WASHINGTON MINE
Boise County, Idaho

GEOLOGICAL EVALUATION

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A. INTRODUCTION

This study was conducted under contract to Allen Shugar of Century City, California. Reconnaissance field work was accomplished on June 10, 1981. The Washington Mine area was examined from aerial photos for an overall understanding of the general geological setting prior to visiting the mine area. The reconnaisance field work consisted of an examination of the geological features of the ground surface and the accessible portions of the underground workings. Assay samples were gathered and the old mill site was examined.

The primary objective of the study is to evaluate the mine in regard to economic production and future development. Several good reports were located that helped with this objective. There are three especially signifigant reports; Walter H. Hill (1916), Frank E. Johnesse (1927), and James Farrell (1929). All three authors were mining engineers. The reports were drawn upon freely since the observed geological interpretation did not differ significantly from that presented in the reports. A former mine owner (The Monetary Metals Co.) prepared a map of the underground workings and plan view of the mine claims in 1923. This study presents the interpretation of the map, reconnaissance findings, assay results, and recommendations concerning further development.

B. LOCATION AND BACKGROUND

The Washington Mine is located in Section 32 & 33, T7N. R6E, and Section 4, T6N, R6E, Boise Meridian of Boise County near Idaho City, Idaho. It is in the Gambrinus Mining District and situated on the southern slope of the Sawtooth Mountains. Access is over a paved road (5 miles) and a dirt road (3 miles) northeast of Idaho City. Idaho City is approximately 34 miles northeast of Boise, Idaho (the state capital). The mine is located in the upper portion of Washington Gluch. See the Location and Site Maps, Figure 1 and 2.

The Washington Mine property consists of nine unpatented claims, four patented claims, and one townsite. The total acreage involved is approximately 307 acres of which 122 acres are owned outright (patented claims and townsite). See Figure 3, Property Map. The Tunnel Site and Montana claims, shown on the map, are not included in the Washington Mine property.

The following background has been taken from various reports prepared by mining engineers and government agencies. All references are included in the Appendix.

The first reference made to the Washington Mine was by Waldeman Lindgren of the USGS in 1897.[1] He mentions the development of the mine through a tunnel 290 feet long and a vertical shaft sunk to 316 feet at the mouth of the tunnel. This mining development was completed on a vein which contained a gold ore shoot 45 feet long and from 1 to 6 feet thick. The ore was stoped and removed from the 200-foot level up to

FIGURE 1
LOCATION MAP

WASHINGTON MINE

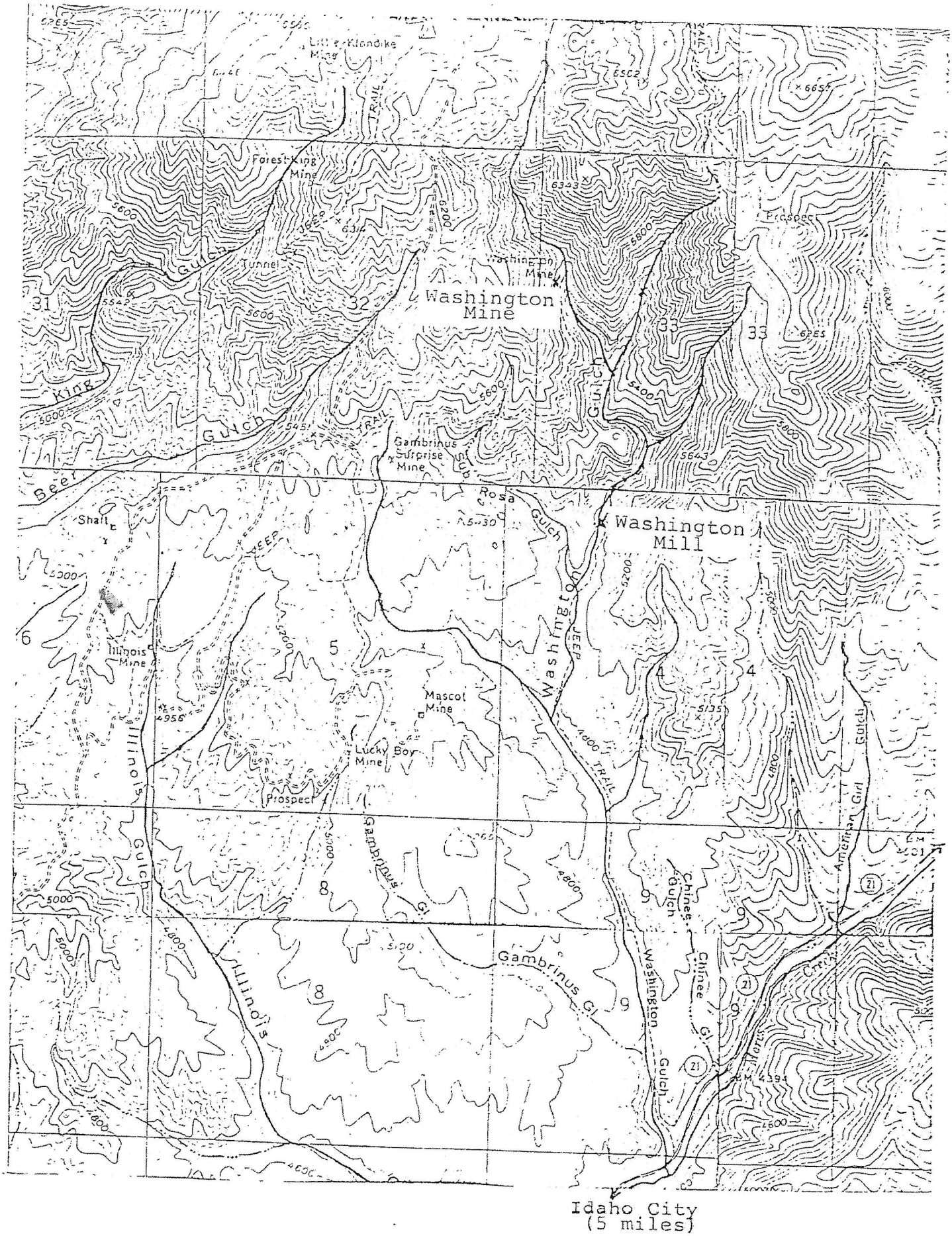


FIGURE 2

WASHINGTON MINE SITE

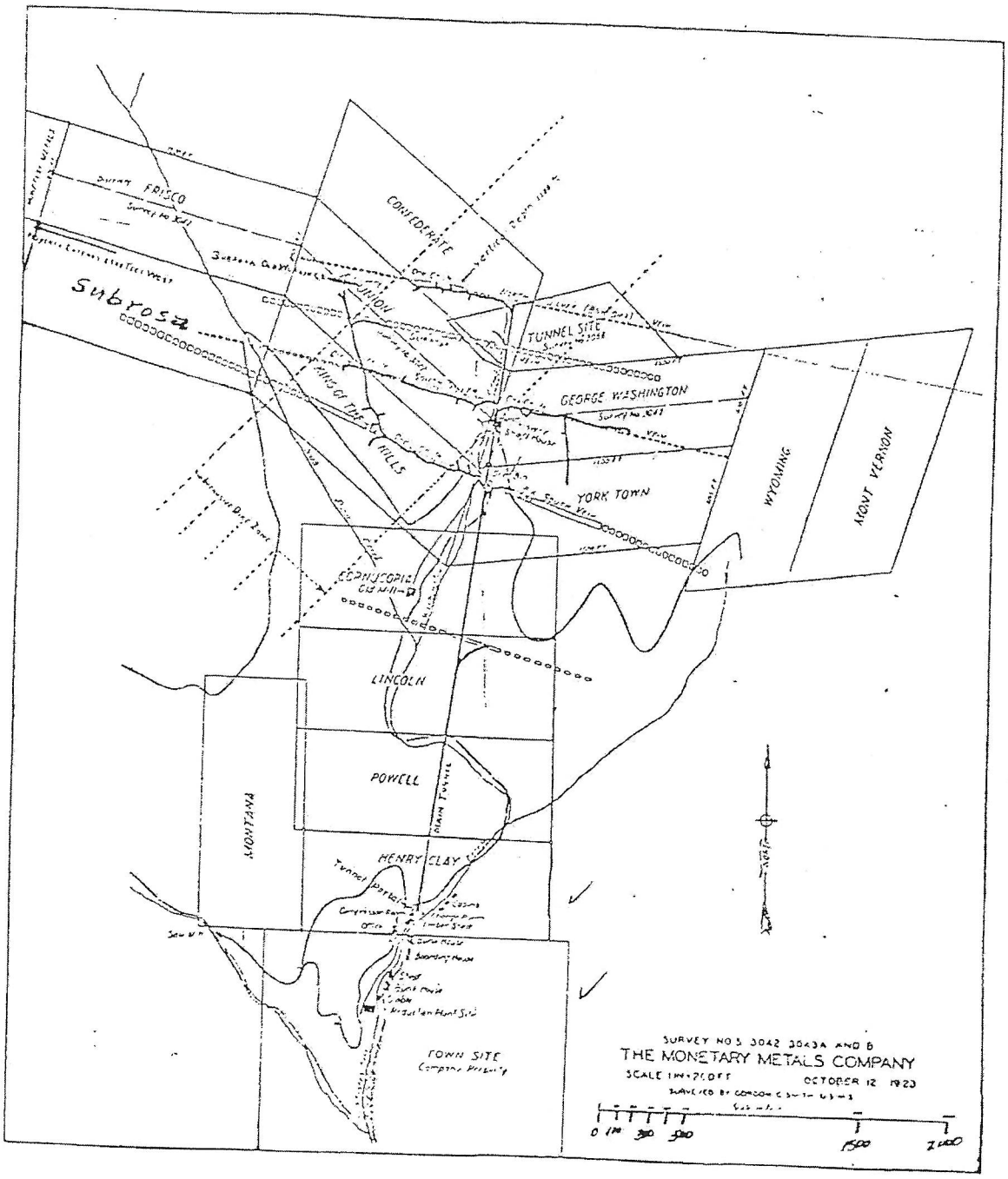


FIGURE 3
PROPERTY MAP
1981

WASHINGTON MINE

the surface. The yield is reported to have been $90,000. from 4,300 tons or approximately one ounce of gold per ton. This would be worth almost $2,000,000 at today's price of $422/oz.

He also mentions a separate silver vein 40 feet north of the gold vein and separated from it by altered granite. The silver vein is from 8 inches to 4 feet wide and was exposed by cross-cut tunnels all the way down (316 feet). It's lateral extent was not completely determined since the miners were only after the gold vein. The average assays of the silver vein was reported to be 33 to 90 ounces of silver per ton.

Creighton - 1916[2]

The next documented reference to the mine was by Alfred Thomas, Secretary for the John A. Creighton Real Estate Co. He refers to John A. Creighton (millionaire miner and benefactor of Creighton University) and Charles Balbach having owned the mine jointly (apparently from inception). He recalls that Creighton had the mine examined in 1904 and the report was very favorable. He also mentions the presence of the silver vein alongside of the gold vein all the way down and remembers that Mr. Balbach told him they could not work the silver ore because the mill was not equipped to treat it.

Work continued in the mine under Creighton, the tunnel was lengthened from 290 to 960 feet, the shaft deepened from 316 to 414 feet, and another drift driven on the 400-foot level. Later a winze (inside shaft) was sunk from the 400-foot level, about 180 feet east of the original shaft, to the 565-foot level. Short drifts were also run out on the 500- and 565-foot levels.

The gold vein was cut-off not far below the 400-foot level by the silver vein, but was worked out from there up to the surface. From the 400-to 565-foot level, the mine development consisted of searching for more economical gold ore. Only more silver ore was found and blocked out for possible removal and treatment later.

The mine could not be worked by the estate after Creighton's death on February 7, 1907 because of legal complications and lay dormant until finally sold in 1921.

Hill Report - 1916[3]

Hill examined the mine in 1916 after it had been dewatered down to the 300-foot level. He assisted Mr. Frank E. Johnesse in taking samples of the ore chute within the Washington silver vein. The ore chute averaged 4 feet wide by 60 feet in length from the surface to the 300-foot level. These assays averaged 22 oz/ton of silver and 0.09 oz/ton of gold. Hill took check samples which supported these averages and showed the silver getting richer with depth. This calculates out as below:

4'x60'x300'	= 72,000 ft^3
@ 167 lbs/ft^3	= 6,012 ton of ore
@ 22oz/ton	= 132,264 oz-silver
@ .09 oz/ton	= 541 oz-gold
@ $8.50/oz-silver	= $1,124,244.00
@ $422/oz-gold	= $ 228,302.00
Total Reserve: (above 300-foot level)	$1,352,546.00

Hill also mentions, "the Berger Report", which delineated a gold ore shoot 25 feet wide, 135 feet long, and unknown depth. It is located in the old workings to the south of the main tunnel on the upper level. It supposedly assayed an average of $6.00/T gold then ($127/T now at $422/oz), but was unaccessable

to him because of caving. Nothing was mentioned of the silver content within this vein.

The following is taken from Hill's report:

"It is authoratively reported that a rich shoot of ore has been opened in the silver vein on the surface on the Sub Rosa ground about 150 west of the west end line of the Washington Claim.

With what I have personally seen of this property, not even taking into consideration the probabilities of the development of more ore shoots, I consider the one shoot developed in the silver vein, the making of a mine that will justify capital investment necessary to take over the property and put it on an economical producing basis.

A metallurgical process should be worked out that would successfully treat both the gold and silver ores. This should determine the amount of capital investment required for a plant and the per ton cost of treatment. The rest would be easy so far as the cost of mining is concerned."

Monetary Metals Co. - 1921(4)

In 1921 the mine, together with the Subrosa, was acquired by the Monetary Metals Co., and development work was resumed. During the next several years an extensive crosscut approximately 3000' long was driven from the lower gulch and in 1924 tapped the bottom of the vertical shaft just below the 400-foot level. The crosscut was extended about 125 feet beyond the shaft and drifts were run along several minor fracture zones, but no workable ore was found, except in the vicinity of the old workings. The company constructed a complete camp, including a new mill, and the development continued until October 1926.

USGS Report - 1924(5)

This report repeated most of what has been written previously but made several noteworthy observations. The first was that, "the better grade of gold ore was above the 400-foot

level whereas the tenor of the lead-silver ore persists with depth. The crosscut to the silver vein at 500 feet revealed silver ore whose tenor is the same as that encounter above (22-90 oz/ton)."

The report further states that, "no attempt was made to mine or treat the silver ore; this yet remains as a future asset for the company."

The report also makes note of the possible genetic relationship between the basic dikes in the area and the ore deposition. Quoting, "a relationship not fully proven, but not to be ignored by those in search of ore."

Mineral Examiner Report - 1925 (6)

This report was prepared in response to Monetary Metals Co. application for patent on the Washington, Union, and Frisco Lode Claims. The report delineates the extensive nature of the underground development work on all the claims and recognizes the value of the ore opened up on these claims (primarily silver with some gold). The vein filling is a sulphide ore and the country rock is an altered granite.

It further states that the development of these ore bodies was being pushed so as to block out as much tonnage as possible by the time a mill was erected for the treatment of the ore in the summer of 1925.*

The patent application was approved on February 16, 1925.

*NOTE: The mill was not completed until early 1927 and never did process any significant amount of ore.

Johnesse Report - 1927[7]

This report includes both the Washington and Subrosa, and was authored by Frank E. Johnesse, President and General Manager of Monetary Metals Co. on January 3, 1927. It represents the high point in the development of the mine since the price of silver dropped to 47¢/oz later in January, 1927. No new development work has been accomplished in the mine since that time.

Johnesse reports the total underground development of both mines consists of the following:

8965 feet	- tunnels and drifts
1740	- shafts, raises and winze
2300	- crosscutting
13,005 feet	Total

It was also reported that the development had revealed at least three distinct ore-bearing veins. Johnesse identified the veins and individual ore shoots in the veins as follows:

1. Washington Gold Vein
   a. Washington gold shoot (mined).
   b. Subrosa gold shoot (mined).
   c. Subrosa gold shoot below the dike cutoff (not mined, not blocked).

2. Washington Silver Vein
   a. Washington silver shoot (not mined, but blocked out).
   b. Subrosa silver shoot (not mined, partially blocked out).
   c. Blue Dick silver shoot (not mined, partially blocked out).

3. Big South Vein
   a. Big South silver shoot (not mined, not blocked).

Johnesse reported the following information concerning the individual ore shoots:

1. Washington gold shoot - 45' long x 3 1/2' wide x 400' high, produced $94,000 in gold.

2. Subrosa gold shoot - 150' long x 4-5' wide x 160' high, produced $300,000 in gold.

3. Subrosa gold shoot below the dike cutoff - well defined, about 4 1/2' wide and carries from 0.19 to 0.31 oz/ton in gold. At today's price ($422/oz) this is $80 to $130/ton. This shoot has never been developed and it's extent is still unknown.

4. Washington silver shoot - well developed and blocked out above the 450-foot level. It is 80' long x 2-4 1/2' wide x 550' high and carries average values of 26 ozs in silver and 0.90 ozs in gold to the ton (approximately $600/ton). Below 450 feet, the zone of secondary enrichment is encountered and reveals large quantities of native silver, argentite, pyrargyrite, stephanite, and cerargyrite. There are sections along the hanging wall six to ten inches in width that carry an average of from 1500 to 3000 ozs of silver and 1 to 2 1/4 ozs of gold to the ton ($13,000 to $26,000/ton).

5. Subrosa silver shoot - 65' long x 2-4' wide x 100' high (distance to surface) and carries average values of 32 ozs in silver and 0.13 ozs in gold to the ton (approximately $325/ton). The shoot is unexplored at depth.

6. Blue Dick silver shoot - 120' long x 4' wide is unexplored at depth. It carries about the same values as the Subrosa silver shoot. It was intersected by extending the long tunnel (420-foot level) to a total length of approximately 3,500 feet.

7. Big South silver shoot - well defined, it has been drifted on for 700 feet and is 7 to 12 feet in width. It carries commercial values in silver and gold where it shows a little finely disseminated iron and lead sulphides. It appears to be heavily replaced with a crystallized manganese oxide and shows heavy oxidization bearing evidence of enrichment at greater depths.

In this summary, Johnesse states,

"The three developed silver shoots (Washington, Subrosa, and Blue Dick) contain upwards of 3,000,000 ounces of silver, or, 150,000 tons averaging 22 ounces silver, with about 0.90 ounces to the ton in gold, above the main tunnel level, and in view of the fact that the zone of secondary enrichment lies below, with every indication of the veins continuing on down to a much greater depth, the estimated amount of available values could be more than doubled, to say nothing of the possibilities of the further development of the gold vein."

Johnesse's recommendation is correct for the price conditions in January, 1927 and he states:

> "In view of the fact that the values so far revealed in this property exist in the form of a dry silver ore with no by-products other than the gold, that there are strong prospects of a much better silver market in the not very distant future, and that the Company owns other properties carrying much higher gold values; even though the ore could be mined and reduced at a profit at the present price of silver, good business judgment would recommend working the other properties for the present and await a more opportune time for putting this property on production."

Farrell Letter - 1929(8)

This letter was written to the Consolitdated Mines Syndicate who had merged with the Monetary Metals Company in 1927. Farrell worked in the mine from 1900 to 1904 and was a mine foreman during the extensive development from the long (3500') working/drainage tunnel from October 1923 to January 1927 when the mine was shut down.

The letter discusses the four distinct silver ore shoots (Washington, Subrosa, Blue Dick, and Big South), and the Subrosa gold shoot below the dike cutoff. Besides confirming what Johnesse had reported, Farrell added the following information:

1. Washington silver shoot

> "The development of the Washington ore shoot has reached the zone of secondary enrichment where some very high grade silver ore is encountered showing native silver, silver glance, ruby silver, and a copper glance running high in silver. At one point where the vein is seven feet wide, it shows an average value of 142 ounces of silver and 0.19 in gold per ton. The other two ore shoots (Subrosa and Blue Dick) do not show any signs of secondary enrichment and are quite highly oxidized at the tunnel level."

2. Big South silver shoot

> "A large vein parallel to the Washington silver vein was encountered about 150 feet to the south which was ten to fifteen feet in width and was drifted on for about 600 feet, but did not reveal commercial ore in quantities, but as it is thoroughly oxidized and shows heavy replacement by crystal-

lized manganese oxide, there is every reason to believe that it, too, will reveal a zone of secondary enrichment at greater depth."

3. Subrosa gold shoot below the dike cutoff

"Near the extreme end of the west drift and about 100 feet beyond the Subrosa silver vein, we encountered what is undoubtedly the Sub Rosa gold vein from which $300,000 in gold is reported having been extracted in the early days from near the surface where it was cut off at 150 foot depth by a sharply inclined intrusive minette dyke. At the point of the intersection in the main level it is well defined about four feet wide and carries average values of from 0.15 to 0.42 ounces in gold per ton. We did not drift more than ten feet before shutting down, but it is a most encouraging lead and further development should reveal a highly valuable ore shoot.

The gold vein encountered in the west drift directly under the old Sub Rosa workings as mentioned above is, in my opinion, a most valuable lead as it can be traced on the surface for a distance of a mile and a half and is no doubt the eastern extension of the Forest King vein about three-fourths of a mile west which produced considerable gold in the early days."

4. Ore reserves and shutdown (1927)

"On the whole, the property is a most promising one and could very quickly be put in shape for substantial ore extraction. There is little doubt but that large ore reserves will be exposed from further development and the mine can be made to produce at a profit on a moderate scale for a long time to come even at the present low price of silver.

The property was just being put in shape for production and the construction of a reduction plant was under way when the sensational drop in the price of silver occured in January 1927, when as I understand it, the resources of the company were limited and as a merging with other interests was being considered, operations were closed.

Mr. Johnesse's estimate of 3,000,000 ounces in commercial ore being available from present workings is, I believe, conservative."

Contributions To Economic Geology, 1943-46[4]

This report was put out by the USGS and indicates that between 1927 and 1946, development work was confined to re-opening only 800 feet of the approximately 3,500-foot long

tunnel. The following information is taken directly from that report:

> "In 1927 the Monetary Mining Co. was merged with the Consolidated Mines Syndicate, but no further work was done, and when the property was visited in 1932 and 1933 the long crosscut was blocked and the camp was in ruins. In August 1934, the surface plant was destroyed by forest fire. In 1937, strenuous effort was made to rebuild the camp and rehabilitate the mine. The road from the highway was rebuilt, camp buildings were constructed, and the long tunnel was opened for a distance of about 800 feet."

The rest of the report contains specific information about the veins, the ore, and the geology. It is presented below:

> "The property is unique among those in Boise Basin in that it has a silver as well as a gold vein and therefore, has a deposit of probable lower Miocene age as well as one of early Tertiary (?) age. All the stoping has been confined to the gold vein. The silver vein, however, has been exposed on each of the levels underground. Some rhyolite porphyry dikes are exposed several miles to the northeast, but locally the only dikes are lamprophyric and one a biotite vogesite, is exposed in the workings underground aligned along a fault striking N 40° E and dipping 60° SE.
>
> The gold vein occupies a well-defined fissure of general easterly trend, which dips vertically to steeply south. The vein filling consisted largely of milky coarse-grained quartz with scattered pyrite crystals, the quartz apparently belonging to the third stage of deposition.
>
> The silver vein is reported to strike about N 70° W and to dip 75° to 90° SW. It intersects the gold vein a few hundred feet east of the shaft as well as at depth. The vein is reported to range from 8 inches to 4 feet in thickness where exposed on the different levels underground, but its length has not been determined. Judging from the ore removed during development and piled on the dump, the vein filling must be composed largely of base metals, particularly sphalerite and galena, in which may be found microscopic grains of chalcopyrite and tetrahedrite. Some of the filling, however, shows evidence of extensive breceiation and the introduction of a younger suite of minerals, including silver sulfosalts. The minerals introduced into the reopened parts of the filling include chiefly quartz considerable arseno-pyrite and some pyrite, and variable but generally scant amounts of miargyrite, pyrargyrite, and another mineral of doubtful composition, though tentatively identified as andorite. Fractures in the ore contain some scattered plates and wires of native silver, undoubtedly

of supergene origin. Most of the quartz is fine-grained, but some is coarse and drusy and shows a marked comb structure. The associated iron and silver minerals are also fine-grained, and it is evident that the conditions attending the deposition of these younger minerals were distinctly epithermal."

C. GEOLOGICAL EVALUATION

A reconnaissance study was made of the mine on June 10, 1981. The only accessible portion of the mine was the original main tunnel which was cleaned out for a distance of approximately 130 feet. The original Washington gold-bearing vein (shoot) was evident by the stoped-out portion of the tunnel. At the end of the open tunnel, the Washington silver-bearing vein (shoot) was exposed, sampled, and measured. The exposed shoot was approximately 38' long x 5' wide x 100' high (distance between tunnel and surface). The full length of the shoot was not exposed, but has averaged 60 feet according to previous reports. This ore is readily accessible and could be mined out in approximately three months. The tonnage and value of this shoot is calculated below:

38'x5'x100' = 19,000 ft^3
@ 167 lbs/ft^3 = 1,600 tons
@ 42 ozs/ton = 67,200 ozs-silver
@ .06 oz/ton = 96 ozs-gold
@ $8.50/oz-Ag = $571,200
@ $422/oz-Au = $ 40,800

Reserve (above main tunnel level) $162,000 → $612,000.00

There were three assay samples taken, the first was from the center of the vein (high grade), the second was an average channel sample across the full 5 feet, and the third was an average sample of the rock removed from the tunnel and shipped for smelting. The assay results are shown below:

		Gold (oz/ton)	Silver (oz/ton)	Lead (%)
1.	Vein center (high grade)	.19	369.3	3.8
2.	Channel across vein	.09	92.5	not tested
3.	Tunnel rock ore	.06	42.3	1.0

The tunnel rock consisted of 8 tons and was shipped to the smelter at East Helena, Montana. The smelter took several assay samples and reported 44 ozs/ton silver for pay purposes. The reserves ($612,000) reported above are based on the tunnel rock assay.

The previous reports indicate that the average ore in the Washington silver shoot above the 450-foot level may vary from 13 ozs/ton silver and .08/oz ton gold to 90 ozs/ton silver and .20 oz gold. It appears prudent to use an average value of 26 ozs/ton silver and .10 oz gold for calculating reserves and making an economic evaluation of the Washington silver shoot above the original main tunnel level. If an average length of 60 feet is assumed for the ore shoot, a higher gold content (.10 oz/ton) and the lower silver content (26 ozs/ton), then the calculated reserve above the main tunnel level is 2,500 ton worth $660,000.

The history of the gold-silver veins in this area of Idaho is that generally the gold content declines with depth and the silver content increases. The Washington vein system is traceable for a mile or more on either side of this location. The difference at this particular spot is the presence of the dike zone which appears to be genetically related to the emplacement of the ore shoots. This theory has not been proven and cannot be completely validated by the limited work or observations made by this writer. This condition was also pointed out in the USGS Report of 1924. However, the presence of the dike zone and the ore shoots in and around this zone appear to be more than coincidental. See Satellite Photo Evaluation section.

The ore observed at the tunnel level within the Washington Silver Vein is strong, well-defined, and would be expected to persist with depth. This observation is enhanced by the information contained in the referenced reports which say that the vein has been followed down to the 565-foot level. Below the 450-foot level, the Washington Silver Shoot is reported to be within a zone of secondary enrichment (Johnesse's report). Values as high as 1,500 to 3,000 ozs of silver to the ton are reported in sections 8 to 10 inches in width.

The intent of the present owners was to explore the original main tunnel level and confirm the presence of the Washington Silver Shoot, it's size, and the contained silver values. This has been accomplished. The shoot is there and from 1,500 to 2,500 tons of ore are readily accessible. This fact lends credability to the other information contained in the reports about the other shoots encountered and their values.

The geology of the mine is very favorable to economic ore deposition and it is doubtful that any appreciable silver ore has been removed from the mine and processed. The likelihood of other ore shoots being discovered are very high. The future development of the mine consists mainly of proving the existence of the ore shoots that have been reported and acquiring the detailed knowledge of the ore emplacement required to make reasonable predictions. All this should be incorporated into an operating plan designed to conserve capital by mining the known reserves as they are discovered and exposed.

The old maps have been updated and redrawn according to this writer's understanding of the development work as out-

lined in the referenced reports. The inferred information is shown by the use of dashed lines and question marks while the original information, as taken from the maps, by solid lines and no question marks. See Figures 4, 5, and 6.

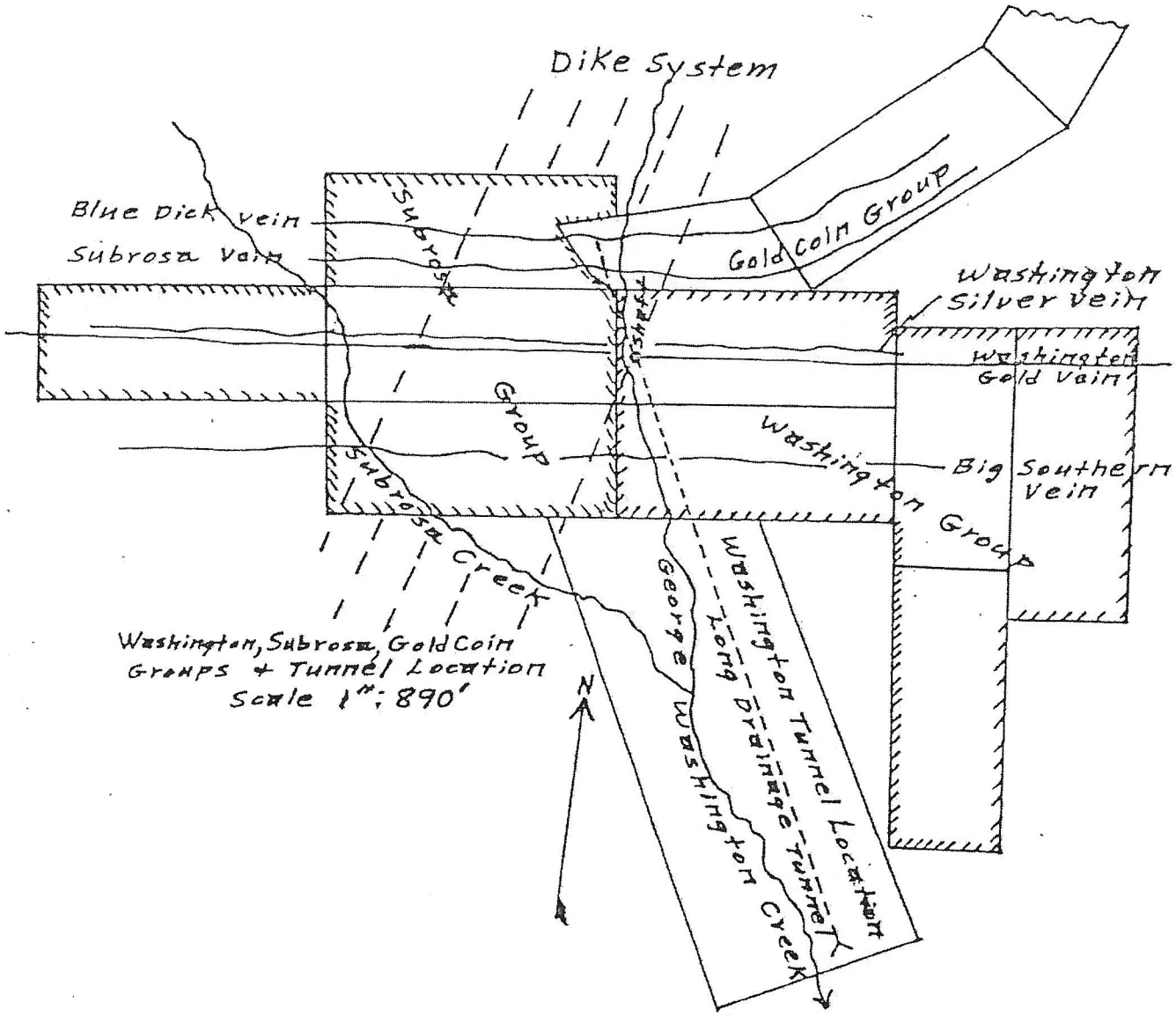
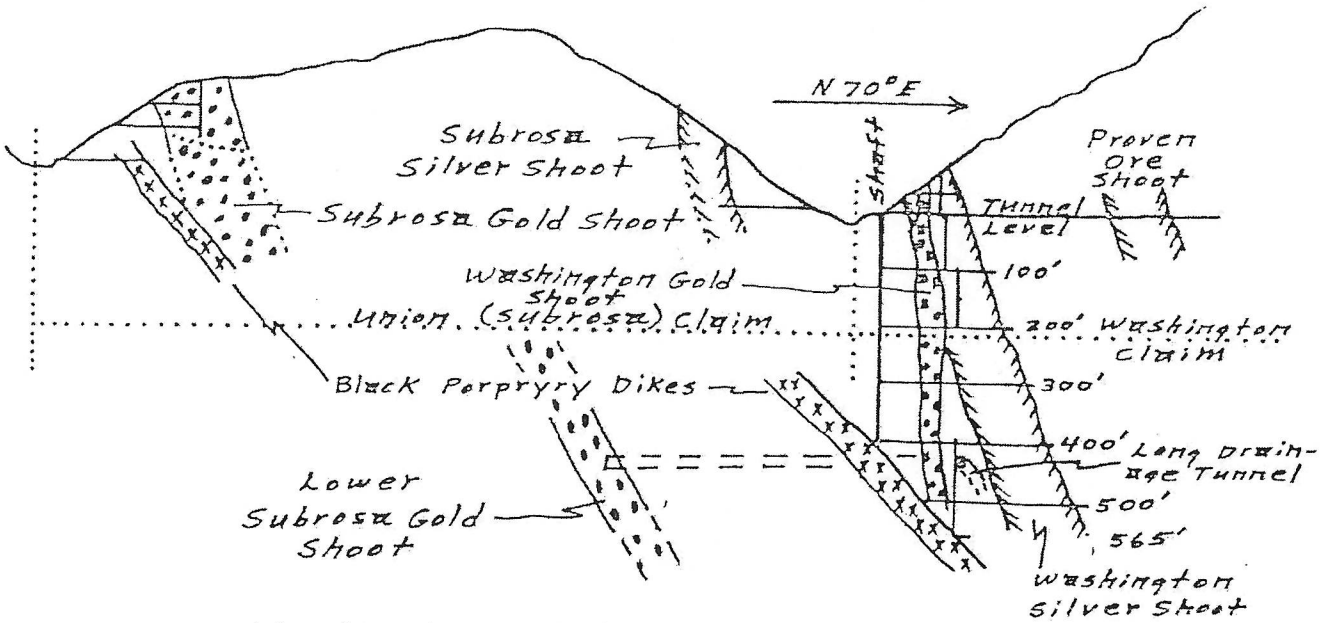


FIGURE 4

scale not correct



Washington + Subrosa Mine

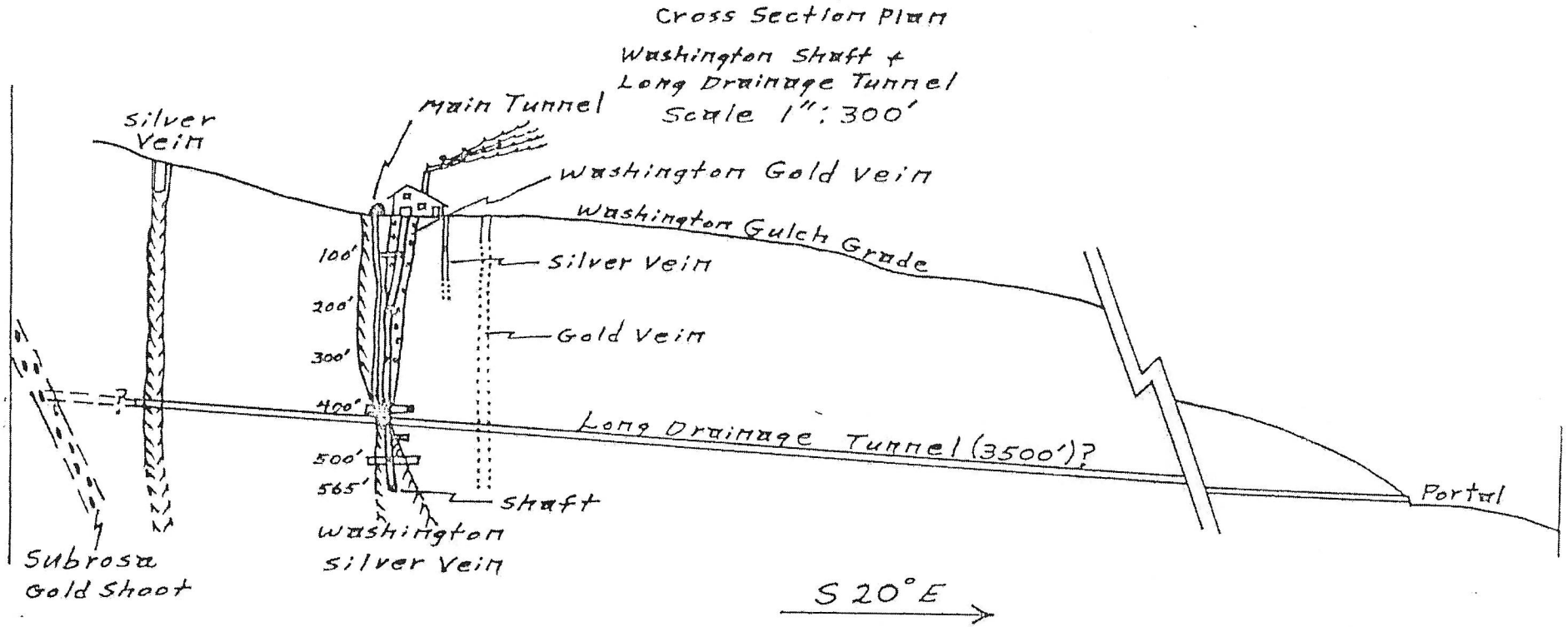
Longitudinal Plan

Veins + Workings

Scale 1" : 350'

FIGURE 5

FIGURE 6


Cross Section Plan
Washington Shaft & Long Drainage Tunnel
Scale 1" : 300'
Silver Vein
Main Tunnel
Washington Gold Vein
Washington Gulch Grade
100'
200'
300'
400'
500'
565'
Silver Vein
Gold Vein
Long Drainage Tunnel (3500')?
Shaft
Portal
Washington silver Vein
Subrosa Gold Shoot
S 20° E

D. SATELLITE PHOTO EVALUATION

An evaluation of the ERTS Photography revealed one important fact. The dike zone is discernable as it trends in a northeast direction through the property. The vein system is not noticeable although it can be seen from a plane. The Washington Mine is located directly on the intersection of these two structures.

Further, it was noted that 9 out of 11 major mines in the area are aligned along a N 41 1/2° E line that includes the dike zone. The dikes within the zone have been reported to strike N 40° E. The other two mines are located about four miles east of the Washington, apparently within the boundaries of the veins. It appears that, indeed, the dike zone is related to the deposition of ore consistent with favorable conditions such as zones of weakness and permeability caused by faulting or open veins.

E. ECONOMIC ANALYSIS

The property comprises approximately 307 acres and is for sale at $1.8 million. The owners want $400,000 down and the remaining $1.4 million financed at 10% interest and paid out over approximately six years. They are willing to entertain an option agreement that includes the sale price and payout while allowing the buyers 4-6 months of mine access to confirm the ore reserves. This access would permit whatever mining work was deemed necessary, but would not permit any large scale ore removal, production, or shipment. This option is available for approximately $20,000.

The economic analysis, at this point in time, must take two forms; the first looks at what is presently known and the second, at what is reasonable to expect.

The only thing that is known for certain is the ore reserve contained within the Washington silver shoot between the original main tunnel (0-foot level) and the ground surface which is approximately 100 feet above. This ore (2,500 tons) contains approximatley $660,000 in gold and silver. It is obvious that this reserve alone does not constitute an economical venture when compared to the selling price of $1.8 million. The net return on this ore body is estimated below:

Costs	
Mining ($40/T)	$100,000
Milling ($120/T)	300,000
Truck ($1,200/30T load)	100,000
Total Costs	$500,000

Net Return

$660,000 - $500,000 = $160,000

However, this ore body can be used to generate operating capital. It will defray costs of further development on this ore shoot and others that are mentioned several times in the referenced reports.

The second way of looking at the economics is to believe the old reports concerning the Washington Silver Shoot below the original main tunnel level (0-foot level). The old shaft can probably be rehabilitated at a reasonable cost ($90,000) down to the 400-foot level. From this level another 10,000 tons of ore is probably available with a net return of an additional $640,000.

The economics of the other shoots mentioned in the referenced reports are more tentative. Only those that can be worked from the original main tunnel level will be considered here.

Subrosa Silver Shoot

The Subrosa Silver Shoot (32 ozs silver & 0.13 oz gold to the ton) represents an ore reserve of 2,100 tons above the main tunnel level (65' long x 2-4' wide x 130' high) or $686,000. This shoot can be worked out at about the same cost as the Washington Silver Shoot. Net return would be about $266,000.

Berger Gold Shoot

This shoot is located in the old workings to the south of the main tunnel on the upper level. It was reported (by Berger & Hill) to carry 0.30 oz per ton of gold and be 25' wide by 135' long x 50' high (at least). The silver content was not reported and thus should be examined but not included

as a readily accessible ore reserve. Gold content alone is only about $127/ton.

Eastern Silver Shoot

This shoot is shown on the cross section map as a proven ore shoot. Nothing more is known about it. It should also be examined but not included as a readily accessible ore reserve.

The remaining ore reserves represent more extensive development work from the long tunnel at the 420-foot level. Cleaning out the long tunnel may run as high as $560,000 (3500' at $160/ft) and take 12 months to accomplish. This development work will open up total reserves of 3,000,000 ozs of silver and 12,000 ozs of gold. This figure is based on the referenced reports, is conservative, and represents, in excess of, $30 million.

If the referenced reports are generally correct, this project is economically viable. However, the cash outlay must be conserved, especially at the beginning, and the owner should not expect a straight cash settlement. An agreement should be worked out whereby they take a payout based on production and revenues.

The project economics are summarized on the following page.

Ore Body	Mining/Mill Costs	Reserve	Net Return
Washington Silver Shoot (above 0' level)	$ 500	$ 660	$160
Washington Silver Shoot (0-400' level)	2,090	2,640	550
Subrosa Silver Shoot (above 0' level)	$ 420	$ 686	$266
			$976

NOTE: Dollars are reported in thousands

There is one major item that can be accomplished to improve the economics of this project even more. The capital investment of approximately $350,000 for a 50T/day concentrating plant would be returned through a reduction of about 80% in milling and transportation charges. For example, the Washington Silver Shoot (above 0-foot level) economics would change as follows:

Costs (based on raw ore, 2500T)	
Mining ($40/T)	$100,000
Concentrating ($16/T)	40,000
Milling ($20/T)	50,000
Truck ($1,200/30T load)	20,000
Total Costs	$210,000

Net Return

$660,000 - $210,000 = $450,000

This means that the concentrating plant cost ($350,000) would almost be paid for out of reduced milling/transportation costs with the Washington Silver Shoot ore above the original main tunnel level. Further processing of ore would represent a much higher positive cash flow. Net return on the Washington Silver Shoot (0-400' level) would then be approximately $1,710,000. The net return on the Subrosa Silver Shoot would be approximately $510,000. Total net returns on these shoots, employing a concentrating plant would be approximately $2.3

F. CONCLUSIONS AND RECOMMENDATIONS

This project is economically sound if the frontend capital can be secured to rehabilitate the original main tunnel level, restore the original shaft down to the 400-foot level, and build a concentrating plant on the old mill site. The price of silver must also remain at $8.50/oz and gold at $422/oz. The cash outlay (for mining) required and the positive cash flow are estimated below:

Rehabilitate main tunnel level (840 ft @ $150/ft)	$126,000
Restore shaft to 400' ($225/ft)	90,000
Build concentrating plant	350,000
Consulting & equipment acquisition	190,000
Mine Washington Silver Shoot ($40/T) (0-foot level to surface)	100,000
Concentrate, truck & mill ore	30,000
Expenses	$886,000
Return on ore	$660,000

A total commitment of approximately $900,000 plus owner contract payments would be required to adequately finance this project through the first 1 1/2 years. Shortly after this time period, the project should be on a positive cash flow. A critical point is the concentrator plant construction and operational status timeframe. It is assumed that a 12 month timeframe will be adequate and the 2,500 tons of raw ore can be concentrated during a 4 month run.

It is recommended that the project be given serious positive consideration based on the three ore bodies that appear reasonably accessible. That is the Washington Silver Shoot above the 0-foot level (known & blocked), Washington Silver

Shoot between 0-400' levels (highly probable & blocked), and the Subrosa Silver Shoot above the 0-foot level (highly probable & blocked).

An option agreement that allows for confirmation of the three ore bodies mentioned above is highly desirable. The option will cost about $20,000 and the confirmation work about $200,000 (cleanout of tunnels, shafts, and equipment).

The following recommendations are proposed in order of relative importance.

1. Negotiate an option to confirm minimum ore reserves over a six month period. This option should include the conditions for continued participation by the principals (buyer/lessee and seller/lessor). Estimated cost is $20,000.

2. Confirm the size and value of the Washington Silver Shoot from the main tunnel level to the surface and down to at least the 200-foot level. Also confirm the size and value of the Subrosa Silver Shoot from the main tunnel level up to the surface. Estimated cost is $195,000.

3. Evaluate the data acquired from the confirmation work. Estimated cost is $5,000.

4. Make decision to exercise the option and go into production or abandon the project.

G. REFERENCES

1. Lindgren, Waldemar, "Extracts From the Eighteenth Annual Report Of The Department Of Interior For The Fiscal Year Ending June 30, 1897."

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3. Hill, Walter H., "Report On The Washington Mine", August 22, 1916.

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5. Unknown, "Monetary Metals Co. (Washington)", USGS Report, 1924.

6. Safley, Frank J., "Letter from Safley to Commissioner of General Land Office, Washington D.C.", January 17, 1925.

7. Johnesse, Frank W., "Washington Mine Report", Report to Monetary Metals Co., January 3, 1927.

8. Farrell, James, "Letter from Farrell to Board of Directors, Consolidated Mines Syndicate", July 31,1929

H. APPENDIX

SUPPORTING ARTICLES
(REFERENCES)

I. EXTRACTS FROM THE EIGHTEENTH ANNUAL REPORT OF THE DEPARTMENT OF THE INTERIOR FOR THE FISCAL YEAR ENDING JUNE 30, 1897

By Waldemar Lindgren, of the United States Geological Survey

THE SUB-ROSA OR FOREST KING VEIN

This vein is traceable for a distance of 2 miles from the Washington mine on the east to beyond the Forest King on the west. It crops in hard granite throughout, though at several places dark-green, dioritic dikes appear near it or cross it.

The Washington claim adjoins the Sub-Rosa on the east. This part of the vein was exploited a few years ago, and a considerable amount of gold was extracted. The mine is equipped with a ten-stamp mill and is developed by a tunnel following the vein for 290 feet and a vertical shaft sunk to 316 feet (now 560 feet)* at the mouthof the tunnel; Three levels are turned from the shaft, and extend, the first 400, the second to 250, and the third to 170 feet toward the east. The vein is vertical, and has about the same strike as the Sub-Rosa. An ore shoot 45 feet long and from 1 to 6 feet thick was found, and has been stoped from the 200-foot level up to the surface. The yield is reported to have been $90,000 from 4,300 tons, or $20 per ton. The ore was practically all free-milling and consisted of fresh quartz. A little pyrite occurred in depth. The shoot was cut off in depth by a small vein carrying silver, and its continuation beyond this is not known. *(Afterwards found to be going down to the lowest level and carrying values). Forty feet north of the gold vein, and separated from it by altered granite, is a strong vein of solid quartz, from 8 inches to 4 feet wide, which has been exposed by crosscuts from all levels. This vein carries silver only--as chloride on top, stephanite and ruby silver in depth--the average assays showing values of from 33 to 90 ounces per ton. Ore of the latter kind carries only $1 of gold. Though much of this silver ore is in sight, none has yet been extracted. Four hundred and fifty feet beyond the breast of the tunnel another ore body is said to show on the surface and to carry both gold and silver. *(This shoot has since been developed from the tunnel level.) This is one of the few occurrences of silver veins in the basin, and is of great interest, as the two veins evidently represent separate periods of vein filling, the silver vein probably being the later.

*Note: Words in parenthesis inserted.

II.

Omaha, Neb., Sept. 30, 1916.

r. Frank E. Johnesse,
Empire Building,
Boise, Idaho.

Dear Sir:-

Regarding the Washington Mine which we had the talk about recently, I shall try to comply with your request and give you what knowledge I have of it, but must admit I know very little about mining, personally, and therefore can not explain details of the workings as shown by the map of the development work. However, I have a few facts that may serve you to some extent.

In the first place, "Why are we selling"? You knew of the late John A. Creighton and perhaps the late Charles Balbach. They owned the mine jointly. Mr. Creighton died February 7th, 1907 and I think Mr. Balbach about four months earlier. The heirs of Mr. Balbach deeded their interest to the John A. Creighton Real Estate Co., a corporation formed for the purpose of handling Mr. Creighton's real estate holdings.

After Mr. Creighton's death, the attorney for the estate, Judge W. D. McHugh, advised the executors that the estate funds could not be used for any speculative purposes and he classed mining as such. We had only the right to keep the property protected, so that all we have done has been to maintain a watchman to keep machinery and improvements in as good a condition as possible.

You perhaps know Mr. Creighton left a very large estate. On his 75th birthday he gave Creighton University deeds to the Byrne-Hammer building and the Pacific Storage and Warehouse Building, valued at over $300,000.00. Some years before he gave them the Creighton Block and the Arlington Block in the heart of Omaha. Then he built the Immense St. Joseph Hospital, the Poor Claire Convent, the Creighton Law School, the Creighton Medical and Creighton Dental College as well as the main part of the Creighton University proper which was started some years ago by his older brother.

After all this philanthropy during his latter years his estate still showed a value when appraised by the state, of three million six hundred thousand dollars.

I have given you these items to show you of the money he distributed. Now I want to inform you how he made the bulk of it.

On December 31st, 1899 Mr. Creighton paid $12,500 for a one-half interest in the Speculator Mine at Butte, Mont., a copper property. From date of purchase to August 1st, 1905 he received in dividends $1,390,000.00. About this time the property was sold to the North Butte Mining Co., for five million; Mr. Creighton receiving for his interest, two million two hundred and eighty-six thousand dollars, which was a fair profit on the original investment.

At this time it would have taken a tidy sum to have bought he Washington mine of him. He has great faith in its future development. Especially, after having an examination made in the fall of 1904 by an Engineer by the name of Akers, W. A., I think. He made the map of the workings and his report was very favorable. We allowed this report to get into the hands of a prospective purchaser and was unable to get a duplicate as this Engineer had also died in the mean time.

I remember however, what seemed to me to be important matters in the report. For instance it recited that it was both a silver and gold mine; that its deposits from the U. S. Assay Office at Boise, in the Boise City National Bank was upwards of $92,000.00 in gold bullion produced from the one developed gold ore shoot. It mentions the silver vein along side of the gold vein all the way down; which I remember Mr. Balbach told me they could not work for the reason that the mill was not equipped to treat the silver ores.

I remember too, that this report recommended the purchase of the property adjoining on the west, for the reason that the territory to the west was the most likely in which to carry on further exploration work.

We have never made any effort to push a sale, but sooner or later the estate will be divided when some disposition will have to be made of this property.

Until patented we have only to pay taxes on the improvements and we concluded it was better to hold it temporarily that way.

I enclose list of all machinery and supplies in the way of tools when I last visited the mine.

I understand that the timbering above the water level has been kept up and that it is all in excellent condition.

The watchman tells me that the silver vein presents an excellent showing in the main tunnel level where it can be examined at all times.

If there is anything further I can do to assist you in bringing about a sale you have only to write me.

Very truly yours,

(Signed) ALFRED THOMAS,
Secretary, John A. Creighton
Real Estate Co.

III. REPORT ON THE WASHINGTON MINE

by

Walter H. Hill, M.E.

1916

The Washington group of mining claims lies in the Cambrinus Mining District, Boise County, Idaho, nine miles northeast of Idaho City.

They compose a large group of quartz claims, covering the vein system of this section of the camp. The property has a considerable amount of equipment, some of which could not be considered serviceable, and will not be mentioned in this report.

Waldemar Lindgren, in his reference to these veins in his geological report of 1897 on the Idaho City Gold Belt, mentions this property and speaks of the geology of these. He refers to the shoot of gold ore 45 feet long and from one to four feet thick, from which at that time a production of $90,000.00 from 4,300 tons of ore had been made.

He also mentions the silver vein 40 feet north of the gold vein, that showed from one to four feet of ore exposed by drifts and cross cuts in all levels down to the 290 at that date, but none of the ore had been stoped.

This vein carries chlorides on top and stephanite and ruby silver at depth. Also some native silver, with assay values running from 33 to 90 ounces to the ton.

At the time of my examination the shaft had been unwatered down to and below the 300 level, and my own examination was of this level and those above.

I have had access to various reports on this property and a plan of survey of the underground workings.

At the hoist or tunnel level the silver vein has been followed for a considerable distance. The first shoot of ore encountered the vein, which is the same as that developed on the lower levels, will average four feet wide by 60 feet in length.

Aside from a series of samples I assisted Mr. Frank E. Johnesse in taking of the several levels exposed, and which gave an average value of the hard quartz ore of 22 ag. ounces to the ton. I took the following check samples:

Sample across the shoot at a point where it was 5 ft. wide on the tunnel level taken in three sections ran as follows:

2.0 wide	$1.64	gold	4.6 oz. silver
1.3 "	2.48	"	26.20 oz. "
.7 "	1.86	"	16.52 oz. "

Sample across the vein about center of shoot 100-level 3.5 wide:

2 ft. wide	$1.65	Gold,	20.01 oz. Silver
1.5 " "	1.66	"	19.8 oz. "

Average sample across vein same shoot 4.6 ft., 200 level:

1.5 ft.	wide	$2.05	Gold,	39.06 oz. Silver
1. "	"	1.98	"	26.08 oz. "
2.2 "	"	1.48	"	16.04 oz. "

#1. 8/04

I selected ore samples by sorting out rich looking pieces from three to ten inches wide, which ran, gold, $8.28; silver, 113.21 oz.; total value, $121.47 per ton. Which indicates the probability of there being rich ore in this and other shoots in the veins that will run the average above the above estimates.

In the Berger report he mentions a shoot of ore 25 feet wide by 135 feet long, which he claims carries average gold value of $6.00 per ton, this was in the old workings to the south of the main tunnel on the upper level, to the south which had been blocked by caves, and was not accessible.

There is no doubt many ore shoots yet undeveloped along the strike of each of these veins.

The topography provides excellent opportunity for working these veins to considerable depth by adit tunnel before sinking will have to be resorted to.

It is authoratively reported that a rich shoot of ore has been opened in the silver vein on the surface on the Sub Rosa ground about 150 west of the west end line of the Washington Claim.

With what I have personally seen of this property, not even taking into consideration the probabilities of the development of more ore shoots, I consider the one shoot developed in the silver vein, the making of a mine that will justify capital investment necessary to take over the property and put it on an economical producing basis.

A metallurgical process should be worked out that would successfully treat both the gold and silver ores. This should determine the amount of capital investment required for a plant and the per ton cost of treatment. The rest would be easy so far as the cost of mining is concerned.

There is hardly an old mine in this district today but what under the new and improved methods of treatment of complex ores, can be made to pay handsome profits, even from the old dumps in many cases.

Respectfully submitted,

(Signed) WALTER HOVEY HILL, M. E.

Boise, Idaho, Aug. 22, 1916.

C - O - P - Y

SUBROSA MINE

The Subrosa mine is reported to be on a continuation of the Forest King lode and is on the high steep slope facing Moore Creek and the central part of Boise Basin. It was located and worked during the early days and was then idle until 1896, when work was resumed with the intention of finding the downward continuation of the ore shoot from a lower level.[75] In 1921 the Subrosa was acquired by the Monetary Metals Co. (later the Consolidated Mines Syndicate), but the workings were not reopened and the development remains the same as in the late nineties. According to unconfirmed reports, considerable ore was mined in the early days, mainly from comparatively small but rich shoots. The ledge strikes in the same direction as the Forest King, about N. 50° W., and dips southwest. Lindgren reports that the lode is several feet thick and is composed in large part of crushed granitic rock with quartz seams in fractures. In places the lode is said to be displaced by faults and cut by dark-colored dikes.

WASHINGTON MINE

The Washington mine is in sec. 33, T. 7 N., R. 6 E., near the east margin of the Gambrinus district and near the head of the east fork of Gambrinus Gulch, about 7 miles northeast of Idaho City. It is within a short distance of the Lowman highway and is reached by a branch road about 2 miles long. The mine was located in the early days of quartz mining and when examined by Lindgren in 1896 had been opened by a 290-foot tunnel and a 316-foot shaft, which was sunk near the portal of the tunnel. Four hundred feet of drifts had been driven from the shaft on the first level, 250 feet on the second, and 170 feet on the third.[76] Work continued for a number of years after Lindgren's visit, and the tunnel was lengthened to 960 feet, the shaft deepened to 414 feet, and another drift driven on the 400-foot level. Later a winze was sunk from the 400 level, about 180 feet east of the shaft, to a depth of 165 feet, and short drifts were run out on the 500- and 565-foot levels. In 1921 the mine, together with the Subrosa, was acquired by the Monetary Metals Co., and development work was resumed. During the next several years an extensive crosscut 3,735 feet long was driven from the lower gulch and in 1924 tapped the bottom of the vertical shaft just below the 400-foot level. The crosscut was extended about 125 feet beyond the shaft, and drifts were run along several minor fracture zones, but no workable ore was found, except in the vicinity of the old workings.[77] The company constructed a com-

[75] Lindgren, Waldemar, op. cit., p. 688.
[76] Lindgren, Waldemar, op. cit., p. 688.
[77] Ballard, S. M., Geology and gold resources of Boise Basin, Boise County, Idaho: Idaho Bur. Mines and Geology Bull. 9, p. 97, 1924.

plete camp, including a new mill, and the development continued until October 1926. In 1927 the Monetary Mining Co. was merged with the Consolidated Mines Syndicate, but no further work was done, and when the property was visited in 1932 and 1933 the long crosscut was blocked and the camp was in ruins. In August 1934 the surface plant was destroyed by forest fire. In 1937 strenuous effort was made to rebuild the camp and rehabilitate the mine. The road from the highway was rebuilt, camp buildings were constructed, and the long tunnel was reopened for a distance of about 800 feet.

The Consolidated Mines Syndicate holdings aggregate four patented and 11 unpatented claims with a total development of approximately 10,200 feet. No records of production were obtained, but Lindgren reports $90,000 milled from 4,300 tons of ore in the early days,[78] and Ballard reports a total of $92,000 above the 400-foot level[79] below which there was practically no stoping.

The property is unique among those in Boise Basin in that it has a silver as well as a gold vein and, therefore, has a deposit of probable lower Miocene age as well as one of early Tertiary (?) age. All the stoping has been confined to the gold vein. The silver vein, however, has been exposed on each of the levels underground. Some rhyolite porphyry dikes are exposed several miles to the northeast, but locally the only dikes are lamprophyric, and one, a biotite vogesite, is exposed in the workings underground aligned along a fault striking N. 40° E. and dipping 60° SE.

The gold vein occupies a well-defined fissure of general easterly trend, which dips vertically to steeply south. According to Lindgren,[80] the vein had an ore shoot 45 feet long and 1 to 6 feet thick, cut off at depth by the silver vein. The ore shoot apparently terminated not far below the 400-foot level and apparently had been mined out before the recent extensive prospecting by long crosscut had been started. The vein filling consisted largely of milky coarse-grained quartz with scattered pyrite crystals, the quartz apparently belonging to the third stage of deposition.

The silver vein is reported to strike about N. 70° W. and to dip 75° to 90° SW. It intersects the gold vein a few hundred feet east of the shaft as well as at depth. The vein is reported to range from 8 inches to 4 feet in thickness where exposed on the different levels underground, but its length has not been determined. Judging from the ore removed during development and piled on the dump, the vein filling must be composed largely of base metals, particularly sphalerite and

[78] Lindgren, Waldemar, op. cit., p. 688.
[79] Ballard, S. M., op. cit., p. 56.
[80] Lindgren, Waldemar, op. cit., p. 688.

galena, in which may be found microscopic grains of chalcopyrite and tetrahedrite. Some of the filling, however, shows evidence of extensive brecciation and the introduction of a younger suite of minerals, including silver sulfosalts. The minerals introduced into the reopened parts of the filling include chiefly quartz, locally considerable arsenopyrite and some pyrite, and variable but generally scant amounts of miargyrite, pyrargyrite, and another mineral of doubtful composition, though tentatively identified as andorite. Fractures in the ore contain some scattered plates and wires of native silver, undoubtedly of supergene origin. Most of the quartz is fine-grained, but some is coarse and drusy and shows a marked comb structure. The associated iron and silver minerals are also fine-grained, and it is evident that the conditions attending the deposition of these younger minerals were distinctly epithermal.

HAYFORK MINE

The Hayfork mine is on Hayfork Creek, a tributary of Moore Creek, in sec. 36, T. 7 N., R. 6 E., about 10 miles northeast of Idaho City. It lies about a mile above the mouth of Hayfork Creek and the same distance from the Boise-Lowman highway on Moore Creek. The mine covers two groups of claims, the Gold Bug, on the creek, and the Black Eagle, on the top of the high ridge west of the Gold Bug. The mine has been known for a number of years and as early as 1906 had been prospected by a number of shallow cuts. Most of the development, however, has been carried on since 1923, when the property was acquired by the Jarvis brothers.

All recent work has been confined to the Black Eagle group. The Black Eagle lode has been opened by three tunnel drifts and explored by other workings. The highest tunnel is just beneath the crest of the ridge, and its 200-foot length takes it through the ridge from the Hayfork side to the Moore Creek slope. The No. 2 tunnel is about 70 feet below the No. 1. Its length is about 280 feet, which also carries it through to the opposite side of the ridge. The No. 3 tunnel, completed in 1937, is 120 feet below the No. 2, and it also has been driven through the ridge, its length being 700 feet. The No. 3 tunnel is connected with the No. 2 by a raise, but no stoping up to August 1, 1938, had been done between. Prospecting was also under way on the Moore Creek slope at two places below the No. 3 level. The workings on the Gold Bug include the original cuts and short tunnels driven about 1906 and some other crosscuts and drifts driven between 1923 and 1933. These workings trace the Switzerland lode on the Gold Bug group for about 2,000 feet. A 200-foot drift on the west end of the lode was open in 1932, but of the two more recent openings on the east end of the lode only the upper crosscut and drifts with some 300 feet of workings were

accessible in 1933. The production up to 1932 from the Switzerland was reported to total $5,000 and from the Black Eagle about $10,000, but since then much more ore has been mined and treated in the mill on the creek below the Gold Bug.

The structural and mineralogical features of the mine are much like those in other parts of the Gambrinus district. Several prominent fissure zones that trend west-northwest and dip southwest cross the property and are in places displaced by northeast faults, some of which are occupied by dark-colored dikes. The Black Eagle fissure zone strikes N. 70° W. and dips about 45° SW., the dip steepening somewhat with depth. The fissure zone is as much as 9 feet across and is made up of intricately fractured rock and considerable gouge. The lode, however, occupies less than one-third of the disturbed zone and is but 2 to 3 feet wide. The ore shoot in the upper workings is about 150 feet long and is made up of small lenses and bunches of quartz and has accompanying thin seams in iron-stained fractures in the weathered but little hydrothermally altered granitic rock. Much of the richer ore was reported to occur along the footwall beneath a prominent postmineral gouge seam, but streaks of high-grade ore also appeared in the hanging wall. All the ore has been stoped above the No. 2 level.

Several fracture zones cross the Gold Bug group, but most of them contain little ore. They strike N. 60°–80° W. and dip steeply southwest, the Switzerland striking N. 70° W. and dipping 70° SW. The zone of fractured granitic rock containing the Switzerland is 4 to 9 feet across, but the lode is only half as wide and is defined by prominent bands of gouge on both the hanging and footwalls. The lode is exposed for only 55 feet in the upper tunnel. It appears to be made up of recurrent quartz seams and lenses a few inches thick in fractured rock bounded by bands of gouge 8 to 12 inches thick. The lode is cut off by a fault trending N. 20° E. at the east end of the drift, and the fault is occupied by a dark-colored dike. The drifting was deflected northeast along the dike for a short distance and then east-southeast along a poorly defined fissure zone, which may be the continuation of the Switzerland. Continued drifting and crosscutting has disclosed other fracture zones.

The ore is not much different from the ore in other parts of the Gambrinus district. It is composed of coarse-textured quartz in places accompanied by minor amounts of sulfides. In the Black Eagle lode most of the quartz is the rather coarsely crystalline young-stage variety, much of which tends to form interlocking combs, in part deposited around fragments of older less coarsely crystalline quartz in which are sporadically scattered fairly large crystals of arsenopyrite and pyrite and fewer grains of sphalerite and galena. These sulfides

MONETARY METALS CO. (WASHINGTON).

1924

The Washington mine is located near the head of Gambrinus Gulch about seven miles northeast of Idaho City. The claim group covers a portion of the shear zone to which most of the early day quartz mining of this part of the Basin was confined. The mine is the only one in the Gambrinus district at which any noteworthy amount of development is being carried on in 1924.

The Washington mine was worked in former years through a vertical two-compartment shaft, which is located near the northern and higher portion of the property, to a depth of 560 feet. Two veins, about 100 feet apart, were exposed in the vicinity of the shaft. The northern one, known as the Silver vein, strikes about N. 70° W. and dips 75°-90° S.; the southern, known as the Washington or Gold vein, strikes E. and dips almost 90° S. The two veins merge a few hundred feet east of the shaft and the principal ore shoot formerly developed was near this junction. The shear zone which strikes eastward across the property consists of several well defined fault fissures 50 to 200 feet or more apart. These fissures are clearly later in age than the aplite intrusions of the locality, several of which are cut diagonally by the fissures.

The Washington, or Gold vein, was worked by former operators to the 400 level through the vertical shaft. From a drift to the east on the 400 level, and 180 feet from the shaft, a 165-foot winze was sunk on the vein. Some drifting was done at the 500-foot and 565-foot levels. A short crosscut to the south on the 500 level intercepted what was called the Silver vein; no crosscut was driven from the bottom of the winze. From assay records it is apparent that the better grade of gold ore WAS ABOVE the 400 level whereas the tenor of the lead-SILVER ORE DOES persist with depth. The crosscut to the SILVER VEIN IN DEPTH silver ore whose tenor is the same as that ENCOUNTERED ABOVE.

It is reported that a recovery of $92,000 was [illegible] gamation of the ore removed between the [illegible] level and the surface from the two shoots which were encountered east of the shaft in the Washington vein. No data are available as to tonnage. The ore was crushed in two 5-stamp batteries and plated. No attempt was made to mine or treat the silver ore; this yet remains as a future asset for the company. No information is available regarding its average value. That from the oxidized zone contained considerable native silver. Specimens from the upper levels of the Subrosa claim show wire silver much resembling in miniature the fleece of a sheep.

Recently the mine has been reopened by the Monetary Metals Co. A good road has been built to connect with the main county road which ascends Moore Creek. A suitable camp has been built, a sawmill has been placed in operation to supply timber needs, and steps have been taken to secure the installation of electric power. The erection of a concentrating plant is contemplated for 1925. The underground work being carried on by the Monetary Metals Co. consists of an adit driven northerly from a point about 1,300 feet south of the old shaft, which it taps 420 feet below the collar. At the time of the writer's visit the adit had

[illegible] beyond the shaft and drifting both to the east and west was in progress along one of several fissure veins which were encountered a short distance beyond the shaft. Two of these fissure veins attain a width of several feet. Workable ore was not disclosed in any of them until the vicinity of the old workings was reached. One specimen, taken from the vein exposed in the east drift and not far below the former workings, carries considerable native silver scattered throughout the fractured and slightly oxidized quartz ore. The main adit penetrates several large aplite dikes and near its connection with the vertical shaft, at a depth of 420 feet, exposes the only basic dike encountered in the recent workings. The rock is shown under the microscope to be a minette. At the point of exposure underground the dike is about 30 feet wide, strikes about N. 40° E., and dips 60° SE.; its age with relation to the fissures could not be determined. There is elsewhere in the same neighborhood, notably on the Subrosa claim, this same persistent suggestion of a genetic relationship between the basic dikes and ore deposition, a relationship not fully proven, but not to be ignored by those in search of ore.

Boise 027180--MA
Monetary Metals Co. VI.
J.Safley,
Mineral Examiner,
Fav.Rept.

DEPARTMENT OF THE INTERIOR,

GENERAL LAND OFFICE.

Salt Lake City, Utah,

January 17, 1925.

APPROVED: 1-27-25
J. Arthur Moore
Chief of Field Division.

Honorable Commissioner,

General Land Office,

Washington, D. C.

Sir:

On August 15, 1924, the Monetary Metals Company, by Frank E. Johnesse, President and General Manager, filed application 027180, in the Boise Land Office, for patent to the George Washington, Union, and Frisco Lode Claims, Survey No. 3042, embracing a part of the E½NE¼, of Sec. 32, and the N½ of Sec. 33, T. 7 N., R. 6 E., B. M., inthe Gambrinus Mining District, Boise County, Idaho, the plat of survey having been approved November 13, 1924.

The records show that on August 25, 1924, the Chief of Field Division protested this application pending investigation and report, and that on October 27, 1924, final certificate was issued.

On November 11, 1924, in company with Mr. Johnesse, I made an examination of these claims, and the following report is respectfully submitted:

Feb 14, 1925 HWH

These claims form a part of what is known as

RECEIVED
JAN 26 1925
G. L. O.

CONFIDENTIAL
NOT FOR PUBLIC INSPECTION

Cleared to Div. W
Approved Feb 16-25
Commissioner

"Washington Group", consisting of thirteen claims, and are located as above described. The claims lie on the southern slope of the mountains, the surface being cut by several gulches leading in a southerly direction. The main workings of the entire group consists of a tunnel, the portal of which is located on the Henry Claim Lode Claim, Survey No. 3043A. The tunnel is 5 X 7 feet, and has been driven a distance of 3,300 feet on a course north 7° 30' east. ~~The first 200 feet of said tunnel being timbered.~~

At a point 2,900 feet from the portal, the vein on the George Washington Lode Claim was cut and a drift has been driven along the vein in an easterly direction a distance of about 300 feet, at a cost of $3,600. This drift connects with the main shaft sunk on the vein at a depth of approximately 565 feet below the surface. Value of the above shaft $11,000.

Other improvements on this claim consist of a cross-cut tunnel 4½ X 7 feet, 126 feet long; value $1,260.

An open cut near the east end of the claim 10 X 12 X 10 feet; Value $200.

A one-thirteenth interest in 2,806 feet of the main tunnel, which was driven at a cost of $12.00 per foot is allotted to each of these claims and amounts to $2,589. The total value of the improvements on or for the benefit of the George Washington Claim is $18,649.

UNION LODE CLAIM

The improvements on this claim consist of a one-thirteenth interest in said tunnel, value $2,589. Also, at a point 2,900 feet from the portal of said tunnel, a drift 5 X 7 feet has been driven westerly on the Union vein a distance of 460 feet; value $5,520.

Two open cuts each 6 X 20 X 10 feet; value $400.

A cross-cut tunnel 4 X 6½ X 680 feet in length; value $6,800.

Cross-cut tunnel 4 X 6 X 60 feet in length; value $600.

A tunnel 4 X 7 X 100 feet in length; value $1,000.

Total value of the improvements made on or for the benefit of this claim, $16,909.

FRISCO LODE CLAIM

The improvements on this claim consist of a one-thirteenth interest in said tunnel; value $2,589.

A tunnel 4 X 16 feet, 48 feet in length, driven on the vein $480.

Four open cuts, each 6 X 12 X 8 feet face on the vein; value $400.

All of the above workings, with the exception of the main tunnel are on the Frisco vein. The total value of said improvements is $3,469.

On each of these claims a good strong vein has been opened up by the workings. These veins are characteristic of those found in this district, and are from eighteen inches to four and one-half feet in width. The country rock being an altered granite. The vein filling is a sulphide ore carrying good values of gold and silver, and from numerous samples taken by me, the values could easily be seen by the naked eye.

These claims are located on the Boise National Forest, and no adverse report has been submitted by the Forest Service.

Ore to the value of many thousand dollars has been opened up on these claims, and the development of these ore bodies is being pushed so as to block out as much tonnage as possible by the time a mill is erected for the treatment of the ore. The mill to be built and ready for operation as early as possible during the summer of 1925. As a matter of fact, the showing of valuable ore on these claims is extremely good, there being no question but that a valid discovery of mineral has been made. As the amount of expenditures made on or for the benefit of each of these claims is far in excess of the required $500.00, it is recommended that the application be approved and that patent issue.

Very respectfully,

Frank J. Selley

Mineral Examiner, G.L.O.

FJS-OES

VII. WASHINGTON MINE REPORT 1927

DEVELOPMENT:

The property, including both the Washington and Subrosa, is quite highly developed, having about two and one-half miles of underground workings attaining a depth on the main ore shoots of over 700 feet. There is approximately 8965 feet of tunnel and drifts, 1740 feet of shaft, raise and winze and 2300 feet of crosscutting.

VEINS AND VALUES:

The present development to date reveals three distinct veins. The gold vein which is easily traced on the surface for a distance of two and one-half miles, and which has produced considerable gold from the Washington, Subrosa and Forest King properties, is developed by shaft and by the main working tunnel for a depth of from 580 to 750 feet, and for a distance along its strike of about 2300 feet. The one ore shoot of this gold vein revealed in the Washington shaft was about 45 feet in length by about 3½ feet in width, and has been stoped down to the 400-foot level of the shaft, where it was cut off by the Washington silver vein. This one shoot produced $94,000.00 in gold.

The Subrosa shoot about 1500 feet to the west was much larger, being about 150 feet in length by 4 to 5 feet wide and from the surface down to the 160-foot level, where it was cut off by an intrusive minette dyke. It has produced upwards of $300,000 in gold.

This gold vein was encountered in the extreme west workings of the main tunnel, where it is in place, well defined, about 4½ feet in width and carries from $3.80 to $6.20 to the ton in gold. Its further development from this level, about 750 feet below the outcrop of the Subrosa ore shoot, will no doubt be productive of a large tonnage of commercial ore.

The main workings reveal three important shoots of silver ore; one in the Blue Dick vein to the north, which is 120 feet long, averaging 4 feet in width, and, although it is highly oxidized at this level, it carries an average of 32 ounces silver and $2.60 in gold to the ton.

The one in the Washington silver vein paralleling the gold shoot at the shaft and which cuts the gold vein at the 400-foot level, is 80 feet in length, from 2 to 4½ feet in width, is developed on all levels, carries values of 26 ounces silver and $1.80 in gold to the ton above the 450-foot level, below which the zone of secondary enrichment is encountered and reveals large quantities of native silver, argentite, pyrargyrite, stephanite and cerargyrite, with sections along the hanging wall six to ten inches in width that carries an average of from 1500 to 3000 ounces of silver and $20.00 to $45,00 in gold to the ton.

The Subrosa silver shoot is in the Washington silver vein about 1500 feet to the west of the Washington shoot, is 65 feet in length, 2 to 4 feet in width and heavily oxidized at the tunnel level, but carries about the same values as the Blue Dick shoot.

While only the Washington shoot is developed on all levels, all three crop at the surface, and together carry an estimated tonnage above the tunnel level of 150,000 tons averaging 22 ounces silver and $2.00 in gold per ton.

The third or big south vein as shown on the map, which has been drifted on for a distance of about 700 feet, is from 7 to 12 feet in width, well defined, and paralleling the other veins with an east and west course and standing almost vertical.

In places where it shows a little finely disseminated iron and lead sulphides, it carries commercial values in silver and gold but appears to be heavily replaced with a crystallized manganese oxide and shows heavy oxidization, bearing evidence of enrichment at greater depths.

SUMMARY:

The three developed silver shoots contain upwards of 3,000,000 ounces of silver, or, 150,000 tons averaging 22 ounces silver, with about $1.80 to the ton in gold, above the main tunnel level, and in view of the fact that the zone of secondary enrichment lies below, with every indication of the veins continuing on down to a much greater depth, the estimated amount of available values could be more than doubled, to say nothing of the possibilities of the further development of the gold vein.

RECOMMENDATION:

In view of the fact that the values so far revealed in this property exist in the form of a dry silver ore with no by-products other than the gold, that there are strong prospects of a much better silver market in the not very distant future, and that the Company owns other properties carrying much higher gold values; even though the ore could be mined and reduced at a profit at the present price of silver, good business judgment would recommend working the other properties for the present and await a more opportune time for putting this property on production.

Respectfully submitted

Frank E. Johnesse

M.E.

Boise, Idaho
January 3, 1927