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IDAHO CIBOLA MINES, INCORPORATED
BALANCE SHEET
JUNE 30, 1973

ASSETS:

Cash		$ 2,912.74
Office Equipment		280.95
Credit toward purchase of trailer		1,400.00
Land		7,000.00
Mill		
Building	$ 77,134.37	
Equipment	96,496.11	173,939.48
Mine		
Building and roads	70,686.52	
Equipment	45,445.18	118,131.70
Tunneling and open pit costs		254,960.00
Unrecovered Developement costs		74,351.76
Organizational costs		33,510.66
Commission on sale of stock		21,750.97
Royalties		6,037.50
TOTAL ASSETS		$694,275.76

LIABILITIES AND STOCKHOLDERS EQUITY:

Liabilities:	
Accounts Payable-Supplies	$ 16,337.49
Accounts Payable-Equipment	16,669.14
Notes Payable	7,500.00
Loans from Gold Reserve, Inc.	2,412.36
Loans from Officers	209,715.55
Stockholders Equity:	
Capital Stock (1,610,092 shares .16¢) 30¢	161,009.20
Capital in excess of par	299,261.85
Income and expense	(18,629.83)
TOTAL LIABILITIES AND STOCKHOLDERS EQUITY	$694,275.76

IDAHO CIBOLA MINES, INCORPORATED
INCOME & EXPENSES
JUNE 30, 1973

INCOME -0-

EXPENSES:

Wages	$ 6,488.00	
Contract labor	1,140.05	
Trailer lease	1,132.00	
Gas, oil, lubrication	1,019.76	
Repairs, parts and supplies	900.99	
Engineering and assaying	200.00	
Truck and auto expense	329.80	
Freight	2,077.59	
Office supplies	340.60	
Insurance	314.80	
Utilities	225.45	
Travel	853.41	
Telephone	2,086.86	
Interest expense	174.78	
Payroll taxes	1,345.74	18,629.83
TOTAL INCOME (EXPENSES)		$(18,629.83)

REPORT ON THE
KENTUCKY VERMILLION MINE
NOW THE SILVER BUTTE MINES,
Situated at Trout Creek, Montana,
By Joseph E. Branscombe, M.E.

AREA OF PROPERTY: This property consists of the following mining claims and mill sites:

Panhandle, Galena, Silver Bow, Monarch, Cariboo, Felicites and Sentinel, Silver Bow, Fides, Felicites and Basil quartz lode claims, and the Montana and the Kentucky mill sites of five acres each.

The lode claims are nearly all full claims, and the aggregate area of the group is about 215 acres.

TITLE: The title of the property is held by F. O. Berg and Major R. E. White, Spokane, Washington.

LOCATION: This group of mining claims is situated on Fisher Creek in Vermillion Mining District, Flathead County, state of Montana, and is 13 miles distant from Vermillion, a station on the Northern Pacific R. R. There is a good wagon road from the mines to Vermillion which is maintained by the state, and is open to travel at all seasons of the year. The entire haul from the mine to the railroad is down grade.

The mines are in the same range of mountains and northeasterly 24 miles from the famous lead-silver mines in the Coeur d'Alenes district, Shoshone County, state of Idaho, which produced over $32,000.00 last year. (See upper right hand corner of map of claims for relative position.)

All the claims are laid out on the northeast slope of the main divide of the Cabinet range and the Panhandle, Silver Bow, Monarch, and Galena claims that cover the same vein for nearly 6,000 feet in length, and are the only claims that have been developed to any length, and are the only claims that have as the Sentinel, Fides, and Felicites claims cover the hanging wall.

The Cariboo, Silver Star, and Basil are below or north of the other claims, and over the Monarch lode, which has been cut in the crosscut tunnel.

FORMATION: The formation is silicified slate and quartzite. The vein dips at an angle of 40 degrees to the south. The hanging wall is quartzite. The foot wall is highly silicified slate, which with depth merges into a quartzite.

The vein filling, or gangue, is a carboniferous shale with an occasional rib of slate. Close to the foot and hanging wall is the pay ore, which consists of associated quartz, cemented together with oxides or iron, and iron pyrites, with a heavy sprinkling of galena and some blendes.

These bodies of pay ore are connected with stringers of ore which cut through the gangue diagonally. The oxidized areas are confined closely to the surface.

DEVELOPMENT OF THE PANHANDLE LODE: The Panhandle vein pitches squarely into the side of the dividing ridge, which rises 2,000 feet about the outcrop and parallel with it, and its development consists of four Adit Tunnels, from 200 to 1,200 feet in length, each driven on the vein, and numerous cuts between the tunnel openings, all of which have exposed the vein.

In addition there is a crosscut tunnel 1,000 feet in length which was driven from the Silver Star claim in to the Panhandle ground, where it first encountered the Monarch vein which is a 5-foot vein and carried fair values. Then 40 feet further in, or 900 feet on the dip of the vein below No. 1 Tunnel. This tunnel was turned 20 degrees to the crosscutting of the ledge there have been several ore bodies exposed from 5 inches to 5 feet in thickness, but the only drifting that has been done in this tunnel is directly

in or near the foot wall where there have been drifts driven from the crosscut tunnel both east and west. Each of these drifts are 100 feet in length and have been in ore most of the distance. At the present time crosscuts are being driven toward both hanging and foot-wall, from the face of these drifts with good results.

NO.1 ADIT TUNNEL: No. 1 Adit Tunnel is directly above the crosscut and was started on the outcrop of the vein near the center of the Panhandle claim, and has followed the ledge continuously for a distance of 1,200 feet in ore without a fault. The vein in this tunnel is from 5 to 40 feet between wals. The first 120 foot the tunnel gained very little depth and the pay ore was small, varying from 1½ to 3 feet, although the vein is well defined at this point; then the ore increased to about 4 feet in thickness. Ore chutes have been put in and the stopes started for a distance of 520 feet. The stoping has all been confined to the foot wall; but by numerous crosscuts and raises to the hanging wall, it has been proven that the ore on the hanging wall is more extensive and of better grade than the foot wall ore. The ore that comes for the first 120 feet of these stopes was nearly all shipped without concentration, with the following results:

CRUDE ORE: Smelter returns from A.S.& R. Co., East Helena

DATE		CAR	NET WEIGHT LBS.	TOTAL
September	23	9787	35,007	303.26
September	26	2340	37,463	234.25
September	26	3351	33,250	296.88
October	1	2107	33532	249.62
October	3	8865	28,764	289.80
November	3	6506	28,452	289.72
November	7	8701	42,788	172.98
November	14	8305	40,696	173.33
November	21	5,952	41,888	323.02
November	26	4063	42,189	198.50
Totals			575,425	$2,405.25

This ore should have been concentrated or sorted closer for shipment so as to save transportation and smelting charges, and thus the net value or profit realized would have materially increased.

There has been approximately 2,600 tons of ore extracted in the next 400 feet of this stope, barely enough to get the stope started about the tunnel sets; of this amount 1,000 tons was run through the concentrator with following results:

One hundred and twenty-five tons of concentrates, assaying 55% lead and 30 oz. in silver, figuring lead at 4¢ per pound and silver at 60¢ per oz., these concentrates were worth $62.00 per ton.

This saving was in a new mill on its first run, where the mineral saving devices were not properly arranged and distributed. By putting in vanners to handle the slimes according to the usual practice, there is no reason why this mill should not make as close a saving as they do on the Coeur d'Alene, as the ore is identical.

The next 550 feet of this tunnel has been driven in the last six months by the present owners and has been crowded ahead without raising, as the objective point aimed for is a large surface showing of ore on the Silver Bow claim where there is at least 5,000 tons of concentrating ore exposed on the surface. This ore sampled 8.5 oz. silver and 14% lead, and 5½ tons of this ore would make one ton of 60% concentrate.

At the present time the face of No. 1 tunnel is 53 feet west from and 90 feet vertical from the bottom of a winze in No. 2 tunnel which has developed the ore 130 feet in depth; or in other words, by driving No. 1 Tunnel 53 feet and raising 90 feet, we

will expose the ore 200 feet vertically under the blowout and thoroughly ventilate the mine.

No. 1 Adit tunnel has but one raise to the surface, which is about 70 feet long; and was started for ventilation but encountered good ore soon after starting, and continued in ore the entire distance, and the stoping begins near this raise. There are eight crosscuts in this tunnel, all driven towards the hanging wall, and from 10 to 53 feet in length. Five of them have encountered ore in a distance of 25 to 30 feet from the foot wall where it appears to be in the form of stringers from the main pay shoot. Several of the stringers are two feet in thickness and will justify mining and milling with the present showing or with good prospects of increasing in size.

The showing of ore in this tunnel is good, and one is almost justified in advising the starting of the mill on this alone, as there are a great many thousand tons of ore in sight, and when the connection is made with the winze, under the large surface showing of ore on the Silver Bow claim, I would recommend that the concentrator be overhauled and put in shape for a long run.

NO. 2 ADIT TUNNEL: No. 2 Adit Tunnel is about 300 feet in length and is driven on the vein from about the center of the Silver Bow claim, and runs northwest along the foot wall where it has encountered several small bodies of carbonate ore but no crosscutting or raising has been done, except in one place about midway in the tunnel, where a crosscut 63 feet in length was driven toward the hanging wall. The face of this crosscut is directly under the large surface showing of ore, and has exposed a body of ore 20 feet thick, assaying 15% lead and 12.2 oz. silver, worth $19.32 per ton. At this point a winze has been sunk a distance of 56 feet all in ore. At the bottom of this winze a crosscut has been driven toward the foot wall for 10 feet, which shows a large body of concentrating ore, assaying 19% lead and 34.4 oz. silver, worth $35.84 per ton and proves that the surface showing extends down that far, at least; and that the values increase with depth. After this winze was sunk the development work was stopped at this place as there was no means of getting the ore to the mill until connection was made by driving No. 1 Tunnel ahead to the point directly under the winze and an upraise made, all of which work should be done at once, as before suggested.

NO. 4 ADIT TUNNEL: No. 4 Tunnel was driven some years ago while the Silver Bow property was owned by the original locator, who before giving a bond, stipulated that this tunnel should be run.

It was started in the gulch from about the center of the Silver Bow claim and was driven southwest under the creek bed for a distance of 145 feet without encountering the vein. They then returned 50 feet from the face and started to drift due west and continued that course for 500 feet, at which place they encountered the vein and drifted on it about 85 feet, but did no crosscutting, although several stringers of fine ore make towards the hanging wall. This tunnel is about 95 feet lower than No. 1 Adit Tunnel, and will eventually be utilized as an intermediate level between the crosscutting tunnel and No. 1 Adit Tunnel and will facilitate the stoping of this intermediate ground.

In the meantime, the Panhandle claim was purchased, No. 4 Tunnel was stoped, and the No. 1 Adit Tunnel started, and the property was then developed from the other side of the mountain from which the ore can be sent to the mill by gravity.

NO. 3 ADIT TUNNEL: No. 3 Tunnel is down the hill and about 400 feet southeast of the large surface showing of ore. It has not been driven far enough to show any results excepting the vein in places containing carbonates of lead.

CROSSCUT OR LOWER TUNNEL: The crosscut tunnel was driven from the north side of the mountain southerly for a distance of 1,000

feet. It is intended as a main working tunnel and is well adapted for that purpose, as it is large and dry and the grade is very uniform. The entrance is about 1,500 feet from and about 525 feet above the mill, which will give it a good grade for a gravity tramway over which large quantities of ore may be transported to the mill at a minimum cost.

As this tunnel encountered the ledge quite recently, the development of the vein is limited to crosscutting in three places and 200 feet of drifting on or near the foot wall.

At a point 920 feet in, the tunnel cuts a vein of quartz five foot thick and known as the Monarch vein. This vein was barren on the surface directly above. But where it was cut by this tunnel it shows very good values -- 6% lead and 5 oz. silver. The work on this vein is limited to crosscutting it by the main tunnel. Forty feet further in the Panhandle vein was encountered and crosscut for a distance of 70 feet, and shows several ore bodies, varying in width from 6 inches to 5 feet. One 2-foot ore body is very high grade silver ore, assaying 50 oz. in silver and 9.5% lead and one 50-foot ore body assaying 35 oz. in silver and 9% lead.

The values in the drifts show about the same silver ratio as the two samples given above, and show that with depth the ratio of silver values increased, establishing a great improvement in the ore. Say, for example, we concentrate 9 tons of this ore into one ton of concentrates, and make a saving of 75% of the total values then 9 x 35 equals 315 oz. 7% of that equals 236.2 which at 60¢ per oz. equals $141.75. 9 x 9 equals 81%. 1,620 lbs. lead, 75% equals 1,215 lbs., which at 4¢ equals $48.60. One ton concentrates worth $190.35.

One ton of these concentrates is worth three tons made from the ore in the upper level on the trial run of the mill. In fact, it is worth still more, as we save the transportation and reduction charges on two tons of concentrates, which amounts to $20.00 per ton or $40.00 for the two additional tons.

ORE IN SIGHT: The condition of the mine at present makes it impossible to give the exact tonnage of ore, as there is but one raise through to the surface. But taking into consideraion the size and continuity of the vein in No. 1 Tunnel and the surface showing of ore directly above and leaving out of my calculation the foot wall ore which is all that has been extracted so far, taking a fair average sample in 85-foot sections, just as it would be mined, then bunching these into 24 samples and assuming that the ore extends only from one-third to one-half of the distance to the surface, I feel that I am not overestimating the value of the ore above No. 1 Adit Tunnel.

BLOCK NO. 1: Block No. 1. Therefore we will say that Block No. 1 begins near the upraise, 150 feet from the opening of No. 1 Adit Tunnel, and extends 600 feet to a short distance beyond the end of the stope. This block of ground will average 140 feet vertical to the surface or 200 feet on the dip of the vein and 4.21 feet wide. The assays located by numbers on the blue print are as follows:

ASSAYS FROM BLOCK No. 1:

NO.	WIDTH	LEAD	OZ. SILVER	TOTAL VALUE PER TON
1	2	5.01		
1	2	5.01	4.80	6.80
3	3	3.04	5.90	5.97
4	2	2.03	2.00	2.82
5	2½	2.06	2.10	2.91
6	4	3.09	8.10	7.33
7	5	19.04	6.80	12.31
8	6	11.05	9.70	14.66
9	6	8.05	2.80	8.12
10	3½	13.03	3.10	12.30
11	4½	10.00	34.40	35.84
12	3	36.04	43.60	54.99
13	4	15.06	5.02	15.06
14	5	22.04	4.05	20.06
15	2½	15.00	12.20	19.32
16	5	14.00	6.80	15.28
17	5	5.04	9.00	9.43
18	6	5.02	7.20	8.34
19	5	8.04	19.90	18.37
20	3½	29.00	15.50	32.50
21	4	5.04	9.00	9.43
22	7	2.02	17.40	29.66
23	6	8.00	9.80	12.28
24	5	10.04	4.80	10.91
33 tals	1½	24.02	17.40	29.66
	101	305.78	261.37	401.44

Average 4.21 feet, 12.74%, 10.8 oz., $16.72.
220 x 600 x 4.21 equals 555,720 cu. ft., and at 10 cu. ft. per ton 55,572 tons, at $16.72 equals $929,163.84, which would be the gross value of this ore provided we know it extended to the surface and held its size and values. This we do not know. Therefore, we cut this gross value in half and calle it $464,581, which is very conservative.

When the profile maps shows the ore to be stoped it should be understood that only the foot wall ore has been extracted as at that time the hanging wall was not known. However, this ore on the foot wall is not included in the above calculation.

BLOCK NO. 2: 420 ft. in length beginning at the east end of Block No. 1 shows an average width of 2.4 feet and 200 feet vertical depth below the surface, which would be 320 ft. on the dop of the vein, with an average value of $14.56 per ton.

The assays located by numbers on the blue print are as follows:

NO.	WIDTH	LEAD	OZ SILVER	TOTAL VALUE PER TON
2	5	8.00	3.00	8.20
29	2½	14.00	16.40	21.04
30	1½	11.50	9.70	15.02
31	1½	9.20	4.20	9.88
32	1½	8.40	19.90	19.66
7	12	51.10	53.20	73.80

Average 2.4 ft, 10.22%, 10.64 oz, $14.56.
420 x 320 x 2.4 equals 322.560 cu.ft or 32,256 tons which at $14.56 per ton equals $479,647.36. As this block of ground is only shown on two sides, I think we should calculate only one third of the total amount which would equal $156,549.00., and is a very conservative estimate, as the showing of ore is continuous the entire distance.

BLOCK NO. 3: Is that portion of ground directly above No. 2 Tunnel and below the large surface showing of ore on the Silver Bow claim, and does not take into consideration the ore in the winze, which is about 56 ft. deep, and good ore the entire distance. The dimensions are: 70 ft. vertical or 100 feet on the dip of the vein, by 100 ft. long by 13.3 ft. wide, at $22.95 per ton. The assays located by numbers on the blue print are as follows:

ASSAYS FROM BLOCK NO. 3

NO.	WIDTH	LEAD	OZ SILVER	TOTAL VALUE PER TON
26	10	15.06	12.20	19.37
27	10	19.00	34.40	35.84
34	20	14.00	4.05	13.63
	40	48.06	50.65	68.84

Average - 13-1/3 ft., 16.02%, 16.88 oz. $22.96
110 x 110 x 13.3 equals 146,300 cu.ft., 14,630 tons at $22.95 per ton equals $335,758.50. In order to be absolutely conservative reduce this amount one half and there remains a total of $167,879.00.

SUMMARY

Block One.
600x220x4.21-55,572 tons at $16.72 per ton-$929,163.84, reduced one half equals $464,581.00.

Block Two.
420x320x2.4-32,256 tons, at $14.56 per ton-$469,647.36 reduced one third equals 156,549.00.

Block Three.
110x100x13.3-14,630 tons at $22.95 per ton-$335,758.50 reduced one half equals $167.879.00.

Total Gross Value - $789.009.00.

NET VALUES OF ORE IN SIGHT: The net values in Block One, Two, and Three are arrived at by figuring costs, values, and deductions as follows:

Mining, traming, and milling at $2.00 per ton ore. Hauling to the railroad at $4.00 per ton of concentrates. Transportation and smelting charges at $16.00 per ton of ore. The deductions are 25% from the assay value of the crude ore, losses in concentration, besides a smelter deduction of 10% of the remaining lead and 5% of the remaining silver. Lead is figured at 4¢ per pound and silver at 50¢ per oz.

BLOCK ONE: Calculating one half of the apparent tonnage, contains 27,786 tons of ore, assaying 12.74% lead and 10.89 oz. silver per ton. Total value $16.72 per ton. By concentrates assaying $49.00 oz. silver, and 57.33% lead, equivalent to 114,616 lbs. of lead, from which a smelter deduction of 5% of the silver and 10% of the lead is made, leaving a balance for which payment is received as follows:

46.55 oz. silver at 60¢ per oz	$27.93
1,031. lbs. lead at 4¢ per lb.	41.27
	69.20
Mining, milling, and tramming 6 tons of ore per ton of concentrates, $12.00 - Transportation and treatment, $20.00 total	32.00
	37.20

4,631 tons concentrates at $37.00 a ton - $171,347.00

BLOCK TWO: Block two, calculating one third of the apparent tonnage, contains 10,732 tons of ore, assaying 10.23% lead and 10.64 oz. silver per ton - Total value $14.56 per ton. By concentrating eight tons of this ore into one ton of concentrates and allowing 25% loss in concentration, there remains one ton of concentrates, assaying 63.84 oz. silver and 61.32% lead, equivalent to 1,226.4 lbs. lead; from which a smelter deduction of 5% of the silver and 10% of the lead is made, leaving a balance for which payment is received as follows:

60.64 oz. silver at 60¢ per oz.		$46.38
1,103.76 lbs. lead at 4¢ per lb.		44.15
		80.53
8 tons of ore per ton of concentrates	16.00	
Transportation and treatment	20.00	36.00
		44.53

1,344 tons concentrates at $44.53 per ton - $59,808.00

BLOCK THREE: Block three, calculating one half of the apparent tonnage, contains 7,315 tons of ore, assaying 16.02% lead and 16.88 oz. silver per ton - Total value $22.95 per ton. By concentrating five tons of this ore into one ton of concentrates and allowing 25% loss in concentrating, there remains one ton of concentrates, assaying 63.3 oz. silver and 60% lead, equivalent to 1,200 lead, from which a smelter deduction of 5% of the silver and 10% of the lead is made, leaving a balance for which payment is received as follows:

60.13 oz. silver at 60¢ per oz		$36.07
1,080. lbs. lead at 4¢ per lb.		43.20
		79.27
Mining, tramming, and milling 5 tons of ore ton of concentrates	$10.00	
Transportation and treatment	20.99	30.00
		49.27

1,463 tons concentrates at $49.27 per ton - $72,082.00

Grand total net value of concentrates, or total profit $303,237.00

This grand total net value of concentrates does not take into consideration the ore below the No. 1 Adit Tunnel, which we may assume goes down a short distance at least, as the crosscut tunnel has cut the vein a depth of 200 ft. vertically below this ore, or 346 feet on the dip of the vein; and at that depth the silver values have increased three and one half fold; nor have I made any attempts to estimate the ore above the crosscut tunnel, as I stated before the limited amount of development in that quarter compels me to confine my estimate to its prospective value which, considering the showing of ore and increase in silver values in the crosscut tunnel, I consider fully as valuable as the three blocks of ground figured in my estimates above.

The Monarch claim east of the Silver bow may be considered a valuable claim as the Panhandle vein has been opened in twelve places by trenching, and a good showing of ore exposed in eight of those cuts, and its prospective value should be considered when estimating the value of this group of claims. Likewise on the Galena claim; and, therefore, which covers the Panhandle vein

on the west, while there has been no work done, but trenching on the surface. I am confident that the ore bodies come up from the east and pass into the Panhandle claim, and therefore with depth will be found in this ground. And in all probability there are other bodies of ore in the Galena claims which have not yet been discovered.

SURFACE IMPROVEMENTS: Buildings, Equipment, and Power.

The buildings and machinery are all new and of modern type. The mill and all other buildings are lighted by a ten horse-power electric plant.

The mill building is a three story frame structure 72x142 ft., heated by steam. It is intended for a 300-ton mill and is equipped with crusher and roll capacity for that amount in 24 hours. The present capacity of the plant is 150 tons in 24 hours. All that is required to double the capacity is ten additional jigs and additional vanners. At present it contains one Comet crusher, one Blake crusher, two sets 16,32 rolls, ten sets 3-compartment jigs, one pair 10-ton wagon scales and all requisite trammels, elevators, turning lathes, etc., necessary for operations. Besides this there is one 50-horse power Atlas engine and boiler used for heating purposes.

The power is supplied by a Laffel water wheel which is driven by water brought two miles in a flume 24.32 inches, and conducted from this flume to the water wheel in a 14-inch iron pipe under all 30-foot head, generating 86 horse power, and there is also ample washwater for milling the ore.

In addition to this water power, the company owns the water of Silver Bow Creek, a branch of Fisher Creek and has the grade completed for a flume, a distance of one and one half miles from the intake to the mill. This power will not be required unless the capacity of the mill is increased very much.

The mill is connected with the ore house near the No. 1 Adit Tunnel by a 1,600-foot double truck gravity tramway. The ore is transported to the mill in two selfdumping cars of 3,000 lbs. capacity each. This tramway has a capacity of 300 tons in 10 hours.

Located 300 ft. from the mill is a two-story frame boarding house, providing running water, electric lights, fine range, and dishes for eighty men, while the lodging facilities are fully ample for that number.

Midway between the mill and the boarding house are located two large office buildings, both of which contain ample sleeping compartments for the superintendent's staff. In close proximity to the mill on the north is located the saw mill, which has a capacity of 30,000 ft. of lumber, and has cut about one million feet, all of which has been used at the mine for mill buildings, shingle mill, and planers.

In addition to these improvements, there is one diamond drill, one extra dynamo, a new assay outfit, 200 ft. of new belting, 10 net horse cars, 150 gallons of lubricating oil, pipe fixtures, and other mining supplies too numerous to mention.

The mine is connected with the railway by private phone, which belongs to the company. The mine is fully equipped with cars, drills, picks, shovels, three blacksmith outfits complete, and the tunnels are laid with 12 lb. "T" rails on a uniform grade.

MINE DEVELOPMENT AND ALTERATIONS RECOMMENDED: I would like to recommend that the terminal of the tramway at the mine be removed from No. 1 Adit to the mouth of the crosscut tunnel because:

1st. It will shorten up the tramway 700 feet, making it more convenient to operate.

2nd. It will give you the use of 2,400 feet of rail.

3rd. It will increase the daily capacity of the tram.

In connection with this change, I would recommend that a raise be started in the crosscut tunnel and connection made with the No. 1 Adit Tunnel for ventilating the lower works, and to be used as an ore chute to transfer all ores about No. 1 Tunnel to the crosscut tunnel, from which it will be sent to the mill over the tramway.

In the crosscut tunnel the work which is now being done, is drifting on the footwal and crosscutting every 100 feet; is about all that can be done at present, excepting to drive the raise which I recommend above.

The showing in the tunnel is most gratifying for the limited amount of work done, and I am sure that it is only a question of blocking out the ground above this level to make this a noted and large dividend paying mine.

In the face of No. 1 Adit Tunnel should be driven ahead as rapidly as possible and connected with the winze in No. 2 tunnel, so as to thoroughly ventilate the stopes above No. 1 level and explore that portion of the ground directly below where the largest surface showing of ore is found.

It would be advisable to drift on some of the most promising stringers which have been cut in crosscutting on this level, as they frequently lead to large bodies of ore. The Empire State Mine at Wardner, in the Coeur d'Alenes, Mining District, is paying $50,000 monthly dividends from a small stringer. Therefore, this work should be looked after and mapped over carefully so as to show the relation of the stringers to the main ore bodies.

COMPRESSORS: I would advise that you purchase a ton-drill compressor and install it at the mouth of the crosscut tunnel, as there is plenty of water to furnish power to operate such a compressor and its installation would reduce the cost of mining 50% in this character of ground.

SUMMARY OF MINE ESTIMATES: In summarizing the estimates in this report, I especially call your attention to the methods by which my estimates were arrived at.

I entirely disregard extensive figures in figuring tonnage of ore; neglecting to include them because the ground was not ready for stoping operations, notwithstanding the fact that considerable ore of even better grade than any ore included in my estimates, had been exposed. The tonnage included in my estimates is arrived at after making extensive deductions from apparent "ore in sight" in the blocks of ore and estimated to be practically ready for stoping, and is undoubtedly an underestimate of the true tonnage which will be realized in actual mining of these blocks of ground.

The gross values of this reduced tonnage is found to be $795,000.00. Then deducting 25% loss in concentration, and in addition 10% for loss in smelting lead, and 5% for loss in smelting silver, and deducting all costs of mining, milling, hauling, railroad transportation, smelting etc., and there remains a net profit of $303,237.00, figuring lead at 4¢ per lb. and silver at 60¢ per oz.

I consider that the deduction already made in tonnage and for loss in milling and smelting will cover my possible contingency of markets, and that, therefore the ore in sight has a gross value of at least $789,009.00, and a net value of at least $303,237.00 under the circumstances.

CHANGES AND IMPROVEMENTS IN THE MILL: The blake crusher should be set in place and the elevators should be properly adjusted, as at the present time they are so flat and they wear very rapidly. This change is simply a matter of moving the shafting, and the cost amounts to very little. The most important improvement in connection with the mill is the addition of vanners for fine concentration.

These vanners are necessary if you expect to save the silver values to a high percentage, and are used in all silver lead concentrators. Milling the ores as carefully as possible, you are bound to make some slimes which cannot be caught in the jigs nor on the round tables, but by running them over vanners properly adjusted, a saving of over 75% of the silver values can be made. These tables cost about $450.00 each, and I would recommend that you purchase four and place them on the lower floor of the mill, just above the ore bins.

I had a mill man look over the plant, and he estimates that $3,500.00 will put the mill in first class order, including the addition of vanners.

COMPARISON OF COEUR D'ALENE AND KENTUCKY VERMILLION MINE: This property is what is known as lead-silver proposition, one of the most desirable of mines, as the ore bodies are large, and therefore can be mined very cheaply by machine drills.

The machinery for concentration is very simple and requires no great technical skill to save a high percentage of the values, and the concentrates are always in great demand by the smelter.

The plant is run by water power. The timber is on the ground and can be had for the cutting. Therefore, this ore can be mined and milled at a minimum cost.

The transportation and treatment is the greatest item of expense to be taken into consideration, and this is very little above the cost in the Coeur d'Alenes, while the cost of mining timbers in the Coeur d'Alenes is something enormous, as they ship their timber 40 miles by rail, then haul them to the mine by team, while at this property the timber is onthe ground and above the mine, and can be had for the cutting. I estimate that there is enough mining timber on your property to supply your mine for ten years. So taking the difference in cost of timbers as an offset to the extra cost of transportation, I think the cost of operating your mine would be about the same as in the larger tunnel mines, and much less than the cost in the shaft mines in the Coeur d'Alenes.

COMPARISON OF VALUES CONTAINED IN ORE FROM KENTUCKY VERMILLION MINE AND ORES FROM THE COEUR D'ALENES MINES: The ratio of silver and lead are about one for one in the No. 1 Adit Tunnel, or 11.5% lead and 10.76 oz. silver, while the ores in the crosscut tunnel show that the silver values have increased to three ounces of silver to the unit of lead values, and that the lead values are about the same as in the Adit Tunnel.

Take as a comparison two of the largest mines in the Coeur d'Alenes, the Morning mines at Mullan, Idaho, owned and operated by Larson & Greenough. This property is mined by machine drills, and concentrator operated by water power, the ore trammed two miles by steam railway, mining and milling 1,000 tons in 24 hours, producing 100 tons of concentrate, or ten into ore, which assays about 53% lead and from 18 to 20 oz. in silver per ton. The crude ore from this property will average about 7.5% lead and 2.5 oz. silver per ton.

In comparing the mine of the Bunker Hill & Sullivan Mining & Concentrating Company, with which I was connected for several years, and I can speak regarding this mine from my own personal knowledge. This mine is one of the largest and best equipped mines in the United States, and before the new mill was built they mined and concentrated about 750 tons of ore in 24 hours. They used eight machine drills and 100 vanners for breaking ore and development work. The average of this ore is concentrated into one ton of concentrates, which assays 60% lead and about 30 oz. silver. All of this ore is hauled from the mine by mules to the head house, distance of three quarters of a mile, dumped in bins, then run through the crushers, transferred to an airial

tramway, which carries the ore one and three quarters of a mile to the mill where it is worked by water power.

This company is now driving a tunnel from the mill level to vein cut 700 ft. below to what is known as the feed level, which is their present working tunnel. The new tunnel is 8x14 ft. and will be 10,000 feet in length when completed, which will be in about four months. This enterprise shows the faith of the company in the lead mining business of the Coeur d'Alenes. While it requires a 10,000-foot tunnel to tap the vein 700 ft. deep in the Bunker Hill & Sullivan mines, a 2,500-foot tunnel will cut the Panhandle ledge at 525 feet below the present crosscut tunnel.

As this short comparison will show, the advantage is in favor of the Kentucky Vermillion Mine property, excepting transportation, which will diminish when your property has become a producer, as the tonnage from a large lead mine is very attractive to railway companies owing to the quantity and rate charged, and was the cause of the railroad building into the rough mountains of Utah, and into the Coeur d'Alene and Wood River districts, Idaho, and also into the Slocan District in British Columbia.

Yours very truly,

(Signed) JOSEPH E. BRAMSCOME, M. E.

REPORT

by

Arthur B. Browne, M. E.

on the

SILVER BUTTE MINES CO.

KENTUCKY VERMILLION MINE

Situated at VERMILLION, MONTANA.

Gentlemen:

In accordance with your request, I have examined the property of the Kentucky Vermillion Mine, on A pril 22nd, to 26th, 1901, and beg leave to submit the following:

REPORT: The property consists of ten mining claims, and the mill site locations named as follows: Galena, Basil, Silver Star, Panhandle, Cariboo, Silver Bow, Fides, Monarch, Felicitas, and Sentinel, together with the Kentucky Mill site and the Montana Hill site.

The claims are all full mining claims, 1,500 by 600 ft., except the Silver Bow, which slightly overlaps the Silver Star claim.

LOCATION: The property is situated on Fisher Creek, in Flathead County, Montana, approximately 12 miles from the station of Vermillion, on the main line of the Northern Pacific Railroad, and is reached by an excellent wagon road over the entire distance. Although situated near the summit of the Cabinet range, where the snowfall in winter is quite heavy, there will be no difficulty in keeping the road open at all seasons. In fact, transportation costs should be materially decreased when hauling on snow.

TITLE: Title to the property is held by Frederick O. Berg of Spokane, Washington, and Major R. K. Waite all claims being patented.

NATURE OF EXAMINATION: At the time of my visit the snow prevented surface examination and I was dependent, therefore, for much information concerning the surface lines, croppings, etc., upon plans and maps furnished me at the company's office. Having checked these maps in several details, I believe them accurate and shall refer to them in this report.

SURFACE CONFIGURATION: The property is situated on the northeast slope of the range. The country is much broken by deep gulches, the steep hillsides affording ideal tunnel and mill sites. Timber of sufficient size for sawlogs, as well as for all mining purpose, covers the claims and surrounding country in profusion. Fisher and Silver Bow Creeks, with their rapid fall, carry sufficient water at all seasons for power and other purposes.

The apex of the vein is exposed continuously for nearly 6,000 ft. throughout the length of the Monarch, Silver Bow, Panhandle and Galena claims. From the evidences of deep erosion, as marked by the topography.

Near the mouth of the Silver Bow tunnel, or Tunnel No. 2, as it is called, deep cutting of the gulch has exposed a big "blowout" of at least 5,000 tons of ore on the surface.

FORMATION: The formation is quartzite, with an apparent overlay of siliceous slate. The strike of the vein is very strong and persistent. Its direction is approximately N. 10 deg. W., with a southerly dip of 40 deg. The footwall as shown in a crosscut from the lower tunnels is quartzite. A crosscut driven 85 ft. from No. 1 tunnel fails apparently to find a hanging wall, so I regard the width of the vein still undetermined.

The vein filling is graphitic shale with its bedding planes corresponding closely to the dip of the footwall. I regard it undemonstrated at present, what position the ore chutes occupy with relation to either wall or to themselves, except that they are approximately parallel with the strike of the vein. The ore chutes are strong, persistent and well define, one chute which I shall mention in detail being absolutely continuous for nearly 900 ft. The ore is quartz carrying galena, liberally with smaller per-

...marked, the galena having been decomposed to lead carbonate, while oxide of iron thoroughly stains the quartz. The zone of oxidation extends apparently only about 60 ft. vertically below the surface, below which point, unaltered minerals alone are found.

DEVELOPMENT: The property has been developed by tunnels exclusively. No. 1 is an adit tunnel, opening the vein for 1,200 ft. easterly. At a point 140 ft. from the mouth of the tunnel a raise was put through to the surface about 65 ft. I am informed that very high grade ore was shipped direct without sorting from this ground, but owing to the heavy ground so near the surface, rendering exploration of these stopes unsafe, I was unable to verify this statement.

Beginning at the upraise is a chute of ore average more than four feet in width and exposed in unbroken continuity for nearly 900 ft. This ore shows an average of nearly 12 oz. of silver, and 18.9% lead. At this point the tunnel leaves the ore chute evidently for the purpose of driving in softer ground. There is no apparent cause why the chute should terminate here, and, from the showing in the tunnel No. 2, I believe that it is continuous over a distance of at least 1,200 ft.

In this tunnel a line of stopes 500 ft. long has been started. In many places the stope is but barely started clear of the tunnel sets, while in others it has been carried up some 50 ft. An average of nine samplings shows the width of the ore to have been 3.75 ft., averaging 11 oz. silver and 16.8% lead.

Several upraises from the westerly end of these stopes have disclosed large ore bodies over the present stopes. Whether this indicates a separate ore chute nearly to the hanging wall, or whether the chute has split, and the one portion only has been stoped, further development will alone determine. Certain it is, however, that another and larger ore body lies in the hanging wall of these stopes and that the ore reserves of this block, if calculated as one body, have not been materially decreased by the encroachments of these stopes.

No. 2 Adit Tunnel on the Silver Bow claim has been run on the vein, westerly, a distance of 160 ft. from a gulch approximately parallel with that from which Tunnel No. 1 is run. This tunnel was driven on or near the footwall under the great "blowout" previously mentioned.

From this tunnel, a crosscut has been driven 80 ft. toward the hanging wall and from the crosscut a winze has been sunk 56 ft., in ore all the way, averaging 3.5 ft. wide and assaying 4.5 oz. silver and 6.5% lead.

It is about equidistant from the surface with the ore previously mentioned in Tunnel No. 1 as constituting the ore body in the hanging wall of the stope. Samples from both places are identical in characteristics and demonstrate forcibly the existance and continuity of the so-called hanging wall ore.

By driving ahead 35 ft. and raising 90 ft., connection can be made between No. 1 tunnel and the winze from No. 2. This will not only develop the ore reserves of this block at a most favorable point, but will provide thorough ventilation for the mine.

NO. 3 AND 4 ADIT TUNNELS: These two being the older tunnels, and at present abandoned, I did not examine them, inasmuch as they have at present no bearing on the value of the property.

CROSSCUT TUNNEL: This tunnel is driven southerly from the Silver Star claim under the apex on the Pahhandle claim until it cuts the footwall of the vein under the surface of the Sentinel claim, a distance of about 1,000 feet. It is intended as the main working tunnel to the mine and is admirably situated for the purpose. It is large and dry and splendidly timbered and of excellent grade.

Its mouth is so located that it materially shortens the distance to the mill by a gravity tram which with its elevation of about 500 ft. above the mill, makes practical its use. At the time of my visit, work was confined to the development of the vein in this tunnel. Drifts had been run 100 ft. each way and three crosscuts driven toward the hanging wall a distance of about 90 ft. and 100 ft. respectively.

In these crosscuts the ore body was cut approximately 80 ft. from the footwall. It was 3.25 ft. in thickness and assayed 11 oz. silver and 11.25% lead. The drift to the east failed to show the ore chute well defined and I did not sample it.

The west drift was continuous and it is still being driven in ore 4.25 ft. wide, assaying 7.75 oz. silver and 12.25% lead.

The position of this drift as on or near the footwall and the ore in it apparently bears somewhat the same relative position to the ore in the crosscuts, as did the two chutes noted in the stopes of No. 1 Tunnel, 320 ft. above and the development here is invaluable in assuring the integrity of both vein and ore between these tunnels as well as in materially adding to the actual available ore reserve.

ORE RESERVES: Owing to the absence of upraises, which would block out the ore, it is impossible at this time to do more than approximate the ore reserves of this property. On the accompanying tracing I have endeavored to demonstrate the method which I employed to arrive at what I believe to be a safe estimate of the extent and value of the ore reserves. The blue lines represent the lateral terminations of the various blocks numbered one to seven inclusive. The figures locate the samples taken and refer to the accompanying table of assays and vein measurements.

Owing to the snow, surface sampling along the line of outcrop was impossible and therefore the samplings of Blocks 2 and 3 were of necessity confined to one side of which while more definite information was obtainable in Block 1 by sampling the exposure and crosscuts. Accordingly I have adopted the plan in this report of dividing the ore quantities by two when more than one face was exposed and by three when either only one face was sampled, or in the case of the trangular blocks 4, 5, and 7 when only the base and apex were sampled.

In justice to the property I must state at this time that I failed to detect any conditions which would warrant the division of these reserves to this extent and I made use of the coefficients above enumerated solely from my inability to reach opposing ore faces.

The method of sampling employed is obvious from the accompanying table. The face of the ore body was crosscut at stated regular intervals and two or more cuttings combined in their relative proportions for quartering down to assay samples.

Block No. 1 lies above Tunnel No. 1 between the upraise and a point in the tunnel 500 ft. distant. The average vertical height being estimated at 130 ft. and the dip 40 deg. gives a distance of 200 ft. on the vein.

The following samples and measurements were taken:

NO.	WIDTH INCHES	ASSAY NO.	SILVER OZ.	% LEAD
13	24.....	VII	12.5	23
14	42)			
15	72).....	VIII	16.0	24.5
16	72)			
17	60).....	IX	10.5	17.5
18	66)			
19	66)			
20	54)			
21	42).....	X	13.0	19.0

Block No. 1 Continued

23	60)				
23	46).....	XI	8.0		10.5
31	60				
32	72				
33	54	XV	11.0		16.0
34	60)				
35	36)				
36	10)				
37	12)	XVI	8.5		18.5
38	36				
39	36				
40	78	XVII	13.5		16.0
			11.625		18.125
Average	4.2 ft.		Value $21.47		

Therefore, we have for Block 1 --
500x200x4.20 equals 420,000 cu. ft. x 1/2 equals 210,000 cu. ft. Calculating 10 cu. ft. of this ore in place as one tone, we have 21,000 tons as the safe contents of the block with a value of 21,000 x $21.47 which equals $450,870.00.

Block No. 2. This block is a continuation of the chute from the eastern termination of Block 1 to a point 350 feet beyond, where the tunnel leaves the ore chute.

The average vertical height is 200 ft., given 320 ft. on the dip of the vein.

This ore face in Tunnel No. 1 samples as follows:

NO.	WIDTH INCHES	ASSAY NO.	SILVER OZ.	% LEAD
24	36)			
25	38)	VII	10.0	13.0
26	40			
27	60			
28	72	VIII	9.5	14.5
29	50)			
30	40)	XIV	14.5	23.5
			11.33	17.0
Average	4 ft		Value $20.40	

The calculation on Block 2 is therefore:
350x320x4 equals 448,000 cu. ft., but as this block was sampled only one side we will divide by three, leaving us conservative contents of 149,333 cu. ft., equivalent to a tonnage of 14,933.3. Its value is expressed as follows:
14,933 tons by $20.40 equals $304,633.20.

Block No. 3. Is that ground overlying Tunnel No. 2 projected to the eastern terminus of Block 2, 200 ft. in length and 100 ft. on the dip of the vein, assaying as follows:

NO.	WIDTH IN FT.	ASSAY NO.	SILVER OZ.	% LEAD
4	12	11	4.5	5
			Value $6.50	

200x100x12 equals 240,000 cu. ft.
As this block was sampled on but one side we will divide the result by three, giving us 80,000 cu. ft. or 8,000 tons:
8,000 x $6.50 equals $52,000.00.

Block No. 4. Is bounded by Block No. 2 on the west and by Block No. 3 above the 56 ft. winze from Tunnel No. 2 on the east and termination in an apex at Tunnel No. 1 below.

NO.	WIDTH INCHES	ASSAY NO.	SILVER OZ.	% LEAD
1	36			
2	42	I	4.50	6.50
3	48)			
30	40)	XIV	14.50	23.50
Average	3.45		14.00	15.00

Value $20.49

130x56x3.45 and 130x65x3.45 equals 54,268 cu. ft., dividing by three, for safety, we have 1,808 tons at $20.40 per ton, which equals $36,883.20 as the value of the block.

Block No. 5. Is below Tunnel No. 1, 320 ft. on the vein, adjoining Block No. 5 on the west and with its termination easterly in a diagonal line drawn from the point where the No. 1 Tunnel leaves the ore to a point a few feet easterly of the middle crosscut from the crosscut tunnel. It samples as follows:

NO.	WIDTH INCHES	ASSAY NO.	SILVER OZ.	% LEAD
22	60			
23	48	XI	8	10.5
24	36)			
25	38)	XII	10	13.
26	40			
27	60			
28	72	XIII	9.5	14.5
29	50)			
30	40)	XIV	14.5	23.5
10	24			
11	26	VI	11.	6.5
Averages	3.8 ft.		10.6	13.6

Value $17.24

This Block, therefore, measures:
450x160x4.6 equals 273,600 cu. ft., dividing by three, we have 91,200 cu. ft., or 9,120 tons at $17.24 per ton equals $157,228.80 in the block.

Block No. 6. Is 200 ft. in length along the drifts from the crosscut Tunnel, a corresponding distance directly below on No. 1 Tunnel and 320 ft. on the dip of the vein. It assays as follows:

NO.	WIDTH INCHES	ASSAY NO.	SILVER OZ.	% LEAD
14	42			
15	72	VII	16.0	24.5
16	72)			
17	60)			
18	66)	IX	10.5	17.5
19	66			
20	54			
21	42	X	13.0	19.0
6	60)			
7	60)	IV	5.0	12.0
5	54			
9	48	III	11.0	16.0
10	29	V	10.0	12.0
11	24)			
12	28)	VI	11.0	6.5
Averages	4.33 ft.		11.0	15.0

Value $18.92

We have therefore:
200x320x4.33 equals 269,120 cu. ft., dividing this by two, we have 134,560 cu. ft. or 13, 456 tons at $18.92 equals $272,448 in Block 6.

Block No. 7 starts from a point directly below the upraise from Tunnel No. 1, bounded by a diagonal line from this point to the face of the west drift from the crosscut tunnel. It is a triangle adjoining Block 6.

This Block samples as follows:

NO.	WIDTH INCHES	ASSAY NO.	SILVER OZ.	% LEAD
13	24	VII	12.5	23.0
14	42)			
15	72)	VIII	16.0	24.5
16	72			
6	60			
7	60	IV	5.5	12.5
8	54			
Averages	4.5 ft.		11.3	20.0

Value $22.78

This block then measures:.
200x160x4.5 equals 144,00 cu. ft., dividing this by three, we have 48,000 cu. ft., or 4,800 tons at $22.78 equals $109,344 for the Block.

SUMMARY

BLOCK NO.	LENGTH	HEIGHT	THICKNESS	COEFFICIENT CONSISTENCY	ESTIMATED TONNAGE
1	300	200	4.20 ft.	.50	21,000
2	350	320	4.00	.33-1/3	1414,933
3	200	100	12.00	.33-1.3	8,000
4	130	56	3.45		
	130	65*	3.45		1,803
5	450	150*	3.80	.33-1/3	9,120
6	200	320	4.33	.50	13,456
7	200	160*	4.50	.33-1/3	4,800
					73,117

* ⅔ of the altitude for the triangle.

VALUE PER TON	TOTAL VALUE
$21.47	$450,370.00
20.40,	304,633.20
6.50	52,000.00
20.40	36,833.20
17.24	157,228.80
18.92	254,587.52
2278	109,344.00
	$1,365.546.72

Total tonnage 73,117
Gross value of ore reserves $1,365.646.72
Average value of ore per ton 18.24
Average width of ore . . . . . 4.00 ft.

Before attempting to estimate the net value of the present ore reserves, it will be necessary to consider the --

EQUIPMENT: No. 1 Tunnel and the crosscut tunnel are both provided with good head houses, blacksmith shops, store, change rooms, etc., They are laid with 12 lb. "T" rails. The grade is both good for tramming and drainage. The tunneling of the entire mine has been well done and is in good condition.

SURFACE EQUIPMENT: The surface equipment consists of a mill and office building and assay office, boarding and bunkhouse for accommodations for 80 men, superintendent's house, sawmill, stable, store-house, etc. All the buildings are lighted by electricity and provided with running water. They are all of a substantial character and well suited to the needs of extensive mining operations. The sawmill has a capacity of 30,000 ft. B.M. per day. It is equipped with a planer and shingle mill and is a valuable addition to the plant.

THE MILL: The mill is a substantial three-story building 72x142 ft. It is exceptionally well framed and is well lighted by roof light windows. Water power is utilized by a Leffel wheel which under the working head of 150 ft., generates 85 I.H.P. Water for power and washing is conducted to the mill in a good flume 24x32 inches. The mill is provided with a 50 H.P. auxiliary steam plant, but I understand occasion for its use has never arizen except for heating purposes.

The machinery in the mill is of modern construction, but its arrangement is not conducive to good metallurgy nor to economical working.

The ore comes to the mill over a gravity frame 1,500 ft. in length from the mouth of Tunnel No. 1. It passes directly from the car to a Comet crusher, thence to a pair of 16x32 rolls, is then elevated to trommels, from whence the rejection is returned to a second set of rolls, crushed and again elevated to the screens. The sized ore passes through 10 jigs, the tailings being directly discharged, while the fines and the slimes, without classification, pass to two double-decked buddles.

The intended capacity of the mill with its present equipment is 150 tons, only half the jig floor being at present occupied. I doubt, however, if this capacity can be combined with proper efficiency with the present arrangement. This is not, however, a serious matter, as a rearrangement can be readily reached with a moderate cost which will insure good results.

There should be no difficulty experienced in concentrating this ore, as it presents no physical nor chemical difficulties, does not slime unduly and presents a marked difference between the specific gravity of its gangue and mineral contents. I believe a capacity of 300 tons can be readily reached with slight changes in and a possible small addition to the building.

SUGGESTIONS: In the mill I would suggest that suitable grizzlies be installed, the fines from which shall pass direct to the rolls, the coarse taking its usual course to the breaker. The breaker should be moved so as to allow chutes to the rolls of such pitch as will permit the ore to run freely. The trommels should be set farther back giving more pitch to the elevators, consequently insuring less wear on the latter.

Ten new jigs should be installed and all the jigs arranged in two series -- roughing and finishing. The tailings from the roughing jigs should be recrushed in suitable rolls and delivered to Wolfley or Bartlett tables. The tailings from the finishing jigs should be classified by Spitzkasson, the course sizes being delivered to True Vanners and the fines to the rotary slime tables.

I can detect no reason why with such an arrangement, which

is in daily use in the best practice of two continents and efficiency of concentration of upwards of 80% could not be obtained with a daily capacity of fully 300 tons.

To provide ample power, the water of Silver Bow creek should be brought in by a flume a little less than 1½ miles. The grade for this flume is already laid and its erection would be comparatively inexpensive. The waterwheel now in the top of the mill should be replaced by a larger one located at the base of the mill. 150 H.P. would thus be available.

The arrangements and additions outlined above should be installed for approximately $10,800.00.

In addition to the foregoing, the tramway should be changed from No. 1 Tunnel to the mouth of the crosscut tunnel. This can be accomplished easily, as all the bents are framed and bolted. This will shorten the tram 600 feet, ease the grade and increase the capacity of the tram, besides facilitating actual mining operations to a marked degree.

Tunnel No. 1 should be extended and a raise effected into the winze from No. 2 Tunnel. A raise should also be started from the crosscut tunnel to connect No. 1 Tunnel. This might be conveniently done about at the center of No. 6 ore block, in which case connection would be made into the crosscut from Tunnel No. 1. These two raises would not only block out the ore and provide adequate ventilation but would provide the most economical method of handing ore from Blocks 1, 2, and 3 direct to the tram and thence to the mill.

An air compressor should be installed, belt driven, or directly connected with a water wheel. This compressor should have a capacity of at least ten 3/8 inch drills. The use of machine drills would not only materially lessen the cost of further development, but are an absolutely necessity in the economical mining of this ore.

SUMMARY OF ADDITIONAL IMPROVEMENTS AND DEVELOPMENTS

Rearrangement of the mill.
Addition to necessary jigs, concentrating tables and fine crushing rolls.
Flume from Silver Bow Creek.
Ten-drill compressor plant consisting of:
Compressor, Drills, Columns, Arms & Clamps, House, Tools, Air Pipe, Bit Steel, Moving Tramway from mouth of the crosscutt Tunnel, Connecting No. 1 Tunnel with winze from No. 2, Upraise from Blocks Nos. 1, 2, and 6.

The last item can hardly be figured as an expense, inasmuch as the ore extracted from the raises would in all probability cover the attending cost, particularly were these raises driven by machine drills.

I estimate the cost of all the foregoing improvements to be approximately $23,000.00. With installation of these improvements the property is ready for immediate, steady, and continuous productio

We will, therefore, consider the NET VALUE OF ORE RESERVES.

As further development is necessary before Blocks 5 and 7 are ready for stoping, we will deduct their value from the total in obtaining what I shall term the immediate vailable ore reserves.

Total ore reserves	73,117 tons	$1,365,546.00
Content of Blocks 5 and 7	13,920	266,572.00
Immediately available ore reserves	59,197	1,098,974.00

Concentration tests on a general sample from all the ore faces showed a rate of 6½ to 1, with a percentage saving of 74.6% of the silver and 80.5% of the lead. It is safe, therefore, to assume that practical working results can be obtained with a saving of at

least 75% of the contained values with a rate of concentration of 6 to 1. The smelter charges, including railroad freight on this grade of concentrates, are at present $23.00 per ton on a basis of settlement of 90% of the contained lead and 95% of the silver content. We therefore may expect to produce 9,866 tons of concentrates assaying 45 oz. silver and 67% lead valued at $80.60 per ton, giving a total value of $795,199. Under normal conditions, this ore should be mined and milled at a cost not exceeding $1.50 per ton; this, figuring including all necessary dead work.

The figures of profit may be summarized as follows:

	CHARGES	RECEIPTS
Mining and milling 59,179 tons at $1.50 per ton	$88,795.50	
Haul to railroad 9,866 tons concentrates at $4.00 per ton	39,464.00	
Railroad and smelter charges $23.00 per ton	226,918.00	
9,866 tons concentrates assaying 45 oz. silver per ton and 67% lead.		
95% of the contained silver equals 42.75 oz. per ton, at 60% equals		25.65
90% of the contained lead equals 1,206 lbs. peper ton, at 4¢ equals		48.24
		73.89
Total settlement values	$728,998.74	
Deduct charges above	355,177.50	
	373,821.24	

Total net value of ore reserves immediately available. This in addition to the ore from Blocks 5 and 7 which have been excluded from this calculation.

WORKING PROFIT:

300 tons per day - net value $12.39 per ton equals	$3,717
300 tons per day - cost per ton $6.00 equals	1,800
	1,917

CONCLUSION: For your convenience, I append the following tabulated statement of facts concerning this property:

Location - 12 miles from Vermillion station N.P.R.R.
Surface - Ten claims, two mill sites, area about 220 acres.
Title F. O. Berg and Major R. K. Waite.
Formation - Quiartzite.
Width of vein hanging wall not cut - more than 85 ft.
Character of mineral - Argentiferous galena.
Average widths of ore chutes - 4.2 ft.
Average assays of ore chutes - 10.11 oz. silver, 14.97% lead.
Development tunnels on vein, not including No. 3 and 4 tunnels-1,360 feet - Crosscut Tunnel 1,000
- Upraises 145
Drifts from cosscuts 310
Winze 690
Elevation of lower or crosscut tunnels above mill 525 ft.
Total reserves 73,117 tons
Value of ore reserves $1,365,645.00
Available ore reserves 59,197 tons
Value available ore reserves $1,098,974.00
Equipment, Mill, daily capacity 150 tons - possible 300tons
Office, Boarding and Bunkhouses for eighty men.
Superintendent's building, Sawmill - capacity 30,000 ft. finished lumber per day - Tramway.
Machinery - Modern but poorly arranged.

Estimated cost of necessary improvements - $28,000.00
Earning capacity of property - $1,917.00 per day.
IN CONCLUSION: I beg to submit that although the nature and extent of the development of this property together with the snow, prevented accurate measurements of the ore reserves, yet I feel that you will give due weight to the methods I have employed in estimating their values, and will agree with me that the assumption of values herein stated is entirely conservative.

It is doubtless unnecessary for me to add that in my opinion this property cannot fail to promptly take its place in the ranks of the heavy silver-lead producers of this continent and that, too, with a comparatively nominal expenditure of time and money.

Respectfully submitted,

(Signed) ARTHUR B. BROWNE, E. M.
Butte, Montana.

FROM REPORT OF ROBERT C. WILLIAMS, E. M.
ON THE KENTUCKY-VERMILLION MINE SITUATED AT
VERMILLION, MONTANA.

TUNNELS AND ORE EXPOSURES No. 1 Tunnel: The principal work on the ledge has been done in No. 1 Tunnel. This tunnel is about 1,300 ft. long with several crosscuts into the hanging wall. It is situated on the Panhandle claim. The first 120 ft. from the mouth does not show the vein of sufficient size to justify stoping. Beyond this point a fine grade of ore was encountered, and much ore was mined and shipped in driving this tunnel. Assays of similar ore from this vicinity give 18 to 20% lead and 22 to 25 oz. silver.

ORE RESERVES, SAMPLING, AND VALUES OF "ORE IN SIGHT" IN VARIOUS BLOCKS: From the end of the first 120 ft., the tunnel was sampled in 20 ft. sections, and where stopes are opened, the same method was pursued. In calculating results and figuring values, the average of these sectional samples was taken.

Block No. 1, commencing at the 120 ft. mark extends 545 ft. along the tunnel and from the tunnel level to the surface. In view of the fact that stopes are opening along this distance we have a fair means of estimating tonnage and values in this block. The tunnel along this 545 ft. follows the foot wall ore which varies in width from 3 ft. to 12 ft. Nineteen chutes have been put into the stopes above and several thousand tons of ore were mined in driving the drift and starting the stopes. This ore was run through the mill and gave concentrates assaying 35 oz. silver and 55% lead. As this was the first run in a new mill, the concentrates are not as high as they should be. In figuring this block onf ore, I have taken 4 ft. as the average width of ore, which will be somewhat below the actual width.

The total dimensions are as follows:

DATA FOR BLOCK NO. 1

Width 4 ft.
Length - 454 ft.
Vertical depth - 130 ft.
Depth on vein - 30 deg - 260 ft.
10 cu. ft. - 1 ton
Lead - 4¢ per lb.
Silver - 60¢ per oz.

AVERAGE ASSAYS
Lead - 15.2%
Silver - 12.7 oz.
Value $19.75 per ton.

This gives 56,680 tons at $10.78 per ton, or $1,121,130.40 as the gross value between tunnel level and surface and along 545 ft. of the vein.

Block No. 2 commences at the end of Block 1 and extends 400 ft. The ground above this blocks has no stopes and the means of calculating the tonnage and values are not as definite as for Block No. 1. In all sampling the method of taking 20 ft. sections to each sample and averaging the result was adopted.

DATA FOR BLOCK NO. 2

Width of ore - 2 ft.
Length of ore - 400 ft.
Depth of vein - 400 ft.
Average assay values - $16.02 per ton.

This gives 32,000 tons at $16.02 or $512,640.00 as gross value between tunnel level and surface and with a length of 400 ft.

Beyond Block No. 2 this tunnel continues along the foot wall, while the ore cuts across diagonally towards the hanging and there is no means of determining the values.

TUNNEL NO. 2: This tunnel is situated on Silver Bow claim and is about 300 ft. long. The first 150 ft. is a crosscut at the end of which the ledge is encountered and the tunnel continues 150 ft. further near the foot wall. Carbonates and iron oxides occur throughout the last 150 ft.

A crosscut has been driven from near the point where the ledge was encountered toward the hanging wall, a distance of 60 ft. where it cuts 19 ft. of galena ore. This ore is under the outcrop previously mentioned and assays 18% lead and 20 oz. silver. Average value from several assays - $25.30 each ton. A winze has been sunk at this place to a depth of about 50 ft. Figuring ore above this tunnel to the surface at a width of 15 ft, depth 110 ft, and length 100 ft., given 16,500 tons at $25.30 or $417,480.00 as gross value in Block No. 3

Tunnel No. s is a short assessement tunel of no particular value.

Tunnel No. 3 was started as a crosscut and continued outside the vein nearly the entire distance. Its principal value will be as a means of air connection in future operations. The work in this tunnel was so laid out that it demonstrates very little.

CROSSCUT TUNNEL: Crosscut tunnel started on Silver Star claim and driven to the south to intersect the ledge at a depth of about 200 ft. vertically below No. 1 Tunnel. The footwall of the ledge was encountered at a distance of 900 ft. Another wall occurs 40 ft. further in. The ledge has been followed for about 130 ft. in opposite directions and crosscut in several places. The east drift whows the ledge but poor values. The west drift has been in ore two to nine feet wide the entire distance. A crosscut from the east drift cuts two feet of high grade ore and one from the west drift cuts the same ore five feet wide, thus showing that the hanging wall ore becomes stronger to the west as the foot wall ore also does in the west drift. The crosscut from the west drift is in quartz 10 ft. wide containing carbonates, galena, and iron assaying 8% lead, 32 oz. silver and $2.00 gold. This tunnel is 201 ft. vertically below No. 1 Tunnel or 402 ft. on the vein.

Block No. 4. Footwall ore between crosscut and No. 1 Tunnel. Width, 2 ft, length 130 ft., depth 402 ft, 10,452 tons. Averaging value of samples taken in 20 ft. sections, $18.81 per ton. This gives $191,376.12 as gross value in Block No. 4.

Block No. 5. Hanging wall ore between crosscuts and No. 1 Tunnel as crosscuts in two places, width, 3 ft., length 130 ft., depth, 402 ft., 15,678 tons, at $40.91 per ton or $641,386.98 as gross value in Block No. 5.

SUMMARY

LOCATION	TONS	GROSS VALUE
Block No. 1	56,680	$1,282,150.40
Block No. 2	32,000	518,640.00
Block No. 3	10,500	417,480.00
Block No. 4	10,432	191,376.12
Block No. 5	10,678	641,386.98
	131,310	2,883,983.50

By this method of figuring ore reserves I obtain $2,883,983.50 as the value of apparent ore blocked out. Considering the fact that no raises are available, penetrating the ore body from level to level, it would not be safe to give an estimate as above. No doubt this estimate might be well within the limit of actual reserves, but one would hardly be justified without more complete data in stating this estimates as ore actually in sight. I, therefore, cut the amount in the middle, leaving 65,655 tons, or $1,441,991.75 as gross value of ore blocked out and ready for stoping, this large deduction may be unfair to the property, but to insure the absolute safety of my estimate, I have followed this course. Besides this deduction, it will be further necessary to make a deduction of 25% for loss in concentration, and 10% for smelter deduction.

One half total gross value. $1,441,921.75 — One half total gross tonnage 65,655 tons

Gross value per ton - $21.96

Cost of hauling, freight, and treating on 10,942 tons concentrates at $27.00 per ton — $295,434.00

Cost of mining and milling 65,655 tons at $1.95 per ton, 25% deduction from $1,441,991.75 for loss in concentration — 360,149.36

10% deduction from $1,081,493.01 for loss in smelting concentrating 65,635 tons to to 1 - 10,942 tons concentrates

Hauling concentrates, per ton	$4.00
Freight & treatment per ton	23.00
	27.00

Total expenses and deductions — $892,108,57

Gross values	$1,441,991.75
Expenses and deductions	892,108.57
	549,883.18

Net value per ton - $8.37

In following the ledge from the outcrop to the lowest workings it is found that the values and size of ore bodies have increased steadily as depth was attained and more uniformity of mineralization occurs. There is some work necessary to be done and other work very desirable before the mill can be started to advantage. Raises should be put through for connections between tunnels in order to get air necessary for stoping the ore already opened. The tramway should be shifted from No. 1 Tunnel to the crosscut tunnel and all ore run down chutes to the crosscut. This will shorten the tram and increase its capacity, besides giving a more uniform grade and lessening the cost of maintainance. Crosscut tunnel should be started at the mill. Such a tunnel will take the ledge at a vertical depth of 950 feet below the outcrop or depth of 1,900 ft. on the vein. The crosscut would be about 2,300 ft. long. With a compressor at the mill, this tunnel should be cheaply run and besides the opening of great reserves of ore, it would cheapen the cost of mining and milling.

It may be stated here that through the forest fire that practically burned up the whole of the Coeur d'Alenes, the mill, bunkhouses, superintendent's houses, and the greater part of the machinery was destroyed in the fire. It is now the intention of the present owners to erect a new mill to carry on the working of the mine.

Yours respectfully,
(Signed) ROBERT C. WILLIAM, E. M.

SILVER BUTTE MINES COMPANY
SPOKANE, WASHINGTON

Gentlemen:

I have spent several weeks on the property of the Silver Butte Mines Company, examining same, and have also thoroughly checked the reports of former mining engineers, named Arthur B. Brown, Joseph B. Branscombe, and Robert C. Williams. I checked the engineers as to their responsibilities and I found that they were men of repute and dependability, and their reports are thorough and exact. I arrived at this opinion after talking to numerous employees that had worked for the mine during the period that these reports were made, as well as to Spokane and Thompson Falls business and mining men.

This property consists of ten (10) patented claims, namely the Sentinel, Panhandle, Silver Star, Bazil, Galena, Cariboo, Silver Bow, Fidis, Monarch Filicites, and two mill sites called the Kentucky and Montana. About 4200 feet of tunnels have been driven on these claims.

Tunnel No. 1 which is 1500 feet in length was driven on the ledge for its entire distance, about 520 feet of stopes have been opened in this tunnel, but very little are taken out. There are eighteen (18) ore chutes in place in these stopes, from which ore can be drawn immediately. The ore here is from two to ten feet wide, average width four feet and showing average values of $16.03 per cent lead and 10 ounces of silver. In the tunnel ore can be followed for 1200 feet, the vein showing an average of 4½ feet in width, with an average content of 18.01 per cent lead and 10 ounces of silver.

Tunnel No. 2 was driven upon the same vein for a distance of 150 feet from the other side of the mountain, at an elevation of 130 feet about tunnel No. 1. In this tunnel a winze was sunk all in ore for a distance of 57 feet. This work was done directly under the out-cropping or blowout which was twenty-five (25) feet wide. A good grade of ore was encountered here, width of vein averaging 3½ feet with values running from three ounces of silver and five percent lead to as high as 39.60 ounces of silver and 20.9 per cent lead, showing that values increased with depth.

The lower tunnel, known as the Crosscut was driven to pick up the Panhandle vein at a point 200 feet below Tunnel No. 1. About 900 feet from the portal four feet of ore was encountered, dipping at a sharp angle into the earth. They drifted on this body for fifty feet until it dipped below the tunnel floor. Another ledge called the Monarch was cut ninety feet from where the Panhandle was located. The Panhandle vein carries Silver and Lead, with the Monarch assays for Gold and Silver. Stoping can be started at once on the Panhandle ledge in this tunnel.

The following ore is available for immediate mining:

Block No. 1 is 220 x 600 x 4.21 - 555,720, Cu.Ft. at 10 Cu.Ft. per tons equals 55,572 Tons at 16.72 per ton TOTAL $929,163.84

Block No. 2 is 420 x 320 x 214 - 322,560 Cu.Ft. at 10 Cu.Ft. per ton equals 32,256 Tons at $14.56 per ton TOTAL 469,647.36

Block No. 3 is 110 x 100 x 100.13.3 - 146,300 Cu.Ft. at 10 Cu.Ft. per ton equals 14,630, tons at $22.95 per ton TOTAL 335,758.50

TOTAL VALUE $1,734,569.70

From report of James Green, M.E. (dated 8-26-35)

October, 1944

REPORT

on the

SILVER BUTTE MINE

This mine is located in Lincoln County, Montana.

This property consists of the following mining claims and mill sites: Panhandle, Galena, Silver Bow, Monarch, Caribou, Felicitas, Sentinel, Fides, Silver Star, Basil, together with the Kentucky Mill Site and the Montana Mill Site.

Title to the property is held by the Silver Butte Zinc Lead Mining Company, Libby, Montana.

The apex of the vein is exposed continuously for nearly six thousand feet (6000). From the mouth of Tunnel No. 2, as it is called, the deep cutting of the Gulch has exposed a big "blowout" of at least five thousand (5000) tons of ore on the surface.

Development: The property has been developed by tunnels exclusively. No. 1 is an adit tunnel, opening the vein for twelve hundred (1200) feet easterly. At a point 140 feet from the mouth of the tunnel a raise was put through to the surface about 65 feet. Beginning at the upraise is a short of ore averaging four feet in width and is exposed in unbroken continuity for nearly 900 feet. This ore shows an average of nearly 12 ounces of silver, and 18.9 per cent lead. The ore is continuous over a distance of at least 1200 feet.

In this tunnel a line of stopes 500 feet long has been started. In most places the stope is but barely started clear of the tunnel sets, while in others it has been carried up some fifty feet. An average of nine samplings shows the width of the ore to have been 3.75 feet, averaging 11 ounces silver and 16.8 per cent lead.

No. 2 adit tunnel on the Silver Bow Claim, on the east side of the mountain, has been run on the vein westerly, a distance of 160 feet from a gulch approximately parallel with that from which tunnel No. 1 is run.

This tunnel was driven on or near the footwall under the great "blowout" previously mentioned. From this tunnel, a crosscut has been driven 80 feet

towards the hanging wall and from this crosscut a winze has been sunk 56 feet, in ore all the way. By driving ahead 35 feet and raising 90 feet, connection can be made between No. 1 Tunnel and the winze from No. 2. This will not only develop the ore reserves of this block at a most favorable point, but will provide thorough ventilation for the mine.

Crosscut Tunnel: This tunnel is driven southerly from the Silver Star claim under the apex of the Panhandle Claim, until it cuts the footwall of the vein under the surface of the Sentinel Claim, a distance of about 1,000 feet. Drifts have been run 100 feet each way and three crosscuts driven towards the hanging wall, a distance of about 90 feet and 100 feet respectively. In these crosscuts the ore body was cut approximately 80 feet from the foot wall; it was 3.25 feet in thickness and assayed 11 ounces Silver and 11/25 per cent lead.

Ore Reserves: A checkup on reports by many competent engineers who have made detailed reports on this property, establishes the fact that there are at least 73,000 tons of ore in sight valued at $1,635,199.00. These estimates on Silver Lead valued only 1 because at that time zinc in the ore was penalized by the smelters, while at the present time this company has A, B - C bonus on zinc which makes a difference in the value of this ore of $28.00 per ton, or an increase in the value of ore reserves of $419,950.00, bringing the total up to $2,054,949.00.

The Silver Butte Zinc Lead Mining Co. has succeeded in getting the Government to build a good road to the property.

They have completed the raise between No. 1 and No. 2 Tunnels which thoroughly ventilates the Mine, as well as proving the continuity of the ore, and making extraction of ore from 17 chutes in tunnel No. 2 possible and practical at lowest cost.

They have prepared the mill foundation, ready for the machinery of a fifty or one hundred ton mill.

Material for the building is on the ground and the Saw Mill set up is complete, for more lumber, if and when needed.

Saw logs and mine timber is on the ground sufficient for mine operation and camp buildings for many years, or the life of the mine.

Metallurgy: A representation sample of the ore has been tested for the separation of zinc sulphides and lead sulphides, at Midvale, Utah, with satisfactory results: showing ceiling price net to the Company of $23.94 plus bonus on zinc of $45.97, a total of $69.91 per ton.

The ratio of concentration is 8 to 1 which will produce 12.5 tons of concentrates daily, or $875.00 with a 100 ton capacity mill.

Labor, supplies, power and supervision is estimated at a cost of $206.00 in 24 hours, showing a daily profit of $435.00 operating on a 100-ton basis.

Respectfully submitted,

By Andrew Freder,
Mining Engineer
1201 E. Baldwin Ave.
-8- Spokane, Wash.

REPORT ON THE SILVER BUTE MINING PROPERTY.

PROPERTY: Consists of ten patented mining lode claims and two mill sites covering 250 acres on the eastern slope of Canyon Peak of the Cabinet Range near its southern end, covering the mountain side between elevations 4,200 to 5,500, for one mile in length and half mile wide. The area has burned over except along the water courses at the north and where there is considerable good timber.

It is in Lincoln County within two miles of the southern boundary, along the drainage of the Silver Butte Fisher which is in the water shed of the Kootenai River. The divide between the Kootenai and Clarks Fork is the county line. Its most accessible point is from the south at Trout Creek station on the Northern Pacific Railway and National Highway No. 95 reached by a good forest Service road 12 miles. The same forest service road leads east to the Glacier Park Highway a distance of 12 miles from whence Libby, County seat of Lincoln County and on the Great Northern Railway, is 32 miles. It is 150 miles to Spokane, Washington, by way of Trout Creek.

GEOLOGY: The country rock on the property is west dipping Prichard slates of the "Belt Series" rocks of the Coeur d'Alenes, which are here on the west side of an anticline along the southern extension of the Shoshone Fault, which is one half mile east. The Shoshone Fault is one of the major faults in the northwest which are associated with the occurence of commercial ore bodies.

ORE BODIES: While a number of veins have showings on the property the most important and upon which all the development has been done is the Panhandle vein. It is the conspicious outcrop of this vein which was discovered in the early '80s by the placer miners on their way to the diggings to the north along Libby Creek. To this outcrop they gave the name of Silver Butte and staked it. Another vein, The Monarch, to the east of the Panhandle outcrops but shows little value.

The Panhandle vein strikes North 48 deg., W., dips 36 deg. W at the north and increasing to 42 deg W at the south of the workings. The vein is 12 or more feet in width. The hanging wall is composed of graphitic slates, then a 3-4 ft. quartz vein mineralized in Galena, some pyrite and zinc blende, then an altered slate vein interbedded quartz and graphite seams of some 3-4 ft., then another 3-4 ft. vein mineralized like the other one with a foot wall of quartzite.

The sulphides in the vein in the present workings carry silver in the ratio of 3.4 oz. to each per cent of lead and small values in gold. The vein shows the effects of oxidation and leaching even at the depth in the crosscut, the water level being at a much greater depth. In places where leaching has not affected the vein, the zinc values run higher than the lead.

Geologically, the vein is identical with that of the Sullivan Mine at Kimberly, B. C., which is the world's largest zinc-lead-silver mine. When depth is reached, a similar and large ore body may be expected, making it one of the major producers of the northwest.

DEVELOPMENT: No. 1 level has a total length of 1,200 ft., with 550 ft. of hooks with chutes for mining and 400 ft. of it is off the vein; six short crosscuts, total of 150 ft., and one raise 70 ft. up along the vein to surface.

No. 2 has 250 ft. of crosscutting and drifting and a 56 ft. winze in material 70 ft. up south of the end of No. 1.

No. 3 is 200 ft, abandoned attempt to pick up and follow the vein.

No. 4 has 100 ft. of crosscut and 600 ft of drift along a badly leached zone of slates.

The crosscut cunnel which should be the main working tunnel 250 ft. below No. 1, cuts the Panhandle vein 266 ft. along the Monarch vein with 110 ft. of crosscutting for exploration.

ORE RECOGNISES: The tonnage and value of these is classified in the report as follows:

BLOCKED: Is that ore which has been fully opened up on one side of channel sampling and opened in enough places on the other side to prove its continuity and value by sampling.

PROBABLE: Is that ore which cannot be sampled continously on either side, is proven by openings to exist and can be sampled in places on both sides.

PROSPECTIVE: Is all other ore which can be sampled in places only on one side and on the other side its longitudinal extent not being determined but its continuity practically certain.

The tonnages are given for actual measured lengths and widths and all samples were channel samples taken across the vein, taking gangue as well as ore. Eleven cu. ft. are figured as one ton. The values of metals used are those of today, 4¢ per lb. for lead and 77¢ an oz for silver. The location of the ore is shown on the plans herewith. There are three known ore shoots and the contents of these is classified.

	Tons	Available and bocked ore
SHOOT NO. 1		
Above No. 1 Level		
308 ft. wall vein 100x160x4 ft.		
7.4% lead, 5.1 oz. silver $9.84	6,000	$59,040
Hanging wall vein 10x160x4 ft.		
9.5% lead, 4.1 oz. silver $10.68	6,000	64,080
Below No. 1 to crosscut		
Level footwal being 100x360x4 ft.		
value as on No. 1 by sampling $9.84	13,000	127,900
Hanging wall seam 100x360x4 ft.		
value as on No. 1, $10.68	13,000	130,000
SHOOT NO. 2		
Above No. 1 Chutes 12-16 Footwall		
Vein 70x320x4 ft.		
4.5% lead, 60 oz. silver, $9.76	8,000	79,056
Below No. 1 Footwall		
therein 70x360x4.5 ft.		
4.5% lead, 8.0 oz silver $8.52	10,000	85,200
Hanging wall vein not opened		
on either levels or surface may		
duplicate the footwall vein.		
SHOOT NO. 3		
Above No. 1 only exposed in		
end of No. 1 and on outcrop		
One vein 240x340x10 ft. $9.84	74,000	738,160
	130,100	1,382,436

BLOCKED: There are 24,100 tons with a total value of $223,296. By selective mining on ore of the grade $15.00 per ton can be produced and 14,886 tons are sent to the mill. The reject and waste used for stop filling, which is necessary for the extraction of the ore.

The ore extracted would have a value of	$223,296
then cost of mining and milling at $5.00 per ton	74,430
Leaving a net of	148,886

That this ore better can be done is shown by samples which I have taken in November 1931, to see what grade could be obtained by selective mining on Shoot #1.

Shoot No. 1	29.9% lead	16.6 oz. silver	$36.70
Shoot No. 2	21.4% lead	7.1 oz. silver	22.68

MIDWEST OIL CORPORATION

1700 BROADWAY
DENVER, COLORADO 80202

MINERALS EXPLORATION DEPARTMENT
345 SOUTH UNION BLVD.
DENVER, COLORADO 80228

January 15, 1971

Mr. Al Chambers
Idaho Cibola Mines, Inc.
Star Route No. 1
Libby, Montana 59923

Dear Mr. Chambers:

In reference to our telephone conversation of last night, I am pleased to inform you that Midwest has decided to investigate the possibility of joining you in the development and production of your mine near Libby, Montana.

I am returning herewith the maps and photographs you were so kind to send me. In addition I've included a print of a redrafted map and a page of typed assays.

If you would be kind enough to keep us informed of the weather, we will wait until it breaks and come up and do some sampling underground. We can also discuss the possible financial arrangements that we might make during our visit.

Yours truly,

G. G. Snow

G. G. Snow
Manager

GGS/as
Enclosures

REGISTERED MAIL

Sample No.	Width of Vein	% of Lead	Value	Oz Silver	Value
1	2.0 ft.	5.01		4.80	
2	5.0 "	8.00		3.00	
3	3.0 "	3.04		5.90	
4	2.0 "	2.03		2.00	
5	2.5 "	2.06		2.10	
6	4.0 "	3.09		5.12	
7	5.0 "	19.94		6.90	
8	6.0 "	11.05		9.70	
9	6.0 "	8.05		2.80	
10	3.5 "	13.05		3.10	
11	4.5 "	19.00		34.40	
12	3.0 "	36.04		43.60	
13	4.0 "	15.06		5.02	
14	5.0 "	22.04		9.05	
15	2.5 "	15.06		12.20	
16	5.0 "	14.00		6.80	
17	5.0 "	5.04		9.00	
18	6.0 "	5.02		7.20	
19	5.0 "	8.04		19.90	
20	3.5 "	28.00		15.30	
21	4.0 "	5.04		9.00	
22	7.0 "	24.02		17.40	
23	6.0 "	8.00		9.80	
24	5.0 "	10.04		4.80	
25	1.5 "	19.06		20.02	
26	10.0 "	15.06		12.20	
27	10.0 "	19.00		34.40	
28	1.5 "	44.80		11.30	
29	2.5 "	14.00		16.40	
30	20 in.	11.50		9.70	
31	18 "	9.20		4.20	
32	16 "	8.40		19.90	
33	18 "	29.02		17.40	
34	40 "	14.00		8.05	
		473.76		402.46	

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