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REPORT ON
MONTE CRISTO MINE
NEAR WICKENBURG, YAVAPAI COUNTY, ARIZONA.

INTRODUCTION

At the request of Mr. F. A. Wardlaw Jr., of the Inspiration Consolidated Copper Company, an examination of the Monte Cristo Mine was made from August 24 to 28, 1936, inclusive. A proposal that the Anaconda Copper Mining Company or a subsidiary acquire a 51% interest in the company operating the property in return for operation and improvements in operating facilities had been made to Mr. Wardlaw by the owners. The examination was therefore directed toward the determination of present available ore reserves, and opportunities for further ore development.

LOCATION, PHYSICAL FEATURES, HISTORY

The Monte Cristo property is located at Constellation, Yavapai County, Arizona, fourteen miles by narrow road northeast of Wickenburg. The country is generally rough, there is no timber available in the surrounding district, and the nearest permanent water supply is at the Hassayampa River about one mile to the north and 700 feet lower than the mine. An electric power line reaches the property from Wickenburg.

The Monte Cristo property was extensively developed prior to 1913 under the ownership of Mr. Ezra Thayer of Phoenix, Arizona. Little stoping was done until the property was acquired by interests headed by Mr. C. C. Julian in the late 1920's. After failure of the Julian enterprise the property was acquired through court sale in 1932 by Mr. E. R. Woolley of Salt Lake and Los Angeles. The mine is now operated by the Albatross Mining Company, an Arizona corporation controlled by Mr. Woolley.

During September 1936 the property was producing at the rate of approximately 35 tons per day which was milled in a flotation plant with a maximum capacity of 35 to 40 tons per day. Water for milling is obtained from the mine in which the water level is just above the 9th level. Concentrates are shipped by truck to the International Smelter at Miami, Arizona.

Available production records for 1934, 1935 and 1936 are separately tabulated.

GEOLOGY AND DEVELOPMENT

The rocks exposed on the Monte Cristo claims are granite gneiss and diabase. The gneiss varies considerably in appearance and is well altered near the veins. Strong fault gouges mapped underground indicate important

faulting but the amount or direction of such fault movements could not be determined from the few accessible exposures.

As shown on the accompanying maps the mine has been extensively developed through a 50° incline shaft from the 2nd to the 11th level. The present operators have partly reopened the 2nd, 3rd, 4th and 8th levels; the 5th, 6th and 7th levels are caved and inaccessible; the 9th, 10th and 11th levels are under water. There is no ore exposed above the 3rd level, and accessible workings on the 4th level show that most of the ore between these two levels has been stoped. Very little of the 8th level has been reopened and there are only poor exposures of the Monte Cristo vein near the shaft.

The development of an ore reserve sufficient to insure a successful mining operation at the Monte Cristo depends upon: 1. Discovery of high grade ore lenses; 2. Development of secondary silver ore in the Fault Vein structure exposed on the 3rd and 4th levels; 3. The main Monte Cristo Vein oreshoot.

Extensive development work at the property during the past thirty years has exposed a small amount of high grade silver and high grade gold ore. No such ore is now exposed in the mine, and the possibilities that any considerable tonnage of such ore will be found by future work do not appear good. The latest discovery,

reported by the owners, of some 300 pounds of gold telluride ore found in a stope on the Fault Vein structure, does not appear of sufficient importance to warrant hopes of development of an appreciable tonnage of gold ore.

Development on the Fault Vein on the 3rd and 4th levels has been done by the present operators, and a small stope four to five feet in width and some 30 feet in length has been mined from 30 feet above the 4th level to 50 feet above the 3rd level where the ore ended. No other ore was encountered on the 3rd level in this structure and no ore was found south of this stope on the 4th level. A small stope and raise immediately north of this stope and above the 4th level have exposed a narrow width of ore with irregular high grade secondary silver values contained in argentite disseminated through highly altered gneiss with little quartz and pyrite. From this part of the Fault Vein about 300 tons of ore may be expected between the 3rd and 4th levels. Present stoping operations are carried over a width of six to twelve feet though sampling shows the ore section to vary from one to two feet in width, and the silver content to vary from 4.0 to 115.0 ozs. silver per ton with little gold and copper. While additional small amounts of this type of ore may be expected by future development on this structure below the 4th level stopes, no important tonnages can be predicted.

The main Monte Cristo Vein oreshoot is partly exposed on the 4th level from 130' to 230' south of the shaft. Stopes above this area show that no ore remains between the 3rd and 4th levels in this section. Below the 4th level no workings are accessible except for the small amount of reopening work done on the 8th level and a raise driven to 70' above that level.

On the 4th level a length of 50' which was accessible for sampling showed this part of the oreshoot over a width of 5.4' to average 2.2 oz. silver, 0.04 oz. gold and 1.4% copper per ton. Scattered samples from exposed portions of the vein on the 8th level showed 1.5 oz. silver, 0.04 to 0.12 oz. gold and 2.5% copper per ton. A sample from the south end of the raise at 70' above the 8th level sill across 2.5' assayed 0.3 oz. silver, 0.12 oz. gold and 1.4% copper. The vein in the south end of the raise at this elevation is composed of strong clay gouges and broken crushed rock with brecciated quartz and pyrite and little chalcopyrite; the north end of the raise showed little quartz or sulphide mineralization.

The amount of low grade ore which may be found between the 4th and 8th levels in the main Monte Cristo Vein cannot be estimated from the few accessible exposures of the vein on these levels. It is possible that several thousand tons of such ore might be developed by reopening caved workings on the 5th, 6th, 7th and 8th

levels. The cost of this work, however, might easily be sufficient to destroy any possible profit to be gained by mining and milling ore of the grade indicated by the samples taken on the 4th and 8th levels.

EQUIPMENT

The property is equipped at present to produce from 35 to 50 tons underground, and the mill has grinding capacity for 35 to 40 tons per day. Electricity is used for all power needs. An increase in the present capacity would involve enlargement of the mill and provision for a permanent water supply; additional underground equipment, and possibly greater compressor capacity. Mine buildings and staff houses are sufficient for an enlarged operation.

CONCLUSIONS

Efficient operation of the Monte Cristo property would necessitate enlargement of the mill and other capital expenditures. Ore reserves at present developed at the property by the owners are negligible. Development cost of reopening old workings in the main Monte Cristo vein would make doubtful an operating profit on the low grade ore expected to be developed. For these reasons, an operation at the property by the Anaconda Copper Mining

Company or a subsidiary would not be an attractive mining venture.

Respectfully submitted,

September 1936.

MILL RECORD

DATE 1936	H E A D S			T A I L S			CONCENTRATES		
	Au	Ag	Cu	Au	Ag	Cu	Au	Ag	Cu
5/26	.01	1.50	0.50	Trace	0.20	0.10	0.44	30.40	15.00
5/30	.01	3.00	0.00				0.88	94.80	
6/1	.015	5.60	0.50	Tr.	0.70	0.10	0.60	133.40	
6/5	.01	2.60	0.00	"	0.80		No assay		
6/8	.01	3.00	0.90	"	0.60	Tr.	0.56	61.80	---
6/-	.005	2.30	0.40	"	0.25	0.30	0.31	54.00	18.70
6/9	.01	2.80	0.40		no assay		0.40	64.10	14.40
6/10		2.90	0.50		0.20	0.10	0.20	52.80	16.00
6/11		2.90	0.50		0.20	0.10		44.00	17.90
6/12	.005	2.20	0.70	Tr.	1.30	0.10	0.20	48.00	15.70
6/15	.10	1.00	1.00	.005	0.16	0.05	1.20	32.80	14.70
6/16	.01	1.00	0.30	Tr.	0.20	0.05	0.44	29.60	16.00
6/19	.04	2.50	2.00	.005	0.10	0.05	1.36	23.90	20.00
6/20	.05	1.80	0.50	.01	0.40	0.05	No assay		
6/22	.02	2.90	0.70	Tr.	0.60	0.05	0.64	40.00	9.84
6/23	.01	2.00	0.50	"	0.40	0.05	0.72	42.00	10.50
6/24	.02	2.20	1.00	.005	0.20	0.05	0.60	29.40	14.60
6/26	.08	2.10	0.25	.015	0.20	0.05	1.01	60.60	7.80
6/27	.36	2.20	0.20	.03	0.30	Tr.	10.80	58.60	7.00
6/28	.52	2.00	0.10	.10	0.20	Tr.	14.22	56.10	11.00
6/29	.45	3.60	0.02	.04	0.20	Tr.	13.60	42.20	10.40
6/30	.24	1.00	0.20	.02	0.10	Tr.	8.96	34.60	----
7/3	.10	4.00	1.20	.01	0.20	0.06	2.48	73.20	16.80
7/4	.10	3.80	1.00	.01	0.60	---	2.52	52.00	18.10
7/6	.40	4.40	0.70	.06	1.80	Tr.	2.00	74.20	16.10
7/7	.34	4.40	1.50	.02	0.40	Tr.	4.00	70.40	19.30
7/8	.26	3.10	0.60	.02	0.10	Tr.	4.58	59.50	19.00
7/9	.30	4.00	0.70	.04	0.40	0.05	4.40	79.60	20.80
7/10	.20	4.00	1.00	.01	0.30	0.05	3.04	78.00	21.10
7/11	.20	5.00	1.00	.01	0.05	0.05	2.40	107.10	----
7/12	.10	2.90	---	.02	0.20	--	2.40	62.00	--
7/13	.10	2.00	0.70	.01	0.10	0.05	2.64	52.00	20.40
7/14	.10	2.20	1.00	.02	0.30	0.05	2.40	40.00	18.70
7/16	.10	1.40	1.00	.02	0.10	0.05	2.00	23.50	23.40
7/17	.16	2.40	1.00	.02	0.40	0.05	2.30	42.60	17.23
7/18	.14	1.20	0.60	.02	0.20	0.05	3.52	33.60	11.80
7/19	.14	1.27	0.30	.02	0.04	Tr.	4.00	34.40	19.30
7/21	.24	1.30	1.20	.02	0.20	0.10	6.00	20.00	20.00
7/22	.18	2.00	1.20	.02	0.10	0.10	4.16	32.40	19.00
7/25	.10	1.50	0.70	.01	0.04	0.05	3.32	34.00	20.00
No date	.065	0.45	1.80	.15	0.13	0.38	1.10	20.25	13.72
7/29	.14	0.86	2.53	.01	0.10	0.13	No assay		
7/31	.135	0.55	1.20	.125	0.33	0.30	3.87	36.80	18.40
8/1	.12	16.00	1.10	.03	0.55	0.10	3.31	25.90	19.80
8/2	.18	1.30	1.30	.01	0.11	0.10	4.80	41.00	17.30
8/3	.17	1.33	1.10	.005	0.17	0.08	3.52	41.59	13.20
8/4	.05	1.00	0.50	Tr.	Tr.	0.06	2.72	40.00	11.50
8/6	.17	1.86	0.40	.01	0.55	0.12	2.00	23.30	15.20
8/6	.07	0.90	0.70	.008	0.16	0.06	2.14	18.95	12.10
8/10	.09	1.16	0.14	.025	0.15	Tr.	2.97	44.00	14.00
8/19	.08	2.83	0.00		None		4.28	73.50	none

DATE 1936	H E A D S			T A I L S			CONCENTRATES		
	<u>Au</u>	<u>Ag</u>	<u>Cu</u>	<u>Au</u>	<u>Ag</u>	<u>Cu</u>	<u>Au</u>	<u>Ag</u>	<u>Cu</u>
8/22	.04	4.50	0.40	.005	0.63	.03	1.07	98.80	14.50
8/21	.08	8.05	0.40	0.01	0.60	.06	2.63	39.60	18.00
8/22	.09	8.95	0.73	.005	0.50	.10	3.14	86.05	11.50
8/27							0.80	560.60	14.0
8/28	.02	7.8	2.5	Tr.	1.25	.04	0.86	478.00	13.6
8/29	.04	8.40	2.1	Tr.	1.00	0.4	1.10	434.00	14.2
8/30	.03	10.30	1.0	.001	1.06	.06	1.07	396.50	12.9

MONTE CRISTO MINE
SMELTER SETTLEMENTS

<u>LOT</u>	<u>DATE</u> 1936	<u>DRY WEIGHT</u>	<u>%</u> <u>Copper</u>	<u>Ounces per ton</u>	
				<u>Gold</u>	<u>Silver</u>
134	1/22	14,447	15.38	0.46	86.8
181	1/28	12,111	16.86	0.64	69.1
475	3/17	7,030	12.68	0.445	24.9
483	3/12	7,355	16.14	0.49	25.7
545	3/18	6,860	17.8	0.64	23.8
581	3/24	7,467	16.14	0.65	35.2
604	3/26	7,978	13.87	0.72	46.6
616	3/27	6,568	6.45	0.325	197.8
707	4/8	6,927	12.22	0.41	72.00
730	4/11	361	.58	0.6	86.1
765	4/16	11,169	14.50	0.98	66.0
807	4/21	6,631	16.05	0.96	62.7
828	4/23	8,122	8.98	0.67	80.7
867	4/28	8,103	7.4	0.43	77.2
934	5/8	8,074	7.68	0.64	106.5
963	5/12	9,577	7.53	0.49	95.5
1-8469	5/18	12,730	13.93	0.97	46.73
2-8480	5/25	10,714	14.80	0.78	35.90
3-8499	6/1	8,570	14.735	0.65	63.23
2	6/2	252.94	-	39.22	24.25
4-8523	6/8	10,143	16.965	0.475	111.09
5-8533	6/15	8,250	17.62	0.37	47.62
6-8552	6/24	12,115	15.70	0.89	34.85
7-8565	7/3	11,047	11,235	3.37	40.63
8-8572	7/6	8,780	16.135	3.18	56.06
10-8608	7/20	12,581	19.44	1.83	39.43
11-8633	8/5	16,049	19.63	2.70	31.42
12-8658	8/15	8,295	14,535	1.82	30.22

YEARLY REPORT
ALBATROSS MINING COMPANY

DATED JULY 1935

<u>MONTH</u>	<u>ASSAY HEADS</u>			<u>ASSAY CONCENTRATES</u>		
	<u>Oz. Au</u>	<u>Oz. Ag</u>	<u>% Cu</u>	<u>Oz. Au</u>	<u>Oz. Ag</u>	<u>% Cu</u>
Oct. 1934	.096	4.41	1.66	.82	54.74	20.95
Nov. "	.054	5.50	.95	.65	99.12	17.45
Dec. "	.025	3.36	1.10	.49	51.38	19.34
Jan. 1935	.030	2.76	1.00*	.57	34.80	19.00*
Feb. "	.025	8.40	1.00*	.70	289.22	19.00*
Mar. "	.014	7.89	1.00*	.49	237.59	19.00*
Apr. "	.029	4.13	.68	.34	113.49	20.06
May "	.036	3.52	.69	.51	66.97	19.65
June "	.061	4.34	.72	.69	120.09	18.34

* Estimate

N. B. Results shown in this table are arithmetical averages.

Cananea, Sonora, Mexico

September 12, 1936

Mr. F. A. Wardlaw, Jr.,
Inspiration Cons. Copper Co.,
Inspiration, Arizona

Dear Frank:

Assay results of the samples taken at the Monte Cristo Mine were received yesterday. Preparation of the report and maps will involve some delay so I will summarize my conclusions about the property in this letter, and later forward the report.

In your letter to Mr. Weed of August 4, 1936 a basis for operation of the Monte Cristo Mine by the Anaconda Company, or a subsidiary, was suggested in which the present owners would relinquish a 51% interest to the Anaconda Company in return for management and operation of the property. Present operation is decidedly inefficient, and operating economies could easily be made. However, for efficient operation capital outlay for development charges to reopen inaccessible workings and to increase mill capacity would be necessary. Increased mill capacity would also make necessary installation of a pumping plant at the Hassayampa River to provide a water supply additional to that now secured from the lower levels of the mine.

The present operators since 1934 have partly reopened the 3rd, 4th and 8th levels, and have done a small amount of new development work on these levels. The mine is filled with water to the back of the 9th level, and the 5th, 6th and 7th levels are inaccessible because of caved ground. There do not appear to be

ore possibilities above the third level. Accessible workings below the third level show only a small tonnage of developed ore.

The development of an ore reserve sufficient to insure a successful mining operation at the Monte Cristo depends upon:

1. Discovery of high grade ore lenses;
2. Development of secondary good grade silver ore in the Fault Vein structure exposed on the 3rd and 4th levels;
3. The main Monte Cristo Vein oreshoot.

Extensive development work at the Monte Cristo during the past thirty years has exposed a very small amount of high grade silver and high grade gold ore. No such high grade ore is now exposed in the mine, and the possibilities that any considerable tonnage of such ore will be found by further work do not appear good. The latest discovery, reported by the owners, of some three hundred pounds of gold telluride ore does not appear to be of sufficient importance to warrant hopes of development of an appreciable tonnage of good grade gold ore.

Development on the Fault Vein on the 3rd and 4th levels has been done by the present operators, and a small stope four to five feet in width and some thirty feet in length has been mined from about twenty feet above the fourth level to fifty feet above the 3rd level where the ore ended. No other ore has been encountered on the 3rd level in this structure, and no ore was found south of this stope on the 4th level. A small stope and raise immediately north of this stope and above the 4th level have exposed a narrow width of ore containing irregular high grade secondary silver values, and approximately 300 tons can be expected from this area between the 3rd and 4th levels. At the present time stoping operations are carried over a width of six to twelve feet though sampling shows

the ore section to vary from one to two feet, and the silver content to vary from 4.0 to 115.0 ozs. silver per ton with a small gold and copper content. While it is possible that an additional small tonnage of this type of ore may be developed by work below the 4th level stopes on this structure, there is no indication from present development that any large tonnage of such ore will be found by further work.

The main Monte Cristo Vein oreshoot is partly exposed on the 4th level from 130 to 230 feet south of the shaft. Stopes above this area indicate that very little if any ore remains above the 4th level development of this oreshoot. Except for a raise driven to 70 feet above the 8th level no workings between the 4th and 8th levels are accessible, and very little of the vein can be seen on the ^{8th} level. Sampling on the 4th level over a length of 50 feet, which was accessible for sampling, showed this part of the oreshoot over a width of 5.4 feet to contain 2.2 ozs. silver, 0.04 ozs. gold and 1.4% copper per ton. Above the 4th level in this oreshoot a lense of high grade native silver of primary origin is reported to have been found in 1913. A few scattered samples from vein material on the 8th level showed 1.5 ozs. silver, 0.04 to 0.12 Ozs. gold and 2.5% copper. A sample from the south end of the 8th level raise at 70 feet above the sill showed 2.5 feet of 0.3 oz. silver, 0.12 ozs. gold and 1.4% copper. The south end of this raise at the back shows the vein to be composed of strong clay gouges and broken crushed rock with brecciated quartz and sulphides; the north end of the raise shows little quartz or sulphide mineralization.

From the foregoing it is apparent that the main chance for ore development at the Monte Cristo is in the main Monte Cristo Vein oreshoot. The little accessible development work does not

Mr. F. A. Wardlaw, Jr.,

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Sept. 12, 1936

provide a basis for an estimate of developed ore, but it is possible that several thousand tons of low grade ore are present between the 4th and 8th levels in this shoot. The capital outlay necessary to prepare this indicated low grade ore for mining, and the necessity for increasing mill capacity if such low grade material is to be treated economically make the operation of the Monte Cristo a marginal mining venture in which a lowering of present silver or copper prices would eliminate any possible operating profit.

For these reasons operation of the Monte Cristo property by the Anaconda Company does not appear attractive at present metal prices. Should the owners reopen the workings in the main oreshoot from the 4th to the 8th levels further investigation to determine the tonnage and grade of this oreshoot would be justified.

Yours very truly,

Robert D. ...

Constellation, Ariz.,
Monte Cristo Mine,
August 24, 1936.

Mr. V. D. Perry,
Cananea, Sonora, Mex.

Dear Sir:

Taking a leaf from the book of Mr. R.H. Sales you are hereby informed that this looks like a dirty job to me. I have spent the past few hours with the owner of the property, Mr. Woolley, and this is the biggest, best and greatest silver mine in the world, and it will probably be a gold telluride mine with additional development.

Mr. Wardlaw following Inspiration practice was unable to accompany me to the property, but did send Al Rood whom I met in Phoenix last night. Mr. Woolley was very disappointed that Mr. Wardlaw could not come as he had made a special trip to be here today expecting Mr. Wardlaw. The said Mr. Wardlaw expects to visit us here on Wednesday, but the aforesaid Mr. Woolley is leaving for Los Angeles this evening, thank God, and will mail this letter in Wickenburg.

Geologically this is a mess. Apparently the original rock was a granite which now shows irregular gneissic structure, and has been intruded by thousand of little pegmatitic dikes and by later fine grained basic dikes. Then there has been considerable fault movements in wide zones which create irregular gouges and slips, and mixed up in the mess are little bunches, seams and veins of quartz, barite?, chalcopryite, lead, silver argentite, etc. In addition along some of the gouges and the highly chloritized wall rock there has been a deposition of some fine sulphides and native silver so that stuff which looks like the finest kind of waste may be pretty good ore; they assayed some today which went 80 ounces. There are only three levels open so we should complete the mapping by tomorrow night and then we will probably have to sample a lot of country to find out just what there may be. As long as Elton, Wraith, Wardlaw etc are interested I suppose I had better have some good sample information on which to turn it down; it certainly doesn't look very good from a quick look, anyway.

Hope the Colorado development continues to look as encouraging as it did last week. Take care of my family for me. Will probably be here for the best part of a week which should get me home in a little less than two weeks. There is a telephone line here from Wickenburg, so I can be reached if it is necessary. Will write when I go to Bagdad.

Regards,