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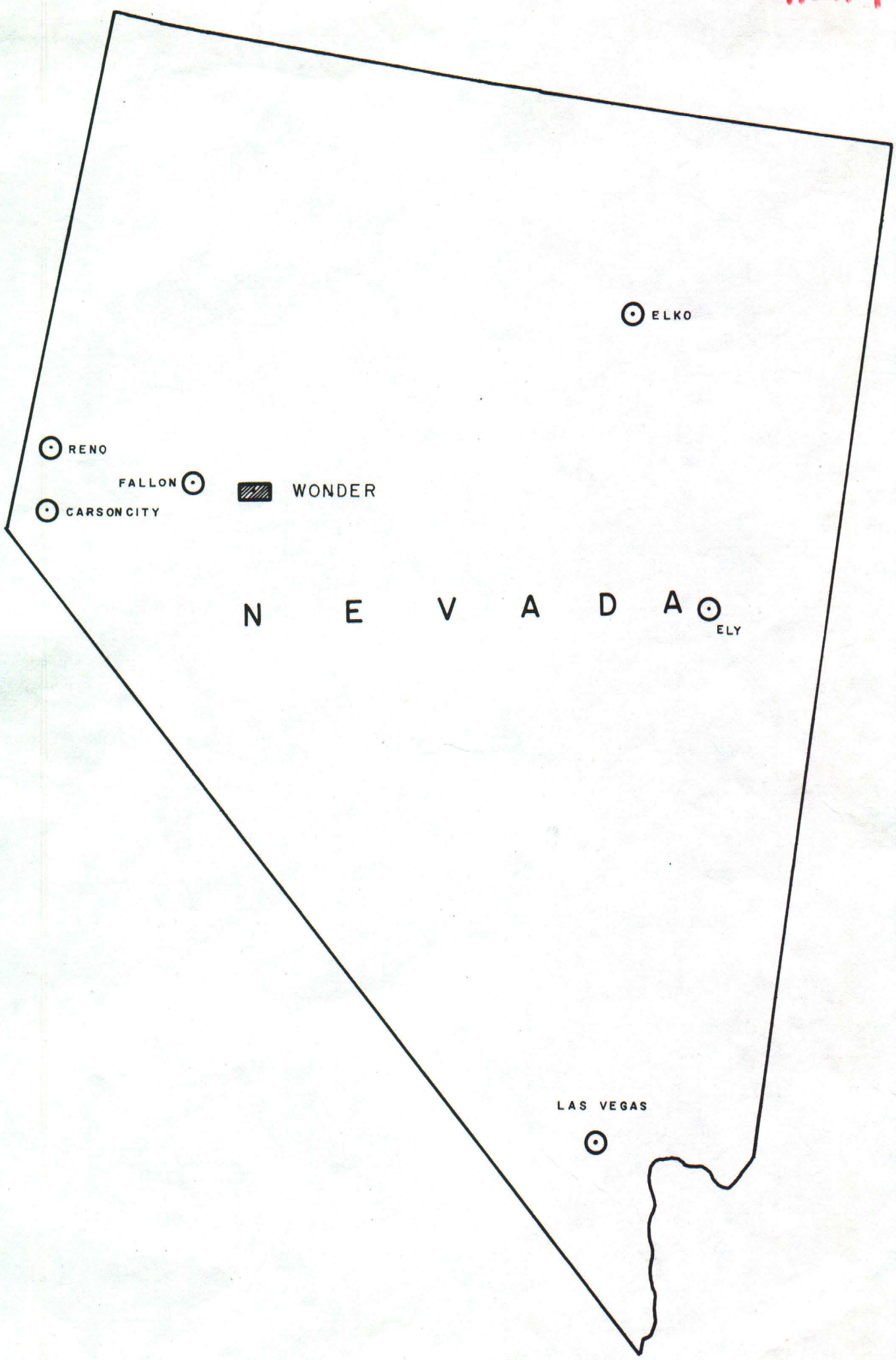

NOTES ON
THE NEVADA WONDER MINE

by
F. W. Lewis

PROPERTY AND OWNERSHIP:

The following property consists of fifty patented mining claims owned by F. W. Lewis, 6904 Woodman Avenue, Van Nuys, California, phone (code 213) 780-5689. The principal part of the property is covered by Title Insurance and no doubt a policy can be procured on the balance.

LOCATION:

The principal mine, the NEVADA WONDER, is located in the Wonder Mining District, Churchill County, Nevada. Wonder is 55 miles east of the town of Fallon, the county seat of Churchill County and the nearest railroad point. Forty of the fifty-five miles are over paved Highway 50, and for the remaining distance there is a good dirt road. There is a gentle grade from the highway to the camp of Wonder, the rise being approximately two thousand feet in fifteen miles.

HISTORY:

The history of the WONDER MINE is well known in Nevada. Discovered in 1905 by Murray Scott, William Mays and others, the rich gold and silver ores caused a stampede to the camp. Prospectors, miners, promoters, merchants, saloon men and the usual array of camp followers flocked to the new strike, and it was not long before a camp of several thousand people was established. Values were found over a wide area, but no permanent ore bodies were opened up except in the ground that afterward became the Wonder Mine.

The property was taken over by a group of eastern capitalists and they began a development campaign. An immense tonnage of ore was blocked out and in 1913 a 200-ton cyanide plant was installed. Electric power was brought in from Bishop, California, and at the time of its installation this hydro-electric power plant held the distinction of being the longest transmission line in the world. The mine and mill were completely equipped with modern, up-to-date electrically driven machinery. Production commenced which eventually yielded over six million dollars.

In 1919 the mine and mill were suddenly closed down and the property remained idle until 1924, when the machinery was placed on the market. In 1925 the mine and what machinery remained were purchased by junk machinery dealers in Reno, Nevada. They stripped the property for its machinery. In the meantime, with the closing of the operating mines in Rawhide, Nevada Hills and Wonder, the principal points of power consumption, the transmission line was removed and all mining operations ceased.

The probable reasons for the mine closing in 1919 follow:

1. The Wonder Mine was the last user of power being brought all the way from Bishop. A large franchise tax payment came due.

2. The price of Gold was $20.00 per ounce.

3. Blocked ore reserves had been depleted. In all probability the mill was closed, at first with the intention of reopening it when conditions were improved and reserves increased. However, the drastic decrease in the price of Silver when Silver dropped from $1.00 an ounce to $.60 per ounce sealed the feasability of reopening the mine and mill.

The mine remained closed except for a little high grading and dump sorting until 1935. We see at this time a revival of significant shipments due no doubt to the increase in the price of Gold in that same year to $35.00 per ounce. The mine was worked solely by lessees without sufficient capital or equipment. Still the mine's production slowly increased over the years until it was closed down by litigation and World War II.

The increase in production over this period occurred despite the fact that the price of Silver remained at or near its all time low. In 1940, the last full year of production, the price of Silver was still only $.34 per ounce. Contrast this with today's values for Silver being $1.29 per ounce; or the price range suggested by the U. S. Geological Survey of $2.58 per ounce to $3.88 per ounce, as a probable future range of price to stimulate production to the point it would meet consumption demand.*

TOPOGRAPHY - ELEVATION - CLIMATE:

The surrounding country is mountainous but only moderately rugged. The hills form a part of the Clan Alpine range, an off-shoot of the Sierra Nevadas. All working places at the mine are accessible by road.

The elevation at the main shaft is 6,080 feet. Wonder Peak, just back of the main working shaft, attains a height of 6,200 feet.

The climate is the same as prevails over western Nevada, there being no excessive heat in summer nor severe cold in winter. Operations were going on 365 days in the year, so far as weather was concerned, when the mine was running.

TIMBER:

There is no timber on the ground, but a plentiful supply of mine timbers and lumber is obtainable at current market prices and within easy reach from the many saw mills and lumber companies on the eastern slope of the Sierra Nevada mountains.

WATER:

The old company's requirements were supplied by a ten mile pipe line from Horse Creek, north of the camp. Water can be developed in the West Gate Wash some ten miles to the south and near Highway 50. An abundance of water there has been developed in wells. Further, Dixie Valley a mile or two west is a vast reservoir of water.

VEINS AND ORE ZONES:

There are two strong, well defined veins on the property from which former production came. These veins vary in width from four feet to forty feet. The ore, in all probability, is a replacement in wide

*Silver: Facts, Estimates, and Projections, Bureau of Mines Information Circular 8257, 1965, p. 11.

zones of crushed material adjacent to the vein in localized areas, possibly hundreds of feet wide.

As is shown, copper, gold, and silver with the copper being over 8½% were mined from the sulphide zone in 1940. In 1940 copper brought $.11 per pound.

No doubt the sulphide zone offers a treasure of sulphides; copper, silver, and gold ore.

IMPROVEMENTS:

The development consists of a main three-compartment working shaft from surface to the 1,300 foot level, and an auxiliary shaft 2,000 feet distant from the main shaft which was sunk to the 800 foot level, from which various sub-shafts and winzes continued on down to the 1,900 foot horizon. Numerous levels connect the two shafts and extend far beyond them on either end of the veins. Altogether there are in excess of eight miles of underground workings.

PRODUCTION:

See Schedule A for a summary of production.

ORE RESERVES:

During the lessees' later prospecting and development work there was opened on the surface what appeared to be either a new vein or a faulted segment of the Badger vein, and this ore yielded good values. No doubt many additional unopened and undiscovered ore bodies can be found using modern exploration techniques. The area remains unexplored in the modern sense of exploration. These ores and the main vein should offer years of reserves for milling grade ore.

MILLING:

During the period of production of the Nevada Wonder Mine, a 150-200 ton cyanide plant was kept in operation, employing the continuous current decantation process. The results were most gratifying, even during the period when the cyanide process had not been developed to the fine point it is today, for the 1919 report of the company showed an extraction of 93.99% for the year. It has thus been clearly proven through big scale demonstration that cyanide is an ideal process for the oxidized ores, and that the ore is amenable to treatment by that method.

RECOMMENDATIONS:

The tonnage indicated, if not in sight, together with the probable and possible ore recoverable, fully justifies the rehabilitation of the mine. For the purpose of ascertaining the best method of mining, treatment, extraction and installation, costs considered, an engineering study should be made.

Dependent upon the results of the engineering study, one envisions several possible modes of development:

1. Open trenching. (Open pitting).

2. Traditional mining. Underground.

3. Solvent extraction. (Cyanide in place).

4. Large scale caving techniques.

5. Consideration of Copper - Lead - Silver - Gold Sulphide ores at depth below the oxidized level.

6. Geochemical exploration over the surface of the district. Detection of hidden veins in Ryolite.

The method that appears to be quite different and of some question is the solvent extraction.

On the surface of it is the obvious fact that the cyanide solution should (under controlled conditions) work just as well right at the site of the ore. That is, extract the ore in place by circulating cyanide solution in place.

This is not the first time that the method has been tried. However, in previous experiments it was tried in very small scale, usually flat ore bodies unlike this vertical vein. In previous experiments the solution would in fact extract the ore material that could be extracted in tanks. However, the solution would be lost out the bottom. This loss of solution is the critical problem.

On a large scale, however, in the particular circumstances at Wonder, Nevada, (and at no other ore bodies I know of) this would not be the case. Both the foot wall and the hanging wall are Ryolite. Very impervious, except close into the ore zone. This is the very area one wants to circulate the solution so as to extract the values.

So the idea, briefly, is to blast (consider using liquid blasting agent) pumped through holes drilled in from the surface. Brecciate large vertical sections of the ore. Cement off an area in lower workings so it drains to sump, for pumping to the surface. Aeriate. Pour cyanide rich solution (or other chemical agent) through the ore body. Pump to surface. Precipitate pregnant solution. Regenerate cyanide. Recirculate. (Ad infinitum).

The strike length of the Wonder vein is 1¼ miles in length. Four to 40 feet wide - 1,300 feet deep to the beginning of the Sulphide zone. Think of the cubes and tonnage in that figure!

The important point in considering the feasability of working this mine is that it was not worked out.

CONCLUSION:

The WONDER MINE offers a rare opportunity for immediate production.

PRODUCTION OF NEVADA WONDER MINE

"Schedule A"

*Tons Produced	**Price Gold	**Price Silver	*Year Produced	*Yearly Production Gold oz.	Silver oz.	Cu lbs.	Per Ton Gold oz.	Silver oz.	Cu%
88 smelted	$20	$ .65	1907	111.48	8,346		1.266	94.8	
59 smelted		.52	1908	112.63	3,783		1.90	64.11	
		.51	1909						
		.53	1910						
9,797 milled		.53	1911	2,476.00	171,900		.253	17.55	
28,376 milled		.60	1912	7,523.87	472,958		.265	16.83	
1 smelted		.60	1912	66.00	1,358		66.00	1358.0	
41,870 milled		.59	1913	9,534.00	699,163		.228	16.85	
50,115 milled		.54	1914	9,704.00	914,511		.194	18.24	
58,394 milled		.49	1915	9,779.00	1,175,839		.167	20.33	
58,131 milled		.65	1916	8,955.31	1,023.046		.154	17.60	
55,800 milled		.81	1917	7,512.74	816,852		.135	14.63	
49,710 milled		.96	1918	4,618.00)	557,924)		.098	12.34	
smelted		.96	1918	259.00)	43,741)				
40,570 milled		1.11	1919	5,612.00	462,294		.138	11.39	
8 smelted		1.00	1920	2.88	284		.360	35.50	
		.62	1921						
3 smelted		.67	1922	2.89	394		.963	131.33	
		.64	1923						
		.66	1924						
		.69	1925						
100 smelted		.62	1926	102.67	902		1.03	9.20	
		.56	1927						
		.58	1928						
		.52	1929						
		.38	1930						
83 milled		.28	1931	31.59	2,484		.380	29.93	
329 smelted		.28	1931	206.44	10,270		.627	31.52	
		.27	1932						
		.34	1933						
	35	.47	1934						
35 smelted		.64	1935	6.32	509		.181	14.54	
292 smelted		.45	1936	119.57	8,787		.409	30.10	
588 smelted		.44	1937	271.00	19,901		.461	33.84	
1,419 smelted		.43	1938	573.00	39,242		.404	27.66	
2,227 milled		.39	1939	388.00	29,852		.174	13.40	
3,378 smelted		.39	1939	1,237.00	84,678		.366	25.06	
4,871 milled		.34	1940	1,192.00	85,373		.245	17.52	
756 smelted		.34	1940	220.00	21,227	1284	.298	28.07	8½
4,388 milled		.34	1941	781.00	56,535		.178	12.88	
1,671 milled		.38	1942	199.00	14,793		.119	8.85	
413,059	Total Produced			71,597.39	6,726,946	Average	.173	16.28	

Total Production in Dollars:

Gold	@ $35.00	$ 2,505,908.65
Silver	@ $ 1.293	8,697,941.18
Total Values		$11,203,849.83

Mine closed
June 30, 1942.

*United States Department of Interior
Bureau of Mines
450 Golden Gate Avenue
Box 36012
San Francisco, California

**Historical Statistics of the United States
Prepared by Bureau of the Census

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EXAMINATIONS
[illegible]

January 17, 1967

Mr. Frank W. Lewis
6904 Woodman Ave.
Van Nuys, Calif.

Dear Mr. Lewis;

In studying the various methods of exploitation suitable for use on the Nevada Wonder mine, as per our conversation of a few days ago, I find the following:

The first one that should be given consideration should be that of cyanide leaching in place, second open pitting to the greatest depth possible by the use of drag line, and the third that of shrinkage stoping but with the use of long hole drilling. They all offer exceptional economies of operation but the first offers by far the greatest as well as the greatest final profit on the mine.

The complete study made by Burgess in 1917, showed the minerals to be argentite, the silver sulphide, embolite, the silver chlorobromide, iodobromite, the iodide-bromide of silver, and bromyrite, the silver bromide, all easily soluble in calcium cyanide solution, and traces of pyrargyrite and stephanite, silver antimony sulfide, difficultly soluble in calcium cyanide. The two latter are negligible in amount. No oxidized zinc, copper or lead minerals were found, which are the ones that would cause heavy loss of cyanide if present, and thus of course result in a prohibitive cost for the principal chemical used, calcium cyanide. Gold, which is easier to dissolve than silver, increases steadily with depth of the mine. From this it is clearly indicated that the reagent cost should be very low.

The walls of the vein are rhyolite for its entire length. They are very strong and tight so that little or no loss should occur through seepage into them of the silver bearing solutions, or the unused cyanide. The vein is very steep, only 10 to 15 degrees off of vertical so that drilling the vein with 100 foot drill holes of small diameter to distribute the explosive, and using a fast powerful dynamite such as 60% to 80% gelatin, good pulverization of the vein should be accomplished and consequently good circulation of solution except in clay bearing areas, and quite complete extraction of the silver in a tightly enclosed environment.

90

By drawing off the solution on the lower levels and pumping it to the surface with acid proof pumps into the usual zinc box precipitation plant, little or no loss of either silver or gold should occur. It should not be forgotten in this operation that the speed of chemical reaction is usually doubled for each ten degrees Centigrade increase in temperature and that the extraction will therefore be greatest during the warmer months of the year. However there are sometimes unexplainable reversals in this rule.

In cyanidation the strength of solution which gives the fastestand most complete solvent action with the greatest economy and lowest cost is determined by laboratory experimentation before an operation is undertaken even on a small pilot plant scale. In the present situation we will have little control over temperature but far greater control over the pressure expecially as de pth is attained in the mine. This increase in pressure should be utilized to increase the speed of reaction. Just as with increases in temperature, here again there are sometimes unexplainable reversals. For the preliminary work single drill holes may be used for preliminary experimentation to determine at what pressure the speed and economy of extraction are greatest, likewise the strength of solution most desirable under these conditions. The records of the old cyanide plant should be consulted for a base on which to start these experiments.

The outlets for drawing off the saturated cyanide solution at the bottoms of the experimental blocks of ore should also be varied until the best collecting points have been determined, taking into account that this solution must be pumped to the zinc boxes. A well equipped assay office to handle both ore assays and solution testing and assay of solutions would shorten the period of experimentation materially.

The major part of the gold-silver values is usually concentrated toward the hanging wall of the vein and any co pper or zinc toward the foot-wall. Drilling and blasting should therefore be concentrated toward the hanging wall to avoid where possible any copper or zinc. By thus increasing the grade of ore treated the profit may be increased very considerably.

From the foregoing summary it would seem that this method of operation offers a remarkably good chance of success and would be by far the cheapest method of recovering the gold and silver values from these veins without all the expense of the conventional methods of mining and the building of a complete cyanidation plant.

Yours truly

C. C. Doyle

C. C. Doyle