



CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

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the local engineers

10

Banks. Report

COPY

De Soto Mine
July 12, 1919

Mr. G. M. Colvocoresses, General Manager
Humboldt, Arizona

REPORT ON SPECIAL SAMPLING

Dear Sir:

Pursuant to your instructions, I have carried out, with the assistance of ~~Mr. H. R. Banks~~, Special Sampling work in the De Soto and in the Whale, with the idea of throwing some light on the possibilities of the De Soto as a low grade mining proposition, and beg to submit herewith the results of such sampling as has been done to date. It is hoped that considerable additional, and possibly more illuminating data will be obtained from certain diamond drilling which is under contemplation.

1. DE SOTO, MAIN WORKINGS

METHOD OF SAMPLING: Channel samples 2" wide and $\frac{1}{2}$ " deep were cut across the formation in the accessible faces of the known areas of mineralization on the upper four levels. 128 samples were obtained, the assay results of which appear on the accompanying assay plans.

ESTIMATE OF LOW GRADE ORE
TONNAGE BETWEEN SURFACE AND 400 FT. LEVEL.

Owing to the inaccessibility of the walls of most of the stopes, the sampling done is inadequate to reach any definite conclusions as to the value of the remaining ore. It is thought, however, that the following estimates, based on the results of the sampling done, are sufficiently conservative to form a basis for the adoption or rejection of any new method of mining and treatment of the ore as a low grade proposition.

It would appear from the results of sampling that the mineral content carries out from the defined orebodies into the wall rock for a short distance. This distance, in the estimating of a zone of mineralization whose copper content is greater than 1%, is, due to the inadequacy of the sampling, a somewhat arbitrary figure. A study of the results of the sampling, however, would seem to suggest that a distance of 10 feet might reasonably be used as a basis of calculation. That is, that the zone of such mineralization extends for a distance of 10 feet from the existing walls of the stopes which have been previously mined. The perimeters of these zones are represented by heavy lines on the level plans.

The averaged mineralized areas of consecutive levels (including the areas of pillars between the orebodies), multiplied by the distance between levels, should give the probable cubic content of 1% ore. A factor of 12 cu. ft. to the ton of unbroken ore was used to obtain the available tonnage.

The number of samples falling within the mineralized zone is 90. The average assay value of these samples is 1.28% copper. The remaining 38 samples which were taken outside this zone have an average assay value of 0.44% copper.

In addition to the faces selected for sampling which are contained in the estimated zone of mineralization, there are known bodies of ore which are at present being worked at a 2% minimum and whose copper content would materially increase the average assay value of the mineralized zone. It is thought, however, that these orebodies should not be represented in the average assay, but should be held in reserve to offset any possible falling off in the values of those areas which it was impossible to sample, but which have been included in the zone of mineralization. In this connection, it would seem, on the whole, in view of the meagerness of the sampling, rather farfetched to assume a total of 275,000 tons of ore averaging 1.28% copper.

The following calculations were used to estimate the tonnage contained within the zone of mineralization.

*Area of Mineralized Zone, 100 Ft. Level,	3760 Sq. ft.
" " " " 200 " "	14805 " "
" " " " 300 " "	9000 " "
" " " " 400 " "	9050 " "

ESTIMATED TONNAGE FROM SURFACE TO 400 Ft. Level 275,000 Tons.

* These figures allow for pillars. Where pillar is small, the cross-sectional area is taken. For the larger pillars it is assumed that the 10 ft. depth of mineralization will represent more closely the cubic content of low grade ore.

Appended hereto will be found a tabulation of the results of the assays, as well as blue prints of the assay plans above referred to.

11. WHALE SAMPLING

METHOD OF SAMPLING Channel samples 2" wide and $\frac{1}{2}$ " deep were cut across the formation at 15 ft. intervals, beginning at the north face of the Whale North Drift, and for 360 ft. south in the Whale South Drift. In addition, continuous channel samples were cut in the walls of the crosscuts within this zone, and 2 samples in the Whale Stope.

RESULTS:

A total of 51 samples were obtained in the Whale, and a tabulation of the results of these samples is appended hereto, as well as a blue print of an assay plan showing the location of the samples, lengths of cuts, and copper content. In connection with the latter item it should be pointed out that, owing to the fact that traces of organic matter contained in the tap water used for assaying gives a slight, but variable reaction with the Permanganate solution used for titrating, any assays running less than 0.05% copper should be considered as carrying "nil" while those running between 0.05% and 0.10% might more properly be reported as a "trace".

In commenting upon the results of the Whale samples it is deemed sufficient to point out that, of the 51 samples taken, only three ran over 1% copper, and the highest of these was 1.37%. No estimation of tonnage is possible.

Respectfully submitted,

H. R. Banks

Re assay

TABULATION OF ASSAYS OF WHALE SAMPLES

SamplesNo.	Place	% Cu.	Sample No.	Place	% Cu.
1	Main X-C	0.20	29	No.1 XC	0.55
2		0.18	30		0.82
3		0.09	31	S. Drift	0.19
4		0.08	32		0.40
5		0.66	33		0.76
6		0.11	34		0.38
7		0.04	35		0.59
8		0.02	36		0.32
9		0.04	37		0.10
10		0.21	38	No. 2XC	0.03
11		0.05	39		0.27
12		0.02	40		0.40
13		0.02	41		0.17
14		0.02	42		0.06
15	N. Drift	0.10	43		0.06
16		0.23	44		0.04
17		0.13	45	S. Drift	0.10
18		0.08	46		0.46
19		1.37	47		0.90
20		0.90	48	Stope	0.69
21		0.29	49		1.26
22		0.73	50	No.3 XC	0.25
23	S. Drift	0.50	51		0.42
24		0.36			
25		0.75			
26		1.11			
27		0.50			
28		0.50			

EXHIBIT E

HUMBOLDT CONCENTRATOR RECORD

TREATING MAINLY BLUE BELL AND DE SOTO ORE

Date	Tons of ore	Cost per ton XX.	Recovery Au.	Recovery Ag.	Recovery Cu.	Ratio of concentrate
1915	81,544	1.2110	62.50	70.50	88.60	4.10:1
1916	80,504	1.5100	80.30	79.90	92.50	3.28:1
1917	103,266	1.7756	74.95	74.22	90.40	3.14:1
1918	104,633	1.9235	67.16	71.91	89.52	3.34:1
1919	100,610	1.5375	67.42	78.25	90.34	2.99:1
1920	91,640	1.5488	69.64	80.66	91.76	3.47:1

XX. Includes flotation royalty averaging over 13¢ per ton.

*Print of flow sheet of mill
attached*

TABULATION OF ASSAYS OF DE SOTO SAMPLES.

S. No.	Level	%Cu.	S. No.	Level	% Cu.	S.No.	Level	%Cu
1*	100	0.31	46	Stope	0.60	92	200	1.30
2		0.62	47	Cont.	1.36	93		0.44
3		1.41	48		0.09	94		0.12
4		1.17	49		0.75	95		0.15
5		2.94	50		1.36	96		0.07
6		3.46	51		1.51	97		0.36
7*		0.77	52*	100	0.49	98*	300	0.06
8*		0.34	53*		0.36	99*		0.11
9		0.06	54*		0.13	100*		0.21
10		1.24	55*		0.06	1-1*		0.37
11		1.77	56*		0.07	102*		1.31
12		0.84	57	Stope	2.31	103*		0.80
13		0.88	58	200	1.30	104		1.66
14		0.98	59		1.79	105*		0.43
15		1.32	60*		0.58	106*		0.78
16		0.53	61*		1.26	107*		0.35
17		1.54	62*		0.37	108*		0.21
18		0.64	63*		0.58	109*		1.18
19		2.32	64*		0.39	110*		0.76
20		1.96	65*		0.45	111		0.57
21		2.24	66*		0.62	112		0.23
22		0.90	67*		0.58	113		0.76
23		2.22	68*		0.51	114		1.26
24	Stope	0.82	69*		0.29	115	250	1.04
25		3.72	70*		0.26	116		0.72
26		3.26	71*		0.19	117		0.08
27		1.85	72*		0.36	118		0.24
28		0.62	73*		0.35	119		5.98
29		1.75	74*		0.42	120	400	0.72
30		0.99	75*		0.43	121		0.18
31		1.28	76*		0.94	122		1.31
32		0.97	77*		0.95	123		0.40
33		0.78	78		1.17	124		0.27
34		2.52	79		0.50	125		1.18
35		0.44	80		0.31	126		2.27
35A		1.71	81		1.55	127		1.45
36		0.28	82		0.50			
37		0.38	83		0.18			
38		0.32	84		0.20			
39		0.28	85		0.71			
40		0.72	86		4.58			
41		1.75	87		4.23			
42		2.18	88		4.74			
43		0.53	89		3.74			
44		2.54	90		2.45			
45		1.92	91		1.28			

* Samples outside assumed mineralized area

EXHIBIT E

HUMBOLDT CONCENTRATOR RECORD

TREATING MAINLY BLUE BELL AND DE SOTO ORE

Date	Tons of ore	Cost per ton XX.	Recovery Au.	Recovery Ag.	Recovery Cu.	Ratio of concentrate
1915	81,544	1.2110	62.50	70.50	88.60	4.10:1
1916	80,304	1.5100	60.30	79.90	92.50	3.28:1
1917	106,266	1.7756	74.95	74.22	90.40	3.14:1
1918	104,633	1.9235	67.16	71.91	89.52	3.54:1
1919	100,610	1.5575	67.42	78.25	90.54	3.99:1
1920	91,640	1.5488	69.64	80.66	91.76	3.47:1

XX. Includes flotation royalty averaging over 13¢ per ton.

*Print of flow sheet will
attached*

DE SOTO MINE

TONS OF ORE SHIPPED TO HUMBOLDT - 1918

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. lbs.	Cost P. T.
Concentg. Ore	42,498	2,245.79	51,152.3	2,190.311	\$ 3.6857
Smeltg. Ore	372	12.31	435.5	17.985	3.6857
T O T A L L	42,870	2,258.10	51,587.8	2,208,296	3.6857

AVERAGE ANALYSIS OF ORE SHIPPED - 1918

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. %
Concentg. Ore	42,498	.0528	1.203	2.577
Smeltg. Ore	372	.0331	1.170	2.417
T O T A L L	42,870	.0527	1.203	2.576

TONS OF ORE SHIPPED TO HUMBOLDT - 1919

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. lbs.	Cost P. T.
Smeltg. Ore	75	--	45.2	2,728	4.7460
Concentg. Ore	26,992	1,345.68	29,402.6	1,272,149	\$ 4.7460
T O T A L L	27,067	1,345.68	29,447.8	1,274,877	\$ 4.7460

AVERAGE ANALYSIS OF ORE SHIPPED - 1919

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. %
Smelting Ore	75	--	0.603	1.819
Conctg. Ore	26,992	.0499	1.089	2.356
AVERAGE	27,067	.0499	1.088	2.355

MINING OF REPLACEMENT DEPOSITS OF COPPER ORE

*Already
done
duplicate*

Ever since D. C. Jackling and his associates pioneered the way the operation of the so-called porphyry-coppers has been carried on with profit and on an increasing scale until at present it accounts for more than three-fourths of the total U. S. output of copper and is reasonably certain to represent an even larger percentage as time goes on.

The natural conditions which permit the profitable application of such a procedure involve the fairly uniform distribution of small quantities of copper mineral, -generally in the form of sulphide, -throughout a large mass of mineralized rock which makes it possible to cheaply mine the very low grade ore in great quantity often more than 10,000 tons per day and then to concentrate it with a ratio of from 20 to 50 to 1 so that only a comparatively small tonnage of high grade material is subjected to the expensive pyro-metallurgical procedure that results in finally putting the metal into a marketable product.

Thus copper derived from crude ore containing less than 1% of the metal is being produced and marketed in some cases for an operating cost of as little as seven or eight cents per pound and where the tonnage in the deposit amounts to some hundreds of millions of tons, - as at Bingham Canyon and Morenci, the large initial investment required to prepare and equip the mines for operation can be amortized at a very trivial figure per ton of ore or pound of copper produced.

Obviously no such procedure could be applied to any ore body that occurred in narrow veins or in any other manner that precluded cheap mining or that could only be beneficiated with a low ratio of concentration

and up to the present time only the disseminated ore bodies,--usually in some type of porphyry rock,--have been profitably exploited.

However, for many years I have given some thought to the possibility of applying a somewhat similar procedure to the replacement deposits in schist such as are found in Yavapai County, Arizona, and of which the largest is the United Verde at Jerome, while among the smaller deposits of similar character may be mentioned the Blue Bell, De Soto, Arizona Binghamton and Little Copper Queen.

The conditions at the United Verde were somewhat unique and here after the best of the ore had been mined from the lenses in the upper levels the entire mineralized zone was stripped of the barren material at the surface and then the low grade ore was mined out from a huge glory hole extending down to the old 600' level, with an area of 52 acres at the top of the mountain which was 1040' above the bottom of the pit where the area was only 1.5 acres. From this pit there was taken 34,000,000 tons of waste and 9,080,904 tons of ore with an average content of 3.00% copper plus 0.03 oz. au. and 2.00 oz. silver.

In all of the other mines mentioned the ore occurs in lenses which have the following characteristics in common:-

(a) The long axis is vertical so that in some cases as at Blue Bell an ore shoot with a horizontal length of only 300' has a known vertical length of 1500' and may extend much deeper.

(b) The greatest width of ore is at or near the horizontal center of the lenses and this condition maintains all the way from the top to the bottom where, except when the shoots are cut off by faults, the copper content decreases and the lense either pinches out or the chalcopryrite gives place to iron sulphide or barren quartz.

(c) On both sides of the core of high grade ore and at its ends the values gradually decrease in the foot and hanging wall of the shoot and the width and length of the mineable ore is determined by assay with the limits extending farther in all directions as the critical grade of the pay ore is reduced.

(d) Where several lenses wholly or partially overlap the wall rock between them is nearly always mineralized to a small extent and often there are stringers of ore connecting the other shoots which are strung out thru the length of a mineralized zone.

These conditions may best be illustrated by sketches which follow and which, while not pretending to accurately represent the exact conditions of any one of the deposits, are fairly representative of the general conditions found in many of them.

In all of the mines mentioned above the heart or core of the ore shoots have already been mined out,--since there was no thought of large scale mining when they were operated,--and therefore the higher grade material has been eliminated,--as shown in the sketches, and the practical application of the proposed procedure must depend upon the tonnage and value of the remaining ore.

While the work previously done in these mines has had the obvious disadvantage above noted yet it has had the advantage of partially proving up the grade and tonnage remaining and thus making future exploration much less expensive than would be the case with a virgin ore-body.

Also this work often serves to make the remaining ore more accessible and advantage can be taken of existing shafts or adits where the caving system of underground mining may be applied in line with the

practice at Miami and at the Ohio Copper Co. of Utah.

In cases where open cut mining methods could best be followed the existence of the old stopes and workings would be advantageous in some respects and disadvantageous in others. The breaking down of ore along the terraces should be made easier but there would be extra expense involved in handling the timber and the fill but if this fill consisted of low grade ore, as is often the case, the general effect should be favorable.

The character of the ore is a matter of the utmost importance for in many cases, e. g., the Blue Bell, much of the ore contains a high percentage of iron-sulfid and unless nearly all of the former could be dropped in the flotation circuit there would be a low ratio of concentration and a low grade concentrate would be produced. At De Soto where there is less iron and the ore is more siliceous I have assumed that the ratio of concentration might be about 10 to 1 so that a 1% ore would produce a 10% cu concentrate.

Equally important is the fact that much of the ore is wholly or partially oxidized in the upper levels of most of these mines and on such material the recovery of values would not be so good as when sulphides were treated. However, the great bulk of the ore is in the form of sulphide and a recovery of 90% should be made. Incidentally, much of the oxidized ore is richer than the sulfide.

The character and dip of the walls must also be given due consideration. The dip of the ore shoots and of the mineralized zone at both the Blue Bell and De Soto is in the order of 70° (to the E 25° N) and while the foot wall will generally stand up pretty well the hanging

wall will naturally tend to cave, altho at the De Soto both walls were remarkably solid and firm.

If an open cut at De Soto were carried down to the 600' level and the northeast contour of the hill averaged 30° (which is about right) it might be necessary to remove some 5,000 tons of waste for each running ft. of the cut in order to bring the slope of the hanging wall to the angle of repose (45°) and this would mean removing some 3,000,000 tons of waste if the pit had an ultimate length of 600'.

Total cost @ 10¢ per ton would be 300,000 equivalent to a charge of 15¢ per ton if only 2,000,000 tons of ore were extracted from the pit. Thus the actual mining of the ore to the mill could not exceed a cost of 25¢ per ton if the total mining cost was to be kept at 40¢ per ton. This might be pretty difficult.

COMPARATIVE STATEMENT OF MINING COSTS

BLUE BELL AND DE SOTO MINES 1918

	Cost per Ton Shipped		Cost P. Lb. Cu in ore	
	Blue Bell	De Sototo	Blue Bell	De Soto
Exploration	\$.0780	--	.1408¢	--
Development in Waste	.2362	.2122	.4262	.4119¢
Development in Ore	.2733	.1632	.4933	.3557
Extraction	1.4708	1.1109	2.6544	2.1566
Shaft Repairs	.0088	--	.0157	--
Pumping	.0171	.0177	.0308	.0344
Hoisting	.1417	--	.2556	--
Hoisting in Winze and Tramg. to Upper terminal	--	.2461	--	.4778
General Supplies	.1171	.0913	.2114	.1772
General Surface Work	.3342	.2156	.6032	.4185
Operating Ropeway, Sort- ing, & Loading Ore	.2794	.2425	.5043	.4709
Gen. Exp. & Gen. Supervn.	.4420	.441	.7977	.8575
T O T A L	\$ 3.3986	\$ 2.7612	6.1334¢	5.3605¢
Operating Revenues (red)	.0592	.0071	.1069	.0333¢
TOTAL NET EXPENDITRS.	\$ 3.3394	\$ 2.7441	6.0265¢	5.3272¢
Decrease Ore Reserve in Mine and in Transit	\$.0661	\$.1551	.1194¢	.3010¢
T O O T A L	\$ 3.4055	\$ 2.8992	6.1459¢	5.6282¢
Frts. on ore to Humboldt	\$.3806	\$.7865	.6868¢	1.5269¢
Total Cost for Humboldt	\$ 3.7861	\$ 3.6857	6.8327¢	7.1551¢

(1)

(2)

(3)

(4)

- (1) 131,090 Tons
 (2) 42,870 "
 (3) 7,263,779 lbs. Cu in Ore Shipped
 (4) 2,208,296 lbs. Cu in Ore shipped

DE SOTO MINE

TONNAGES OF ORE SHIPPED

Month	1915	1916	1917	1918	1919
Jan.	--- T.	1,229 T.	3,226 T.	4,186 T.	2,498 T.
Feb.	--- T.	2,369 T.	2,940 T.	4,504 T.	2,569 T.
Mar.	140 T.	3,086 T.	3,375 T.	4,656 T.	2,875 T.
Apr.	604 T.	3,120 T.	2,918 T.	4,530 T.	2,674 T.
May	487 T.	3,622 T.	3,569 T.	4,793 T.	2,478 T.
Jun.	560 T.	2,720 T.	4,109 T.	4,690 T.	1,535 T.
Jul.	601 T.	2,444 T.	4,005 T.	3,733 T.	1,793 T.
Aug.	741 T.	2,993 T.	4,082 T.	2,813 T.	1,764 T.
Sept.	815 T.	2,738 T.	4,693 T.	2,595 T.	1,998 T.
Oct.	1,231 T.	3,487 T.	4,204 T.	2,322 T.	2,103 T.
Nov.	1,429 T.	3,828 T.	4,152 T.	2,133 T.	2,033 T.
Dec.	1,752 T.	2,746 T.	4,210 T.	1,915 T.	2,747 T.
TOTALS	8,360 T.	34,382 T.	44,483 T.	42,870 T.	27,067 T.

METAL CONTENTS OF ORE SHIPPED

	Gold Ozs.	Silver Ozs.	Copper lbs.
1915	378.86	9,563.2	586,271
1916	1,446.87	37,179.7	2,320,980
1917	2,558.61	57,485.0	2,700,478
1918	2,258.10	51,587.8	2,208,296
1919	1,345.68	29,447.8	1,274,877

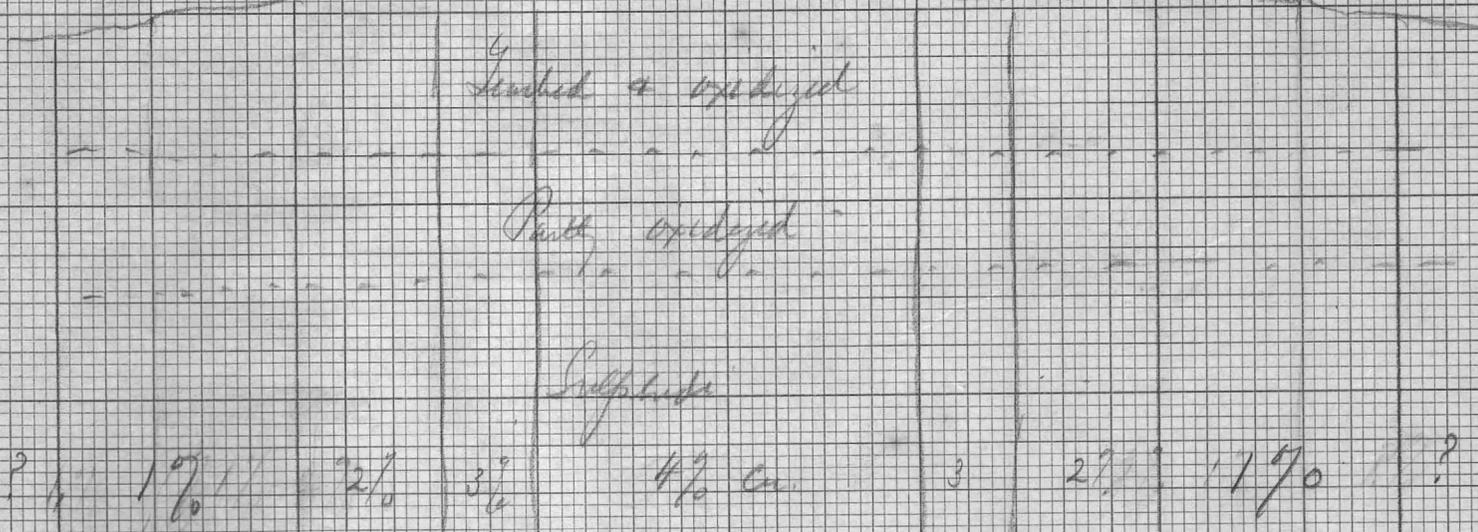
AVERAGE ASSAY OF ORE SHIPPED

	Gold Ozs.	silver Ozs.	Copper %
1915	0.0453	1,144	3.5
1916	0.0421	1.081	3.375
1917	0.0535	1.292	3.035
1918	0.0527	11203	2.576
1919	0.0499	1.088	2.355

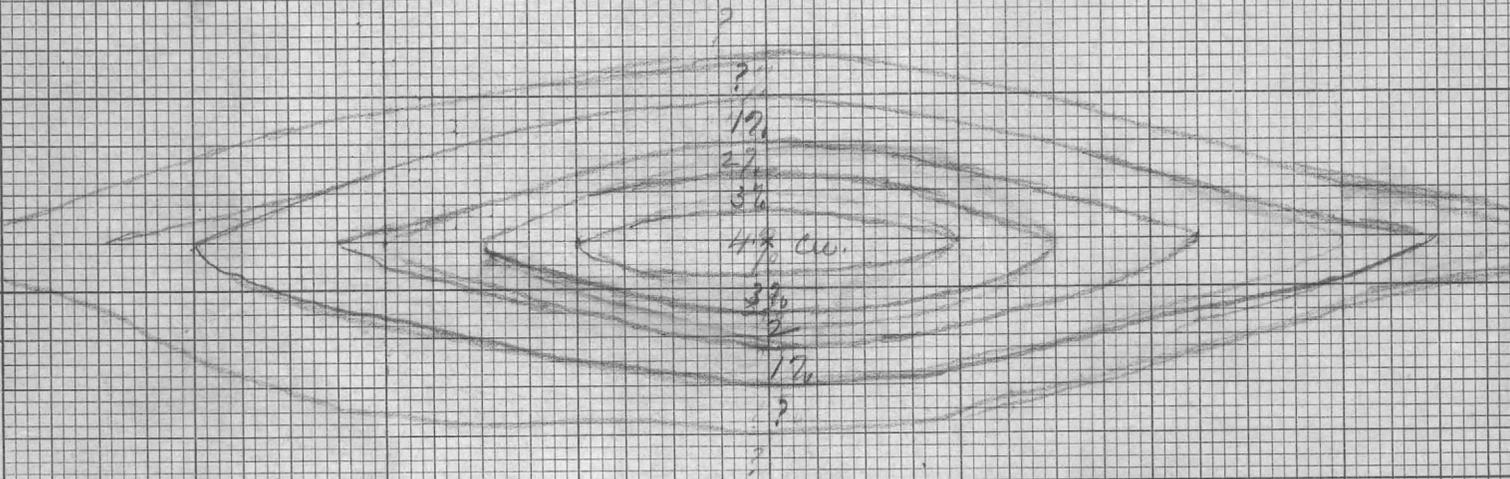
DEVELOPMENT WORK PERFORMED

		Total Cost	Cost P. Ft. Adv.
1916	Total (not segregated)	\$ 17,301.40	\$ 9.53
	Exploration 186.5)		
1917	Dev. in Waste 164.0)	5,957.82	11.20
	Dev. in Ore 181.5)		
	Exploration ---)		
1918	Dev. in Waste 572.5)	16,949.61	19.38
	Dev. in Ore 3302.0)		
* Includes 124 ft. shaft and 30 ft. winze.			
	Dia. Drilling 1,417)		
1919	Dev. in Waste 407)	17,284.38	6.69
	Dev. in Ore 760)		

Typical Occurrence of Copper Ore in a Replacement Sheet
 Vertical Section Surface



Plan



Plumbe = water layer
 layer = copper ore

4891311.68
 5252769.75
 2322038.20
 4410192.48
 3543380.53
 4346470.83
 4091428.57

28,857,592.04

18,172,000.

47,029,592.04

The P. & L. Corp from Dec 31st 1935 to Dec 31st 1943
 estimated that for Dec 31st 1935 to Dec 31st 1943
 they would earn 12,743,706 but
 actually they earned 28,857,592.04. Another method
 of arriving at the estimate of 18,172,000
 estimated future profits arrived at by multiplying
 the P. & L. of 4,543,000 by 4 which
 factor has been selected because P. & L. had

previously estimated that the profit from the ore
 which they mined during '42 would be only 985,000 in place
 of the actual profit of 4,091,428.75 which is more
 than 4 times the estimate.

Since the P. & L. estimates since 1935 have on
 the average represented only 44.16% of the actual profits
 earned during that period the defendants assume that
 a similar underestimate has been made for the
 future i.e. that the estimated future profit of
 4,543,000. will be only 44.16% of the actual
 future profit which they then establish in the
 "overall case" as being in round figure 10,287,000
 They then assume that the life of the mine will

D E S O T O M I N E

TONNAGES OF ORE SHIPPED

Month	1915	1916	1917	1918	1919
Jan.	--- T.	1,229 T.	3,226 T.	4,186 T.	2,498 T.
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Jun.	560 T.	2,720 T.	4,109 T.	4,690 T.	1,535 T.
Jul.	601	2,444	4,005	3,733	1,793
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Sept.	815	2,738	3,693	2,595	1,998
Oct.	1,231	3,487	4,204	2,322	2,103
Nov.	1,429	3,828	4,152	2,133	2,033
Dec.	1,752	2,746	4,210	1,915	2,747
TOTALS	8,360 T	34,382 T	44,483 T.	42,870 T	27,067 T.

METAL CONTENTS OF ORE SHIPPED

	Gold Ozs.	Silver Ozs.	Copper lbs.
1915	378.86	9,563.2	586,271
1916	1,446.87	37,179.7	2,320,980
1917	2,558.61	57,485.0	2,700,478
1918	2,258.10	51,587.8	2,208,296
1919	1,345.68	29,447.8	1,274,877

AVERAGE ASSAY OF ORE SHIPPED

	Gold Ozs.	silver Ozs.	Copper %
1915	0.0453	1,144	3.5
1916	0.0421	1.081	3.375
1917	0.0575	1.292	3.035
1918	0.0527	11.203	2.576
1919	0.0499	1.088	2.355

DEVELOPMENT WORK PERFORMED

			Total Cost	Cost P. Ft. Adv.	
1916	Total (not segregated)	1,814 Ft.	\$ 17,301.40	\$ 9.53	
1917	Exploration	186.5)	532 ft.	5,957.82	11.20
	Dev. in Waste	164.0)			
	Dev. in Ore	181.5)			
1918	Exploration	- -)	* 874.5	16,949.61	19.38
	Dev. in Waste	572.5)			
	Dev. in Ore	302.0)			
1919	Dia. Drilling	1,417)	2,584 ft.	17,284.38	6.69
	Dev. in Waste	407)			
	Dev. in Ore	760)			

* Includes 124 ft. shaft and 30 ft. winze.

COMPARATIVE STATEMENT OF MINING COSTS

BLUE BELL AND DE SOTO MINES - 1918

	Cost per Ton Shipped		Cost P. Lb. Cu in ore	
	Blue Bell	De Soto	Blue Bell	De Soto
Exploration	\$.0780	--	.1408¢	--
Development in Waste	.2362	.2122	.4262	.4119¢
Development in Ore	.2733	.1632	.4933	.3557
Extraction	1.4708	1.1109	2.6544	2.1566
Shaft Repairs	.0088	--	.0157	--
Pumping	.0171	.0177	.0308	.0344
Hoisting	.1417	--	.2556	--
Hoisting in Winze and Tramg. to Upper terminal	--	.2461	--	.4778
General Supplies	.1171	.0913	.2114	.1772
General Surface Work	.3342	.2156	.6032	.4185
Operating Ropeway, Sort- ing, & Loading Ore	.2794	.2425	.5043	.4709
Gen. Exp. & Gen. Supervn.	.4420	.4417	.7977	.8575
T O T A L	\$ 3.3986	\$ 2.7612	6.1334¢	5.3605¢
Operating Revenues (red)	.0592	.0071	.1069	.0333¢
TOTAL NET EXPENDTRS.	\$ 3.3394	\$ 2.7441	6.0265¢	5.3272¢
Decrease Ore Reserve in Mine and in Transit	\$.0661	\$.1551	.1194¢	.3010¢
T O T A L	\$ 3.4055	\$ 2.8992	6.1459¢	5.6282¢
Frts. on ore to Humboldt	\$.3806	\$.7865	.6868¢	1.5269¢
Total Cost for Humboldt	\$ 3.7861	\$ 3.6857	6.8327¢	7.1551¢
	(1)	(2)	(3)	(4)

- (1) 131,090 Tons
 (2) 42,870 "
 (3) 7,263,779 lbs. Cu in Ore Shipped
 (4) 2,208,296 lbs. Cu in Ore shipped

DE SOTO MINE

TONS OF ORE SHIPPED TO HUMBOLDT - 1918

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. lbs.	Cost P. T.
Concentg. Ore	42,498	2,245.79	51,152.3	2,190.311	\$ 3.6857
Smeltg. Ore	372	12.31	435.5	17.985	3.6857
T O T A L	42,870	2,258.10	51,587.8	2,208,296	3.6857

AVERAGE ANALYSIS OF ORE SHIPPED - 1918

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. %
Concentg. Ore	42,498	.0528	1.203	2.577
Smeltg. Ore	372	.0331	1.170	2.417
T O T A L	42,870	.0527	1.203	2.576

TONS OF ORE SHIPPED TO HUMBOLDT - 1919

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. lbs.	Cost P. T.
Smeltg. Ore	75	--	45.2	2.728	4.7460
Concentg. Ore	26,992	1,345.68	29,402.6	1,272.149	\$ 4.7640
T O T A L	27,067	1,345.68	29,447.8	1,274,877	\$ 4.7460

AVERAGE ANALYSIS OF ORE SHIPPED - 1919

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. %
Smelting Ore	75	--	0.603	1.819
Conctg. Ore	26,992	.0499	1.089	2.356
AVERAGE	27,067	.0499	1.088	2.355

Copy date & note in final version
(1936)

INTRODUCTION

Recently I listened to a very excellent talk in which the speaker stated that the people of the United States were prone to view every political and economic change as being either wholly black or white, whereas in reality nearly everything of this nature should be seen as a shade of gray with the black and white, i. e. the bad and good, mixed in varying proportions. Today I find that nearly everyone with whom I talk is inclined to either almost wholly approve or condemn the policy of the Roosevelt Administration and to prophecy that this will lead the nation either to a splendid Utopia or to most dismal ruin.

People easily forget their fears, as long as they are not actually hurt but injuries stay long in ones memory while benefits are soon forgotten and it is for this reason that we have on the one hand so many sore heads who made good money during the many years of Republican prosperity but now see nothing good in that party because they eventually lost so heavily and on the other hand we find the equally ungrateful who were saved from total ruin by the Democratic policies but now find that these are making it difficult for them to make as much money as they think they could under a plan of unrestricted individual competition.

Now it seems to me that both positions are entirely wrong; in all fairness we must recognize that the nation and in general the individual has prospered under the industrial freedom of the past century but that gradually certain abuses to that system had been steadily forcing a certain amount of Government control, or regimentation. Long before President Franklin Roosevelt came on the scene, we ~~have~~ had anti-trust laws, public utility regulations, income and excess profits

(2)

Standing just below that point & they had
opened up the 300' level & mined some
very good ore of almost the same grade as
that found in the back
of the ^{old} 230 Stope & they got some other
ore north of the stopes but all are south of
the shaft (#2 ore body) was too low grade
to mine with profit. Never connected with Blue
Buck workings in either the 300 or 500' levels.
Nashwan wanted to know the location
of drill hole #50 from our 8th level
south in which some fair grade ore had
been found & by consulting the record drill
hole record & the long section map the
hole was found to be 130' north of the

merely the formal statement of a Bill of Rights or alterations in details of our government. One hundred and forty-six years is a long time especially when during that period the unprecedented advances in science have so completely changed the lives and manners of all civilized people and if today we stand in need of some further amendments to our integral principles of government in order to permit social conditions to catch up with progress in other lines, then by all means let us make these changes not in haste or conflict but in the sober and orderly manner as foreseen by the men who constructed this instrument for our guidance.

So I have set down some of the thoughts which have come to me during the past few months and some of the methods by which I believe that we can hope to bring the nation out of the present and past depression and to steer its course safely into less troubled waters.

I have tried to point the present situations in gray-- as I see it, and to figure out how some/^{of}the black can gradually be taken out of the picture and the white shade of true and widespread national prosperity more nearly attained.

No doubt this is a presumptuous undertaking but publicly or privately everyone is doing it--so I might as well have my say--

METHOD OF OPERATION

In nearly all plans of general reform the objects sought are quite similar, a better and wider distribution of the natural productive wealth of the nation (not a sharing of the wealth already acquired by some for the benefit of others) the abolition of all real poverty both in years of plenty and depression,- a healthier, happier life for the great mass of the underprivileged and the elimination of unrest and class conflict with its ever present danger to life and property and at its worst to the very foundations

(3)

Old Blue Thunder Staff. There is a
chance that he might decide to get a
new lease & go after this we had he said
that this was unlikely.

Framham & Adams had been over
the Hill Lots some on several occasions but
he had never been given any help. He
had offered to do some work there if Clark
would build ^{at his expense} a road from Middleton to
the mine but he was not interested
when Clark refused to do this.

It is all right for me to try & get
a lease on the Hill Lots on behalf of others.
Framham & Adams are looking for another
mine, - mentioned Stone End

(9)

Curry seats of various sills &
dull holes. Show to command
we expect such as has since been
worked out

Mr. D. W. Fountain

-2-

June 21st, 1940

proceedings as these will at least give me some added protection and doubtless bring more pressure on the Bullard Company than I have so far been able to exert.

Yours very truly,

GMC:MF

Digitized by
HOMER BOND
KANSAS CONTENT U.S.A.

General:

We are operating from eight ore shoots at De Soto, no one of which is very large, but we believe that considerable additional ore still remains to be proved up in them and the small amount of work done on the 700 and 800' levels would seem to indicate that ore continues strong to a considerably greater depth. Six of the ore shoots are cut off by a strong fault which traverses the property and during the present year we shall make every effort to find the continuations of these ore shoots below the fault. We have also good reason to hope that exploration now under way will develop some entirely new ore bodies of considerable importance. I consider the prospects of the De Soto to be very good indeed.

LEASOTO MINE

TONNAGES OF ORE SHIPPED

Month	1915	1916	1917	1918	1919
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		Total Cost	Cost P. Ft. Adv.
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	Dev. in Ore 760)		

COMPARATIVE STATEMENT OF MINING COSTS

BLUE BELL AND DE SOTO MINES - 1918

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T O T A L	\$ 3.4055	\$ 2.8992	6.1459¢	5.6282¢
Frt. on ore to Humboldt	\$.3806	\$.7865	.6868¢	1.5269¢
Total Cost for Humboldt	\$ 3.7861	\$ 3.6857	6.8327¢	7.1551¢
	(1)	(2)	(3)	(4)

(1) 131,090 Tons
 (2) 42,870 "
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SANTA FE TANK & TOWER COMPANY

DIVISION OF
INDUSTRIAL MANUFACTURERS, LTD.

Lafayette 0194

Teletype LA 417-X



Main Office & Factory:
3401 S. BOYLE AVE.
LOS ANGELES 11, CALIF.

NOTHING....JUST NOTHING
TAKES THE PLACE OF EXPERIENCE

That, Sir,

Is a truism on which Santa Fe bases this invitation to you---to requisition your next Wood Tank from Santa Fe Tank & Tower Company.

There are 43 years of experience behind every Tank fabricated by Santa Fe. Performance, Economy and Durability, the theme of Santa Fe, has been built into every Tank fabricated since 1904.

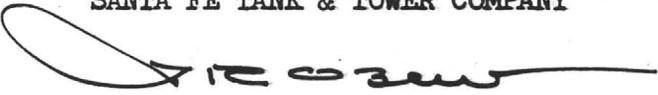
To assure you your requirements will be followed to the Nth degree, Santa Fe has 21 acres of equipment, manned by seasoned craftsmen, and backed up by a high inventory of raw materials.

It will pay you to consult Santa Fe when your requirement is a Wood Tank.

FOR EXPERIENCE, PERFORMANCE, ECONOMY AND DURABILITY, LOOK TO SANTA FE.

Yours very truly,

SANTA FE TANK & TOWER COMPANY



L. R. Obert

LRO:5

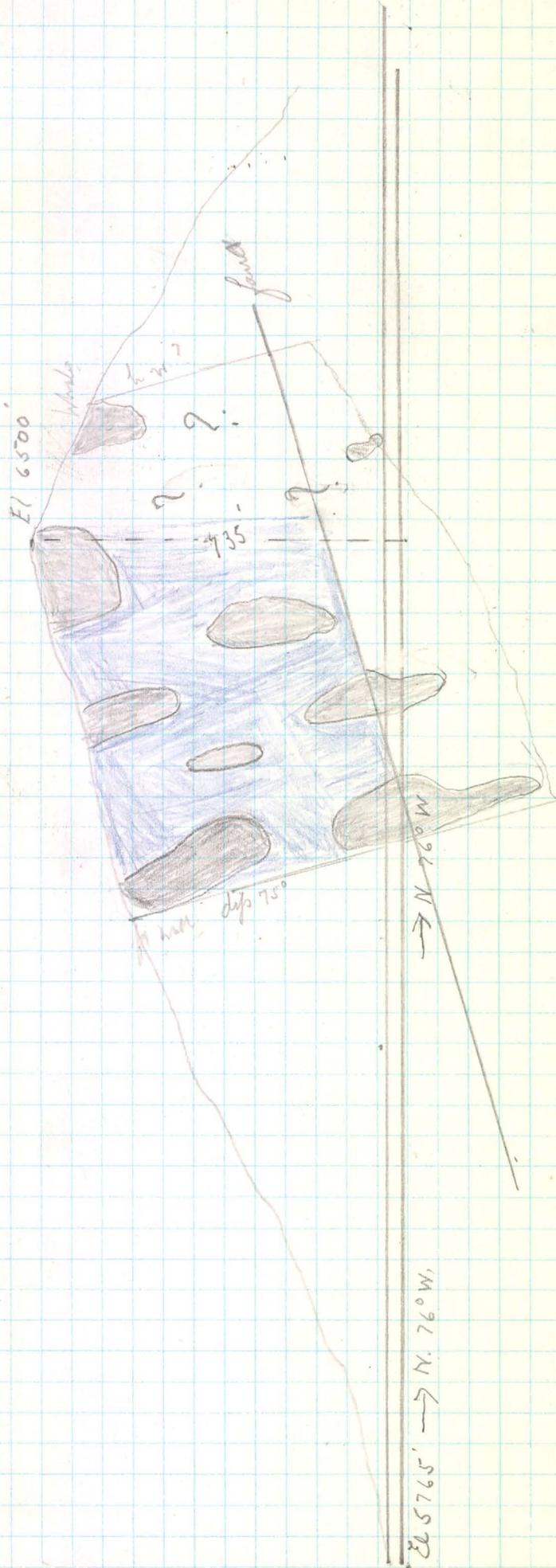


BRANCHES: HOUSTON, TEXAS ★ TULSA, OKLAHOMA ★ NEW YORK, N. Y. ★ SAN FRANCISCO, CALIFORNIA



De Soto

Blind Hill number 1 Pit to pond under summit of hill 2000'



hill line from length El 5765 to
with h.s. of a depth 500'

Area dip is actually sampled (approx) from
of profile low grade on, shaded blue, each 300'

Section Looking S. 76° W.

outlines of low grade ore; much of which could be mined by open-pit operation but much of which might prove to be too low ^{grade} to mine with profit.

After you h

DE SOTO MINE.

TONS OF ORE SHIPPED TO HUMBOLDT - 1918

	Dry Tons	Au. Ozs.	Ag. Ozs.	Cu. lbs.	Cost P. T.
Concentg. Ore	42,498	2,245.79	51,152.3	2,190.311	\$ 3.6857
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W A S H O T O M I N E

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		Total Cost	Cost P. Ft. Adv.
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* Includes 124 ft. shaft and 30 ft. winze.			
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ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department

V. D. PERRY, Asst. Chief Geologist



July 18, 1946

818 Kearns Building
Salt Lake City, Utah

Mr. George M. Colvocoresses
Mining and Metallurgical Engineer
102 Luhrs Tower
Phoenix, Arizona

A 7/22/46

Dear Mr. Colvocoresses:

Conforming with the request contained in your letter of July 16 I am returning herewith prints of the maps on the De Soto mine. I have kept the rather voluminous notes that you sent concerning the De Soto since you did not request the return of these data.

I will be pleased to have you keep me posted on activity at this property.

With kind personal regards...

Sincerely yours,

V. D. Perry

VDP/io

Enc.

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department
RENO H. SALES, Chief Geologist
M. H. GIDEL, Asst. Chief Geologist



Nov. 14, 1945.

Mr. George M. Colvocoresses,
1102 Luhrs Tower,
Phoenix, Arizona.

Dear Sir:

It was a pleasure to meet you at Globe, and I regret we did not have more time to talk about mines.

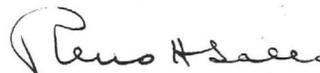
Personally, I am not familiar with the Blue Bell or mines of that area. I think Mr. Perry knows something of that district, so I am forwarding your letter to him for his consideration. No doubt, you will hear from him within the not distant future.

With kindest regards and thanking you for calling the above properties to our attention, I am

Sincerely yours,

RHS:KM

cc: CEW
VDP



RENO H. SALES

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department

V. D. PERRY, Asst. Chief Geologist



818 Kearns Building
Salt Lake City, Utah

November 19, 1945

Mr. George M. Colvocoresses,
1102 Luhrs Tower
Phoenix, Arizona

BLUE BELL MINE
Yavapai County, Arizona

Dear Mr. Colvocoresses:

I have read with interest your letter to Mr. Sales on the Blue Bell and DeSoto Mines, Yavapai County, Arizona.

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With kind personal regards,

Sincerely yours,

V. D. Perry.

VDP:C

cc - R. H. Sales

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Lud. H. make
+ My and the grade as in a*

ANACONDA COPPER MINING COMPANY

Butte, Montana

A. 4/29.46

Geological Department
V. D. PERRY, Asst. Chief Geologist



818 Kearns Building
Salt Lake City, Utah

April 25, 1946

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

DESOTO and BLUE BELL MINES
Yavapai County, Arizona

Dear Mr. Colvocoresses:

Mr. Sales and I have discussed your presentation of the DeSoto and Blue Bell mines, Yavapai County, Arizona. After giving the subject our careful consideration we have decided against undertaking an examination of these properties at the present time.

I assume you have copies of the notes that you sent with your letter discussing the feasibility of reopening the DeSoto mine. However, if you wish to have me return the copy that you sent my office, please let me know.

We appreciate the information that you submitted and wish to take this opportunity to thank you for your cooperation.

Sincerely yours,


V. D. Perry

VDP:C
cc - R. H. Sales

A 3/29, 45

Cleator Arizona
March 27th 1945

Mr. S. M. Colvocoresses,
Phoenix Arizona.

Dear Sir:-

I am interested to know
if the claim that my Dad
and Manley Glass worked
on for the Company is
patented and if the Taxes
are paid up on it. You know
it was a prospect that they
worked on between the Whale
Claim and where Manley
Glass and Bishop lived.
I think the Company called
it the little Johnny.
You know there was

a pretty good little streak of
ore in it but it wasnt big
enough for the Company at
that time.

The reason I am interested
is that there has been 3 or
4 parties trying and have
located it and are figuring
on packing what ore that
is on the dumps away and
shipping it. I told them
It was patented and belongs
to your Company to go to
the records and see for
them selves. The last
report I had they were
going to sue me for
causing them so much
trouble and they claim
it is not patented and

Is open ground. I wish you
would Inform me in the
matter or come up and
see for yourself.

Yours Truly
Robert A. Ort
Clifton Arizona

P.S. They figure there is
about 10 tons of ore on the
dump

Duplicates

A. 4/29, 46

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department
V. D. PERRY, Asst. Chief Geologist



818 Kearns Building
Salt Lake City, Utah

April 25, 1946

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VDP:C
cc - R. H. Sales

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department
V. D. PERRY, Asst. Chief Geologist



July 18, 1946

818 Kearns Building
Salt Lake City, Utah

Mr. George M. Colvocoresses
Mining and Metallurgical Engineer
102 Luhrs Tower
Phoenix, Arizona

A 7/22/46

Dear Mr. Colvocoresses:

Conforming with the request contained in your letter of July 16 I am returning herewith prints of the maps on the De Soto mine. I have kept the rather voluminous notes that you sent concerning the De Soto since you did not request the return of these data.

I will be pleased to have you keep me posted on activity at this property.

With kind personal regards...

Sincerely yours,

V. D. Perry

VDP/10

Enc.

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department

V. D. PERRY, Asst. Chief Geologist



July 18, 1946

828 Kearns Building
Salt Lake City, Utah

Mr. George M. Colvocoresses
Mining and Metallurgical Engineer
102 Luhrs Tower
Phoenix, Arizona

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VDP/10

Enc.

ANACONDA COPPER MINING COMPANY

Butte, Montana

818 Kearns Building
Salt Lake City, Utah

Geological Department
V. D. PERRY, Asst. Chief Geologist



November 19, 1945

Mr. George M. Colvocoresses,
1102 Luhrs Tower
Phoenix, Arizona

BLUE BELL MINE
Yavapai County, Arizona

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cc - R. H. Sales

*Why not the grade as in a
log. Name from - Dept
and R. H. Sales*

ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department
V. D. PERRY, Asst. Chief Geologist



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Sincerely yours,

V. D. Perry.

VDP:c
cc - R. H. Sales

*Why not the grade as in a
log, never give up
and make*

(12)
Deep

REPORT ON SAMPLING AT DE SOTO MINE
MAY, 1930, by G. J. Harbauer.

There appears to be considerable low grade sulphides of copper remaining in the De Soto Mine, especially in the section known as the "40 New" orebody which was opened up on the 3rd, 4th and 5th levels.

On the 3rd level a sill floor^y was cut and timbered and a shrinkage stope carried up 23 feet. Wide sills were cut on the 4th and 5th levels but not timbered.

To determine what portion, if any, of this sulphide body could be mined and milled at a profit, sampling was started on the 540 sill. Channels were cut five feet apart at right angles to the schistosity and a length of 5 feet was included in each sample which averaged about 20 pounds.

A total of 47 samples was cut on the 540 sill and 41 samples were cut on the 440 sill. No samples were cut in the 340 stope due to a drop in the price of copper.

The results of the sampling are shown on the assay map and the tonnage figure is based upon a 1.9% cu. content allowing for sorting out some of the coarse waste to make a 2% grade. On the 540 sill a width of 10' and length of 60', or 600 sq. feet is figured. On the 440 sill a width of 15' and a length of 25' is considered, or an area of 375 sq. ft.

The slope distance between these two faces is 105' and the contents of the block would be: $\frac{600 \text{ plus } 375}{2} \text{ times } 105 = 51,200 \text{ cu. ft.}$

Using 11 cu. ft. per ton this would be 4660 tons.

The block between the 440 and 340 sills would be possible ore and would contain: $\frac{375 \times 93}{11} = 3,170 \text{ tons.}$

The block above the 340 sill shows some good streaks of sulphides and might yield at least 2,000 tons of 2% ore.

Other sulphide bodies that should yield additional tonnage of milling ore are the 490, 390, and 290 stopes which carry a higher copper content but are smaller than the "40" orebodies.

The 490 sill is cut but not timbered. The 390 stope is worked

out half way up to the 200 level, but the timbers are down now. The 290 stope was not worked to its full width and several thousand tons might be expected in this body.

A total of 15,000 tons of $2\frac{1}{2}\%$ ore is reasonably assured and with some new prospecting and development additional tonnage can be expected.

G. J. Harbauer

(Note by S. M. C.)

Altho it does not appear that these samples were assayed for gold & silver yet it is certain that their average content ~~could~~ must have been similar to that of other samples taken in their vicinity which has been

Assessment Return for Year 1928.

Southwest Metals Company.

Copy for SMC

*Recorded
Borth/Thomas page*

1. De Soto Mine.

Survey #

Patented Mining Claims: (^{PECK}~~Big~~ District)

Water Lode	20.578 Acres..)	- 83 (duds) p 269
Enterprise.....	19.95 " ..)	52 mini 470
Tidal Wave.....	20.66 " ..)	52 " 475
Favorite.....	20.66 " ..)	52 " 472
Iron Clad.....	20.66 " ..)	52 " 473
Arizona Chief.....	20.66 " ..)	52 " 476
Fortune.....	20.66 " ..)	52 " 474
Grand View.....	20.66 " ..)	52 " 484
Elephant.....	20.66 " ..)	52 " 482
McKinley.....	20.66 " ..)\$ 13,020.00 52 p 479
Anchor.....	20.66 " ..)	52 " 480
Whale.....	20.66 " ..)	52 " 481
Copper Bar.....	9.49 " ..)	54 " 5
Homestake.....	20.66 " ..)	52 " 477
Washington.....	20.66 " ..)	52 " 478
Garfield.....	19.95 " ..)	52 " 471
Hot Number.....	20.66 " ..)	52 " 483
Copper Link.....	20.137 " ..)	- 56 - 442
Copper Link Millsite.....	4.99 " ..)	
	<u>363.675 Acres.</u>	

1462

Improvements on Patented Mines..... 500.00

Personal Property:
Tramway..... 200.00
Sorting Plant, Mining Machinery & Supplies..... 200.00

Total De Soto Mine.....\$ 13,920.00

? re Survey #

ESTIMATE OF ORE RESERVES

DE SOTO MINE

REVISED. JAN 1ST. 1921

LOCATION	TONS
110 STOPE	100
330 ..	500
430 ..	4000
340 ..	300
440 ..	300
540 ..	1500
350 ..	700
450 ..	500
860 ..	1000
270 ..	100
490 ..	4500
	<hr/>
	13,500
BROKEN ORE	1891
	<hr/>
	15,391

© Average Assay. Cu - 2.50%
Au & Ag - \$2.00.

Copy for Mr. Colvocoresses.

CONSOLIDATED ARIZONA SMELTING COMPANY

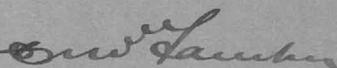
DE SOTO MINE

Statistical Data

1919

and previous years.

Humboldt, January, 1920



Auditor.

Two Copies
of this, please -
1 black, 1 white

#1

ORE IN PLACE

DeSoto Mine,

January 1st, 1915.

LOCATION	Tons Positive & Highly Probable	Equip. Copper in Lbs. P. H. Positive & Highly Prob' l	Total Lbs. of Copper in positive & highly probable Ore	TONS Probable Ore	Equip. Copper in lbs. per ton in Probable Ore	Total Pounds Copper in Probable Ore	TOTAL TONS ORE.	Total Pounds Copper in O R E	Estimated Total Gross Value. Copper figured at 15¢ per lb.
Big Stope - (#3) Above 100	297	93.80	25,859	3000	80.00	240,000	3297	265,859	34,561.67
100--200	500	93.80	46,900				500	46,900	6,097.00
200--300	2222	88.80	197,314				2222	197,314	25,650.82
300--400	1111	95.00	105,545				1111	105,545	13,720.85
400 to Fault	1457	60.00	87,420				1457	87,420	11,364.60
Foot Wall 100--200	2222	77.60	172,427				2222	172,427	22,415.51
" " 200--300	2222	77.60	172,427	500	70.00	35,000	2722	207,427	26,965.51
First Stope Out - (#4)									
Above 100									
100--200				1100	65.00	71,500	1100	71,500	9,295.00
200--300				500	66.80	33,400	1340	89,512	11,636.56
300--400	840	66.80	56,112	300	80.00	24,000	1737	153,330	19,932.90
400--500	1437	90.00	129,330				337	28,240	3,671.20
500 to Fault	337	83.80	28,240						
Pigeon Hole Stope (#1)									
Above 100				250	80.00	20,000	250	20,000	2,600.00
F.W. 100--200				200	110.80	22,160	200	22,160	2,880.80
200--300	1800	104.20	187,560	500	104.20	52,100	2300	239,660	31,155.80
300--to Fault	555	116.00	64,380				555	64,380	8,369.40
52 1/2 Stope (#5)									
Above 200									
200--300	92	82.00	7,544				92	7,544	980.72
300--400	178	106.00	18,868				178	18,868	2,452.84
400--to Fault	924	80.00	73,120				924	73,120	9,505.60
Lost Stope (#2)									
Above 100				250	91.60	22,900	250	22,900	2,977.00
100--200	1715	90.00	154,350	600	90.00	54,000	2315	208,350	27,086.50
200--300	1166	88.40	103,054	500	88.40	44,200	1666	147,254	19,143.02
2nd & X-cut E. Stope (#6)									
100--200	200	86.20	17,240	500	86.20	43,100	700	60,340	7,644.20
200-300				600	86.20	51,720	600	51,720	6,723.60
No. 7 Ore Body 500--800				1400	90.00	126,000	1400	126,000	16,380.00
TOTAL DeSOTO MINE Ore in Place	19275		1,647,690	10200		840,080	29475	2,487,770	323,410.10

BROKEN ORE

Big Stope --300	35				70.00			2,450	318.50
400	200				82.20			16,440	2,137.20
Pigeon Hole Stope 200	150				85.00			12,630	1,641.90
300	1000				104.20			104,200	13,546.00
52 1/2 Stope 300	25				163.20			4,080	530.40
Lost Stope 100	100				205.00			20,500	2,665.00
2nd X-Cut E. Stope 200	50				80.40			4,020	522.60
Perona Drift 100	10				80.00			8,000	1,040.00
Raise 600	36				94.40			2,491	323.83
Upper Terminal	50				66.80			3,345	434.85
Siding Bins	457				85.60			39,216	5,098.08
Total Broken Ore	2113				99.40		2113	217,372	28,258.36
GRAND TOTAL DeSoto MINE	21388						31588	2,705,142	351,668.46

S. M. C.
1/26.15

DE SOTO MINE - COST OF MINING AND TRANSPORTATION BY MONTHS

Month	1916		1917		1918		1919	
	Total	Per ton	Total	Per ton	Total	Per ton	Total	Per ton
Jan.	\$ 6,181.49	\$ 5.020	\$ 10,956.08	\$ 3.396	\$ 14,491.41	\$ 3.4619	\$ 13,617.41	\$ 5.4513
Feb.	9,323.42	3.935	9,218.18	3.135	15,144.38	3.3624	11,192.87	4.3569
Mar.	11,247.32	3.645	9,941.27	2.9456	16,943.54	3.6391	11,612.63	4.0392
Apr.	10,914.96	3.498	9,457.94	3.2412	14,674.09	3.2393	11,367.61	4.2512
May	12,449.03	3.437	11,831.73	3.3148	14,275.36	2.9784	10,554.56	4.2593
Jun.	12,164.41	4.472	12,854.23	3.1283	14,380.36	3.0662	8,399.66	5.4721
Jul.	10,457.69	4.279	13,245.92	3.3073	11,865.29	3.6576	8,860.65	4.9418
Aug.	9,605.97	3.210	12,918.92	3.1648	11,289.63	4.2180	9,186.11	5,2075
Sep.	8,214.97	3.000	11,942.57	3.2338	9,977.93	4.3505	9,454.01	4.7317
Oct.	11,301.07	3.241	13,020.71	2.9972	10,549.79	4.2971	11,529.05	5.4822
Nov.	11,662.07	2.890	12,445.43	2.9202	10,763.17	4.9460	10,676.67	5.2517
Dec.	9,409.23	3.427	12,293.88			5.6204	12,009.30	4.3718
TOTAL	\$ 122,331.63	\$ 3.558	\$ 140,126.86	\$ 3.1501	\$ 158,008.76	\$ 3.6857	\$ 128,460.53	\$ 4.7460

The Cost of \$4.633 per ton for the year 1915 includes \$0.72 for development and exploration

The Cost of \$3.558 per ton for the year 1916 includes \$0.24297 for development work and \$0.26024 exploration

The Cost of \$3.1501 per ton for the year 1917 includes \$0.09858 for development work and \$0.03536 exploration

The Cost of \$3.6857 per ton for the year 1918 includes \$0.3954 for development work; no exploration charges

The Cost of \$4.7460 per ton for the year 1919 includes \$0.5247 for development work and \$0.1138 for exploration

1138
6385

DE SOTO MINE

TONNAGES OF ORE SHIPPED

Month	1915	1916	1917	1918
Jan.	--- T.	1,229 T.	3,226 T.	4,186 T.
Feb.	--- T.	2,369 T.	2,940 T.	4,504 T.
Mar.	140 T.	3,086 T.	3,375 T.	4,656 T.
Apr.	604 T.	3,120 T.	2,918 T.	4,530 T.
May	487 T.	3,622 T.	3,569 T.	4,793 T.
Jun.	550 T.	2,720 T.	4,109 T.	4,690 T.
Jul.	601 T.	2,444 T.	4,005 T.	3,733 T.
Aug.	741 T.	2,993 T.	4,082 T.	2,813 T.
Sep.	815 T.	2,738 T.	3,693 T.	2,595 T.
Oct.	1,231 T.	3,487 T.	4,204 T.	2,322 T.
Nov.	1,429 T.	3,828 T.	4,152 T.	2,133 T.
Dec.	1,752 T.	2,746 T.	4,210 T.	1,915 T.
TOTALS	8,360 T.	34,382 T.	44,483 T.	42,870 T.

METAL CONTENTS OF ORE SHIPPED

	Gold Ozs	Silver Ozs	Copper Lbs.
1915	378.86	9,563.2	586,271
1916	1,446.87	37,179.7	2,320,980
1917	2,558.61	57,485.0	2,700,478
1918	2,258.10	51,587.8	2,208,296

AVERAGE ASSAY OF ORE SHIPPED

	Gold Ozs	Silver Ozs	Copper %
1915	0.0453	1.144	3.5
1916	0.0421	1.081	3.375
1917	0.0575	1.292	3.035
1918	0.0527	1.203	2.576

DEVELOPMENT WORK PERFORMED

		Total Cost	Cost P. Ft. Adv.
1916	Total (Not Segregated) 1,814 ft.	\$ 17,301.40	\$ 9.53
1917	Exploration 186.5) Dev. in Waste 164.0) 532 ft. Dev. in Ore 181.5	\$ 5,957.82	\$ 11.20
1918	Exploration ---) Dev. in Waste 572.5) *874.5 ft. Dev. in Ore 302.0)	\$ 16,949.61	\$ 19.38

*Includes 124 ft. Shaft and 30 ft. Winze.

TONS OF ORE SHIPPED TO HUMBOLDT - 1918

	Dry Tons	Au Ozs	Ag Ozs	Cu Lbs.	Cost P T
Concentg. Ore	42,498	2,245.79	51,152.3	2,190,311	\$3.6857
Smelting Ore	372	12.31	435.5	17,985	3.6857
T O T A L	42,870	2,258.10	51,587.8	2,208,296	\$3.6857

AVERAGE ANALYSIS OF ORE SHIPPED - 1918

	Dry Tons	Au Ozs	Ag Ozs	Cu %
Concentg. Ore	42,498	.0528	1.203	2.577
Smelting Ore	372	.0321	1.170	2.417
T O T A L	42,870	.0527	1.203	2.576

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the more thought and ^{attention} ~~care~~

is to be taken to give
military spirit. The one
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military training might be
combined with other ~~to~~

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MAPS

18 patented and one unpatented

- > 1. Blue print of mining claims (to be photostated) *Scale 200' = 1"*
- > 2. Blue print of plan of mine showing surface and workings above second level in 1928, scale 30' = 1" (can be photostated on smaller scale. *60' = 1"*) *with descriptive list attached*
- X 3. Blue print of survey of Extention No. 2 and Pen claims by Waara showing Iron Chief claim and part of Hot Number, scale 100' = 1" (will have to be photostated)
- X 4. Blue print of old mine workings in plan from 100' to 900' levels inclusive as of 1928, scale 30' = 1" (should be photostated on smaller scale). *Scale 60' = 1"*
- > (X) 5. Blue print of section of mine surface to 9th level, scale ~~30' = 1"~~ *workings & stopes* *Scale 60' = 1"* *with all stopes carried over on plane, 1919 (have one photostate on smaller scale 60' = 1")*
- (X) 6. Plan of mining on reduced scale upper workings and lower workings but marked up for low grade project. *none* *Surface & 2nd level, cut 1, 1928 reduced on photostate to scale 70' = 1"*
- (X) 7. Tracings of assay maps to go with Banks report covering upper 4 levels, scale 30' = 1" (prints can be made from these tracings).
- (X) 8. Blue print of assay maps of various cross-cuts and drill holes made in 1919 (could be photostated) *1920, Scale 30' = 1"* *(12 prints)*
- 9. Tracings of assay maps of all ~~one~~ on levels 1-8 inclusive but *made in '19* *much of this has probably been worked out subsequently*
- X 10. Assay map of sills on 440' and 540' levels to go with Harbauer's report in 1930. *Scale 30' = 1"* *340' stopes*
- (X) 11. Blue print of assay map of Whale Drift (both of the above could be photostated). *mineralized section* *Scale 30' = 1"*

DOCUMENTS

- 1. Report prepared *by S. M. C. in Feb 43 & revised in Nov 45* for H. M. How, president of Western Machinery Company, who had leased the De Soto property from Southwest Metals Company. Original date February 1943, but slightly revised in November, 1945. (some of the maps are mentioned as exhibits in this report).
- 2. List of De Soto patented mining claims with acreage and location of record to accompany claim map.
- (B) 3. Report on sampling of portions of De Soto by Harbauer in May 1930 and map which goes as exhibit represents his sampling. *copy listed map #7*
- (B) 4. Report of special sampling in upper levels by H. R. Banks in 1919 exhibit gives assay map of his results. *listed as # 5* *to accompany*

LIST OF REPORTS, MAPS, ETC.

Bearing on present and future value of De Soto Mine

Of which copies are available in file of

GEORGE M. COLVOCORESSES

* * * * *

REPORTS

1. General report by G. M. C. embodying all information from previous reports by self and others which appear to have any bearing on the present or future value of the mine; except for large scale operations and the production of low grade (1% plus) ore. Prepared in February 1943 and revised in November 1945 and again in April 1947.
2. Report of special sampling of low grade ore in upper levels by H. R. Banks in 1919. Assay map of samples listed as map No. 5.
3. Report on sampling of portions of the mine between the 3rd and 5th levels by G. J. Harbauer in May 1930 with assay map listed as map No. 7.
4. Estimate of ore reserves with notes by Claude Ferguson as revised in January 1921. Almost all of this ore still remains in the mine but some of it will not be easily accessible.

MAPS

1. Print of survey of 18 patented mining claims or ^rfactions with descriptive list attached, -scale 200' = 1".
2. Print of section of stopes from surface to 9th level inclusive, all reduced to one plane, made in 1919.
3. Print of survey map of Pen, Extension and Iron Chief Claims with note, -scale 100' = 1".
4. Print of plan of all mine workings from surface downward to 900' level, -scale reduced on photostat to 60' = 1", made in 1928.
5. Assay maps to go with Banks report, -scale 30' = 1"
 - (a) 100' level
 - (b) 200' "
 - (c) 250' "
 - (d) 300' "
 - (e) 400' "
 - (f) Stope known as 130

6. Print of assay maps of various cross cuts and all drill holes (12 prints) made in 1919 and 1920, -scale 30' = 1".
7. Print of assay maps of sills on 340, 440 and 540 stopes to accompany Harbauer's report in 1930.
8. Print of assay maps of mineralized section of Whale Drift, -scale 30' = 1".
9. Assay maps of all drifts, etc. on levels 1 to 8 inclusive, super imposed on coordinates. Made in 1919 and some of the ore shown has since been removed.

(Might be difficult to reproduce these tracings as they are in poor condition but perfectly legible)

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1 = 150
2 = 100
3 = 100

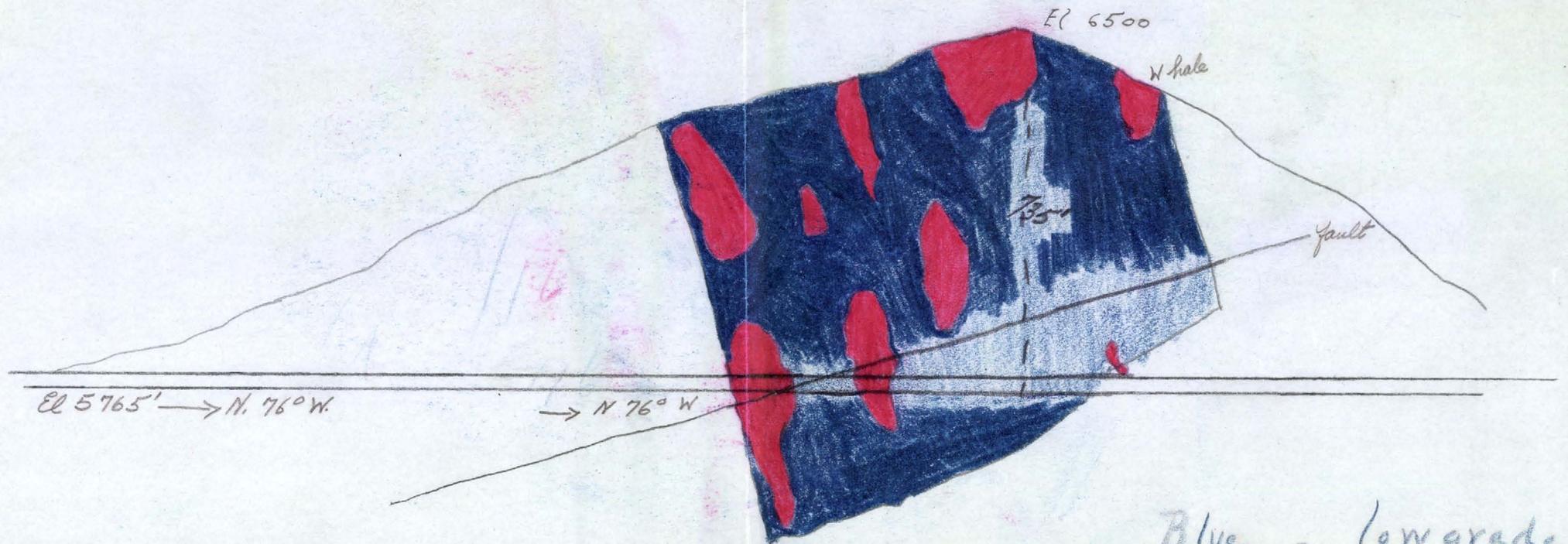
Print from an enlarged photostat of a portion of the U. S. Geologic and contour map of the Bradshaw Mountain Quadrangle (Plate 2, Bulletin 782). Scale in print about 1.5 inch = 1 mile.

Showing at lower black circle (#124) the DeSoto Mine and at upper black circle (#104) the Blue Bell Mine.

Area shaded with blue pencil indicates approximate suggested location of mill-site on or near Turkey Creek and pencil line running from north-east by east from mill to Agua Fria River indicates route of proposed pipe line if it should be found necessary to draw water from the Agua Fria.

- Qt -- Alluvium
- Ay -- Yavapai schist
- Tv -- Volcanic flows and tuffs
- gd -- Granodiorite
- rp -- R^yholite porphyry
- mp -- Monzonite porphyry
- di -- Diorite
- bg -- Bradshaw granite and Crooks complex

De Soto, Section



Blue, - low grade ore
Red, - partly stoped

De Soto Section
looking S. 76° W.

Scale 1" = 300'

GEORGE M. COLVOCORESSES
MINING AND METALLURGICAL ENGINEER
1102 LUHRS TOWER
PHOENIX, ARIZONA

November 28, 1945

REPORT ON DE SOTO MINE

This report is based upon my personal acquaintance with this mine and investigations by engineers under my direction.

I first examined the property in November, 1913, subsequently supervised its reopening and operations until 1921 and to a certain extent the work of the leasers until the autumn of 1929 since when I have visited the property only at infrequent intervals, the last occasion being in September, 1941.

LOCATION

The eighteen (18) patented lode mining claims and one mill site which comprise the De Soto Group with an area of 364 acres (see map and description attached as Exhibit A) are located in the Bradshaw Mountains, Yavapai County, Arizona, five (5) miles S. 20° W. from the Blue Bell Mine.

The Crown King Branch of the Santa Fe Railway formerly passed within a mile of the mine from which the ore was sent down to Middleton Siding by a gravity aerial ropeway. The lower ropeway towers and siding bins were burned down in 1930 and this section of the railway has since been taken up. Present access to the mine is by way of the Black Canyon and Crown King Highway to the site of Middleton Siding, a distance of 48 miles from Prescott, 19 miles from Mayer or 18 miles from Blue Bell Siding which is the present end of the railway.

From the siding to the mine there is only a steep horse-trail nearly two miles in length and this would have to be replaced by

over three miles of mountain road in order to make the workings accessible by auto or truck. The rebuilding of the aerial ropeway is also feasible.

The mining claims cover the summit of a steep ridge extending northeast-southwest for over a mile and they extend down along its eastern and western slopes for a considerable distance. Most of the outcrops and mine openings are located near to the top of the eastern slope which descends over 1500 feet to a gulch locally known as "Crazy Basin". The west slope of the ridge extends down into Peck Canyon.

CLIMATIC AND GENERAL CONDITIONS: Climate

The altitude of the main haulage level known as the "600" or "Hot Number Adit Tunnel" is 5765 feet above sea level and the ore shoots extend upwards from this point to the various outcrops, the highest of which--near the summit of the ridge--has an elevation of about 6500 feet.

The climate is pleasantly cool throughout the summer with considerable frost and often some snow in winter. The mean annual rainfall is about 17 inches and both surface and underground work can be conducted at all seasons with very little inconvenience due to weather conditions.

The mine workings are located mostly along the east slope of the ridge and the surrounding country is mountainous with deep gulches between the ridges and summits. There is little vegetation except for native shrubs and grasses and no large timber.

Water

Running water is found in the deeper gulches only during wet weather and on the "Water" Claim there is a very small spring which has never been developed. Domestic water was obtained from a well

near Middleton Siding and taken up to the mine on the aerial ropeway. From the Hot Number Adit there is a steady flow of about 5,000 gallons per day which would be suitable for industrial purposes but to obtain a supply sufficient for milling it would be necessary to tap the underflow in Crazy Basin which has never been thoroughly tested but would probably exceed 100,000 gallons per day. A much larger supply might be obtained from Turkey Creek, some three miles north of Middleton Siding at which point there are favorable sites for a large mill and storage space for tailings.

Power

The Prescott-Mayer-Blue Bell-Crown King high tension power line of the Arizona Power Company passes close to the portal of the Hot Number Adit where transformers were formerly installed and the compressor room and shops were located. The old rate for electric power averaged about 1.5¢ per kilowatt hour but it is expected that within the course of a few years the U. S. Reclamation Service will furnish Colorado River Power throughout all this district at a ~~cost of less than 0.5¢~~ much lower cost.

Labor

Because of the long distance from any town, living accommodations would have to be provided at the mine. All of the old dwellings and other buildings have been burned or wrecked.

A certain number of local men would probably be available but to fill out any sizable crew, workers would have to be brought from some distance. Mexican miners were formerly employed to a large extent and with satisfactory results.

Transportation

Present lack of transportation facilities constitute a serious handicap to reopening this mine and no large scale work could be

undertaken until the situation is improved which could be done by building a road along the old railway grade from Middleton Siding to the present terminus of the railway at Blue Bell Siding a distance of about 10 miles.

In order to transport machinery and supplies from Middleton Siding to the mine and to haul ore from the mine to a siding or to a mill site, it will be necessary to either construct a new ropeway or to build a branch road from the siding to the mine workings.

GEOLOGY AND ORE OCCURRENCE

This has been studied by various geologists and is described briefly by Lindgren (who did not visit the mine) in U. S. G. S. Bulletin No. 782 at pages 162-164.

The country rock is pre-Cambrian Yavapai schist of sedimentary origin, highly metamorphosed and uptilted now lying with strike north 20 east and dip of about 70 degrees to the north west. Different phases of this rock range from highly siliceous chlorite and sericite schist to a much more compact biotite or hornblende schist. A zone of silicification extends for several miles northward from the De Soto through the Blue Bell claims and on to the Binghamton and a short distance south of the De Soto the formation changes giving place to Bradshaw granite and Crooks complex which extend south throughout the greater part of the Crown King district.

The ore bodies, which at De Soto are confined to the chlorite schist, are of the replacement type occurring in detached lenses or shoots in a more intensely silicified ledge which occupies practically the entire De Soto ridge having a width of over 3000 feet and a length of some 6000 feet. The lenses generally conform to the strike and dip of the schist and overlap one another as may be noted from the plan maps of the workings (Exhibits C and D).

X The greatest individual length of any one shoot of pay ore is slightly over 200 feet with maximum width of about 40 feet. The maximum vertical height is about 1000 feet for while all of the shoots outcrop on the surface none was found to persist to any great depth below the main fault which cut through the mine between the 400 and 600 foot levels. Two of the ore bodies were followed down for an additional 300 feet but as depth was gained the dimensions of the pay ore rapidly decreased while the copper minerals gradually gave place to barren quartz. These ore bodies may be considered to represent the roots of original shoots since the pre-Cambrian surface is believed to have had a much greater elevation than at present and several thousand feet has since been removed by erosion.

The ore consists of chalcopyrite and iron pyrites, mixed with quartz, and while similar in character and origin to the Blue Bell ore, it is generally more siliceous, carries a slightly lower content in gold and silver and only traces of lead and zinc except in one or two specific locations.

The outcrops of most of the ore shoots are very prominent, standing up many feet above the normal surface and stained bright green with small veinlets of malachite. In this mine as at the Blue Bell the best ore was always found at and near the heart of the various lenses where the maximum grade might be 6 or 7% copper, decreasing gradually toward the ends and sides of the lenses until it became no longer commercial. Oxidation of the ore extends irregularly downward from 100 to 200 feet and the impregnation of copper into the wall rock was much more extensive than at Blue Bell particularly in the upper levels and between the various parallel lenses so that a large mass of rock between and around the shoots was found to carry appreciable copper values as will be mentioned later in this report.

HISTORY AND PRODUCTION

The De Soto Mine, which formerly was known at different times as the "Buster" and "Copper Cobre" was discovered in about 1890 when at first a small tonnage of high grade carbonate ore was gouged out and shipped by burro and wagon from various outcrops; no records of this production have been preserved. Later on the mine was worked on a more extensive scale and the larger ore bodies were developed and partly mined above the 600 foot level.

In 1904 the mine was acquired by the Consolidated Arizona Smelting Company and equipped with the aerial ropeway to the siding where a steam power plant was located. The Hot Number Adit, otherwise known as the 6th level, was driven beyond the main workings and connected with the upper stopes which were located in six ore shoots above that level while two of them, which were opened up through a winze, were mined for two hundred feet below the adit.

From 1904 until the mine was closed in August, 1907, about 40,000 tons of ore were produced with average content of 0.05 oz. gold, 1.30 oz. silver and over 4.00% copper.

All the principal ore shoots had been well developed by that date but by reason of the low price of copper no further work was done until 1915 when a careful measurement and sampling of the positive and probable ore, made under my direction, resulted in estimating a reserve of 31,588 tons with average 0.05 oz. gold, 1.2 oz. silver and 4.28% copper. This estimate justified the reopening of the mine, a record of whose production to date is approximately as follows:

PRODUCTION OF DE SOTO MINE

	Tons	Au. OZS.	Ag. OZS.	Cu. %	
1890 to 1905	30,000	?	?	5.00%	(estimated)
1905 to 1908	40,000	.05	1.3	4.00	(approximate)
1915	8,360	.0453	1.14	3.50	
1916	34,382	.0421	1.08	3.37	
1917	44,483	.0575	1.29	3.04	
1918	42,870	.0527	1.20	2.58	
1919	27,067	.0499	1.09	2.36	
1920	19,219	.040	1	2.09	
1922 to 1931	44,000	.050	1.20	3.75	(approximate)
<hr/>					
TOTAL (ABOUT)	290,381	.050	1.20	3.00	plus

During the period from 1915 to 1920 the relatively high price of copper made it profitable to mine and ship a lower grade of ore than had been estimated as commercial in January of 1915 and a substantial additional tonnage of ore was developed by the company operations which were discontinued after 1920 when the Humboldt Mill and Smelter were shut down for over a year.

When active operations were resumed at Humboldt and at the Blue Bell in 1922 it did not appear advisable for the Southwest Metals Company to reopen the De Soto which was later leased to E. S. Chafey who in turn employed a number of sub-lesers and whose work proved to be much more extensive and profitable than had been anticipated. Chafey confined his mining largely to portions of the upper workings,--above the 100 foot level,--and to various outlying outcrops to the north and west of the mine and near the summit of the ridge. A large quantity of new ore was thus developed and mined much of it being highly oxidized and in some cases carrying 6 to 8% copper. These operations sometimes produced up to 1000 tons

per month and in the aggregate I am informed that they produced over 40,000 tons of ore, although I have no complete record of the tonnage or grade. They continued until the lower tramway tunnel and ore bins were destroyed by fire in 1930 and on a smaller scale until the early part of 1931 when the price of copper fell to a point which made all copper mining unprofitable.

Since 1931 there has been no active work at the De Soto and all of the equipment and the structures,--except for the upper terminal of the aerial ropeway,--have been dismantled and removed from the property.

ORE RESERVES

The manner in which the nine commercial lenses of ore wholly or partially overlap one another makes it difficult to visualize the true nature of the deposit but in the section map these lenses are projected into one plane, while the two plan maps show the relative locations of the principal stopes on the various levels and the surface location of the outlying workings which were the principal sources of the ore produced by Chafey and the other leasers.

The better grade of ore in the main shoots had been largely worked out when the mine was closed at the end of 1920 at which time the positive and probable ore which could be estimated in these workings amounted to 15,391 tons with average values 0.05 oz. gold, 1.2 oz. silver and 2.50% copper, about 10,000 tons of this ore averaged better than 3% copper. This estimate did not include a large but uncertain quantity of ore which was indicated by outcrops and shallow workings in outlying sections of the property and subsequently mined by the leasers.

After 1929 the leasers were unfortunately permitted to work in and around the old stopes and to rob the sills and pillars which resulted in the caving of the workings in the vicinity of the main

winze from the 200 to the 400 foot levels thus rendering much of the remaining ore inaccessible without a certain preliminary expenditure.

Obviously the leasers did not carry out any comprehensive campaign of development at any point but merely followed the best of the ore as long as it could be mined with economy from each one of the six or seven different diggings in which they worked and often shifted to a new location mainly because the cost of tramping or hoisting had become disproportionately high.

The present condition of the mine is therefore most unsatisfactory and estimates concerning the remaining ore can only be made from the old maps and records because so small a portion of the ore bodies can actually be examined.

On the occasion when I last went through the main workings of the De Soto, which was in 1930, shortly before all mining in those workings was discontinued, nearly all of the ore which had been left in 1920 was still in place. Subsequently I was informed that some 2000-3000 tons of ore had been robbed from the pillars around the main winze before that section caved in and rendered this portion of the mine inaccessible.

I believe that upwards of 6000 tons of 3.00% ore should still be left at or near this winze and could be mined after an expenditure of about \$2000 had been made to clean out the waste which has caved around it.

Some good ore was left in the gouge of the main fault where 3% and 4% copper ore was sorted out at several points near the 600 foot level but the tonnage of this material is uncertain. There is also a small block of ore at the very top of one of the shoots above the 00 tunnel.

Aside from the above most of the reserves left in or near the main workings are low grade material to which reference will be made below.

In one section of the mine between the 3rd and 6th levels some 15,000 tons of ore that will average 2% copper was left in place and the tonnage and grade of this material was carefully checked in 1930.

Above the fault which cuts through the mine below the 400 foot level the mineralization extends into the wall rock between the lenses of higher grade ore and in 1919 a very thorough investigation was carried out to determine the quantity and quality of low grade ore which might have been partly or entirely mined by a glory hole from the surface or block caving from below. In order to secure accurate information on this matter a number of diamond drill holes were drilled and carefully sampled and 128 channel samples were cut. The estimate of this block was 275,000 tons with average content of 1.28% copper. Only a few samples were assayed for gold and silver from which it was judged that this ore would carry somewhat less than half as much of these metals as in the working stopes, say 0.02 oz. gold, and 0.6 oz. silver, with combined value of slightly over \$1.²/₇₀ per ton. I am inclined to think that this estimate of tonnage could be substantially increased by further exploration and development.

Another area in which there appeared to be a wide spread mineralization was found in the Whale Claim on the west side of the De Soto Ridge but a thorough sampling of the ground opened up by the Hot Number Tunnel indicated that there was no substantial tonnage which would carry as much as 1% copper although better values had been found at a higher level from the old Whale adit and in winzes.

I inspected these operations in 1929 and 1930. At that time there was a very favorable showing in and near the "Buster Cut" located in the hanging wall of the main stopes where the ore carried better than 3% copper with higher than average values in gold and silver. To the northwest of this location some good ore was being opened up and mined in the Treadwell Shaft. In the 00 tunnel the ore was averaging over 3.5% copper, the shoot at this point is some 20 feet wide and while some of the best ore was mined out, a substantial tonnage should still remain.

On the west side of the hill two very good stopes were producing, one known as the McCulcheon workings and the other above the old Whale Adit Tunnel.

Another inspection of some of the workings at the De Soto was made by me in 1937 and all of the accessible openings in the autumn of 1941. Very little ore had been mined since 1930. On this last occasion the 1st level of the mine and the upper tunnels known as the 0 and 00 were largely open but there had been some caving near the stopes. The 2nd level was open almost to the main winze but caving in that section of the mine made it impossible to get down into the lower levels. Some of these would probably have been accessible by way of the Hot Number Tunnel but although this appeared to be in good condition a dam at the portal had backed up the water to a depth of 3 feet through which I did not attempt to wade.

COSTS

The operating costs were as follows for the years when the mine was a regular producer:

Aside from the ore which has been mentioned as remaining near to the main winze, in the gouge of the fault and at the top of the #9 shoot above the 00 tunnel, it is my opinion that all of the commercial ore in this property will be found above or away from the old main workings and much of this outlying ore can only be classed as ~~other than~~ "probable" or "possible".

The location and tonnage of this material is estimated in the table which follows:

Remaining Ore Reserves in De Soto Mine with Average Grade of ^{over} 2.5% copper and about 0.05 oz. gold and 1.20 oz. silver.

	Positive	Probable	Possible or Indicated.
Old workings around main winze	6,000	4,000	-
In gouge of main fault	2,000	3,000	-
Above 0 and 00 stopes and in hanging wall	2,000	4,000	10,000
Chafey Tunnel		5,000	5,000
Treadwell Shaft		4,000	4,000
Guthrie Tunnel		3,000	2,000
Buster Cut		3,000	2,000
McCutchen Stope		2,000	3,000
Whale Adit and above near surface		4,000	10,000
	10,000	32,000	36,000

The location of some of the openings by which this ore is indicated is shown on the plan map of the upper levels (Exhibit C) and nearly all of them were being worked by the lessees until the price of copper started to fall in 1930 and reached an all time low in 1931.

	Mining per ton excluding develop- ment, exploration and transportation to Humboldt	Total cost per ton of ore at Humboldt mill or smelter
1916	1,8383	3,558
1917	1.8000	3.1501
1918	2.11296	3.6857
1919	2.7297	4.7460
1920	2.50 (about)	3.9336

The following table shows the detailed operating costs for 1918 and 1919 per ton of ore shipped:

	1918	1919
Exploration and development	0.3954	0.6385
Mining, tramming, pumping, hoisting, etc.	1.2420	1.5202
Tramming in haulage level to upper terminal	0.1327	0.1215
Ropeway, sorting and loading	0.2425	0.3321
General surface work and supplies	0.3069	0.4340
General expense and supervision, taxes, etc.	0.5797	0.7755
Freight on ore to Humboldt	0.7865	0.9242
Total cost F. O. B. (Humboldt)	3.6857	4.7460
" " " per pound copper contained with no credit for gold and silver	0.07155	0.1076

PROPOSED PROGRAM OF DEVELOPMENT AND OPERATION

From the above description of the mine it will be evident that there is only a small tonnage of positive or fully developed ore that can at present be estimated as available and that the future of the mine will largely depend upon the results of further development in the ore bodies which are now partially developed or only indicated.

Such a situation is perfectly natural in the case of any mine where the last ten years of operation were carried on exclusively by leasers and followed by over a decade of complete idleness.

The past record of the De Soto and its condition when work was discontinued in my opinion amply justifies the resumption of activity at any time that a copper price of say 18¢ can be expected and such a situation exists today.

However, before any large expenditure is actually made, I believe that it will be prudent and advisable to carry on development in all of the more promising showings to such a point that the ore which can now be classed as only probable or possible is exposed in such a manner that it can actually be measured and sampled;

For this purpose I recommend that:

(1) A truck road from the siding to the workings should be constructed as cheaply as possible in order to make it passable.

(2) That the Hot Number Tunnel should be drained and cleaned out and the old winze reconditioned up to the 400 and 300 foot levels which can probably be accomplished at a very small expense. This should render accessible most of the pay ore which still remains in and around the caves in the upper stopes and in the gouge of the fault.

(3) That all of the workings at the locations where probable and possible ore is estimated should be cleaned out and advanced to such an extent that at least the probable tonnage of ore can be classed as reasonably assured.

Aside from the road building machinery which can be leased from the County, it will be advisable to secure two portable gas driven compressors and two or three tugging-hoists in order to carry on the work in the most advantageous manner together with the

requisite drills and steel, small tools, etc. A light truck will be particularly essential and it will be desirable to put up at least two small buildings; one to serve as an office and assay office and the other as a boarding house with bunks for the workmen. The bulk of the crew can be housed in tents during the summer months.

The above outlined development work will not serve to produce any ore but if the results are in line with my expectations it will serve to develop and make accessible for mining a total of from 40,000 to 60,000 tons of ore with an average content of 0.05 oz. gold, 1.2 oz. silver and over 2.5% copper, having a gross value at present prices of about \$13.00 per ton with every reasonable prospect that much additional tonnage will subsequently be proved up by further development.

METALLURGY OF THE ORE

None of the ore produced from the De Soto was sufficiently basic to make it desirable for direct smelting but some of it was so highly siliceous as to be suitable for convertor flux. Moreover some of the ore, especially from workings near to the surface was largely oxidized and it must be expected that a certain amount of carbonate and oxide ore will be produced in future and cannot be treated in a mill with high recovery of values. The tonnage of such ore will be comparatively small and the grade of same,--after a certain amount of sorting,--should be sufficiently rich to permit its shipment to Clarkdale or Hayden as convertor flux with a fair margin of profit since the smelters will take ore of this character with a low treatment charge.

Aside from the oxidized material all of the ore is extremely suitable for flotation and its average composition can be inferred from the following analysis:

TYPICAL ANALYSIS OF THE DE SOTO ORE

Au.	0.05 oz.
Ag.	1.20 oz.
Cu.	3.08
Fe.	5.9
S.	6.54
CaO	1.2
MgO	0.77
Al ₂ O ₃	4.9
SiO ₂	72.3

Upwards of 150,000 tons of De Soto ore were concentrated in the Humboldt Mill from 1915 through 1920 along with a larger tonnage of ore from the Blue Bell Mine.

While no separate records were kept to apply only to the De Soto ore it was well recognized that this was even better suited to concentration than the ore from Blue Bell and that an equally good recovery of values was obtainable with a higher ratio of concentration, while the cost of crushing and fine grinding was substantially less.

It may therefore be confidently anticipated that,--aside from oxidized ore,--the future output of the De Soto can be milled with a recovery of 85% of the gold and silver and over 93% of the copper and with a ratio of concentration of 6 to 1.

SUMMARY AND CONCLUSION

The present physical condition of the De Soto Mine is largely due to the generally uncertain and unfavorable condition of the copper market since the close of the first World War.

The normal amount of exploration and development which had been maintained up to the end of 1918 was reduced at that time and discontinued entirely before the end of 1919, so that the last two

years of production made by the Consolidated Arizona Smelting Company amounting to 46,000 tons, was largely drawn from the ore reserves.

The mining subsequently done by the leasers was surprisingly successful under the circumstances and served to discover and partially develop a large quantity of new ore but obviously they had no incentive to open up the mine for future operations and their efforts during 1930 and 1931 were devoted to cleaning up as much of the remaining ore as could be mined and shipped before the constantly falling price of copper rendered all operations unprofitable.

The present showings coupled with the recently advanced price of copper seem to well justify the reopening of the mine on a comparatively small scale which can later be increased as the new development work proceeds and always assuming that the results of this work are favorable and in line with reasonable expectations.

Yours very truly,

S. H. Colvocoresses,

EXHIBIT A

DE SOTO GROUP OF PATENTED MINING CLAIMS (to accompany Map)

Name	Survey No.	Acres	Recorded Book of Mines and page.
Water Lode	2351	20.578	83 (Deeds) page 269
Enterprise	1463	19.95	52 (Mines) " 470
Tidal Wave	1463	20.66	52 " " 475
Favorite	1463	20.66	52 " " 472
Iron Clad	1463	20.66	52 " " 473
Arizona Chief	1462	20.66	52 " " 476
Fortune	1463	20.66	52 " " 474
Grand View	1462	20.66	52 " " 484
Elephant	1462	20.66	52 " " 482
McKinley	1462	20.66	52 " " 479
Anchor	1462	20.66	52 " " 480
Whale	1462	20.66	52 " " 481
Copper Bar	1462 (amended)	9.49	54 " " 5
Homestake	1462 (amended)	20.66	52 " " 477
Washington	1462	20.66	52 " " 478
Garfield	1463	19.95	52 " " 471
Hot Number	1462	20.66	52 " " 483
Copper Link	1534	20.137	56 " " 442
Copper Link Millsite (re-survey)	3020	4.99	

363.675

Township 10 No. Range 1 East.

dupl.

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		563.675	

Township 10 N. Range 1 East.

SOUTHWEST METALS CO.

FORD BUILDING
DETROIT 26, MICHIGAN

April 5th, 1945.

Duplicate

Cy.

Mr. Roscoe Hurst,
387 N. Second Avenue,
Phoenix, Arizona.

Dear Sir:

This will acknowledge your letter of March 28th in regard to the purchase of the 18 patented claims of the DeSoto group from the Southwest Metals Co.

I have taken this matter up with the Directors and this will constitute authority that we shall convey the above claims to your associates upon payment of the \$3600.00 in cash to a representative that we may later constitute in Phoenix to handle this transaction. It has been suggested that you have your attorneys prepare the conveyances that are acceptable and forward the same to me, prepared in its final form, and we will insert the designated patented claims. Upon receipt of this conveyance and word from you that the money is available, we shall advise you accordingly.

Yours very truly,

Bernard A. Clark

Bernard A. Clark.

Pres.

BAC:rg

OK

DE SOTO MINE

(Taken from U. S. G. S. Bulletin 782 by Waldemar Lindgren, 1926)

The outcrops of the DeSoto Copper mine lie 2 miles northeast of the Peck Mine, on the summit of the high ridge separating Peck Canyon from Crazy Basin. The altitude is about 5800 feet. The main tunnel is 600 feet below the outcrop, and from it an incline leads down to Middleton station on the Crown King branch road. The property is owned by the same interests that control the Humboldt Smelter (Southwest Metals Co.) to which the ore has been shipped. Work was discontinued in 1922, the ore bodies being considered exhausted. Most of the information given below was obtained from Mr. J. L. White, of the staff of the smelter.

The Yavapai chloritic schists strike N. 23 degrees E. at the mine and dip 70 degrees NW. The ore bodies, which carry pyrite-chalcopyrite ore and are contained in the chloritic schist, have yielded a total of 180,000 tons, averaging about 3.75 per cent of copper with 1 ounce of silver and 0.02 ounces of gold to the ton. The last ore treated contained 2.25 per cent of copper. There is less pyrite than at the Blue Bell mine, some sphalerite and galena, and occasional specimens of tetrahedrite. (see pl. 17, A.) A few prisms of arsenopyrite were observed.

The gangue is fine-grained quartz. There are also lenses of coarser quartz, much of it crushed and showing undulous extinction. Gangue and sulphides replace the schist, which is mainly chloritic with a little biotite.

The ore occurs in overlapping lenses (see fig. 10) On the upper levels there were seven such lenses close together, with an individual width of as much as 50 feet and a greatest length of 250 feet. Exploration extended to a depth of 300 feet below the main tunnel level, and at this depth only one small lens persisted. The total length of the ore zone is 350 feet; the total width 200 feet.

The ore bodies are said to have been cut off in depth by

650

a flat fault 250 feet below the surface. The small bodies found below this depth are believed to represent the continuation of the ore below the fault. The ore bodies are shown in Figure 10, each separately, in a longitudinal projection, for they overlap so that they cannot be indicated in their correct relative position.

From the Crown King Road to the mine there is only a steep horse-trail nearly two miles in length and this would have to be replaced by about four miles of mountain road in order to make the workings accessible by auto or truck.

The mining claims cover the summit of a steep ridge extending northeast-southwest for over a mile and they extend down along its eastern and western slopes for a considerable distance. Most of the outcrops and mine openings are located along the upper portion of the eastern slope which descends over 1,500 feet to a gulch locally known as "Crazy Basin". The west slope of the ridge extends down into Peck Canyon. (See Map Exhibit B)

CLIMATIC AND GENERAL CONDITIONS:

Climate

The altitude of the main haulage level known as the "600" or "Hot Number Adit Tunnel" is 5,765 feet above sea level and the ore shoots extend upwards from this point to the various outcrops, the highest of which--near the summit of the ridge--has an elevation of about 6,500 feet.

The climate is pleasantly cool throughout the summer with considerable frost and often some snow in winter. The mean annual rainfall is about 17 inches and both surface and underground work can be conducted at all seasons with very little inconvenience due to weather conditions.

The surrounding country is mountainous with deep gulches between the ridges and summits. There is little vegetation except for native shrubs and grasses and no large timber.

Water

Running water is found in the deeper gulches only during wet weather and on the "Water" Claim there is a very small spring which has never been developed. Domestic water was obtained from a well near Middleton Siding and taken up to the mine on the aerial ropeway. From the Hot Number Adit (600' level in the mine) there is a steady flow of about 5,000 gallons per day which would be suitable for industrial purposes but to obtain a supply sufficient for large scale mining it would be necessary to tap the underflow in Crazy Basin which has never been thoroughly tested but would probably exceed 100,000 gallons per day. A much larger supply might be obtained from Turkey Creek, some three miles north of Middleton Siding, along which creek there are favorable sites for a large mill and storage space for tailings.

Power

The Prescott-Mayer-Blue Bell-Crown King high tension power line of the Arizona Power Company passes close to the portal of the Hot Number Adit where transformers were formerly installed and the compressor room and shops were located. The old rate for electric power averaged about 1.5¢ per kilowatt hour but it is reasonably certain that within the course of a few years the U. S. Reclamation Service will furnish Colorado River Power throughout all this district at a cost of less than 0.5¢ per kilowatt hour.

Labor

Because of the long distance from any town, living accommodations would have to be provided at the mine and mill. All of the old dwellings and other buildings have been burned or wrecked.

A certain number of local men would be available from the vicinity of Mayer and Prescott. Mexican miners were formerly employed to a large extent and with satisfactory results while the excellent climate always attracted workers from other camps in the State.

GEOLOGY AND ORE OCCURRENCE

This has been studied by various geologists and is described briefly by Lindgren (who did not visit the mine) in U. S. G. S. Bulletin No. 782 at pages 162-164.

The country rock is pre-Cambrian Yavapai schist of sedimentary origin, highly metamorphosed and uptilted now lying with strike north 20 east and dip of about 70 degrees to the northwest. Different phases of this rock range from highly siliceous chlorite and sericite schist to a much more compact biotite or hornblende schist. A zone of silicification extends for several miles northward from the DeSoto through the Blue Bell claims and on to the Binghampton, but a short distance south of the DeSoto the formation changes giving place to Bradshaw granite and Crooks complex which extend south throughout the greater part of the Crown King district.

The ore bodies, which at DeSoto are largely confined to the chlorite schist, are of the replacement type occurring in detached lenses or shoots in a more intensely silicified ledge which occupies practically the entire DeSoto ridge having a width of over 3,000 feet and a length of some 6,000 feet. The lenses generally conform to the strike and dip of the schist and overlap one another as may be noted from the plan maps of the workings (Exhibits C and D).

The greatest individual length of any one shoot of 3% copper ore was slightly over 200 feet with maximum width of about 40 feet. The maximum vertical height is about 1,000 feet for while all of the shoots outcrop on the surface none was found to persist to any great depth below the main fault which cut through the mine between the 400 and 600 foot levels. Two of the ore bodies were followed down for an additional 300 feet but as depth was gained, the dimensions of the pay ore rapidly decreased while the copper minerals gradually gave place to barren quartz. These ore bodies may be considered to represent the roots of original shoots since the pre-Cambrian surface is believed to have had a much greater elevation than at present and several thousand feet has been removed by erosion.

The ore consists of chalcopyrite and iron pyrites, mixed with quartz, and while similar in character and origin to the Blue Bell ore, it is generally more siliceous, carries a slightly lower content in gold and silver and only traces of lead and zinc except in one or two specific locations.

7 The outcrops of most of the ore shoots are very prominent, standing up many feet above the normal surface and stained bright green with small veinlets of malachite. In this mine as at the Blue Bell the best ore was always found at and near the heart of the various lenses where the maximum grade might be 6 or 7% copper, decreasing gradually toward the ends and sides of the lenses until it became no longer commercial. Oxidation of the ore extends irregularly downward from 100 to 200 feet below the surface and the impregnation of copper into the wall rock was much more extensive than at Blue Bell particularly in the upper levels and between the various parallel lenses so that a large mass of rock between and

around the shoots was found to carry appreciable copper values as will be mentioned later.

HISTORY AND PRODUCTION

The DeSoto Mine, which formerly was known at different times as the "Buster" and "Copper Cobre", was discovered in about 1890 when at first a small tonnage of high grade carbonate ore was gouged out and shipped by burro and wagon from various outcrops; no records of this production have been preserved. Later on the mine was worked on a more extensive scale and the larger ore bodies were developed and partly mined above the 600 foot level.

In 1904 the mine was acquired by the Consolidated Arizona Smelting Company and equipped with the aerial ropeway to the siding where a steam power plant was located. The Hot Number Adit, otherwise known as the 6th level, was driven ^{with double track} beyond the main workings and connected with the upper stopes which were located in six ore shoots above the level while two of them, which were followed down by a winze were mined for over two hundred feet below the adit.

From 1904 until August, 1907, about 40,000 tons of ore were produced with average content of 0.05 oz. gold, 1.30 oz. silver and over 4.00% copper.

The principal ore shoots had been partially developed by that date but, by reason of the low price of copper, no further work was done until 1915 when a careful measurement and sampling of the positive and probable ore, made under my direction, resulted in estimating a developed reserve of 31,588 tons with average 0.05 oz. gold, 1.2 oz. silver and 4.28% copper. This estimate justified the reopening of the mine. A record of the total production to date is approximately as follows:

PRODUCTION OF DESOTO MINE

	Tons	Au. OZS.	Ag. OZS.	Cu. %	
1890 to 1905	30,000	?	?	5.00%	(estimated)
1905 through 1907	40,000	.05	1.3	4.00	(approximate)
1915	8,360	.0453	1.14	3.50	
1916	34,382	.0421	1.08	3.37	
1917	44,483	.0575	1.29	3.04	
1918	42,870	.0527	1.20	2.58	
1919	27,067	.0499	1.09	2.36	
1920	19,219	.040		2.09	
1922 to 1931 (worked by leasers)	54,000	.050	1.20	3.75	(approximate)
TOTAL (ABOUT)	280,000	.050	1.20	3.00	plus

During the period from 1915 to 1920 the relatively high price of copper made it profitable to mine and ship a lower grade of ore than had been estimated as commercial in January of 1915 and a substantial additional tonnage of ore was developed by the Consolidated Arizona Smelting Company operations which were discontinued after 1920 when the Humboldt Mill and Smelter were shut down for over a year.

When active operations were resumed at Humboldt and at the Blue Bell in 1922 it did not appear advisable for the Southwest Metals Company (successor to Consolidated Arizona) to reopen the DeSoto which was later leased to E. S. Chafey who in turn employed a number of sub-lesers and whose work proved to be much more extensive and profitable than had been anticipated. Chafey confined his mining largely to portions of the upper workings, --above the 100 foot level, --and to various outlying outcrops to the north and west

of the mine and near the summit of the ridge. A large quantity of new ore was thus developed and mined much of it being highly oxidized and in some cases carrying 6 to 8% copper. These operations sometimes produced up to 1,000 tons per month but naturally very little development work was done by the leasers and my estimate of the ^{3% Copper} ore reserves made in 1931 was as follows:

	Positive	Probable	Possible or Indicated.
Old workings around main winze	6,000	4,000	-
In gouge of main fault	2,000	3,000	-
Above O and OO stopes and in hanging wall	2,000	4,000	10,000
Chafey Tunnel		5,000	5,000
Treadwell Shaft		4,000	4,000
Guthrie Tunnel		3,000	2,000
Buster Cut		3,000	2,000
McCutchen Stope		2,000	3,000
Whale Adit and above near surface		4,000	10,000
	<u>10,000</u>	<u>32,000</u>	<u>36,000</u>

There would obviously be no incentive to recondition this mine in order to work out so small a tonnage of better grade ore unless one were assured a very high price for the copper.

CHARACTER AND METALLURGY OF ORE

The following is a complete analysis of typical DeSoto sulphide ore as mined and milled at Humboldt.

Au.	0.05 oz.
Ag.	1.20 oz.
Cu.	3.08
Fe.	5.9
S.	6.54
CaO	1.2
MgO	0.77
Al ₂ O ₃	4.9
SiO ₂	72.3

Some 150,000 tons were treated by flotation from 1915 through 1920 with an average recovery of 85% of the gold and silver and 93% of the copper and with a ratio of concentration of about 6 to 1.

Obviously the lower grade copper ore would be much more siliceous and with combined iron and sulphur content not exceeding 4 or 5% and by dropping out some of the iron, the ratio of concentration might be expected to approximate perhaps as much as 20 to 1 with a 90% recovery of copper but probably not more than a 70% recovery of gold and silver.

LOW GRADE ORE RESERVES

Except for the mining of a considerable tonnage of slightly lower grade ore during '18, '19, and '20, it had always been the intention of the management of this mine to keep the average grade of production above 3% copper and no stoping was done except in the hearts of the various lenses where work was discontinued nearly as soon as the assay value of the ore fell below that point. There remains around all of these old stopes and between them a shell of lower grade material whose extent and character have only been investigated in a few places, and since the great bulk of the higher

grade ore has been removed and chances for finding any large new bodies of such ore are dubious, the future value of the mine, if any, must depend upon the tonnage and average tenor of low grade material.

Because of the fact that some of the ore shoots and much of the mineralized rock extended to or very near to the surface of the eastern slope of the ridge, it occurred to me during the First World War, that an open pit might be started through opening benches along this slope and that a large tonnage of 1% copper ore might thus be cheaply mined after removing a comparatively small quantity of waste capping.

In order to obtain some basic data on this point I then started to explore and investigate the mineralized rock between and around the ore shoots and although this investigation was never carried to a logical conclusion, some of the data obtained, as noted below, appears to have been significant and not unfavorable.

Above the 400 foot level at points where the mineralization extended into the wall rock between the lenses, an investigation was carried out in one block of ground which might have been partly or entirely mined by a glory hole or benches from the surface. Here we put in a number of diamond drill holes whose cores were carefully sampled while 128 channel samples were cut in drifts and crosscuts. This block was then estimated to contain 275,000 tons with average content of 1.28% copper. Only a few samples were assayed for gold and silver from which it was judged that this ore would carry somewhat less than half as much of these metals as in the working stopes say 0.02 oz. gold, and 0.6 oz. silver, with combined value of slightly over \$1.10 per ton at present prices. It appeared that

this estimate of tonnage could have been substantially increased by further exploration and development throughout a wider area in the same section of the mine.

A small block of low grade ore left in another section between the 3rd and 6th levels was found to contain 1,500 tons that would average 2% copper and this estimate was checked by a resampling in 1930.

Other investigations of low grade material adjacent to the main workings by drills and crosscuts have indicated that the following areas justify further investigations.

On 1st level (elevation 6171') a large number of samples taken in an area 300' north-south by 200' east-west averaged better than 2% copper.

2d level (elevation 6104') area 350 x 200', samples averaged around 2%

250' level (elevation about 5950') 5 samples along one wall averaged 1.61% copper.

300' level (elevation about 5900') area 300 x 150, samples averaged about 2% copper.

4th level (elevation about 5850) area 120 x 100, samples averaged about 2% copper.

5th level (elevation about 5800') area 120 x 100, samples averaged about 2% copper.

6th level, Hot Number Adit, (elevation 5765') area 150' north-south x 200' east-west, samples averaged about 2% copper.

Most of these samples were cut along the side walls of the old stopes while some were cut in the walls of crosscuts or were core samples from short drill holes. They were not taken in any logical

pattern and hence can not be used to calculate any weighted average of the sampled ore nor as a basis for any estimate of tonnage. However a careful study of the assay maps has lead me to conclude that they roughly represent the outer shell of the ore zone from which the core has been removed with a remaining tonnage in the order of 1,500,000. This material should assay close to 2% copper with approximately \$1.00 value in gold and silver and surrounding it is found a certain amount of mineralized rock which I shall call the outer ore-zone and this has a length (north-south) of well over 600 feet, a width of 300 feet and an average height to surface of probably 550 feet so that, allowing for the tonnage which has already been removed, there should remain some 7,000,000 tons of mineralized rock a large part of which, including as a sweetener the small tonnage of 3% ore left in place and the above described 2% ore in the shell of the ore shoots, may reasonably be hoped to have an average grade in excess of 1% copper and with values of perhaps \$0.⁷⁰60 in gold and silver.

At some distance from the main workings are found several ore showings which probably have no connection with the principal ore body but the ore found on and near the surface of the Whale Claim along the east slope of the DeSoto Ridge is in a different category and while the tonnage of better than 1% ore is very problematical, it appears as if it might either be mined with the main deposit or more probably worked from a separate open pit with a possible production of over one million tons. This ore was partly found in a porphyry dike near the surface but apparently petered out with depth; I have not taken it into account in making calculations of investment and returns and merely mention it as a possibility.

In order to check the estimates of tonnage I also applied a different method of calculating based on such data as I possess concerning the contours of the surface and the extent of copper mineralization which had been actually noted on each of the underground levels. Although the estimate resulting from this procedure did not work out so well as in the first instance, it appeared that the quantity of mineralized rock which might be hoped to average 1% copper was in the order of six million tons which is the figure that I have used in subsequent calculations.

WORKING COSTS

After the mine had been properly prepared and equipped for operation and for the purpose of making preliminary calculations, one may assume that the working cost of the low grade ore, to be mined by open-cut or caving and milled at the rate of 3,000 tons per day, would be about as follows:-

Mining including stripping and development	\$0.40
Coarse crushing	0.10
Transportation to mill, fine grinding and concentration	0.40
Freight and treatment of concentrates ratio 20 to 1	0.15
Refining and marketing Cu (over 2.5¢ per lb.)	<u>0.45</u>
	\$1.50
Add for taxes and amortization of plant	<u>0.50</u>
	\$2.00

From a 1% copper ore it may be assumed that at least 18 pounds of copper would be recovered (making due allowance for the fact that some of the ore will be oxidized) and at 12¢ market price this would have a value of \$2.16 to which one might add \$0.44 for recovered gold and silver making the total return \$2.60 and leaving a margin of profit of 60¢ per ton or say \$3,600,000 for the entire venture if a total of ⁶5,000,000 tons of ore should be produced.

PRELIMINARY CAPITAL EXPENDITURE

Local conditions are such that the preparation of the ore body for large scale operation by benching along the east slope of the hill should be a comparatively inexpensive matter.

A good road must first be built up from the old railway grade (now the highway to Crown King). This would probably have a length of some 4 miles to the top of the proposed workings and with hard rock surface and proper drainage it would cost in the order of \$100,000.

The side roads or levels of the working benches would branch directly off this main haulage way and such capping as would have to be removed could be hauled on an average for not over half a mile and dumped on the west slope of the ridge south of the ore body.

The ore, as broken in the benches, would be loaded in self dumping trucks and dumped into a large underground storage bin to be located above the present Hot Number Adit which was cut out for a double track and ^{once provided} with electric equipment could handle a large tonnage. At the bottom of this bin would be located the coarse crushing plant with belt conveyor to the fine ore bin on the surface from

which either an aerial gravity ropeway or the main truck road would lead to the mill, the proposed site of which is near the junction of Turkey and Cedar Creeks about 3 miles from the mine and at an elevation of some 3,700 feet.

The total cost of mine equipment including the roads and trucks should not exceed \$1,000,000 if coarse storage bin and crusher were installed at the mine and ropeway erected to the mill.

Such a plan would probably result in permitting the lowest operating cost but much more careful study will have to be given to the entire project before any detailed program of operation can be planned.

The Mill might possibly require some special equipment for the treatment of a small quantity of oxidized ore but essentially would consist of a very simple flotation plant with fine grinding equipment required to reduce the size of the ore to approximately 65% through 100 mesh, which we found adequate at Humboldt, and if built on a site where gravity could be utilized, it would not seem that its cost, with capacity up to 3,000 tons per day, should exceed \$1,500,000 since no power plant needs to be provided. An additional \$500,000 should be allowed for camp buildings and miscellaneous equipment making the total investment in the order of \$3,000,000.

As to Power the high tension line of the Arizona Power Co. passes directly over the mining claims and only a short distance from the proposed mill-site; however this would have to be replaced by a line of much larger capacity which may be constructed by the Government.

RAIL TRANSPORTATION TO SMELTER

The southern section of the Crown King Branch of the Santa Fe Railroad has been torn up and no longer passes by the DeSoto at Middleton and the end of the line is now at Cordes Siding about 4 miles from the proposed site of the mill and at a similar elevation. If a substantial traffic were definitely assured, there is every reason to believe that the Santa Fe Railroad would gladly replace the rails as far as the mill-site so that all material could be delivered by rail and the concentrates could be loaded for direct shipment to the Phelps Dodge smelter at Clarkdale (about 100 miles) or if that smelter should no longer be in operation to the A. S. & R. plant at Hayden (nearly 300 miles).

WATER SUPPLY

The local water supply including the flow in the mine which runs out through the Hot Number Adit, a spring on the Water Claim, and the underflow in Crazy Basin at the foot of the DeSoto Hill will be sufficient and suitable for domestic and mining requirements but wholly inadequate for a large concentrating mill. Water sufficient for this mill might perhaps be obtained from Turkey Creek which flows within two miles of the mine and at its junction with Cedar Creek, some three miles from the mine, is close to the location that I should prefer for the mill-site, but the flow in this creek has never been gauged, so far as I know, and it is very seasonal so that it may be found essential to obtain a supplemental supply which would have to be secured from the Agua Fria River involving a pumping

plant to lift the water probably 300 feet and force it through some eight miles of pipe.

Below the millsite which I have tentatively selected (or several other possible sites) there is ample room for the disposal of the tailings by gravity and an ordinary dam built up by the tailings themselves should serve to properly impound them and avert any claims for damages through fouling either lower Turkey Creek or the Agua Fria River.

TENTATIVE PROGRAM OF MINING

Lacking a contour map of the surface and complete cross-sections of the ore body it is difficult to visualize the methods by which the ore might best be mined, nor can this be determined until the limits of the ore are more accurately defined.

While there are some outcrops on the west side of the ridge and along the top, the bulk of the surface showings are on the eastern slope, the upper outcrop along a portion of the crest being at an elevation of 6,500 feet or 735 feet above the Hot Number Adit; however the average elevation of the top of the deposit is around 6,365 feet so that the vertical dimension of the deposit is about 600 feet, and I have used a figure of 550 in my calculations to allow for capping and leached material near the surface.

The dip of the ore zone is to the ^{hotte}west, about ^o75°, which would tend to produce an overhang in a pit unless the grade of material in the hanging wall should prove good enough to be mined.

To mine the eastern section of the ore body benches could be run along the slope and waste carried off at the south end, where there is quite a deep gulch while the ore could presumably be best

handled by dumping it into a long chute or pocket to the Hot Number level crushing plant and fine ore bin from which it would be sent to the mill, preferably by an aerial ropeway of large capacity.

GENERAL

The text of the above is intended to present a general picture of the possibilities at the DeSoto Mine as these appear from scattered records and very incomplete data which was not originally gathered with any such program in mind. If it should appear that the acquisition, reopening and operation of this property might constitute an attractive mining venture capable of ^{profitably} producing some 120,000,000 pounds of copper over a period of six years and with chances of a larger production and longer life, it would first of all be advisable to recheck all of the records and data on which I have based this summary and at the same time to make certain minor physical examinations of the physical conditions at the mine, which is entirely abandoned at present, and to very quietly investigate the ^{best} method of securing title.

In order to more definitely determine the mining conditions and value of the low grade ore it would next seem advisable to make a thorough physical examination of the surface and all accessible workings and a topographical survey. If the result of this investigation should be favorable, it would ^{then} next be in order to reopen portions of the old workings and put in a number of horizontal diamond drill holes on the various levels so as to thoroughly cross-cut the formation.. This last will probably involve some 6,000 to 8,000 feet of drilling and the total cost of the investigation, including the cleaning out of portions of the mine, may be estimated at around \$40000. The result of this work could be checked and

combined with all of the data previously secured and it is my opinion that a basis would then be reached for drawing a pretty definite conclusion as to the merit of the entire venture, particularly in the light of the most recent developments in the copper market which will obviously be a factor of the greatest importance.

Review of Ledger

CALCULATION OF GRADE OF ORE NECESSARY THAT THE OPERATIONS OF
THE DE SOTO MINE BE PROFITABLE.

Estimated cost of Mining\$2.60
Freight..... .95
Estimated cost of Concentrating..... 1.00
" " " Smelting..... 1.00
Estimated total cost per ton.....\$5.55

Gold value per ton shipped to Dec. 1920.....\$.725
Silver " " " " " " 1920..... .73

\$.725 Gold @ 65% Recovery.....\$.471
.73 Silver @ 75% "547

Total recovered gold & silver values.....\$1.018 or \$1.02

Estimated total cost per ton.....\$ 5.55
Total recovered gold & silver values..... 1.02

Net value of copper necessary.....\$ 4.53

90% recovery in mill, plus 95% recovery in smelter = 85.5% net recovery.

Copper @ ~~14¢~~ = 11½¢ net value

\$4.53 @ 11½¢ = 39.4 pounds of recovered copper

39.4 @ 85.5% = 46 pounds gross copper in the ore, or 2.3% Cu.

2.3% Copper ore required to break even

2.50% Copper ore = \$.393 profit @ ~~14¢~~ copper

2.75% Copper ore = \$.86 profit @ ~~14¢~~ copper

Humboldt, Ariz.,
Aug. 10, 1922

JLW:T

A. 5/15/47

Sunnyslope,
Prescott, Arizona.
May 14, 1947

Mr. G. M. Colvocoresses,
1102 Luhrs Tower,
Phoenix, Ariz;

Dear Mr. Colvo:-

Re: De Soto Mine:

I should have answered yours of May 1st sooner but todate have not been able to work out anything definite with Farnham and Adams. It seems that when Mr. Clark was out here that some discussion was had between him and Farnham as to whether or not the De Soto was included in Farnham's lease, and that correspondence between them since Clark's return to the east has not been very satisfactory. I gather this idea more from listening between words than from any outright statement by Farnham. I talked again yesterday with Adams but of course he is not in a position to make any agreements on either the Blue Bell or De Soto as the contract is in Farnham's name. I had hoped before now to have something definite on the matter but as time runs along I am beginning to think that I had better forget about the DeSoto under the circumstances that seem to obtain.

I think that the prices you ask for the data on the De Soto are quite reasonable and if I find eventually that I am to go into the venture either with or without Farnham then I shall forward you a check. However, it is probable that I shall not want that material that you list as "Class B".

I met and talked with Clark for a few minutes when he was here, - I had answered a blind ad in the Mining World which I figured referred to the Binghamton but heard nothing from my letter for almost two months. Then one day this chap Clark called me from the hotel and said that he would like to see me in regard to my letter. I had never met the fellow before and was much surprised to learn that the Ad was in regard to the Blue Bell and not the Binghamton. I tol dhim that I was'nt interested in the Blue Bell and after talking for a few minutes in a general way we parted.

Will let you know which way the cat jumps soon.

FRED GIBBS
MINING ENGINEER
PRESCOTT, ARIZONA

Sincerely,

Fred.

387 North Second Avenue
Phoenix, Arizona
March 28th, 1945

Mr. Bernard A. Clark
c/o Southwest Metals Company
Room 1513 Ford Building
Detroit, 26. Michigan

Dear Mr. Clark:

I acknowledge yours of January 15th on the above subject, replying to mine of January 10th.

Recent conferences with the party to whom I referred in my previous letter indicate that he would be disposed to purchase the 18 patented claims of the De Soto group @ \$200.00 per claim, i.e., for the total sum of \$3,600.00 cash, but since some of this money would have to come from an associate he asks that you should first discuss this matter with the other Directors of the Southwest Metals Company, and if they are agreeable to the deal that you should write me a letter stating definitely that the Southwest Company would make a sale to me on that basis.

In the opinion of my attorneys, such a transaction would not require the consent of the Southwest Stockholders since the Directors would not be selling all or even, in point of value, a substantial part of the holdings of the Company. However, you can readily satisfy yourself on that point.

I also wish to have such a letter in order to arrange with Mr. How of the Western Machinery Company for the cancellation of his lease on these particular claims.

My next step would be to make positively certain that the prospective purchaser would have the cash actually available after which I should ask you to prepare and send out to your local attorney or to a bank a proper conveyance and deed to the said mining claims made to me or my assign with instruction that this should be delivered against the payment of \$3,600.00 in cash or by Cashier's Check.

Trusting that you will take action on this matter as soon as convenient, I remain

Yours very truly,

ROSCOE HURST

May 1, 1947

Mr. Fred Gibbs
Sunnyslope
Prescott, Arizona

RE: De Soto

Dear Fred:

I have yours of April 28 and have carefully noted contents. I am not altogether surprised that Farnham and Adams are considering the discontinuance of operations at the Blue Bell as I think that they have done remarkably well to keep going for so long working, if I understand correctly, only near the surface and from the Blue Buck Shaft or old raises. I think that Adams has always wanted to have a try at the De Soto and he knows the surface conditions and the workings of Chaffee very thoroughly.

Obviously the value of my data and maps to you will depend to a large extent upon the type of agreement that you can make with Farnham and whether or not Farnham has any of this or similar data in his possession.

On the assumption that you may wish to secure some of the documents listed with my letter of April 24, I have checked these over and divided them into three classes. The first one of which entitled Class A comprises reports No. 1 and 4 and maps No. 1, 2 and 4. This data would, I believe, be essential to anyone who attempts to operate the mine unless they merely gopher around in the surface pits and trenches, and for copies of same I think I should be justified in asking \$150.00. Items included in Class B, namely reports No. 2 and 3 and maps No. 3, 5, 6, 7 and 8 refer almost entirely to a grade of ore which is too low to be shipped ~~through~~ ^{through} to a smelter and the ore would only be useful in the event that the operators were considering the erection of a local mill. For copies of this data I should ask another \$100.00 and in the event that it was desired to purchase maps listed as No. 9, I should have to ask an additional \$100.00 as a very considerable amount of work and some expense would be involved in preparing copies of these quite elaborate assay maps. If you and Farnham should decide to work the De Soto Mine jointly and both of you wish to have copies of the documents and maps, I should ask an extra \$25.00 to send duplicate copies of items listed as A and also an additional \$25.00 for duplicate copies of items listed as B or C.

For your information I understand that Bernard A. Clark, the President of the Southwest Metals Company, has been out to Arizona very recently and has been trying to purchase some of the Southwest Metals Company stock which he and his associates do not own, also to secure additional technical data regarding the Blue Bell and the De Soto or both. Of course Clark did not approach me in reference to any of these matters since our relations are by no means friendly, but I am sure that information is reliable.

v
mg

When you go over the property with Adams you will doubtless be impressed by the several different surface showings and the opportunities for three or four different outfits to work at the mine without interfering with one another in anyway. The principal handicap to any operation is found in the lack of transportation facilities and also housing accommodations for which purposes a certain amount of initial investment would seem to be required, but I believe that there is still a lot of good grade ore at the De Soto which should render a substantial profit even on the basis of small scale operations and shipping to a smelter.

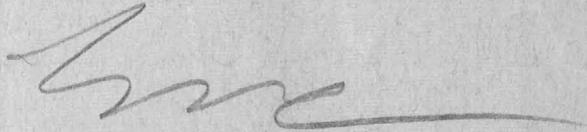
If you decide to go ahead with this project, I will later on tell you something of the possibility of the mine as a large producer of low grade ore; such a program would obviously involve a very heavy capital expenditure and could only be undertaken by some large mining company. I have never been in a position to discuss this in detail with such people, but I have talked it over in a general way and feel that it is something that may eventually be worked out in a very profitable manner.

Should you wish to separate the items which I have listed as Class A, that will be all right with me and you can make me an offer for individual items; although personally I think that all of them would be of real value to anyone working the De Soto.

Best personal regards.

Sincerely,

GMC:IM

A handwritten signature in dark ink, appearing to be 'GMC', written in a cursive style.

R. Lee Soto

387 North Second Avenue
Phoenix, Arizona
January 10th, 1945

Mr. Bernard A. Clark
Ford Building
Detroit, Michigan

Dear Mr. Clark:

I recently came in contact with a local party who has some ideas regarding a new method of working copper mines, and he is looking for some small property on which he could actually experiment along those lines to determine whether or not his process has any value.

He knows something of the De Soto Mine belonging to the Southwest Metals Company and tells me that no work has been done at that property for several years, from which I assume that the Western Machinery Company have no intention of operating there as well as at the Blue Bell.

It occurs to me that under such conditions the Southwest Metals Company might be disposed to sell the De Soto Mining Claims at a comparatively low figure, as this mine was never a large producer and reports indicate that it was pretty well cleaned out of all commercial ore.

Even if my friend's experiment should turn out favorably, he might not decide to actually operate the De Soto, but on the other hand, there is a chance that he might wish to do so, and in that case I would want to be in a position to make a little money from this transaction. Please let me know if you would be disposed to give me a two-year option to purchase the De Soto for, say, \$200.00 a claim; which is a price that idle mining property is often sold for, and any revenue that you might obtain from this source would be helpful in paying taxes, and meeting other expenses connected with retaining the Blue Bell.

If you and Tom decide to give me this option I will make an attempt to make arrangements with Mr. How, which I believe will not be hard to do as he is disgusted with the whole thing. If any shipments are made I will pay a 10% royalty to the Southwest Metals Company, all money received from royalty to be applied on the purchase price.

Yours very truly,

R. Lee Soto

*2
3600
to claim @ 200 = 3600*

SOUTHWEST METALS CO.

FORD BUILDING
DETROIT 26, MICHIGAN

Rov 1513

January 15th, 1945.

Mr. Roscoe Hurst,
387 North 2nd Avenue,
Phoenix, Arizona.

Re: DeSoto Mining Claims.

Dear Mr. Hurst:

I am in receipt of your letter in reference to the purchase of an option on the claims of the above.

You state that you desire a two-year option to purchase the DeSoto at \$200.00 a claim, which contains 18 mining claims as shown from the records of the company. In other words, your proposition is that you desire a two-year option to purchase the DeSoto claims for \$3600.00 and shall pay for same out of royalties if and when shipments are made.

If you desire to make a purchase of these claims for \$3600.00 cash, I shall submit the same to the directors for their consideration, but I think an outright sale would require action of the stockholders.

Should your party be interested in the latter proposition, kindly advise.

Yours very truly,

Bernard A. Clark
Bernard A. Clark.

BAC:rg

A 5/1, 47

Sunnyslope,
Prescott, Arizona.
April 28, 1947

1 @ 1502 Luhl + 25th
2 @ 100 " + 25th
3 @ 100 " & dupl. ?

Mr. G. M. Colvocoresses,
1102 Luhrs Tower,
Phoenix, Ariz;

Dear Mr. Colvo:-

Re: De Soto Mine:

Thank you very much for your letters of the 22nd and 24th relative to the De Soto Mine. The data that you have seems to be quite complete and I doubt that there have been any changes of note at the property since you last visited it in 1941. Without actually seeing the various different pieces of data it is of course impossible for me to arrive at a proper value so I would appreciate it if you would let me know the price that you think you should have for each piece, - and for all that you listed, in a lump.

My interest is so ~~day~~ that of a small operator as I have no one in mind on the project. As I told you, I will soon be finished at the Hackberry and will then have to find some other place on which to dig. However, since writing you, I have had quite a long talk with Farnham and much to my surprise learned that he and Al (Adams) are seriously considering quitting their operation of the Blue Bell and moving on up to the De Soto. I discussed with him the possibility of joining them on the job or of sub-leasing some portion or portions of the mine in which they may not wish to work but nothing definite was decided. My best bet now apparently will be to go over the property with Al Adams and after that have another talk with Farnham. It seems that Farnham holds the lease on both mines and that he and Al have some sort of gentlemen's agreement covering their operation. It is probable also that Al will be able to advise me as to just what data that you have would be of the most value to me. In any event I will get in touch with you again as soon as I have made this trip of examination with Al and have had another talk with Farnham. In the meantime I hope that you will be able to provide me with your idea as to the price that will apply on the individual items of data covered in your last letter. As to map size, - I think that the 60 to I scale would be satisfactory.

FRED GIBBS
MINING ENGINEER
PRESCOTT, ARIZONA

Sincerely yours,

Fred Gibbs

April 24, 1947

Mr. Fred Gibbs
Sunnyslope
Prescott, Arizona

RE: De Soto

Dear Fred:

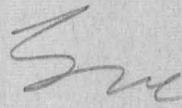
Enclosed herewith is the list of documents referred to in my letter of April 22, and I believe that they cover the situation in a very thorough manner except for such changes as may have taken place during the past few years and particularly since I last visited the property with Al Adams in 1941. Of course anyone interested in the mine would wish to make a personal inspection of the surface workings and such portions of the underground workings as are now accessible, and if you care to follow up this matter, I suggest that you get Adams to go along as a guide since he is very familiar with all of the work which was done during the last few years of operation, and my reports and assay maps will serve to complete the picture as far as can be done without reopening many of the old mine workings.

I trust that you will wish to follow this matter up and that we shall be able to cooperate on a mutually satisfactory and profitable basis.

Should you desire to purchase the documents listed or some of them, it would require a few days to have the reports copied and make the necessary prints. The original maps of which I have blue prints were nearly all made on the scale of 30' = 1" and they are too large to photostat here in Phoenix except by reducing them in size as I have sometimes done with similar maps and on the scale of 60' = 1". They are much easier to handle and usually perfectly legible.

Yours very truly,

GMC: IM
Enclosure



September 16, 1946

Mr. F. M. Stephens
American Smelting and Refining Co.
Post Office Box 2229
Tucson, Arizona

RE: De Soto Mine

Dear Mr. Stephens:

I have your letter of September 12 with which you enclosed maps of the De Soto as per your list. Thank you very much for returning these so promptly after you had reached a conclusion in respect to making a further investigation of the property.

Of course, I am disappointed that you do not feel that the De Soto is, at present, sufficiently attractive to justify exploration work, but I can readily understand your reasoning in this matter, and I can only hope that general conditions may change in future to such an extent that either your company or some other company will decide to explore the property and determine its actual value.

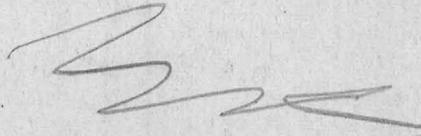
For legal reasons it is perhaps just as well that such an investment should be postponed under any circumstances, and later on if there are any developments of importance, I will see that you are advised of same.

It seems probable that some other work will oblige me to visit Tucson at some time in the near future in which case I shall see you in that city.

Personal regards to you and other members of the staff.

Sincerely,

GMC: IM

A handwritten signature in dark ink, appearing to be 'GMC', is written over the typed name 'GMC: IM'.

O 4/21 47

Sunnyslope,
Prescott, Arizona.
April 19, 1947

Mr. G. M. Colvocoresses,
1102 Luhrs Tower,
Phoenix, Arizona.

Dear Mr. Colvo:-

Inasmuch as my operations at the Hackberry Mine are about at an end due to ore exhaustion I have been doing some looking around trying to find something else worthwhile digging on. One of the things which looks as though it might be of interest is the old De Soto mine. I understand that Farnham's lease on the Blue Bell also covers the DeSoto but I feel that I could make a satisfactory deal with him in the event that it became desirable.

Due to the fact that the mine is not very accessible at this time for examination it occurred to me that you might have quite a bit of data on it which would be of interest and to this end I would appreciate it very much if you would let me have a detailed list of it and the price that you set on a copy of it, if, that is, you would care to sell it. I have in mind that the last time we talked together that you mentioned that you might like to work the mine yourself with some type of leaching operation and with this in mind it is altogether possible that you may not want to dispose of what data you have. In any event, I would appreciate hearing from you soon on the subject.

I trust that this finds you and all of your family enjoying good health. I am glad to be able to report that though the family is now quite scattered (as your own) that by and large we have no complaints to offer and much to be thankful for.

With best personal regards,

Sincerely,

FRED GIBBS
MINING ENGINEER
PRESCOTT, ARIZONA

Fred.

C O P Y

April 5th, 1945

Mr. Roscoe Hurst
387 N. 2nd Avenue
Phoenix, Arizona

Dear Sir:

This will acknowledge your letter of March 28th in regard to the purchase of the 18 patented claims of the De Soto group from the Southwest Metals Co.

I have taken this matter up with the Directors and this will constitute authority that we shall convey the above claims to your associates upon payment of the \$3600.00 in cash to a representative that we may later constitute in Phoenix to handle this transaction. It has been suggested that you have your attorneys prepare the conveyances that are acceptable and forward the same to me, prepared in its final form, and we will insert the designated patented claims. Upon receipt of this conveyance and word from you that the money is available, we shall advise you accordingly.

Yours very truly,

BAC/rg

/s/ Bernard A. Clark, President

June 17, 1946

Mr. F. M. Stephens
American Smelting and Refining Company
813 Valley Bank Building
Tucson, Arizona

RE: DeSoto Mine

Dear Stephens:

The last time that you called on me I was not at liberty to fully discuss the situation at DeSoto by reason of negotiations that were then going on with another mining company.

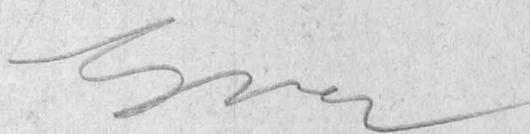
However, that situation has now changed and if you are passing this way again in the near future, I hope that you will drop in and talk the matter over, at least in a preliminary way.

The outlook for copper and other base metals seems to be gradually improving and I believe that in due course of time the government restrictions and ceilings will all be lifted and we can perhaps look forward to obtaining a price for copper that will be fair and commensurate with prevailing costs for labor and materials.

Hope that all is going well with you and with your company and that the strikes will soon be over.

Regards to your other officials in Tucson and to you personally.

Sincerely,

A handwritten signature in cursive script, appearing to read "G. M. C.", is written over the typed word "Sincerely,".

GMC: IM

To file

July 16, 1946

Mr. V. D. Perry
818 Kearns Building
Salt Lake City, Utah

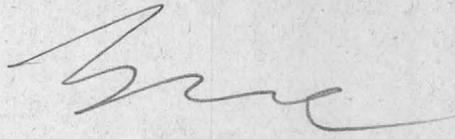
RE: DeSoto Mine

Dear Mr. Perry:

Please refer to your letter to me of April 25 and my reply of April 29, 1946.

Unexpectedly I have been requested to furnish some other parties with an extra copy of the maps which I sent to you along with my report on the feasibility of reopening the DeSoto Mine, and if you will kindly return the prints of the maps as per your letter of April 25, I shall be greatly obliged to you for doing so.

Yours very truly,



GMC:IM

April 29, 1946

Mr. V. D. Perry
818 Kearns Building
Salt Lake City, Utah

RE: DeSoto

Dear Mr. Perry:

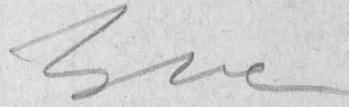
I acknowledge your letter of April 25 and note that after discussion with Mr. Sales it has seemed advisable not to continue with any further investigation of the DeSoto or Blue Bell Mines at the present time.

I have kept copies of all notes and reports that were sent to you and I am glad to have you retain those which are in your possession as perhaps you may care to refer to them at some later time.

I am hoping that during the next few months the future of the copper industry will be substantially clarified and if the outlook is more favorable than at present, I believe that the DeSoto operation will make more appeal to some one of the large mining companies.

Personal regards.

Yours very truly,

A handwritten signature in cursive script, appearing to read "Bue".

GMC:IW

May 6, 1948

Mr. L. L. Farnham
Post Office Box 179
Mayer, Arizona

RE: De Soto

Dear Mr. Farnham:

You will probably recall our meeting several years ago and in any event you know that I was for a long time connected with the operations at Humboldt ^{and} for the Blue Bell and De Soto Mines.

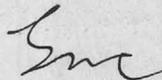
I have often thought that the De Soto merited some further investigation and on the last occasion when I discussed this matter with our mutual friend, Al Adams, I understood that there was a question as to whether or not your lease on the Blue Bell also covered the De Soto.

I am anxious to find out whether or not you hold a lease on the De Soto claims and if so whether you would be disposed to sub-lease this property to other parties, and I shall be greatly obliged if you will inform me in that regard.

In the event that you have no interest in the De Soto, I presume that I should take this matter up with the officials of the Southwest Metals Company in Detroit.

Yours very truly,

GMC:IM



103.85

500 tons

MINNY L&L.

Cost / ton

.40 shooting

.25 "

.21 Labor

.05 water

.08 Power

1.20 Cans & Acid

.25 Maintenance

.18 Depr.

2.62

.50 Hauling & Smelting

3.12 Total.

$$\text{Cost / lb. } \frac{3.12}{20} = 15.6$$

SHATTUCK DENN MINING CORPORATION

120 BROADWAY
NEW YORK 5, N. Y.

DeSoto
h. a.

THOMAS BARDON
PRESIDENT

November 13, 1945

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Dear Mr. Colvocoresses:

I was much interested in reading your letter of November 9, 1945 in regard to the Blue Bell and DeSoto mines. It recalls my first visit to Humboldt in 1930 or thereabouts when I visited the Humboldt smelter in company with a couple of men from the Electric Autolite Company who had an idea they wanted to get into the copper mining business in order to assure their company of a regular supply of copper.

I doubt that Shattuck Denn would be in a position to take over these properties, but we can give the matter some thought and I am forwarding a copy of your letter to Mr. Mills. My present plan is to get down that way in January and, if you are available, I would enjoy a visit with you at that time.

With kindest regards, I am

Yours very truly,

Thomas Bardon

TB:OP

cc: Mr. H. F. Mills

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN MINING DEPARTMENT
P. O. BOX 2229
TUCSON, ARIZONA

D. J. POPE
MANAGER

VALLEY NATIONAL BLDG.
TELEPHONE 503

A. *9/16,*
46

September 12, 1946

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

Dear Mr. Colvocoresses:

DE SOTO MINE
Cleator
Yavapai County, Arizona

We have now given the data which you submitted to us on the De Soto Mine our careful consideration and regret to have to advise you of our decision not to undertake doing anything there at the present time.

Nevertheless, we wish you would please accept our thanks for bringing us this proposal.

I return herewith by registered mail the various maps which you were kind enough to let me have.

With best regards,

Yours very truly,

F. M. Stephens
F. M. STEPHENS

FMS:ar

Attachments:

- ✓ Section De Soto Mine
- ✓ Claim map " " "
- ✓ Photostat U.S.G.S. Topog. map.
- ✓ Plan 2nd level workings De Soto mine
- ✓ Longitudinal sect. stope map " "
- ✓ Cc: DJPope

AMERICAN SMELTING AND REFINING COMPANY
SOUTHWESTERN MINING DEPARTMENT

P. O. BOX 2229
TUCSON, ARIZONA

D. J. POPE
MANAGER

VALLEY NATIONAL BLDG.
TELEPHONE 503

June 20, 1946

File

Mr. George M. Colvocoresses
1102 Luhrs Tower
Phoenix, Arizona

DE SOTA MINE
YAVAPAI COUNTY, ARIZONA
CLEATOR

Dear Mr. Colvocoresses:

I have your kind letter of the 17th.

Office work here will probably keep me busy for the balance of this month so the "near future" will likely not be until shortly after the Fourth of July.

I will be glad to then call on you and discuss this matter, and possibly also make a trip to the property so as to familiarize myself with conditions there.

The strike seems to be settled for the time being, at least.

With best regards,

Yours very truly,

F. M. Stephens
F. M. STEPHENS

FMS:R
Cc: DJPope

File

March 22, 1946

Mr. V. D. Perry
818 Kearns Building
Salt Lake City, Utah

RE: DeSoto and Blue Bell Mines,
Yavapai County, Arizona.

Dear Mr. Perry:

Please refer to my letter to Mr. Sales and to your letter to me dated November 19, 1945, and accept my apology for the long delay in replying to same.

Very soon after your letter was received, I started to check out and condense from my very voluminous files on these properties such data as I believed you might find most interesting, but a lot of other work which could not well be postponed prevented me from making much progress.

At the Blue Bell there are at present several complications, legal and otherwise, which will, I believe, be cleared up in time but would seem to make it inadvisable to stir up at present any local curiosity concerning its possibilities as a large scale producer of low grade ore and the fact that the great percentage of that ore would have to be mined by underground methods is of course a great disadvantage.

Therefore, I have not attempted to enclose with this letter any data regarding the Blue Bell and the notes which I am sending you regarding the DeSoto and particularly the maps can be supplemented if you should feel, after looking them over, that the property might merit further investigation.

I prepared the said notes some time ago and intended to send with them a number of maps but found that the proper preparation of the latter would require a great deal of work and accordingly, for the time being, I only enclose a print of the general location showing topography and geology, which print can be much improved, and a print showing the location of the various stopes of higher grade ore that has been mined on the different levels and the approximate outlines of low grade ore; much of which could be mined by open-pit operation but might prove to be too low grade to mine with profit.

Page #2

After you have given the enclosed data consideration, please let me have your general impression and indicate whether you think that the DeSoto Mine might be attractive to your company in which case I will proceed as time permits to send you some additional maps and revisions of those which go forward at present.

Personal regards.

Yours very truly,

GMC:IW
Enclosures