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REPORT
ON THE
SILVER KING MINE
NELSON M.D.
for
NEW CRONIN CABINE MINES LIMITED

by
M. K. Lorimer, P.Eng.

23 January, 1967

Hill, Manning & Associates Ltd.

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January 30, 1967.

The President and Directors,
New Cronin Babine Mines Limited,
Vancouver, B. C.

Dear Sirs:

The following report describes the Silver King Mine near Nelson, B. C., summarizes the exploration work carried out in the 1965 and 1966 seasons, details the ore reserves and assesses the economics of putting the property into production.

SUMMARY:

Exploration work on the Silver King property near Nelson, B. C., was commenced by New Cronin Babine Mines Limited in 1965 and continued in 1966.

Diamond drilling and underground sampling have proved ore reserves of 63,400 tons of ore grading 8.4 ounces of silver per ton, 2.2 per cent copper and 1.0 per cent lead. Ore of this grade has a net smelter return value of \$26.76 per ton, or a total of \$1,714,600. Pre-production, production, capital and exploration costs are estimated at \$1,613,300, leaving a profit of \$101,300 exclusive of financing charges.

Probable ore is estimated at 36,000 tons grading 12.8 ounces of silver per ton and 1.8 per cent copper. The estimated profit from this ore is \$373,800.

There are several places where ore may possibly be located.

Preliminary metallurgical tests have shown that 85 per cent of the silver and 87 per cent of the copper can be recovered in a concentrate grading 93 ounces of silver per ton and 25 per cent copper.

SUMMARY: (Continued)

The pre-production and production costs will rise to a maximum of \$962,000 before receipts from the sale of concentrates are available.

The prospects of the property becoming a small but profitable mine are considered good. The assured profits from the proven ore should be increased by mining some, if not all, of the probable ore and by an expected increase in the price of metals, particularly silver.

It is recommended that the property be put into production on a 200-ton per day basis and that exploration work be continued to prove additional tonnages.

LOCATION:

The Silver King property is located on Toed Mountain about 4 1/2 miles south of Nelson and at an average elevation of 6,000 feet above sea level. It is readily accessible from Nelson, a road distance of 8 miles. Its geographical location is 49°25' N Latitude, 117°18' W Longitude., National Topographic Sheet 82 F 6 West.

Nelson is an important distributing and administrative centre for the West Kootenay region. It is located on the West Arm of Kootenay Lake. Highways lead to the east, west and south. Both the Canadian Pacific and Great Northern Railways serve the city. Daily air connections with Vancouver and Calgary are available at Castlegar, 28 miles to the west. Plate 1.

CLAIMS:

The property consists of 32 claims and fractions. Of this total, 24 are Crown Grants, 2 are Mineral Leases and 6 are located mineral claims.

The claims are listed below:

<u>Claim</u>	<u>Type</u>	<u>Number</u>	<u>Owner</u>
Grizzley Bear	Crown Grant	L105 ✓	Cominco
Kootenay Bonanza	Crown Grant	L140 ✓	Cominco
Silver King	Crown Grant	L141 ✓	Cominco
American Flag	Crown Grant	L142 ✓	Cominco
Democrat	Crown Grant	L230	Cominco
Dandy	Crown Grant	L231 ✓	Cominco

CLAIMS: (Continued)

<u>Claim</u>	<u>Type</u>	<u>Number</u>	<u>Owner</u>
Forrest	Crown Grant	L233 ✓	ComInco
New Market	Crown Grant	L235 ✓	ComInco
Kohincor	Crown Grant	L245 ✓	ComInco
Young Dominion	Crown Grant	L254	ComInco
Kannah	Crown Grant	L371 ✓	ComInco
Hidden Treasure	Crown Grant	L411 ✓	ComInco
Ollie	Crown Grant	L412 ✓	ComInco
+ Etna	Crown Grant	L414 ✓	ComInco
Money Market	Crown Grant	L3252 ✓	ComInco
O. V. G.	Crown Grant	L3254	ComInco
+ Victor Fr.	Crown Grant	L12273 ✓	ComInco
Starlight Fr.	Crown Grant	L12274 ✓	ComInco
Silver Queen	Crown Grant	L105A ✓	I.C. Marquis
Lulu	Crown Grant	L247 ✓	I.C. Marquis
Copper King	Crown Grant	L417 ✓	I.C. Marquis
Grandview	Crown Grant	L685 ✓	I.C. Marquis
- Eureka	Crown Grant	L3255	I.C. Marquis
Union Jack	Crown Grant	L244 ✓	N.A. Hager
Ivanhoe	Mineral Lease	M60 ✓	L. Telfer
Cariboo	Mineral Lease	M70	New Cronin Babine -
Sheri Fr.	Mineral Claim	7304 ✓	R. Palmer
Jim Fr.	Mineral Claim	7305 ✓	R. Palmer
- Brenda Fr	Mineral Claim	7435	R. Palmer
Goldendale	Mineral Claim	7895	New Cronin Babine -
C. O. D.	Mineral Claim	7896 ✓	New Cronin Babine -
Royal Charter	Mineral Claim	7893	New Cronin Babine -

All claims not owned by New Cronin Babine Mines Ltd. are held under agreements with the registered owners. Plate II.

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TOPOGRAPHY:

The property lies on the northern slope and summit of a shoulder on Toad Mountain. The general topography is hilly with several benches and flat areas.

The lower slopes carry heavy overburden. Rock outcrops are confined to the upper portions.

Giveout Creek, an important source of water throughout the year, flows through the western and northwestern parts of the property.

HISTORY: (Continued)

The shut-down was due to unsatisfactory development at depth and to the fact that the operators did not keep development work sufficiently far ahead of mining to allow uninterrupted and economic extraction of ore. Even during the productive period, the years 1898 and 1900 were largely devoted to development work.

The former superintendent, H. S. Davys, leased the property in 1903 and operated in a small way. In 1904, Davys entered into a partnership with the Hall Mining and Smelting Company, the successor to Hall Mines Co. Ltd. It was proposed to concentrate efforts below the 7 level. A diamond drill hole gave an ore intersection grading 16 to 18 oz. silver per ton and 2 per cent copper at a depth of 1,200 feet. This was regarded as an important discovery at depth.

In the next three years only about 4,000 tons of ore were mined. Plans for dewatering the shaft and developing the lower levels were not carried out. The Kootenay Bonanza shaft was sunk to 35 feet. The partnership agreement was terminated in 1906. As a final blow, the smelter was closed in 1907 because of a shortage of Silver King and custom ores.

In 1908 the property was leased to the Kootenay Development Syndicate. Mining was carried out in a small way, the ore being sent to Trail. A power line was built to the mine and all necessary electrical installations made for extensive work on the Dandy Level and below.

A big fire in 1909 destroyed part of the surface installations and put the mine out of operation for two months. After producing 1,589 tons, the property was closed down for lack of capital in 1910.

A merger of the Hall properties and nearly all other properties on Toad Mountain was made in the fall of 1910 with the object of developing the Silver King at depth and developing other properties as well. However, little was accomplished.

A controlling interest was purchased by the Consolidated Mining and Smelting Company in 1912. In the next two years the Dandy tunnel was driven to a connection with the shaft, the surface plant was rebuilt, mining was carried out in a small way in the glory hole and in three small 5 level stopes, and 5,000 feet of diamond drilling done. After producing 13,421 tons grading 8 oz. silver and 2 per cent copper in 1914, the mine was closed due to war conditions.

HISTORY: (Continued)

During the war years a small amount of development work and 6,485 feet of diamond drilling were done but there was no production and no additions to the plant. The property was closed again in 1919.

Except for a few small leasing operations the mine has been dormant since 1919.

GEOLOGY:

The Silver King Mine lies in a region where fine-grained intrusive rocks grading from porphyritic syenites to quartz diorites have intruded augite porphyries of the older Rosslund Formation.

In the immediate area of the mine, monzonite stocks and dykes are intrusive into augite porphyry with the resulting development of schists. A band of coarse augite porphyry is prominently displayed to the north of the mine and is also to be seen to the south where it apparently dips below the surface rocks. Plate III.

The intrusive activity apparently resulted in the development of several strong shears and tension fractures which were later mineralized. Three of these shears, the Silver King, Kohinoor and Iroquois veins, are parallel, striking S 60°E and dipping at 60 to 70 degrees to the south. Another strong vein, known as the South Vein, strikes due east and intersects the Main or King Vein.

The productive ore bodies occurred where the tension fractures meet the Main and South Veins and where the Main and South Veins intersect. Also, the localities are in the coarse augite porphyry where, presumably, the fractures were best developed. The resulting ore bodies were up to 50 feet wide and had a rake to the east-south-east.

The metallic minerals are chalcopyrite, bornite, tetrahedrite, stromeyerite, galena, sphalerite, malachite, azurite, pyrite and manganite. The stromeyerite is believed to be the only important argentiferous mineral. Galena is scarce at the eastern end and strengthens towards the west. Sphalerite and pyrite are comparatively unimportant.

DEVELOPMENT:

The mine was developed from the Number 5 level which was the main haulage level. Its portal, at 6,000 feet elevation, was at the upper end of the aerial tramway. This level is open and readily accessible except for a few minor cave-ins. The stopes generally have a tangle of caved timber and ore at the bottoms but most of them are accessible although probably not entirely safe. The hanging walls appear remarkably sound. Plates IV and V.

Number 4 level, 200 feet above Number 5, was also used as a haulage level, the ore being sent down to the main aerial tramway at Number 5 portal by means of a short aerial tramway. This level originally led to the bottom of the Kootenay Bonanza Shaft, 1,500 feet from the portal. This shaft was sunk from the surface from a high grade outcrop and is 280 feet deep. From the Number 4 level, stoping was carried up to the surface and an open pit was developed. Subsequent caving has rendered this level impassable in the stoped areas. However, judging by the condition of other drifts and cross-cuts in the mine, it is expected that the cross-cut from the stoped areas to the Bonanza Shaft will be open.

Numbers 1 and 3 levels, above Number 4, were largely destroyed by open pit operations and stoping from 4 level.

An internal 500-foot shaft was sunk from Number 5 level to Number 10 level. Because of the water flowing down the shaft, the timbers have been well preserved and even the manway ladders are still useable.

Numbers 6 and 7 levels are accessible by climbing up the shaft from the Dandy level. They are in good condition except for the stoped areas.

Since levels 8, 9, and 10 are flooded, they have not been examined recently. Old maps show that approximately 2,500 feet of level development has been done.

The Dandy level was collared at an elevation between Numbers 7 and 8 levels and driven approximately 2,000 feet to connect with the shaft. This level is in good condition and has track throughout its length. Several small stopes have been worked from the Dandy. It drains the upper portions of the mine. Below this level the mine is flooded.

DEVELOPMENT: (Continued)

Most of the mine production came from above Number 5 level. This area must be considered largely worked out but there is still ore in sight in pillars and stope walls. Below 5 level there is one stoped area which decreases in length with depth and eventually pinches out at 8 level. In addition to these stoped areas, which are mainly on the Main and South veins, several small stopes have been developed and mined on tension fractures.

RECENT EXPLORATION:

New Cronin Bobine Mines Ltd. began an active exploration programme in June, 1965. Efforts were mainly directed towards finding extensions or branches of the main vein by diamond drilling. Considerable work was done on the access and property roads and the caved portal to Number 5 level was opened up.

In 1966, the diamond drilling was continued with particular emphasis on the ground between the Dandy and No. 5 levels, below the Dandy and in the vicinities of the Kohinoor and Iroquois veins. Much time and money was spent on a new access route. Underground sampling was also started and the dumps were surveyed and sampled.

These developments will be discussed more fully under their respective headings.

ROADS:

In 1965 the mine was reached by travelling the old wagon road originally built about 1890 but modified in recent years by loggers. This road, about 11 miles long, was narrow, rough and poorly drained.

A logging road built since World War II led up the valley of Giveout Creek and passed within a mile of the mine. This route was four miles shorter than the old road. Most of the road was in good condition and only a half-mile connection near the mine was needed to give access to the Silver King.

Because a portion of the road was blocked by private property, negotiations had to be undertaken to acquire access rights. These were completed early in 1966. In addition, the Department of Mines and Petroleum Resources agreed to pay half the cost of repairing the road and installing culverts in accordance with the requirements of the Water Resources Service. This work was completed late in 1966.

Roads within the property have been built and repaired to give 4-wheel drive access to the mineralized areas and to the lake.

DIAMOND DRILLING:

In 1965, 28 holes with a total footage of 6,596 feet were drilled from the surface. Most of these holes were drilled to the east of the old workings and in the general area of the Kootenay Bonanza shaft and pit. The purpose of the drilling was to check for extensions of the main vein, to check the Grizzly vein to the north and to locate mineralized cross veins in the Bonanza area. The last three holes were drilled to intersect the main vein between the Dandy and Number 5 levels. One hole was drilled to the west of the Dandy portal.

The holes which can be regarded as ore holes are listed below. (Holes drilled in the current programme have been given the prefix CB to distinguish them from the previous holes which were designated by simple numerals.

<u>Hole No.</u>	<u>Width (ft.)</u>	<u>Silver oz/ton</u>	<u>Copper (percent)</u>	<u>Lead (percent)</u>
CB 3	7.0	22.9	5.9	0.8
CB 8	8.0	5.9	1.8	4.2
CB 9	7.0	11.1	3.2	0.9
CB 10	5.0	11.6	2.4	0.4
CB 11	8.0	4.2	1.3	0.6
CB 18	4.0	3.2	1.6	1.4
CB 26	4.5	5.0	1.1	6.1

The first six of these holes proved the existence of a previously unknown ore body which has been named the King Vein. CB 26 located ore 100 feet below the 5 level portal and above a small stope which had been started from the Dandy level.

In the 1966 season, 16 AX diamond drill holes totalling 3,673 feet and 11 x-ray holes totalling 314 feet were drilled, all from the surface.

Five of the AX holes were drilled to intersect the Iroquois vein, a structure roughly parallel to the main vein and known to carry some mineralization. Although the intersections on the vein ranged from 6 to 32 feet, no commercial mineralization was located.

Two holes were drilled to intersect the main vein between 5 level and the Dandy in an effort to locate more ore shoots. One hole intersected 7 feet of sub-marginal mineralization, the other failed to intersect any mineralization.

Five holes were drilled to intersect the main vein below the Dandy level. None of them showed commercial mineralization although one of them was marginal.

DIAMOND DRILLING: (Continued)

Both of the pit footwall holes intersected mineralization. The first located two separate veins one of which would have made an acceptable pit ore if it had not been so far from the pit wall. The second hole was collared in mineralized material which was six feet thick. Unfortunately the core from this section was lost during casing operations. However, these intersections indicated the presence of one or more veins branching from the main vein and influenced the decision to drill short x-ray holes into the pit footwall.

Seven x-ray holes were drilled into the footwall, two into the hanging wall and two into the footwall of a smaller pit to the west. Four of the main pit footwall holes located mineable pit ore. The hanging wall holes were unsuccessful. Both the holes in the smaller pit intersected material which is sub-marginal in view of the amount of waste to be removed. These two intersections apparently represent another branching vein.

The holes which can be regarded as pit ore holes are listed below.

<u>Hole No.</u>	<u>Width (ft.)</u>	<u>Silver oz/ton</u>	<u>Copper (percent)</u>	<u>Lead (percent)</u>
CBX 3	6.0	0.3	1.0	0.2
CBX 4	5.0	5.3	1.2	-
CBX 5	20.0	3.6	1.8	-
CBX 6	12.5	1.8	1.1	0.8

UNDERGROUND SAMPLING:

A total of 93 underground samples were cut and assayed. Most of these were taken on the Dandy level where old assay plans showed high grades over narrow widths. In order to establish the ore potential, samples were cut over a width of four feet regardless of vein width. Two sections with a total length of 170 feet were found to be of ore grade.

24 samples were cut along a mineralized drift on 7 level and 6 samples were taken from the back of an old stope on 5 level. No ore was found in either place.

The results of this sampling are by no means a complete assessment of the underground possibilities except in the case of the Dandy level. Pillars and stope walls in and around the old workings show much high grade mineralization still in place. They were not sampled because the Inspector of Mines ruled against crews entering the old stopes until they had been rendered safe. Because of a lack of time and qualified personnel, this work could not be done.

DUMPS:

Former operators left several small dumps of obviously hand-sorted ore at the portals of 4 and 5 levels and in the pit. Six of these dumps were surveyed and sampled. The sampling was done by digging into each dump at several points with a front-end loader. The recovered sample was coned and quartered to reduce it to assay size. Five of the dumps were found to be rich enough to cover handling and milling costs.

ORE RESERVES:

A. Proven

As a result of the exploration work done so far, proven ore reserves have been established as follows:

<u>Place</u>	<u>Tons</u>	<u>Silver oz/ton</u>	<u>Copper (percent)</u>	<u>Lead (percent)</u>
King Vein	40,725	10.1	2.8	0.7
Dandy D45	1,018	6.6	0.6	4.3
D50	2,400	8.0	1.1	3.6
Open Pit	6,777	2.9	1.2	0.3
Dumps #1	3,600	2.2	0.8	0.2
#3	404	3.8	1.8	0.2
#4	471	3.7	1.6	0.2
#5	317	1.9	1.0	0.2
#6	<u>1,691</u>	<u>8.0</u>	<u>2.9</u>	<u>0.3</u>
Total	63,403	8.4	2.2	1.0

Ore of this grade has a Net Smelter Return value of \$26.76 per ton.

In arriving at these figures a tonnage factor of 11 cubic feet to the ton has been used for ore in place and 17 cubic feet for dump ore. Ore in place has been diluted 10 per cent and the dilution material has been given an assumed grade equal to one tenth that of the ore.

B. Probable:

The ore reserves which may be classed as probable are based on old assay plans, a knowledge of the geology and on personal observations. None of these have been drilled or sampled by New Crown Babine Mines. The plans used were furnished by Cominco and are considered reliable.

ORE RESERVES: (Continued)

The probable ore reserves are as follows:

<u>Place</u>	<u>Tonnage</u>	<u>Silver (oz/ton)</u>	<u>Copper (percent)</u>	<u>Lead</u>
Bonanza Pit	25,000	14.9	1.7	No assays
Main Pit	1,000	14.0	2.8	No assays
Underground	<u>10,000</u>	<u>7.6</u>	<u>1.8</u>	No assays
Total	36,000	12.8	1.8	

Ore of this grade has a Net Smelter Return value of \$26.84 per ton.

C. Possible

Possible ore reserves may be located in five main areas. These areas are:

1. Down the rake of the mined ore bodies and on the junction of the Main and South veins particularly below 7 level.
2. In pillars and stope walls in and around the mined areas.
3. West of the shaft and well below the Dandy level.
4. West of the Dandy portal.
5. In cross-fractures in the mine area. The drilling to date in this area has been at right angles to the main vein and could easily have missed cross-fracture ore-bodies. Several of these fractures were the locations of productive stopes in the past.

The locations of proven, probable and possible ore are shown on Plate V.

METALLURGY:

A sample of ore taken from underground was sent to Britton Research Limited for metallurgical testing. Unfortunately the chosen sample did not conform closely to the mine average, particularly in regard to lead, in which it was much too low. Because of the low lead assay, no attempt was made to produce a lead concentrate.

METALLURGY: (Continued)

According to the Britton report, a copy of which is attached (Appendix A), it is possible to recover 85% of the silver and 87% of the copper. The resulting concentrate contains 143 ounces of silver to the ton and 25 per cent copper plus non-commercial amounts of lead, zinc, gold and iron. Further testing would probably increase these recoveries and might indicate the advisability of producing a lead concentrate as well.

Applying these recoveries to the average Silver King ore, the actual concentrate shipped would contain 93 ounces of silver per ton and 25 percent copper for a net smelter return value of \$329.25 per ton at the mill. The concentrate would weigh 7.7 per cent of the ore weight.

On the basis of this metallurgical testing and on the prices prevailing in December, 1966, the net smelter return values of silver and copper are:

Silver: \$1.00 per ounce

Copper: 0.39 per pound

These values have been used in all financial calculations in this report. Lead has been given a net smelter return value of \$0.06 per pound.

DEVELOPMENT:

In working out development costs it is assumed:

1. That the mill would be in the vicinity of the Dandy portal.
2. That as much ore as possible would be handled underground because of the heavy snow in winter.
3. That the dumps would be handled by loader and truck.

King Vein:

For mining the King Vein, the following work would have to be done:

A drift 600 feet long would have to be driven in the footwall of the Main Vein in order to bypass the extensive caved areas on 4-level. This drift would connect with the cross-cut to the Bonanza Shaft. The cross-cut would have to be cleaned out and pipe and track would have to be installed. Another cross-cut would be required from the Bonanza Shaft area to the King Vein. Raises and sub-drifts would have to be driven in the King Vein so

DEVELOPMENT: (Continued)

as to provide as many working faces as possible.

For handling the King Vein ore, an ore pass would be required from 4 level down to the Dandy level with a connection at 5 level. A grizzly on 4 level, a control or by-pass chute and grizzly on 5 level and a chute on the Dandy level would also be required.

Dandy Level:

The Dandy level would require new track for handling production tonnages.

Open Pit:

A raise from 4 level to the open pit would have to be driven to handle ore from the pit and from Number 6 dump.

Dumps:

The dumps other than Number 6 would require no development work other than road repairs.

DEVELOPMENT COSTS:

The development costs have been calculated as follows:

King Vein:

By pass drift	\$ 36,000	
Reconditioning 4 level	3,135	
Cross-cut to King Vein	16,500	
Main King Vein Raise	22,070	
Sub drift	2,400	
Raises	23,600	
Total	\$103,705	
Cost/ton ore handled		\$2.55

Ore Pass System:

Raises	\$ 15,600	
Grizzlies	400	
Chutes	1,000	
Total	\$ 17,000	
Cost/ton ore handled		\$0.35

DEVELOPMENT COSTS: (Continued)

Dandy Level:

Replacing ties and rails	\$ 4,415	
Cost/ton ore handled		\$0.08
Preparing D45 stope	1,866	
Cost/ton ore handled		\$1.83
Preparing D50 stope	2,156	
Cost/ton handled		\$2.57

Coen Pit:

Pit ore pass	\$ 3,400	
Chute & grizzly	1,000	
Total	\$ 4,400	
Cost/ton handled		\$0.65

Dumps:

Road repairs	\$ 1,000	
Cost/ton handled		\$0.92

TOTAL DEVELOPMENT COST \$134,542

PRODUCTION COSTS:

The estimated production costs for the various working places are set out in the following table on a per-ton basis:

	<u>King</u>	<u>D45</u>	<u>D50</u>	<u>Pit</u>	<u>Dump 1</u>	<u>Dumps 3,4,5</u>	<u>Dump 6</u>
Breaking	1.30	1.30	1.30	1.00	-	-	-
Scraping	1.80	1.80	1.80	-	-	-	-
Timber	0.15	0.15	0.15	-	-	-	-
Tramming	1.82	0.60	0.68	1.54	-	-	1.54
Loading	-	-	-	0.68	0.59	1.18	0.68
Trucking	-	-	-	-	0.37	0.74	-
Development	2.93	1.85	2.61	1.08	-	0.92	1.08
Milling	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Sub-total	13.05	10.70	11.54	9.30	5.96	7.84	8.30
General and Administration	3.26	2.68	2.83	2.32	1.49	1.96	2.08
TOTAL	16.31	13.38	14.42	11.62	7.45	9.80	10.38

MILLING:

The milling costs cannot be accurately calculated at this stage. They will depend on the daily tonnage, the mill design, the efficiency of the crew and the number of metallurgical problems. For the purposes of this report a daily rate of 200 tons and a cost of \$5.00 per ton have been assumed.

PRODUCTION PROFITS:

The calculated production profits for the various working places are given in the following tables:

A. Proven Ore:

Place	Tons	N.S.R.Value per ton	Total Value	Production cost/ton	Total Cost	Profit
King	40,725	32.73	1,334,966	16.31	664,225	670,741
D45	1,018	16.44	16,736	13.38	13,621	3,115
D50	8,400	20.90	175,560	14.42	121,128	54,432
Pit	6,777	12.62	85,526	11.62	78,749	6,777
Dump 1	3,600	8.68	31,248	7.45	26,820	4,428
3	404	18.08	7,304	9.80	3,959	3,345
4	471	16.42	7,734	9.80	4,616	3,118
5	317	9.94	3,151	9.80	3,107	44
6	1,691	30.98	52,387	10.38	17,553	34,834
Totals	63,403		1,714,612		933,778	780,834

The above costs include all development costs and an allowance for general and administration costs equalling 25 per cent of the calculated production and development costs.

B. Probable Ore:

Place	Tons	N.S.R.Value per ton	Total Value	Production cost/ton	Total Cost	Profit
Bonanza	25,000	28.16	704,000	16.31	407,750	296,250
Pit	1,000	35.84	35,840	11.62	11,620	24,220
Under-ground	10,000	21.64	216,400	16.31	163,100	53,300
Totals	36,000		956,240		582,470	373,770

These probable profits have not been included in the feasibility calculations in this report.

PRE-PRODUCTION PROGRAMME:

Before production could be started it would be necessary to complete all development work, have mining operations well under way, establish a stockpile, build a mill, erect surface buildings, provide electric power, purchase mining equipment and carry out more exploration.

The development work would have to start at least two months before work was started on the mill. The drifting on 4 level to give access to the King Vein would be of prime importance, and the new track on the Dandy level would have to be started as soon as possible so that work on the ore pass system could be started. The ore pass would have to be completed in time to handle development ore from the King Vein which would have to be stock-piled at the mill. Development of the two ore bodies on the Dandy would also have to be completed in the first five months.

Because shrinkage stoping appears to be the most suitable method of mining the ore blocks, the breaking of ore would have to be well advanced before milling started since the bulk of the broken ore would have to remain in the stopes until the breaking was finished.

To ensure an uninterrupted flow of ore to the mill it would be necessary to establish a stockpile at the mill. By stock piling the readily available ore on the dumps and in the open pit, by developing and mining D45 stope and by bringing all development ore to the mill, it would be possible to establish a stockpile of over 18,000 tons before milling started.

The mill construction is estimated to require four months. It should be started two months and completed six months, after the development work is started.

Provision should be made for a continuation of exploration. It should be particularly directed towards proving the probable ore so that any ore proven can be made available when required.

A suggested pre-production schedule which would ensure an uninterrupted flow of ore to the mill follows:

- 1st month: Start 4 level development.
Replace Dandy level track

- 2nd month: Continue 4 level development
Start ore pass
Start surface buildings
Start exploration.

PRE-PRODUCTION PROGRAMME: (Continued)

3rd month: Start mill construction.
Recondition old 4 level crosscut.
Start King Vein crosscut.
Complete ore pass.
Haul dumps 1, 3, 4 and 5 to stockpile
Start open pit breaking.
Finish surface buildings
Develop D45 stope and break ore, tramming excess ore to stockpile.
Start and complete pit ore pass.
Continue exploration.

4th month: Continue mill construction
Finish King Vein cross-cut
Start King Vein stope development, tramming ore to stockpile.
Tram dump No. 6 to stockpile
Continue pit mining and tram to stockpile
Start D50 development
Continue exploration.

5th month: Continue mill construction
Continue King Vein stope development
Finish D50 stope development
Start D50 breaking
Continue pit mining and tramming
Continue exploration.

6th month: Complete mill construction
Continue King Vein development
Continue pit mining and tramming
Continue D50 mining.
Continue exploration.

7th month: Commence milling.

In order to take advantage of the snow-free summer months work should be started in May if possible.

The estimated costs of the pre-production programme are listed below:

Development	\$134,542
Mining and stockpiling	64,375
Mill	400,000
Surface buildings	50,000
Electric power	50,000
Mining equipment	130,000
Exploration	45,000
	<u>\$873,917</u>

} 275,000

PRE-PRODUCTION PROGRAMME: (Continued)

Since income from production would not be received for another month, add 7th month cost of \$ 78,023

Total Pre-Production Expenses \$951,940

A pre-production chart is given in Appendix B

CONCENTRATES:

In the first three months it is anticipated that the mill would handle 5,000 tons of ore per month and produce 385 tons of concentrate worth \$329.25 per ton net for a total net income of \$126,761 per month. After three months the milling rate should be 6,000 tons per month and the production 462 tons of concentrate for a monthly net income of \$152,113.

CASH FLOW:

The cash flow for the 18-month life of the property, based solely on the proven ore, is:

Month	Expenditure	Income	Accumulated	
			Debt	Profit
1	22,415		22,415	
2	121,500		143,915	
3	283,703		427,618	
4	147,042		574,660	
5	149,229		723,889	
6	150,028		873,917	
7	78,023		951,940	
8	72,102	126,761	897,281	
9	63,476	126,761	833,996	
10	72,085	126,761	779,320	
11	58,869	152,113	686,076	
12	58,869	152,113	592,832	
13	58,869	152,113	499,588	
14	58,869	152,113	406,344	
15	41,285	152,113	295,516	
16	34,314	152,113	177,717	
17	34,314	152,113	59,918	
18	2,432	152,113		89,763
19	--	11,524		\$101,287

The above figures do not include financing expenses and they assume a constant head grade and recovery rate at the mill.

CASH FLOW: (Continued)

If the operation ended after 18 months the mill and mining equipment would be a saleable asset estimated at \$200,000. Added to the profit this sum gives a total of approximately \$301,000.

If the probable ore could be proven and then mined and milled, it would add approximately \$374,000 for a total of \$675,000.

A cash flow chart is given in Appendix B.

CONCLUSIONS:

The proven ore reserves are sufficient to cover the costs of putting the Silver King Mine into production and to realize a small profit.

The possibilities of increasing the profits are considered good because some, if not all, of the probable ore will be mineable and the prices of metals, particularly silver are expected to rise in the near future.

RECOMMENDATIONS:

In accordance with the foregoing discussion and conclusions it is recommended:

1. That the Silver King property be put into production at a daily milling rate of 200 tons per day.
2. That the sum of \$952,000 be made available to finance pre-production expenses and the period until receipts from the sale of concentrates are available.
3. That work commence in May so that all necessary surface operations can be completed before the snow starts.
4. That pre-production operations be carried out according to the schedule outlined under "pre-Production Programme."
5. That exploration work be carried out in an attempt to prove the probable ore and investigate the possible ore locations.
6. That further metallurgical testing of the ore be carried out before the mill design is started.

HILL, WANNING & ASSOCIATES LTD.

M. K. Lorimer
M. K. Lorimer, P. Eng.

BRITTON RESEARCH LIMITED
755 BEATTY STREET
VANCOUVER 3, B.C.

W. BRITTON, A.R.S.M., B.S.C., P.ENG.

January 10, 1967

PHONE: 681-6032

Mr M. K. Lorimer, P.Eng.,
Hill, Manning and Associates Ltd.,
890 West Pender Street,
Vancouver 1, B.C.

Dear Mr Lorimer,

Re: New Cronin Babine Mines - Silver King
Property - Metallurgical tests

We summarise below the results obtained to date on the sample of Silver King ore which we received from you on December 14, 1966:

1. Assay of ore:

Gold	(Au)	0.005 oz/ton
Silver	(Ag)	14.6 oz/ton
Copper	(Cu)	2.48%
Lead	(Pb)	0.10%
Zinc	(Zn)	0.30%
Sulphur (total)	(S)	2.39%
2. Specific gravity of ore: 2.93, equivalent to 10.9 cubic feet per short ton.
3. Grindability of ore: Work Index (Bond) 15 K.W.H. per short ton.
4. Flotation test conditions and results: See attached tables.
5. Comments: 61.5% of the gold, 78.2% of the silver, 81.6% of the copper, 56.6% of the lead and 53.9% of the zinc were recovered in the final concentrate, which assayed 0.04 oz/ton gold, 143.7 oz/ton silver, 25.46% copper, 0.71% lead and 2.03% zinc, together with 19.04% iron. The overall recoveries in the rougher and scavenger concentrates were as follows:

cont.

Mr M. K. Lorimer (cont.)

Gold 84.6%
Silver 90.2%
Copper 91.5%

When treating similar ore in a full-scale mill the following results can be expected:

Weight of concentrate: 8.7% of ore

Assay of concentrate: Gold 0.04 oz/ton
Silver 143 oz/ton
Copper 25%
Lead 0.7%
Zinc 2.0%
Iron 20%

Recoveries: Gold 70%
Silver 85%
Copper 87%
Lead 65%
Zinc 60%

Owing to the low lead and zinc contents in the ore, no attempt was made to produce separate lead or zinc concentrates.

The recovery of copper and silver was lower than expected. The scavenger tailing assayed 0.04% oxide copper, indicating that the problem was at least partly due to oxidation.

We have suspended work on the ore as instructed, pending the receipt of a more representative sample.

Yours very truly,

BRITTON RESEARCH LIMITED

John W. Britton, P. Eng.
John W. Britton, P. Eng.

Consulting Metallurgist

Closures (2)

JWB/t

BRITTON RESEARCH LIMITED
755 BEATTY STREET
VANCOUVER 3, B. C.

New Cronin Babine Mines (Silver King property)
Test 130-1 flotation conditions.

	STAGE							Total
	1	2	3	4	5	6	7	
Reagents: Lb/ton of ore								
CaO	1.0	—	—	—	—	—	—	1.0
Z 200 (Dow)	—	0.036	0.018	—	0.018	—	0.018	0.090
Pine oil.	—	0.018	—	—	—	—	—	0.018
Pulp volume — Ml (l)	—	4800	4800	2600	2600	1200	4800	—
% solids	65	33	33	10	3	14	29	—
Time — Minutes	30	5	10	5	5	5	5	—
pH	—	4.9	9.5	9.2	8.6	8.9	8.8	—
Temperature — °C	—	17	17	16	18	19	18	—

Notes: (1) Per 2000 grams of original ore.

- Stages:
1. Grinding (69% - 200 mesh)
 2. Conditioning.
 3. Rougher flotation
 4. 1st cleaning — Primary concentrate
 5. 1st cleaning — Secondary concentrate
 6. 2nd cleaning (of primary concentrate).
 7. Scavenging (of rougher tailing).

BRITTON RESEARCH LIMITED
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VANCOUVER 3, B.C.

Table 2

New Cronin Babine Mines (Silver King property)
Test 130-1 results.

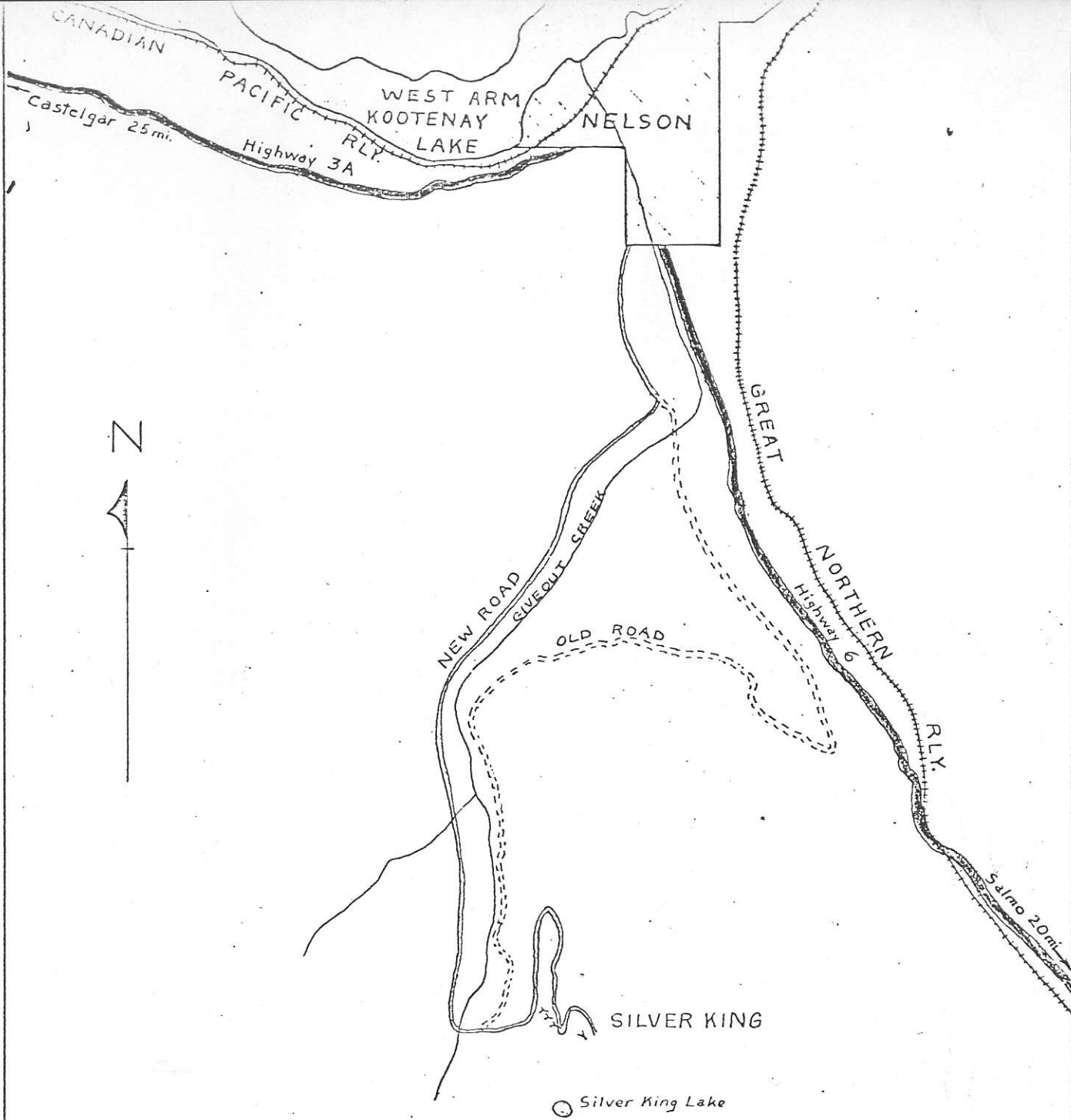
No	Product	Weight %	Assays					Units					Distribution %				
			Au oz/ton	Ag oz/ton	Cu %	Pb %	Zn %	Au	Ag	Cu	Pb	Zn	Au	Ag	Cu	Pb	Zn
1	Final concentrate	7.97	0.04	143.7	25.46	0.71	2.03	0.32	1145.3	20292	5.66	16.18	61.5	78.2	81.6	56.6	53.5
2	2nd cleaner tailing	1.29	0.03	38.4	5.65	0.22	0.53	0.04	49.5	729	0.28	0.68	7.7	3.4	2.9	2.8	2.5
3	Secondary concs. 1 st cleaning	0.74	0.02	69.5	9.60			0.01	51.4	7.10			1.9	3.5	2.9		
4	1st cleaner tailing	3.59	0.01	13.1	1.72			0.04	47.0	6.17			7.7	3.2	2.5		
5	Scavenger concentrate	1.64	0.02	16.3	2.47			0.03	26.7	4.05			5.8	1.9	1.6		
6	Scavenger tailing	84.77	0.001	1.7	0.25			0.08	144.1	21.19			15.4	9.8	8.5		
7	Head (calculated)	100.00	0.005	14.6	2.49			0.52	1464.0	248.72			100.0	100.0	100.0		
7	Head (direct assays)		0.005	14.6	2.48	0.10	0.30				10.00	30.00					

Cumulative results:

1	Final concentrate	7.97	0.04	143.7	25.46	0.71	2.03	0.32	1145.3	20292	5.66	16.18	61.5	78.2	81.6	56.6	53.5
1+2	Prim. conc. after 1 cleaning	9.26	0.04	129.0	22.70	0.64	1.82	0.36	1194.8	21021	5.94	16.86	69.2	81.6	84.5	59.4	56.2
1+3	Prim. + Sec. concs. af 1 cleaning	10.00	0.04	124.6	21.73			0.37	1246.2	217.31			71.1	85.1	87.4		
1+4	Rougher concentrate	13.59	0.03	95.2	16.44			0.41	1293.2	223.48			78.8	88.3	89.9		
1+5	Rougher + scavenger concs.	15.23	0.03	86.7	14.94			0.44	1319.9	227.53			84.6	90.2	91.5		

Additional assays: Head 2.39% S (total)
#1 19.04% Fe.

John Britton, P.E.S.
January 10, 1957



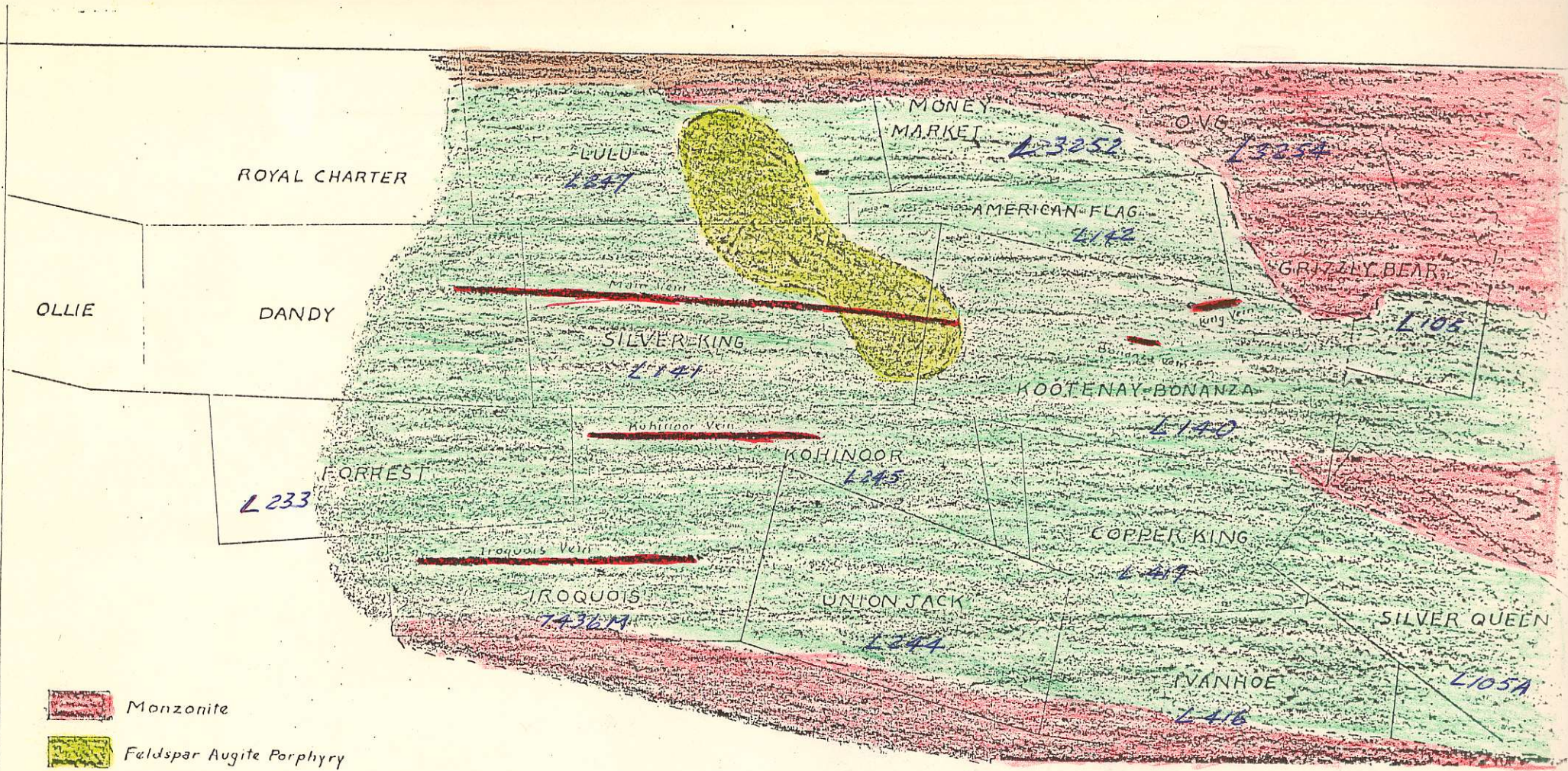
SILVER KING MINE
LOCATION MAP

January, 1967

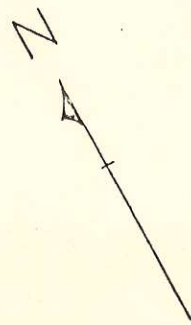
SCALE 1" = 4/5 mi.

M. K. Lorimer

FILE NO. **PLATE I**



-  Monzonite
-  Feldspar Augite Porphyry
-  Andesite Schists
-  Agglomerate
-  Veins



SILVER KING MINE
SURFACE GEOLOGY

DATE January, 1967

SURVEYED BY

DRAWN BY M.K. Lorimer

TRACED BY

SCALE 1" = 500'

CHECKED BY

PLATE III

REF. NO.