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BDS

THE RUSH AND BROWN MINE.

(Alaska Gold & Metals Co.) KX 119-1 119-2

LOCATION.

The property, consisting of 4 claims and two millsites, all unpatented, lies near the upper reaches of Kasaan Bay on Prince of Wales Island, in Southeastern Alaska. It is about 46 miles distant from Ketchikan, the trading center for the area; The Saltchuck mine is the adjoining property and is located about 6,000 ft. to the Eastward. At high tide shallow draft boats and barges can be brought within one mile of the mine workings. A 42 inch gauge railway, in disrepair, connects the mine with saltwater.

HISTORICAL.

The original discovery and the orebody first exploited, was discovered by U. S. Rush and his partner about the year 1900 and ore was shipped from this body for a number of years. This is a contact deposit with values in gold, silver and copper. Upon the discovery of shear zone deposits operations were confined to these later discoveries on account of the much higher content of the precious metals as well as copper. The property was operated on a small scale for many years with possibly 75% of the ore extracted by hand drilling methods. The property has not been productive since 1923. The property, handicapped always by the lack of sufficient working capital, was caught with ore in transit on a rapidly falling copper market with settlements less than half of net values when shipments were made. Insufficient cash reserves resulted in loss of the property by the owner.

In 1929, the Solar Development Co., a subsidiary of the Consolidated Mining & Smelting Co. of Canada optioned this property together with the neighboring Saltchuck mine. The two properties were connected by means of an air line extended from the Saltchuck compressor plant 6000 ft. distant. The mine was unwatered, sampled, and a long adit undertaken to enter the mine workings about 280 ft. below the outcrop. The total length of the adit when completed will be about 1460 ft. Approximately 1300 ft. has been driven leaving the face 160 ft. short of it's objective. The development company apparently withdrew due to the drop in metal prices.

GEOLOGY.

The mine lies to the southwest and just outside the basic intrusive mass which apparently underlies a large portion of Kasaan Peninsula and environs. Various phases have resulted from differentiation of the coolingmagma resulting in two main type products, gaboro and pyroxenite and grading into diorite in some of the margins. Locally, near the Rush and Brown mine

a mass of syenite also occurs.

An outlying tongue of diorite invades the graywacke sedimentary on the Rush and Brown property and the formation of the orebodies can be attributed to this activity. Orebodies have been deposited both at the contact resulting in a so-called contact metamorphic deposit and also in shear zones of which two at least are known. Several cross fractures can be observed in the mine workings displacing the productive shear as much as forty ft. but the faulting has been readily solved. One of these cross fractures was productive to a limited extent near the main shear zone. It may be also that the contact deposit is at or near the junction of one of these cross fractures and the diorite.

The rock sequence and alteration as disclosed by the adit is of interest as it shows the change in rock structure due to the action of ore-bearing solutions and intrusion of the diorite. For the first 600 ft. the adit is in rather firm, unaltered graywacke with occasional slips and cross fractures. Then follows a belt for about 300 ft. of altered and broken graywacke. At the beginning of this alteration one of the shear zones is evidently cut at a very acute angle. There is a slight showing of ore here. Then follows a belt for about 100 ft. which is notable for the schistose structure developed. Then a belt of mixed graywacke and limestone follows for about 100 ft. and following this the adit penetrates a more siliceous area changing finally to a rock of cherty nature for the last 50 ft. or so. The true thickness of these alterations would be but a fraction of the distances given, possibly 10 to 20% as deduced from a study of the mine maps. It is possible that the cherty ground encountered is near the contact deposit whose rake and dip would carry it over the adit at this depth.

CHARACTER OF MINERALIZATION.

The metals of economic importance are gold, silver and copper. The precious metals apparently accompany the copper which is in the form of chalcopyrite. Pyrite and pyrrhotite also occur in varying amounts and occasionally molybdenite occurs locally. Magnetite comprises the greater portion of the ore in the contact deposit and forms local segregations also in the shear zone. Calcite and silica are present in minor quantities.

In the shear zone, ore shoots are mainly tabular, lenticular bodies of massive sulphides with varying proportions of chalcopyrite, pyrite and pyrrhotite, with color varying from brassy to greenish yellow as determined by the proportions of the various sulphides present.

Mineralization is more of the disseminated type in the contact deposit and consequently this body is of lower grade.

Reticulating veinlets of chalcopyrite have also mineralized the broken and shattered graywacke in the shear zone and there may be a considerable tonnage of milling ore to be derived from this area in addition to the more massive segregations.

MINE WORKINGS.

The first orebody discovered, the contact deposit, crops on a knoll about 400 ft. above sea level. It was opened by means of a shaft 200 ft. in depth, sunk alongside the orebody. Then, later, the shear zone deposit was discovered, a drift from the shaft westward intersected the downward extension of the shear on the 200 ft. level. The drift is about 100 ft. in length.

The shear zone was stoped to the surface and also sunk on from a point about 200 ft. southwesterly from where first encountered. The winze was sunk from the 200 ft. level to a point about 40 ft. below the 500 ft. level. Levels were opened from the winze in both directions along the shear at intervals of 50 ft. The dip is about 60 degrees to the southeast at the surface but the average is more nearly 45 degrees. The width varies from four to fourteen ft. and the strike is north 50 degrees east with a change to about due east noted at the northeast end of the 400 and 450 levels.

Ore shoots vary in thickness from a few inches to seven ft. or more in this dimension. Thickness of massive ore however has probably not exceeded 4 ft.

The two shearzones so far known are about 325 ft. apart horizontally and there is some evidence to indicate that they are parallel in strike but whether the dip is the same is not known. However an exploratory drift driven on the 200 ft. level along one of the cross fractures apparently crossed no. 3 shear zone as it has been called, at a point about 325 ft. horizontally from the productive shear. This drift was driven in a southerly direction making an angle of about 45 degrees with the strike of the shear zone. It's length is about 460 ft.

Exclusive of this drift and the main projected adit the mine workings proper comprise approximately 3000 ft. of drifts and 500 ft. of winze and shaft. Sumps represent an additional footage, possibly 75 ft.

The mine workings require only a limited amount of timbering which is confined mostly to occasional stulls. These together with pillars constitute all the support required.

THE SHEAR ZONE DEPOSIT.

Only one of the two known shears has been exploited. It has produced about 9,700 tons of shipping ore of the following average content and value per ton.

SHEAR ZONE (cont.)

	Gross Value Per Ton.	Net Value Per Ton.
Gold 0.26 oz. @ $35 0.26 oz. @ $33	$9.10	$8.58
Silver 1.60 Oz. @ 64¢ 1.10 oz. @ 60¢	1.03	.66
Copper 10.5% 210# @ 9¢ 184# @ 0.5¢	16.90	11.96
TOTALS	$ 29.03	$21.20
Gross and Net Production from shear zone.	$281,300	$205,640

THE CONTACT DEPOSIT.

Available data indicate that this orebody produced 35,000 tons of ore. The average content and value is as follows

	Gross Value Per ton.	Net Value Per Ton.
Gold 0.06 oz. @ $35 .06 @ $33	$2.10	$1.98
Silver 0.25 oz. @ 64¢	.16	--
Copper 2.25% 45# @ 9¢ 38# @ 6.5¢	4.05	2.47
Gross Value	$6.31	Net $4.45

The above ore was shipped on a higher copper market and considered today as a milling proposition is of doubtful value due to the present price of copper. A surface area of about 12,000 ft. is indicated here however and since mining costs in this zone would probably not exceed $1.50 per ton including development, this orebody may sometime be of value. Each increase of 1¢ per lb. in the price of copper is eqivalent to an increase of 45¢ per ton of ore.

DUMP

A dump containing about 14,000 tons derived from sorting operations to raise the grade of ore shipped from the shear zone is estimated to average as follows:

Copper 1.75% Gold 0.06 Oz. Silver 0.30 Oz.

It appears that the ore as mined had an average grade about as follows

		Gross Value Per Ton	Net Value Per Ton.
Copper	5.33% 106.6# @ 9¢ 96# @ 6.5¢	$9.00	$6.24
Gold	0.14 oz. @ $35 .14 Oz. @ $33	4.90	4.62
Silver	0.80 oz. @ 64.5¢ .60 Oz. @ 60¢	.51	.36
		$ 15.01	$11.22

ORE

Operations in the shear zone were confined to one ore shoot which has an average length of about 200 ft. It has been followed and was consistently productive to the 500 ft. level. A block of ore between the 500 and 520 ft. horizon which is the bottom of the winze sunk on this shoot is estimated to contain 1100 tons averaging over a 4 ft. width and a length of 80 ft.

Gold 0.22 oz. Silver 1.22 oz. Copper 7.2%

with a net value and a realized price of 6.5¢ per lb. for copper, of $17. per ton.

On the opposite side of the winze, ore evidently extends for another 80 to 100 ft. The average value is the same, that is, $17 per ton net. It seems safe to figure 500 tons in this block.

In and about the old stopes and pillars sampling indicates an additional tonnage of at least 1100 tons. The average values are the same as given above.

Tonnages and average values are deduced from a study of the assay map of the mine workings made by the engineers of the Solar Development Co.

PROBABLE ORE.

We may infer that, since this ore shoot has been continuously productive to the 500 ft. level that it will extend at least an additional 100 ft. below the lowest present exposure.

This block of ground should yield 5,000 tons of the following average value as calculated from ore so far derived from this oreshoot.

Gold 0.14 oz. Silver 0.80 oz. Copper 3.53%

with gross and net values of $15.01 and $11.22 per ton respectively. This ore could be sorted to yield 2 000 tons of ore of previous shipping grade if desired, though naturally the mining costs will be increased proportionally.

POSSIBLE ORE.

There is a volume of ground between the 200 level and the surface directly above one section of the stoped ground which should be productive as appearances indicate that ore may persist in this direction. I believe a reasonable estimate of possible ore in this section of the shear is 5,000 tons. The assumed grade is the same as formerly produced.

There are also possibilities of ore at greater depths as well as laterally. I see no reason why other ore shoots should not be present in this zone which has been but little prospected.

The so-called number 3 vein which appears to be a similar shear is almost entirely unprospected except for a surface cut now caved. The ore in this shear zone is similar to that already mined. There is evidence that this zone was cut by the adit at a point about 640 ft. from the portal. A 3 inch stringer cut here in a shear zone about 8 ft. wide, gave values in gold, silver and copper comparable with the ore found in the productive zone. No exploration has been done here.

Lack of surface exposures make it difficult to estimate the probable length of the shear zones. Evidence disclosed by the adit however indicate that they have a length of at least 1000 ft. and surface topography indicates extensions in each direction amounting to several thousand feet.

ORE RESERVES

	Tonnage		Net Value P/T
Developed.	2760		$17.00
Probable 520-620 lev.	5000		11.22
Total	7760	Av. Value	$13.65 p/t.
Possible			
Surface to 200 level	5,000		$ 11.22

The possibilities of the property, in my opinion, have been scarcely touched and there are many areas in which ore may be expected. It is impossible to make a reasonably accurate estimate however.

EQUIPMENT.

The camp buildings located on top of the knoll from which previous mining operations were initiated, are in a state of disrepair and are of little present value as future operations will be conducted throught the adit level at the foot of the hill.

Miscellaneous equipment including hoists, pumps etc. is still intact and a blacksmith shop built by the Solar Development Co. is in good repair. The pipe line from the Saltchuck consisting of about 4000 ft. of 4 inch pipe and 2000 ft. of 3 inch is still in place except for a short section on the tailings dump at the Saltchuck property.

The railway, which is 42 inch gauge, 16 lb. rails will require a considerable expenditure of money although light loads approximating 2000 lbs. were taken over it during the past summer and fall. This railway passes about 1,000 ft. from the Saltchuck mill which is the logical and feasible place to handle the ore. Both properties are under the same ownership.

Mining operations can also be conducted from the Saltchuck property, so that the abandonment of camp buildings at the Bush and Brown is not an operating handicap.

COSTS.

Costs are estimated to be as follows, based on milling ore of the following average grade, Gold 0.13 oz. Silver 0.80 oz. Copper 3.0%, at a rate of 50 tons per day. With development theproperty may be able to produce at double the above rate.

Mining	$2.50
Development	.75
Haulage	.25
Local Transport.	.15
Milling	1.00
Overhead	.50
Marketing Conc. Ratio of Conc. 3.5	1.60
Total cost per ton	$6.75
Recovered Copper 90% Gold 85% Silver 85%	9.88

Profit per ton $3.13

CAPITAL REQUIREMENTS

If available, capital should be provided in the following amount

Completion of Adit	$2,000
Unwatering mine below 300 level	2,000
Sinking winze 200 ft.	4,000
Exploration in shear zones	6,000
Repair and extension of Railroad	7,000
Misc. Equipment including drills	2,000
Reserve	15,000
Total	$38,000

It is possible to operate on a more restricted schedule if necessary.

SUMMARY & CONCLUSIONS.

1. The property is favorably located with respect to market and transportation.

2. It has a production record of relatively high grade shipping ore.

3. The property has never had a milling plant which need is solved by the availability of the 200 ton plant at Saltchuck.
4. Persistence of ore shoots is indicated.

5. 2760 tons of ore which may be reasonably assumed to be in sight should yield an operating profit of $10 per ton. An additional 5,000 tons of probable ore on the basis of past production should yield a profit of $3.00 per ton.

8. Possibilities for extension of orebodies in every direction are good.
9. The ore is notable for it's relatively high gold content. compared to copper. It would be of interest to make comparative assays between copper, silica and gold.
10. Although a rise in the price of copper is not in prospect in the immediate future an increase of 1¢ per lb. is equivalent to at least $1.00 per ton.
11. Natural conditions are favorable for year round operation.
12. There is enough ore in sight to warrant re-opening the mine though naturally it's future value can only be determined by exploration and development

Respectfully Submitted,

(SGD) A. L. Howard

Feb. 13, 1935