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NW. Nev. Soc.

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(238)

SYNOPSISILLINOIS MINE, NYE COUNTY, NEVADA

near Lodi Tanks.

PROPERTY, AREA AND LOCATION:

The realty consists of 5 patented and 18 unpatented mining claims, aggregating about 450 acres and 2 mill sites, located in the Lodi or Mammoth Mining District, Nye County, Nevada, 42-1/2 miles (by good wagon road) northeast of Lunino, Nevada, a station on the Tonopah & Goldfield branch of the Southern Pacific Railway, and about 75 miles, air line, northwest of Tonopah, Nevada. The exact location of the Illinois Mine is shown (designated by "Lodi Tanks" and the old town of "Marble") in the northwest corner of the U. S. Geological Survey topographical map of the "Tonopah Quadrangle". The mine is located in the west side of the Lodi Valley (this Valley is about 2-1/2 miles wide) at an elevation of 5500 above sea level.

TITLE:

The Illinois group of claims is owned by C. I. Burt, of San Francisco, California, and the title (5 claims secured by United States patent and 18 claims and 2 mill sites by Location is perfect; the property is absolutely without encumbrance.

GEOLOGY:

Limestone, probably of Carboniferous period, uplifted by andesite on the east and granite on the west, intruded by andesite. The ores occur in three distinct fractures along or parallel to bedding planes of the limestone in shear zone several hundred feet in width between the andesite and granite uplifts. The fractures, and bedding planes, dip to the southwest but a few degrees from the vertical, the strike of the shear zone being northwest and southeast. On the surface the mineralized fractures are from 100 to several hundred feet from the granite-limestone contact. The ore bodies are found in intimate association with the andesite intrusions.

ORE OCCURRENCE:

The mineralized fractures are well defined on the surface for a distance of over 1 mile, and several shoots from which ores have been taken for shipment or smelting on the property are exposed for small depths in addition to the main "Illinois" shoot which has been developed to a vertical depth of approximately 900 feet. On the surface the ore fractures have width of from 2 to 5 feet, and are from 20 to 35 feet apart. Where developed to any depth the fractures show a tendency to unite; at a depth of 600 feet in the main shoot the ore-bearing fractures are less than 20 feet apart.

The ore deposits are characteristic of limestone formations. While well defined, continuous and strongly mineralized throughout and showing values in silver, gold, and, usually, lead—the ores occur in lenses and shoots at irregular intervals. These shoots, as developed in the deep workings of the Illinois shows widths of from 2 to 15 feet, lengths up to 100 feet and depths of several hundred feet.

ORE ANALYSIS:

The ores consist of argentiferous and auriferous lead carbonate (cerussite) and lead sulphide (galena) with oxides of iron and magnese in calcite-quartz gangue. The silver is present usually as chloride, and the gold is often in free state. Zinc (in carbonate form) is usually found in association with the valuable metals but seldom exceeds 10%. Analysis of a composite sample, made from several lots of ore, taken from depths from 100 to 600 feet, recently shipped to smelter gave as follows:

Gold	0.96 oz. per ton
Silver	91.94 " " "
Lead	10.20%
Copper	0.20%
Zinc	0.30%
Iron	18.20%
Lime	3.20%
Manganese	4.40%
Magnesium	0.20%
Sulphur	0.35%
Arsenic	4.60%
Insoluble	13.30%

Shipments of ore made to the smelter of the United States Smelting, Mining & Refining Company, Midvale, Utah, in December, 1921, and March, 1922, were paid for on the following assays and analysis:

<u>LOT</u>	<u>GOLD</u>	<u>SILVER</u>	<u>LEAD</u>	<u>INSOL.</u>	<u>IRON</u>	<u>ZINC</u>	<u>SULPHUR</u>	<u>LIME</u>	<u>MANGAN</u>
1	0.8275	101.95	10.10	17.50	16.35	12.40	0.40	5.20	Not
2	0.8700	82.50	9.60	14.70	17.55	10.40	0.45	5.00	det.
3	0.3450	80.40	7.55	4.90	6.40	5.60	0.40	18.20	"
4	0.8550	91.80	9.45	16.05	15.35	10.15	0.25	6.40	4.25

(Lot #3 = table concentrates from stope fills)

DEVELOPMENT:

The Illinois mine has been opened by an inclined shaft to a vertical depth of approximately 900 feet and by several thousand feet of drifts and cross-cuts. The level intervals are (vertical) 95 feet, 144 feet, 202 feet, 291 feet, 345 feet, 443 feet, 499 feet, 553 feet and 609 feet below the surface to the 8th level, and below the 8th level the intervals are said to be 50 feet.

Since the discovery of the Illinois Mine in 1875, the property has been worked, intermittently, mostly by lessees and has produced approximately \$1,000,000 in silver, gold and lead values. Having been worked in this way at no time was an attempt made to develop or block out ore for economical extraction. Most of the ore marketed from the Illinois Mine has been taken out by means of windlasses in 50 foot "lifts". This costly method of mining, high freight charges, and low price of silver prohibited the early operators from shipping ore containing less than \$100 gross values; and, as a result, there is a considerable tonnage of ore exposed in the drifts and old stopes that can be profitably extracted for shipment direct to smelter or for treatment in mill.

ORE AVAILABLE:

Practically no attempt has been made at mining since the drop in prices of silver and lead in 1907. A smelter was erected on the property some years ago, but it was not successful because of the low lead content of the ores exposed in the old workings of the property.

Subsequently, a small concentrating mill consisting of a crusher, ball mill, and one table was installed; and some high grade concentrates were made from dump material and shipped, but it became apparent that only about 50% of the values in the ores could be saved by table concentration. An examination of the mine was made and a large tonnage of stope fills and low grade ores was found, and the process of profitable extracting the value of fills and low grade ore determined. In October 1920, a series of tests were made to determine the adaptability of the ores to treatment by cyaniding. By first running the ores over the table and then cyaniding the tailings, excellent results were obtained. About that 85% of the total values were recovered in this manner, and I am confident that by more careful handling over 90% can be recovered. The surface equipment, living quarters, etc., were put in first-class condition although but little was done underground.

Being familiar with the underground workings, and having the results of sampling and experiments of this company, I secured an option to purchase with lease, on the Illinois Mine in September, 1921, and put the underground workings in shape and determined the values and tonnages of shipping ore, and stope fills and low-grade ore for milling. With a force of 6 men, over 6 months were devoted to putting the shaft in working condition, clearing out drifts and cross-cuts, mining shipping ore and drawing stope fills. During this time approximately 40 tons (dry weight) of ore were taken out for direct shipment to the smelter (Lots 1, 2 and 4) and over 200 tons of stope fills drawn and hoisted to the surface for sampling.

Of the 200 tons of stope fills drawn over 50 tons were taken for a sample after boulders of high-grade (shipping) ore had been removed by hand. These boulders assayed from 50 ozes. silver per ton to over 100 ozs. silver per ton. No account of the tonnage assorted for shipment, by these boulders, was taken. The fifty ton sample was crushed by Blake type of crusher and then reduced to pulp in ball mill before cuts were taken for samples. Out samples thus taken give an average of:

Gold	0.2375 Oz. per ton
Silver	17.31 " " "
Lead	1.50%

MILL ORE AVAILABLE:

In addition to the 50 ton sample taken and treated as described above, a great many samples were taken of the fills "in place" avoiding rich boulders, and the average values in the samples were greater than given above. In opening drifts and drawing fills stopes were rendered accessible for sampling and tonnage estimates; and actual measurements show a tonnage in excess of 5000 available for economical "mining" of grade indicated above. All the ground containing stope fills was not opened up for inspection; and, in addition to the measured tonnage of fills stated above, there is a probable tonnage of at least 5000. I am firmly of the opinion that not less than 10,000 tons of sope fill of grade indicated are available for milling. With the low-grade ore (25.00 ozs. silver per ton and better) exposed in the old workings and exposures of ore in the shallow workings from the surface one can safely count on sufficient ore, of profitable milling grade, to keep a 50 ton per day mill in operation for one year, and I am confident that when the old stopes are emptied, a considerable tonnage of shipping ore will be obtained and further development for the old stopes will bring in more bodies of rich ore.

No records of prospecting and development below the 8th (609 feet vertical distance) level are obtainable, but men who have worked Below the 8th level state that practically no exploration work (by drifts and cross-cuts) was done, that the veins show no signs of "pinching" and that there is good ore in the bottom of the shaft. There is no indication of a pinch on the 8th level—good ore, assaying from 50 to over 300 ozs. silver per ton, is exposed in the drift and at the station on the 8th level.

As stated above, it has been demonstrated by mill tests that ample gravity concentration is not sufficient for the profitable extraction of the values in the low-grade ores and stops fills of the Illinois Mine. It has been determined, however, that a total recovery of more than 85% of the values can be obtained by cyaniding the tailings from table concentration with a very low consumption of cyanide, and it is quite probable that a total extraction exceeding 90% can be made by this combined concentration-cyanide treatment. Rough tests for extraction of values by oil flotation have also been made, and the results obtained indicate that further investigation will be worth while.

TREATMENT:

The lowest records for extraction of concentration cyanidation show recovery of 32.30% of the silver and 66.00% of the lead by table concentration and 75.00% of the gold and silver values by cyanidation of tailings. Using these lowest figures, and applying the same for the treatment of the stops fills of values determined by 50 ton mill test, the minimum extraction and profit per ton can be determined. From heads assaying gold 0.2375 oz. per ton, silver 17.31 ozs. per ton and 1.50% lead, tailings were obtained that assayed: gold 0.26 oz. per ton, silver 11.72 ozs per ton, and lead 0.50% by table concentration. It will be noted that the tailings contained higher gold content than the heads.

EXTRACTION:

Applying above extraction figures:

	<u>GOLD</u> <u>OZS. PER TON</u>	<u>SILVER</u> <u>OZS. PER TON</u>	<u>LEAD</u> <u>% per ton</u>
Heads	0.2375	17.31	30.00
Table Recovery	<u>0.0000</u>	<u>5.50</u>	<u>19.80</u>
Tailings Assay	0.2600	11.72	10.20
Cyanide Recovery	<u>0.1950</u>	<u>8.50</u>	<u>—</u>
Total Tails	<u>0.0650</u>	<u>2.92</u>	<u>10.20</u>

VALUE OF HEADS:

Gold	0.2375 oz.	At \$19.00	\$4.51
Silver	17.31 " 95%	At 0.96625	15.99
Lead	30.00 lbs. 90%	At 0.05 less .017	<u>0.89</u>
			\$ 21.39

VALUE OF PRODUCT PER TON OF ORE TREATED:

Gold	0.195 oz.	At \$19.00	3.71
Silver	14.39 " 95%	At 0.96625	13.21
Lead	19.80 lbs. 90%	At 0.05 less	
		.017 0.50	

Loss in tailings per ton of ore treated 17.51
\$ 3.88

Total Extraction - 17.51 = 81.86%

On basis of 50 tons of low grade ore and stope fill per day operating costs should not exceed the following:

PROFIT:

Gross value of ore per ton		\$ 21.39
Cost of mining and milling	\$5.50	
Loss in tailings	3.88	
Royalty, etc.,	3.53	12.91
		\$ 8.48

EQUIPMENT:

The present mill contains a Blake type jaw-crusher, 5 ft. ball mill, Akins classifiers and two Overstrom Concentration Tables. Power for mill is supplied by 40 HP Fairbanks-Morse distillate engines. In addition to mill machinery in place there is a set of large rolls, Colorado Iron Works Type, in good condition. The mine is equipped with good steam hoist and small air compressor. All machinery, in mill and at the mine, is in good condition.

The mine and mill should be put in condition to mine and treat 50 tons of mill ore and stope fills a day. This amount of ore can be hoisted from the mine as it now stands. The mill is now complete so far as concentration is concerned, and requires only the addition of cyanide tanks to handle the tailings, at a small additional cost.

At the present time water for camp and mine and mill purposes is obtained from a source owned by C. I. Burt, located about 4 miles from the mine. Water is conveyed by 3-inch standard pipe line; the pipe line and storage water tanks at the mine are in good condition. Additional water can be obtained, if required, from the lower workings of the Illinois.

On the property is one of the best equipped laboratories in the State of Nevada, and there are sufficient buildings to house the number of men to operate the mine and mill on 50-ton-per-day basis.

The ground in the Illinois Mine stands well and very little timber is required in mining operations. At the present time the workings are in good shape and milling ore, high grade for shipping, and stope fills can be mined at comparatively low cost. The steam hoisting plant is equipped for use at crude oil under the boiler.

A good road connects the mine with Luning and the distance (42-1/2 miles) from the mine is easily covered by automobile. Supplies for the mine and ore for shipment are hauled by automobile trucks. The trucks have no difficulty in making the round trip in less than 12 hours. Weather conditions are favorable for operation the entire year.

The Illinois mine is situated in one of the most heavily mineralized sections of Nevada and despite the fact that the mines have been in operation off and on for the past 47 years, there remains a great deal of very promising virgin territory within the boundaries of the claims of the Illinois group. I have spent several months in thoroughly prospecting and sampling the underground and surface of the mines and the results I have obtained have been very satisfactory. This synopsis is intended only to give a general idea of the conditions at the Illinois and for further information reference must be made to mine maps, assay results from sampling and the other reliable working data available on request.

Eagle Rock, Calif.
May 13, 1922.

F. H. LERCHEN
Mining Engineer

