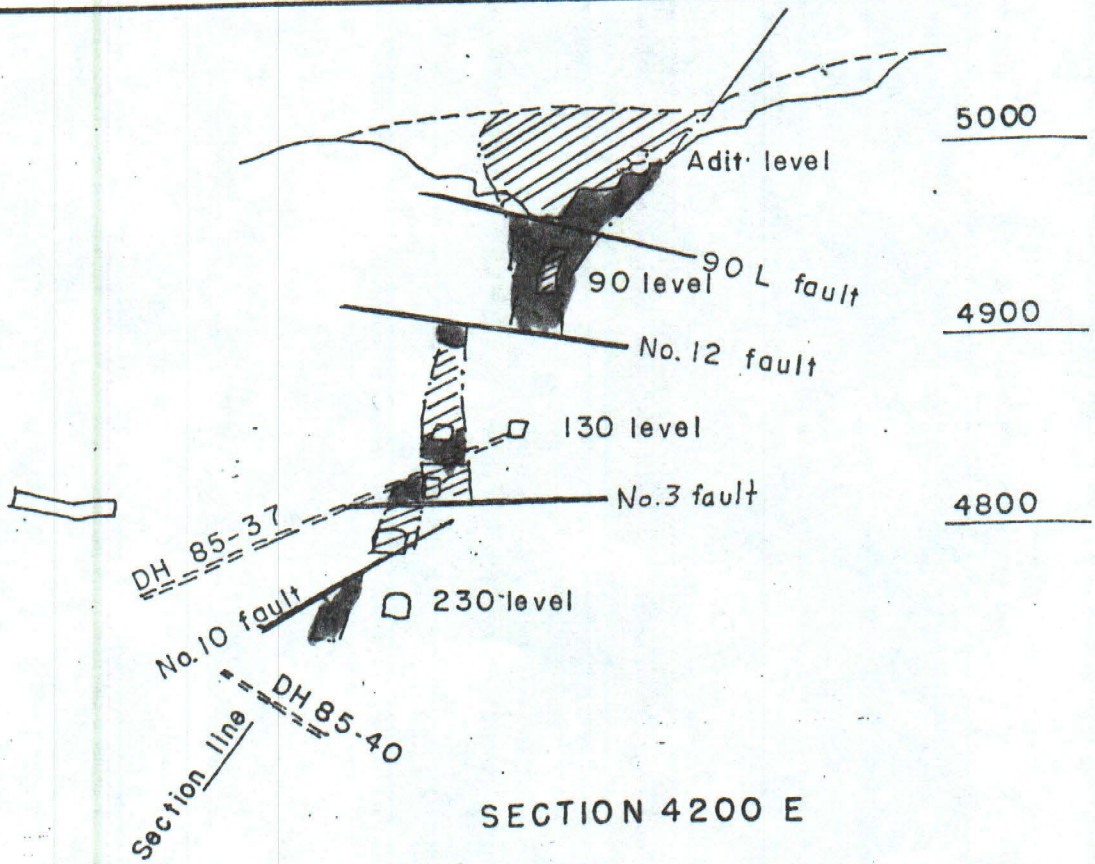
Carl Pescio reported to me that, based on assays from the 40 drill holes before testing underground, Pacific Silver estimated the ore grade at 0.20 oz. My own calculations, using the same data, suggests a gold value within the vein of 0.22 oz.

In mining this ore body, Pacific Silver hoisted and stockpiled separately each blasted round of from 5 to 30 tons of ore. A 50 pound grab sample of each ore pile was taken and assayed, and the mill feed grade was determined by these assays. The arithmetic average of hundreds of these small ore piles is 0.15 oz. per ton.

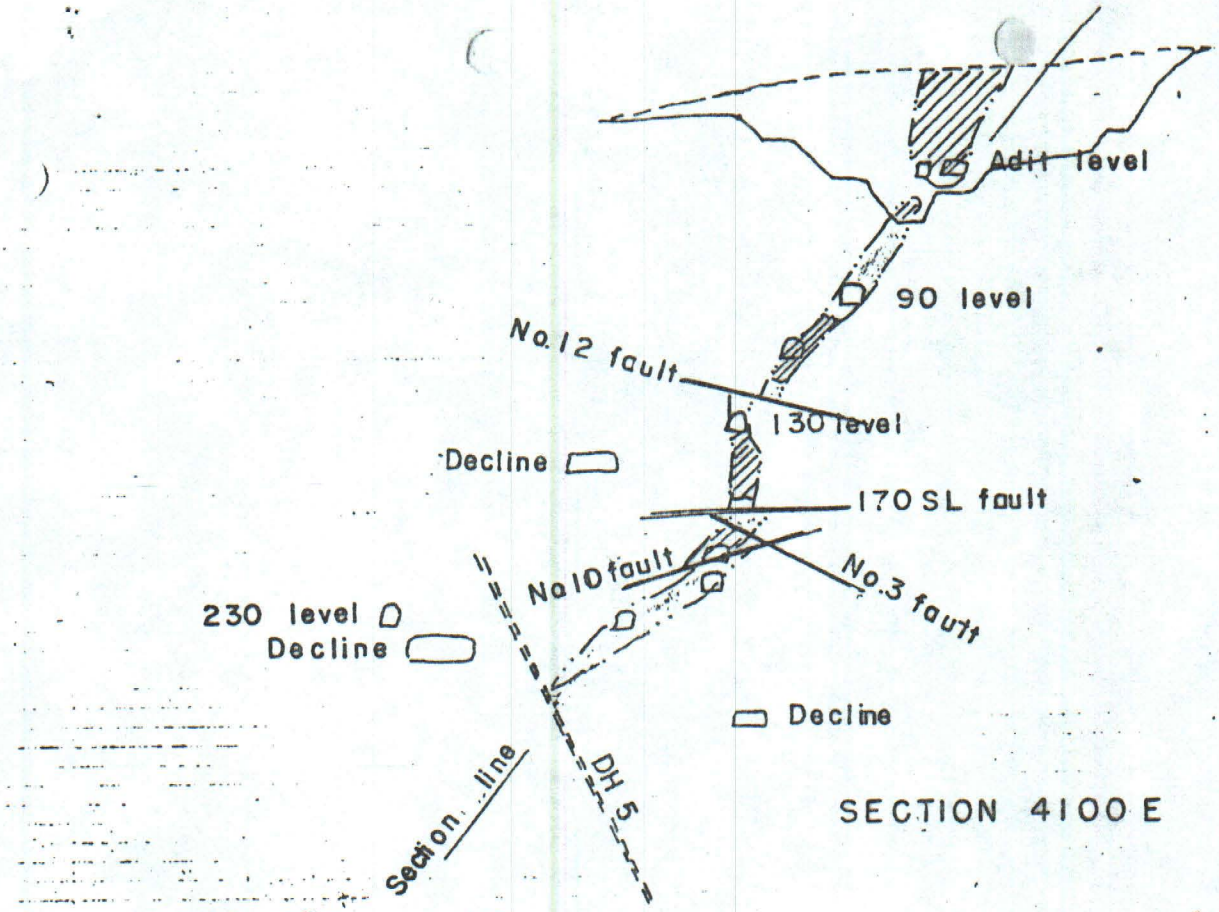
The ultimate and most meaningful sample of an ore body is the total production. Pacific Silver produced 160,000 tons grading 0.10 oz. Au and 0.7% Cu.

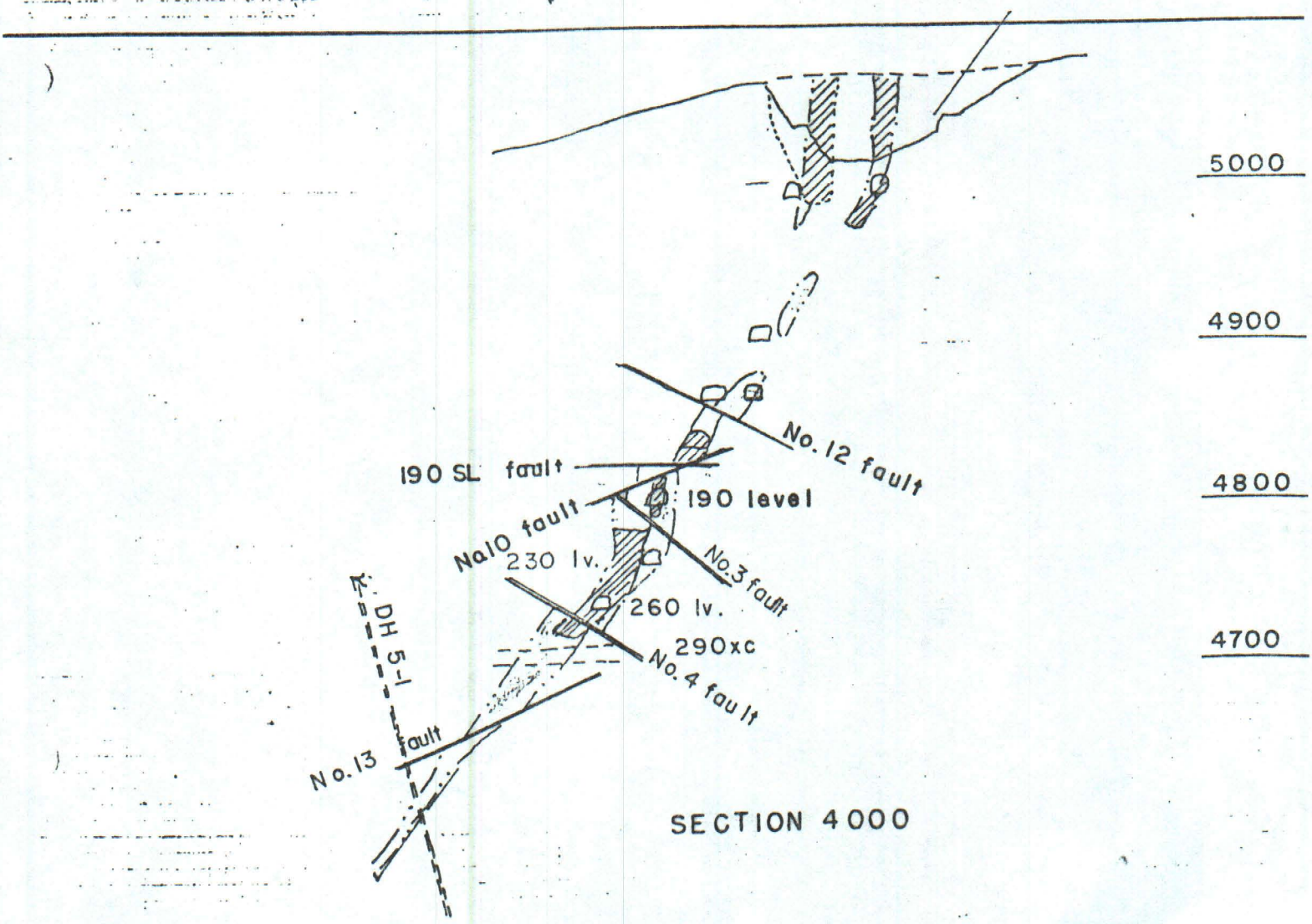


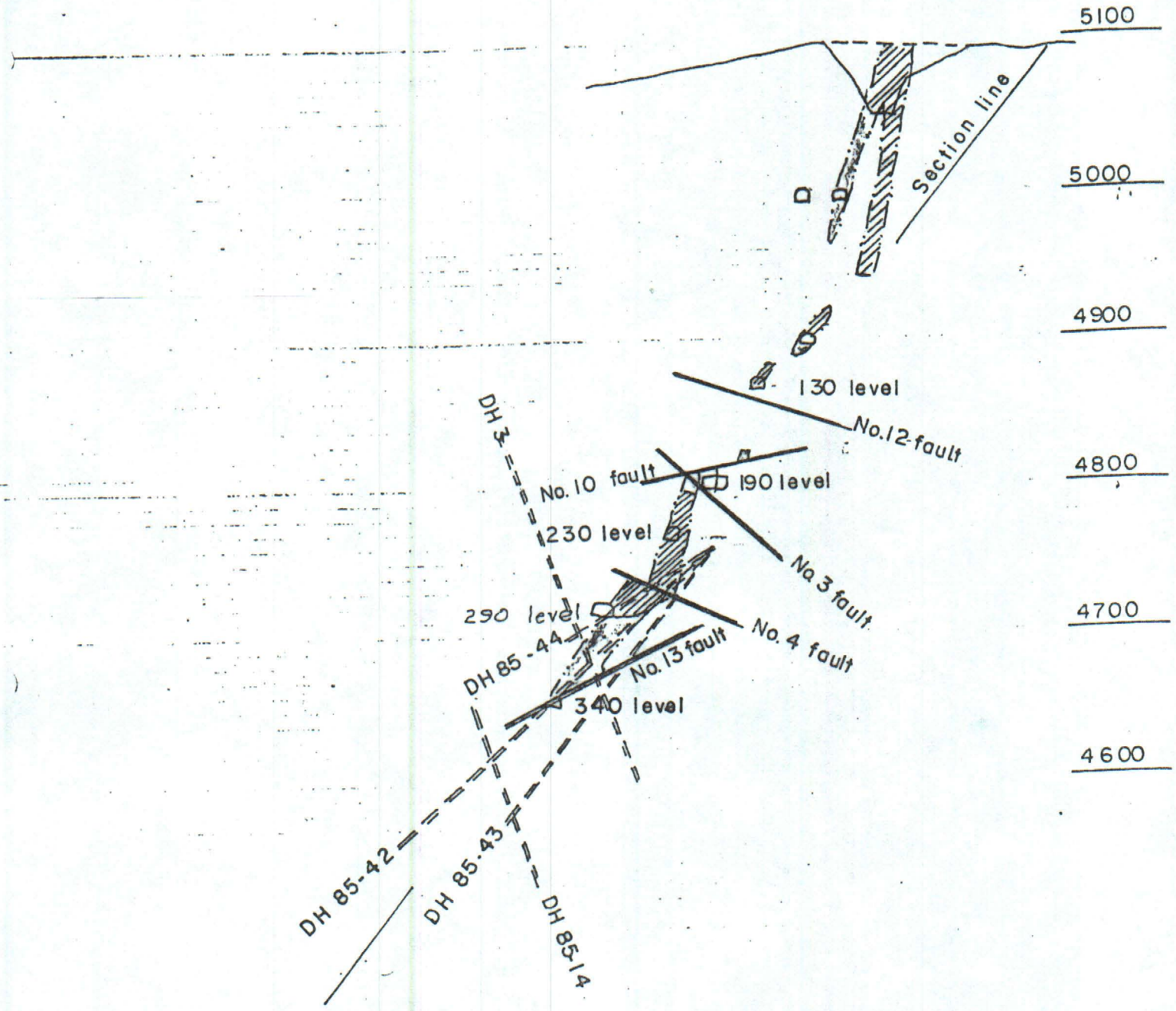
SECTION 4300 E



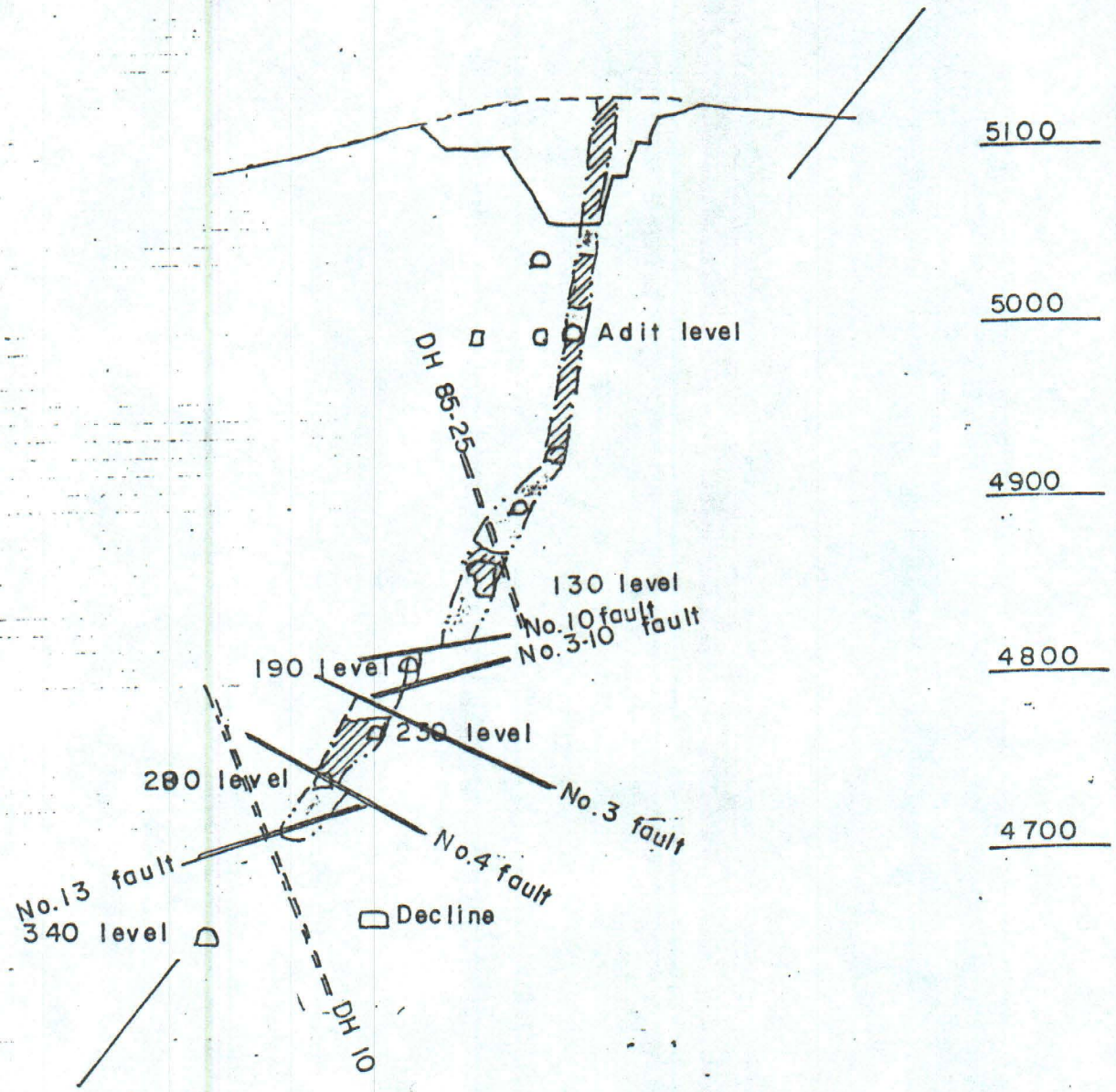
SECTION 4200 E


Adit level
5000
90 level
4900
No.12 fault
130 level
Decline
170 SL fault
4800
No.10 fault
No.3 fault
230 level
Decline
Decline
4700
Section line
DH 5
SECTION 4100 E

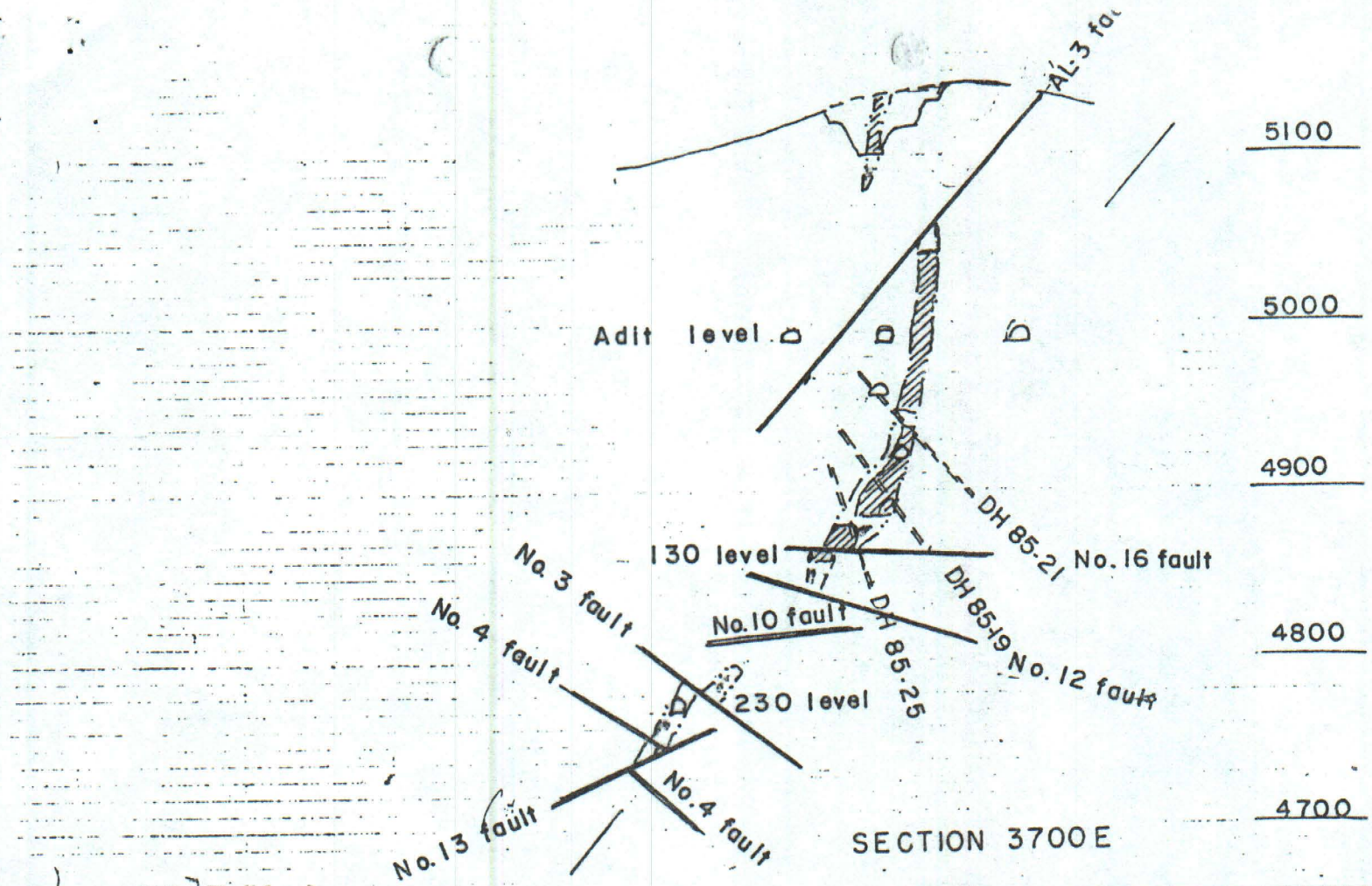

5000
4900
No.12 fault
190 SL fault
190 level
4800
No.10 fault
230 lv.
No.3 fault
260 lv.
290xc
No.4 fault
4700
DH 5-1
No.13 fault
SECTION 4000

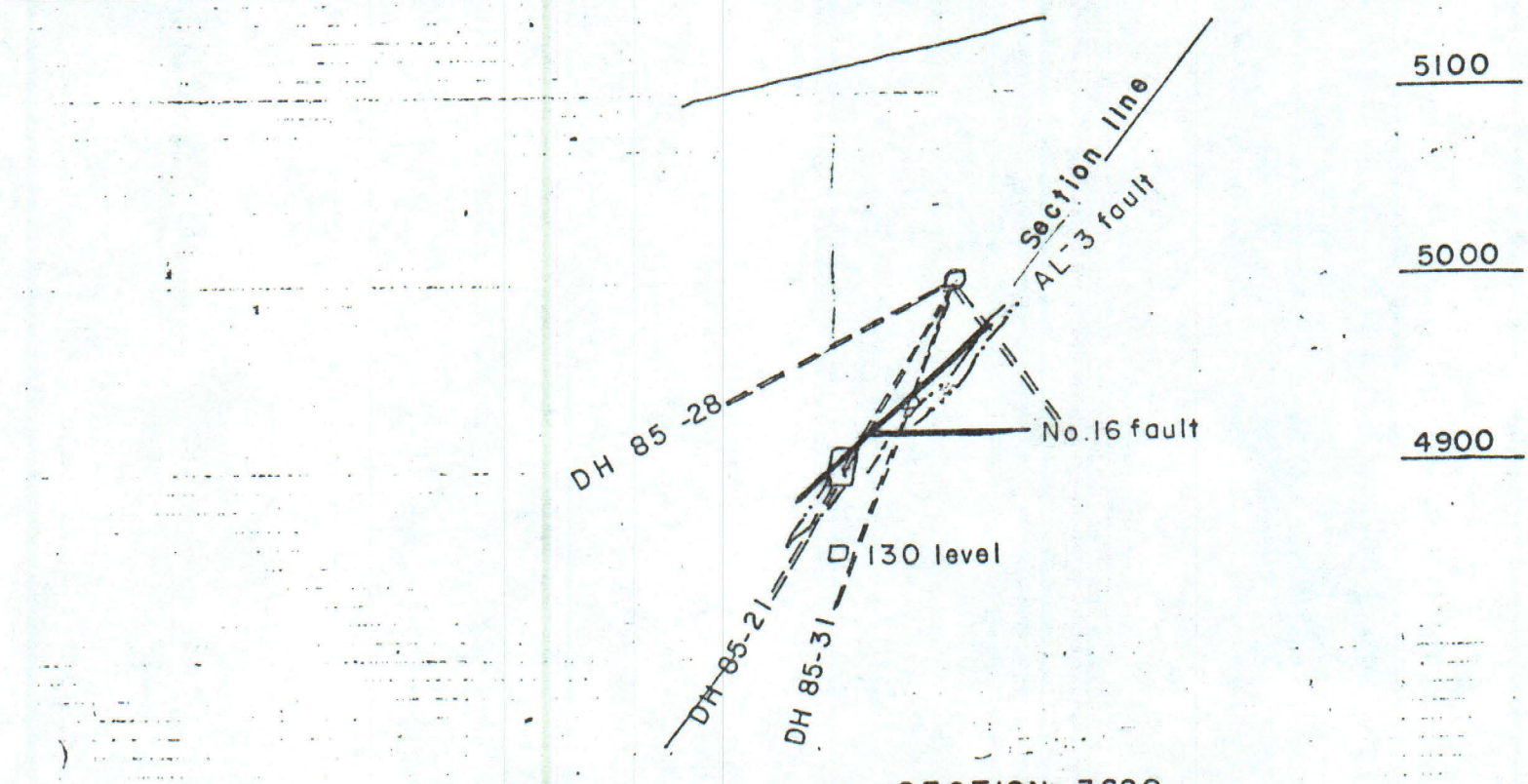


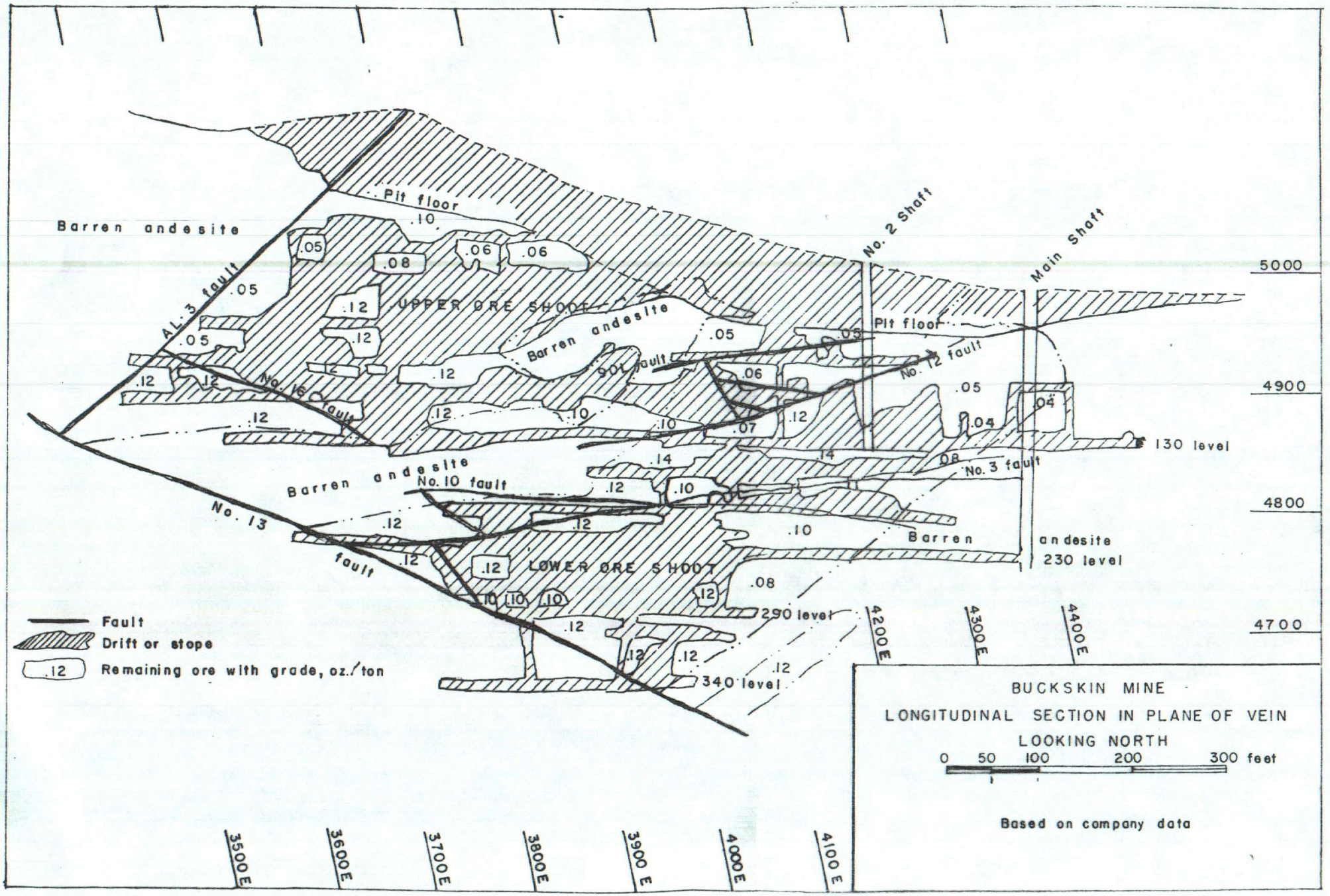
SECTION 3900



SECTION 3800E


AL-3 fa
5100
5000
Adit level
4900
DH 85-21
No. 16 fault
130 level
No. 3 fault
DH 85-19
No. 10 fault
4800
No. 4 fault
DH 85-25
No. 12 fault
230 level
No. 4 fault
4700
No. 13 fault
SECTION 3700E


5100
Section line
AL-3 fault
5000
DH 85-28
No. 16 fault
4900
130 level
DH 85-21
DH 85-31
SECTION 3600


Barren andesite
Pit floor
.10
.05
.08
.06
.06
.05
AL-3 fault
.12
UPPER ORE SHOOT
.05
.12
.12
Barren andesite
.12
No. 16 fault
.12
.12
.10
.10
.07
.12
.14
.14
.08
No. 3 fault
Barren andesite
No. 10 fault
.12
.10
No. 13 fault
.12
.12
.10
Barren andesite
.12
.12
LOWER ORE SHOOT
.12
.08
.10
.10
.10
290 level
.12
.12
.12
.12
340 level
No. 2 Shaft
Main Shaft
Pit floor
.05
.05
No. 12 fault
.06
.05
.04
.04
130 level
5000
4900
4800
4700
4200E
4300E
4400E
3500E
3600E
3700E
3800E
3900 E
4000E
4100 E
Fault
Drift or stope
.12 Remaining ore with grade, oz./ton
BUCKSKIN MINE
LONGITUDINAL SECTION IN PLANE OF VEIN
LOOKING NORTH
0 50 100 200 300 feet
Based on company data

It may be valuable to determine why the grade estimates have varied so much. The grade based on drilling represents the grade of the ore itself and does not take into consideration the substantial waste dilution, particularly where the wall rock is badly shattered along the flat faults. Dilution may cut the ore grade by as much as 50% in serious cases, while increasing the tonnage mined accordingly. Such dilution would bring the actual mined grade from 0.20 indicated by drilling to 0.15 oz. Assuming a 10% metallurgical loss in the mill, the actual recovered grade would be 0.135 oz. This still does not agree with the realized grade.

Many of the drill holes cut obliquely across the vein, giving poor angles of intersection. There is a tendency for a hole drilled at such an angle to be deflected to follow a softer rather than harder portion of the formation. If the better values are contained in the softer material, such a drill hole deflection can give an exaggerated ore value.

The bulk samples taken of the individual ore piles included the waste from wall sloughage as well as vein material. They generally were of the finer (softer) portion of the ore rather than the coarser masses of quartz. If, as seems likely, the softer, finer portion of the ore is also the richer, sampling only the fine material will inadvertantly salt the results. Pacific Silver found that when both coarse and fine material were crushed before the sample was taken, the results were lower than indicated by the fines alone.

The only way to have avoided this accidental salting of the ore samples would have been to maintain a systematic channel sampling program, taking a balanced portion of hard and soft vein material to give a true value of the entire vein. This was not done.

Mine Economics

Including smelter payments for the contained gold and copper after treatment charges, as well as the value of the gold recovered by cyanidation of the tailings, the Buckskin Mine ore showed a recovered gold equivalent of 0.105 ounces per ton (converting the copper value to gold equivalent). The metallurgical recovery at the mill was 90%, and a gold equivalent value of 0.117 oz. is indicated for the mill feed.

During the past operation, the mining costs were $25.00 a ton, milling costs $13.00 a ton, and overhead charges $3.00 a ton. Transportation and smelter charges amounted to $6.00 per ton of ore, bringing the total cost to $47.00 per ton of mine run ore or $448 an ounce of gold produced. Since the bulk of the recent Buckskin production was at a gold price of about $325 an ounce, it is clear that the operation was far from profitable.

Future of the Buckskin Mine

The recent 160,000 ton production from the Buckskin represents about 60% of the developed reserves. The balance of the reserves, estimated at 110,000 tons, is largely contained in pillars left to give ground support for the partially caved stoped areas. While the main decline and the main shaft may still be accessible, the various levels would have to be repaired at large expense in order to gain access to the pillars.

Even if these pillars were now accessible to mining, pillar extraction is a costly operation and, at best, can remove no more than 60% of the pillars. The expenditure of hundreds of thousands of dollars needed to make these pillars accessible would not be repaid by sales of gold from 66,000 tons of 0.10 oz. ore, regardless of the gold price.

There is no indication that ore of equivalent or better grade can be developed along the strike or down the dip of the Buckskin vein.

Mining of the Buckskin vein should not have been allowed to proceed until the vein had been adequately developed. Such development would have shown that the ore grade was too low, the projected mining costs too high to allow a profitable operation. The Buckskin Mine has no future under forseeable conditions.

330

Item 52

~MAR.-APR. 1937

9-9

Buckskin Mill, Buckskin District,

Douglas County, Nevada.

Operated by Ambassador Gold Mines, Ltd.

Frank Sharp.

Buckskin Mill, Buckskin District, Douglas County, Nevada. Operated by Ambassador Gold Mines, Inc.

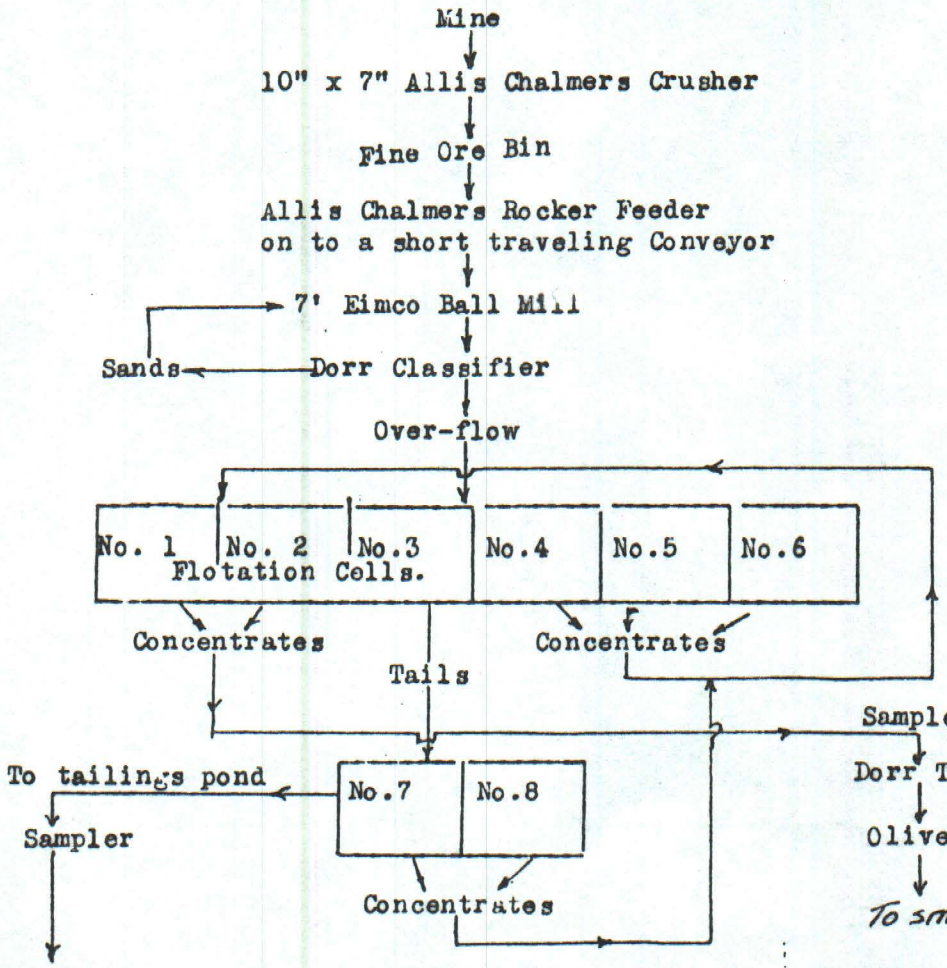
The Buckskin Mine is located two and one-half miles from Artesia, Douglas County, Nevada.

The mill is located in an old building that formerly held a 100 ton concentrating mill. The present metallurgical practice is bulk flotation. The mill in the present condition is capable of handling about 46 tons per day.

The scope of this paper is confined to the following facts related to the Buckskin Mill:

1. Flow sheet
2. Explanation of the flow-sheet and details.
3. Planad improvements and reasons for them.
4. Discussion of Operating Data and Marketing and Milling Costs.
5. Conclusions embrassing weak spots in the mill and possible changes.

FLOW-SHEET:



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EXPLANATION of FLOW-SHEET AND DETAILS:

The ore coming to the jaw crusher is regular run of mine ore being dumped from the mine cars to a covered grizzly above the crusher. A mixture of fines and rock up to 6 to 8" in diameter is put through the crusher. This primary crusher is a Allis Chalmers Blake Type Jaw Crusher having a 10 x 7" throat opening and crushing to one and one-half inches with good jaws and proper adjustment. The moving jaw on the crusher is so worn at the present that the crusher only crushes the big rocks to two inch product. The crusher is powered by a 15 hp. Induction Motor which seems to handle it very satisfactorly.

The product from the crusher falls into a 50 ton storage bin below the crusher. This bin was formerly a storage and loading bin for truck hauling and for the old mill. From the bin the ore flows thru a shute to an Allis Chalmers Rocker feeder on to a traveling conveyor belt. At the ball mill end of the conveyor is a hand sampler that cuts the entire stream when it is thrown into position by means of a hand lever. A sample is cut every half hour for a half minute. The material cut out is weighed and the weight recorded, thereby, giving the operator a record of the feed going into the ball mill. The sample is then sacked and used as a heads sample.

The ore from the traveling conveyor feeds into the feed box of the 7' Eimco Ball Mill. A scoop feeder picks up the material and feeds it to the mill.

The ball mill is gear driven from a line shaft that is powered thru V-belts to a 60 hp. motor. The motor is to large for the mill but was one that was on hand so it was put in service.

The discharge from the ball mill is 75 to 80% solids. This product goes directly to Dorr classifier which is in closed circuit with the ball mill. Classifier overflow goes directly to flotation cell, while the sands are returned to the ball mill feed box. A circulating load of

200% is carried in the ball mill classifier circuit.

The classifier overflow runs from 25 to 28% solids and is about an 80 mesh grind or carries from 12 to 15% minus 200 mesh material.

The first flotation bank has six Kraut cells in it. The first two cells are cleaner cells which take off the final concentrate. Cell No.3 has no concentrate taken from it. The last three cells are roughers and the concentrate from them pass back to the first part of the bank and the concentrate cleaned in cells Nos. 1 & 2. The tails from this bank pass down to a two cell bank where further concentrate is removed and sent back to cells Nos. 1 & 2. The tails pass from this last bank to the launder that takes them to the tailings pond, after passing through an automatic sampler. The concentrate from cells Nos. 1 & 2 pass thru an automatic sampler and then to a 10' Dorr thickner.

The thickened concentrate passes to an Oliver filter and then to the drying racks out on the dump where they are air dried.

The water from the thickner passes out to settling barrels and on to the tailings stream. A tank is to be installed for settling this solution before it is wasted.

All the flotation machines now in use are Kraut machines. Vertical 5 hp. motors for every two machines are used on the cells.

Several different reagents are used:

Reagent No. 301 added as 6% solution:
22 cc. per minute to No. 1 cell.
40 cc. " " " " 4 "
10 cc. " " " " 7 "

Frother: 4 to 1 mixture of pine oil and Aerofloat No. 15 added to cells No. 5 and 7. No frother is added to cells No. 1 and 2 because enough is carried back with concentrates from other cells to froth cells not receiving it.

Sodium sulphide is added as a 6% solution to cell No.5. The amount varies from 0 to 7500 per. minute. The purpose of the sodium sulphide is not to sulphidize but it helps clean the pulp and gives a thinner froth to be returned to cleaner cells.

The Oliver filter is an old type with 3 revolving discs instead of the revolving cylinder. The vacumn is supplied by 12" x 6" Ingersoll Rand machine. The air is supplied from the mine compressors.

PLANNED IMPROVEMENTS AND REASONS FOR THEM:

A dry feeder is to be added to the circuit of ball mill for the purpose of adding lime for PH control. The water used in the mill is contaminated with sulphate salts that make it slightly acid. The lime will be added to make the circuit alkaline and maintain a constant Ph of about 8 instead of one that varies from acid to alkaline as is now the case.

The moving jaw of the primary crusher is so badly worn it need be replaced. A new set of jaws has been ordered and when they arrive and are installed will reduce the size of the ball mill feed. This will necessarily reduce the hourly capacity of the primary crusher but will not reduce it such that the daily tonnage can not be put through it. With the finer feed to the ball mill it is thought that the capacity can be increased to around 60 tons per day as against 46 tons at present. Another advantage of the finer feed to the ball mill will be the decrease in slimes from the circuit. As the circuit is now, the feed is so course that it stays in the circuit to long and slimes badly.

A unit cell is to be added between the ball mill discharge and the classifier. The purpose of this cell is to remove some of the heavy sulphides and relieve the classifier and ball mill circuit. This is developing to general practice with sulphide and free gold ores. The general practice is to have a gold trap in the cell that catches the heavy gold particles thus taking them out of the ball mill circuit, and keeping the circuit from building up to such high value as it generally does. From information received a Denver Sub-A machine is to be installed.

DISCUSSION of OPERATING DATA AND MARKETING AND MILLING COSTS:

Up to this last month oxidized ore has been treated. The ore being treated now is essentially a sulphide with some oxidation.

In the period from Feb. 16 to 28 an average extraction of 69% was obtained on oxidized ore. Average tons milled per day during the period 48.5; total tons milled 601; heads assay 0.26 oz. gold/ton,; tails assay 0.08 oz. gold/ton; concentrate 2.27 oz. gold/ton; average hours per day 21½ and ratio of concentration 12.3 to 1.

Following is the operating data for week March 7 to March 13:

		Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Average
Shift	*Rate	28.6	27.0	22.0	30.8	31.3	31.7	28.6
	Ratio	8.2	----	13.5	18.0	16.8		14.1
Day	Grade	2.1	----	2.0	2.56	1.88		2.1
	Rec.	87.8	----	78.8	77.7	78.5		80.1
	Rate	26.3	19.0	29.0	30.1	31.7		27.2
Nite	Ratio	7.0	----	----	16.9	14.2		12.7
	Grade	2.2	----	----	1.76	1.68		1.68
	Rec.	83.8	----	----	85.8	83.5		84.4
	Rate	27.4	15.2	30.9	29.0	36.1		27.7
Aft.	Ratio	5.4	8.1	13.9	10.8	----		9.6
	Grade	2.2	2.2	1.8	1.84	----		2.01
	Rec.	90.7	82.5	81.2	83.4	----		84.2

*Rate is expressed in pounds per half minute.
Ratio of concentration
Grade of concentrate Gold in oz. per ton
Recovery figured equal to Heads minus tails/Heads.
Tails for this period said to run at 0.04 oz. gold/ton, conc.

In comparing these two periods a rough comparison is all that can be made due to fact that the heads assay is not known for the last period

In the period from Feb. 16 to 28 the ore was chiefly oxidized ore while the ore in the weekly period here given the ore is chiefly sulphide This would to some extent give the difference in per cent of extraction. But a great deal of credit need be given to Mr. Benston for his endeavor to increase the per cent of extraction.

Quoting from Mr. Benston " by bi-passing the conditioners I have increased the extraction 10 to 15%."

Mr. Benston has made a real ende vor to increase the extraction but as it is, he is handicapped by certain factors such as: mechanical deffects, lack of proper feeding equipment for pH control, and lack of efficient grinding equipment.

The concentrates are shipped at present to the U.S. Smelting Co. at Midvale, Utah. They were formerly shipped to the Selby Smelter at Vallejo, California. The change was made because the cost of freight, treatment charge and assaying charge was cheaper at the U.S. smelter. They are hauled by truck to MaKay Siding, a distance of ten miles from the mill, where they are loaded loose on railroad cars.

The total freight to smelter	"$10"
Smelting charges	"$ 6"
Lot sampling	"$ 4"

No figures were obtained on smelter deductions or on smelter payments, but the analysis of two shipments were obtained from which the per cent of the total value of the concentrate is absorbed by marketing costs can be figured out (approxiametly).

2-- 7 ton lots--	Lot 1	Lot 2
Gold Oz./ton	2.92	2.18
Silver Oz./ton	2.0	1.80
% Copper	4.7	6.8
% Sulphur	22.6	25.7
% Iron	26.0	26.8
% Insoluable	32.2	28.7

Gold @$35/Oz.	2.92		$ 102.10
Silver @ 0.77/Oz.	2.00		1.44
Copper @ 2.40/%*	4.7		11.29
			114.83

16% 114.83 equals 13.9% of value is marketing expense without figuring in the smelter deductions or sampling costs, which if vere added would raise the cost materially.

*The price of copper assumed at 12¢ per pound which at the present price may be to low but was taken as a good conservative figure.

Two 30 tons lots of concentrate were shipped recently but as yet no returns had been received.

The milling costs per ton of ore treated averages (approx.) "$ 1.50". This cost is not excessive considering the tonnage milled per day, and the type and the condition of the machinery being used. A small decrease may be effected by putting in smaller motors where machines are overpowered and by trying to raise the power factor of the system and lowering the power costs. The power factor as it now stands is "72" which could stand some betterment.

CONCLUSIONS:

The grinding circuit at the present seems to be the poorest part of the plant. As was stated the primary crusher is badly in need of jaw replacements., When this is corrected it is hoped by the operator that the feed can be maintained much finer and the slimes from the circuit decreased. If the feed was to be cut down to the minimum size the crusher could crush to or to a ¼ inch product the capacity of the crusher would be greatly decreased. At the present time the ore for three shifts in the mill is put through the primary crusher in two 8 hour shifts with the crusher working about two-thirds of the time. The rated capacity of a crusher this size set at ¼ inch is about 2 tons per hour. To crush the 46 tons now put through the mill would take 23 hours at this 2 hour rate. With a finer feed it is hoped that the capacity of the mill can be increased to 60 tons per day which at a 2 ton crushing rate would take 30 hours to crush with a steady feed to the primary crusher. The feed to the crusher is not a steady flow but an intermittent feed by mine car lots. It seems apparent that some difficulty is going to be encountered if a finer crush is maintained.

Quoting from Mr. Benston " the normal crush is 1½" , while now it is 2" with the jaws in the present condition". With this 2 inch crush the complaint is to much sliming from the ball mill circuit, which they hope to correct to some extent by addition of a unit cell between the ball mill and classifier.

With a course feed of 1½" it seems that the addition of the unit cell is not going to help the sliming problem, unless the primary grind is reduced so the material will braak down quicker in the ball mill and release the heavy sulphides with a much shorter period of grinding and a much smaller reduction ratio sliming will continue.

The filter now in use is an old type and does not seem to particularly adapted for the work it is doing or the work expected from it. If the capacity of the mill was to be increased this factor would have to be corrected with a filter of higher capacity.

Summing up would say that with a few miner changes and additions to the plant equipment a recovery over 90 per cent could be expected.