

800233

THE BAYONNE MINE
NELSON MINING DIVISION
BRITISH COLUMBIA

The Bayonne Mine lies in the Bayonne Midge Creek area of the Eastern Mineral Survey District of British Columbia. It is situated west of Kootenay Lake and approximately eight miles due east of the former producing mines of the Sheep Creek district. The seventeen Crown granted mineral claims comprising the property are located on the south-westerly slope of John Bull Mountain, north of Bayonne Creek, a tributary of the West Fork of Summit Creek. They are identifiable as follows:

| | | |
|----|----------------|-----------|
| 1 | Kentucky | Lot 5966 |
| 2 | Maryland | Lot 5085 |
| 3 | Ohio | Lot 5962 |
| 4 | Columbus | Lot 5961 |
| 5 | Bayonne | Lot 5083 |
| 6 | Oxford | Lot 5084 |
| 7 | Virginia | Lot 6887 |
| 8 | Skookum | Lot 9360 |
| 9 | New Jersey | Lot 5967 |
| 10 | Delaware | Lot 5960 |
| 11 | Illinois | Lot 6888 |
| 12 | Ontario | Lot 13016 |
| 13 | Echo | Lot 13014 |
| 14 | Echo Frac. | Lot 13015 |
| 15 | St. Elmo Frac. | Lot 13018 |
| 16 | Portland | Lot 13017 |
| 17 | Idaho | Lot 13019 |

Accessibility

Between the years 1925 and 1930 a wagon-road was built from Tye Siding up Cultus Creek for about six miles and from this a pack-trail extended through a low pass to Canyon Creek and up Canyon Creek to the Spokane Mine on Wall Mountain. This trail was later extended to the Bayonne. The Bayonne road, carried through to the mine in 1935, followed the same route from the end of the wagon-road. Tye Siding is on the Kettle Valley Branch of the Canadian Pacific Railway running along the west shore of Kootenay Lake. This wagon-road, approximately 23 miles in length, was used by trucks in summer and caterpillar tractors during the winter. As the new Salmo-Creston Highway, scheduled for completion within a year, will pass within five miles of the Bayonne Mine no consideration is being given to the possible rehabilitation of this access route and its present condition is not known. The claims, present access route and property location are indicated on the accompanying sketch-maps.

History of the Property

The seventeen claims originally comprising the Bayonne and Echo groups were acquired under option agreement by Bayonne Consolidated Mines Limited in 1935. The Bayonne Group was staked in 1901 and the claims Crown-granted in 1904. The Echo group was staked a few years later but the claims were not brought to

Crown-grant until 1935. Prior to the year 1915 the vein system was explored on three horizons but the property remained relatively inactive from that time to the year 1929. From 1929 to 1935 work was done intermittently but it was during this period that the road to the Spokane Mine was completed and eventually extended to the Bayonne in the summer of 1935. In the fall of that year a 36 ton shipment of high grade ore was made to the Trail smelter and control of the property then passed to Bayonne Consolidated Mines Limited.

Construction of a 60 ton cyanide plant and an underground development program were initiated in 1936 and the property brought into production in November of that year. Production was relatively continuous throughout the years 1937 and 1938 but was curtailed in 1939 in favor of an extensive exploration and development program. This program proved up sufficient ore to maintain continuous production from April 1940 to August 1942 at which time labor and material shortages forced cessation of operations for the duration of the war. The property remained inactive throughout 1943 and 1944 but was re-opened and renovated in the late summer of 1945. From that time to July 1946 development work was concentrated on the "A" vein. A shaft was sunk from No. 8 Level of the "A" vein and No. 9 Level opened. Milling operations were resumed but, once again, shortage of labor and materials forced closure in July 1946. Between the years 1947 and 1951 various lessees removed some 1,000 tons of ore from the workings but there has been no activity on the property since that time. It is estimated that throughout its productive life, the Bayonne property processed or shipped a total of 85,000 tons of ore for a recovery of 40,000 ounces of gold and 95,000 ounces of silver. A single dividend in the amount of \$25,000.00 was paid in the year 1942. It should be noted that this production was achieved despite a severe transportation problem as well as the labor and material shortages prevalent during and immediately following the cessation of hostilities.

Geology

The Bayonne property lies near the southwest corner of a large area of intrusive rocks known as the Bayonne batholith. Rice, in Memoir 228, Geological Survey of Canada comments on the highly variable nature of this batholith but classes its average composition as that of a fairly alkaline granodiorite. A striking feature of the rock in the immediate vicinity of the Bayonne holdings is the variation and grain size and color even within the confines of a single exposure.

The Bayonne vein system is a zone of fracturing striking north 60 to 80 degrees east with an almost vertical dip. Rice describes the wall-rock as "fine-grained, light-coloured, biotite hornblende granodiorite altered to a talc-carbonate rock for a distance of two to three feet on either side of the vein." The fracture zone tends to split into branches at various points, with the branches following the general strike or diverging at

considerable angles. Generally speaking, however, it is fairly regular as to strike and, depending on its width, is filled in whole or in part, with quartz. Where the zone is two feet or less in width it is usually filled with quartz but, where wider the quartz appears in two or even three veins separated by granodiorite. Where branches diverge, however, the zone may be as much as ten feet wide and still filled, across its total width, with quartz.

Referring again to Memoir 228 published in 1941 Rice states: "The bulk of the ore milled was mined from the oxidized zone which extends down the vein to a maximum depth of 450 feet. In this zone the sulphides have largely disappeared, their place being taken by limonite and minor amounts of secondary lead and zinc minerals. The bottom of this zone is characterized by a rather abrupt transition from highly oxidized and leached material to primary sulphides with little or no trace of oxidation or leaching."

Again Rice states: "The oxidized ore consists of an unattractive looking mass of limonite and rusty, honeycombed quartz. Yet this ore 150 feet from the surface averaged 1 to 2 ounces of gold a ton and assays as high as 12 ounces a ton have been obtained. Below the oxidized ore shoots there is a zone, apparently in primary ore, which assays from 0.5 to 1 ounce of gold a ton. This zone extends to a depth of 50 feet below the limit of oxidized ore. Below this zone again there is little or no change in the appearance of the ore, but the values drop to about 0.40 ounce gold a ton. The most plausible explanation of this rich zone is that some of the gold has come from the zone above and has been deposited in some form not yet recognized." The sulphite content of each ore shoot, however, appears to be decreasing at depth. Indeed, little or no commercial ore was encountered in No. 8 adit under productive shoots in the levels above. The change in gold content may, therefore, be due to zoning in the primary ore rather than enrichment of the sulphides. At the present time there are four known veins on the Bayonne holdings, namely the Main Vein, The "A" Vein, The South Vein and The North Vein. All four veins appear to converge in the vicinity of #2 Level Portal of the Main Vein as shown on the attached print. Prior to 1937 all mining activity was confined to the so-called Main Vein and, so far as can be ascertained, development of the "A" Vein was initiated in 1938 from crosscuts driven from the Main Vein. As Memoir 228 is based on field work done during the seasons 1936, 1937 and 1938 Rice's statement that "little or no commercial ore was encountered in No. 8 adit under productive shoots in the levels above" has reference to No. 8 Level on the Main Vein. As indicated on the attached print ore blocks of substantial grade remain to be extracted on both the No. 8 Level and No. 9 Level of the "A" Vein.

Gold and silver, which constitute the principal metals of economic value in the ore appear to be associated with sulphides, principally pyrite, galena and sphalerite.

PRESENT CONDITION OF PROPERTY

1. Underground

The Bayonne Mine has been developed primarily along the strike of two of the four known veins, namely, the Main Vein and the "A" Vein. As noted previously all four veins appear to converge in the vicinity of the portal of No. 2 Level of the Main Vein. The accompanying maps, prepared by C. Rutherford P. Eng., R. B. King P. Eng., and staff following the cessation of operations in 1946 show:

1. Mine Plan
2. Longitudinal Section "A" Vein
3. Longitudinal Section Main and South Veins
4. Vertical Projections showing ore reserves on Main, South and "A" Veins.

During a recent visit to the property the writer attempted to gain access to some of the underground workings but met with limited success. This is understandable because of the gentle slope of the hill, the blocky nature of the hanging-walls and the stoping carried through to surface. On the Main Vein the condition of the seven adits is as follows:

No. 8 Level - Accessible for an unknown distance but blocky, partially decomposed granite in the roof makes entry extremely hazardous.

No. 6 Level - Caving from the 6 - 1 stope has blocked access at approximately 200 feet from the portal.

No. 5 Level - Entry blocked off with overburden from westend of 5 - 1 stope.

No. 4 Level - Accessible to western limit of 4 - 1 stope.

No. 3 Level - Caved at breakthrough to surface 100 feet from portal.

No. 2 Level - Caved close to portal.

No. 1 Level - Caved close to portal.

The "A" Vein was developed primarily from a crosscut driven from No. 8 Level of the Main Vein. From the point at which this crosscut intersected the "A" Vein the 8 AW Drift was driven south-westerly to break through to the surface approximately 1200 feet southeasterly of the No. 8 Level Main Vein Portal. The 8 AW Portal is in heavy overburden which has resulted in sluffing of the walls.

As the 8 AW Drift was driven southwesterly it has an adverse grade and all tramming to the surface was done through the cross-cut and the No. 8 Main Vein haulageway.

2. Surface

The following buildings have collapsed from snowload:

1. Concentrator
2. Assay Office
3. Dry
4. Cookhouse
5. Powerhouse

Remaining standing and in relatively good condition are the following:

1. The Refinery
2. Bunkhouses
3. One cottage
4. Stable
5. Steel Shop

Two large bunkhouses with accommodation for forty men are in excellent condition with the exception that the plywood partitions, plumbing facilities, etc. have been removed. In the case of other buildings left standing their use would involve principally a thorough cleaning.

The concentrator building is located on a flat bench running parallel to the slope of the hill. Its upper walls and roof were subjected, therefore, to severe snow loads. Its rehabilitation would call for a completely new structure. As the power plant, compressors etc. are housed in the south end of the mill building this section would also have to be rebuilt. Unfortunately the collapse of the concentrator building resulted in severe damage to equipment contained therein, principally in the cyanidation section of the operation.

3. Equipment

a) Mine

There is an adequate supply of mine cars, rail, etc. on the property to permit initiation of an exploration and development program. The few rock drills on hand are obsolete and some of the underground piping would undoubtedly have to be replaced. As horses were used for tramming there is no locomotive and the mucking machine has been disposed of.

b) Shops

There is little of salvage value remaining in the shops. Conventional drill steel was used at that time and the steel shop remains equipped with furnace, sharpener, etc.

c) Power and Compressor plant

This section of the operation comprises the following equipment:

1. Holman 2-stage compressor, symbol CB, Serial # 3484, Size 12 x 7.5 x 8, belt driven by a Petters Atomic Diesel Engine, 112 B.H.P., Serial # 220596, 410 R.P.M.
2. Canadian Ingersoll Rand Compressor -ER 2, Serial # 8443, Size 14 x 9 x 12, 250 R.P.M. driven by a Petters Diesel Engine on which no data are available.
3. A generator of unknown manufacture driven by a Fairbanks-Morse Diesel Engine, Model 32-E-14, 225 H.P., 300 R.P.M. This unit is direct-connected.

The Holman compressor and its power unit appear in good condition and could be rendered serviceable if parts are still available. The Rand compressor is an old model but certainly operable though it is doubtful that its power unit could be returned to service. In the case of the generator all copper has been removed and the unit would have to be shipped to Vancouver for rewinding. Here again reconditioning of the power unit does not appear warranted.

All five oil storage tanks distributed on the property are in excellent condition and could be placed into service following cleaning of the interior walls.

d) Mill

All ore was delivered to the coarse ore bunker via the #8 Level on the Main Vein or by truck from the upper levels. Beneficiation followed relatively standard cyanidation practice with the following equipment:

1. Traylor Type "H" 12" x 16" Saw Crusher with accessory conveyor system to the fine ore bin; this unit is in good condition but the conveyor system would have to be rebuilt and belts replaced.
2. Hardinge 6' x 24" Conical Ball Mill in closed circuit with Dorr 12" Duplex Classifier. Both units completely serviceable after minor repairs. Some spare liners, scoop lips, etc. are available.

3. The thickeners, agitators, solution tanks, clarifier and precepitation units have been damaged to an appreciable extent by the collapse of the building. All units, however, can be repaired should exploration warrant adoption of the cyanide process for beneficiation of the ore.
4. All refinery equipment is on hand and in good condition.
5. Several pumps, both centrifugal and suction, are buried under the wreckage of the mill building. Most of these should be salvable.

It should be noted here that all electrical equipment has been removed from the property. This includes motors, starting units, service boxes, etc.

Present Potential of the Property

On the accompanying map Messrs. Rutherford and King summarize ore reserve blocks as follows:

| <u>VEIN</u> | <u>TONS</u> | <u>WIDTH</u> | <u>GRADE</u> <u>oz/Au/ton</u> |
|-------------|--------------|--------------|----------------------------------|
| A | 6,300 | 21" | 0.72 |
| South | 3,300 | 19" | 0.81 |
| Main | <u>1,400</u> | <u>17"</u> | <u>0.87</u> |
| TOTAL | 11,000 | 20" | 0.76" |

Converting the above summary to a percentage tonnage and ounce basis you have:

| <u>VEIN</u> | <u>% OF</u> <u>TOTAL TONNAGE</u> | <u>% OF</u> <u>TOTAL OUNCES</u> |
|-------------|-------------------------------------|------------------------------------|
| A | 57.3 | 54.2 |
| South | 30.0 | 32.0 |
| Main | <u>12.7</u> | <u>13.8</u> |
| TOTAL | 100.0 | 100.0 |

Disregarding the probable addition to the above reserve and assuming an 80% recovery of the indicated blocks, an 85% plant recovery and a 10% grade dilution after sorting you still have approximately \$180,000.00 to offset partially pre-production and operating costs. The inference must not be drawn from the above statement that immediate consideration should be given to planning production. The writer is very definitely of the opinion that the present reserve tonnage should be added to substantially before any consideration whatsoever is given to the production stage.

It is felt that the chances of increasing this reserve tonnage are good as there are numerous locations, both underground and on surface, where exploration is fully warranted. Some of these are enumerated herewith:

1. The easterly, westerly and down-dip projection of the "A" Vein from the 9 AW drift.
2. The area lying above the 7 AE drift east of the 7 AIE stope.
3. The area lying above #6 Level of the Main Vein and below the 4 - 3 stope.
4. The area down-dip and east of the point of intersection of the veins.
5. The North Vein which appears to strike due west from the intersection point and on which a very small amount of surface trenching has been done.
6. The area lying south and southeast of the 8 AE Portal. This is considered as potential area for another vein.

The above list will undoubtedly be added to when access to underground workings is feasible. Based on available information, branch veins enter the hanging and footwall at numerous locations and geological mapping, where access is economically practical, might prove very informative. An appreciable amount of diamond drilling was done between 1936 and 1941 but, unfortunately, the records are not available. Most of the holes were drilled horizontally in an effort to locate parallel veins. As the vein material does not core readily its intersection by drilling may easily be reported as "lost core" unless sludge samples are taken.

Referring again to the reserve tabulation it is interesting to note that reserve blocks lying between the 8A and 9A drifts, though in the primary zone, show an average grade not much below the average of many blocks in the oxidized zone. The "A" Vein reserve contains 57% of the total reserve tonnage and 54% of the total reserve ounces. The blocks said to be in the primary zone contain respectively 63% and 66% of the above percentages. It should be noted however that the two lowest blocks, namely Nos. 10 and 11, are below average grade.

Because past performance records are not available a cost comparison in the event of production is not possible but the following points are worthy of note:

1. With the advent of the new Salmo-Creston highway transportation costs will be greatly reduced.

2. Labor costs will be higher but improved techniques should offset the increase in the cost of materials.
3. Average grade of ore processed will be lower but recoveries should be substantially higher.

At this point attention should be drawn to the low gold recovery per ton of ore processed as indicated by existing records. If one accepts the production figure of 40,000 ounces of gold from 85,000 tons of ore --- which indicates a recovery of 0.47 ounce per ton --- it follows that one must also accept one or more of the following points:

1. The ore in place was not as high grade as indicated.
2. Excessive dilution in stoping.
3. Poor sorting.
4. Low recovery by cyanidation.

The writer is inclined to the acceptance of a combination of the last three points for the following reasons:

1. Stopes at present accessible are very wide in comparison to the width of the vein. Admittedly the blocky nature of the hanging wall promotes dilution.
2. The sorting arrangement in the crushing plant is inadequate.
3. Practically all the tonnage processed originated in the oxidized zone and was probably not readily amenable to cyanidation.

With reference to the last item a study of the old flow-sheet leaves one with the impression that grinding facilities were inadequate to expose the gold for dissolution, that dissolved losses were excessive and that sliming created a serious operating problem. Should production studies become warranted the writer would suggest that, in view of the present condition of the cyanidation section of the plant, its replacement by a jigging and flotation circuit be given consideration. This would call for preliminary laboratory testing and market studies but the small outlay involved might be well worthwhile. This step would not have been economical in the past because of the transportation problem but might well prove financially advantageous should operations be resumed under the new transportation conditions. If the ore is amenable to jigging and flotation and a readily

marketable product, or products, is attainable the increase in silver recovery, plus any revenue derived from base metal content, should more than offset the cost of shipping a concentrate.

CONCLUSIONS AND RECOMMENDATIONS

Following two visits to the property, discussions with Mr. R. B. King and a study of all available data the writer concludes that the property warrants further investigation for the following reasons:

1. The extent, grade and location of the reserve blocks outlined by Messrs. Rutherford and King on the accompanying maps.
2. The numerous underground locations which offer further exploration possibilities.
3. The possible eastward and westward extension of the vein fissures.
4. The limited amount of work done on the westward projection of the North Vein. A chip sample taken from an ore dump lying alongside a shallow shaft 200 feet north of #3 Level Portal assayed 1.42 ounces per ton.
5. The possibility of uncovering parallel veins by surface trenching.

In view of the foregoing the writer recommends an initial program along the following lines:

1. Conduct a right-of-way survey and construct a rough access road from the new Provincial highway to the property. Financial assistance may be obtainable from the Provincial Government and/or from the logging company holding timber limits in the area.
2. Recondition one of the bunkhouses or, as an alternative, establish a tent camp on the property.
3. Re-open the #8 Level on the Main Vein to provide access to the 8A drift through the connecting crosscut.
4. Dewater #1 shaft and the 9A drift to permit examination and resampling of the indicated ore blocks.

5. Resample all reserve blocks to which access can be gained at reasonable cost.
6. Cut surface trenches at various locations across the strike of the North Vein and in the depressions lying south and southeast of the 8A Portal.
7. If results justify the expenditure a portable compressor could then be taken into the property. This would permit the establishment of drill stations to test favorable zones by diamond drilling.

Without a right-of-way survey and with no knowledge of the extent of the work involved in re-opening No. 8 Level the writer is unable to prepare a cost estimate for this program but would place the capital outlay required in the \$40,000 to \$50,000 range.

Respectfully submitted

George L. Mill, P.Eng.

2820 Birch Street,
Vancouver, B.C.

July 26th, 1962.

GLM-s

I, GEORGE I. MILL, HEREBY CERTIFY----

1. That I reside at 2820 Birch St., Vancouver 9, B.C.
2. That I am a graduate of Queen's University, B.Sc., and a registered member of the Corporation of Professional Engineers of the Province of British Columbia.
3. That I have practised my profession for 31 years.
4. That I have no direct or indirect interest in the financing of this program nor any connection, financial or otherwise, with individuals involved in the financing of the program except as pertain-
to fees for professional services rendered.
5. That I do not expect to obtain any such interest.
6. That information contained in this report is based on personal inspection of the property in question, on discussions with engineers familiar with the property and on data compiled from existing records and reports.

GEORGE I. MILL

To accompany report on Bayonne Mine.

Vancouver, B.C.
July 26th, 1962.