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E.L.D.	
J.R.	
E.C.J.	

To..... P. M. KAVANAGH

Subject..... BETHLEHEM MINING

Bethlehem Copper Corporation
Highland Valley BC
1961

rch 7th, 1961

in George Cross newsletter
which was returned
to Sirola

Herewith a different version of the Bethlehem
Story! It would appear that they can produce copper for
a cost of 18.5¢ per lb. when the milling rate is only
3,000 tons per day. Not bad!!

W

WILLIAM SIROLA

[Signature]

Enc.

WS:rl

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

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A	N
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P.M.K.	✓
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J.I.R.	
E.C.J.	

To..... P. M. KAVANAGH..... From..... WILLIAM SIROLA.....

Subject..... BETHLEHEM MINING CORPORATION LTD..... Date..... March 7th, 1961.....

*in George Cross newsletter
which was returned
to Sirola*

Herewith a different version of the Bethlehem
Story! It would appear that they can produce copper for
a cost of 18.5¢ per lb. when the milling rate is only
3,000 tons per day. Not bad!!

W

WILLIAM SIROLA

Sirola

Enc.

WS:rl

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

REC'D JAN 30 1961

92 H.
Attach to previous
correspondence

To..... P. M. KAVANAGH..... From..... WILLIAM SIROLA.....

Subject..... BETHLEHEM COPPER CORPORATION..... Date..... JANUARY 26, 1961.....

I did not make clear in my summary of the Bethlehem situation the reason for showing a copper price of 26 $\frac{1}{2}$ ¢ per lb. This figure represents the floor price that Japanese interests have tentatively submitted to Bethlehem over a period of ten years.

I have always felt that Bethlehem had some merit if a plant in the order of 7,500 tons per day or better could be financed. A more or less analogous situation would be the Esperanza Copper Deposit owned by Duval Sulphur & Potash Co. in Arizona. I say analogous only because both are disseminated type deposits and the grade of the Esperanza deposit is 0.70% copper. The principal difference between the two probably lies in the proximity of the Esperanza Mine to a copper smelter and in the fact that the Esperanza deposit is a much more ideal open pit situation than is Bethlehem. Conceivably too, since the Esperanza deposit is an enriched chalcocite blanket a considerably higher grade may be available in the first years of operation.

Both deposits were deemed at one time to contain approximately 50,000,000 tons of 0.70% copper but much of this tonnage in the case of Bethlehem remains to be more adequately confirmed. The 18,000,000 tons mentioned in my report falls into the category of reasonably assured open pit tonnage.

I cannot see the wisdom of putting low grade ore through a small mill except as a means of providing work for a number of people and as a means of providing needed copper concentrates for the Japanese. Regards.

Bill
WILLIAM SIROLA.

WmS:MEW

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

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E.C.J.	

To.....P. M. Kavanagh.....From.....W. M. Sirola.....

Subject.....Bethlehem Copper.....Date.....December 20, 1960.....

The grade of 1.5% Cu for Bethlehem is indeed too high. This was a figure given us in Tom Elliot's office by Huestis as a starting grade. Actually the grade will be somewhere between 1.10 and 1.15% Cu with a daily mill capacity of 3,000 tons initially. These, I think are realistic grades for the East Jersey zone which would contain some 4,800,000 tons above adit level. In other words, this would be open pit ore. The Jersey zone is estimated (by Buffam and James) to contain 12,600,000 tons of 0.70% above adit level. There would be a core of perhaps 6,000,000 tons of 0.80% but this would be uneconomical until such time as the capital costs were amortized.

If the E&MJ price of copper is 30¢ (average) during the 4-5 years of mining on the East Jersey zone, the Japanese would pay Bethlehem 26¢ per lb. of refined copper. Mining and Milling costs would be perhaps 18¢ a lb. and if transportation and smelting will cost 6¢ per lb. then total operating and treating costs will be 24¢ per lb. leaving a profit of 2¢ per lb. or perhaps 50¢ per ton.

I do not like this situation in the light of present copper stocks and prices and I particularly do not like it at 3,000 tons per day. The grade is just a little too low. This is a pretty rough evaluation and I will submit a much more detailed and concise account as soon as possible. The Japanese have until the end of February to make their decision. The Buffam and James recommendation was for a 7,500 ton per day plant but money for such a unit was difficult to come by at this time. With such a plant, costs could be kept in the vicinity of 20¢ per lb. of Cu.

W. M. Sirola

92H

MEMORANDUM

92H

TORONTO April 2nd, 1958.

TO: MR. W. S. ROW
FROM: MR. G. M. RADISICS
SUBJECT: BETHLEHEM COPPER CORPORATION, B.C.



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R.D.S.	
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G.P.R.	
E.L.D.	
J.I.K.	
E.C.J.	

Further to my recent memorandum submitted to yourselves dealing with this property, I understand that Bethlehem Copper Corporation have granted Asarco a two year extension on their outstanding commitments, and under the terms of this new arrangement Asarco is committed to spend \$1/2 million each year for the ensuing two years to retain their existing equity in the property.

A handwritten signature, likely of G.M. Radisics, written over a horizontal line.

GMR:vk

92.H.

92H

March 28th, 1958

TO: MR. W. S. ROW

FROM: MR. G. M. RADISICS

SUBJECT: BETHLEHEM COPPER CORPORATION, B.C.

I understand that one of the recent diamond drill holes completed by Asarco on the Bethlehem Copper property encountered a wide section of copper mineralization assaying several percent in copper. While, of course, this intersection does in no way increase the tonnages put in sight by exploration work completed to date on this property, it nevertheless suggests that high grade ore lenses do occur within relatively low grade orebodies, which could possibly have important economic implications.

GMR: vk

L.E.D.
 J.I.K.
 E.C.J.

72 H

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MEMORANDUM

TORONTO March 26th, 1958

TO: MR. W. S. ROW
FROM: MR. G. M. RADISICS
SUBJECT: BETHLEHEM COPPER



A	N
	W.S.R. ✓
	R.J.B.
✓	E.O.C. ✓
	H.A.P.
	R.D.S.
	B.C.B.
	G.P.R.
	E.L.D.
	J.I.K.
	E.C.J.

It is my understanding that after lengthy negotiations the Bethlehem Copper Corporation have extended their agreement with Asarco under the terms of which re-negotiated agreement Asarco's option commitments on this property have been extended for a twelve month period, although Asarco are committed to expend considerable further funds in continued exploration on the Bethlehem property.

GMR:vk

Apr. 1, 1958 - Copy to: J. W. Baker, Virginiatown

MEMORANDUM

92H

TORONTO February 17th, 1958

TO: DIRECTORS, TRIANA EXPLORATION LIMITED
FROM: MR. G. M. RADISICS
SUBJECT: BETHLEHEM COPPER CORPORATION, B.C.



A	N
	W.S.R. ✓
	R.J.B.
	E.O.C.
	H.A.P.
	R.D.S.
	B.C.B.
	G.P.R.
	E.L.D.
	J.I.K.
	E.C.J.

I hear that American Smelting & Refining are relinquishing their options on the Bethlehem property very shortly. As you no doubt remember, the terms under which they optioned this property from the Bethlehem Copper Corporation were very onerous, and they were obliged to put a plant in operation this year. Due to the depressed state of the copper industry in general as well as American Smelting & Refining's important new copper discovery in Arizona, I presume the directors have decided to abandon this B.C. project.

Highland Valley Area

[Signature]

GMR:vk

c.c. Mr. W. S. Row
Mr. R. V. Porritt
Mr. J. W. Baker
Dr. P. Price
Mr. G. C. Andrew

INTER-OFFICE CORRESPONDENCE

92H

FROM

DATE Jan 17th, 1958

TO

SUBJECT Bethlehem Copper-Asarco
option.



MESSAGE

(TO BE COMPLETED IN TRIPLICATE)

A	N
	W.S.R.
	R.J.B.
	E.O.C.
	H.A.P.
	R.D.S.
	B.C.B.
	G.P.R.
	E.L.D.
	J.L.K.
	E.C.J.

Following are notes based on an examination of the Bethlehem Copper property on Jan 15th, and published reports:

Airphoto mosaic study suggests the mineralized zones, Jersey, Iona, possibly White and Symmons are outlined on plan surface as circular zones of breccia in the Younger Complex. The older quartz-diorite occurs east and west of the mineralized breccia zones.

Older qtz diorite contains pink feldspar which is absent in the younger q-d.

DDH B 74 examined box 375-400. showed medium sized breccia, chalcopyrite and bornite est. 1.5-2.0% Cu

Drilling is being concentrated on Jersey zone with two machines.

Tempo of expl. is decidedly down from last year

Probable cost of \$20.00 per foot is current at Bethlehem for which they receive 10.0 feet per shift of NX core and good recovery. Mud used exclusively and credited with improving recovery. Wire line core barrel tried but not considered satisfactory with mud. Audible clicking in of barrel not heard. Labour cost \$4.50 per ft record 11.6'/shift Dec.

Significant alteration of host mineral rocks is:

quartz

seracite

chlorite. epidote widespread and not indicative.

Overabundance of supervisory staff. Seven staff, two drills

Development operation being run from Wallace Idaho, now.

Iona and Jersey breccia not similar.

Covney has worked out a sludge recovery system which he considers important where core recovery is poor.

Deadline for stating production plans is Sept 14th /58

INSTRUCTIONS FOR USE OF THIS FORM

Form to be completed in triplicate by originator. Two copies — No. 1 and No. 2 — to be forwarded to addressee. Copy No. 3 to be retained in originator's file until reply received. Addressee to complete reply in duplicate on reverse side of sheets 1 and 2 and return No. 1 to originator. In following this procedure both parties have the complete message and reply on one sheet of paper.

92H

MEMORANDUM

92H

TORONTO April 11th, 1957

TO: DIRECTORS, TRIANA EXPLORATION LIMITED
FROM: MR. G. M. RADISICS
SUBJECT: BETHLEHEM COPPER CORPORATION



A	N
	W.S.R. ✓
✓	E.O.C.
	R.D.S.
	E.C.J.
	R.W.B.
	J.I.K.
	E.L.D.
	E.G.A.

I have obtained from friendly sources an analysis of the Bethlehem Copper situation, which I thought might be of interest to yourselves.

As you will note from the attached, this estimate is based on the assumption that A.S.&R. will proceed with developing this property, putting it into production at an ultimate daily tonnage rate of 20,000 tons.

I may further bring to your attention the fact that no provisions have been made to estimate income taxes which this company will have to pay after the three year tax exemption period. However, with much capital expenditures involved, it is quite likely that this company will have sufficient write-offs for tax purposes, so that income taxes for the first three year period after the tax exemptions have ceased, will be of no consequence.

GMR:as

c.c Mr. W. S. Row ✓
Mr. R. V. Porritt
Mr. J. W. Baker
Dr. P. Price
Mr. G. C. Andrew

BETHLEHEM COPPER

Capitalization -

Authorized 6,000,000 shares

Issued 2,825,000 shares

Options (50,000 shares at \$2.00 to June 6/57
(225,000 shares at \$2.25 to Nov. 6/57

Ore Potential - 100,000,000 tons

Recoverable Grade - 0.7% copper or
14 lbs. per ton

Assume 30% concentrate

Cost - \$2.25 per ton for all operating costs

Freight - \$4.0 per ton or 6.7¢ per lb.

Capital Costs - \$25,000,000

Copper at	30¢	35¢
Revenue on 14 lbs.	\$4.20/ton	\$4.90/ton
Costs	2.25	2.25
	1.95	2.65
Less refining at 7¢ per lb. & transportation	.84	.84
Operating Profit	\$1.11	\$1.81

Agreement with A. B. & H. provides that A. B. & H. be repaid for pre-production expenses out of 80% of first profits with remaining 20% to be split 55%-45%. After capital repaid will share on same basis.

- Assumption 1. Assume operation at 10,000 tons/day the first year.
2. " " 15,000 " " second "
3. " " 20,000 " " third "
4. " pre-production expenditures to be paid out of full 80%.

Copper at 30¢

	1st Year	2nd	3rd	4th	5th	6th
Mill Rate	10,000 TPD	15,000	20,000	20,000		
Operating Profit	4,000,000	6,100,000	8,000,000	8,000,000	8,000,000	8,000,000
Less 80% preprod.	1,200,000	4,880,000	6,400,000	6,400,000	4,120,000	
Profits	2,800,000	1,220,000	1,600,000	1,600,000	3,880,000	8,000,000
Bethlehem share 45%	1,260,000	550,000	720,000	720,000	1,750,000	3,600,000
Per share	\$0.11	\$0.18	\$0.23	\$0.23	\$0.57	\$1.16

Copper at 35¢

	1st Year	2nd	3rd	4th	5th	6th
Mill Rate	10,000	15,000	20,000	20,000	20,000	20,000
Operating Profit	6,500,000	10,000,000	13,000,000	13,000,000	13,000,000	13,000,000
Less 80% preprod.	3,200,000	8,000,000	10,400,000	1,400,000		
Profits	3,300,000	2,000,000	2,600,000	11,600,000	13,000,000	13,000,000
Bethlehem share 45%	1,485,000	900,000	1,170,000	5,220,000	5,850,000	5,850,000
Per share	\$0.19	\$0.29	\$0.38	\$1.68	\$1.89	\$1.89

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- 2 -

NOTE:

No income taxes have been deducted - Company will be tax free for three years and carry over of write-offs for tax purposes will mean a substantially longer period of tax free operation.

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MEMORANDUM

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TORONTO March 21st, 1957

TO: DIRECTORS, TRIANA EXPLORATION LIMITED

FROM: MR. G. M. RADISICS

SUBJECT: BETHLEHEM COPPER



N
W.S.R. ✓
E.O.C. ✓
R.D.S.
E.C.I.
R.W.B.
J.K.
E.L.D.
E.G.A.

I understand from confidential sources that the deep drilling program initiated by A. S. & R. on their Highland Valley property under option from Bethlehem Copper Corporation will be brought to a successful conclusion during April. On completion of this program, I understand A. S. & R. will initiate preliminary underground work, probably by means of two vertical shafts, for the purpose of checking their indicated grade and tonnage estimates made based on the exploration program undertaken by means of diamond drilling only. If these subsequent investigations confirm ore estimates and grade estimates based on diamond drill results, an announcement by A. S. & R. will be made to the effect that they propose immediately to put the property into production with a mill capacity of between 10,000 - 15,000 tons per day, and probably plans to initiate production will be initiated early in 1958.

GMR:vk

c.c. Mr. W. S. Row
 Mr. R. V. Porritt
 Mr. J. W. Baker
 Dr. P. Price
 Mr. G. C. Andrew

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MEMORANDUM

TORONTO September 21st, 1956

TO: DIRECTORS, TRIANA EXPLORATION LIMITED

FROM: MR. G. M. RADISICS

SUBJECT: BETHLEHEM COPPER PROPERTY, HIGHLAND VALLEY AREA OF
BRITISH COLUMBIA



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<input checked="" type="checkbox"/> R.W.B.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> J.I.K.	<input checked="" type="checkbox"/>
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A deep vertical hole, one in the proposed series of such holes to test the Jersey Zone on the Bethlehem Copper property under development by the American Smelting & Refining Company, has reached a depth of 700 feet towards its 1000 foot objective. The hole shows persistent disseminated chalcopyrite and bornite mineralization with assays over 5 foot sections running between 0.85% to 1.40% in copper. Overall averages to the 700 foot depth are 0.98% in copper.

GMR:vk

c.c. Prospectors Airways
Mr. R. V. Porritt
Mr. J. W. Baker
Dr. P. Price

MEMORANDUM

TORONTO July 20th, 1956

TO: DIRECTORS, TRIANA EXPLORATION LIMITED

FROM: MR. G. M. RADISICS

SUBJECT: BETHLEHEM COPPER CORPORATION

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A	N
✓ D.S.R.	✓
✓ G.C.A.	✓
✓ G.E.	✓
✓ E.O.C.	✓
✓ R.D.S.	✓
✓ J.I.K.	✓
✓ E.L.D.	✓
✓ R.W.B.	✓

Further to my recent report to yourselves dealing with the above property, I have received additional information as follows:

Three diamond drill holes, all inclined at 40°, were drilled in a panel formation which returned an overall grade of .9% in copper over true widths of 800 feet. Hole #28, which is one I reported on before, returned 1.07% in copper over a core length of 475 feet, with a 50 foot section running 4.3% within this zone. Hole #25 drilled 200 feet north of #28 returned 972 feet of core length grading 0.74% in copper. Hole #11 in the same general area averaged 0.72% in copper over a core length of 300 feet, with the last 10 feet still grading .72% when the hole had to be stopped due to drilling difficulties.

Jersey Zone.

GMR:vk

c.c. Prospectors Airways
Mr. R. V. Porritt
Mr. J. W. Baker
Dr. P. Price



92 I

TORONTO

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✓ P.E.R.	✓	X
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✓ GE.		
✓ E.O.C.		C
✓ R.D.S.		
✓ J.I.K.		/
✓ R.W.B.		✓

Since this information was given to me in confidence, I would appreciate if it would be treated as such.

such.

[Handwritten signature]



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MEMORANDUM

TORONTO July 5th, 1956

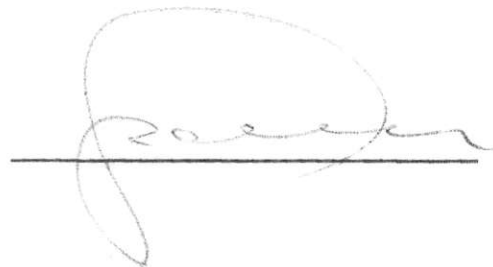
TO: THE DIRECTORS, TRIANA EXPLORATION LIMITED

FROM: MR. G. M. RADISICS

SUBJECT: BETHLEHEM COPPER CORPORATION LIMITED, BRITISH COLUMBIA

A		N
✓	W&R	✓
✓	G.C.A.	✓
✓	G.E.	✓
✓	E.O.C.	✓
✓	R.D.S.	✓
✓	(J.K.)	✓
	E.L.D.	
✓	RWB	✓

Supplementing my recent report submitted to yourselves covering an examination made of the Bethlehem Copper Corporation's property under option to A. S. & R. in the Highland Valley Area of British Columbia, I take pleasure in enclosing coloured photographs taken of some of the diamond drill cores originating from that property, which will show the general appearance of the breccia zone as well as well mineralized sections of the core, for your information.



GMR:vk
Encl.

c.c. Prospectors Airways
Mr. R. V. Porritt
Mr. J. W. Baker
Dr. Peter Price



92 H

BETHLEHEM COPPER CORPORATION
A.S. & R. OPTION.



Core showing typical breccia



Core showing massive chalcocite stringers parallel to core



Core showing bornite.

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92 H
Virginiatown, Ontario
January 5, 1956.

MEMO TO: W. S. Row

J. D. Bateman verbally gave the following information on the Highland Valley Copper Prospects in B.C.

Bethlehem Copper Corp. - controls the Snowdrift, Ione & Jersey deposits.

Ione - 32,000 tons/vt. ft. of 0.49% cu in carbonate zone 150' thick covering primary ore.
Later work by 3 U.B.C. staff is supposed to have indicated 113,000 tons/vt. ft. of 0.54%.

Jersey - 53,000 tons/vt. ft. at 1.00% cu.

Trojan - lies north of Bethlehem - 32,000 tons/vt. ft. of 1.5%.

Krain - lies north of Trojan - 10,000 tons/vt. ft. of 1.00%. Size could be much greater because exposure is covered to some extent by overburden and overcapping flow.

Bateman describes deposits as possible old volcanic plugs elongated on one dimension. District and deposits described in Memoirs of Ashcroft & Nicola, Geological Survey of Canada.

Bateman says Sandy Richardson has taken down a property of theirs lying between Bethlehem and Trojan on which a company by the name of Northlodge Copper Mines Limited is being formed. Richardson has paid them 20¢ per share for 500,000 shares. Company formation in hands of lawyers. They have other properties with better showings on which they are calling East Lodge & West Lodge. But Sandy preferred the central location of Northlodge ground. Name for Krain claims will likely be Farlodge.

Bateman didn't rate Eureka very highly. Says metallurgy still beats Consolidated Sudbury Basin but it is strictly Dunlop's show. Says Lindsley not very happy because new president Anderson says he can't go on spending 4,000,000.00 a year from \$2,000,000. earnings. Mentioned Lindsley forming new exploration branch to get out from under Anderson's thumb.

Bateman doubts Giant will make 30¢ a share. Metallurgical problems eliminate zones running one ounce. Homestake examining Giant with view of buying out Bear's holdings of Giant. Says they would prefer not to have Homestake because under present set-up there is no opposition to Ventures operating policy.

J. W. Baker.

92 H
March 1956

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J.K.	
E.L.D.	

BETHLEHEM COPPER--A PORPHYRY COPPER DEPOSIT IN B.C. by W.H. White

The current operation of Bethlehem Copper Corporation has revived keen interest in an area of copper mineralization that has been known and casually explored for over half a century. Compared to many mining camps, Highland Valley is very favorably located on a broad rolling plateau, easily reached by road either from Ashcroft, a railroad town on the Fraser River 30 miles to the northwest, or from Merritt, 40 miles to the south.

Highland Valley is within a metallogenic province extending from the Border north to Kamloops that is dominated by copper mineralization. Despite widespread drift cover and concealing Tertiary basalts, this region is known to contain literally hundreds of copper showings, plus the great Granby Mine at Copper Mountain. Certainly within this region other important ore bodies must exist, but their discovery is not an easy task.

Geology

Highland Valley is in the Guichon batholith, one of the smaller intrusions that fringe the eastern side of the Coast Range Batholith. The Guichon batholith is about 40 miles long in a northerly direction and 16 miles wide. It intrudes Upper Triassic volcanics of the Nicola Group and near Ashcroft it is unconformably overlain by Middle Jurassic sediments. Thus it is distinctly older than many of the granitic bodies of B.C. The main rock type is quartz diorite. Patches of Middle Tertiary basalt, in places, cap the older rocks.

On the Bethlehem property "older quartz diorite", typical of much of the Guichon batholith, is cut by a complex conveniently referred to as "younger intrusions". Rocks of this complex, gradational in composition and of slightly differing ages, include granite, hornblende quartz diorite, leuco quartz diorite, coarse-grained porphyry, and fine-grained porphyry. The porphyries and, to some extent, the hornblende quartz diorite form irregularly tabular bodies, but the leuco quartz diorite tends to form masses of roughly equi-dimensional outline. The rocks of this complex, particularly the porphyries have distinct volcanic aspects. One theory that explains the nature and distribution of the "younger complex" is that it is a crypto-volcanic structure related to Upper Cretaceous or even Lower Tertiary vulcanism.

What may be considered a still younger rock type is the rock referred to simply as "breccia". Originally believed to be some kind of intrusion breccia, this is now known to be a shatter breccia made up of fragments of all rocks of the area cemented by comminuted quartz, feldspar, mica, and other minerals. Breccia is important because wherever seen, it has carried copper mineralization. It is best exposed in the Iona zone where it forms a mass some 800 feet wide and 1,500 feet long, but it is developed in patches in the Jersey zone, and probably in the Simons zone as well. The origin of the breccia is a mystery. At this stage of development it does not seem to be a fault breccia. Perhaps it is related to deep-seated volcanic disturbances.

Structure

Wherever there is mineralization, the rocks are closely jointed. In places only one northeasterly-striking set of joints is developed, but more commonly several sets of closely-spaced joints are present. Faults are not uncommon in and near the mineralized zones. These tend to have north to northeasterly strikes and steep dips either way. A prominent group of sub-parallel faults strikes about North 20° East through the Jersey zone, and another major fault may underlie the drift-filled valley immediately east of the Iona zone. Many of the faults are pre-mineral in age.

Mineralization

Although copper minerals can be found sparsely disseminated in nearly any kind of rock in the Highland Valley area, important concentrations appear to be associated closely with rocks of the "younger complex", particularly where such rocks are thoroughly brecciated or jointed.

The main areas of mineralization on Bethlehem property are referred to as the Iona zone, Jersey zone, Simons zone, and the Snowstorm-White zone. Metallic minerals include hematite, chalcopryrite and bornite and small amounts of molybdenite. Pyrite is almost absent except in the northern end of the Jersey zone. Non-

metallic gangue minerals include secondary micas, tourmaline, epidote, zeolites, and small amounts of carbonate. Introduced quartz is not abundant.

The Iona zone is nearly all closely-jointed breccia. Some copper minerals occur in the matrix or even in fragments of the breccia, but the greater proportion are present as fillings of joints and faults. The Jersey zone has prominent fault zones cutting well-jointed rocks, but only local areas of breccia. Mineralization is disseminated in the altered and jointed rock, but vein-like bodies of massive chalcopyrite or bornite as much as six inches wide occupy fault zones. These are more common here than in the Iona zone. Thus far, the Simons zone has not been extensively explored. It is a large zone of well-jointed hornblende quartz diorite containing widely disseminated copper minerals and perhaps one or more narrower zones of more concentrated mineralization. Small amounts of high-grade bornite-chalcocite ore was mined in the past from small workings on the Snowstorm claim. This is a different kind of occurrence. The rock is older quartz diorite cut by porphyry dykes. The ore occurred in restricted "pods" within a branching shear or fracture zone that has a north to northeasterly strike and a steep dip to the east. These fractures are similar to and may be co-extensive with a mineralized, sheeted zone about 1,800 feet to the south, called the White zone.

Exploration

During the period June to September, 1955, a program of surface stripping and bulk sampling was carried on. This was considered necessary because of the high degree of surface oxidation and the disseminated and locally irregular nature of the mineralization. The Iona zone was cross-cut by three bulldozer trenches. These were 18 feet wide and ranged in depth from 6 to a maximum of 40 feet. The aim was to reach relatively fresh rock for sampling. Samples were cut from a smaller trench blasted and excavated in the floors of the main cuts. Each 20-foot sample weighed about 2,200 pounds. An old 280-foot adit driven at shallow depth in the Iona zone also was bulk sampled by drilling and blasting a channel along one wall. One trench on the Jersey zone was bulk sampled; others were made for inspection. All samples were cut down to a manageable size by passing through a small crusher and triplex splitter. The following statistics may give an idea of the scale of the operation:

Total length of bulldozer trenches	6,900 feet
Total yardage excavated (about half rock)	54,520 cubic yards
Total length bulk sampled	3,360 feet
Total weight of bulk samples	233 tons

At the present time, a program of NX and BX diamond drilling is proceeding under direction of the American Smelting and Refining Company. Two heavy machines are working steadily and to date eight holes totalling about 4,000 feet have been completed.

Exploration Results

From the results of the bulk sampling, it is estimated that the Iona zone contains 113,000 tons per vertical foot of material grading 0.49 per cent. copper. About 25 per cent. of this tonnage is material grading better than 0.70 per cent. copper. The estimate for the Jersey zone, of a distinctly lower order of accuracy because it is based on less extensive exploration, is 53,000 tons per vertical foot grading 1.00 per cent. copper. To the copper values may be added molybdenite present in amounts ranging from $\frac{1}{4}$ to $\frac{1}{2}$ pound per ton. Very low values in gold and silver are present but may not be recoverable.

Thus far, the drilling by A.S. and R. has been done mainly to delimit mineralized zones and to gain sub-surface information on the distribution of favorable rock types and structures. It is too early to assess the results in detail. However, it may be stated that holes within the mineralized zones show that primary mineralization, similar in grade to the surface persists to depths in excess of 300 feet.

Summary

The mineral deposits of Bethlehem Copper have many of the characteristics of the "Porphyry Copper" type of deposit. The mineralization is disseminated in closely-jointed rock that is more-or-less hydrothermally altered; it is related intimately to minor intrusions that have volcanic features; the copper minerals are accompanied by molybdenite in small amounts; and the deposits are very large but very low grade. However, these deposits differ from most Porphyry Copper deposits in several ways: ~~Pyrite enrichment has not occurred.~~ A great deal of exploratory work remains to be done before the commercial possibilities of these copper deposits can be evaluated. However, the work done thus far warrants optimism in the future of the camp.

5

**FIFTH
ANNUAL
REPORT**

FOR THE YEAR ENDED FEBRUARY 29th, 1960

BETHLEHEM COPPER CORPORATION LTD.

(NON-PERSONAL LIABILITY)

Map showing locations of

BETHLEHEM COPPER CORPORATION PROPERTIES.





BETHLEHEM COPPER CORPORATION LTD.

(Non Personal Liability)

EXCHANGE LISTINGS

Shares of this Company are listed on the
Vancouver and Toronto Stock Exchanges in Canada.

DIRECTORS

Richard F. Dooley	Hugh A. Martin
Donald F. Farris	John Addison McLallen
Fred J. Garbutt	Patrick M. Reynolds
Herman H. Huestis	Murray Watts

OFFICERS

John Addison McLallen,
Chairman of the Board

Herman H. Huestis,
President

Richard F. Dooley,
Vice-President

P. M. Reynolds, C.A.,
Secretary-Treasurer

REGISTRAR AND TRANSFER AGENT

The Eastern Trust Company,
Vancouver and Toronto, Canada

AUDITORS

McIntosh, McVicar, Dinsley & Co., Vancouver, B.C.

SOLICITORS

Lawrence, Shaw, McFarlane & Stewart,
Vancouver, B.C.

OFFICES

Head Office:
805-402 West Pender Street, Vancouver, B.C.



BETHLEHEM COPPER

DIRECTORS' REPORT TO THE SHAREHOLDERS

Your Directors are pleased to present the fifth annual report of the Company including financial statements as at February 29th, 1960 together with auditors' report thereon. The report of our consulting engineers Drs. W. F. James, B. S. W. Buffam and Mr. M. A. Cooper of Toronto, Ontario is also included.

HIGHLAND VALLEY PROPERTY

(158 mineral claims of which 56 are crown granted)

The exploration program undertaken in 1958 to prove the ore reserves in the Jersey and East Jersey orebodies was completed during the year with a reasonably assured tonnage of 18,100,000 tons of .83% Cu. down to the tunnel level (4600-ft. elevation). Below the tunnel level surface diamond drilling has indicated a further 41,400,000 tons of similar grade ore as reported by Dr. Buffam in his progress report to the shareholders on November 5th, 1959.

At this point it is opportune to remind our shareholders that detailed work has been done only on the Jersey and East Jersey zones and that proven ore is only shown to tunnel level. Potential zones available for future exploration include the Iona, Simons, Snowstorm, White, "A" and "B" zones as well as the indicated ore below tunnel level in the Jersey and East Jersey zones.

ACKNOWLEDGMENTS

Your Directors are indebted to Drs. W. F. James, B. S. W. Buffam and to Mr. M. A. Cooper for the personal interest which they have taken in the development of our property. We also wish to thank Dr. H. M. Howard of the University of British Columbia and Mr. D. A. Livingstone of Manitou Barvue Mines Limited who have conducted the metallurgical tests. During the year, your Company was fortunate in obtaining the services of Mr. C. J. Coveney, geological engineer who was formerly with the Exploration Department of American Smelting & Refining Company and is now on our head office staff as Chief Geologist.

"A" AND "B" ZONES—GEOPHYSICAL

In October and November, 1959 an Induced Polarization geophysical survey was conducted over our property in the vicinity of the Jersey, East Jersey and Iona zones. Two anomalies were outlined which on our maps are now referred to as the "A" and "B" zones.

The "A" zone lies between the Jersey and East Jersey orebodies and has dimensions of approximately 200 feet by 800 feet. Bulldozer cuts show that the structure and mineralization is similar to that on the East Jersey both as to dissemination and as to fracture filling. This zone is therefore of great importance and it is the intention of your Company to test it by diamond drilling during the summer of 1960.

The "B" zone lies approximately 1,000 feet east of the Iona zone and has dimensions about equal to the combined area of the Jersey and East Jersey zones. Interesting future exploration possibilities exist in this area.

WATER SUPPLY

Highland Valley is in a somewhat arid portion of British Columbia and your Board was concerned

C O R P O R A T I O N L T D . (Non-Personal Liability)

over a possible deficiency of water for production purposes. During January and February, 1960 under the supervision of Robinson & Roberts, Ground-Water Geologists, Tacoma, Washington, testing for water was done by means of a churn drill. A water horizon was encountered at a depth of 242 feet and continued to a depth of 300 feet and resulted in an artesian well. Conditions therefore look favourable for developing a water supply for mining operations.

FUTURE PLANS

In February, 1960 your Directors entered into an agreement with the Sumitomo Metal Mining Company Limited with the object of bringing our property into production without delay. The Sumitomo Metal Mining Company Limited is a member of the Sumitomo group of companies which comprise one of the three largest industrial groups in Japan. We believe that it is in the interest of our Company to associate itself with a large mining company capable of providing the millions of dollars necessary to complete our production schedule.

Sumitomo Shoji New York, Inc., through Matthews & Company Limited, underwriters of Toronto, Ontario are purchasing 300,000 shares of our stock for a consideration of \$350,000.00. Of this sum \$100,000.00 has been received and it is expected that this transaction will be completed by May 31st, 1960.

During the balance of 1960, the Company proposes to employ these funds in diamond drilling the "A" zone, doing an underground development program on that zone if such work is warranted and will principally concentrate its efforts on the preparation of an engineering feasibility report on production plans.

The Sumitomo group have contracted to take the full output of our mine for a period of ten years provided that prior to February 28th, 1961 they commit their Company to supply the funds necessary to bring the property into production at a minimum capacity of 3,000 tons of ore per day and the funds required to increase the production to a minimum of 5,000 tons per day within 24 months after production commences. The target date for mill completion is September 1st, 1962.

The Bethlehem Copper Corporation mining camp, Highland Valley, B.C.





BETHLEHEM COPPER

Directors' Report to the Shareholders (Cont'd.)

MAMIT LAKE AREA

(98 mineral claims of which 8 are crown granted)

Last year we reported to you that 15 mineral claims surrounding the Aberdeen property of Torwest Resources Ltd. were sold to its wholly owned subsidiary Groveland Enterprises Ltd. for a total sum of \$750,000.00. To date \$2,000.00 has been received. The balance is due in monthly instalments over a nine year period commencing November 1st, 1960.

The remaining claims have been retained but no work has been done on them during the past year and no exploration work is contemplated this year.

YALAKOM RIVER AREA, ELIZABETH GROUP

(4 crown granted mineral claims)

Further work in this area has been postponed until your Highland Valley property has been brought into production.

ATLIN AREA, LAVERDIERE GROUP

(8 mineral claims of which 3 are crown granted)

These claims have a potentially large zone of high grade iron and copper and are being held by your Company for future development.

TULAMEEN AREA

(36 mineral claims)

In 1958 Dr. Wm. H. White and Associates directed a prospecting team on our behalf in the Tulameen area of British Columbia. Bethlehem obtained a 75% interest in 36 located mineral claims having base metal possibilities. Recently a 90% interest in these claims was optioned to The Consolidated Mining & Smelting Company of Canada Limited for a total sum of \$200,000.00, \$1,500.00 of which was paid in cash, the balance due in annual payments over a ten year period.

FINANCIAL

Cash in bank and invested in short term securities at February 29th, 1960, the date of the attached balance sheet, amounted to \$194,745.00. Option presently outstanding involves 214,286 shares on or before May 31st, 1960 for a total sum of \$250,000.00.

GENERAL

Since our last annual meeting Mr. E. R. E. Carter, President of Patino of Canada Limited has resigned as a Director of the Company. In his place the Directors propose to nominate a representative of the Sumitomo Metal Mining Company Limited at the shareholders' annual meeting on June 24th, 1960.

Respectfully submitted, on behalf of the Board of Directors,

H. H. HUESTIS,
President.

May 23, 1960.

W. F. JAMES, B. S. W. BUFFAM and M. A. COOPER

REPORT OF THE CONSULTING ENGINEERS
FOR THE YEAR MARCH 1, 1959 TO FEBRUARY 29, 1960

The Chairman and Directors,
Bethlehem Copper Corporation Limited,
Vancouver, B.C.

Gentlemen:

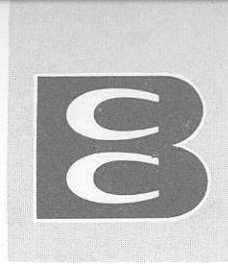
During the fiscal year 1959-1960 the preliminary underground programme of exploration and development work was completed in the Jersey and East Jersey orebodies at Highland Valley, B.C. In addition, geophysical mapping using the Induced Polarization Method was done in the area extending from the Jersey and East Jersey orebodies to Spud Lake. Extensive metallurgical test work was carried out on ore obtained from the underground work.

UNDERGROUND DEVELOPMENT

The 4600 adit was started in July, 1958 and underground work was stopped in September, 1959. Altogether 9823 feet of crosscutting and drifting, 22,766 feet of long hole percussion drilling, and 941 feet of diamond drilling were accomplished. This work was distributed as follows:

	Headings	Year 1958-1959	Year 1959-1960	Total Footage
Crosscutting	Main Tunnel	3,582 feet	1,677 feet	5,259
	Jersey x-cuts	—	639 feet	639
	E. Jersey x-cuts	—	219 feet	219
	TOTAL			6,117
Drifting	Jersey	264 feet	2,217 feet	2,481
	East Jersey	—	1,225 feet	1,225
	TOTAL			3,706
	TOTAL CROSSCUTTING & DRIFTING			9,823
Percussion Drilling	Jersey	1040 feet	15,136 feet	16,176
	East Jersey	—	6,590 feet	6,590
	TOTAL			22,760
Diamond Drilling	Jersey	—	130 feet	130
	East Jersey	—	811 feet	811
	TOTAL			941
	TOTAL DRILLING			23,707

Altogether 38% of the underground workings had to be timbered. Most of this work was done to prevent minor spalling rather than to support heavy ground. The shattered condition of the rocks in the area of the two zones will not interfere with open pit mining.



BETHLEHEM COPPER

Consulting Engineers' Report (Cont'd.)

SAMPLING

Sampling of the ore exposed underground followed closely the proposed methods outlined in last year's report. Muck samples were taken from the cars as they reached the surface and in addition 9/10 of the ore from the drifts and crosscuts was channelled through a sampling plant with a capacity of 200 tons per day. The results of these two methods of sampling checked closely as shown below. The lengths shown include areas beyond the limits of ore grade material.

	JERSEY Length Sampled 3945 feet	EAST JERSEY Length Sampled 1189 feet
Muck Sample	0.70	0.97
Sample Plant	0.72	0.96

Altogether 4,632 feet of percussion drilling was checked by crosscutting and drifting along the holes. This was done to provide a comparison that could be used to calculate the drilling done in the walls of the workings.

The overall difference between the averages of the muck samples and the drill hole samples was approximately 4.3 percent. The grades given by the drill hole sludges were therefore raised by 3 percent for calculation of the average ore grades of the two zones.

The results given by the mine assay office corresponded closely with results of check assaying done in Vancouver and in the Laboratories which did the metallurgical test work.

METALLURGICAL RESEARCH

Metallurgical research was carried out during the year on composite samples of Bethlehem ore by Mr. D. A. Livingstone at Manitou Barvue Mines Limited and by Dr. H. M. Howard at the University of British Columbia

The research work indicates that the grinding and flotation characteristics of the Jersey and East Jersey ore are similar. Copper recovery varies directly with the fineness of grind and inversely with the grade of concentrate. The optimum grind appears to be about 65-70% through 200 mesh into concentrates grading about 30% copper. Percentage recovery of copper from 85 to 92% can be expected depending upon ore grade.

DEVELOPMENT COSTS

The total cost, including capital assets of \$65,833, of the underground exploratory and development work, sampling, and metallurgical investigations from June, 1958 to February 29th, 1960 amounted to \$1,076,000.

Unit costs are \$99.00 per foot for drifts and crosscuts, and \$4.00 per foot for drilling where all costs including capital expenditures are applied against the underground phase of the work.

ORE RESERVES

Copper

The following estimate of ore reserves in sight includes only the portions of the Jersey and East Jersey orebodies from surface to the 4600 adit level. This level is at an average depth of 260 feet below surface in the Jersey section, and about 350 feet in the East Jersey section.

The surface diamond drill holes that penetrated below the adit level indicate that ore in both zones continues to depth. However, the information about the habit of the ore below this horizon is not known in sufficient detail to enable a close appraisal to be made of its potential.

It is estimated that the Jersey orebody contains 12,600,000 tons of ore grading 0.70% copper between surface and the 4600 adit level. This tonnage is equivalent to approximately 48,500 tons per vertical foot.

The East Jersey orebody is estimated to contain 5,500,000 tons of ore grading 1.15% copper above the adit level. At the 4600 tunnel level the ore body contains 16,000 tons per vertical foot.

The reasonably assured ore in place in the two orebodies above the adit level amounts to:

	TONS	GRADE	HEIGHT (Above Adit Level)
Jersey	12,600,000	0.70	260 feet
East Jersey	5,500,000	1.15	350 feet
TOTAL	18,100,000	0.83	

Other Metals

The ore in addition to its copper content contains gold, silver and molybdenum. The metallurgical test work indicates that the concentrates will contain 0.03 to 0.06 oz. gold, 2.5 to 2.9 oz. silver and 0.55% molybdenum sulphide.

The value of the gold, silver and molybdenum that is recoverable from the concentrate will probably total 15 cents per ton of ore.

GEOLOGY

The ore occurs in diorite and porphyry and in its mode of occurrence is similar to the porphyry coppers of the Cordilleran regions of North and South America.

Microscopic examination of the flotation concentrates indicates that the proportions of sulphide copper minerals in the ore are chalcopyrite 55%, bornite 45% with small amounts of chalcocite and covellite. Non-sulphide minerals comprising oxides and carbonates were observed infrequently and about 11.5% of the total copper can be classed as "oxide" copper.

April 18, 1960.

W. F. JAMES, B. S. W. BUFFAM & M. A. COOPER
Per: B. S. W. BUFFAM.



BETHLEHEM COPPER

BALANCE SHEET AS (With the Comparative

ASSETS

	1960	1959
CURRENT ASSETS		
Cash on hand and in bank	\$ 4,355	\$ 28,686
Employees' expense advances		489
Accounts receivable—sundry	3,432	
Short term notes receivable and accrued interest	190,390	231,494
Government of Canada bonds—at cost and accrued interest		100,204
TOTAL CURRENT ASSETS	198,177	360,873
NON-CURRENT ASSETS		
Investment in wholly owned subsidiary—at cost (Note 1)	\$ 500	—
Option to purchase land	2,000	—
	2,500	—
CAPITAL ASSETS—at cost		
Mineral claims	119,498	118,992
Campsite land	17,700	17,700
Mining and other equipment—less depreciation 1960 - \$37,577, 1959 - \$22,246	37,689	45,304
	174,887	181,996
PREPAID AND DEFERRED COSTS		
Exploration and development expense (Schedule 1)	1,323,457	641,384
Administration expense (Schedule 2)	211,791	151,533
Prepaid expense	4,427	623
Incorporation and organization expense	3,449	3,449
	1,543,124	796,989
	\$1,918,688	\$1,339,858

APPROVED ON BEHALF OF THE BOARD

J. A. McLALLEN, Director

H. H. HUESTIS, Director

C O R P O R A T I O N L T D . (Non-Personal Liability)

AT FEBRUARY 29, 1960

Figures As At February 28, 1959)

LIABILITIES AND CAPITAL

	<u>1960</u>	<u>1959</u>
CURRENT LIABILITIES		
Accounts payable	\$ 5,795	\$ 51,108
CAPITAL		
Authorized		
6,000,000 shares of 50c each par value		
Issued		
2,060,714 shares (1959—1,575,000) for cash	\$1,030,357	787,500
Add Premium less discount and commissions	788,786	407,500
	<u>1,819,143</u>	<u>1,195,000</u>
1,500,000 shares—for properties	750,000	750,000
Less discount	656,250	656,250
	<u>93,750</u>	<u>93,750</u>
<u>3,560,714 shares</u>	1,912,893	1,288,750
	<u><u>\$1,918,688</u></u>	<u><u>\$1,339,858</u></u>

AUDITORS' REPORT TO THE SHAREHOLDERS

We have examined the balance sheet of Bethlehem Copper Corporation Ltd. (Non-Personal Liability) as at February 29, 1960, and have obtained all the information and explanations we have required. Our examination included a general review of the accounting procedures and such tests of the accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion, the above balance sheet supplemented by the accompanying notes and schedules is properly drawn up in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year, so as to exhibit a true and correct view of the state of the company's affairs as at February 29, 1960, and results of its operations for the year ended on that date, according to the best of our information and the explanations given to us and as shown by the books of the company.

Vancouver, Canada
May 13, 1960.

McIntosh, McVicar, Dinsley & Co.
Chartered Accountants.



BETHLEHEM COPPER

STATEMENT OF SOURCE AND APPLICATION OF FUNDS

For the Year Ended February 29, 1960

APPLICATION OF FUNDS

Prepaid and deferred costs:

Exploration and development expenses—(Schedule 1)	\$682,073		
Less depreciation allowance not requiring the outlay of funds	15,330	\$666,743	
Administration expense (Schedule 2)		72,321	
Prepaid expense		3,803	\$742,867

Capital assets acquired:

Mineral claims		506	
Fixed assets—furniture and fixtures	2,113		
—equipment in mine buildings	1,034		
—mine buildings	3,683		
—ore dump trestle	886	7,716	8,222

Investment in wholly-owned subsidiary			500
Land purchase option			2,000
			<u>753,589</u>

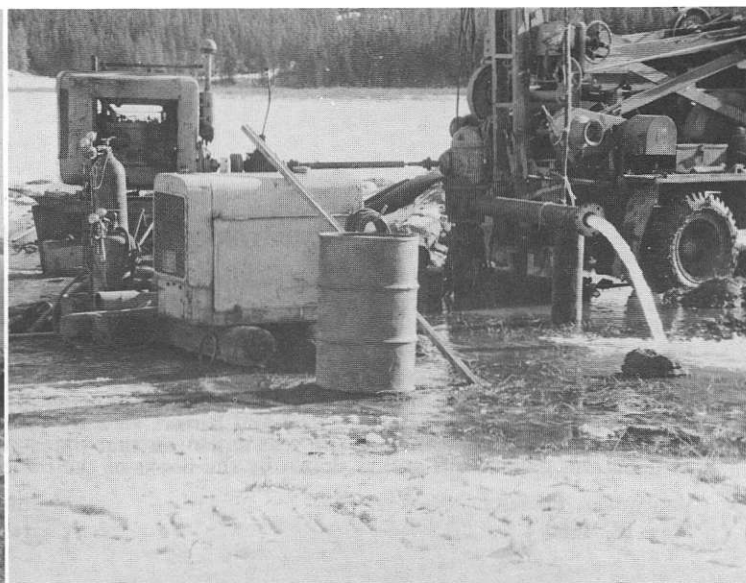
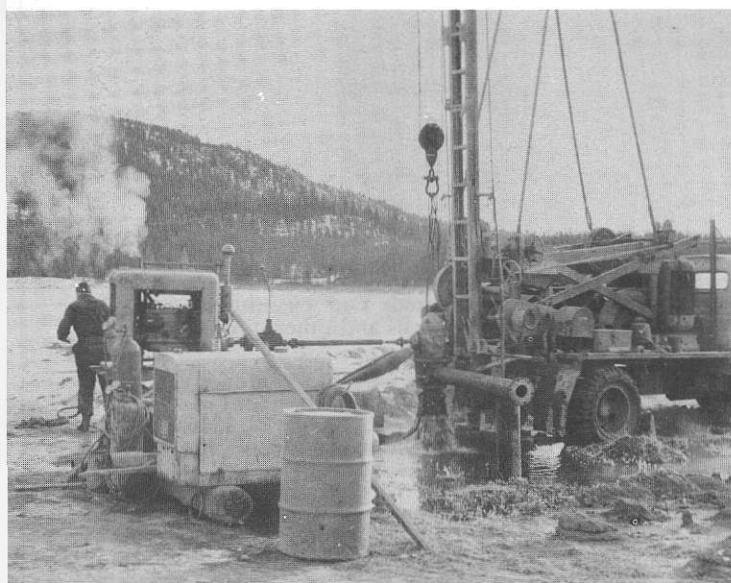
SOURCE OF FUNDS

Proceeds from sale of capital stock:

Par value	242,857		
Premium less commission	381,286		
	<u>624,143</u>		
Interest earned on bonds and short term notes (Schedule 2)	12,063	636,206	

DECREASE IN WORKING CAPITAL

\$117,383



Water drilling at Bethlehem

C O R P O R A T I O N L T D. (Non-Personal Liability)

SCHEDULE 1

SCHEDULE OF EXPLORATION AND DEVELOPMENT EXPENSE

For the period from February 9, 1955 (Date of Incorporation) to February 29, 1960

	Year Ended February 29, 1960	Four Years Ended February 28, 1959	Total to February 29, 1960
Assaying and sampling	\$ 55,523	\$ 25,138	\$ 80,661
Automobile and truck expense	7,783	15,946	23,729
Board and lodging—net	12,763	7,826	20,589
Camp supplies	4,668	10,437	15,105
Depreciation allowance	15,330	22,246	37,576
Equipment rentals	—	44,957	44,957
Equipment repairs and maintenance	119	735	854
Exploration and development—Yalakom	30	30,639	30,669
—Mattagami Lake	—	4,793	4,793
—Atlin	500	—	500
Professional fees and expenses	26,881	67,134	94,015
Insurance	1,486	1,789	3,275
Land Survey	4,072	22,245	26,317
Loss on sale of equipment	—	5,135	5,135
Maps and blueprinting	8,268	2,185	10,453
Mill testing	13,206	—	13,206
Mining claim options written off	—	10,300	10,300
Permits, recording fees and assessments	2,365	3,492	5,857
Property taxes	220	657	877
Prospecting	—	23,925	23,925
Road maintenance	1,000	1,753	2,753
Light, heat and power	3,005	—	3,005
Staking	—	2,126	2,126
Wages, salaries and wage assessments	20,758	43,603	64,361
Contractors' charges—tunnel development	491,070	287,805	778,875
Mine office overhead	6,067	6,518	12,585
Water well expense	6,959	—	6,959
TOTAL EXPLORATION AND DEVELOPMENT EXPENSE	\$ 682,073	\$ 641,384	\$1,323,457



Jersey Lake



A winter road in Highland Valley



BETHLEHEM COPPER

SCHEDULE 2

SCHEDULE OF ADMINISTRATION EXPENSE

For the period from February 9, 1955 (Date of Incorporation) to February 29, 1960

	Year Ended February 29, 1960	Four Years Ended February 28, 1959	Total to February 29, 1960
Management salaries and salary assessments (Note 5)	\$ 28,440	\$ 51,456	\$ 79,896
Accounting and secretarial services	7,490	33,312	40,802
Dues, subscriptions and donations	575	1,153	1,728
Legal and audit	4,620	9,727	14,347
Licenses	218	658	876
Office rent and light	2,122	4,276	6,398
Promotion and advertising	6,592	28,588	35,180
Registrar and transfer agents	2,839	4,855	7,694
Shareholders' reports and meetings	6,169	12,728	18,897
Stationery, postage and office supplies	2,184	5,301	7,485
Stock exchange fees	647	2,406	3,053
Telephone and telegraph	4,327	11,003	15,330
Travel	8,798	47,203	56,001
Miscellaneous (gain) losses (Note 2)	(2,700)	4,079	1,379
	<u>72,321</u>	<u>216,745</u>	<u>289,066</u>
Deduct—Interest earned on bonds and short term notes	12,063	64,737	76,800
—Rentals received	—	475	475
	<u>12,063</u>	<u>65,212</u>	<u>77,275</u>
TOTAL ADMINISTRATION EXPENSE	<u>\$ 60,258</u>	<u>\$ 151,533</u>	<u>\$ 211,791</u>

NOTES TO FINANCIAL STATEMENTS

- Investment in wholly owned subsidiary represents shares acquired in Highland Valley Smelting & Refining Co. Ltd. which was incorporated during the current year. The subsidiary company did not operate during the year.
- During the year the company disposed of certain Crown granted mineral claims and located mineral claims for \$750,000 of which \$1,500 was paid during the year. The balance is payable in instalments in varying amounts and at various dates until April 1, 1969. The unpaid balance is secured by first mortgages on the mineral claims. The \$1,500 received during the current year has been credited to administration expense (Schedule 2) and the balance owing has not been reflected in the accounts.
- The company has granted an option exercisable at any time up to February 28, 1961 whereby the optionee may contract for the entire mine output for a period of ten years after it comes into production, on the condition that the optionee provides the funds to finance the capital expenditure required to bring the company's Highland Valley properties into production.
The optionee may advance the required funds to finance the capital expenditure by either:
 - Loans secured by mortgages (in which event the optionee may, prior to December 31, 1962, purchase 300,000 treasury shares at a price of \$1.40 per share), or
 - The purchase of up to 1,700,000 treasury shares at an average price of approximately \$1.81 per share and the balance on loan secured by mortgages.
- An option to purchase 214,286 shares of the company for the sum of \$250,000 on or before May 31, 1960 (subject to Toronto Stock Exchange escalator regulations) was outstanding as at February 29, 1960.
- Management salaries and salary assessments include an amount of \$14,750 remuneration to officers and salaried director for the year under review.

JERSEY ORE BODY
ON 4600 LEVEL

4600 MAIN TUNNEL

JERSEY LAKE

EAST JERSEY
ORE BODY
ON 4600 LEVEL

A
ZONE

CAMP LAKE

IONA
ZONE

B
ZONE

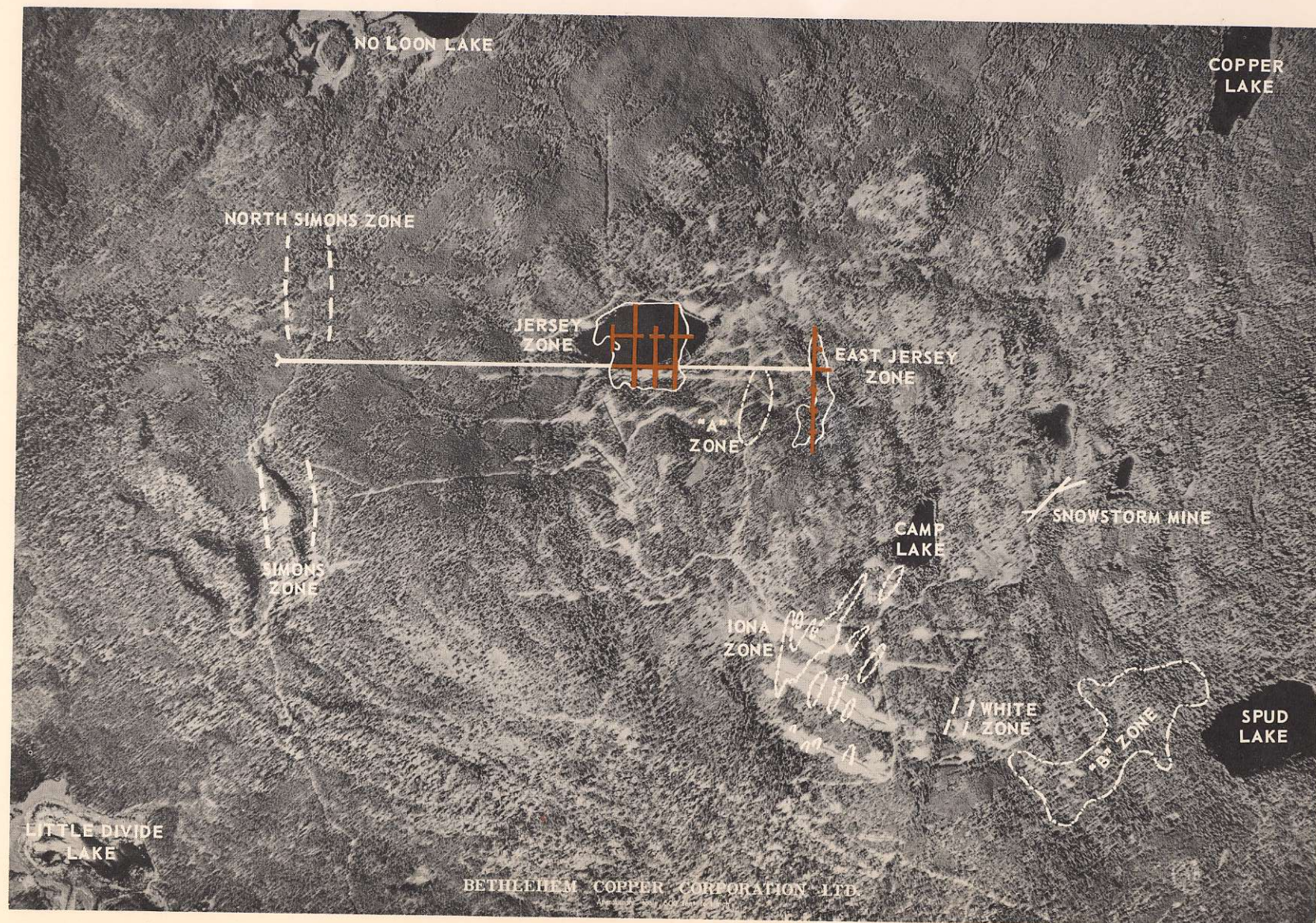
SPUD
LAKE

BETHLEHEM COPPER CORP. LTD.
HIGHLAND VALLEY B.C.
KAMLOOPS M.P.
SCALE 1"=500' 1960

4600 Level

Progress to May 23, 1960

— Tunnelling in Ore Body





BETHLEHEM COPPER CORPORATION

GENERAL SUMMARY

by

W. M. SIROLA

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PURPOSE

The purpose of this summary is to acquaint Kerr Addison with a generalized picture of the potential of the Bethlehem deposit.

LOCATION AND ACCESS

The property is located in the Highland Valley district of the Kamloops Mining Division. It is 25 miles south-east of Ashcroft by gravel road and 223 miles north-east of Vancouver by paved highway. The elevation is 5,000' above sea level.

HISTORY

Originally known as the Snowstorm Group, these claims have had sporadic investigation since 1907. In 1955 Mr. Herman Huestis and associates staked 150 claims surrounding the original Snowstorm Group and optioned the claims to an American Smelting and Refining Company on a 55%-45% basis. A. S. and R. conducted a rigorous exploration program on the claims and concentrated their efforts on the Iona, Jersey and East Jersey zones. Their work consisted principally of diamond drilling but included magnetic and electrical surveys. Their total expenditure was approximately \$1,250,000.00. A. S. and R. dropped the option in 1958 and Messrs. Buffam and James were subsequently hired as consultants. They advocated a long adit to penetrate the Jersey and East Jersey zones. The prime purpose of this adit was to bulk sample the deposit. When this work was completed in 1959, Japanese interests undertook to do some additional drilling and limited underground work. The Japanese option expires February 28th unless an extension of time is granted. A request for extension is quite likely because engineering plans are still being worked on by Wright Bros. of Vancouver.

GENERAL GEOLOGY

The Bethlehem claims are located in the heart of the Guichon Creek batholith. The batholith is composed of older and younger quartz diorites and granodiorites, dacite porphyry and breccias composed of these rocks. The mineralized zones occur on or near the contact between younger and older diorites. Both are cut by numerous north-south trending dacite dykes. Portions of the Jersey zone are composed of volcanic breccia and the Iona zone which is uneconomic to date is essentially a breccia zone. The East Jersey ore body is on a contact between porphyry and older quartz diorite. Chalcopyrite and bornite in a 55%-45% ratio are disseminated through the rocks.

TONNAGE, GRADE AND MINING METHOD

The Buffam and James estimates are as follows:

	TONS	GRADE	HEIGHT (Above Adit Level)
Jersey.....	12,600,000	0.70	260 feet
East Jersey.....	<u>5,500,000</u>	<u>1.15</u>	350 feet
TOTAL	<u>18,100,000</u>	<u>0.83</u>	

*Leisola is apparently using
the first person
plural when
referring to himself
MJC*

We feel that the Jersey zone could be mined by open pit below the adit level and the tonnage enlarged perhaps 15,000,000 tons. However, the East Jersey zone is too narrow to be mined to adit level and available tonnage reduces to 3,000,000 tons or less. The total open pit tonnage then would be essentially the same as the 18,000,000 tons estimated by Buffam and James but the average grade would be reduced to 0.82% Cu. assuming that 70% of the ore came from the Jersey zone and 30% from the East Jersey zone.

The value of associated gold and silver would be 15¢ per ton of ore.

METALLURGY

Metallurgical research has been carried out by the University of British Columbia and by Manitou Barvue Mines Limited. It has been estimated that 85% to 92% of the copper could be recovered by grinding 65% to 70% of the ore through 200 mesh to produce a concentrate grading 30% copper.

The purchase of the Barvue Mill located at Barraute Quebec has been considered by the Japanese. The announced intention of the Bethlehem people is to start with a 3,000 ton per day flotation concentrator and ultimately to expand to 5,000 tons per day.

CONCENTRATE HANDLING

Several possibilities exist but for the purpose of this summary we will assume a 25 mile truck haul to Ashcroft, B.C. and a 200 mile rail haul to Vancouver ports.

CAPITAL COSTS

Concentrator.....	3,000 tons per day at \$1,500.00 per ton = \$4,500,000.00
Mining Equipment.....	\$1,500,000.00
Preproduction Preparation.....	\$ 850,000.00
Mine buildings, Staff dwellings, Townsite development, etc.....	<u>\$2,150,000.00</u>
TOTAL.....	<u>\$9,000,000.00</u>

OPERATING COSTS

The following operating costs are based on the 70%-30% mining ratio mentioned under tonnage and grade:

	<u>\$ per Ton</u>
Mining	\$1.25
Milling	1.00
Treatment and handling of concentrates	0.90
Administration and general overhead	<u>0.30</u>
	<u>\$3.45</u>

ECONOMICS

<u>OUTCOME ON A 3,000 T.P.D. BASIS</u>	<u>BOTH ZONES</u>	<u>EAST JERSEY ZONE</u>
Grade	0.82%	1.10%
Recovery	90%	90%
Recovered Copper	14.76#	19.80#
Ore Value @ 26.5 Cu.	\$3.90	\$5.25
Value of Au. and Ag.	\$0.15	\$0.15
Total Value	\$4.05	\$5.40
LESS, Operating Costs	\$3.45	\$3.86
Operating Profit Per Ton	\$0.60	\$1.54
Annual Operating Profit	\$630,000.00	\$1,620,000.00
Prepayment Period	19 years	7.4 years
Annual Operating Profit @ 30¢ Cu.	\$1,185,000.00	\$2,340,000.00
Repayment period @ 30¢ Cu.	10.1 years	5.1 years

ECONOMICS Cont'd.

Because of limited tonnage in the open pit portion of the East Jersey zone it would appear necessary to blend ores from both the Jersey and the East Jersey zones. In any case, mining of the East Jersey zone alone would prevent mining of Jersey zone mineralization because of its comparatively low grade. It is not considered possible to mine a grade of 0.70% Cu. even if amortization is completed. We grant that there may be a small nucleus of ore in the Jersey zone which would exceed the 0.70% average.

If the ores are blended to a grade of 0.82% as shown, write-offs at 30¢ Cu. would take ten years. This allows for no differential between U. S. and Canadian funds. Assuming that the 70%-30% ratio of mining is adhered to, the total tons removed from the Jersey zone would be $1,050,000 \times 10 \times .30 = 3,150,000$ tons. This means that the open pit supply in the East Jersey zone would then be exhausted in the ten-year period and additional mill feed would have to come either from the Jersey zone alone or from a combination of Jersey zone ore and underground ore from the East Jersey zone. This would constitute new problems in economics and are deemed to be beyond the scope of this report.

CONCLUSIONS

Unless copper prices improve beyond the 30¢ level the Bethlehem operation would not appear to be any asset to the shareholders.

A possible solution would be to locate another East Jersey zone by additional exploration.



W. M. SIROLA

January 25, 1961.



ccs.

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attach to

*An Investment Study
of*

**BETHLEHEM COPPER
CORPORATION LTD.**

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Bethlehem Earnings Well Ahead Of 1965 Dividend Boosted

Net earnings of Bethlehem Copper Corp. for the nine months ended Nov. 30, 1966, were more than double those for the corresponding period of the previous year.

Net for the 1966 period is equivalent to 80.9¢ per share against 36.4¢ per share for the nine months of 1965. Net for the third quarter at 24.1¢ per share is down from the previous quarter's 34¢ per share.

In the three months ended Nov. 30, 1966, the mill averaged 9,595 tons per day against 9,610 tons per day in the previous three months. Grade of ore was 0.59% copper against 0.62% and production amounted to 8,442,109 lbs. copper against 8,793,047 lbs.

Despite the decrease, production value increased from \$4,438,918 to \$4,519,886. Operating costs moved up from \$2,232,472 to \$2,693,071, leaving operating profit of \$1,826,815 against \$2,206,446 in the August quarter. Net income after deducting \$567,083 depreciation, debenture interest, exploration, income and mining taxes was \$1,259,732 compared with \$1,778,357.

A bonus dividend of 5¢ per share has been declared payable Jan. 20, 1967, which will bring first quarter total to 15¢ on payment of the regular quarterly dividend in March.

The company is embarking on a \$2 million program for improvement of plant facilities. The program includes: Modification of fine ore storage facilities; expansion of mill building; installation of a new ball mill scheduled for delivery mid-1967; additional flotation equipment; construction and equipping of a modern laboratory building; construction of a small parts warehouse and increased engineering facilities.

Operating Results Compared		
9 mos. to Nov. 30:	1965	1966
Tons per day	8,667	9,595
Copper grade, %	0.61	0.62
Recovery, %	81.86	83.02
Copper output, lbs.	23,848,261	17,305,925
Production value	\$12,304,537	\$6,604,387
Production costs	4,549,849	3,225,357
Admin., other costs	2,054,334	1,479,045
Operating profit	\$ 5,700,354	\$ 1,899,985
Dep., other charges	1,479,557	
Net income	\$ 4,220,797	\$ 1,899,985
Net per share	80.9¢	36.4¢

Accuse Government In Injunction Case

An Ontario mine official has blasted the Ontario Water Resources Commission for its handling of an injunction court case involving a copper mine on the east shore of Lake Superior.

Patrick Sheridan, president of Sheridan Geophysics which operates the Coppercorp Mine through the private company North Canadian Enterprises, accused the commission's lawyer of "sounding off" to the press on the injunction even before he knew of it himself and before it was properly dealt with by the Ontario Supreme Court.

The commission obtained a 21-day injunction late last week against the operators of the mine on the allegation that they were polluting a stream which drained into Lake Superior. The injunction was later suspended temporarily but the court has yet to hear Mr. Sheridan's side of the story.

An affidavit filed with the court alleges that the creek water was polluted, however Mr. Sheridan stated that the commission had acknowledged that such was not the case. He said that the commission appeared to be upset about the orange color of the water draining from the mine's tailings disposal pond.

He noted that there was absolutely no sign of pollution since the entire supply of water for both drinking and operations at the mine was obtained from a point near the creek mouth in the lake.

Cassiar Asbestos Corporation Limited

Notice is hereby given that an interim dividend of ten cents (10¢) per share plus an extra dividend of five cents (5¢) per share has been declared payable in Canadian Funds on January 27th, 1967 to shareholders of record at the close of business on December 30th, 1966.

By Order of the Board,

C. R. ELLIOTT,
Secretary-Treasurer.

Toronto, Ontario
December 16, 1966



COPPERFIELDS MINING CORPORATION LIMITED

Initial Dividend

NOTICE is hereby given that a dividend of Five Cents per share on the Capital Stock of the Company is payable February 14, 1967, to shareholders of record January 31, 1967.

By Order of the Board

J. H. WESTELL,
Treasurer.

Toronto, December 13, 1966.

The orange coloring comes from iron solids suspended in the water which settle out very shortly after reaching the lake.

Mr. Sheridan expressed complete surprise at the commission's behavior. He said that he had made a number of changes at the mine in accordance with the wishes of the commission in June.

"They were satisfied at the time," he said, "but then they came along with this injunction with no warning at all." They did not even attempt to reach me or any other of the company officials who have been available at almost any time in the last two months."

Tantalum Bet

(Continued from Page One)

bulged. As opposed to a level below \$3 per lb. for tantalum contained in concentrates in the immediate post-war years, the price currently is above \$12, with much of the increase taking place in the past nine months.

The Upper Ross Lake deposits were purchased earlier this year by Barrington Explorations. Subsequently, they were optioned to International Bibis Tin Mines. At the same time, a deal was made with the CIBA people by which they may earn a 50% interest in the property through expenditure of \$200,000 on evaluation work. The deal allowed some preliminary examination which was completed, apparently favorably, earlier this fall, and CIBA has committed itself to the bigger program.

Surrounding ground (the main showings so far as is known are confined to a 14-claim group known as the PEG claims) has been staked on a joint account by CIBA and International Bibis, and exploration is scheduled for these claims.

Pegmatite Zones

The PEG group deposits, located 44 miles northeast of Yellowknife, lie within pegmatite zones, some in dike or vein zones, some quite narrow and small, but with the significant ones being quite large — measuring as much as 2,000 ft. in length with widths of up to 600 ft.

Rare earth elements of potential importance have been noted in many pegmatite zones; in fact, 19 zones are known to involve tantalum-columbium chances, while beryl is also evident, but has not really been looked into seriously.

Where tantalum is concerned, incidentally, the host mineral within the pegmatites is topazite, while on the basis of metallurgical research, it has been indicated that tantalum is the dominant constituent, representing upwards of 65% of the mineral.

Extensive trenching, some underground work, and detailed bulk sampling on a relatively few of the known tantalum-bearing zones has suggested a grade of something of the order of seven lbs. per ton. Limited high grade zones have been noted ranging as high as 35 lbs.

CIBA's program, scheduled to start early in the New Year, will involve detailed mapping, bulk sampling employing a portable crushing and sampling plant, close-spaced drilling to shallow depths, and continued metallurgical and feasibility studies. It is felt that a season's work, or possibly even less, could bring the project to a point where a tentative production decision could be reached.

Will Advance Senior Money

If CIBA decides to go ahead to production (and, The Northern Miner gathers, it certainly has both the financial resources and the markets necessary if the property responds to the evaluation program) a new company will be formed of which CIBA will have management plus a 50% ownership position.

International Bibis would have the remaining ownership, while Barrington, on a scale of stock payments reflecting CIBA's expenditures, would develop a substantial stock position in International Bibis. For example, 75,000 shares were issued on completion of the option, but on completion of the first part of the present phase of the CIBA program, Barrington will receive another 75,000 shares, and when \$200,000 has been expended by CIBA, 250,000 shares will be issued. If the property is brought to production and production is maintained at a rate of 100 tons or more daily for a six-month period, a further 450,000 shares will be issued.

International Bibis and CIBA staked surrounding ground to the extent of 34 claims on a joint basis, and preliminary exploration will be on the same basis. However, if more advanced development is called for, CIBA will advance loans against production, as it will also do on the main group after the full evaluation program is complete.

Buffalo Lake To Drill Pine Point Property

A final report on the geophysical survey conducted on Buffalo Lake Mines' Pine Point property was recently submitted to the company by Intercontinental Mining Development Ltd.

An initial drilling program of five holes has been outlined by Intercontinental consulting geophysicist, D. Sutherland of McPhar Geophysics.

A number of anomalies were located and it is proposed to drill the best of these as soon as the Christmas and New Year season is over.

Offers for outside financial participations are at present being studied by company officials and an announcement is pending.

CRESTLAND SHARES FREED

Toronto Stock Exchange has consented to the release Dec. 21 of the remaining 54,000 Crestland Mines shares still held in escrow.

Radiore Drill Hole Cuts Wide Zone

Radiore Uranium Mines has intersected a wide zone of disseminated mineralization in the first hole in its recently resumed drill program to test the lengthy copper-bearing zone on its Matagami area property.

A shallow boring, it was collared at the extreme eastern fringe of the zone. Thinking was that it wouldn't find much of economic interest. Officials, therefore, were more than a little surprised to find 200 ft. of mineralization extending from 105-305 ft. While the section is not likely to assay ore grade, there is a fair amount of copper mineralization.

The drill has now been set up 100 ft. further back to cut the zone in the same plane but at a deeper horizon.

Plans are to systematically probe the zone at regular intervals all the way to the west boundary. But it will be another month or so until any deep holes are put down.

The drill program, as now planned, will continue right through till break-up next spring, though of course will be suspended over the Christmas holiday.

Inco Participating In Australian Project

International Nickel Company of Canada is participating with The Broken Hill Proprietary Co. of Australia in further exploration of indicated nickel deposits in Queensland, Australia.

An Inco statement says the two companies "have come to an understanding regarding further intensive prospecting of the area and metallurgical investigation of the ore occurrences." The ground is held by Broken Hill.

Most of the metallurgical tests will be carried out at Inco's Ontario research facilities.

Deep Bordun Drill Hole Cuts Wide Mineralization

Deepening of the No. 3 hole on the Pardee Twp. property of Bordun Mines in the Thunder Bay area has come up with a wide section of disseminated nickel-copper mineralization.

The hole, which was collared in the northeast corner of the property only 200 ft. from the Great Lakes Nickel boundary, cut what is believed to be the extension of the great Lakes ore-making sill between 1,616 ft. and 1,757. The entire 141 ft. of mineralized core is being split and will be sent for assay.

Columbium Find

(Continued from Page One)

interesting ground in the immediate vicinity of the license.

Three other exploratory licenses are held in the Lowland area. The Moosonee Gypsum has 4,000 acres in Roebuck and Maher Twps. to the southwest of Moosonee. The Algoma Central Railway holds 58,650 acres about 40 miles north-east of Hearst in McBrien and neighboring townships. The Keewil Mining group holds 25,000 acres in Kineris Twp. which is about 20 miles southeast of Coral Rapids.

In addition to these, three other license areas are being discussed for non-metallics in the Lowlands. An oil company is also discussing an oil concession to the north — closer to the Hudson Bay area of Ontario.

An Ontario Mines Department official also predicted that there would be considerable excitement on diamonds in the area. He noted that a full report on the diamond possibilities was now being prepared by the department for release in the near future. This report is the result of extensive investigation into potential diamond locations carried out during the past year.

Earlier government geophysical surveys have indicated a number of small circular magnetic features caused by carbonatite — a rare rock in the Canadian Shield. These have been found in a band stretching from Moosonee to Sault Ste. Marie and are interesting since it is the even rarer kimberlite diamond pipes which have been found near the carbonatite plugs. To date no kimberlite has been found in Canada. In 1963, an intensive exploration program by De Beers Consolidated established rock conditions favorable for diamonds, but although the associated garnets were found, no definite proof of the presence of kimberlite was established.

The lignite situation seems to be the most promising as far as immediate changes in the area are concerned. Ontario Mines Minister George Ward-roppe said "we are quite enthusiastic about this since we hope that it will attract new interest in the northern sections of the province."

Alberta Coal must spend at least \$25,000 annually exploring the lignite

deposits and will be entitled to mine 5% of the area if the material proves economic. The company indicated that it would spend closer to \$60,000 in its first year and that it would begin exploration work right after the new year.

The Onakawana lignite fields, which are estimated to contain some 100,000,000 tons have been explored intensively by the provincial government at various times during the past 30 years. Each time the same conclusion was reached — the deposits were not economic in their location almost 600 miles from the population centre of Toronto.

Modern technology has changed all this. Alberta Coal now mines lignite in Western Canada for a variety of uses including the generation of power in steam plants. Both Algoma Steel Corp. and Stelco have carried out research on the lignite in an effort to find a substitute for bentonite — which is largely imported — used as a binder in the pelletizing of iron ore.

Lignite has other uses too, such as a filter media in sewage and water purification plants.

Interest in the Onakawana lignite fields was re-awakened this past summer when Ontario bid for a Canadian General Electric heavy water plant at the site. The province offered to finance a \$15 million lignite-fuelled steam plant in the area if General Electric would locate its heavy water plant there. However the company decided to locate its plant in Nova Scotia instead.

Delaur Gold Mines at June 30, 1966, had current cash assets of \$716.00 and investments in government bonds with a market value of \$2,985. Current liabilities amounted to \$70.00.



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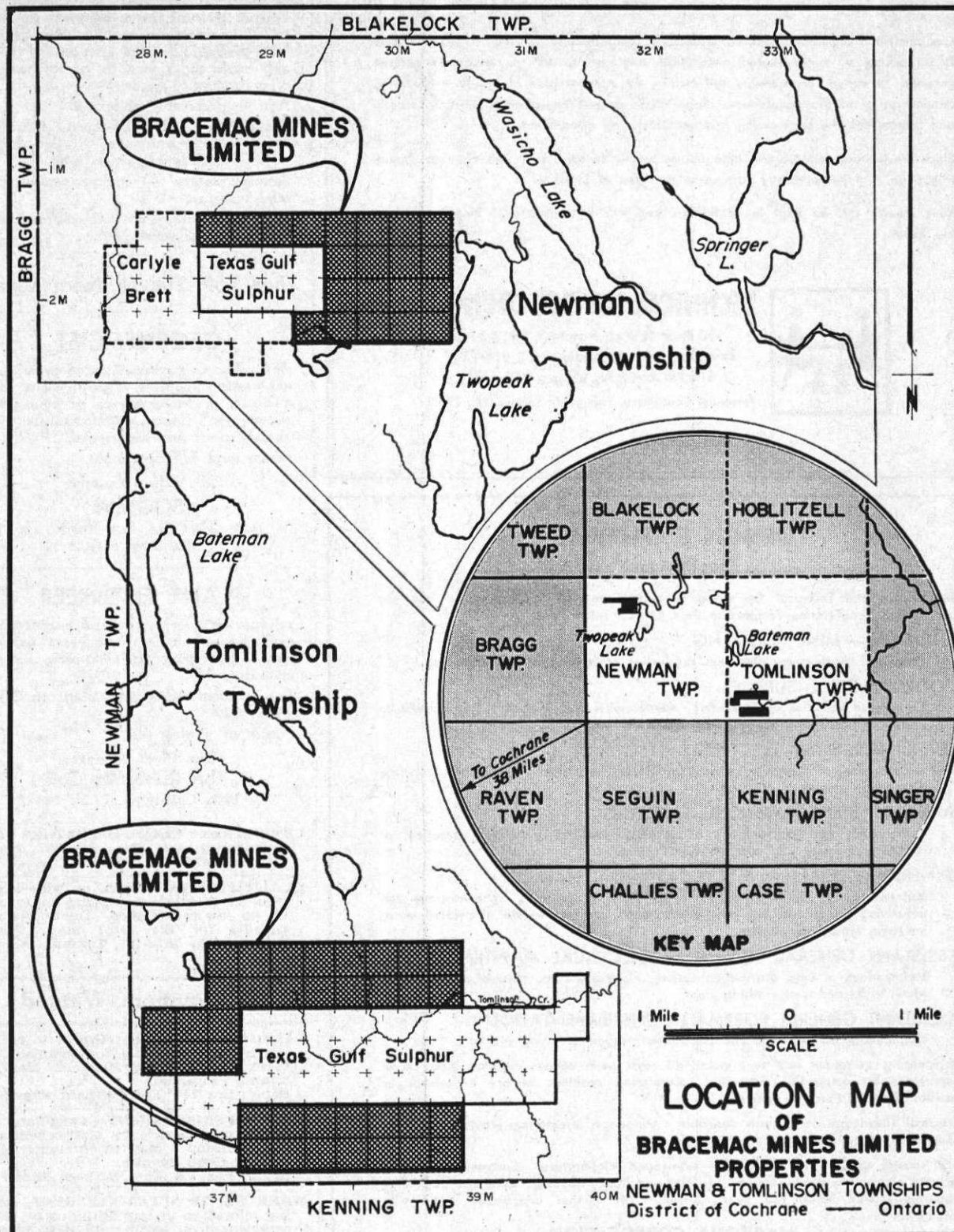
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Box 755, The Northern Miner

Help Wanted (Cont.)

FALCONBRIDGE NICKEL MINES LIMITED

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For electrical maintenance and installation — underground and surface. Experience in mining industry an asset; should have construction experience in conduit and cable work.

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Vacation plan includes special vacation leave of five extra weeks on completion of five years service which is renewable on completion of each additional five years.

Please reply in writing, giving particulars of personal history and work experience to:

Pay and Personnel Supervisor
Falconbridge Nickel Mines Limited

Nickel Division — Sudbury Operations
Falconbridge, Ontario

ELECTRICAL FOREMAN FOR UNDERGROUND

Experienced Electrical Foreman is required for a broadly based gold mining company in Northern Ontario. Housing is available, with excellent schooling, medical, and recreational facilities.

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Help Wanted (Cont.)

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Monsieur Edwain Gaucher
SOQUEM

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ASSISTANT SUPERINTENDENT, MAINTENANCE

Open pit iron mining and pelletizing operation requires technically trained man to assist in direction of 180-man maintenance and plant engineering activity. Opportunity for experienced maintenance supervisor or maintenance engineer to broaden his experience with established company.

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Age — preferably under 40.

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All replies will be treated confidentially and will be acknowledged.

Reply to

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A Québec Company engaged in mining exploration requires a geophysicist with a Ph.D. or M.A. degree or equivalent experience. Salary commensurate with qualifications and experience.

Please send full details to:

Mr. Edwin Gaucher
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Employment Wanted

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WORK STUDY SUPERINTENDENT, seeking relocation in mining industry. Well experienced in setting up new department, time and method study, incentive system, slope cycle planning, salary and job evaluation, etc. Please reply to Box 770, The Northern Miner. v

Mining Property Wanted

NEW MINING GROUP invites the submission of copper, lead, zinc or silver properties for financing and development.
Reply: Box 764, The Northern Miner. u

Mining Property Available

CLAIMS FOR SALE — Burnt Bush area. Five months' accumulation of choice claims adjacent to major mining properties currently being drilled. Contact K. R. Kent, P.Eng., Telephone Toronto, 481-5958. u

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30 CLAIMS, large uranium occurrence, copper & nickel showings. 2 major companies drilling in immediate vicinity. Large orebody with copper to 30% being mined within ½ mile, exploration recommended. We require financing or participation deal. Property never drilled. Please reply Box 771, The Northern Miner. u

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FOR SALE — Symons Crushers, Jaw Crushers, Ball Mills Hoists, Flotation Units Sheave Wheels Pipe Rail Motors, etc. Everything reconditioned and guaranteed Northern Metal Company Limited P.O. Box 459 Phone 679-3811, Cobalt Ontario tf

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Since the location is Montreal, bilingualism would be an asset. The opening should attract an engineer presently earning in the area of \$10,000.

Your inquiry will be kept in confidence and will be answered. Please refer to file 133M.



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Maintenance of townsite and beneficiation electrical equipment, including distribution system.

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Construction and maintenance of townsite facilities including operation of related aggregate and concrete batch plants.

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Maintenance of electrical equipment in crushing, grinding, concentrating and pelletizing plants and two deep water ports and supervision of related shops including motor rewind shop.

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Maintenance of field distribution system, electric shovels, electric drills, electric wheel trucks and mine crushing plant.

ASSISTANT GENERAL FOREMAN — INSTRUMENTATION

Maintenance of electronic and pneumatic instruments in all plants.

Engineering personnel and superintendents must have college training with broad experience in comparable operation. Operating positions require experience as Assistant General Foreman or above.

Practical knowledge of Spanish desirable. Language orientation provided prior to assumption of duties if required.

Arid coastal climate with comfortable year-round temperature. Company community includes elementary school, medical facilities and family housing. Excellent long-range opportunity with initial two year contract. For further information reply with resume to:

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66-67/3



**REPORT
TO THE
SHAREHOLDERS**



September - October - November

1966

*Third Quarter of Fiscal Year
Ending February 28, 1967*

**BETHLEHEM
COPPER CORPORATION
LTD.**

1818 - 355 Burrard Street

Vancouver 1, B.C.

BETHLEHEM COPPER CORPORATION LTD.

PRESIDENT'S REPORT

The interim report for the third quarter of our fiscal year and for the nine months ending November 30th, 1966, as summarized below, shows earnings of 24c for the quarter and 81c for the nine months, being an increase of 11c and 44½c over the corresponding period a year ago.

At a Directors Meeting held in Tokyo on October 25th, 1966, the following program for the improvement of our plant facilities was approved:

1. Modification of fine ore storage facilities.
2. Expansion of mill building.
3. Confirmation of an order for a new 12'6" x 15' ball mill for delivery in mid-1967.
4. Additional flotation equipment.
5. Construction and equipping of a modern laboratory building.

6. Construction of a small parts warehouse.

7. Increased engineering facilities.

The total cost of the additions and alterations will be just over \$2,000,000 and will result in a more efficient operation.

Labour Agreement

A new labour contract covering the period July 1st, 1966 to June 30th, 1969 has been concluded between the Company and the Highland Valley and District Mine and Mill Workers' Union.

Exploration — Bethex

(a) In March 1966, Bethex acquired, by staking, 100 mineral claims in the Babine Lake Area of British Columbia about 3 miles northeasterly from the Granisle Mine. Three anomalies have been outlined by both Magnetometer and Induced Polarization surveys. The largest measured 3500 feet in length and about 1000 feet

in width. A work program to consist of diamond drilling and a continuation of the geophysical work has been recommended by the geophysicists.

(b) The drilling results at the Kelly Creek and the Agassiz properties were negative.

Dividends

Enclosed is your December dividend cheque amounting to 10c per share.

The Directors have declared a dividend of 5c per share payable January 20th, 1967, which is in addition to the regular quarterly dividend to be paid in March.

Canadian shareholders are reminded that when they file their 1966 Income Tax Return they are entitled to a 20% depletion allowance with respect to dividends paid by Bethlehem.

P. M. REYNOLDS
President

December 16th, 1966

SUMMARY OF OPERATING RESULTS

Mill Feed (Dry) - average per calendar day Tons
Grade of Ore - Copper %
Recovery %
Concentrate Grade %
Copper Produced Pounds
MARKET VALUE OF PRODUCTION

Deduct:

Production costs
Administration, transportation and marketing

OPERATING PROFIT

Depreciation, debenture interest, exploration, income and mining taxes

NET INCOME

SHARES ISSUED

EARNINGS PER SHARE

Three months ended November 30th

	1966	1965
Mill Feed (Dry) - average per calendar day Tons	9,595	5,802
Grade of Ore - Copper %	.59	.65
Recovery %	82.10	81.83
Concentrate Grade %	31.76	31.44
Copper Produced Pounds	8,442,109	5,577,630
MARKET VALUE OF PRODUCTION	\$ 4,519,886	\$ 2,194,656
Deduct:		
Production costs 1.91	\$ 1,666,777	\$ 1,020,760
Administration, transportation and marketing	1,026,294	507,021
	\$ 2,693,071	\$ 1,527,781
OPERATING PROFIT	\$ 1,826,815	\$ 666,875
Depreciation, debenture interest, exploration, income and mining taxes	567,083	—
NET INCOME	\$ 1,259,732	\$ 666,875
SHARES ISSUED	5,219,500	—
EARNINGS PER SHARE	24.1c	12.8c

First nine months of Fiscal Year

	1966	1965
Mill Feed (Dry) - average per calendar day Tons	8,667	5,469
Grade of Ore - Copper %	.61	.69
Recovery %	81.86	83.02
Concentrate Grade %	31.64	33.24
Copper Produced Pounds	23,848,261	17,305,925
MARKET VALUE OF PRODUCTION	\$12,304,537	\$ 6,604,387
Deduct:		
Production costs	\$ 4,549,849	\$ 3,225,357
Administration, transportation and marketing	2,054,334	1,479,045
	\$ 6,604,183	\$ 4,704,402
OPERATING PROFIT	\$ 5,700,354	\$ 1,899,985
Depreciation, debenture interest, exploration, income and mining taxes	1,479,557	—
NET INCOME	\$ 4,220,797	\$ 1,899,985
SHARES ISSUED	—	—
EARNINGS PER SHARE	80.9c	36.4c

17c/16.

9c/16.

8.6c/16

8.5c/16.

An Investment Study
Of
BETHLEHEM COPPER CORPORATION LTD.

November 1966

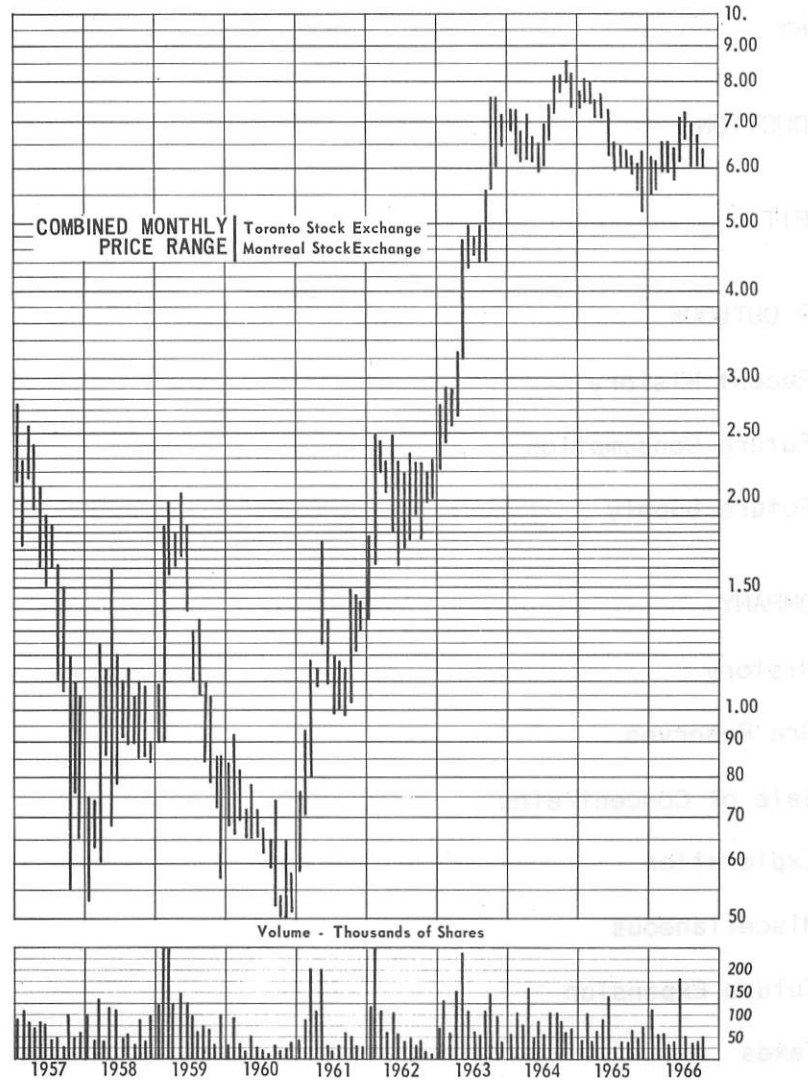
Burns Bros. and Denton Limited
Investment Research Department

Estimates and projections contained herein are our own. Factual data, while not guaranteed, has been obtained from sources which we believe to be reliable.

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BETHLEHEM COPPER CORP.



CAPITALIZATION

	Authorized	Issued and Outstanding
6% Convertible S.F. Debentures Series A	\$4,000,000	\$4,000,000
Common Stock - 50¢ par value	6,000,000	5,219,500

BETHLEHEM COPPER CORPORATION LTD.

Recent Price:
\$6.40

Dividend:
\$0.40

Yield:
6.25%

SUMMARY

Bethlehem Copper Corp. Ltd. operates a large open pit copper mine in the Highland Valley area of British Columbia. Production began in December 1962 at an operating rate of 3,300 tons of ore per day. The operation was subsequently expanded to 4,000 tons per day in 1964, 6,000 tons per day in early 1965 and 10,000 tons per day in May of this year. Further additions and modifications to the milling circuit are currently being considered which would significantly improve copper recovery as well as substantially increase milling capacity. This program includes the addition of a ball mill to be operational by mid-1967 which should improve copper recoveries from the present level of approximately 83% to 90%. The Company is currently considering further additions to the mill which would increase production capacity to 15,000 tons per day. A decision will probably be made in mid-1967 with increased production to become effective in mid-1968.

Proven ore reserves on Feb. 28, 1965 were reported at approximately 38 million tons with an average grade of 0.60% copper or 35 million tons grading 0.62% copper depending upon the cut-off grade. These reserves are sufficient for approximately 10 years of operations at the current operating capacity of 10,000 tons per day. The company's recent involvement in plant additions and alterations has limited exploration over the past year. However,

an extensive exploration program is currently being carried out on ore zones adjacent to the present ore body. It was pointed out at the last annual meeting that potential ore sufficient for an additional 10-20 years, based on an operating rate of 10,000 tons per day, is expected to be developed on the property.

The company has contracted for the sale of all its copper concentrates to a Japanese group until Feb. 28th, 1973. Payment for the copper content of the concentrates will be based on the United States Export Refinery price which for the first 6 months of the company's current fiscal year averaged approximately \$0.525 U.S. per lb. Based on a conservative average price of \$0.45 U.S. per lb. for the balance of the year Bethlehem should report earnings of approximately \$1.00 per share after taxes for the fiscal year ending Feb. 28, 1967, an increase of approximately 83% over the previous year. A \$0.01 U.S. change in the Export Refinery price of copper would alter this earnings projection by approximately \$0.028 per share. For the first 10 weeks of the company's current third quarter the U.S. Export Refinery price averaged \$0.506 U.S. per lb. For the week ended Nov. 14, 1966 the price averaged \$0.542 U.S. per lb. and appears firm at these levels over the shorter term.

Earnings in subsequent years will depend upon copper prices and the company's expansion program mentioned above. However, assuming an expansion to 15,000 tons per day in mid-1968, sufficient ore reserves for 16 years of operations, which based on present indications seems to be highly realistic, and a reasonable estimate of copper prices, the common stock of Bethlehem Copper Corp. Ltd. has a present value approximating \$9.85 per share based on a 10 per cent discount rate.

An additional factor which could alter earnings is the company's current stripping ratio of 2.5 tons of waste to 1.0 ton of ore excavated. The open pit was designed on a 0.5 to 1.0 stripping ratio. The additional cost of the higher stripping ratio is being charged directly to current earnings. By adopting this policy during a period of high copper prices, the company will be able to mine at a much lower stripping ratio in future years. No allowance has been made in our projections for this potential saving but it could add \$0.10 per share to future earnings.

The company is currently carrying out test work on molybdenite recoveries and an extraction circuit is planned. The addition of this recovery unit could add significantly to our earnings projections.

In view of the company's favourable longer term outlook, the reasonable price earnings ratio of 6.5 times projected earnings for the fiscal year ended Feb. 28, 1967 and a favourable yield of 6.25% based on the regular dividend of \$0.40 per share, the shares of Bethlehem Copper are recommended for substantial capital appreciation. There is also an excellent possibility that the company will declare an extra dividend during the current fiscal year.

BETHLEHEM COPPER CORPORATION LTD.

INTRODUCTION

The purpose of this study is to assess the investment worth of Bethlehem Copper Corporation Ltd. To achieve this objective the following factors are considered:

(1) Bethlehem operates a large low grade open pit mine and is currently involved in an extensive expansion program. In order to illustrate the relatively high productivity and low operating costs associated with operations of this nature as well as the improvements in operating costs that can be obtained by dramatically increasing production capacity, a brief comparative analysis of pertinent operating statistics for an open pit versus an underground operation is made.

(2) The future supply-demand relationship for copper and the probable price trend for the metal is assessed.

(3) The company's past and present operations are considered.

(4) The major factors which will influence the company's future profitability are discussed and based on these factors earnings projections are made, and a present value calculation is determined.

OPEN PIT MINING

During the past decade there has been an ever increasing trend in the mining industry towards the development of large low-grade open

pit mining operations. The exploitation of these mines has been necessitated by the tremendous increases that have taken place in free world demand for non-ferrous metals as well as the ever decreasing availability of high grade base metal ore bodies. This trend, which can be expected to continue in the foreseeable future, has been largely brought about by the spectacular technological gains made by the mining industry through the development of new as well as much larger capacity mining equipment. It is interesting to note that due to technical progress the economic cut-off grade for copper ore mined in the United States and Canada has dropped from 1.5 per cent in 1910 to approximately 0.50 per cent today.

An additional factor that has contributed to the trend towards the development of large low-grade open pit mining operations has been steadily rising labour costs. In general, it can be stated that the operating costs associated with most open pit operations are very significantly lower than similar sized underground operations due, in large part, to the lower labour cost as well as the generally lower materials and supplies cost.

It is extremely difficult to make comparative general statements regarding the relative operating costs and productivity of open pit versus underground mines because of the many variables involved in any particular operation. However, the comparative statistics illustrated in Table I provides an indication of this relationship. The statistics on the 4,000 ton per day operation are based on reported data on two particular Canadian mining operations. On the other hand, the statistics relating to the larger tonnage operations are not reported figures but represent reasonable estimates of the operating costs and productivity that could be expected from a scaled-up

version of the 4,000 ton per day production units.

As can be readily seen in Table I labour costs represent a small percentage of total operating costs in an open pit. For this reason and because of the increased efficiency inherent in the use of larger mining equipment, unit open pit operating costs can be significantly lowered by increasing production capacity. A similar increase in the production capacity of an underground operation would only provide moderate improvements in operating costs due to the high variable costs and, in particular, the high labour content of these variable costs. The estimates indicate that an increase in production capacity to 10,000 tons per day would decrease operating costs by approximately 25% whereas a similar increase in an underground operation would only decrease operating costs by approximately 8%.

Another highly significant factor illustrated by Table I is the difference in labour costs between an open pit and an underground mine. For the 4,000 ton operation estimated open pit labour costs are equivalent to \$0.39 per ton of ore treated versus \$1.62 per ton for the underground operation. These figures can be compared to open pit and underground labour costs of \$0.22 per ton and \$1.42 per ton respectively for the expanded production units. Based on these figures unit labour costs of the scaled-up open pit declined by approximately 44 per cent whereas the equivalent costs for the larger underground operation declined by only 12 per cent.

In summary, it can be generally stated that dramatic improvements in open pit unit operating costs can be obtained by significantly increasing the production capacity of an operation. However, an improvement of this magnitude is not possible with a similar underground mine

due, in large part, to the high variable costs and, in particular, the high labour costs associated with most underground mining methods.

TABLE I

	<u>OPEN PIT*</u>		<u>UNDERGROUND**</u>	
Production -- Tons/day	4,000	10,000	4,000	10,000
Total Employees	110	150	455	1,000
Productivity -- Tons/man year	13,400	24,300	3,200	3,650
Operating Costs \$/Ton	2.45	1.85	3.70	3.40
Estimated Labour Cost \$/Ton***	0.39	0.22	1.62	1.42
Labour Cost as a % of Operating Costs	16.0	11.8	44.0	42.0

* Assumes: (a) 1 to 1 stripping ratio
(b) Includes milling operation

** Assumes: (a) Sub-level blast hole mining
(b) Includes milling operation

*** Based on an average labour cost of \$2.50 per hour

COPPER OUTLOOK

Recent History

For the past two years the world has experienced a copper shortage of unprecedented duration and acuteness. One can obtain an answer to the cause of this shortage by comparing the year 1963 with what happened in 1964 and 1965.

The year 1963 was a relatively trouble-free year of equilibrium and stability in the copper market. Free World production and consumption were in approximate balance. Mines operated at high rates, though somewhat less than capacity, and ample copper was available. There was stability of price with the United States producers' price at 31¢ per pound throughout the year and prices in the outside market, of which the U.S. Export Refinery price is one of a number, were a shade lower.

From this base the situation changed gradually into one of tight supply, culminating in today's very stringent position, with prices for copper in the outside market ranging up to more than double the North American producers' prices. By and large, the cause of this imbalance has not resulted from a failure of supply. Notwithstanding severe labour and political problems production of copper in the non-Communist world increased to new records in 1964 and 1965. Last year's output was at an all-time high both in the United States and abroad. Using the Copper Institute's figures for 1963 as 100, Free World production in 1964 was 105 and 1965 was 110. In the United States the corresponding figures were 100, 103 and 113. These are certainly respectable and indeed somewhat above normal production increases.

The main reasons for the current shortage is due to the recent large increases in demand for copper. Some 75 - 80% of all copper consumed

is used in the manufacture of durable goods of all kinds, including military hard goods, with most of the balance being used by the construction industry. The production of durables tends to reflect, in amplified form, basic swings in the economy; that is, to decline more than the overall economy in slack times, and to increase more than the average when the economy is expanding. The last two years have been boom years for the North American economy in general and, in particular, for the production of durable goods; both consumer durables (primarily automobiles and appliances) and producer durables (machinery and equipment). The following table compares these factors again using 1963 as 100 with the copper production indices previously mentioned:

	<u>1963</u>	<u>1964</u>	<u>1965</u>
Copper production in the United States	100	103	113
Construction (non-residential and residential structures)	100	104	111
Consumer durable goods*	100	110	121
Producers' durable equipment*	100	114	132
New plant and equipment expenditures (all industry)*	100	114	132

* United States Department of Commerce "Survey of Current Business"

In addition, the impact of growing demand for copper for defence hard goods, particularly ammunition, arising from escalation of the war in Viet Nam, has also been a strong factor. Thus, demand for copper-using goods has virtually exploded, at a rate far surpassing historical growth rates, and outstripping copper production increases by a wide margin.

The gap resulting from this difference in the growth rates for copper demand and production has been narrowed by the draw-down of inventories and the releases of copper from the U.S. stockpile. Reflecting these

factors, the corresponding indices for net U.S. domestic consumption of copper are: 1963 - 100; 1964 - 110; 1965 - 121. However, apart from the possibility of some further release from the stockpile these are non-recurring sources of supply.

Future Consumption

Copper consumption in the Free World during 1965 is estimated at a record 4,617,000 short tons, 2 1/2% above 1964, or some 59,000 tons more than the Free World's 4,558,000 ton mine output. Based on a projection of first-half 1966 Copper Institute statistics, 1966 consumption can be placed tentatively at 4,720,000 tons. This statistic compares with strike-crippled mine output of approximately 4,600,000 tons suggesting a prospective shortage of 120,000 tons.

There are a number of reasons to suggest that the present shortage of copper will last for some time. The North American economy has continued its growth which began in 1961 and although a levelling off is expected, a major recession is not apparent at the present time. Industries such as construction have been hurt by tight money conditions and high interest rates. However, interest rates are reaching the point where they should level out and with the expected slowdown in the economy an easing of the current "tight money" conditions should take place. Thus this large copper consuming industry should show signs of improvement in the not too distant future.

The degree of acceptance of this year's car models is too early to predict. However, it is interesting to note that a decline of one million in U.S. car sales would decrease U.S. copper consumption by about 20,000 tons. In Britain where a definite downturn in car sales is expected,

a similar sales reduction would decrease copper consumption by 15,000 tons.

Britain's "austerity program" is expected to reduce copper consumption in that country with the influence spreading over into the Continent. On the other hand, the Japanese economy has gone through a mild recession and has now recovered.

Copper Institute statistics for the first six months of 1966 clearly mirror the current spectacular increase in demand. Free World producers' deliveries totalled a record high of 2,360,000 short tons, 11% above a year earlier. Foreign producers' deliveries to fabricators in the first half lagged 4.2% behind last year; however, U.S. producers shipped a record 1,192,567 tons, 30% above the like 1965 interval. U.S. shipments exceeded refined output of 930,166 tons by a wide margin. The imbalance was met from stockpile releases, reduced exports and a running down of producers' inventories. The latter, by mid-year, had been pared to 57,115 tons or barely 1 1/2 week's shipments.

The present large deficiency in the U.S. strategic stockpile will be an aid to the demand outlook if general economic conditions slow down. The U.S. reserve has been reduced to 409,000 tons versus the minimum objective of 775,000 tons. The U.S. government already has repurchase contracts for the 366,000 ton deficiency but no metal will be forthcoming until civilian demand is relatively satisfied.

United States military requirements are presently consuming large quantities of copper and with the escalation of the Viet Nam war even greater quantities will be consumed in the future. In the fall of 1965 Secretary of Defence, McNamara, while not giving a figure for military needs alone

estimated that 1966 military requirements for copper would be double 1965's and that total U.S. government needs would be about 250,000 tons, double the government's requirements in 1965. However, the U.S. commitment in Viet Nam has grown so much since this latter estimate, that it is now believed the U.S. government currently is using copper at a rate close to 400,000 tons annually.

Just recently BDSA (U.S. Business and Defence Service Administration) raised set-asides on copper refined from U.S. domestic ore to 18% in the fourth quarter from 13% in the third quarter. This will further tighten the amount of metal available for civilian consumption. Presently no plans have been announced for further stockpile releases to relieve this shortage.

Additional demand for copper should result from a build-up of fabricator inventories. These inventories will be increased as a hedge against possible U.S. strikes. Important labour contracts expire in the U.S. in mid-1967.

Thus, the current consumer demand which is expected to stay at a high level, the rapidly growing military requirements, mainly stemming from the Viet Nam war as well as the huge stockpile deficiency and the build-up of fabricator inventories should keep copper demand at a high level over the next few years.

TABLE 2 - CONSUMPTION OF NEW COPPER
IN THE NON-COMMUNIST WORLD, 1955 - 1965

(Short Tons)

<u>Year</u>	<u>Total</u>	<u>United States</u>	<u>All Other Non-Communist Countries</u>
1955	2,988,000	1,316,000	1,672,000
1956	3,121,000	1,329,000	1,792,000
1957	3,231,000	1,151,000	2,080,000
1958	3,296,000	1,047,000	2,249,000
1959	3,263,000	1,181,000	2,082,000
1960	3,719,000	1,141,000	2,578,000
1961	3,991,000	1,235,000	2,756,000
1962	3,871,000	1,352,000	2,519,000
1963	4,149,000	1,423,000	2,726,000
1964	4,504,000	1,493,000	3,011,000
1965	4,617,000 (P)	1,666,000 (P)	2,951,000 (P)

(P) Preliminary

Consumption of newly-mined copper has been calculated as follows:

Mine production of copper in the non-Communist world, as reported by the United States Bureau of Mines, has been adjusted by;

(1) Changes in stocks, as reported by the Copper Institute.

(2) Exports of copper to the Sino-Soviet bloc, as estimated by British Metals Corporation in its Annual Reviews, have been deducted.

(3) Deliveries to the United States stockpile, as reported by the Copper Institute, have been deducted. Releases from the United States and United Kingdom stockpiles have been added

back, when made. The releases from the United Kingdom stockpile are as estimated by British Metals Corporation. The net result is believed to be a fairly close approximation of industries' consumption of new copper in the non-Communist world.

United States consumption is "Apparent Withdrawals on Domestic Account" as reported by the U.S. Bureau of Mines, plus or minus net deliveries from or to stockpile. 140,000 tons of copper from the stockpile are included in the 1965 figure.

Phelps Dodge Corporation
Comptroller's Department
Statistical Section
March 4th, 1966

Table 2 indicates consumption of New Copper in the non-Communist world for the period 1955-1965. Projecting from the 1965 base at a 4 1/2% compounded growth rate (the average annual rate of growth over the past ten years) would indicate Free World consumption of newly mined copper might reach 5.75 million tons by 1971. At a 5% growth rate consumption would equal 5.89 million tons, at 5 1/2%, 6.03 million tons and at 6%, 6.18 million tons. These figures do not include sales to the stockpile which could equal 366,000 tons. Given the current military usage in Viet Nam and the expected inventory build-up, the consumption rate for copper will probably exceed the long-term expected growth rate of 4 1/2% in 1966 and 1967.

Future Supply

Copper production is scattered all over the world, with much of it in politically unstable areas such as Zambia, Chile, and Congo, South

Africa, etc. For this reason, the industry has been plagued with strikes of one sort or another for a number of years. The mine workers in these less developed countries have been demanding higher wages and better working conditions and in most cases have resorted to strikes to obtain their demands.

TABLE 3

COPPER

Estimated Free World Mine Capacity
and Summary of Planned Additions

(000 Tons)

<u>Area or Country</u>	<u>Total Planned Additions 1966-1970</u>	<u>1970</u>	<u>1969</u>	<u>1968</u>	<u>1967</u>	<u>1966</u>	<u>Estimated Capacity 1965</u>
United States	510	90	100	44	168	108	1,399
Canada	169	10	(24)*	44	99	40	576
Latin America	840	434	222	60	67	57	1,006
Africa	263	24	36	27	42	134	1,295
Asia	74	-	-	18	29	27	285
Australia	60	-	-	-	50	10	117
Europe	<u>20</u>	<u>-</u>	<u>5</u>	<u>10</u>	<u>-</u>	<u>5</u>	<u>181</u>
	1,936	558	339	203	455	382	4,859

* Net of mine exhaustion. Figure in parentheses indicates reduction in capacity.

Source: Copper Range Company

According to Copper Range Company (Table 3), the estimated mine capacity for copper at the end of 1965 was 4,859,000 tons. Since mine production in that year is estimated at only 4,558,000 tons, the industry only operated at 94.0% of capacity. This low rate was caused by strikes, down

time at some of the mines and the fact that the capacity figure is taken at the end of the year and thus some capacity was not on stream for the full year. In the Copper Range figures an increase of 1,936,000 tons of mine capacity is anticipated during the next five years, and a future mine capacity of 6,795,000 tons is projected for the end of 1970. Assuming the industry operated at a 95% operating rate, 1970 mine production should approximate 6,450,000 tons. These figures suggest a surplus of copper production by 1970. However, the demand for copper in the first two years of this period namely 1966 and 1967, should exceed the five year growth rate of 4 1/2% and thus a shortage of copper is forecast until the end of 1968 or early 1969. If severe strikes should occur in the United States in 1967 or if the Zambian-Rhodesian situation gets worse, a copper shortage could persist throughout the five year period.

In this study allowances have been made for an easing of copper prices in view of the expected improvement in the supply-demand relationship for the metal. The price currently being received by Bethlehem for its copper production is based on the quoted U.S. Export Refinery price. This price is a weighted average based on copper sales outside the United States which are reported to the Engineering and Mining Journal.

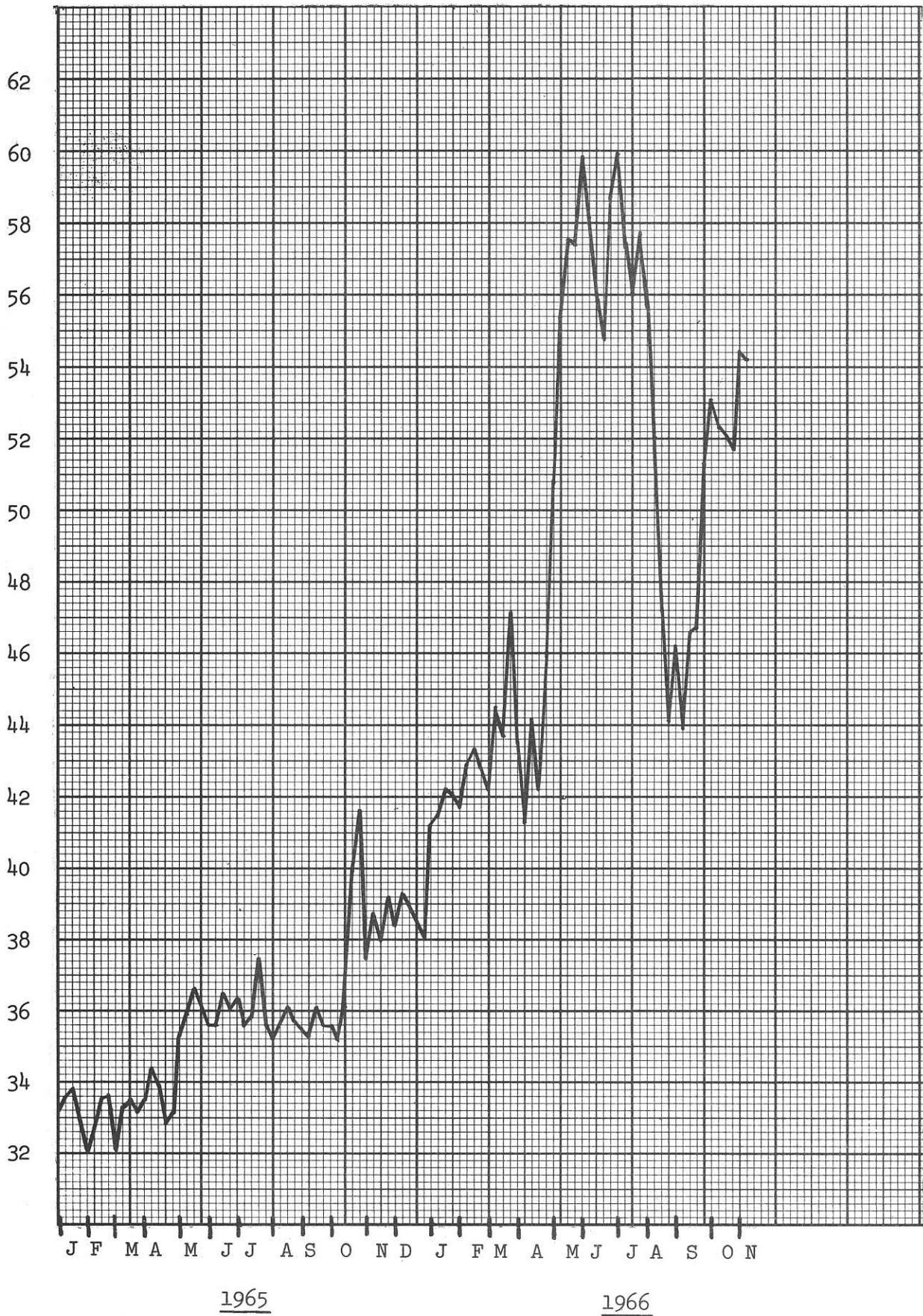
The attached graph indicates the trend in this copper price in the past two years. It is interesting to note that following the decline in July and August of this year, the price recently recovered to approximately \$0.54 U.S. per lb. This decline was due in large part to the resumption of copper shipments from Zambia and some easing in European demand for the metal.

It is difficult to relate projected metal supply and demand to specific prices. However, in view of the expected improvement in the

GRAPH I

UNITED STATES EXPORT REFINERY PRICE OF COPPER

U.S. cents per lb. - Weekly Average



supply-demand balance for copper mentioned above, the following copper prices were used in projecting Bethlehem earnings.

	<u>Balance of 1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
U.S. Funds	\$0.45	\$0.45	\$0.40	\$0.40
Cdn. Funds	0.486	0.486	0.433	0.433

THE COMPANY

History

Bethlehem Copper Corporation Ltd. was incorporated in February, 1955 to explore a copper prospect consisting of 202 claims in the Highland Valley area near Ashcroft, British Columbia. An intensive exploration program was carried out during the summer of 1955 with sufficiently encouraging results to attract American Smelting and Refining Company (ASARCO) who took over management and financing of the property with an agreement to divide profits 55 per cent with American Smelting and 45% with Bethlehem. In May, 1958 after expending approximately \$1,200,000 American Smelting terminated its agreement with Bethlehem. The results of Asarco's exploration program which had outlined two ore zones of economic importance accrued to Bethlehem. Fortunately, Bethlehem had approximately \$600,000 in its treasury at the time and was able to immediately commence an underground sampling program to substantiate the diamond drilling results and to prove sufficient ore to warrant production. While this program was underway the company sold 600,000 treasury shares to provide \$695,000. In early 1960 the Sumitomo Group of Companies from Japan agreed to provide \$350,000 U.S. to complete the exploration program

on the Company's Jersey and East Jersey ore zones. In return, they received 300,000 shares of Bethlehem stock.

By late 1960, 16 million tons of ore had been proven in the Jersey and East Jersey ore bodies and a further 44 million tons was indicated by surface and underground drilling in these ore zones. In addition, substantial tonnages were also indicated in the Company's Iona ore zone.

At this time, Wright Engineers Ltd. of Vancouver, B.C., and an independent Vancouver consultant prepared a feasibility report recommending construction of a mine and mill. In order to carry out these recommendations the Sumitomo Group agreed in February 1961 to purchase an additional 400,000 shares at \$1.25 U.S. per share and to loan the Company \$5 million U.S. to bring the property into production. In exchange Bethlehem agreed to sell to Sumitomo and Sumitomo agreed to purchase all the copper concentrates produced by the company for a period of 10 years. Construction began in July of 1961 and on Nov. 28, 1962, a 3,300 ton mill began to produce concentrates. Production was further increased in the following stages; to 4,000 tons daily by late 1964, 6,000 tons per day early in 1965, and finally a further expansion to 10,000 tons per day was completed in late May 1966.

The loan from the Sumitomo Group was repayable by June, 1968 in minimum annual instalments. However, during the 1964-1965 fiscal year the balance of the outstanding bonds were redeemed. The redemption was effected in part by conversion of \$600,000 U.S. principal amount into Bethlehem shares at \$1.50 per share.

Financing for the above-mentioned expansion to 6,000 tons daily was provided by bank loans secured by 6% first mortgage bonds and by the Japanese Group through the purchase of 300,000 shares at \$1.50 per share and 200,000 shares at \$1.75 per share.

In October, 1965, \$4 million in 6 per cent convertible sinking fund debentures, series A, were issued in order to; retire the bank loans mentioned previously, provide the Company with adequate working capital, and complete the mill expansion to 10,000 tons per day. The debentures are convertible into common shares at a conversion rate of \$8, up to and including Oct. 1, 1971 and \$10, up to and including Oct. 1, 1975.

Ore Reserves

The company reported the following proven ore reserves as of Feb. 28, 1966:

<u>East Jersey Pit</u>	<u>Tons</u>	<u>Grade</u>	<u>Cut-Off Grade</u>	<u>W/O Ratio*</u>
(1) Present Pit	124,981	1.10%	0.40%	**
(2) South Extension	1,176,600	0.87%	0.40%	2.69/1

Jersey Pit

Either of the two figures shown are valid depending upon cut-off grade:

38,330,819	0.60%	0.35%	0.37/1
35,451,998	0.62%	0.40%	0.48/1

* Ratio of waste rock mined to ore mined

** This ore is covered by 500,000 to 1,000,000 tons of slide material.

The above ore reserves are sufficient for 10 years at the current operating rate of 10,000 tons per day. The disruptions caused by the various expansion programs over the past several years has allowed very little time for detailed exploration. However, the company recently commenced an extensive exploration program, on the following zones:

(a) East Jersey and Jersey Zones;

Both have definite indications of ore below the presently designed open pits.

(b) Iona and Huestis Zones;

Drilling to date has indicated approximately 10 million tons respectively in each of these ore zones grading approximately 0.60 per cent copper.

(c) White Zone:

A total of 39,000 feet of geophysical lines have been cut and surveyed on this zone. In addition, some trenching has been recently carried out on this potential ore body indicating some of the best copper mineralization found on the property to date. A diamond drill recently began testing this promising area.

(d) Spud Lake, Snowstorm, Hank and Simons Zones;

All these zones are favourable for future exploration.

In summary, based on reported ore reserves and assuming a 10,000 ton per day operation, the mine has sufficient proven reserves for approximately 10 years of operation. The primary objective of the company's current exploration program is to prove an additional 50 million tons or more over the next several years with an average grade approximating 0.62% copper. Based on the indicated ore in the Iona and Huestis zones and the presence of ore below the presently designed East Jersey and Jersey pits, the probability of achieving the above exploration objective appears to be excellent. In addition, the possibility of finding additional ore in other areas of the property are very promising.

Sale of Concentrates

The Company has contracted for the sale of all its copper concentrates to the Sumitomo Group of Companies of Japan until February 28th, 1973.

The terms of the contract state that payment for the copper content of the concentrates will be based on the United States Export Refinery Price as quoted in the Engineering and Mining Journal, published weekly in New York. Up until Feb. 28/67 this price is reduced by 25% of the amount between the price of 33 1/2¢ U.S. and 42¢ U.S. per lb. In our earnings projections beyond 1966, it has been assumed that Sumitomo will not receive the 25 per cent differential.

The company is paid for 90 per cent of the value of the concentrates, on board ship in Vancouver. Final payment, however, is based on the average export refinery price for the month the concentrates arrive in Japan. The contract with Sumitomo also provides for copper losses during the smelting and refining processes. This penalty is equal to 20 lbs. of copper per ton of concentrates shipped. In addition, the contract includes a confidential base charge which includes smelting and refining costs as well as the cost of moving the concentrates from Vancouver to Japan. However, as discussed in a latter section of this report, it is possible to make a reasonable estimate of these charges.

Concentrates are shipped by truck from the mine property to Vancouver, a distance of 262 miles, on a contract basis with a local British Columbia trucking firm, at a cost of \$.031 per ton mile. In addition, the company is responsible for the storing of and the loading and trimming of concentrates on board ship estimated to cost approximately \$2.30 per ton.

Exploration

In July, 1965 Bethlehem formed a new company, Bethex Explorations Ltd. The share capital of Bethex consists of 5,800,000 Common shares, and

200,000 Common B shares. The Common B shares, which have the right to elect a majority of Directors, are all owned by Bethlehem. Approximately 1,757,250 Common shares are outstanding.

Bethlehem has options on Bethex shares as follows:

750,000 shares at \$0.50 per share

750,000 shares at \$0.75 per share

1,000,000 shares at \$1.00 per share

Bethlehem is obligated to exercise options on sufficient Bethex shares to provide it with a minimum of \$100,000 in each year for a 5 year period. Under the terms of a contract between Bethlehem and Bethex, Bethlehem shall participate in the development of properties prospected and explored by Bethex, terms of such participations to be determined in accordance with the circumstances existing at the time.

Miscellaneous

Bethlehem's labour contract, which was due to expire in December 1967 was renegotiated recently, and, as a result, was extended to June 30, 1969. The cost of this settlement is equivalent to less than \$.01 per share per year.

A circuit for the extraction of molybdenite from the copper concentrates was installed at a total cost of \$100,000 in late 1962. The circuit was operated during 1964 and 1965 but due to mechanical difficulties, metallurgical problems and greater than anticipated irregularities in the occurrence of molybdenite values in the ore, production fell well below original expectations. For this reason operation of the circuit has been discontinued. Further test work is being carried out on molybdenite recoveries and a new extraction circuit is planned.

Future Expansion

The company is currently considering further additions and modifications to the milling circuit which would significantly improve copper recovery as well as substantially increase milling capacity. A recent announcement indicated that an additional ball mill will be installed in the mill in order to achieve a finer grind of the ore. This addition to the grinding circuit is expected to improve copper recoveries to approximately 90 per cent from the current level of 83 per cent as well as increase production to a full 10,000 tons per day plus from the current operating rate of 9,800 tons. Installation and operation of the new mill is expected to be completed by June 1967. At the same time the company plans to enlarge the mill building in order to provide sufficient space for two additional ball mills. If their installation is proceeded with, as well as modifications and additions to the crushing plant, to the coarse and fine ore storage, and to the concentrate handling facilities, production capacity will be increased to 15,000 tons per day. A firm decision with regard to the installation of this additional capacity awaits the results of the company's current exploration program. To date, the results of this program have been most encouraging. The earliest date when an expansion to 15,000 tons per day could be expected to be operative has been established at June 1968.

Taxes

Bethlehem Copper, for federal income tax purposes, receives the depletion allowance allowed Canadian mining companies which states that the company may deduct 33 1/3 per cent of the profits before taxes for the year reasonably attributable to the production of prime metal from the mine. In addition to federal income taxes British Columbia levies a tax at the rate

of 10 per cent of income in excess of \$25,000. However, this amount is deductible in calculating federal income taxes. Because of this and other write-offs available to mining companies, Bethlehem's total tax liability probably will not exceed 40% of pre-tax profits over the longer term.

The three year tax free period on the East Jersey mine expired on November 30th, 1965. For the period from December 1st, 1965 to February 28th, 1966 the Company may apply sufficient preproduction expenses and capital cost allowances in excess of depreciation to offset any income taxes. As at November 30, 1965, the following capital assets and preproduction expenses were available for tax purposes:

Buildings, equipment and roads	
less accumulated depreciation	\$8,586,383
Preproduction Expenses*	\$4,255,543

*The Company has applied for a tax free period on the Jersey mine. This application is still under consideration by the Department of National Revenue. If the tax free period is not granted, this amount would be decreased by \$970,040. For accounting purposes the company has already applied this amount against retained earnings for the fiscal year ending February 28th, 1966.

It appears that the company has provided \$540,000 for taxes on profits for the first half of the current year. We estimate the tax rate for the full year to be 25% of profits before taxes. Our projections assume a 38 per cent tax rate for the fiscal year ended Feb. 28, 1968 and a 40 per cent rate beyond that date. Since a portion of these taxes could represent a deferral, our estimated cash flows could be understated. ✓

Depreciation & Preproduction Expenses

For accounting purposes, the Company has established a depreciation policy of 5 per cent of depreciable assets on a straight line basis.

Our projections also assume a similar rate. With regard to preproduction expenses, the accounting treatment has been to charge these expenditures to retained earnings. Assuming a continuation of this practice the balance of \$3,285,503 will be charged directly to retained earnings this year, although they will be applied to offset income taxes.

Earnings Projections

The company's historical production statistics and earnings record up to and including the fiscal year ended February 28, 1966 are illustrated in Table 4. Because of Bethlehem's significantly lower and varying operating rates during this period it was not possible to use this past performance as a basis for projecting earnings for the current year and beyond. For this reason a detailed assessment of the company's historical operating costs has not been included in this report. However, based on the assumptions outlined below, Bethlehem's earnings have been projected over the next few years and are illustrated in Table 5B.

(1)		Copper Prices* (U.S. Export Refinery)		
<u>Balance of 1966</u>		<u>1967</u>	<u>1968</u>	<u>1969</u>
U.S. Funds	\$0.45	\$0.45	\$0.40	\$0.40
Cdn Funds	0.486	0.486	0.433	0.433

(2)	<u>Mill Rate Tons/Day</u>	<u>Recovery %</u>	<u>Concentrate Grade %</u>
Balance of 1966	9,800	83.0	32.0
1967	9,980*	88.2*	33.9*
1968	12,900*	90.0	35.0
1969	15,000*	90.0	35.0

* Yearly averages

Inherent in the above assumptions is that the company's currently planned installation of additional grinding capacity becomes operational in June 1967. As discussed previously this circuit is designed to improve mill recoveries from the present 83% to about 90%. An improvement in concentrate grade to 35 per cent is also anticipated as a result of this addition to the mill. In addition, it has been assumed that the company's proposed expansion to 15,000 tons per day goes on stream in June 1968.

(3) Smelting and Refining Charges

As mentioned previously this is a confidential figure; however, an examination of the company's earnings statement for the fiscal year ended Feb. 28, 1965 provides a reasonable estimate of these costs. In the "Report of the Mine Manager" the company indicates total production costs (including smelter charges) of \$4,978,736. By deducting marketing, mining, milling, and other production costs from this figure a reasonable approximation of smelting and refining charges can be arrived at as follows:

Production Cost (including smelter charges)	\$4,978,736
Less Marketing Costs	<u>338,564</u>
	\$4,640,172
Less Mining, Milling & Administration Costs	<u>3,713,438</u>
Estimated Smelting and Refining Costs	<u><u>\$ 926,734</u></u>

Concentrate Production = 28,764 Tons (Table 4)

Estimated Smelting & Refining Costs = $\frac{926,734}{28,764} = \underline{\underline{\$32/\text{Ton}}}$

(4) Mining, Milling and General Maintenance Cost

For the first 6 months of the current fiscal year these costs amounted to \$1.91 per ton of ore treated. An approximate breakdown of these expenses and an estimate for the balance of the current year is given below.

	<u>\$/Ton</u>	<u>Balance of 1966</u>
Mining	0.90	\$1.00
Milling	0.93	.96
Maintenance etc.	<u>0.08</u>	<u>.09</u>
	\$1.91	\$2.05

During the current year the company has been involved in increasing production capacity from 6,000 tons per day to the current rate of about 9,800 tons per day and produced at an average rate of 8,209 tons per day. Due to normal start-up problems and the fact that the mill has operated at the lower operating rate for part of the period some improvement in these operating costs can be expected. A 12% improvement to \$1.80 per ton has been assumed in the earnings projections for 1967. At the proposed higher operating rate of 15,000 tons per day a further 14 per cent improvement in these expenses has been assumed which would lower the total to \$1.55 per ton. It is highly probable that these operating costs could be significantly improved upon.

An additional factor which could further improve operating costs is that the design of the Jersey pit is based on a waste to ore ratio of 0.5 to 1.0. However, the company is currently mining on the basis of a 2.5 to 1 waste to ore ratio. The additional cost of the higher stripping ratio in the Jersey pit is being charged directly to current earnings. The company

proposes to continue the heavy stripping program into 1968 depending upon copper prices. If this program is continued the Jersey pit, at that time, would have a life of at least 6 more years, during which time the company would then move the stripping equipment to another pit to prepare it for mining. Thus by stripping ahead the company could, if copper prices should temporarily decline, mine for several years at a \$0.50 - 0.60 per ton mining cost versus the \$1.00 per ton assumed for the balance of the current fiscal year. No allowance has been made in our projections for this potential saving. However, assuming a \$0.60 per ton mining cost our projected earnings for 1967 - 1969 inclusive would be increased by approximately \$0.10 per share.

(5) Depreciation and Taxes

As discussed previously, depreciation has been taken on a 5 per cent straight-line basis and a 40 per cent tax rate has been assumed over the longer term. The higher depreciation charges in 1967, 1968 and 1969 are due to the assumed expansion to 15,000 tons per day. A rough approximation of \$4 million has been taken as the cost of this expansion program. The cost of the current expansion program, to be completed by June 1967, is estimated at \$2 million.

(6) Conversion of the debentures has been assumed to take place in 1968.

(7) No allowance has been made for any contribution from the company's planned molybdenite circuit.

Present Value of Shares

In order to more fully assess the long term investment worth of the shares of Bethlehem Copper Corp. Ltd., a present value calculation has

been carried out using a 10 per cent discount factor (Table 6). Based on the assumptions listed below, a present value of approximately \$9.85 per share was determined:

(a) The cash flows assumed for the years 1966-1969 inclusive are as discussed previously and illustrated in Table 5B.

(b) A mine life of 16 years has been assumed. Included in this assumption is the company's proposed expansion in production capacity to 15,000 tons daily by late 1968. In terms of ore reserves the calculation assumes the company is able to prove an additional 50 million tons over and above current proven ore reserves with an average grade of 0.62 per cent copper. Based on the potential ore reserves indicated in the Iona and Huestis zones and the presence of ore below the presently designed East Jersey and Jersey pits, the probability of finding at least this amount of additional ore appears to be excellent.

(c) An average price of \$0.35 U.S. per lb. has been assumed for the Export Refinery price of copper between 1970 and 1981 inclusive.

(d) The production costs used in arriving at the cash flow for 1969 were applied to the 1970-1981 period.

CONCLUSIONS

The shares of Bethlehem Copper Corp. Ltd., at the current market price of \$6.40 per share, are selling at approximately 6.4 times 1967 projected earnings of about \$1.00 per share. Beyond 1967 earnings will depend upon copper prices and the timing of the company's proposed expansion to 15,000 tons daily. However, assuming an expansion to 15,000 tons daily in

mid-1968 and an average U.S. Export Refinery price of \$0.40 per lb. for copper in 1969 the company could report fully taxed earnings approximating \$1.30 per share. A 1¢ change in the projected U.S. Export Refinery price for copper would alter the earnings estimates illustrated in Table 5B as follows:

	<u>\$/share</u>
Balance of 1966	.028
1967	.050
1968	.058
1969	.069

An additional factor which could further improve earnings is a lower mining cost resulting from a decreased stripping ratio which was discussed in some detail previously. This improvement could increase the 1967 - 1969 earnings projections by approximately \$0.10 per share.

The company is currently carrying out test work on molybdenite recoveries and an extraction circuit is planned. The addition of this recovery unit could add significantly to our earnings projections.

Assuming sufficient ore reserves for 16 years of operations, which based on present calculations appears to be highly realistic, the stock has a present value approximating \$9.85 per share. It must be emphasized that this present value is, at best, a rough approximation of the longer term investment worth of Bethlehem due to the many variables involved in attempting to project a company's cash flows 16 years hence. However, it does provide an excellent indication of the long term potential of the stock.

The company currently pays a dividend at the rate of \$0.40 per share per year payable quarterly and established with an initial dividend

of \$.10 per share on March 23, 1965 and which has been paid regularly. It appears possible that the company will pay an extra dividend during the final quarter of the current fiscal year. At the regular dividend rate the stock is currently yielding approximately 6.25%.

Based on the company's excellent ore reserve outlook, the strong probability of future increases in production capacity and the favourable outlook for continuous buoyant copper demand, the shares of Bethlehem Copper are recommended for excellent capital appreciation.

BURNS BROS. AND DENTON LIMITED
A. D. MacKenzie
Investment Research Department

TABLE 4

BETHLEHEM COPPER CORPORATION LTD.HISTORICAL STATISTICS

<u>Production</u>	<u>1963*</u>	<u>1964</u>	<u>1965</u>
Dry Tons Milled	1,265,987	1,444,696	2,007,883
Calendar Days	366	365	365
Average Milling Rate Tons/day	3,459	3,958	5,501
Average Heads - % Copper	1.058	0.892	0.691
Recovery - %	93.62	92.08	83.31
Concentrate Grade - % Copper	42.30	41.25	31.86
Copper Contained in Concentrates			
- pounds	25,023,892	23,730,516	23,118,998
Concentrate Production - tons	29,579	28,764	36,282
<u>Earnings & Cash Flow</u>			
<u>Revenue from Concentrates</u>			
Produced**	\$7,081	\$7,711	\$8,187
Marketing Costs***	318	339	429
Production Costs	3,299	3,550	4,449
Administration Costs	145	163	184
<u>Operating Profit</u>	3,319	3,659	3,126
Depreciation	237	313	318
Interest	259	135	31
Bond Discount Amortized	--	--	9
<u>Net Earnings</u>	\$2,823	\$3,211	\$2,768
<u>Cash Flow</u>	3,060	3,524	3,086
<u>Shares Outstanding</u>	4,270,500	5,201,000	5,211,500
<u>Earnings per Share</u>	\$0.66	\$0.62	\$0.53
<u>Cash Flow per Share</u>	0.72	0.68	0.59

* Fiscal Year ends Feb. 28, 1964

** Revenue from metal production less smelting, refining and transportation charges from Vancouver to Japan

*** Includes transportation costs to Vancouver plus loading and trimming charges on board ship

TABLE 5A

BETHLEHEM COPPER CORPORATION LTD.

PRODUCTION STATISTICS

	6 months* to Aug 31 1966	6 months to Feb 28/67 1966	Full Year 1966	1967	1968	1969
Dry Tons Milled	1,502,247	1,783,600	3,283,256	3,641,470	4,710,000	5,475,000
Calendar Days	183	182	365	365	365	365
Av. Milling Rate Tons/day	8,209	9,800	8,995	9,980	12,900	15,000
Av. Heads - % Copper	0.62	0.62	0.62	0.62	0.62	0.62
Recovery - %	82.7	83.0	82.9	88.2	90.0	90.0
Concentrate Grade - % Copper	31.57	32.0	31.8	33.9	35.0	35.0
Copper Contained in Concentrates - pounds ('000)	15,406	18,357	33,763	39,847	52,564	61,101
Concentrate Production - tons	24,400	28,683	53,083	58,723	75,091	87,287

*Reported

TABLE 5B

BETHLEHEM COPPER CORPORATION LTD.

PROJECTED EARNINGS AND CASH FLOWS

(\$000)

	6 months* ended Aug 31/66	6 months ended Feb 28/67	1966	1967	1968	1969
Market Value of Production**	\$7,785	\$8,643	\$16,428	\$18,795	\$22,059	\$25,641
Marketing Costs***	1,028	918	(	1,879	2,403	2,793
Transportation Costs °	**=	299	(2,245	591	787	908
Production Costs	2,883	3,656	(	6,555	7,683	8,486
Administration		100	(6,639	200	300	400
Operating Profit	3,874	3,670	7,544	9,570	10,886	13,054
Depreciation	#	250	(	530	600	800
Debenture Interest	#	120	(2,107	240	--	--
Income & Mining Taxes	912	825	(	3,344	4,114	4,902
Net Earnings	2,961	2,475	5,436	5,456	6,172	7,352
Cash Flow	3,211##	2,725	5,936	5,986	6,772	8,152
Stock Outstanding	5,219,500	5,219,500	5,219,500	5,219,500	5,719,500	5,719,500
Earnings per share	\$0.57	\$0.47	\$1.04	\$1.05	\$1.08	\$1.29
Cash flow per share	0.62	0.52	1.14	1.15	1.18	1.43

* Reported Earnings

**= Included in Marketing Costs

Included in Income & Mining Taxes

Estimated

** Revenue From Metal Production

*** Estimated smelting and refining charges

° Cost of moving concentrates from mine to Vancouver plus loading and trimming charges

TABLE 6

BETHLEHEM COPPER CORPORATION LTD.

PRESENT VALUE CALCULATION *

(\$000)

	<u>Year</u>	<u>Cash Flow</u>	<u>Present Value Factor (10%)</u>	<u>Present Value Cash Flows</u>
0	1966	\$5,936	--	\$5,936
1	1967	5,986	0.9091	5,442
2	1968	6,772	0.8264	5,596
3	1969	8,152	0.7513	6,125
4-16	1970-1981	6,231	5.3368	33,254

$$\text{Present Value} = \frac{56,353,000}{5,719,500} = \$9.85 \text{ per share}$$

* Assumptions:-

(a) Cash Flows 1966-1969 as outlined in Table 5B

(b) Cash Flows 1970-1981

- (1) Average metal price of \$0.35 U.S. per lb.
- (2) Production at 15,000 tons per day
- (3) All costs etc. based on 1969 projections

Table 7

Bethlehem Copper Corporation Ltd.

Directors

R. F. Dooley	- Chicago	Y. Maruo*	- Vancouver
K. Ohta*	- Japan	J. A. McLallen	- Vancouver
H. H. Huestis	- Vancouver	W. H. McLallen	- Vancouver
K. Kawakanu*	- Tokyo	P. M. Reynolds	- Vancouver
H. A. Martin	- Vancouver		

* Represent the Sumitomo Mining Group of Japan who own an estimated 30 per cent of Bethlehem's outstanding stock.

Management

J. A. McLallen	- Chairman of the Board
H. H. Huestis	- Honorary Vice Chairman
P. A. Reynolds	- President
R. F. Dooley	- Vice President
Y. Maruo	- Vice President
K. E. Steeves	- Secretary-Treasurer
T. P. Liss	- General Manager
D. C. Stevens	- Manager-Engineering
C. W. Overton	- Manager-Mill Production
H. G. Ewanchuk	- Manager-Mine Production