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REPORT ON THE
WHITE CAPS GOLD MINING COMPANY
BY
JOHN L. DYNAN

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-by-

JOHN L. DYNAN

February 6, 1934

SITUATION AND PROPERTY:

The property of the White Caps Gold Mining Company is at Manhattan, Nevada, 42 miles north of Tonopah, the railroad shipping point. The property consists of 8 patented mining claims and 7 unpatented mining claims, containing a total area of 177 acres. A map is attached showing the property and the important features of the surface geology.

HISTORY:

The first company to work the present White Caps ground was organized in 1906, and the first production was made in 1911. A cyanide mill was operated in 1913-14, and treated 19,909 tons containing \$381,053.49 in gold. At about 150 feet below surface the oxidized ore changed to a base sulphide, high in antimony and arsenic, and the mill could no longer be used,

The company was reorganized in 1915, and development work actively carried on. A new mill of 100 tons daily capacity was started in September 1917, in which the ore was roasted before cyanidation. This mill was operated until January 1920, treating 59,056 tons of ore averaging \$12.17 per ton, or \$718,723.62 gross content. Of this \$470,595.10 was recovered as bullion, a recovery of 65.5%.

During 1920 and 1921 development work was continued in the mine, reaching the 800 Level. During this period some arsenic rich ore was shipped to smelters, payment being received for both gold and arsenic content.

In 1922, after further tests of the ore, the mill was again started, and ran until early in 1924. During this period 39,277 tons were milled, averaging \$11.28 per ton or \$443,318.58 gross content. Of this \$348,718.47 was recovered as bullion, a recovery of 78.6%. Since early in 1924 no ore has been milled. A reorganization and refinancing was effected in 1925.

Development of the mine was continued, reaching the 1300 foot level. Little work was done on this level, due to bad ground and the company's poor financial position. Shipments of higher grade ore to smelters were continued. At the end of 1931 company work was stopped and throughout 1932 and 1933 the mine was operated by leasers. 1933 was the most successful year the company has had, resulting in a profit of \$10,000 from leasing operations.

A table is attached showing the production made by the mine in different years.

MINE DEVELOPMENT (Cont.)

available on the western part of this level is from the mine foreman, who states that ore was developed on the West Ore Shoot. There are no figures available as to how much ore was shipped from these lower levels, from the incline shaft. The mill was not running while these levels were being worked, and ore mined had to be good enough to ship to a smelter. Under these conditions it is probable that a considerable amount of ore of milling grade remains on these levels.

ORE SHOOTS

The largest and most productive ore body in the mine has been the East Ore Shoot. This occurs in a block of White Caps limestone which outcrops 200 feet northeast of the White Caps shaft. This limestone block is 350 feet long on surface, and is bounded on the northwest by the White Caps Fault and on the southeast by the East Fault, both of which faults dip to the southeast. The mineralized areas in this block, as developed to date, are as follows on the various levels.

310 level	3600 square feet in horizontal section					
440 "	6000	"	"	"	"	"
565 "	5400	"	"	"	"	"
670 "	5500	"	"	"	"	"
800 "	2160	"	"	"	"	"
900 "	2100	"	"	"	"	"
1100 "	1500	"	"	"	"	"
1200 "	Unknown					
1300 "	"					

These mineralized areas are not all commercial ore. As depth is gained, the ore shoot pitches away from the White Caps fault and towards the East Fault, so that from the 440 level down the ore is against the East Fault. On the 1200, from a study of the map, it appears that the ore may have broken through the East Fault into the next adjacent block of limestone to the southeast. To have this condition, the displacement on the East Fault would have to be smaller here than it is on upper levels, so that the two blocks of limestone would not be separated. It may well be that on the 1100 also a part of the East Ore Shoot is in the block southeast of the East Fault, and that this accounts for the smaller mineralized area on the 1100 as developed to date. This is a condition that should be carefully investigated when these levels are unwatered. If the East Fault is post mineral, as seems likely, then the East Ore Shoot should exist on both the northwest and southeast sides of the fault. Hitherto it has been on the footwall or northwest side. The condition noted above, on the 1100 and 1200 levels, seems to indicate it may there be, in part, on the southeast side. If so, in a few more levels it will probably be entirely on that side, in another block of limestone. There should then be nothing to hinder this ore shoot from going to much greater depth in its new limestone block. This may be of great importance to the future of the mine. It can be tested on the 1100 level at small expense by cutting through the East Fault and then running a crosscut northeast. One hundred feet of work may be enough to determine this.

The next ore shoot to be considered is the Shaft Ore Shoot. This is a small shoot, occurring in the block of limestone which outcrops 200 feet

ORE SHOOTS: (Cont.)

northeast of the White Caps Shaft. This block is 300 feet long on surface. It is bounded on the southeast by the White Caps fault, on the northwest by the Morning Glory fault, which strikes North 15 degrees East and dips 55° east. The mineralized area in this block is 1700 square feet on the 310, where there are two branches, and 1200 square feet on the 440 level. Just above the 500 level, this shoot cuts off against the Morning Glory Fault. The block of limestone will also cut off, coming to a point below the level in the angle between the White Caps and the Morning Glory faults. It appears unlikely that this shoot will go any deeper. There are still good chances for more intensive exploration of this limestone block to open more ore, as is, in fact, now being done by leasers, on the 565 and 310 levels.

On the 200, 310, and 440 levels this shoot is cut off on the west, not by the Morning Glory fault, but by a more steeply east dipping fault (70 degrees) known as the West Fault, which on its dip joins the Morning Glory Fault at the 565 level. On the 440 and levels above, there should be a block of White Caps limestone, between this West Fault and Morning Glory Fault. It should be displaced to the south where the Shaft Ore Shoot ends against the West Fault. It should be a productive block, as the blocks next east and west of it have produced good ore. This possibility can be easily tested, at small expense, by a raise or diamond drill hole from the 310 level.

The third shoot of importance is the West Ore Shoot. This occurs in a limestone block which outcrops in the gulch southwest of the White Caps Shaft. No ore shows in the outcrop of this block. It is bounded on the southeast by the Morning Glory Fault. On surface, proceeding west, the limestone is cut by numerous faults, and a very complicated condition exists. On the 310 level, however, there is a practically continuous block of limestone from the Morning Glory Fault westward for 500 feet. Most of the ore mined to date has come from an area within 200 feet of the Morning Glory Fault. In this area a shoot of ore has been followed from the 800 to about 80 feet from the surface. Leasers are still mining ore, much of it of exceptionally good grade. This block can also be observed on the 565 and 800 levels, where it has been productive. On these levels it is somewhat more disturbed by faulting. The 800 face can not be observed, as the drift is blocked by caving. On the 500, for 250 feet west of where ore has been mined, the limestone is well fractured. Right in the west face there is a strong fracture, showing mineralization, from which an assay of 0.40 ounce gold per ton was obtained.

There is every reason for believing this block will produce much more ore, both in depth below the 1100 level, and by more intensive development on upper levels. Also, there is no indication that its western limit has been reached, as the west face on the 565 looks promising. Drifting to the west from this point is a piece of work that can be carried out at small expense, and may have very important results. This drift should be advanced to the western limit of your property. In addition to the good looking present face, the Consolidated Ore Shoot, referred to above, should be picked up. It is about 700 feet, on the strike of the limestone, from this face to where the limestone will pass out of your property.

ORE SHOTS: (Cont.)

We have now considered the three main ore shoots developed to date, and have seen that they occur in limestone blocks having a total combined length of 1150 feet. This leaves 850 feet of the 2000 feet of White Caps limestone traversing the property still practically unexplored. It is true there are no known outcrops of ore in these blocks, but there was no outcrop of the West Ore Shoot, which has been very productive. This additional length of limestone should be explored, preferably at a new and deeper level, such as 1500 feet.

SUMMARY AND RECOMMENDATIONS:

To sum up briefly, your property is traversed by 2000 feet of White Caps Limestone, exploration of 1150 feet of which to a depth of 1100 feet (1200 and 1300 levels excluded because of limited work) has developed three main ore shoots which have produced 152,950 tons of ore averaging \$16.25 per ton, a gross value of \$2,485,635.66. On account of poor metallurgical results and high mining and development costs, operations have nevertheless been carried on at a heavy loss, made up by assessments and refinancings. The question now is, do conditions warrant raising new money for further development in the mine?

After considering all the evidence presented above, it is my belief that the ore should continue to considerable depth below the present deepest workings. I also believe there are good chances to develop new ore shoots by further lateral exploration of the limestone. From the viewpoint of further ore supply I think there is no question of the advisability of continuing development.

The metallurgical question is beyond the scope of this report. There are few mines, however, where an adequate ore supply is developed, where satisfactory metallurgical treatment can not be worked out. The milling problem will be very much simplified, if, as seems probable, the arsenic and antimony continue to decrease in depth. It should also help if the mine is developed well ahead of mill requirements, so that a more careful grading and selection of ore to be sent to the mill can be had. Much trouble has been caused in the past by sending to the mill ore high in antimony and arsenic, made necessary by the demands of the mill for tonnage.

Costs of development should also be much less than in the past. The geology of the mine has been well worked out, and the position of the productive limestone blocks located. I think much money could be saved by sinking small winzes on ore Shoots, before driving long crosscuts to pick them up on new levels. In this way main levels could be spaced 200 or 300 feet vertically, and the expense of driving long crosscuts at 100 foot intervals saved.

Another factor of great importance is the new gold price. Practically all the mines production has been at the old price of \$20.67 per ounce, the ore averaging about 0.72 ounce gold per ton. At the new price of gold, \$35.00 per ounce, this same grade of ore is worth \$27.30 per ton, which is an exceptionally good grade of ore.

It is my recommendation, therefore, that development of the mine be

SUMMARY AND RECOMMENDATIONS: (Cont.)

continued, a new level established at 1500 feet, and the limestone thoroughly explored at that depth, by drifting on the various fault blocks from end to end, and crosscutting them wherever favorable fracturing is found. To do this, a new vertical underground sub shaft should be sunk from the 800 foot level. It should be so situated that if developments on the 1500 are favorable the shaft can be raised through to surface, coming out at a point favorable for a permanent mining plant.

In addition to this main campaign, there are many pieces of development work which should be done on the present levels. One of the most important is the westward extension of the 565 level, to pick up the Consolidated Ore Shoot and develop possible new shoots. On some level all the limestone blocks east of the East Fault should be prospected. The new shaft should be connected by a crosscut with the present 1100 Level workings and that level reopened. There is small doubt that considerable ore will be found on it. A winze can be started at any time to prospect the West Ore Shoot below the 800 level. This work can start on ore. The probable missing limestone block, between the West and Morning Glory Faults, on the upper levels, can be prospected for at small expense. In addition to these, there are many smaller development jobs that offer good promise of finding ore.

COST OF PROGRAM:

This work can be done with the company's present equipment, except for such small tools and supplies as may be needed. The double drum hoist now at the head of the incline can be moved to the new vertical shaft. The greatest element of uncertainty is the amount of water met in sinking, which is not likely to be great, as the present unwatering operations will soon have the water below the 1100 level.

A tentative estimate of the cost of doing this work is as follows:

Sinking 3 compartment Vertical Shaft,				
800 to 1500 level, and 100 foot sump,				
Total 800 feet shaft sinking	--	--	--	\$60,000
2000 feet drifting on 1500 level	--	--	--	20,000
1000 " crosscutting "	--	--	--	10,000
2 Raises on Limestone, 1500 to 1100				
Levels, 1500 feet	--	--	--	20,000
Hoist station, Sheave Raise, etc.				
on 800 Level	--	--	--	5,000
Crosscut to new shaft site on 800 level	--	--	--	5,000
Lateral development on present levels	--	--	--	30,000
				<u>\$150,000</u>

I believe the expenditure of this sum is warranted, and recommend that it be raised, and the above program of development carried out. It should develop an ore reserve adequate to put your property on a paying basis.

COST OF PROGRAM: (Cont.)

If a large ore reserve is developed there will be, of course, further capital expenditures required, such as raising the shaft through to surface, erection of permanent mining plant and whatever alterations and additions may be decided upon in the mill. No estimate on these can be made now with any degree of accuracy, as they will depend on results obtained in the mine.

In the meantime, the present leasing system is no doubt the best way to work the old parts of the mine. The leasers are working ground which could not be economically worked by the company, and the company is earning a profit without risking any large expenditure. There are also a number of places, some of them discussed above, where there is a good chance to open bodies of ore large enough to be of importance to the company, at no very great expense. It would be good policy for the company to do some of this work while awaiting completion of a larger financing and development program.

Respectfully submitted,

John L. Dynan
Mining Engineer

WHITE CAPS GOLD MINING COMPANY

Tonopah, Nevada.

June 12, 1931.

Mr. Homer L. Williams:

Pursuant to your request, I sampled, estimated the tonnage, and made cyanide tests on that portion of the White Caps Gold Mining Company tailings located near the mill. The following is a summary of the information obtained.

There are two tailing dumps. The lower dump of about 14,000 tons, consists entirely of fine-ground slime, and the upper dump of about 5,000 tons consists of a mixture of fine-ground slimes and coarse sands.

The lower tailing has an average assay value of about \$4.40 per ton, and the upper tailing an average value of about \$7.50 per ton. This gives a valuation of \$61,600.00 for the lower dump and \$37,500.00 for the upper dump or a total of about \$99,000.00 for the combined tailings.

The cyanide tests indicate an extraction of about 50% on the lower tailing and about 50% on the upper tailing which figures a total recoverable value of about \$49,500.00.

The simple method of cyanide treatment adopted in the tests is comparable to a sluicing of the tailing into the mill followed by the counter-current process available with the equipment in the mill. The total cost of such treatment on the basis of 100 tons per day would be about \$1.25 per ton of tailing, or about \$24,000.00 for the entire tailing. To this operating cost must be added the initial expense of repairing the mill which has been idle for seven years. I believe this would require an additional expenditure of about \$10,000 to \$15,000.00. The total cost would then approximate \$39,000.00. Deducting this expense from the expected recovery of \$49,500.00 leaves a profit of \$10,500.00. This profit would be increased between \$5,000.00 and \$10,000.00 by the treatment of 200 tons daily, which I regard as the maximum possible tonnage with the present available mill equipment.

(Signed) H. A. Burk

Tonopah, Nevada.

Nov. 9, 1931.

Mr. Homer L. Williams, Agent,
White Caps Gold Mining Co.,

The following is a summary of the results obtained in measuring the tonnage and in taking bore-hole samples of the tailing below the mill of the White Caps Gold Mining Company, at Manhattan, Nevada.

The accumulation of tailing down the gulch from the mill was separated into individual lots called Ponds No. 1, 2 etc., for convenience in measuring and sampling, the separation of each pond being marked by dams where the tailing was originally "housed in" upon being discharged from the mill. The largest of these ponds contains about 26,000 tons of slime and is about 21 feet deep at the forward crest. The others aggregate about 22,000 tons and are of less depth. This makes a total of 48,000 tons. In addition there is, closely adjoining the mill on the north side, about 20,000 tons of tailing which was measured and sampled in June of this year. This gives a combined total of 68,000 tons.

I consider this to be a very conservative estimate since in most cases the irregular, curved, crest of the dams was omitted in the estimates to simplify the calculations in figuring the tonnages. Furthermore, the tonnage estimate of the tailing at the mill is also doubtless low, since bore-hole depths were not taken on this pond in June; and at that time, for the purpose of tonnage estimation, the minimum cross-section triangle areas, predicated on steep sides and a V shaped containing gulch, were taken as a basis for estimation; whereas now, by the knowledge gained in bore-hole exploration, I am convinced the mill gulch is much flatter, of greater area, and therefore encloses a considerably greater tonnage than estimated. It is safe to assume that there are at least 70,000 tons of tailing available for treatment, of which amount 66,000 tons are White Caps Mill tailing and 4,000 are from the Associated Mill, operated in 1912 and part of 1913.

A total of 170 bore-holes were put down on the various ponds. The drillings from the group of holes on each pond were collected, well mixed, and cut down to a sample of from 50 to 100 pounds in weight. These samples are for the purpose of ascertaining the assay value of the tailing, and for cyanide tests to determine the probable extraction by the proposed method of treatment. These results should be available within a week.

A site for disposal of the tailing after the proposed cyanide treatment was also, tentatively, selected in the locality originally suggested by you. This is situated in the gulch southwest of the mill, beyond and below the dwelling houses of the White Caps Gold Mining Company, and on their property. The capacity of the proposed site is 18,000 tons, and the cost of the necessary, initial retaining wall and

tailing dam would be very low. Furthermore, when the tailing has accumulated to the crest of the initial retaining wall, it would be an easy matter, using dump material nearby and the tailing itself, to increase the height of the dam to accomodate several thousand tons of additional tailings. The expense of pumping the tailing into the gulch would be low. The distance is about 700 feet, and the elevation of the ridge leading into the gulch is not more than 16 feet above the mill, if the discharge pump be placed on the mill floor, and this elevation could be made zero if the pump is placed just below the point of discharge of the slime from the final counter-current tank.

SUMMARY

There are about 70,000 tons of tailing available for treatment, of which, 20,000 tons should yield a recovery of about \$2.00 per ton. The expected recovery on the remaining 50,000 tons will be experimentally determined in a short time.

There is an excellent site on the White Caps Gold Mining property for disposal of the tailing after treatment.

(Signed) H. A. Burk

Tonopah, Nevada.
Nov. 19, 1931.

Mr. Homer L. Williams, Agent,
White Caps Gold Mining Co.,

The following report is supplementary to that of Nov. 9, 1931, and contains a summary of the results obtained by cyanidation tests on the tailing collected by bore-hole sampling. This tailing is accumulated down the gulch from the mill in several ponds separated from one and another by dams. The largest of these ponds contains about 26,000 tons, and the others vary in size from 1400 to 5700 tons. These ponds contain tailing of the White Caps mill, resulting from the cyanidation of roasted ore of the White Caps mine, with the exception of the last two ponds located at the lower end of the gulch. The lowest of these later two ponds contains 1400 tons of tailing from the Associated Milling Company plant, which operated in 1912 and 1913 by direct cyanidation on oxidized ores from the upper levels of the White Caps mine. The other pond contains 3400 tons of a mixture of tailing from the two mills.

It was thought advisable to determine the percentage of extraction on the tailing collected in the largest pond separately; and to group the other ponds, adjacent to each other, in lots of about 5500 to 6000 tons and test each lot by itself. The last two ponds, containing respectively the mixture of tailing, and the Associated Milling Company tailing, previously mentioned, were also tested separately.

The data on these tests follows:

A low strength of cyanide solution, about 0.1 to 0.2 of a pound of Sodium Cyanide per ton of solution, is sufficient to obtain the extractions shown in the table following. Higher strengths up to 2.0 pounds Sodium Cyanide per ton of solution do not yield a better extraction.

The chemical consumption of Cyanide is from 0.15 to 0.3 pounds, and of lime from 4 to 7 pounds per ton of tailing.

	TONS	ASSAY PER TON	TAILING ASSAY	AMOUNT EXTRACTED	PERCENTAGE EXTRACTED	TOTAL PROBABLE RECOVERY
White	(26000	\$3.60	1.80	1.80	50.0	\$46,800.00
Caps	(5500	3.72	1.46	2.26	60.7	12,400.00
Mill	(5700	3.60	1.74	1.86	51.7	10,600.00
Tailing	5900	2.66	1.66	1.00	37.6	5,900.00
Mixture	3400	2.80	1.50	1.30	46.4	4,400.00
Associa.	<u>1400</u>	1.86	1.34	0.52	28.0	<u>700.00</u>
Total	<u>47900</u>					<u>\$80,800.00</u>

These figures, excluding the last lot, Associated Milling Co., tailing, indicate that there is 46,500 tons of tailing available, of an average assay value of \$3.44 per ton from which an extraction of \$1.72 per ton or 50% may be obtained by simple cyanidation. This would result in a

probable gross recovery of about \$80,000.00.

In my report of June 12th, 1931, relating to the accumulation of tailing situated at the mill, the tonnage there is estimated at 19,000 and the probable recoverable value at \$49,500.00. Adding these items to the foregoing estimates, the total available tonnage is 65,500 tons, and the probable recoverable value is \$129,500.00.

(Signed) H. A. Burk

WHITE CAPS GOLD MINING COMPANY

COMPANY DUMP SHIPMENTS MAY 1st, 1931 to NOV. 1st, 1931.

22 Cars	1146 tons	Average value per ton	\$17.45
	Gross Value		\$20,029.88
	Less Freight and Treatment		<u>9,146.74</u>
			10,883.14
	Less Hauling to Tonopah		<u>6,719.50</u>
	NET TO COMPANY		4,163.64

LEASERS SHIPMENTS JUNE 1, 1931 to AUG. 1, 1932.

52 Cars	2649 Tons	Average value per ton	\$29.70
	Gross Value		\$78,710.53
	Royalty received by company		5,765.70

NEVADA COALITION GOLD MINES COMPANY

Leasers shipments from 1929 to date:

\$20,853.81 Net Smelter Returns