93m/6W 888314 93m043





# SUNRISE SILVER PROPERTY

Hazelton, B.C.

J. D. Mason, Prof. Eng.

Dec. 10th 1974

### SUMMARY & CONCLUSIONS

The Sunrise Silver Property has a number of long persistent generally narrow veins which at today's metal prices have interesting values in silver, lead, and zinc.

No systematic trenching and sampling program has ever been undertaken. This is necessary before more than an approximation of the average grade can be determined.

The main vein can be followed on the surface for over 600 feet and extends into adjoining properties. Four large cuts blasted this year on about a 150 foot length of the zone show it to be from 6 to 8 feet in width. Some samples taken and a visual examination of some 1500 tons mined suggest an average grade of 8 to 10 oz. Ag., and 10 to 12% combined lead and zinc. The zone for 600 feet of length with the widths indicated would make 500 tons for each foot of depth, sufficient size to support a 200 ton per day mining operation. Although there are no blocked out ore reserves, the chances of developing a several hundred thousand ton or larger ore body are considered very good.

Access to the property is difficult but the road could be improved to a fair truck road for a modest sum. The mine has a good camp and is well equipped with machinery, including compressors, tractors, and vehicles for further development.

A small amount of money could be made by mining, sorting and shipping ore to the smelter. The same applies to completing and operating the small mill on the property However, it is the writer's opinion that the best possibility for a return to the shareholders with the least risk would be in exploring and developing the larger potential on the main vein, at least to a point where the surface grade is known, as then a major mining company can be interested.

It is recommended that the main vein be evaluated, first by systematic surface trenching and sampling, to be followed, if results are favourable, by a limited program of underground development. The costs of the program recommended for 1975 would be \$64,500.00.

# REPORT ON THE SUNRISE SILVER PROPERTY HAZELTON, B.C.

This report is prepared to cover the exploration work completed to date, to discuss the merits of the property, and the alternatives for further development. The writer examined the property on September 6th and 7th, 1974. Other inspections were made in 1963 and when supervising a trenching and sampling program on the Sunrise and adjoining properties in 1952.

Additional information was obtained from a report prepared by E.D.Cruz, Professional Engineer, dated September 1973, Memoir <sup>#</sup>223 of the Geological Survey, and various reports by the Minister of Mines.

Brief reference only is given to the geology as the information available is covered in Memoir #223.

## LOCATION, ACCESS, ETC.

The Sunrise property is situated at 55° 20' north latitude and 127°29' west longitude. It lies on the north slope of Nine Mile Mountain, 8 miles northeast of New Hazelton, B.C., a town and supply point serviced by both rail and highway transportation. The port of Prince Rupert is 177 miles to the west.

Elevations of the mineral deposits vary between 4800 ft. and 5200 ft. above sea level.

Access to the property is via the Nine Mile Mountain secondary road to Silver Cup Basin, a distance of 13 miles, thence by Company truck road  $l_2^1$  miles to the camp and mine.

Ample timber of good quality is abundant at lower elevations in close proximity to the mine. Hemlock, cedar and spruce are the chief varieties. Timber line is about 4500 feet.

The average rainfall at New Hazelton is about 30 inches. The climate is moderate. At the mine, due to its elevation and location on the north face of a mountain, the weather is more severe and there is a snow drifting problem. However, a mining operation could be carried on throughout the year.

### PROPERTY

The Sunrise Silver property consists of 6 Crown Granted Mineral Claims and 36 Claims held by location. The Grants were made early in the century and have both mineral and surface rights.

Crown Granted	Lot #	Crown Granted	<u>Lot #</u>	
Ethel	593	Noonday	59 <b>6</b>	
Sunset	594	Hidden Treasure	597	
Sunrise	595	Ethel Fraction	59 <b>9</b>	

#### Held by Location

Name of Claim	Record Number				
Van <sup>#</sup> 1 to 6	26761 - 26766				
Alpha #1 to 5	22036 - 22040				
Alpha #6	21304				
Alpha #7	21305				
Alpha #8	22471				
Alpha #9	22 <b>472</b>				
Alpha #10	22 <b>473</b>				
Alpha #11 to 26	253 <b>87 -</b> 25402				
Alpha <sup>#</sup> 27 to 30	26767 - 26770				

#### HISTORY

The Claims were first staked about 1908. Surface trenching and some short adits and shafts were driven during the next twenty years by various operators. Some hand cobbed ore was shipped during the early days. Assays from remaining old ore stock piles carry up to ninety ounces of silver.

In 1927 - 28, the lower adit was driven some 200' vertically below the "main vein" outcrops for some 750'. A 65 foot raise was completed from the adit face. Although a number of mineralized veins were cut it is extremely doubtful if the main zone was intersected.

Additional prospecting and trenching was undertaken in 1937 and again in 1952.

No further work was done until the present owners acquired the property in 1963. They have carried on exploration each year since. A good twelve man camp has been established at the mine. A diamond drill program was undertaken but failed to give information due to poor core recovery in the vein areas. The components for a 35 ton mill have been acquired and partially erected some 3000' distant and below the outcrop of the veins A difficult access road has been constructed from the Silver Cup Basin and improvements made on the existing road Trenching and bulldozer stripping has been done and several large cuts were blasted on the main vein in 1974 during the course of mining some 1500 tons of ore.

#### GENERAL GEOLOGY

Nine Mile Mountain is underlain by a sequence of sedimentary, well bedded formations varying from impure sandstone to thinly bedded argilites and slates. The formation is probably of Cretaceous age and is classified with the Hazelton formation Structurally the sediments form broad flat lying northeasterly trending synclines and anticlines

These sedimentary rocks in the Nine Mile Mountain area have been intruded by a number of granodiorite stocks and sills, the largest of which is in the immediate area of the Sunrise Property and is over three miles long by half a mile wide. The intrusive is coarse grained and fairly uniform in composition

The geology should be mapped in more detail and the various veins and fault zones tied in with a transit survey.

Numerous quartz and calcite veins, and replacements with simple and complex minerals containing lead, zinc, silver, antimony and arsenic occur. Generally these are flat lying like layers in a cake, although they do branch, and cross veins of steeper dip occur. Shearing, faulting, replacement and alteration of the country rock are associated with the vein deposition Generally the veins are exposed for remarkably long distances but pinch and swell greatly. However, this does not appear to be the case with the main vein which is much wider and more uniform.

The former Lead King property adjoins the Sunrise Crown Grants on the East and the Barber Bill property, owned by other interests, to the West. The Lead King is now covered by staked claims owned by the Silver Sunrise Company.

The veinage lies in a disturbed zone that extends along the mountain side for over 3000 feet with a width of 700 feet, the extensions being on the Lead King and Barber Bill properties. Although the mineralization is similar both to the east and west of the Sunrise property, generally speaking the continuity is poorer and the valuable metal content is lower.

The veins occur in both the sedimentary rocks and in the granodiorite. The zones are wider and stronger in the intrusive and sulphide replacement and alteration of the country rock is confined to the veins in the granodiorite. The main vein on the Sunrise is in this rock type.

#### MINERALIZATION AND VEIN DESCRIPTION

Numerous, (some 20 to 30) veins have been found on the Sunrise Silver property. In general they are narrow, several inches to twelve inches with local swellings up to a couple of feet. They have been opened up by usually one or two trenches and with the exception of the main vein have not been traced out. The veins usally contain a band or two of solid mixed sulphides. The early miners were looking for high silver ore that could be sorted and taken out on pack horses. These old trenches in some cases undoubtedly do not show the entire width of the vein, the highgrade band usually being along the hanging wall where the trenches were made. There is the possibility that some of them will show good widths of milling ore when completely cross trenched similar to the main vein described later in this report.

The Sunrise Silver Company has found many new veins that have not been opened up to date.

The silver, lead, and zinc content varies greatly from vein to vein and even from trench to trench on the same vein as will be seen on the plan accampanying this report. In general, the silver to lead ratio is about 1.5 oz. for each 1% of contained lead.

The chief minerals are Jamesonite ( $Pb_5$  Sb4 S11) Galena (PbS) Sphalerite (ZnS) and Freibergite ((Cu, Ag) 12 Sb<sub>4</sub> S13) as determined by the Federal Department of Energy, Mines and Resources. Arsenopyrite and pyrite are also present. Quartz and calcite are the chief gangue minerals. The sulphides are intimately intermixed as well as in separate aggregates.

Assays taken from various trenches by a number of individuals are shown on the enclosed plan. It should be noted that all sampling to date has been of a preliminary nature and that additional trenching and a much closer sampling interval is necessary before more than an approximation of grade can be obtained. However, it is the writer's opinion, based on the results to date, that the property could produce, for a few years, a limited amount of sorted ore running in the 25 - 30 oz. silver range, and with 10 - 15% lead and zinc. The larger tonnage possibility as described under the main vein is much more attractive.

#### THE MAIN VEIN

The most important vein found to date called the "Main vein" in this report, until this year was exposed by irregularly spaced trenches, a short inclined shaft, and a short adit. Most of these openings made by the early miners in their search for shipping ore, were confined to the hanging wall where a band of massive mixed sulphides is located. In no place was the full width of the zone exposed. This lead earlier reporters, including the writer, to think of the property as a series of narrow highgrade but erratic veins. The main vein strikes east-west and dips to the south into the mountain at  $10 - 15^{\circ}$ . The trenching and intervening gossen exposures show the vein to be continuous for at least six hundred feet. The vein disappears under overburden to the west and runs into the Lead King property to the east and probably extends for double the length that can now be traced.

During the course of mining and sorting high grade ore this year, the Sunrise Silver Company blasted several large deep trenches into the vein over a length of 150 feet. One cut is 50 feet long and goes into the vein outcrop some 25 feet. For the first time the full width of the mineralized zone has been exposed at a point where the sulphides have not been removed by leaching. These trenches furnish an entirely new concept of the mining potential...They expose a mineralized zone of good mining width that could support a substantial mining operation rather than a system of narrow high-grade veins.

An almost continuous band of massive sulphides varying from 4" to 12" runs along the hanging wall with a more or less continuous band of heavy sulphides along the foot wall. The walls of the zone are separated by from 6 to 8 feet of completely altered bleached granodiorite that is intensely fractured and mineralized with a multitude of irregular veinlets up to an inch in width of quartz and massive sulphides. The altered granodiorite in sections has also been replaced with disseminated ore type mineralization.

The photographs with this report, although not too clear, show the bleached zone and a close inspection will disclose massive sulphides along and near the contacts with the numerous veinlets between.

Only two heavy samples were taken by the writer in September, from the large trench 50' apart. The other two trenches although they showed similar mineralization over five or six feet, had not been completed and the foot wall higher grade section was not exposed. The two samples which are believed representative of the ore that can be expected over the full width of the zone for most of its exposed length, assayed as follows: -

Sample #	Width	oz . Ag	<u>%Pb</u>	<u>%Zn</u>	<u>%Sb</u>	%Cd
70776	8'	6.9	2.26	4.96	0.97	0.05
70777 70778 <sup>)aver</sup>	age 6.3'	13.7	5.3	8.3	1.32	0.10

This would give a weighted average of 9.9 oz. Ag, 3.6% Pb and 5.8% Zn.

In excess of 1500 tons of vein zone material have been blasted and stock piled below the trenches, all having an estimated grade similar to that exposed in the face of the cuts. A sample of a 200 ton pile taken by the writer this September assayed 6.5 oz. Ag, 4.6% Pb, 4.3% Zn. The surface rusty gossan, well exposed along most of the 600 feet of known vein length, is all similar in appearance to that which covered the zone where the large open cuts were blasted. This would indicate that the underlying vein should contain a comparable grade mineralization.

#### AVERAGE GRADE IN SIZE OF MINERAL DEPOSIT

As stated earlier it will be necessary to sample the veins more systematically at closer regular intervals before more than an approximation of grade can be determined. This is due both to the irregularity of the veins and primarily the large changes in silver content over short distances. However, several conclusions are apparent from the work done to date. Sorted ore can be mined for a limited period that will yield a profit after shipment and smelter charges. The old timers sorted ore that ran 70 to 90 oz. as is evidenced by the remnants of their ore piles. Mr. and Mrs. Schneider, principals of Sunrise Silver, sorted some 60 tons of ore this fall, in a few weeks, that by their careful sampling, assayed 54.16 oz. Ag., 28.67% Pb, and 9.38% Zn. The antimony content was 4.92%

By mining greater widths but doing it selectively, the writer's opinion is that a grade of about 25 oz. Ag, and 15% combined lead and zinc could be maintained. This would be good mill feed for the small mill on the property at the present price of metals.

On the other hand, preliminary sampling of the new trenches and the dump of unsorted ore supported by observation, would indicate that a grade of 8 - 10 oz. silver and 10% combined lead and zinc could be obtained from the main vein. The 600 feet of assured length of the main vein over the width indicated would yield approximately 500 tons of ore per foot of depth, or 50,000 tons for each hundred feet. Additional ore would also be obtained from other veins on the property. Such an ore body would support a 200 - 300 ton per day operation profitably.

Although there is no blocked out ore on the property, as it is not opened up on three sides, the possibility of developing a several hundred thousand ton ore body is considered very good. In fact there could well be much more than this if stripping and trenching prove the existence of other wide ore sections along strike and into the Lead King area.

#### DEVELOPMENT POSSIBILITIES

There are three courses open for further development of the Sunrise Silver property, assuming the required funds are available.

#### A. Lease Property, Sort Ore and Ship

This should only be done if adequate finances are unavailable.

High grading is rarely profitable on Company time. In the case of Leasing the lessee usually makes the money and the company ends up with worn out machinery and some caved in workings. In any case the life at Sunrise would probably be fairly short. When the lessee got down a short distance from the surface the operation would cease to be profitable, due to the narrow width of the rich ore. In a shipping operation there would be almost no returns for the zinc content of the ore which would be a considerable loss to the mine.

# B. Complete the 35 Ton Mill and Operate

This would require considerable capital, say \$75 - \$100,000.00. If this is done, consideration should be given to move the mill to some place near Hazelton and haul the ore to the mill. Power would be cheaper and by stock-piling ore it would not be necessary to operate the mine in the extreme winter months. It would be difficult to obtain the experienced men necessary for such an operation. The erratic grade and nature of the ore would make good recoveries difficult to obtain.

#### C. Explore and Develop the Main Vein

If the main vein stands up to the grade and size indicated to date, it will make possible a low tonnage, low unit cost operation. A mechanized room and pillar method of mining would give low mining costs and mill recoveries would be better due to more uniform mill feed. If the zone stands up to a limited development program there should be no difficulty in securing additional finances or in interesting a senior mining company in proceeding with the development.

#### PROPERTY ACCESS

In the initial exploration stage, access to the property will be a problem. The last  $1\frac{1}{2}$  miles of road is bad and would require a major expenditure to bring it up to good truck road standards. However, when this is required, in all probability the Government will contribute 50% of the costs. In the meantime, \$5,000.00 to fill and gravel some of the worst stretches, will suffice.

If a mining operation eventuates, it will probably be most economical to eliminate the upper section of road by using a 3000' aerial tram. In this regard there is an abandoned tram complete with buckets, bull wheels and cable within a few miles of the mine.

#### RECOMMENDATIONS

The following development work is recommended: -

1. Trench the main vein at 25 foot intervals. The cuts should cover the full

width of the mineralization and go in far enough to expose frech material. High-grade encountered in this work should be stock-piled and shipped to a smelter as it would defray part of the costs. The trenches should be systematically sampled.

2. The mineralized veins and all openings should be tied in with a transit survey. Additional geological data should be mapped at the same time.

3. The last  $l_2^{\frac{1}{2}}$  miles of access road should be improved. It should be possible to obtain Government assistance for half the cost.

4. If the above trenching and sampling confirms grade and width, then the main vein should be opened with one or two adits and drifts to ascertain its continuity down dip. This work can be economically done with a diesel scoot-tram type of unit. Any high-grade encountered should be sorted and shipped to the smelter. The underground work should be done by contract.

The above program would take four months and would cost approximately as follows: -

1.	Trenching program including sampling & assaying	\$ 12,000.00
2.	Surveying & Geological Mapping	2,500.00
3.	Road Improvements assuming Gov't puts up 50%	5,000.00
4.	Underground adits & drifts, initially allow 500' @ \$70. per ft.	35,000.00
	Allowance for indirect cost, supervision, engineering etc.	10,000.00

TOTAL \$ d

\$ 64,500.00

Respectfully submitted,

Mason. Prof. Eng.

December 10th 1974





The above pictures show the faces of two trenches completed in 1974. Note the darker streaks of massive sulphides near the foot and hanging wall of the zone, the numerous irregular veinlets of sulphides cutting the bleached granodiorite in the centre portion of the zone.

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10 Mr. Schneider

ACME ANALYTICAL LABORATORIES LTD. Assaying & Trace Analysis 6455 Laurel St., Burnaby 2, B.C.

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Tel: 299-5242

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	818	Cum	oer'	land	Crese	nt.	

North Vancouver, B. C.

# ANALYSES CERTIFICATE of

3626 File No.

Type of Samples \_\_\_\_\_Rock

Disposition <u>1 year</u>

		- Sta	ick Diles	high a	Fade D	18	5 		
No.	Sample	Pb%	Zn%	Ag oz/ton	Sb%	Cd%		N	Jo.
1	7401R	28.67	9.38	54.16	4.92	.10			1
2				19					2
3									3
4									4
5								,	5
6									6
7									7
8									8
9									9
10							2	1	0
11								1	1
12								1	2
13	12							1	3
4			-					1	4
15								1	5
16								1	6
17								1	7
18	÷					1		1	8
19				-				1	9
20								2	20
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# ACME ANALYTICAL LABORATORIES LTD.

Sunrise Silver Mines Ltd., 818 Cumberland Cr.,

North Vancouver, B. C.

# Assaying & Trace Analysis 6455 Laurel St., Burnaby 2, B.C.

**ANALYSES CERTIFICATE** 

Tel: 299-5242

4028 File No. \_\_\_\_\_

Type of Samples Ore pulp

Disposition .....

	- Engla			Silver				
NO.	Sampie	PD %	Zn %	oz/ton				No.
1	Lower Vein #3	52.10	.42	391.40				1
2								2
3					·			3
4								4
5								5
6								6
7								· 7
8					,			8
9								9
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						DEAN TOYE, B.Sc. CHIEF CHEMIST		
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TO \_\_\_\_\_



Department of Energy, Mines and Resources Ministère de l'Énergie, des Mines et des Ressources

Mines Branch Direction des mines

File Number Nº à rappeler

> 40 Lydia Street, Ottawa 1, Ontario. September 3, 1968

MINERAL PROCESSING DIVISION

Mr. O. Schneider, President, Sunrise Silver Mines Ltd., Room 425 - 718 Granville St., Vancouver 2, B. C.

Dear Mr. Schneider:

At the time of writing we have not received a sample of freshly broken Sunrise Silver ore as promised in your letter of April 17, 1968.

A total of 20 flotation tests has been carried out on the oxidized sample received last January. As stated in our letter of March 26, 1968, the object of these tests has been to selectively float lead-silver and zinc concentrates from the ore. The best results obtained (Test 7) were as follows:

· · · · · · · · · · · · · · · · · · ·	Wt	Assays *			Distribution 6		
Product	%	Pb	Zn	Ag	Pb	Zn	Ag
Lead conc	37.0	52,73	4.70	123.66	73.6	11.0	71.4
Lead cleaner tail	5.9	34.82	18.40	63.53	7.7	6.9	5.8
Zinc conc	19.6	2,64	58.46	· 27.79	2.0	72.4	8.5
Zinc cleaner tail	12.7	26.88	7.50	55.37	12.9	6.0	11.0
Final tailing	24.8	4.10	2.39	8.47	3.8	3.7	3.3
Feed (calcd)	100.0	26.51	15.83	64.08	100.0	100.0	100.0
Lead rougher conc	42.9	50.27	6.58	115.39	81.3	17.9	77.2

Best Results (Test 7)

\* Assays are expressed in per cent except Ag which is in oz per ton.

## APPENDIX I

### DEPARTMENT OF ENERGY, MINES AND RESOURCES

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	Best	Results	(Test 7)				
•	Wt	-	Assays	(x)	Dist	ributic	on %
Product	070	Pb	Zn	Ag	Pb	Zn	Ag
Lead conc	37.0	52.73	4.70	123.66	73.6	11.0	71.
Lead cleaner tail	5.9	34.82	18.40	63.53	7.7	6.9	5.
Zinc conc	19.6	2.64	58.46	27.79	2.0	72.4	8.
Zinc cleaner tail	12.7	26.88	7.50	55.37	. 12.9	6.0	11.
Final tailing	24.8	4.10	2.39	8.47	3.8	3.7	3.
Feed (calcd)	100.0	26.51	15.83	64.08	100.0	100.0	100.
Lead rougher conc	42.9	50.27	6.58	115.39	81.3	17.9	77•

(x) Assays are expressed in per cent except Ag which is in oz per ton.

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Appendix I (Cont'd)

Reagent	s and Condit	ions for Test	7	
Operation	Time, min	Reagents, 1b/	ton	pН
Grinding	50 (98%-200m)	Soda Ash Z-6 (X)	5.0 0.05	
Lead conditioning	10	Soda ash	2.0	8.4
Lead rougher flotn	15	Z-6 Pine Oil Dowfroth 250	0.09 0.02 0.01	
Lead cleaner	6	Z-6 Dowfroth 250	0.01 0.04	
Zinc conditioning	10	Lime CuSO <sub>4</sub>	5.0	9.3
Zinc rougher flotn	5	Z-6 Dowfroth 250	0.15 0.06	
Zinc cleaner	3	Lime Dowfroth 250	2.0 0.04	10.9

Reagents and conditions for Test 7 are given below:

(x) Potassium amyl xanthate

It should be noted that good zinc depression was obtained during the lead float without the use of zinc depressants. This is unusual for a lead-zinc ore and may be due to the effects of oxidation.

Mineralogical examination of the ore shows that some of the freibergite (silver mineral) is intimately associated with sphalerite. This explains why a considerable portion of the silver reports in the zinc concentrate. In some tests both lead and zinc rougher concentrates were reground before cleaning with the view of liberating some of these finely associated minerals from each other, but this did not result in any improvements in the results.

Enough work has now been done on the ore sample to indicate that the production of lead-silver and zinc concentrates is feasible. However, we believe that any further work on this oxidized sample is not warranted because any treatment schemes developed may not apply to freshly broken ore.

Would you therefore advise us when we can expect a sample of freshly broken ore so that we can continue with this investigation.

Yours very t ly, A. Stemerowicz, Non-Ferrous Metals Section



O Main Adit - End & Raise . #4545-3 . AU. 0.35, 3.7, .41, 0.45 Bi-Tr/2ft. ASSAY PLAN 533 Sunrise Silver Mines Ltd. 1+5+55-2.1, 3.19, 16.09, 561.34%, Bi-T-/25+. map adapted from G.S.C. Mem. 223 and report E.D. Cruz, P. Eng. Sept 1973 ASSAYS: 02. Ag, % Pb, %Zn 0 #45483-AU.Tr, 16.4, 1.9, 3.64, Sb-0.99%/14" WIDTH J.D. Mason. #45482-AU Tr, 23.8, 10.37, 19.29, 56-1.99 CU-90% /2' 50 100 P.Eng. Dec 5- 1974 CALL OF THE PARTY Scale in Feet A ST the state of the second state of the second