

REPORT ON EAST END OF MANHATTAN DISTRICTNYE COUNTY, NEVADA

The properties considered in this report, consisting of the Nevada Coalition Gold Mines Company, Manhattan Consolidated Mines Development Company, White Caps Gold Mining Company and White Caps Extension Mines Company, are located at the eastern end of the Manhattan Mining District in the state of Nevada. This district lies about forty miles north of the town of Tonopah in the Toiyabe Mountains and can be reached by the Tonopah and Goldfield Railroad. Trucking charges are reasonable, being \$10.00 per ton for outgoing and \$5.50 per ton for incoming freight.

HISTORY

The Manhattan District has been known and in production for the past 27 years, ore having first been discovered in 1905. Production has been continuous since that date in greater or less amount. In 1917 rich ore was discovered in the lower levels of the White Caps Mine. This ore, while base and offering metallurgical difficulties, gave promise of extending to depth and of forming large replacements in the limestone in which these orebodies occurred. This promise has since been realized, a gross production of about \$2,225,000.00 in gold having been made up to date from the White Caps mine. According to Nash the Manhattan Consolidated produced \$183,000.00 for the same period. No data is available as to production of Manhattan Consolidated from that time up to date. The Nevada Coalition produced \$24,120.79, net smelter returns between 1918 and 1925, this amount having produced by leasers. At the present time operations are being conducted at both the White Caps Gold and the Nevada Coalition Gold Mining Company by means of the leasing system.

GEOLOGY

Ore bodies in the eastern end of the Manhattan District are formed by replacement of the limestone. There are several beds of limestone of which the White Caps limestone is the most important and the one in which the orebodies occur. The age of this rock is given as Cambrian by Henry G. Ferguson of the United States Geological Survey and probably corresponds to limestone of similar age in which the orebodies of Eureka, Nevada occur.

The White Caps limestone is a relatively pure, bluish crystalline rock, from 30 to 60 feet in thickness, with a northwesterly strike and dipping southwesterly at an angle of 47 to 50°. This region is one of intense faulting, the limestone being cut into numerous small blocks; these blocks being fractured to such an extent that mineralizing solutions readily penetrate and replace large bodies. In some places, notably on the 400 and 500 foot levels of the East orebody of the White Caps mine, practically the whole limestone block has been replaced by quartz and other gold bearing minerals.

Associated with the gold in the White Caps Gold and Manhattan Consolidated properties are minerals of arsenic and antimony. These minerals seem to have a zone of concentration from the 600 level to the zone of oxidation about the 200 level. Below the 600 level the arsenic and antimony content diminish, the gold being contained in a black quartz.

At the deepest workings so far reached in the White Caps mine, conditions favorable for the deposition of gold bearing quartz still persist and there seems to be no reason why this condition should not continue for much greater depth.

While orebodies in the Nevada Coalition property occur in the White Caps limestone, the conditions of ore deposition are not the same as in the White Caps mine. A large fault known as the Mud Fault divides the East Manhattan district into two zones of ore deposition. The eastern half in which the White Caps Extension, White Caps Gold and a part of the Manhattan Consolidated are located contain the gold deposits in which considerable antimony and arsenic appear and are known as Base Ores. West of this Mud Fault in the western half of the Manhattan Consolidated and the Nevada Coalition we have a different type of deposit; one in which the gold occurs as free gold and therefore causes no metallurgical difficulties. These deposits are replacements of the limestone also, but are more in the nature of quartz veins formed along a fault plane.

Ore has been found on the 700 foot level of the Nevada Coalition property altho not in commercial quantity. Geological conditions on this level, however, indicate that additional development work would be justified with every hope of opening up new ore chutes.

The Manhattan Consolidated property has produced ore to a depth of 500 feet, this ore being similar to the Base Ore of the White Caps Gold property. These deposits indicate, however, that conditions favorable for ore deposition are present and that additional development work should be performed.

WATER

Water has been encountered in the White Caps Gold, Nevada Coalition and Manhattan Consolidated properties. The pumping problem is not a serious one, however, as none of these properties have had to handle more than 100 gallons per minute for any length of time. Maximum pumping capacity is required when penetrating a fault and opening up a new limestone block. When this excess flow is pumped down, however, a normal flow of about 100 gallons per minute is maintained at the White Caps mine. Water pumped from the mine was enough to run the cyanide mill of 100 tons daily capacity.

EQUIPMENT

WHITE CAPS EXTENSION

On the White Caps Extension property are located two shafts; one, the old White Caps Extension shaft is of two small compartments, 400 feet deep. This shaft has a head frame, hoisthouse and residence. Also a Chicago Pneumatic, five drill compressor and a 35 H.P. single drum hoist.

EQUIPMENT: (Cont.)

There is also a second shaft known as the New White Caps Extension shaft. This shaft is a three compartment one, each compartment being 4'6" by 5', 90 feet deep and equiped with head frame. Assessed valuation of the improvements according to 1932 Nye County Tax Roll is \$1060.00. A one half interest in the equipment located at the old shaft belongs to the Zanzibar Mining Company.

WHITE CAPS GOLD MINING COMPANY

This property has a two compartment, vertical shaft 800 feet deep, with additional depth of 500 feet attained by means of underground inclined shaft, equiped complete with headframe, 40 H.P. double drum hoist, one five drill Leyner Compressor and one seven drill Ingersol compressor. Transformer House, 3 100 KW Transformers, Blacksmith shop, tools and equipment, 2 Triplex pumps and motors, (underground), one Triplex pump and motor (surface), ore cars, drills, tools, track, change room, carpenter shop, assay and mine office buildings, assay furnace and equipment, assay office and crusherroom equipment, two cottages and garage, conveyor, 9 houses, 3 ore bins, crusher and motor at lower ore bin, Rolls building, crusher, trommell rolls etc., oil tanks, Roasting Plant and Building, 100 ton Cyanide Plant. Assessed valuation of improvements according to 1932 Nye County Tax Roll \$40,080.00. 150

MANHATTAN CONSOLIDATED

This property is equiped with a two compartment shaft, 500 feet deep, complete with head frame, hoist and compressor. There is also located on this property complete surface equipment for operation of the mine. Assessed valuation of improvements according to 1932 Nye County Tax Roll \$5,345.00.

MANHATTAN CONSOLIDATED GOLD

On this property are located two operating shafts known as the Bath Shaft and the Coalition Shaft, as well as a third shaft, the Earl, not in operation at the present time. The Bath Shaft is an incline shaft and is equiped with head frame, hoist and one ton skip. There is also a two drill compressor at this shaft.

The Coalition Shaft is a three compartment shaft, 700 feet deep with complete equipment consisting of head frame with all necessary surface equipment, together with pumping equipment necessary for the handling of 100 gallons of water per minute from the 700 foot level to the surface. Assessed valuation according to 1932 Nye County Tax Roll \$10,000.00

ACREAGE

One of the important things to be considered, when considering acreage of the various companies, is the length of White Caps limestone outcropping on these properties and if said limestone will remain for any distance in said properties if followed downward on their dip. A decision of the District Court in favor of the White Caps Mining Company in the case of White Caps Mining Co. versus Morning Glory Mining Company, would make it difficult for one mining company to follow an ore chute into the neighboring property, claiming apex to a vein as a right to do so. Listed below is the footage of White Caps limestone outcropping on the several properties:

ACREAGE (Cont.)

White Caps Extension	2700 feet
White Caps Gold	1900 "
Manhattan Consolidated	1000 "
Nevada Coalition	2700 "
Total	8300 "

In acreage we find the territory divided approximately as follows:
White Caps Extension, 300 acres, 13 patented claims, 7 located claims.
White Caps Gold, 177 acres, 8 patented claims, 7 located claims.
Manhattan Consolidated, 200 acres, 5 patented claims, 12 located claims.

Nevada Coalition, 292 acres, 17 patented claims, 15 located claims.
As can be seen from the accompanying map any downward extension of orebodies would be protected for many hundred feet.

METALLURGY

Ore taken from the Nevada Coalition being free, offers no metallurgical difficulties and the gold is readily recovered from the gangue by amalgamation or cyanidation.

When we consider the Base Ores of the White Caps and the Manhattan Consolidated properties, however, a different condition arises. The large amount of arsenic and antimony present in the raw ore renders cyanidation impossible without preliminary treatment to remove these chemicals. Much time and money has been spent on experimental work. Flotation gave negative results.

A process of roasting was finally developed by the Bureau of Mines, whereby the ore was roasted at a low temperature in the presence of lime. This low temperature roast prevents the formation of arsenates and antimonates; two substances which tend to lock up the gold values. This process, it is believed, will finally solve the problem of economic treatment of the base ores of the Manhattan district, making available as commercial ore many tons of lower grade material not so available under present working conditions.

Another asset to be considered in examining these properties is the item of White Caps Tailings.

Attached hereto is a copy of a report on these tailings made by H. A. Burk, mill superintendent of the Tonopah Extension Mines, Inc. This report would indicate a net profit of \$30,000.00 after cost of installation, about \$15,000.00, and cost of treatment.

FINANCIAL CONDITION

WHITE CAPS EXTENSION MINING COMPANY

At the present time the White Caps Extension Mining Co., has outstanding 116,350 shares of stock with 1,883,650 shares of stock retained in the treasury. A note of \$6000.00 in favor of the Tonopah Banking Corporation is outstanding with interest on same amounting to about \$600.00 as of present date.

FINANCIAL CONDITION (Cont.)

WHITE CAPS GOLD MINING COMPANY

Accounts payable:	
Tonopah Trucking Company	\$42,000.00
Estate of John G. Kirchen	19,500.00
T. F. Cole	3,000.00
Tonopah Banking Corporation	12,000.00
Total	<u>\$76,500.00</u>

Stock outstanding amounts to about 800,000 shares with 200,000 shares retained in the treasury.

MANHATTAN CONSOLIDATED

This company is incorporated for 2,000,000 shares all of which is outstanding.

NEVADA COALITION GOLD MINES

This company is incorporated for 1,000,000 shares, 666,001 shares of which are outstanding. An indebtedness of \$3200.00 in the form of a note to the Tonopah Banking Corporation, represents the liabilities of this company.

CONCLUSION

At the present time leasing operations are being conducted at both the White Caps Gold and Nevada Coalition properties. Hereto is attached a summary of recent shipments showing grade of ore. This ore, as can readily be seen, is of very good grade and the amount being shipped by leasers should justify further work on company account.

Conditions are right for the development of ore bodies in the White Caps limestone at greater depth. The percentage of arsenic and antimony in the ore seems to be decreasing on the lower horizons, making the metallurgical problem less difficult, and consequently insuring a lower milling cost.

I would recommend, therefore, that a vertical shaft be sunk to the 1500 foot level and laterals be extended to explore the White Caps limestone at this horizon. The location of this shaft should be determined only after careful study of all available engineering data with the purpose of making it the main working shaft in the event that large ore-bodies are developed. It might be advisable to start this shaft as an underground shaft from the 800 foot level of the White Caps mine, to be raised to the surface if future development warrants.

Pumping operations could be concentrated at one shaft, thereby saving duplication of effort and rendering mining operations easier on the higher horizons of the western end of the properties, notably the Nevada Coalition Gold Property.

CONCLUSION (Cont.)

The logical method of developing and exploiting this east Manhattan district would be then, to consolidate the various properties herein considered on some equitable basis, taking into consideration, financial situation, previous production and possibilities for the future.

Respectfully submitted,

(Signed) Homer L. Williams

September 1932.

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 accommodate 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. 1400	1.86	1.34	0.52	28.0	700.00
Total 47900					\$80,800.00

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
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	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