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FEASIBILITY STUDY

COLUMBIA RIVER MINES LTD. (N.P.L.)

A.R. Bullis, P. Eng. August 31, 1967

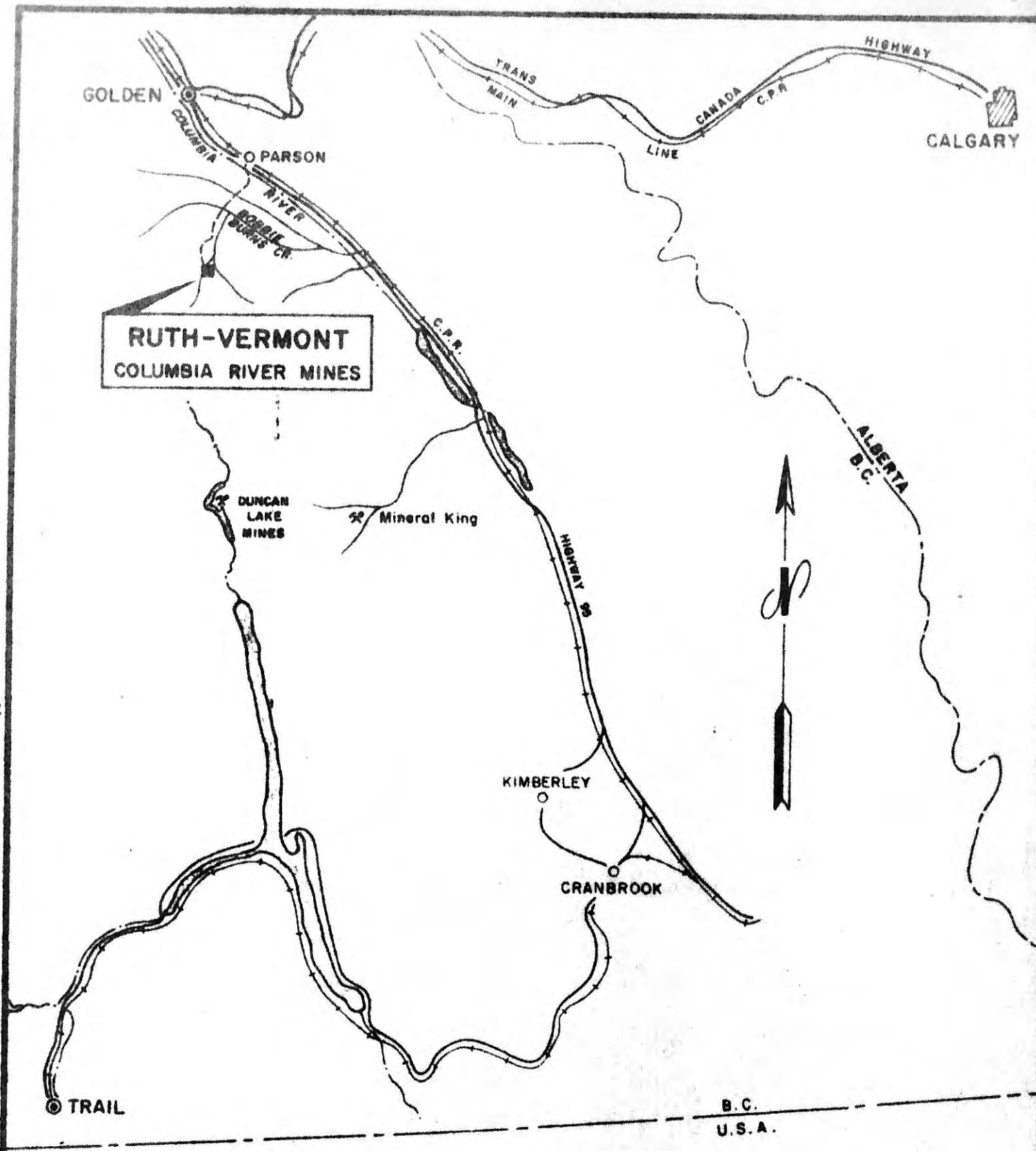
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COLUMBIA RIVER MINES LTD. (N.P.L.)

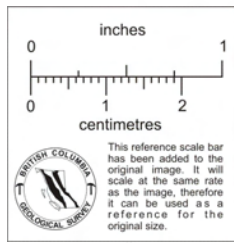
GOLDEN, B.C.

A.R. BULLIS, P.ENG.

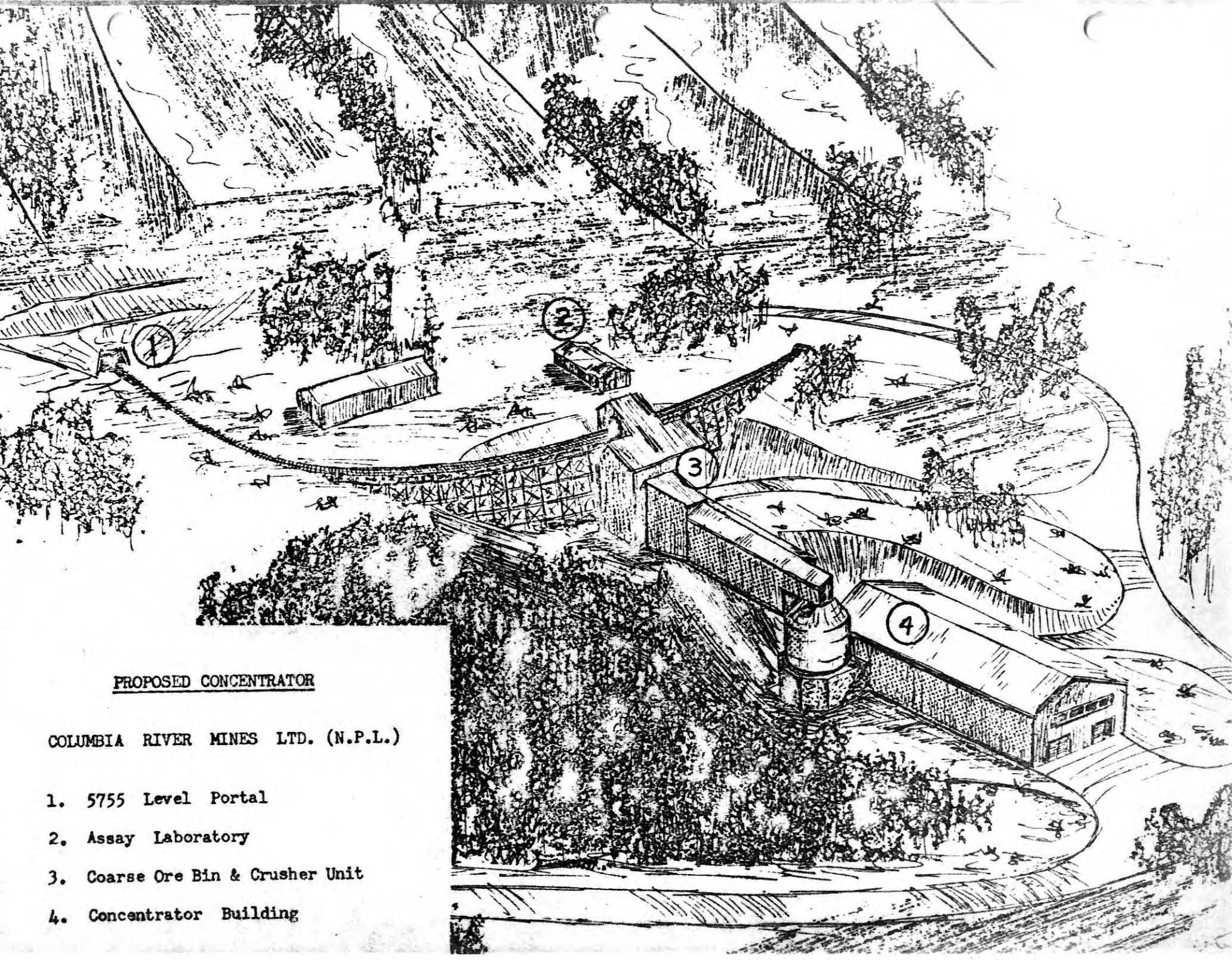
VANCOUVER, B.C. AUGUST 31, 1967



**RUTH-VERMONT
COLUMBIA RIVER MINES**



COLUMBIA RIVER MINES LTD.	
LOCATION MAP	
DRAWN BY:	SCALE: 1" = 20 Miles
DATE:	DRAWING No.
PROJECT RUTH-VERMONT	



PROPOSED CONCENTRATOR

COLUMBIA RIVER MINES LTD. (N.P.L.)

1. 5755 Level Portal
2. Assay Laboratory
3. Coarse Ore Bin & Crusher Unit
4. Concentrator Building

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CONCLUSIONS

The Columbia River Mines property on Vermont Creek contains a total of 1,060,175 tons of ore that contain 4.62 ozs. Silver per ton, 3.48% Lead and 3.76% Zinc. The net recoverable value of this ore is \$16.47 per ton and the estimated operating costs will be \$8.87 per ton, leaving an operating profit of \$7.60 per ton. Enough reserves exist to sustain an operation of 500 tons per day for about six years.

The mine could be financed by a debenture issue of \$ 3,000,000.00 at 8% interest, payable semi-annually. The debenture could be retired at the end of 33 months of production, if 90% of the operating profit is used to retire the debt.

RECOMMENDATIONS

1. The Columbia River Mines property on Vermont Creek should be put into production at an early date.
2. Financing should be arranged in order that the Mill, Mine and Camp construction can begin as early as possible.
3. The Mill design should be finalized and construction begun as soon as weather permits.
4. All necessary stope preparation, ore passes and development underground should be completed as soon as funds are available.
5. The necessary additional mining equipment should be purchased and installed.
6. No additional exploration should be done at this time.

Respectfully Submitted,



A. R. Bullis, P. Eng.

SUMMARY

Columbia River Mines Ltd. (N.P.L.) have a mining property on Vermont Creek in the Purcell Mountains, near Golden B.C.

The mine has been developed on two principal levels and the ore-body outlined by underground development and diamond drills. The ore occurs in manto deposits (replacements) that are intersected by veins.

The ore outlined is as follows:

	<u>Tons</u>	<u>Ag. ozs./ton</u>	<u>Pb %</u>	<u>Zn %</u>
Proved	100,950	4.27	3.05	3.66
Probable	643,175	4.78	3.54	4.10
Inferred	316,050	4.40	3.50	3.12
TOTAL	1,060,175	4.62	3.48	3.76

The net operating profit on one ton of ore will be \$ 7.60, using August 1st prices as published in the Engineering and Mining Journal, the Pro Forma Settlement with Bunker Hill and a milling rate of 500 tons per day.

Total capital requirements are estimated at \$ 2,888,800.00 to place the property into production.

If financing is arranged by the issue of Debentures for \$ 3.0 million; the bonds can be retired at the end of 33 months of production, if 90% of the net operating profit is allocated for this purpose.

Respectfully Submitted

A. R. Bullis

A. R. Bullis P. Eng.

COLUMBIA RIVER MINES

INTRODUCTION

The writer was engaged by the officers of the Columbia River Mines Ltd. to assess the company's mine located near Golden, B.C. All data relating to the property was made available to the author who has reviewed reports, sections, assays of drilling, and ore calculation figures. The assessment of the property as presented in this report is based on the data which was made freely available to the author. The author visited the property August, 15th and 16th 1967, and examined some of the diamond drill core and the underground workings..

LOCATION

The mine is located in south-eastern British Columbia in the Golden Mining Division. The property is accessible from the C.P.R. and Highway 95 via a good all-weather road that leads westward for 35 miles from the village of Parson.

The mine is located in the Vermont Creek Valley, which is a tributary of Vowell Creek, at an elevation of 5,700ft.

PROPERTY

The Columbia River Mines property consists of the following claims held by mineral lease M-16:

<u>CLAIM</u>	<u>LOT NO.</u>
Minnie	419
Charlotte	405
Ruth	418
Sheba	8124
Vermont	8123
Cleopatra	8122
Ruth Fraction	8125

PROPERTY - Cont-d

There are forty-four located claims held by Columbia River Mines:

CLAIM	LOT NO.
Dianna Fraction	3302
Margaret	3303
Debbie	3326
Anna	3327
Maureen	3328
Carol	3329
Carolanna 1 - 6 inclusive	3384 - 3489 inclusive
Bongo 1 - 12 "	4016 - 4027 "
Dipsey 1 - 16 "	4028 - 4043 "
Jane 1 - 4 "	11532 - 11535 "

WORK TO DATE

The property was discovered in 1893 and was held by The Galena Syndicate of London, England, from 1926 until 1956, when Rio Canadian Exploration Ltd. took an interest in the property. The previous owners drove an adit on the 6,000' level to develop a silver-lead-zinc vein; Rio Canadian Exploration outlined 77,500 tons of vein and replacement ore bodies by drilling from the surface and from existing underground workings. The grade of the material outlined by Rio Canadian Exploration was too low to be economic during the period of depressed metal prices and the property was abandoned.

The property was restaked by Mr. M. Pardek who optioned it to Columbia River Mines Ltd. The present owners have developed the ore-bodies on two levels; the upper level (6,000) includes 2,500 feet of drifting and crosscutting, the lower level (5,755) has been developed by an adit for 637 feet. Columbia River Mines has driven 2,344 feet of crosscuts, drifts and raises since 1965 and have outlined the ore-bodies with about 40,000 feet

*7 page
summary*

✓ In addition, Columbia River Mines Ltd. have one contingent liability to M.M. Pardek as balance of the acquisition of the property and is payable by way of 200,000 common shares on commencement of commercial production of ore, and \$250,000.00 payable at the rate of 25¢ per ton of ore mined.

The total common shares issued and optioned is 3,648,761 shares. The remaining property payments total \$250,000.00.

GENERAL GEOLOGY

The mine area is located within a broad belt of late Pre-Cambrian sediments that extend from below the U.S. border to the Yukon. The area is flanked on the east by the prominent Rocky Mountain Trench and on the west by the Purcell Trench which is occupied by the Duncan River. The broad belt of sedimentary rocks is folded and faulted and the sediments are metamorphosed to some degree; the assemblage of sediments has been intruded by granitic bodies of Jura-Cretaceous age.

LOCAL GEOLOGY

The property is located in rocks belonging to the Horsethief Creek Group (Windermere Series) that occupy the area between the two trenches. The Horsethief Creek Group are composed of a thin upper slate member and a lower, thicker quartzite member which have been folded into a regional syncline, trending northwesterly. The ore has been deposited in the

LOCAL GEOLOGY - Cont.

syncline, in faulted and drag-folded limestone horizons of the slate member.

ORE DEPOSITS

The ore deposits belong to two types; replacement bodies (manto) and steep veins, or chimneys, that join the replacement bodies and form appendages, or apophyses, at the junction. The replacement ore body ranges in true width from ten to one hundred feet; locally it pinches and swells. The manto body is very irregular in cross-section, varying in shape from square to lense-like. Dips are relatively steep on the flank of the ore but flatten toward the synclinal axis. The manto pinches out towards the southwest where the plunge of the syncline steepens and opens into a broader fold.

ORE RESERVES

The ore-reserve calculations used in this report are based on standard engineering practice. The total volume of cubic feet of mineralized rock has been calculated in the following manner. The mine has been divided into blocks of ground that are bounded by vertical sections 50 to 75 feet apart. The data relating to grade of ore and total volume of ore has been obtained from diamond drill holes that have been drilled in fans on the various sections. In addition to the drill hole data, information regarding the grade and width of ore has been obtained from samples taken in three cross-cuts

ORE RESERVES - Cont.

that pass through the ore-body on the various sections (See Map of Ore-Body, Appendix). The volume of ore is related to the width of the ore-block, the height of the ore-block and the distance between adjacent sections. For instance, if the ore-body is rectangular in outline on a given section and it is 40 feet wide, 120 feet high and the distance between sections is 50 feet, then the volume of ore for the block would be (40' x 120' x 50') 240,000 cubic feet. The specific gravity of the ore is such that ten cubic feet of ore weighs one short ton (2000 lbs.) Therefore, the block would contain 240,000 cu ft. = 24,000 tons of ore. Each block of ore 10 cu. ft.

shown in the Appendix "Ore Reserves by Sections" has been calculated in this manner.

The various categories of ore as used in this report are as follows:

1. Proved Ore include the ore blocks that lie adjacent to mine openings that have penetrated the ore body. Proved ore includes all ore that lies within twenty-five feet of these openings.
2. Probable ore include the blocks of ore that lie between the diamond drill holes that have intersected the ore body. These blocks of ore extend mid-way to the sections on either side of the fan of drill holes. Probable ore lies

ORE RESERVES - Cont.

adjacent to Proved Ore where applicable.

3. Inferred Ore includes the blocks of ore that can reasonably be expected to exist beyond the blocks of Probable Ore. These blocks are inferred from direct drilling evidence or from geological evidence.

The grade of the ore blocks has been obtained from a compilation of samples taken from mine openings and from drill hole cores. The samples have been averaged and weighted by length of intersection of ore; the grade has been obtained from core and channel samples.

The grade of Proved Ore comes directly from samples obtained in mine openings and drill holes that bound the block of Proved Ore.

The grade of the Probable Ore is calculated from samples obtained from bore holes that penetrate the ore block.

The grade of Inferred Ore is calculated from the average of the blocks of Probable Ore adjacent to the Inferred Ore.

The author has calculated the reserves as shown in the Appendix "Ore Reserves by Sections"; the reserves include the replacement ore and the ore in the veins. Mineralized material that contains less than \$ 8.87 per ton of recoverable metal has not been included in the reserve. The "cut-off" grade was

established from the estimated total operating cost per ton (See Section "Direct Operating Cost/ton of Ore Produced", Page 14) and the metal values have been assumed to be those quoted in the Engineering and Mining Journal, dated 1 August, 1967, using the Bunker Hill Pro-Forma Settlement (See Appendix).

The author must emphasize that the smelter settlement to be received by Columbia River Mines as set out in the Bunker Hill Pro-Forma Settlement is a preliminary estimate only; the final settlement is subject to negotiation between Columbia River Mines and the Smelter.

The author has not included a dilution factor because the main bulk of the ore will be mined to assay walls; that is, no material below the "cut-off" grade will be mined from the replacement body. The better grade ore that exists in the Pinetree and Blacksmith veins will undoubtedly mine to the grade shown in the reserves.

Dr. D. D. Campbell, in a report dated February 22, 1967 has reported that the veins contain a total reserve, in all three categories, of:

categories, of:	Tons	Ag oz/ton	Pb %	Zn %
Pinetree Vein -	253,357	13.38	7.80	5.46
Blacksmith Vein -	107,184	9.00	4.68	2.79

The author has incorporated the various blocks of ore from the Pine Tree and Blacksmith Veins into the reserves given below in the "Summary of Ore Reserves".

SUMMARY OF ORE RESERVES

	<u>Tons</u>	<u>Ag ozs./ton</u>	<u>Pb %</u>	<u>Zn %</u>
<u>PROVED</u>	100,950	4.27	3.05	3.66
<u>PROBABLE</u>	643,175	4.78	3.54	4.10
<u>INFERRED</u>	316,050	4.40	3.50	3.12
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TOTAL	1,060.175	4.62	3.48	3.76
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(See Appendix - Ore Reserves by Sections)

CASH FLOW EXPECTED AT COLUMBIA RIVER MINES.

The operating profit at Columbia River Mines has been calculated from data relating to grade of ore, to metal prices prevailing at 1 August, 1967, predicted recovery of metals in the concentrator, transportation costs and the Bunker Hill Pro-Forma Smelter Settlement. The calculations are based on a production of 500 tons of ore per day. The smelter payments are those given in the Bunker Hill Pro-Forma Settlement (See Appendix). The operating costs were calculated from costs and data supplied by Mr. H. Graham, Managing Director of Columbia Mines, Ltd. The operating costs as used in this report compare favourably with those of the Mineral King Mine which is a

CASH FLOW - Cont.

producing mine in the same district. (See Appendix).

In order to arrive at a net operating profit to be realized at the Columbia River Mines the following calculations were made (with assumed conditions as noted):

1. The net value of one ton of Lead and Zinc concentrates, F.O.B. the railcar at Parson, B.C. (See Location Map)
2. The net smelter return per unit (Pound or Troy Ounce) of metal, F.O.B. Parson, has been calculated from the net value per ton of Concentrate.
3. The net value of one ton of ore has been calculated using the predicted recovery of metals in the concentrator, as set out in the Metallurgical Report by J. W. Britton, P. Eng. (See Appendix)
4. The direct operating costs per ton of mined ore have been calculated from predicted cost relating to mining and milling of ore at Columbia River Mines. (See Appendix).
5. The operating profit has been calculated for each ton

CASH FLOW - Cont.

5. Cont. of ore processed. The monthly operating profit has been calculated assuming that 15,000 tons of ore will be mined and milled during any month.

*30 days
minimum*

NET WORTH OF ORE - F.O.B. RAILCAR AT PARSON, B.C.

The following conditions and assumptions have been used:

1. Bunker Hill Pro Forma Settlement in U.S. Dollars, August 3rd, 1967.
2. Metal Prices - (U.S. Dollars)
 - Silver - \$ 1.814 per troy oz.
 - Zinc - 13.5 cents per lb.
 - Lead - 14.0 cents per lb.
 - Cadmium- \$ 2.65 per lb.
3. Rail freight to Smelter
 - Zinc Concentrate - \$ 13.35 per short ton
 - Lead Concentrate - \$ 19.50 per short ton.
4. Metal content of concentrates in Bunker Hill Pro-Forma Settlement

2/2/68

NET WORTH OF ORE - Cont.

4. Cont.

Zinc Concentrate - 59.5% Zinc
 0.45% Cadmium
 6.2 ozs. Silver per ton
 Lead Concentrate - 62.7% ^{ARB} Lead
 66.5 ozs. Silver per ton

5. Duty on metals contained in Concentrates:

Lead - 0.75 cents per lb.

Zinc - 0.67 cents per lb.

Then: Net Smelter returns less freight

1.	Zinc Concentrate	\$ 72.50 per short dry ton
2.	Lead Concentrate	\$202.50 " " " "

Value of Metals F.O.B. Railcar at Parson

One pound Zinc (with contained Cadmium) is worth	- 5.4 cents
One pound Lead is worth	- 7.1 "
One troy ounce Silver is worth	- \$ 1.68

PREDICTED METAL RECOVERY

In all flotation concentrators used for the processing of base metal ores, a certain portion of the lead, zinc and silver minerals are lost in the tailings. Mr. J.W. Britton, P. Eng., in his report dated 19 may, 1967, reports that tests conducted on ore from the Columbia River Mines show that:

- 95% of the lead will be recovered in the Lead Concentrate
- 90% of the Zinc will be recovered in the Zinc Concentrate
- 90% of the Silver will be recovered in both Concentrates

Britton anticipates that the Lead Concentrate will contain 80 ozs. Silver/ton, 60% Lead and 4% Zinc; the Zinc Concentrate will contain 11 ozs. Silver/ton 1% Lead, 59% Zinc and 0.45% Cadmium. (See Appendix "Metallurgical Tests on Samples of Silver-Lead-Zinc Ore submitted by Columbia River Mines Ltd", Page 2.).

VALUE OF ONE TON OF ORE

Value: (In U.S. Dollars) F.O.B. Railcar at Parson

Silver	-	4.62 ozs. x 90% x \$ 1.65	-	\$ 6.99
Lead	-	3.48 x 95% x 20 lbs. x 7.1c		\$ 4.68
Zinc	-	3.76 x 90% x 20 lbs. x 5.4c		\$ 3.65

\$15.32

Plus Exchange at 7.5% \$ 1.15

Net Value Per Ton In Canadian Funds \$16.47

DIRECT OPERATING COSTS PER TON OF ORE PRODUCED

Exploration and Development	\$ 0.70
Mining and Trammig to Mill	\$ 1.70
Miscellaneous Mine Charges	\$ 0.80
Milling	\$ 1.60
General Expenses at Property	\$ 0.80
Mine Office and Supervision	\$ 0.55
Vancouver Office	\$ 0.45
Camp Loss (Cookery)	\$ 0.56
Concentrate Haul to Railway	\$ 0.65
Royalty to M.M. Pardek	\$ 0.25
	<u>\$</u>
	\$ 8.06
Plus 10% Contingency	\$.81
	<u> </u>
Total Operations Cost per Ton	\$ 8.87

The Direct operating costs per ton, as calculated above for Columbia River Mines Ltd., compares favourably with Direct Operating costs for the Mineral King Mine, located in the same district. At the Mineral King, the production during 1966 has averaged 370 tons of ore per day and direct costs are reported to be \$ 6.81 per ton. The Mineral King direct costs do not include the following items; "Concentrate Haul to Railway", "Royalty to M.M. Pardek" and the 10% contingency. (See Appendix).

NET OPERATING PROFIT

The Net Operating Profit is determined by deducting all the direct costs of production from the anticipated net smelter settlement for metals contained in the concentrates. The Operating Profit is calculated on one ton of ore in the following manner:

Value of ore per ton	\$ 16.47
Less Total Operating Cost per ton	\$ 8.87
	<hr/>
<u>Net Operating Profit per ton</u>	<u>\$ 7.60</u>

We Assume that:

10,000 tons will be produced during first month of operation
 15,000 tons will be produced during subsequent months of operation.

Therefore

Operating Profit 1st month		
10,000 x \$ 7.60	=	<u>\$ 76,000.00</u>
Operating Profit following months		
15,000 tons x \$ 7.60	=	<u>\$121,000.00</u>

DETAILS OF PROPOSED DEBENTURE ISSUE

Amount

\$ 3,000,00.00

Interest will be paid semi-annually. The first interest payment will be due twelve months after the Minimum Subscription of \$2,100,000.00 is reached.

Each \$ 1000,00 Bond will carry the right to purchase 200 shares of the Company at \$ 1.00 per share during the twelve month period following the official start of production.

The Term will be 48 months after the Minimum Subscription is reached. Proceeds from the sale will go into a Trust Fund until the Minimum Subscription is reached.

TIME-TABLE OF BOND RETIREMENT

Assume that \$3,000,00.00 is immediately subscribed. Production will begin not later than 15 months from the date of minimum subscription. Production could commence 12 months from date of minimum subscription if all factors, such as weather, supplies and access are favourable.

However, if the 15 months pre-production period is used, then the Principal plus Interest at the start of production will be;

(P) \$ 3,000,000.00 plus (I) \$ 246,525.00 = \$ 3,246,525.00

Assume that the operating profit remains stable at \$ 121,000.00 per month and 90% is allocated to Bond Retirement, then:

TIME-TABLE OF BOND RETIREMENT Cont.

<u>Production Plus</u>	<u>Subscription Plus</u>	<u>Principal & Interest</u>
0 Months	15 Months	\$ 3,246,525
6 Months	21 Months	2,723,120
12 Months	27 Months	2,178,720
18 Months	33 Months	1,611,720
24 Months	39 Months	1,022,820
30 Months	45 Months	309,020
33 Months	48 Months Surplus	(13,550)

Note

If the share rights are purchased, as outlined in Details of Debentures then the bonds could be retired earlier by allocating the funds from purchase of stock to debt retirement.

REFERENCES

B. C. Minister of Mines Reports:

- 1936 Page E 37
- 1956 Page 112
- 1957 Page 65

Aetna Investment Corporation Limited -
 Annual Report on the Mineral King Mine
 Year Ending May 31, 1966.

APPENDIX 1.

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CECIL J. GOODMAN

CERTIFIED GENERAL ACCOUNTANT

311 LEE BUILDING, 175 EAST BROADWAY, VANCOUVER 10, B.C. TELEPHONE 876-2021

AUDITOR'S REPORT

The Shareholders,
Columbia River Mines Ltd. (N.P.L.)

I have examined the Balance Sheet of Columbia River Mines Ltd. (N.P.L.) as of October 31, 1966 and the related Schedule of Development Expenditures, both of which are attached hereto and form part of this report and have obtained all the information and explanations I have required. My examination included such tests of accounting records and other supporting evidence as I considered necessary in the circumstances.

In my opinion, the accompanying Balance Sheet and Schedule of Development Expenditures present fairly the financial position of Columbia River Mines Ltd. (N.P.L.) at October 31, 1966 and cost of its development expenses for the period then ended, according to the best of my information and the explanations given to me and in conformity with generally accepted accounting principles and practices applied on a basis consistent with that of the preceding year.

Cecil J. Goodman

Certified General Accountant.

Vancouver, B. C.
December 19, 1966.

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COLUMBIA RIVER MINES LTD. (N.P.L.)

BALANCE SHEET

OCTOBER 31, 1966

ASSETS

Current Assets:

Cash on hand and in bank	\$	21,744.05	
Investments		150,000.00	
Accounts Receivable		<u>15,072.27</u>	\$ 186,816.32

Fixed Assets:

Mining Properties, at cost, acquired by issue of 1,050,000 shares (notes 1 and 2)	\$	1,050,000.00	
Mining Properties, at cost, payable by cash (notes 1 and 2)		33,812.13	
Buildings and Equipment, at cost		<u>281,065.42</u>	1,364,877.55

Deferred Charges:

Development and other expenditures (schedule attached)	\$	917,132.16	
Prepaid Charges		<u>1,718.62</u>	918,850.78

Other Assets:

Incorporation Expense			<u>8,160.35</u>
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Total

\$ 2,478,705.00

LIABILITIES

Current Liabilities:

Accounts and Wages Payable	\$	45,133.70	
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Long-term Liabilities:

Mining properties, payments due after one year on an extended basis			22,250.00
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Capital:

Authorized: 6,000,000 common shares
of no par value

Issued:

For properties	1,050,000 shares	\$ 1,050,000.00	
For cash	1,718,761 shares	<u>1,361,321.30</u>	2,411,321.30

Total

\$ 2,478,705.00

Signed on behalf of the
Board of Directors.

J. R. McKensie
Director.
Don B. Johnson
Director.

This is the Balance Sheet referred to
in my report dated December 19, 1966.

Lucas Y. Carlson
Certified General Accountant.

COLUMBIA RIVER MINES LTD. (N.P.L.)

NOTES TO BALANCE SHEET OF OCTOBER 31, 1966

Note 1:

A contingent liability to W. D. Mining Company Ltd., exists in the amount of \$ 99,432.16, being the balance of the consideration for the acquisition of property, and is payable only out of, and at the rate of 7 1/2% of net smelter returns. ✓

Note 2:

A contingent liability to M. M. Pardek exists, being the balance of the consideration for the acquisition of property, and is payable by way of 200,000 shares of the Company upon commencing commercial production of ore, and \$ 250,000.00 payable at the rate of .25¢ per ton of ore mined.

These are Notes 1 and 2 referred to in the Balance Sheet of October 31, 1966.

Paul V. Loo-Swan

Certified General Accountant.

COLUMBIA RIVER MINES LTD. (N.P.L.)

SCHEDULE OF DEFERRED DEVELOPMENT AND OTHER EXPENDITURES

for the year ended October 31, 1966

Development Work:

Engineering	\$ 12,196.15	
Insurance	3,159.52	
New Portal	25,426.54	
Road, Road Maintenance and other surface costs	83,913.51	
Transportation	11,821.96	
Underground development	274,864.72	
Wages and Benefits	121,805.06	
General mine expense	2,634.90	
Telephone	<u>5,751.55</u>	\$ 549,573.91

Administrative and General:

Advertising	\$ 11,491.66	
Legal and Audit	12,833.75	
Licences, Registrations and Transfer Agent's Fees	5,410.14	
General office expense	816.07	
Printing, postage and office supplies	9,954.87	
Rent	3,915.00	
Telephone	2,887.19	
Wages and benefits	<u>28,159.83</u>	<u>75,468.51</u>

\$ 625,042.42

20,981.70

Deduct Investment Income

Net expenses incurred in the year

\$ 604,060.72

Total deferred at October 31, 1965

313,071.44

Total deferred at October 31, 1966

\$ 917,132.16

APPENDIX 2.

THE BUNKER HILL COMPANY

BOX 29, KELLOGG, IDAHO 83837 TELEPHONE SU 4-1261 AREA CODE 208

August 3, 1967

Mr. H. R. Graham, P. Eng.
Managing Director
Columbia River Mines Ltd. (N.P.L.)
215 - 543 Granville Street
Vancouver 2, B. C., Canada

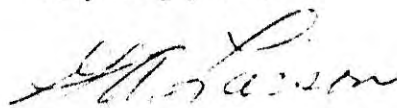
Dear Mr. Graham:

In accordance with your letter of July 28, and based on the incomplete assays submitted, we have worked pro forma settlements on both the lead and zinc concentrates you expect to produce. You will note that by using present terms and present metal prices we arrive at a value per dry ton of \$202.49 for the lead concentrate and \$72.50 for the zinc concentrate, f.o.b. our plants.

At this time there is no freight rate from Parson, B. C. to our plants and we have used \$19.52 for the lead and \$13.33 for the zinc. I would expect to be able to negotiate something lower for the lead, perhaps about \$15.00 per ton.

Unfortunately, right now we are fully committed for all the raw material we can handle. Whether this situation will still prevail next year, when you get your property into production, is difficult to say but we would hope to be in position to make an offer.

Very truly yours,



G. A. Larson
Manager-Sales & Traffic

GAL/cl

Enc.



P. O. Address:
KELLOGG, IDAHO
Freight Address:
SILVER KING, IDAHO

SETTLEMENT

Electrolytic Zinc Plant

In Account With

Columbian Refractory Mines Ltd. (N.P.L.)

Mine _____ Mine Lot _____ Plant Lot _____
Location _____ Shipping Point _____ Class _____ Flotation

Date of Arrival _____ Date of Sampling _____ Date of Settlement 8-2-67

Car Initial	Car Number	Lbs. Wet Weight	H ₂ O	CONTENTS		VALUE	Per Ton
		2222	10.0	Zinc	1190.4 Lbs. @ .135	\$ 160.70	
				Lead	— Lbs. @		
				Silver	6.2 Oz. @ 1.814	11.25	
				Gold	— Oz. @		
				Cd	9.0 lbs. @ 2.65	23.85	
Gross Weight				GROSS VALUE		\$ 195.80	
Moisture Pounds				DEDUCTIONS			
222				Zinc	15% 24.11		
Dry Weight				Lead			
2000				Lead			
Dry Tons				Silver			
1.0				Silver	1.00 oz. @ 1.814 1.81		
ASSAYS		Quotations		Silver	1.04 oz. @ 1.814 1.89		
Zinc	59.52 %			Cd	5.00 # @ 2.65 13.25		
Lead	.07 %			Gold	1.20 # @ 2.65 3.18		
Silver	6.2 Oz. per ton			Cd	2.80 # @ .50 1.40		
Gold	.01 Oz. per ton			Metal Deductions	45.64		
Cd	.45 %			Treatment	55.68	\$ 101.32	
Insol.	%			NET VALUE		\$ 94.48	
Iron	3.44 %			FREIGHT AND MISCELLANEOUS			
Lime	%			Freight Value \$	Per Wet Ton \$		
Magnesia	%			Freight	1.111 Tons @ \$13.33	14.71	
Arsenic	.28 %			Switching			
Antimony	%			Federal Tax			
TREATMENT		Per Dry Ton		TOTAL Freight			
Base		\$ 55.500		Zn Duty	59.52% - 6.0% =		
Zinc from	¢ @ \$			1070.4 # @ .67¢	7.17	21.98	
Zinc over	¢ @ \$						
Zinc under	% @ \$						
Lead under	% @ \$						
Iron	% @ \$						
As over	.1 % @ \$ 1.00		180				
Net Treatment Per Ton		\$ 55.680		BALANCE DUE		\$ 72.50	

LEAD SMELTER ORE SETTLEMENT

In Account With: Columbia River Mining Ltd. (U.S.A.)
215-543 Granville St.
Vancouver 2, B.C., Canada

Name of Mine Ruth-Vermont Mine Lot No. _____ Smelter Lot No. _____

Location _____ R. R. Shipping Point _____ Class _____

Date of Arrival _____ Date of Sampling _____ Date of Settlement 8-2-17

Car No.	H ₂ O%	Weight, Lbs.
	<u>8.0</u>	<u>2174</u>
TOTAL GROSS WEIGHT OF ORE		
Moisture Pounds		<u>174</u>
DRY WEIGHT OF ORE		<u>2000</u>

ASSAYS		
Gold	<u>0.4</u>	Oz. P. T.
Silver <u>66.4-10 =</u>	<u>65.40</u>	Oz. P. T.
Copper	<u>46</u>	% P. T.
Lead <u>62.72-1.5 =</u>	<u>61.22</u>	% P. T.
Zinc	<u>3.73</u>	% P. T.
Antimony	<u>66</u>	% P. T.
Iron	<u>5.28</u>	% P. T.
Insol.	<u>3.35</u>	% P. T.
Lime		% P. T.
Sulphur		% P. T.
Arsenic	<u>68</u>	% P. T.
Bismuth		% P. T.

QUOTATIONS		Date
Gold	<u>31.81825</u>	Per Oz.
Silver	<u>1.814</u>	Per Oz.
Lead <u>.14-.02 =</u>	<u>.120</u>	Per Lb.
Zinc <u>.135 @ 25% =</u>	<u>.03375</u>	Per Lb.

DEDUCTIONS	PER TON
Specified Base Charge	<u>21.500</u>
Wet Lead: Credit <u>12.72</u> % Lead over 50% @ 10c per unit	<u>1.272</u>
Silver: Debit <u>62.13</u> ozs. per ton paid for @ <u>1.0</u> c per oz.	<u>.621</u>
Silver: Debit <u>12.13</u> ozs. per ton paid for over 50 ozs. @ 1.5c per oz.	<u>.182</u>
Arsenic: Debit excess over 1.0% @ \$1.00 per unit	_____
Bismuth: Debit excess over 0.1% of Wet Lead content @ 50c per lb.	_____
Sulphur: Debit excess over 16.0% @ 10c per unit	_____
Moisture: Debit excess over 10.0% @ 20c per unit	_____
Labor Charge: Debit _____ c per hour @ 8c	_____
Freight on Lead Paid For: Debit _____	_____
TOTAL DEDUCTIONS	<u>21.031</u>

PAYMENTS	VALUE - PER TON
Gold <u>.04</u> Oz. @ <u>31.81825</u> Per Oz.	<u>1.273</u>
Silver <u>65.40</u> Oz. @ <u>1.814</u> Per Oz.	<u>112.704</u>
Lead <u>61.22</u> % @ <u>94.5</u> % @ <u>.120</u> Per Lb.	<u>138.847</u>
Zinc <u>3.73</u> % @ <u>50.0</u> % @ <u>.03375</u> Per Lb.	<u>1.259</u>
TOTAL PAYMENTS	<u>254.083</u>
Less Total Deductions	<u>21.031</u>
NET VALUE PER TON	<u>233.052</u>

Total Ounces Silver in this Shipment _____
Dry Weight 2000 Pounds = 1.0 Tons @ \$ 233.052 Per Ton equals \$ 233.052

Less Inbound Freight: 1.087 Gross Tons @ \$ 19.52 Per Ton equals \$ 21.218

Duty on Lead 62.72% - 2.0% = 12.144 # @ .75¢ 9.108
Duty on Zinc 3.73% - 2.0% = 34.6 # @ .67¢ .232 30.55

NET PROCEEDS \$ 202.494

APPENDIX 3.

METALLURGICAL TESTS ON SAMPLES OF
SILVER-LEAD-ZINC ORE
submitted by
COLUMBIA RIVER MINES LIMITED (N.P.L.)
Progress Report No.1

Our Project No: B134

Date: May 19, 1967

Investigation by: John W. Britton, B.Sc., A.R.S.M., P.Eng.,
Consulting Metallurgist,
Britton Research Limited,
1612 West 3rd Avenue,
Vancouver 9, B.C.

INTRODUCTION

This report describes concentration tests carried out on samples of silver-lead-zinc ore submitted by Columbia River Mines Limited, (N.P.L.), Suite 511, 543 Granville Street, Vancouver 2, B.C.

The first test (134-1), was carried out on a sample which was received on January 26th, 1967. The sample assayed 16.7 oz of silver per ton, 10.66% lead and 10.50% zinc; these assays were appreciably higher than those of the anticipated mill feed. Arrangements were therefore made for the supply of a sample of low-grade material which was blended with the high-grade material in the proportion of one part high-grade to 1.5 parts low-grade. The composite sample, which assayed 6.7 oz of silver per ton, 4.61% lead and 4.70% zinc, was used for tests 134-2 and 134-3.

Authorization for the tests to be carried out was given in a letter dated January 27th, 1967 from Mr. H.R. Graham, Managing Director of Columbia River Mines Limited.

SUMMARY

1. The composite sample used in tests 134-2 and 134-3 assayed 0.02 oz of gold and 6.7 oz of silver per ton, 4.61% lead, 4.70% zinc, 0.02% cadmium, 0.09% copper and 0.03% tin.

2. In test 134-3, which gave appreciably better results than test 134-2, the ore was ground to 73% minus 200 mesh. Selective flotation of the lead was then carried out, followed by flotation of the zinc after activation with copper sulphate. Each concentrate was cleaned twice.

3. The final lead concentrate assayed 0.04 oz of gold and 66.4 oz of silver per ton, 62.72% lead, 3.73% zinc and 0.46% copper. The final zinc concentrate assayed 0.01 oz of gold and 6.2 oz of silver per ton, 0.07% lead, 59.52% zinc and 0.45% cadmium. (For complete assays see page.12).

4. It is anticipated that the following results would be obtained when treating similar ore in a full-scale mill:

Lead concentrate. Weight: 6.8% of ore.
Assays: Silver 80 oz/ton, lead 60%,
zinc 4%.

Zinc concentrate. Weight: 6.1%.
Assays: Silver 11 oz/ton, lead 1%,
zinc 59%, cadmium 0.45%.

80% of the silver, 95% of the lead and 7% of the zinc would be recovered in the lead concentrate and 10% of the silver, 1% of the lead and 90% of the zinc would be recovered in the zinc concentrate, giving overall recoveries of 90% of the silver, 96% of the lead and 97% of the zinc.

5, No unusual difficulty is anticipated in treating the ore in a full-scale mill.

Respectfully submitted,
BRITTON RESEARCH LIMITED

John W. Britton, P. Eng.
John W. Britton, P. Eng.
Consulting Metallurgist.

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ASSAY OF HEAD SAMPLES

	<u>High-Grade ore</u>	<u>Waste</u>	<u>Composite ("C")</u>
Gold (Au)	0.054 oz/ton	0.005 oz/ton	0.020 oz/ton
Silver (Ag)	16.7 oz/ton	0.28 oz/ton	6.7 oz/ton
Lead (Pb)	10.66%	0.13%	4.61%
Zinc (Zn)	10.50%	0.67%	4.70%
Iron (Fe)	12.27%		7.07%
Sulphur (S)	19.01%		8.90%
Acid insol. (SiO ₂ etc)	34.20%		35.48%
Cadmium (Cd)	0.05%		0.02%
Copper (Cu)	0.22%	0.02%	0.09%
Tin (Sn)			0.03%

Note: For spectrographic analyses, see page 4.

Spectrographic analyses of head samples

		<u>High-grade ore</u>	<u>Composite ("C")</u>
Antimony	(Sb)	0.1%	0.1%
Arsenic	(As)	1%	1%
Barium	(Ba)	0.03%	0.03%
Boron	(B)	0.005%	0.01%
Cadmium	(Cd)	0.05%	0.03%
Chromium	(Cr)	0.02%	0.01%
Cobalt	(Co)	0.008%	0.005%
Copper	(Cu)	0.4%	0.1-0.2%
Gallium	(Ga)	0.0005%	0.001%
Gold	(Au)	0.1 oz/ton	N.D.
Lead	(Pb)	10%	5%
Manganese	(Mn)	0.4%	0.4%
Molybdenum	(Mo)	0.02%	0.002%
Nickel	(Ni)	0.005%	0.02%
Silver	(Ag)	10 oz/ton	10 oz/ton
Strontium	(Sr)	N.D.	0.1%
Tin	(Sn)	0.1%	0.03%
Titanium	(Ti)	0.1%	0.3%
Vanadium	(V)	0.01%	0.02%
Zinc	(Zn)	15%	1-10%
Zirconium	(Zr)	0.002%	0.01%
Aluminum	(Al ₂ O ₃)	7%	5-50%
Calcium	(CaO)	3%	10%
Iron	(Fe)	10%	10%
Magnesium	(MgO)	1%	3%
Silica	(SiO ₂)	10-100%	10-100%
Sodium	(Na ₂ O)	N.D.	0.5%
Potassium	(K ₂ O)	1%	2%

Be, Bi, Ce, Ge, Hf, In, Ir, La, Li, Hg, Nb, Nd, Pd, P, Pt, Rh, Ru, Ta, Te, Tl, Th, W, U, Y - not detected in either sample.

Note: N.D. Not detected.

All figures are approximate.

SPECIFIC GRAVITY OF ORE

(a) High-grade sample: 3.72, equivalent to 8.6 cubic feet per short ton.

(b) Composite sample: 3.13, equivalent to 10.2 cubic feet per short ton.

WORK INDEX OF ORE (Composite sample)

For grinding from minus 10 mesh (21.3% minus 200 mesh) to flotation feed size (73.1% minus 200 mesh): Work index (Bond) 9.6 k.w.h. per short ton.

DETAILS OF TESTS

(a) Crushing. Crushing was carried out in a laboratory jaw crusher in closed circuit with a 10 mesh screen.

(b) Grinding. This was carried out in a Denver laboratory ball-mill using a pulp density of 65% solids.

(c) Flotation. Conditioning and flotation were carried out in a Denver laboratory machine, type D1.

(d) Test conditions and results. These are shown in tables 1 to 7 inclusive.

(e) Discussion of results. In test 134-1, 62.7% of the silver, 96.9% of the lead and 9.1% of the zinc were recovered in the rougher concentrate, which assayed 56.0 oz of silver per ton, 55.37% lead, and 5.39% zinc. In addition, 16.6% of the silver, 1.5% of the lead and 6.2% of the zinc were recovered in the lead scavenger concentrate, giving overall recoveries of 79.3% of the silver, 98.4% of the lead and 15.3% of the zinc.

9.1% of the silver, 1.0% of the lead and 82.1% of the zinc were recovered in the zinc rougher concentrate, which assayed 7.9 oz of silver per ton, 0.55% lead and 47.14% zinc; including the zinc scavenger concentrate, overall recoveries of 93.6% of the silver, 99.6% of the lead and 98.5% of the zinc were obtained in the lead and zinc concentrates.

In test 134-2, 89.9% of the lead was recovered in the final lead concentrate, but this was of relatively low grade (45.02% Pb) and contained 16.0% of the total zinc in the ore. The zinc concentrate, however, was of high grade (57.57% Zn). The overall recoveries (96.8% of the silver, 98.4% of the lead and 97.5% of the zinc) were very satisfactory.

In test 134-3, the grinding time was increased from 18 to 21 minutes and some changes were made in the reagent additions. The assay of the final lead concentrate increased from 45.02 to 62.72% Pb and the zinc assay decreased from 8.15 to 3.73%. The Zn and the recovery of zinc in the zinc concentrate increased from 74.7% to 86.7%.

Based on the results of test 134-3, a metallurgical balance was drawn up (see table 8). It is anticipated that when treating similar ore in a full-scale mill, 80% of the silver, 95% of the lead and 7% of the zinc would be recovered in a concentrate assaying 0.04 ozs of gold and 80 ozs of silver per ton, 60% lead, 4% zinc, 0.5% copper, 6% iron, 0.7% arsenic, 0.7% antimony, a trace of bismuth and 4% of insoluble matter. 10% of the silver, 1% of the lead and 90% of the zinc would be recovered in a zinc concentrate assaying 0.01 ozs of gold and 11 ozs of silver per ton, 1% lead, 59% zinc, 0.45% cadmium, 4% iron, 0.3% arsenic, a trace of bismuth, 0.06% tin, less than 0.01% chlorine and 0.02% fluorine.

The ore is relatively easy to crush and grind (work index 9.6) and flotation contact times and reagent consumptions are moderate. No unusual difficulty is anticipated in treating the ore.

Columbia River - Test 134-1

Flotation conditions

TABLE 1

	Stage							Total
	1	2	3	4	5	6	7	
Reagents: Lb per ton ore								
CaO	3.0	-	-	-	-	-	-	3.0
NaCN	0.4	-	-	-	-	-	-	0.4
ZnSO ₄ ·7H ₂ O	-	1.2	-	-	-	-	-	1.2
CuSO ₄ ·5H ₂ O	-	-	-	-	1.2	-	0.3	1.5
CX51 (1)	-	0.05	0.04	0.02	-	-	0.02	0.13
Z200 (Dow)	-	-	-	-	-	0.072	0.036	0.108
M.I.B.C.	-	0.015	0.005	0.005	-	-	0.015	0.040
Pulp volume - Ml (2)	-	4800	4800	4800	4800	4800	4800	-
% Solids	65	32	32	27	27	27	22	-
Time - Minutes	24	5	12	4	5	10	4	-
pH	-	-	11.0	11.6	-	11.3	10.9	-
Temperature - °C	-	-	19	20	-	21	22	-

Notes: (1) Potassium amyl xanthate (Chemcell)
 (2) Per 2000 grams of original ore

- Stages:
1. Grinding (75% - 200 mesh).
 2. Pb conditioning.
 3. Pb rougher flotation.
 4. Pb scavenger flotation.
 5. Zn conditioning.
 6. Zn rougher flotation.
 7. Zn scavenger flotation.

Columbia River - Test 134-1 results

TABLE 2

Product	Weight %	Assays					Distribution %				
		Au oz/ton	Ag oz/ton	Pb %	Zn %	Cu %	Au	Ag	Pb	Zn	Cu
1 Pb rougher conc.	18.15	0.02	56.0	55.37	5.39	0.38	7.7	62.7	96.9	9.1	31.4
2 Pb scavenger conc.	2.71	0.02	99.2	5.88	24.79	1.44	1.1	16.6	1.5	6.2	17.7
3 Zn rougher conc.	18.74	0.01	7.9	0.55	47.14		4.0	9.1	1.0	82.1	
4 Zn scavenger conc.	2.65	0.02	31.4	0.84	4.41		1.1	5.2	0.2	1.1	
5 Tailing	57.75	0.07	1.8	0.07	0.28		86.1	6.4	0.4	1.5	
6 Head (calculated)	100.00	0.047	16.2	10.37	10.76		100.0	100.0	100.0	100.0	
6 Head (direct assays)		0.054	16.7	10.66	10.50	0.22					100.0

Calculated results:

1+2 Pb rougher & scav. concentrates	20.86	0.02	61.6	48.94	7.91	0.52	8.8	79.3	98.4	15.3	49.1
3+4 Zn rougher & scav. concentrates	21.39	0.01	10.8	0.59	41.85		5.1	14.3	1.2	83.2	
1 to 4 combined concs.	42.25	0.02	35.9	24.46	25.09		13.9	93.6	99.6	98.5	

Additional assays: Head: Cd 0.05%; total Fe 12.27%; S 19.01%; acid insol. 34.20%

Columbia River (Composite "C") - Test 134-2

TABLE 3

Flotation conditions

Stage

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Reagents:													
Lb/ton of original ore													2.0
CaO	2.0	-	-	-	-	-	-	-	-	-	0.3	-	0.8
Ca (OH) ₂	-	-	-	0.3	-	0.2	-	-	-	-	-	-	0.24
NaCN	0.2	-	-	0.02)	-	0.02)	-	-	-	-	-	-	0.72
ZnSO ₄ ·7H ₂ O	-	0.6	-	0.06}{3)	-	0.06}{3)	-	-	-	-	-	-	1.3
CuSO ₄ ·5H ₂ O	-	-	-	-	-	-	-	0.3	1.0	-	-	-	0.15
CX51 (1)	-	0.05	0.06	0.01	0.01	0.01	0.01	-	-	-	-	-	0.15
Z200 (Dow)	-	-	-	-	-	-	-	0.030	-	0.090	0.030	0.015	0.165
Pine Oil	-	-	-	-	-	-	-	-	-	-	0.018	-	0.018
M.I.B.C.	-	0.030	-	0.005	-	0.005	-	0.005	-	0.015	0.010	0.015	0.085
Pulp volume - Ml (2)	-	4800	4800	1200	1200	1200	1200	2600	4800	4800	2600	1200	-
% Solids	65	32	32	19	3.4	16	3.4	1.7	29	29	8	10	-
Time - Minutes	18	10	12	6	2	6	3	4	10	10	5	4	-
pH	-	11.6	11.6	11.4	10.9	11.0	9.7	8.0	-	11.1	11.2	9.5	-
Temperature - °C	-	20	20	19	20	20	21	21	-	22	18	19	-

Notes: (1) Potassium amyl xanthate; (2) Per 2000 grams of original ore; (3) added as mixture.

Stages: 1. Grinding (69%-200 mesh)

2. Pb conditioning

3. Rougher Pb flotation

4. 1st Pb Cleaning - Primary concentrate

5. " " " - Secondary concentrate

6. 2nd Pb Cleaning - Primary concentrate

7. 2nd Pb cleaning - Secondary concentrate

8. Secondary Zn flotation (from comb. Pb cleaner tails)

9. Zn conditioning (of rougher Pb tailing)

10. Rougher flotation (Zn)

11. 1st Primary Zn cleaning

12. 2nd Primary Zn cleaning

Columbia River (Composite "C") - Test 134-3

Flotation conditions

TABLE 5	Stage									Total
	1	2	3	4	5	6	7	8	9	
Reagents:										
Lb/ton of original ore										2.0
CaO	2.0	-	-	-	-	-	-	-	-	0.8
Ca(OH) ₂	-	-	-	0.2	0.2	-	-	0.3	0.1	0.22
NaCN	0.2	-	-	0.01	0.01	-	-	-	-	0.66
ZnSO ₄ ·7H ₂ O	-	0.6	-	0.03 ⁽¹⁾	0.03 ⁽¹⁾	-	-	-	-	1.0
CuSO ₄ ·5H ₂ O	-	-	-	-	-	1.0	-	-	-	0.1
Aero Depressant 610	0.1	-	-	-	-	-	-	-	-	0.11
CX51 (2)	-	0.05	0.04	0.01	0.01	-	-	-	-	0.15
Z200 (Dow)	-	-	-	-	-	-	0.090	0.045	0.015	0.024
Aerofloat 31	-	-	-	-	-	-	-	0.024	-	0.075
M.I.B.C.	-	0.015	-	-	-	-	0.030	0.015	0.015	-
Pulp volume - Ml (3)	-	4800	4800	1200	1200	4800	4800	2600	1200	-
% Solids	65	32	32	17	13	29	29	8	11	-
Time - Minutes	21	10	12	6	4	10	12	6	4	-
pH	-	11.6	11.6	11.4	11.4	-	11.0	11.2	10.9	-
Temperature - °C	-	18	19	18	20	-	21	18	21	-

Notes: ⁽¹⁾ Added as mixture; (2) Potassium amyl xanthate; (3) Per 2000 grams of original ore.

- | | | |
|---------------|-----------------------------|-------------------------|
| <u>Stages</u> | 1. Grinding. (73%-200 mesh) | 6. Zn conditioning |
| | 2. Pb conditioning | 7. Zn rougher flotation |
| | 3. Pb rougher flotation | 8. 1st Zn cleaning |
| | 4. 1st Pb cleaning | 9. 2nd Zn cleaning |
| | 5. 2nd Pb cleaning | |

Columbia River (Composite "C") - Test 134-2 results

TABLE 4

#	Product	Assays						Distribution %				
		Weight %	Au oz/ton	Ag oz/ton	Pb %	Zn %	Cu %	Au	Ag	Pb	Zn	Cu
1	Final Pb concentrate	8.80	0.03	55.4	45.02	8.15	0.50	10.3	70.3	89.9	16.0	48.9
2	Secondary Pb concs (comb'd)	1.98	0.10	52.9	10.95	6.85	0.81	8.0	15.1	4.9	3.0	17.8
3	Secondary Zn concentrate	0.82	0.02	20.4	6.57	5.93		0.8	2.4	1.2	1.1	
4	Secondary Zn tailing	1.37	0.02	13.7	3.95	0.88		1.1	2.7	1.2	0.2	
5	Final Zn concentrate	5.83	0.01	2.8	0.16	57.57		2.4	2.3	0.3	74.7	
6	2nd Zn cleaner tailing	0.64	0.02	6.1	1.13	5.59		0.4	0.6	0.1	0.8	
7	1st Zn cleaner tailing	4.77	0.01	5.0	0.77	1.54		2.0	3.4	0.8	1.7	
8	Rougher tailing	75.79	0.025	0.29	0.09	0.15		75.0	3.2	1.6	2.5	
9	Head (calculated)	100.00	0.025	6.9	4.41	4.49		100.0	100.0	100.0	100.0	
9	Head (direct assays)		0.020	6.7	4.61	4.70	0.09					100.0

Calculated results:

1	Final Pb concentrate	8.80	0.03	55.4	45.02	8.15	0.50	10.3	70.3	89.9	16.0	48.9
1+2	Total Pb concentrates:	10.78	0.04	54.9	38.76	7.91	0.56	18.3	85.4	94.8	19.0	66.7
1to4	Rougher Pb concentrate	12.97	0.04	48.4	33.05	7.04		20.2	90.5	97.2	20.3	
5	Final concentrate	5.83	0.01	2.8	0.16	57.57		2.4	2.3	0.3	74.7	
5+6	Zn conc. after 1 cleaning	6.47	0.01	3.1	0.26	52.43		2.8	2.9	0.4	75.5	
5to7	Rougher Zn concentrate	11.24	0.01	3.9	0.47	30.83		4.8	6.3	1.2	77.2	
1to7	Total rougher concs.	24.21	0.03	27.7	17.93	18.09		25.0	96.8	98.4	97.5	

Additional assays: #1 8.25% insol.; 5.71% Fe
 #5 3.77% Fe; 0.42% Cd.

Columbia River (Composite "C") - Test 134 - 3 results.

TABLE 6

#	Product	Weight %	Assays				Distribution %					
			Au oz/ton	Ag oz/ton	Pb %	Zn %	Cu %	Au	Ag	Pb	Zn	Cu
1	Final Pb concentrate	6.32	0.04	66.4	62.72	3.73	0.46	19.1	59.3	88.2	5.2	32.3
2	2nd Pb cleaner tailing	2.37	0.02	52.6	16.15	4.67		3.8	17.6	8.5	2.5	
3	1st Pb cleaner tailing	3.24	0.02	20.3	2.60	3.24		4.6	9.3	1.9	2.3	
4	Final Zn concentrate	6.58	0.01	6.2	0.07	59.52		5.3	5.8	0.1	86.7	
5	2nd Zn cleaner tailing	0.72	0.04	15.8	0.94	7.46		2.3	1.6	0.1	1.1	
6	1st Zn cleaner tailing	4.39	0.02	4.4	0.32	1.01		6.9	2.7	0.3	1.0	
7	Rougher tailing	76.38	0.01	0.34	0.05	0.07		58.0	3.7	0.9	1.2	
8	Head (Calculated)	100.00	0.013	7.1	4.49	4.52		100.0	100.0	100.0	100.0	
8	Head (direct assays)		0.020	6.7	4.61	4.70	0.09					100.0

Calculated results:

1	Final Pb concentrate	6.32	0.04	66.4	62.72	3.73	0.46	19.1	59.3	88.2	5.2	32.3
1+2	Pb concentrate after 1 cleaning	8.69	0.03	62.6	50.02	3.99		22.9	76.9	96.7	7.7	
1to3	Rougher Pb conc.	11.93	0.03	51.1	37.14	3.78		27.5	86.2	98.6	10.0	
4	Final Zn concentrate	6.58	0.01	6.2	0.07	59.52		5.3	5.8	0.1	86.7	
4+5	Zn conc. after 1 cleaning	7.30	0.02	7.2	0.16	54.38		7.6	7.4	0.2	87.8	
4to6	Rougher Zn conc.	11.69	0.02	6.1	0.22	34.34		14.5	10.1	0.5	88.8	
1to6	Total rougher concs.	23.62	0.02	28.9	18.87	18.91		42.0	96.3	99.1	98.8	

Additional assays:

#1 As 0.68%; Sb 0.66%; Bi trace; Fe 5.28%; acid insol. 3.35%
 #5 As 0.28%; Bi trace; Sn 0.06%; Cd 0.45%; Fe 3.44%; Cl 0.01%; F 0.02%

Columbia River Mines Ltd. (N.P.L.) - Metallurgical Balance

TABLE 8

Product	Assays				Distribution %		
	Weight	Silver	Lead	Zinc	Silver	Lead	Zinc
	%	oz/ton	%	%			
Lead concentrate	6.8	80	60	4	80	95	7
Zinc concentrate	6.1	11	1	59	10	1	90
Tailing	87.1	0.8	0.2	0.1	10	4	3
Head (assumed)	100.0	6.8	4.3	4.0	100	100	100
Combined concentrates	12.9	47	32	30	90	96	97

Other assays:		Head	Lead concentrate	Zinc concentrate
Gold	Au	0.02oz/ton	0.04oz/ton	0.01 oz/ton.
Copper	Cu	0.1%	0.5%	
Cadmium	Cd	0.03%		0.45%
Iron	Fe	7%	6%	4%
Arsenic	As	1%	0.7%	0.3%
Antimony	Sb	0.1%	0.7%	
Bismuth	Bi	-	Trace	Trace
Tin	Sn	0.03%		0.06%
Insoluble matter	SiO ₂ etc.	35%	4%	
Chlorine	Cl			Less than 0.01%
Fluorine	F			0.02%
Sulphur	S	9%		

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APPENDIX 4.

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APPENDIX 4

SUMMARY OF PRE-PRODUCTION COSTS

1.	Mine Development, Stope Preparation, Exploration	\$ 260,000.00
2.	Miscellaneous Mine Charges	178,400.00
3.	General Expenses at Property	159,000.00
4.	Mine Office Supervision	110,700.00
5.	Head Office Administration	92,700.00
6.	Mill and Crushing Plant	946,400.00
7.	Additional Plant and Equipment	330,000.00
		<hr/>
	Sub Total	\$2,077,200.00
	Contingency @ 15%	311,600.00
		<hr/>
	Total	\$2,388,800.00
	Plus Working Capital	500,000.00
		<hr/>
	Total Pre-Production Cost After August 1, 1967	\$2,888,800.00
		<hr/> <hr/>

NOTES TO PRE-PRODUCTION COSTS

1. Mine Development - includes 3,900 feet of lateral development and 300 feet of raising to prepare ore body for mining.
2. Miscellaneous mine charges include equipment maintenance and repairs, first-aid and supervisory salaries, lamp

APPENDIX 4 Cont.

rental, ore and waste dump maintenance, and drill steel and bits for 15 months prior to mill production.

3. General expenses include Workmen's Compensation, Insurance, holiday pay, unemployment insurance, road maintenance, first aid supplies and transporting of supplies and employees from Golden to mine.

4. & 5.

Salaries and Office expenses for 15 months prior to production.

6. The total cost of Mill & Crushing plant has been taken from the "Budget Estimate", Project 511, by Wright Engineers dated July 26th, 1967. The items marked "Contingency" have been deducted from the total shown by Wright Engineers and a sum of \$ 70,000.00 has been added for "Engineering".

7. Additional plant and equipment includes underground mining equipment and compressors: power generating plant, maintenance shop supplies, bunk houses, cookhouse and dry buildings.

PRE-PRODUCTION COST ESTIMATEMINE DEVELOPMENT

Drifting, Cross Cutting Raising.

Service Drift	600 x \$ 40	\$ 24,000
Service Raise	300 x \$ 50	\$ 15,000
Devel.& Prep.	3600 x \$ 40	\$144,000
5750 Portal Retimber & Trestle		\$ 30,000
Relocating Air & Water Lines		\$ 2,000
Diamond Drilling		
Surface	600' @ \$ 10	\$ 6,000
Underground	1500' @ \$ 5	\$ 7,500
Assaying		\$ 1,500.
Stopeing	10,000 @ \$ 3.00	\$ 30,000
	SUB TOTAL	<u>\$260,000</u>

ADDITIONAL PLANT, BLDGS. EQUIP.

10 Rock Drills \$ 1,500 ea.		\$ 15,000
2 30 H.P. Slushers/scrapers		\$ 14,000
2 Tuggers		\$ 2,000
1 1200 C.F.M. Compressor		\$ 20,000
2 Copco Large Loader		\$ 30,000
1 Mine Fan		\$ 3,000
1 Air Receiver		\$ 1,000
1 Cat. 950 Loader (\$ 1300/mo. lease x 15)		\$ 19,500
90 Lockers		\$ 2,500
3 Cat 298 D Diesel/Electric		\$150,000
	Sub Total	<u>\$257,000</u>

APPENDIX 4 Cont.

Additional Plant, Bldgs., Equip.

	Sub Total	\$257,000
Misc. Supplies - Mine		\$ 10,000
" " - Mill		\$ 10,000
Shop Equipment		\$ 10,000
10 Mine Cars @ \$ 2,000		\$ 20,000
2 Diesel Loco. @ \$ 6,000		\$ 12,000
1 Shop Building (20' x 94' max)		\$ 10,000
3 Bunkhouses { 60 men		\$ 31,000
1 Cookhouse { 80 men		
1 Dry		\$ 10,000
Site Preparation		\$ 10,000
	SUB TOTAL	<u>\$380,000</u>
<u>Less Allowance for Sale of Surplus Equip.</u>		
2 Diesel Electric Generators		\$ 35,000
2 G. D. Compressors		\$ 10,000
1 Eimco 630 Loader		\$ 5,000
	LESS	<u>\$ 50,000</u>
	<u>NET SUB TOTAL</u>	<u>\$330,000</u>

APPENDIX 4 Cont.

GENERAL EXPENSES AT PROPERTY FOR 15 MONTHS PRIOR TO PRODUCTION

1. Workmen's Comp. - 15 months		
20 - 80 Men - Average 40 @ \$500 per month		
\$300,00 @ 6.75%		\$ 20,200
2. <u>Insurance</u>		\$ 6,000
3. (First Aid Supplies		
{ Pre employment costs		\$ 2,000
4. Road Maint. & Plowing (or Helicopter Cost)		
Present cost per winter month \$4,200		
9 Winter months @ \$4,200		\$ 37,800
6 Summer Months @ \$1,500		\$ 9,000
5. Transport of Supplies & Employees		
8 Complete Trips per Week @ \$75 each		
\$600 per week for 67 weeks		\$ 40,200
Plus Helicopter cost		\$ 3,000
6. Group Insurance)		
Holiday Pay	40 Men @ \$500 per month	
Statutory	x 15 months	
U.I.C.	10% of \$300,000	\$ 30,000
Can Pension)	
7. Vehicle Leases	2 @ 150 x 12 \$3,600	
	1 @ 600 x 12 \$7200	\$ 10,800
		<u>\$159,000</u>
	<u>SUB TOTAL</u>	<u>\$159,000</u>

MISCELLANEOUS MINE CHARGES FOR 15 MONTHS PRIOR TO PRODUCTIONCompressor & Power Plant

Labour 3 men x \$ 30 ea./day 450	\$ 40,500
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Fuel & Supplies Maint. 450 days @ \$ 100	\$ 45,000
--	-----------

Repairs to Mine Equipment

Slushers, Drills, Tuggers, Loaders, Cars,

Hoists, Locis. (5 months @ \$ 500	
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(10 months @ \$ 1,500	\$ 17,500
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Surface Buildings & First Aid

Dry, Surface Buildings, Lamp Maint.

1 man \$ 30 x 450 days \$ 13,500	
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Fuel & Supplies \$10/day 450 days \$4500	\$ 18,000
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Mine Supervision

1 Foreman	\$800 x 12 x 1	\$ 9,600
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2 Shifters	\$700 x 12 x 2	\$ 16,800
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Level Maint. Ditch, and Vent

Labour & Maintenance	\$ 5,000
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Sundry

Drill Steel, Bits, & Resharpener	\$ 10,000
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Tools & Maint.	\$ 2,000
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Safety Lamp Rental & Maint.

60 x 21.80 per month for 13 Months	\$ 1,500
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Ore & Waste Dumps

	\$ 5,000
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SUB TOTAL

<u>\$178,400</u>

APPENDIX 4 Cont.

MINE OFFICE & SUPERVISION

1 Gen. Supt. @ \$1,200 per month	14 months plus 1	\$ 18,000
1 Geologist @ \$700 per month	15 months	\$ 10,500
1 Chief Eng. @ \$900 per month	14 months plus 1	\$ 13,500
1 Surveyor @ \$600 per month	12 months	\$ 7,200
1 Mech. Supt. \$900	15 months	\$ 13,500
1 Mill Supt. \$900	14 months plus 1	\$ 13,500
1 Accountant @ \$600 per month	15 months	\$ 9,000
1 Bookkeeper @ \$500 per month	10 months	\$ 5,000
1 Assayer @ \$600 per month	15 months	\$ 9,000
Telephone, Radio \$500 per month	15 months	\$ 7,500
Misc.		\$ 4,000

SUB TOTAL

\$ 110,700

ADMINISTRATION

Legal & Audit	\$ 10,000
Licences	\$ 8,000
Sundry	\$ 1,200
Office Supplies	\$ 7,500
Rent	\$ 6,000
Telephone (500 x 15 months)	\$ 7,500
Wages, Expenses (15 months x \$3,500.00)	\$ 52,500

SUB TOTAL

\$ 92,700

APPENDIX 5.

Project No. 511

July 26th, 1967.

COLUMBIA RIVER MINES LTD. (N.P.L.)

RUTH-VERMONT PROPERTY

500 T.P.D. Pb-Zn CONCENTRATOR

EQUIPMENT & INSTALLATION BUDGET ESTIMATE

Discharge Chute	\$ 1,400.00
42" x 84" Vibrating Feeder	4,000.00
Chaingate	600.00
24" x 36" Kue-Ken Jaw Crusher	
(Secondhand - \$16,000.00)	30,000.00
Discharge Housing	320.00
4' Standard Cone Crusher	28,000.00
Discharge Housing	400.00
30" Conveyor No. 1 - 36' horiz. (Used)	4,050.00
Skirting Mount	600.00
24" Conveyor No. 2 - 85' (Used)	4,750.00
Transfer Chute Conveyors 2 - 3	1,200.00
24" Conveyor No. 3 - 93' (Used)	5,000.00
Tramp Iron Magnetic Pulley (Used)	500.00
Screen Feed Chute	600.00
4' x 10' D.D. Screen (Used)	3,100.00
Screen Fine Chute	<u>1,000.00</u>
	\$ 86,420.00



Screen Oversize Chute	\$ 1,000.00
18" Conveyor No. 4 - 113' (Used)	4,200.00
5 Ton Underslung Bridge Crane	2,000.00
8,000 c.f.m. Dust Collector	2,600.00
8,000 c.f.m. Fan	1,225.00
Item - Dust Collection Piping	5,000.00
2 - Slot Feeders	3,210.00
24" Conveyor No. 5 - 28' horiz. (Used)	2,450.00
24" Conveyor No. 6 - 28' horiz. (Used)	2,450.00
2 - Chutes	800.00
18" Conveyor No. 7 - 40' (Used)	3,450.00
Weightometer (Used)	2,750.00
Ball Mill Feed Chute	800.00
8' x 11' Ball Mill (Used)	26,000.00
Launder and Pumpbox	2,400.00
2-5 x 5 S.R.L. Pumps	2,000.00
2 - 12" Cyclones	1,810.00
	<hr/>
	\$ 64,145.00



2 Ton Monorail Crane	\$ 1,500.00
6' dia. x 6' Conditioner	2,400.00
10 - No. 24 Denver Sub A Cells	15,450.00
Item - Launderers	1,000.00
2 - Pumpboxes	800.00
2" x 2" S.R.L. Pump	1,000.00
6 - No. 21 Denver Sub A Cells	9,000.00
Item - Launderers	600.00
Pumpbox	400.00
2 - 2" x 2" S.R.L. Pumps	2,000.00
10' dia. x 12" Stocktank with Agitator	5,300.00
2" x 2" S.R.L. Pump	1,000.00
6' dia. x 4 Agidise Filter	7,700.00
Pumpbox	400.00
2" x 2" S.R.L. Pumps	1,000.00
8' dia. x 8' Conditioner	2,800.00
10 - No. 24 Denver Sub A Cells	15,450.00
	<hr/>
	\$ 67,800.00



	\$ 1,000.00
Item - Launderers	800.00
Pumpbox	2,000.00
2 - 2" x 2" S.R.L. Pumps	9,000.00
6 - No. 21 Denver Sub A Cells	600.00
Item - Launderers	400.00
Pumpbox	1,000.00
2" x 2" S.R.L. Pump	5,300.00
10' dia. x 12 Stocktank with Agitator	1,000.00
2" x 2" S.R.L. Pump	7,700.00
6' dia. x 4 Agidise Filter	4,500.00
Vacuum Pump	600.00
Blower	2,640.00
6 - Reagent Mixing Tanks 4' dia. x 5'	300.00
1 - Reagent Mixer (Portable)	1,725.00
10 - 1" Reagent Pumps	600.00
1 - Reagent Storage Tank 12' x 2' x 2'	1,000.00
20 - Flowrators	700.00
Denver 24" Dry Feeder over Conveyor No. 7	<u>700.00</u>
	\$ 40,865.00

2 - Denver 6" Dry Feeders over Cleaner Cells	\$ 700.00
3 - Vertical Sump Pumps	<u>1,800.00</u>
	\$ 2,500.00
	261,730.00
Installation 25%	<u>65,433.00</u>
	<u>\$327,163.00</u>

PROCESS & WATER PIPING

Process Piping	\$ 25,000.00
Water Supply Piping, Installation & Controls (350 I.G.P.M.)	5,000.00
2 - Pumps 15 H.P.	1,000.00
Fire Sprinkler System for 12,000 S.F.	7,200.00
6" Water Piping from Storage to Mill 1,300 ft.	<u>13,000.00</u>
	<u>\$ 51,200.00</u>

ELECTRICAL

Motors	\$ 24,000.00
Motor Control and Installation	50,000.00
Power Distribution (excluding generation)	5,000.00
Building Lighting	9,000.00
Area Lighting	<u>1,000.00</u>
	\$ 89,000.00
Taxes on \$62,332.00 (5%)	<u>3,117.00</u>
	<u>\$ 92,117.00</u>



COLUMBIA RIVER MINES LTD. (N.P.L.)

BUDGET ESTIMATE - PROCESS PLANT

CONSTRUCTION

Rough Excavation		\$ 15,000.00
Detail Excavation		6,000.00
Concrete - Building Walls & Footings	305 C.Y.	51,800.00
Equipment Bases	250 C.Y.	32,400.00
F.O. Bin Foundation	170 C.Y.	25,500.00
C.O. Bin Foundation	120 C.Y.	18,000.00
Floor Slabs	157 C.Y.	15,700.00
Miscellaneous (Pumphouse, etc).	100 C.Y.	15,000.00
Drainage		3,200.00
Backfill		6,000.00
Building (superstructure only) - Crushing Plant (Steel)		30,000.00
Concentrator (Steel)		45,000.00
Conv. Galleries (Steel)		30,000.00
Crane Supporting Steelwork		6,000.00
Access Platforms (Wood Deck) and Stairs - Crushing Plant		14,000.00
(Including Equipment Supports) - Concentrator		42,000.00
Coarse Ore Bin (Timber), Grizzly		20,000.00
Fine Ore Bin		20,800.00
Electrical Rooms		6,500.00
Offices in Concentrator (Walls only)		<u>3,000.00</u>
	TOTAL	\$405,900.00
Contingencies - 10%		<u>40,590.00</u>
		\$446,490.00



Equipment and Installation	\$517,528.
Construction (Buildings, etc.)	<u>446,490</u>
TOTAL ESTIMATE (Engineering not included)	<u>\$964,018.</u>



APPENDIX 6.

APPENDIX 6

MINERAL KING MINE DATA

PRODUCTION - - 133,408 tons ore in 1966

or about 370 tons ore per day

DIRECT COSTS

Mining and Milling	\$ 6.08 per ton
Camp and Cook House	0.19 " "
Administrative and Head Office expenses	0.54 " "
	<hr/>
Total Operating Cost	\$ 6.81 per ton

Taken from information published in the Annual Report of the Aetna Investment Corporation, Mineral King Mine, Windermere, B.C., year ending May 31, 1966.

APPENDIX 7.

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APPENDIX 7

ORE RESERVES BY SECTIONS

PROVED RESERVES

<u>Section</u>	<u>Tons</u>	<u>Ag oz./ton</u>	<u>Pb %</u>	<u>Zn %</u>
09-00	42,000	2.83	2.83	3.52
09-50	1,500	18.10	8.00	7.60
10-00	15,300	2.82	1.92	2.54
10-50	5,100	10.65	4.93	4.73
11-00	1,000	11.40	5.00	2.50
11-75	3,250	5.65	2.71	2.60
13-00	15,800	3.86	2.74	3.47
16-00	17,000	5.67	3.87	4.78
TOTAL	100,950	4.27	3.05	3.66
	=====	=====	=====	=====

APPENDIX 7 Cont.

PROBABLE RESERVE

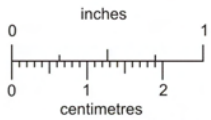
<u>Section</u>	<u>Tons</u>	<u>Ag oz./ton</u>	<u>Pb. %</u>	<u>Zn. %</u>
09-00	82,000	2.65	2.68	3.38
09-50	9,400	6.53	3.73	5.03
10-00	29,900	3.61	3.96	3.91
10-50	29,450	4.61	1.82	3.28
11-00	32,500	2.80	1.87	1.50
11-75	75,950	4.40	3.55	4.21
12-25	28,800	6.37	5.26	5.09
13-00	38,700	4.80	5.43	3.71
13.50	25,600	4.60	2.39	2.61
14-00	29,500	4.22	3.69	3.67
14-50	20,000	5.53	2.93	4.76
15-00	36,000	5.44	4.25	5.75
15-50	18,100	4.36	2.49	3.77
16-00	19,100	6.33	4.28	4.88
16-50	32,925	3.46	2.51	2.94
17-00	26,350	5.99	4.07	4.35
17-50	25,900	10.94	5.78	4.31
18-50	33,200	4.41	3.51	2.94
19-75	47,000	6.33	5.27	7.67
20-75	2,800	3.05	3.60	6.20
TOTAL	643,175	4.78	3.54	4.10

APPENDIX 7 Cont.

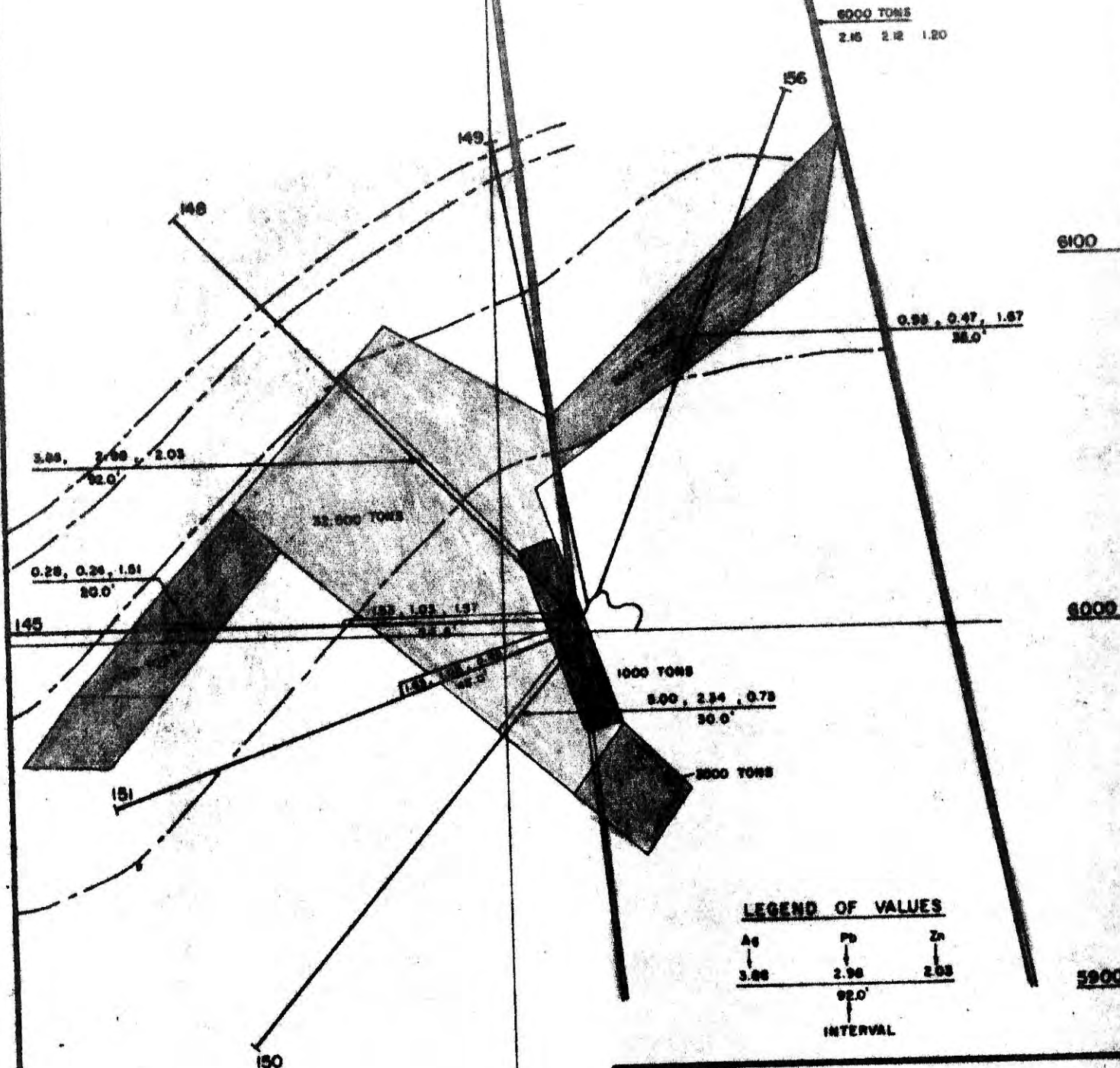
INFERRED RESERVE

<u>Section</u>	<u>Tons</u>	<u>Ag oz./ton</u>	<u>Pb%</u>	<u>Zn %</u>
09-00	49,600	3.79	2.81	2.37
09-50	16,900	4.68	3.11	2.61
10-00	26,800	4.97	2.67	3.40
10-50	11,450	5.40	3.01	2.05
11-00	20,000	2.71	4.16	2.26
11-75	17,350	3.21	2.32	2.36
12-25	14,800	5.30	3.91	4.03
13-00	43,150	4.80	5.43	3.71
13-50	13,450	3.82	2.56	2.83
14-00	14,875	3.68	3.03	3.25
14-50	11,000	3.34	2.65	2.93
15-00	14,800	3.60	2.89	2.27
15-50	12,300	3.44	2.75	3.07
16-00	11,700	8.62	5.69	4.84
16-50	11,500	3.34	2.61	2.92
17-00	13,025	4.03	2.88	2.97
17-50	3,750	11.47	5.68	3.99
18-50	2,500	7.76	6.26	1.12
19-75	5,700	6.33	5.26	7.67
20-75	1,400	3.05	3.60	6.20
Total	316,050	4.40	3.50	3.12





APPENDIX 8.



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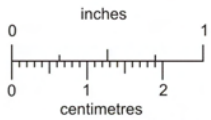


LEGEND

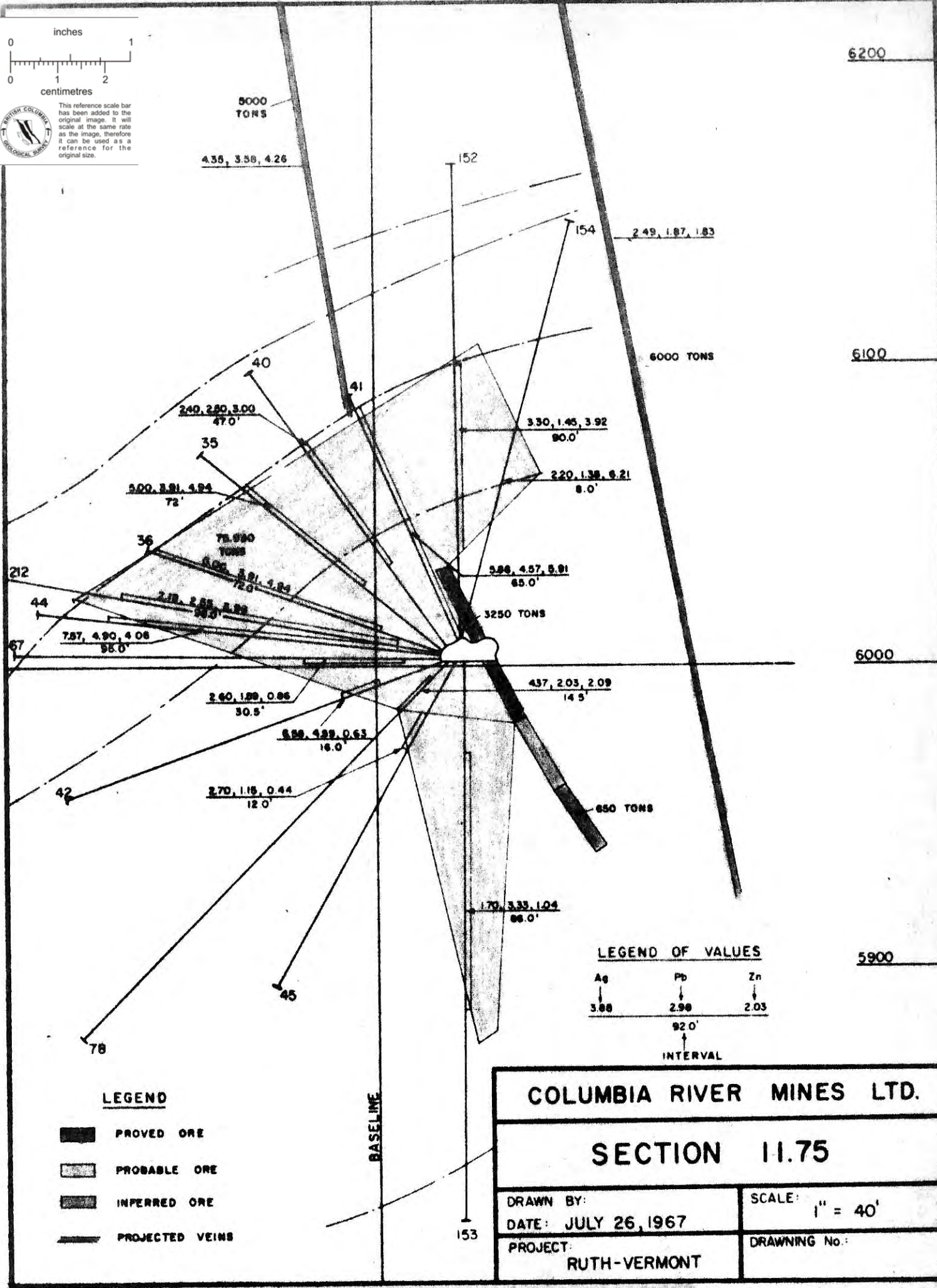
-  PROVED ORE
-  PROBABLE ORE
-  INFERRED ORE
-  PROJECTED VEINS

BASELINE

COLUMBIA RIVER MINES LTD.	
SECTION 11.00	
DRAWN BY:	SCALE: 1" = 40'
DATE: JULY 26, 1967	DRAWING No.
PROJECT: RUTH-VERMONT	



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.



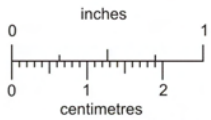
LEGEND

- PROVED ORE
- PROBABLE ORE
- INFERRED ORE
- PROJECTED VEINS

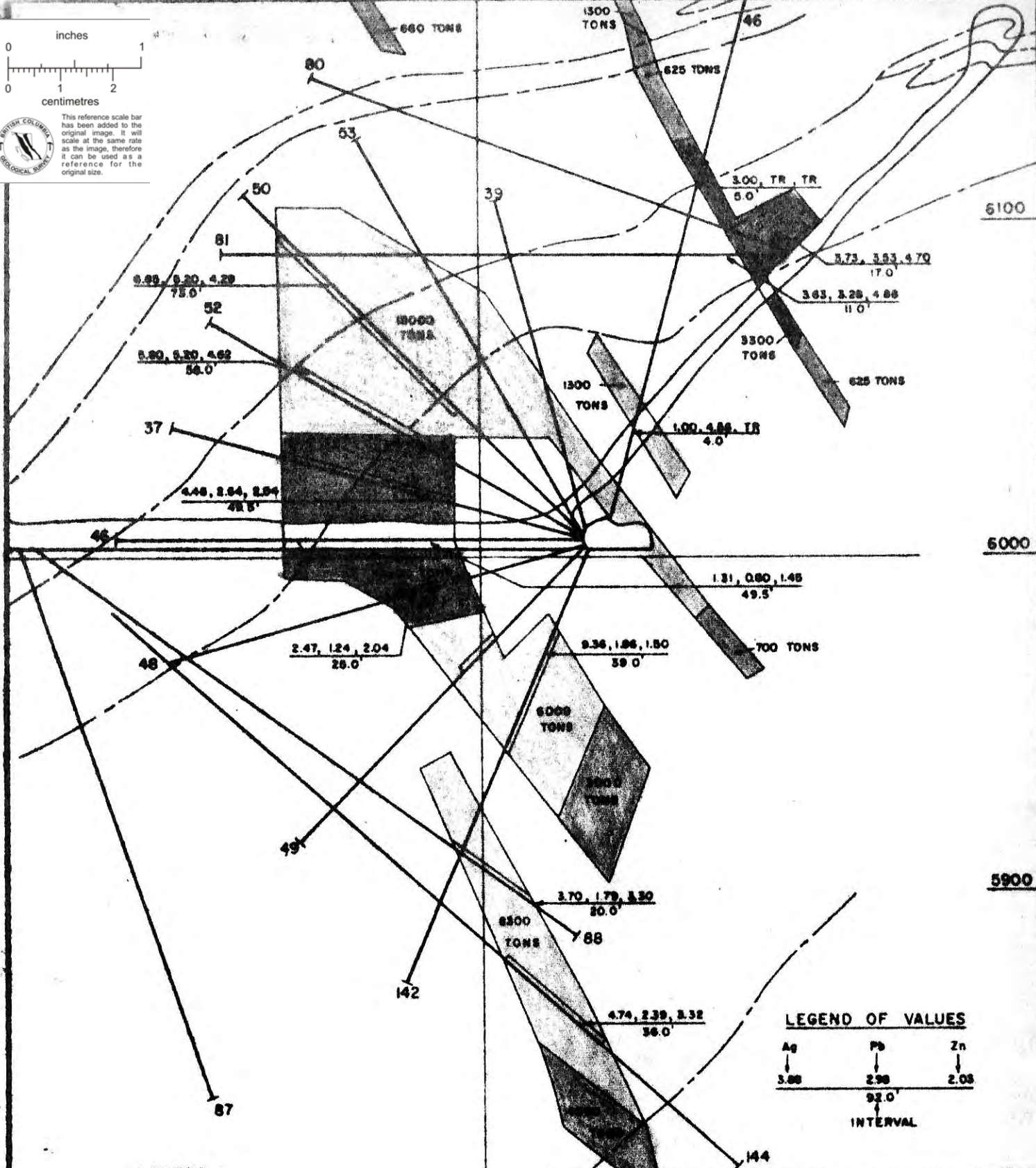
LEGEND OF VALUES

Ag	Pb	Zn
3.88	2.98	2.03
92.0'		
INTERVAL		

COLUMBIA RIVER MINES LTD.	
SECTION 11.75	
DRAWN BY:	SCALE: 1" = 40'
DATE: JULY 26, 1967	DRAWING No.:
PROJECT: RUTH-VERMONT	



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.



LEGEND

- PROVED ORE**
- PROBABLE ORE**
- INFERRED ORE**
- PROJECTED VEINS**

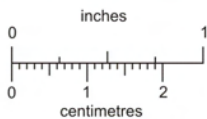
LEGEND OF VALUES

Ag	Pb	Zn
3.88	2.98	2.08
92.0'		
INTERVAL		

COLUMBIA RIVER MINES LTD.	
SECTION 13.00	
DRAWN BY:	SCALE:
DATE: JULY 26, 1967	1" = 40'
PROJECT:	DRAWING No.
RUTH-VERMONT	

BASE LINE

6200



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

6300 TONS

438, 358, 428

6000 TONS

249, 187, 183

6100

82

64

62

8000 TONS

121, 119, 153
260

60

782, 538, 722
41.0'

528, 428, 728
65.0'

30,000 TONS

477, 389, 427
38.0'

56

6000

828, 438, 548
28.5'

4000 TONS

2500 TONS

470, 403, 592
18.0'

249, 187, 183

77

59

LEGEND OF VALUES

Ag	Pb	Zn
3.88	2.98	2.03
92.0'		
INTERVAL		

5900

LEGEND

- PROVED ORE
- PROBABLE ORE
- INFERRED ORE
- PROJECTED VEINS

BASELINE

COLUMBIA RIVER MINES LTD.

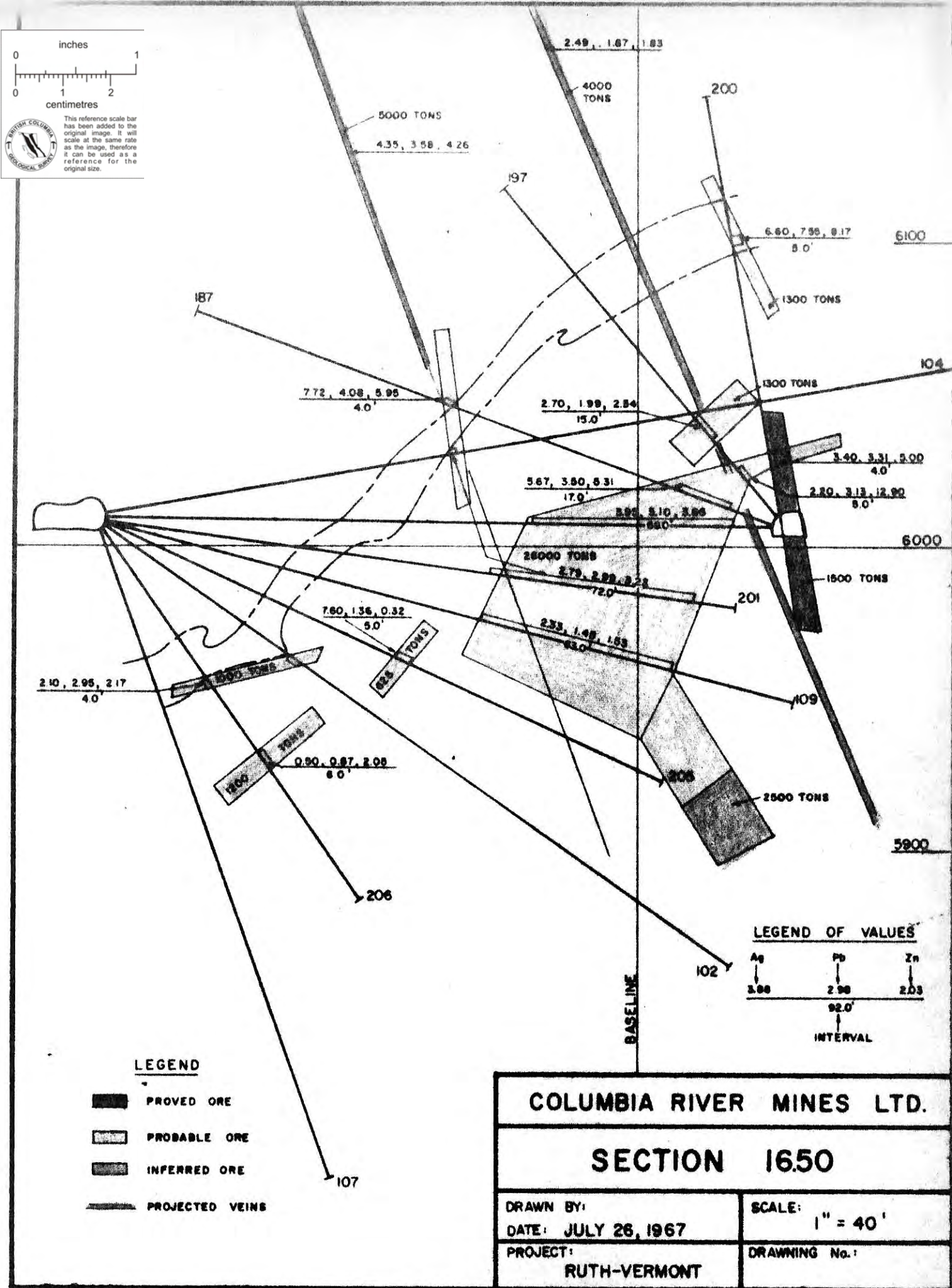
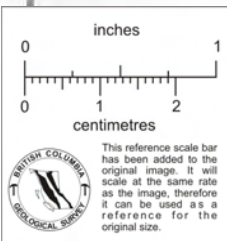
SECTION 15.00

DRAWN BY:
DATE: JULY 26, 1967

SCALE: 1" = 40"

PROJECT:
RUTH-VERMONT

DRAWING No.



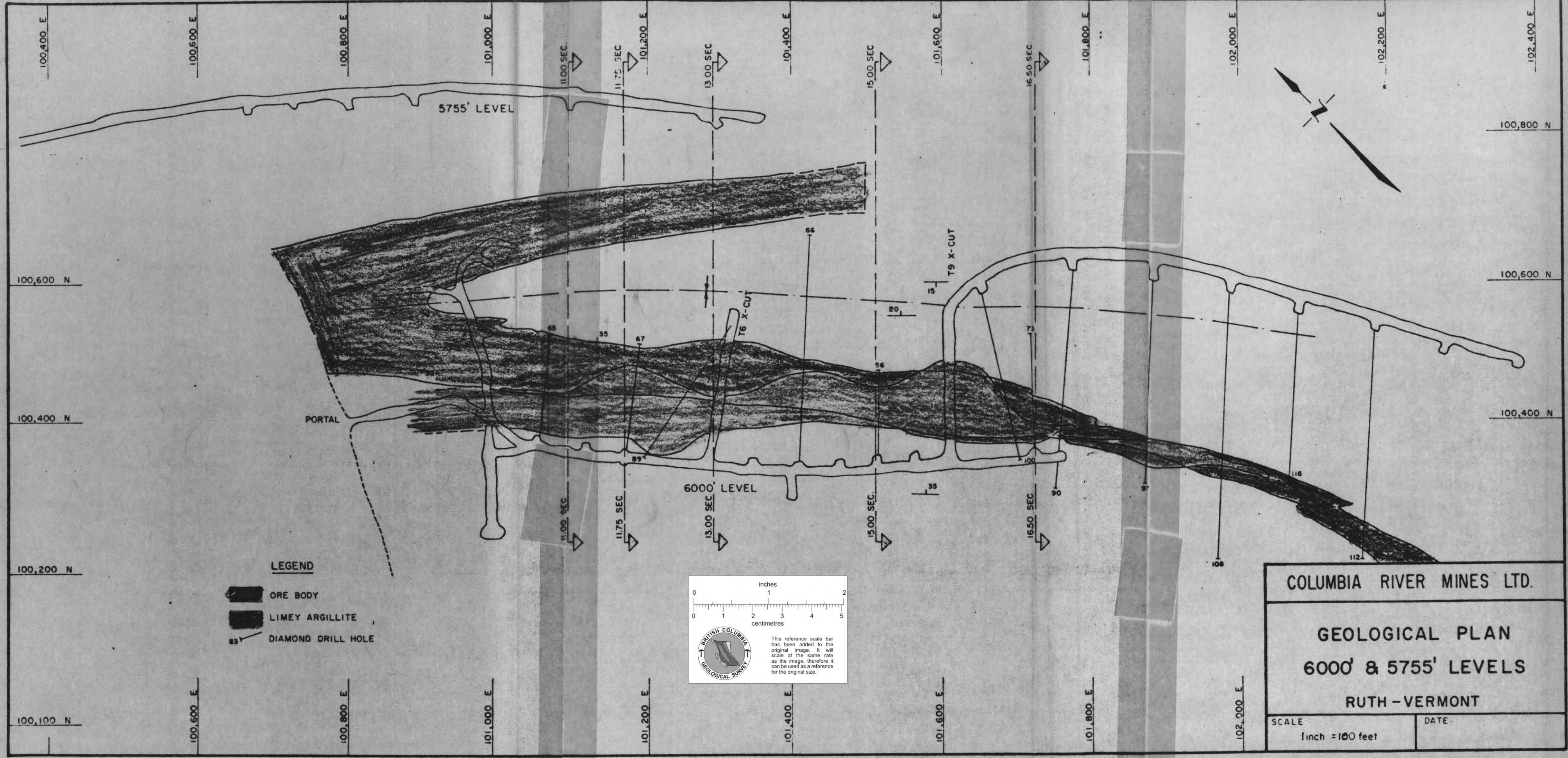
LEGEND



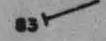
- PROVED ORE
- PROBABLE ORE
- INFERRED ORE
- PROJECTED VEINS

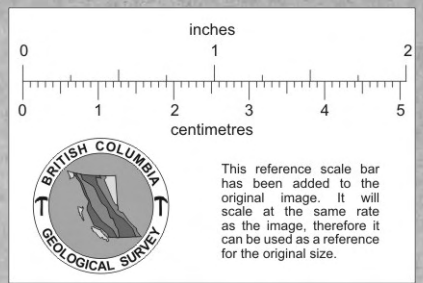
LEGEND OF VALUES

Ag	Pb	Zn
3.00	2.90	2.03
92.0'		
INTERVAL		

COLUMBIA RIVER MINES LTD.	
SECTION 1650	
DRAWN BY:	SCALE: 1" = 40'
DATE: JULY 26, 1967	DRAWING No. 1
PROJECT: RUTH-VERMONT	



- LEGEND**
-  ORE BODY
 -  LIMEY ARGILLITE
 -  DIAMOND DRILL HOLE



COLUMBIA RIVER MINES LTD.	
GEOLOGICAL PLAN 6000' & 5755' LEVELS RUTH - VERMONT	
SCALE: 1 inch = 100 feet	DATE: