

010310

DIAMOND DRILLING REPORT

on the

JEAN 1 FR., JAY 16 and J 31 MINERAL CLAIMS

HIGHLAND VALLEY AREA

KAMLOOPS MINING DIVISION

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N.T.S. Sheet - 92I/7W	U.T.M. Grid - Zone 10
Latitude 50° 27.4'	North - 5591330
Longitude 120° 57.4'	East - 644950

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BETHLEHEM COPPER CORPORATION  
Suite 2100 - Guinness Tower  
1055 West Hastings Street  
Vancouver, B.C. V6E 2H8

November 3, 1977

John R. Bellamy  
Project Geologist

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SECTION A - SUMMARY OF WORK

Introduction:

During August and September, 1977 a deep diamond drilling program was conducted in the Highland Valley on claims held or optioned by Bethlehem in the areas adjacent to the mutual boundary between Bethlehem and Sheba Copper Mines. The program was the latest in a number of exploration projects being conducted on both properties by Bethlehem and by past operators on the Sheba property. The diamond drilling was a follow-up project to a percussion drilling program conducted by Western Mines on the northern portion of the Sheba claims and a similar program conducted by Bethlehem just north of the Sheba ground. Bethlehem acquired control over the 81 Sheba claims in July by obtaining an option from Sheba Copper Mines Ltd.

Four holes totalling 3,177' were completed in this exploration program. Two holes were drilled on the mine property to evaluate at-depth mineralized intercepts encountered while drilling percussion holes PC-77-366 and PC-77-367. The remaining, widely spaced holes were drilled on the Sheba property to test geological structures that previous drilling indicated to be conducive to the localizing of a porphyry copper-molybdenum system. Results of this program, from an economic standpoint, were largely negative and although several high grade sulphide sections were intersected, overall the grades were marginal and lacked continuity.

Location and Access:

The Bethlehem Mine property and the adjoining Sheba claims are located in the Highland Valley area, Kamloops Mining Division, B.C. The 81 claims of the Sheba property are bounded by the Bethlehem, Lornex and Highmont mining properties and can be reached by bush roads from all of the above properties. Due to the steep nature of the topography along the Bethlehem-Sheba boundary, access from the Lornex - Logan Lake

highway was found to be preferable for those drill sites located in the valley bottom. This access route necessitated the construction and up-grading of old drill roads leading south from the J.A. zone. The southern most hole on the Sheba claims was located on a percussion access road built by Western Mines. This site was readily accessible from the Highmont road and by a network of roads leading from the B.C. Hydro right-of-way.

Because of the heavy rainfall during the drilling program enough water was available from the various intermittent water courses to supply gravity fed water to the drill sites.

Claim Status:

The claims upon which drilling was carried out north of the Sheba boundary were purchased from Highland Valley Mines Ltd. in 1972 by Bethlehem Copper. Bethlehem holds all right, title and interest to this property.

The Sheba claim group consists of 81 full-sized and fractional mineral claims that are owned by Sheba Copper Mines Ltd. of Vancouver, B.C. Bethlehem holds an option on these claims pursuant to the terms and conditions of an agreement dated July 8, 1977.

History and Previous Work:

In 1969 Highland Valley Mines Ltd. conducted an induced polarization survey over their claims in the Highland Valley. As outcrop exposures were limited, geophysical methods were used to delineate possible porphyry exploration targets. Two diamond drill holes were sited on two widely-spaced I.P. anomalies, one of which occurred between I.R. 14 and the Sheba claims. The 220', angled ( $-45^{\circ}$ ) drill hole spotted on this anomaly encountered an altered but weakly mineralized phase of Guichon Quartz Diorite.

In 1973 as part of a general exploration program around the J.A. deposit, Bethlehem drilled several deep, widely spaced holes on I.R. 14 and I.R. 15 but only background copper values were encountered.

Significant, though sub-economic, grades of copper were intersected in two percussion holes drilled by Bethlehem just north of the Bethlehem - Sheba boundary.

Since the early 1960s there has been many fairly extensive exploration programs conducted on the Sheba property. Prior to Bethlehem's acquisition of the Sheba claims, there has been 49,256 feet of diamond drilling (81 holes) and 17,510 feet of percussion drilling (82 holes) completed on the property. A general exploration history of the claim group is as follows:

1961 - 1963      Peel Resources Ltd.

The first exploration activity consisted of trenching and drilling the J 101 showings. In conjunction with the development of this mineralized shear zone, 6 diamond drill holes totalling 1,400' were drilled.

1964 - 1965      Anaconda American Brass Limited

Anaconda ran geochemical, induced polarization and magnetometer surveys over the claims. Anomalies were checked with trenching and an eleven hole diamond drilling program totalling some 7,585'. In 1965 after a further fill-in I.P. survey was conducted, six holes totalling 2,355' were drilled.

1967 - 1968      Sumitomo Metal Mining

Work consisted of a detailed program of geological mapping, geochemical and induced polarization surveying with follow-up percussion and diamond drilling. Percussion drilling totalled 4,000' in 16 holes and diamond drilled totalled 6,600' in 15 holes. In 1968 Sumitomo completed 8,400' of bulldozer trenching and a further 1,785' of percussion drilling (5 holes).

1968 - 1969      Anaconda American Brass Ltd.

This exploration program consisted of geological mapping, I.P. surveys and the drilling of 7 diamond drill holes with a cumulative footage of 5,214'.

1971 - 1974      Dowa Mining Co. Ltd.

Dowa financed a four year program consisting primarily of diamond drilling. The property was re-mapped at a scale of 1" = 400'.

1971              12 diamond drill holes totalling 8,569'.

1972 Spring      6 holes totalling 4,800' drilled.

                  Fall              8 holes totalling 5,272' drilled.

1973              7 holes totalling 5,373' drilled.

1974              3 holes totalling 2,088' drilled.

1976 - 1977      Western Mines Ltd.

During the winter Western Mines tested two north-south trending depressions called the East and West Swale which run north to the Bethlehem-Sheba boundary. 61 percussion holes, including two holes drilled on Bethlehem claims (W-27, E-36) were located over the two depressions and several marginal intersections were encountered. Follow-up percussion drilling did not find any continuity to this mineralization.

#### General Geology:

The Sheba claims occupy a central position in the multi-phased, concentrically zoned, post Upper Triassic-pre Middle Jurassic aged, Guichon Creek batholith. The batholith is roughly oval with the long axis striking slightly west of north. Rock types grade outward from a quartz-monzonite core to older dioritic rocks at the margin. All phases of the batholith are cross-cut by late magmatic dykes and dyke swarms.

On the Sheba property several of the phases which make up the Guichon Creek batholith are found. The eastern portion of the property is underlain by quartz diorites and granodiorites of the Highland Valley phase. Two varieties are present in this area, Guichon quartz diorite and Chataway quartz diorite or granodiorite, which are differentiated only by textural criteria and colour index. The western

and southern portions of the Sheba claims are underlain by younger Bethlehem quartz diorites and a texturally close variety called Skeena. A small body of Bethsaida quartz monzonite is located in the north central part of the property. Closely related to the Bethsaida are several swarms of quartz-plagioclase porphyry and aplite dykes which occur throughout the property and generally strike north-south.

Past drilling has indicated a weak but widespread argillic and propylitic alteration on the Sheba property. Sericitic feldspar alteration is moderately to intensely developed in areas affected by faulting, heavy fracturing and porphyry dyke emplacement.

Copper mineralization replaces mafic minerals and occurs on fractures in quartz-epidote, pyrite-chlorite-epidote-chalcopyrite and quartz sericite veins. Molybdenite coats fractures and shears and occurs in quartz or quartz-chalcopyrite veins. The latter veins often occur in or near strong fault zones. The dominant trend of faults and veins is  $100^{\circ}$  with equally well developed sets at  $025^{\circ}$ ,  $065^{\circ}$  and  $160^{\circ}$ , most of which are steeply inclined. Most of the dykes parallel the topographic lineaments and often strike northward or east-northward. A generalized geology map of the Highland Valley taken from the 1972 B.C. Department of Mines, Geology, Exploration and Mining in British Columbia (W. J. McMillan) is included in this report.

#### Summary of the 1977 Program:

The 1977 diamond drilling program was a follow-up to earlier percussion drilling programs on both the Bethlehem and Sheba claims. Persistent though sub-economic mineralization was intersected in several of the percussion holes along the Bethlehem-Sheba boundary and three drill holes were completed to check the grade, continuity and extent of these earlier holes. A fourth hole was located further south just off a Bethlehem-Chataway-Guichon rock contact in an area that contained several percussion holes with above background copper intersections.

The area was also on strike with a porphyry dyke system which had been intersected in earlier drilling programs. Several high grade copper sections were found above this dyke. The Bethlehem-Guichon contact area could have provided a suitable structurally and geologically complex situation in which a possible porphyry system could have been emplaced. Although some sulphides were intersected in the northern three holes, overall copper grades were low and did not provide enough encouragement for the continuation of this year's program.

Diamond Drilling:

A Connors Diamond Drilling Ltd. Boyles 25 A machine was mobilized to the Sheba-Bethlehem boundary area on August 29 and demobilized on October 7. Four holes totalling 3,177' were drilled, two of which were located on claims owned by Bethlehem. Core recovery was generally greater than 95% except in areas encountering severe faulting. Water was obtained from seasonal water courses that were augmented by the heavy rainfall experienced during the drilling program. All the drill core was split, logged and assayed for copper-molybdenum.

The following are four generalized drill hole logs from this program. Detailed logs can be found in Section E of this report.

Sheba Property 1977 Drill Hole Data

Drill Hole Beth-Sheba 77-1

Overburden Depth: 12.2 m (40')      Depth of Hole: 275.9 m (905')

Dip: Vertical

Location: 2615.0 S, 11910 E

Rock type: Fine grained porphyritic Guichon granodiorite.

This variety differs slightly from typical Guichon in that it has scattered medium grained mafic phenocrysts. Below 550' the rock texture differs significantly from the Guichon variety and is probably a

gradational contact between Skeena and Guichon. From 906' to 917' a pink quartz feldspar porphyry was intersected.

Alteration: Fairly strong sericitic and argillic alteration is found throughout the hole and is probably related to strong faulting and fracturing in the area. The mafics are usually heavily chloritized around these zones and are often partially epidotized and leached. Some K-feldspar flooding was observed but was usually obscured by zeolite staining or by staining associated with the presence of fine hematite in alteration halos.

Mineralization: Bornite replaces the hornblende in the upper part of the hole and can be found in some quartz veins and on fine chlorite healed fractures with some chalcopyrite. Molybdenum occurs in chlorite-sericite shears with zeolite veins and on chlorite shears with quartz veining. Overall the mineralization was fairly weak and usually accompanied zones of stronger chlorite-sericite-quartz alteration which was related to intense fracturing and faulting.

Veins: The fractures were healed with massive white calcite, late stage calcium zeolites, chlorite-ocherous hematite, quartz-epidote and sericite-chlorite.

#### Drill Hole Beth-Sheba 77-2

Overburden Depth: 19.8 m (65')      Depth of hole: 201.6 m (661.3')

Dip: -65° to -70° at 270°

Location: 2015 S, 10750 E

Rock type: Guichon Quartz Diorite. A slightly porphyritic medium-grained hypidiomorphic granular quartz diorite to granodiorite. Biotite is euhedral with more well developed books than is normally found in good Guichon. Hornblende also tends to form isolated poikilitic clumps.

Alteration: Chlorite-epidote alteration is generally weak except near a few fault zones. Sericite-argillic alteration is very weak

except in the interval from 379' to 425' which is heavily sheared, faulted and shattered. The strong shattering in the first 150' of the hole did not affect the rock alteration.

Mineralization: Malachite occurs on fractures to 235'. No disseminated sulphides were observed. Bornite and molybdenite occurred in a few isolated quartz veins. Overall, mineralization is sporadic and weak and probably about background for the Highland Valley.

Veins: The most common vein filling was calcium zeolites and quartz veins. The few fracture sets are healed by chlorite-epidote or more often calcite or calcium zeolites. Epidote sometimes accompanies K-feldspar flooding and quartz veining.

Drill Hole Beth-Sheba 77-3

Overburden Depth: 12.2 m (40')      Depth of Hole: 224 m (735.7')

Dip: Vertical

Location: 2920 S, 13120 E

Rock type: Chataway Quartz Diorite. The host rock is a medium to coarse-grained diorite whose texture and composition is similar to the Guichon variety. The mafics differ from Guichon in that the biotite to hornblende ratio is 2:1 with the biotites being particularly well developed euhedral books (to 1 cm). Hornblende occurs as small chloritized laths and larger subhedral clumps which are interstitial to the plagioclase feldspars. From 195' to 735.7' the biotite ratio decreases as does the grain size and the rock in this section is assigned to the Guichon variety. A quartz feldspar porphyry dyke occurs in the interval from 478.5' to 549.5'. Its texture grades inwards from the margins of the dyke from coarse-grained phenocrysts in an aphanitic groundmass to a medium to coarse grained granitic texture in the core of the dyke.

Alteration: Strong sericite alteration is associated with zones of faulting and shattering. Quartz veining, chlorite alteration

of the mafics and stronger argillic alteration also occur in these zones. Overall, the alteration is weakly propylitic with locally developed phyllic and potassic zones. The quartz feldspar porphyry dyke is relatively unaltered except for chloritization and epidotization of the mafics.

Mineralization: Mineralization is usually found in relatively more intensely altered zones and adjacent to the margins of the porphyry dyke. While bornite is usually found in association with chlorite-epidote healed fractures, weak chalcopyrite was observed to be disseminated in the mafics throughout the drilled section. Molybdenum is associated with the few quartz veins in heavily altered and faulted sections.

Drill Hole Beth-Sheba 77-4

Overburden Depth: 5.48 m (18')      Depth of Hole: 266.7 m (875')

Dip: -67° at 090°

Location: 6200 S, 11500 E

Rock type: Guichon Quartz Diorite. The rock is a hypidiomorphic granular quartz diorite. Textural changes occur below 229' in the drill section and the Guichon has textures and compositions approaching that of the Chataway variety. Some sections 229-240', 250-326' and 549-561' contain coarse grained hornblendes and biotites and have the composition of granodiorites. A quartz feldspar porphyry dyke occurs in the interval 641-683'. Below 683' there occurs a K-feldspar rich Chataway granodiorite.

Alteration: Strong sericite alteration occurs between 60' and 142' and is associated with a very strong zone of faulting and shearing. Chlorite-epidote alteration is fairly strong in all rock types and is probably caused by the strong faulting, fracturing and shearing that occurs in the drilled section. K-feldspar flooding is more prominent in this hole and is usually accompanied by zeolite and calcite veining

and zeolite flooding:

Mineralization: The mineralization is about background or below for diorites in the Highland Valley. The few sections with marginal sulphide values occur in intensely altered fault zones that have K-feldspar-quartz veining, zeolite flooding and chlorite-epidote veining. Ocherous hematite can occur on shears and with chlorite-epidote alteration.

Conclusions and Recommendations:

The 1977 diamond drilling program on the Bethlehem and Sheba properties encountered widespread argillic and propylitic alteration that appears to be related to zones of faulting and fracturing. Weak copper-molybdenum values can be found in many of these zones and in altered zones adjacent to the larger quartz feldspar porphyry dykes. Although most of the mineralized intersections were sub-marginal and lacked continuity there was sufficient copper present to account for the above background copper values returned from percussion holes drilled in the area. The intensity of faulting and fracturing in the first three holes is probably related to a major north east - south west structural system and porphyry dyke trend. There is a possibility that some of the faulting and shattering of the host rock is related to the postulated Highland Valley fault (W. J. McMillan, 1972, B.C. Department of Mines, G.E.M. 1972).

The very low copper mineralization found in hole BS-77-4 probably precludes there being a porphyry copper system in the vicinity of the Guichon-Chataway-Skeena boundary on the Sheba claims. Although faulting and fracturing were fairly intense in this hole the overall alteration was generally weak.

As all of the porphyry systems in the Highland Valley are emplaced on or adjacent to rock phase contacts, the search for new but undetected porphyry deposits should be along the rock boundaries on the Sheba-Bethlehem property. The large amount of previous drilling

on the Sheba claims has almost eliminated the chance for a near surface porphyry system located on the Skeena-Guichon, Guichon-Chataway and Bethlehem-Skeena rock contacts. At the current low copper price it is doubtful whether a search for deep seated porphyries can be justified. Of interest is the high molybdenum values known to occur in the southern part of the property and it is recommended that this area be researched fully before a decision is reached as to the future of the Sheba claims.

Respectfully submitted,



John R. Bellamy  
Project Geologist

SECTION E

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DRILL HOLE DATA

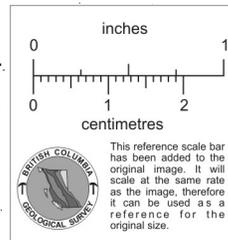
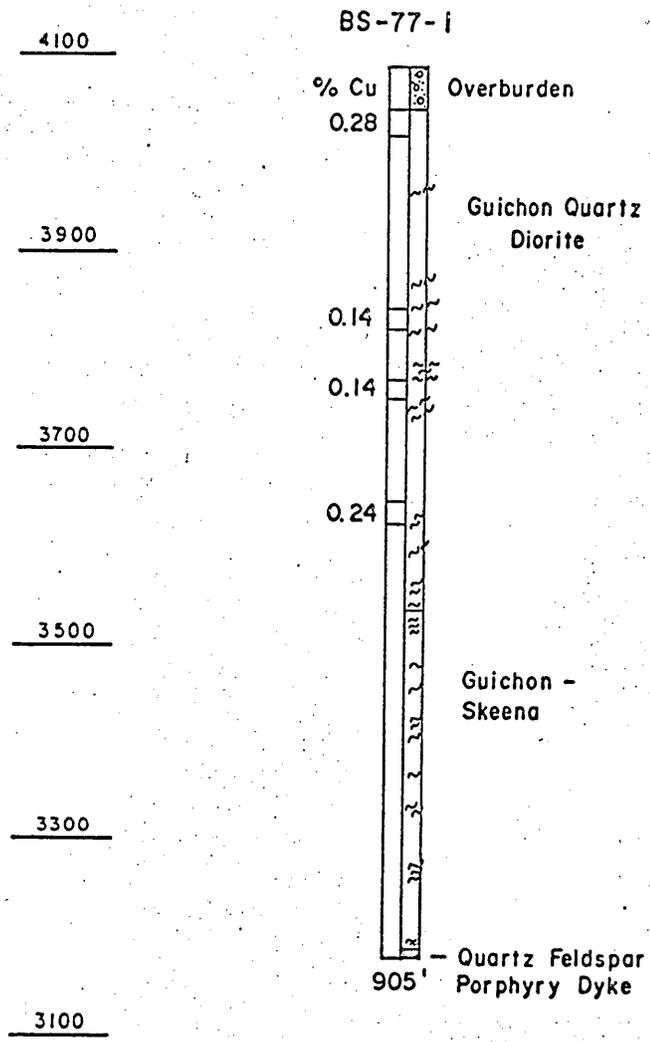
Drill Hole Record

Drill Hole Logs



W.

E.



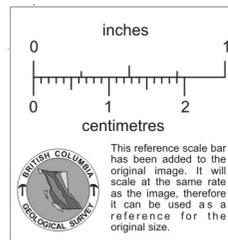
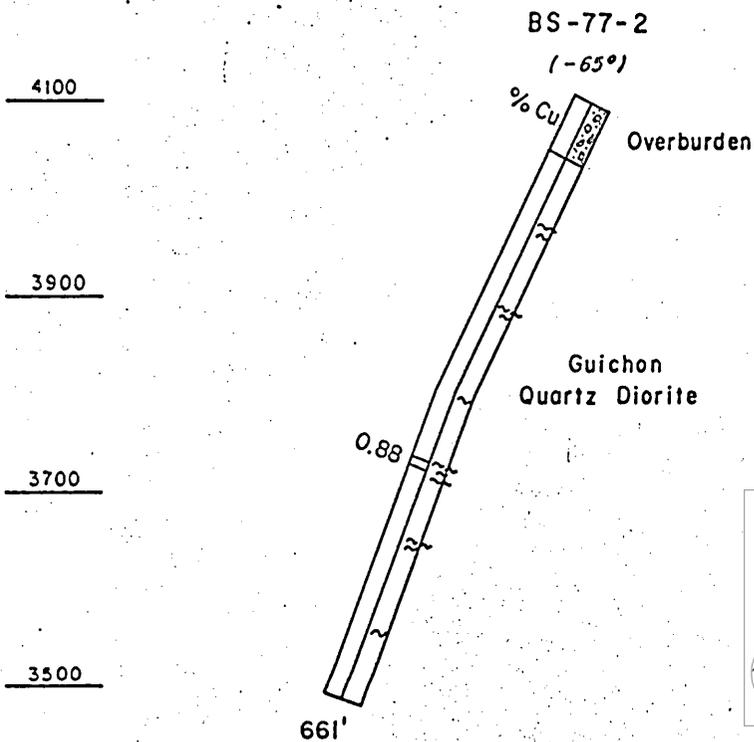
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Commenced: Aug. 30 / 77  
Completed: Sept. 8 / 77

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		CHECKED - J. B.		BS-77-1
		DATE - OCT. 1977		FILE NUMBER -
		SCALE - 1" = 200'		DRAWING NUMBER -

W.

E.



**DRILLING**

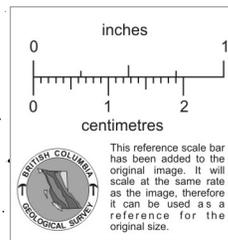
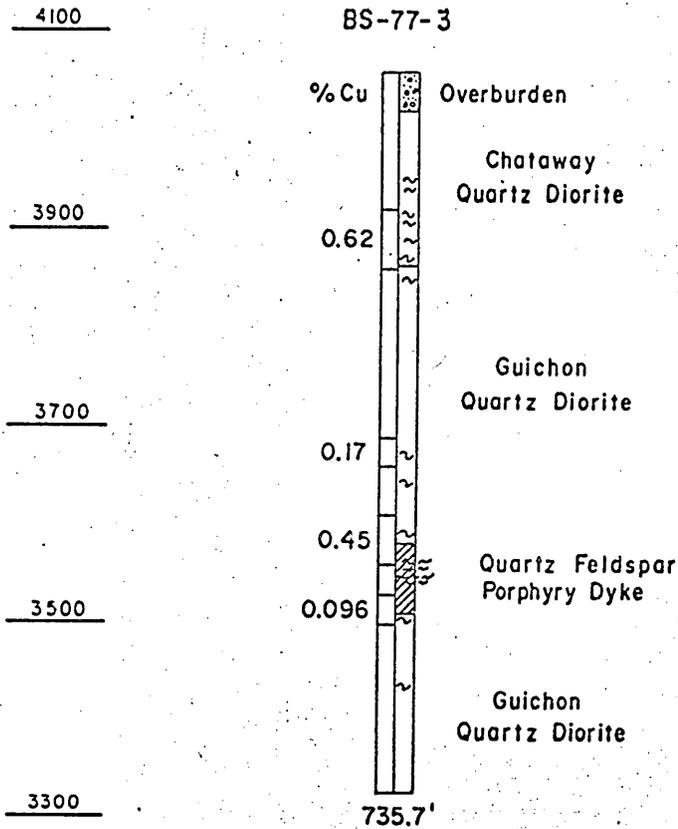
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Completed: Sept. 15 / 77

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		APPROVED -				
		DATE - OCT. 1977				
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W.

E.

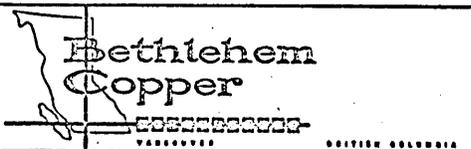


**DRILLING**

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Completed: Sept. 27/77

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		APPROVED -
		DATE - OCT. 1977
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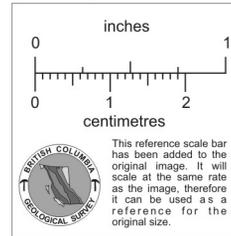
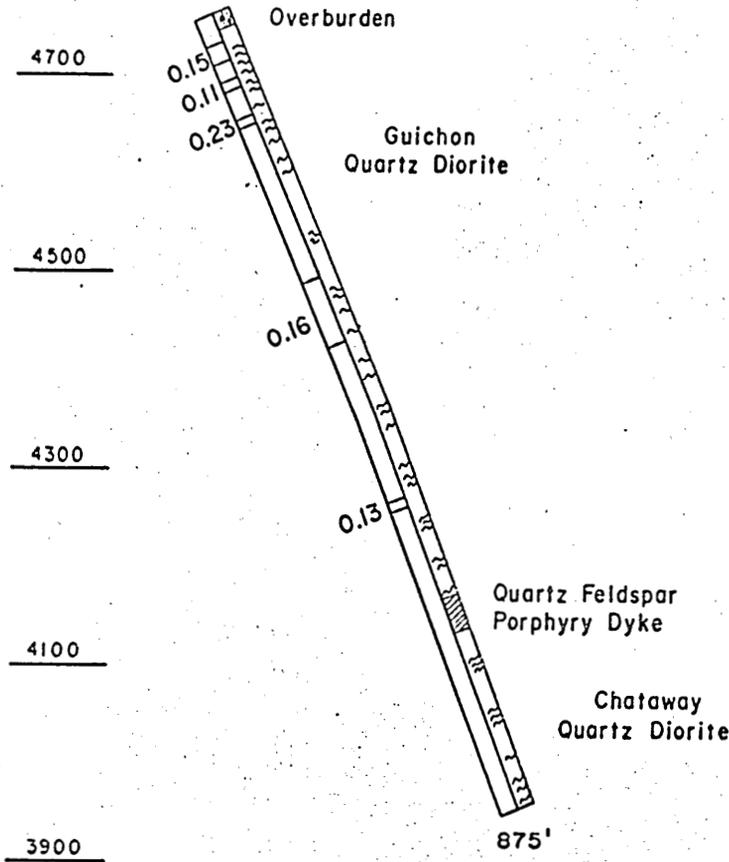


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FILE NUMBER -	DRAWING NUMBER -

W.

E.

BS-77-4



**DRILLING**

Commenced: Sept. 27/77  
Completed: Oct. 6/77

DATE REVISION	BY	DEPT - EXPLORATION		TITLE -
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		CHECKED - J.B.		BS-77-4
		APPROVED -		FILE NUMBER -
		DATE - OCT. 1977		DRAWING NUMBER -
		SCALE - 1" = 200'		

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 1

Property	Bethlehem	Hole No.	Beth.-Sheba 77-1	Bearing	-	Elevation	4,090'	Logged by	J. Bellamy
District	Kamloops	Length	917' (905')	Dip	- 90°	Overburden	40'	Date	September 1, 1977
Commenced	August 30, 1977	Latitude	2615.0 S	Hor. Comp.		Recovery	95% +		
Completed	September 8, 1977	Departure	11910 E	Vert. Comp.	917.0	Purpose			

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Sec	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
type GUICHON GRANODIORITE (Contact phase transitional) Propylitically altered granodiorite except near fault zones where stronger chloritization of mafics & sericitization of feldspars occur. Fractures - chl.-calcite healed with a later zeolite-calcite fracture set cutting older structures. Strong fracturing to 60'. 60 - 120' Fairly fresh Guichon with calcitic zeolites staining the groundmass adjacent fract. Bn & magnetite in mafics cut by fine hairline fracts. ~2 per foot. Guichon mod. magnetic. Stronger zeolite fracturing at depth.	Mal.			W-S	M 70%		5%	90° shears	Strong 10° @ 55° 30°		Zeolites @ 55°	40	50	16401	.170	.001			60%
		Bn		W-M	M-S 80%		10%	52' 3" zouge	Strong 30-40°	59' 1" @ 20° Bn Ep		50	60	16402	.53	.008			75%
				W	M 50%		<5%		1/2 inch 30-40°			60	70	16403	.160	.001			50%
				W	W-M 40%		<5%		3/foot 40° to CA.			70	80	16404	.020	.001			95%
		weak Bn on fract.		W	W 30%		<5%		3/foot 30°			80	90	16405	.024	.001			98%
		1:1		W	W-M 40%				4/foot 35-45°	MoS <sub>2</sub> @ 100' @ 50° & 75°		90	100	16406	.052	.007			98%
				W	W 30%				3/foot 25 & 40°	110' 1/8" @ 40° Bn	~ 85° ~ 40° w/Ep	100	110	16407	.038	.001			98%
		minor MoS <sub>2</sub> or fract.		W	W 30%				4/foot 30°			110	120	16408	.045	.001			98%
				W-M	M 40%			124' 2" @ 60°	4/ft 25° 40' major	128' 1/4" @ 40° Bn		120	130	16409	.051	.001			95%
				W-M	M 40%	W cn recess.		134' 2" @ 20°	4-5/ft 30°, 40°, 60°		135' aplite dyke	130	140	16410	.014	.001			95%
		1:1		W-M	M 50%	W			7/ft 30°, 40° 60°	144' 1/4" @ 40° Bn	~ 60°	140	150	16411	.080	.001			95%
				W-S	M-S 30%	W			7/ft 30°, 40°			150	160	16412	.028	.001			95%

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 2

Property Bethlehem

Hole No. Beth.-Sheba 77-1

Logged by J. Bellamy

Date September 1, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
5% calcite & zeolites on young, vuggy fractures.		1:2		W-M	M 60%	W		Shears @ 40°	4/foot 40', 60'		zeolites 40' ca. 75"	160	170	16413A	.039	.001			95%
Rock very magnetic with visible magnetite in blebs & mafics. Sections of strong chl. ser. alteration. Very little mineralization except some Bn in mafics.				W	M 30%	W 55%	10% fracts.		mod. 8/foot			170	180	16414	.071	.003			"
Strong zeolite veining & adjacent flooding.				W	M 65%	"	W		strong 2/inch 30', 60'		zeolite ca. veining	180	190	16415	.067	.004			"
Most fracturing late stage-cc.-zeolite healed.				W	M 50%	W-M on fracts.	W	196' 3"	60° 70°		50', 60', 70', 80' strong	190	200	16416	.060	.001			90%
Hornblendes are poikilitic with quartz inclusions & are either fresh or totally chloritized.				W	W 30%	VW	<10%		3/foot 40', 50'			200	210	16417	.009	.001			95%
218 - 221' Strong ser. alteration with cc. healed shattering.				W-S	W 30%	-	W	219' 1' @ 40° to CA	weak 2/foot 15', 40'			210	220	16418	.010	<.001			95%
231 - 233' Strong shattering.				M	S 80%	W on fracts.	<10%		strong 60'		zeolite flooding 10%	220	230	16419	.009	.001			98%
233 - 238' Zeolite flooding, feldspars altered to clay gypsum on fractures. 5% of the mafics are leached to pale brown clays.				W-M	W-M 30%		10%		3/foot mod.			230	240	16420	.041	.001			95%
				M	M 55%	W	<10%	241' 6" @ 20°	mod. 20-30°			240	250	16421	.082	.003			93%
				M-S	S 90%				strong		flooding & veins @ 60-70°	250	260	16422	.120	.006			98%
266 - 270' Strong faulting and shearing.				S	S 100%	W on fracts.		268' 1'	strong		"	260	270	16423	.160	.003			93%
276 - 278' Fault zone - strong ser. chl., weak diss. magnetite. Mafics foliated @ 30° to CA				W	W-S 70%		278' M	276' 1" @ 60°	strong 15-20° 90°		veins @ 70-80°	270	280	16424	.089	.001			98%
K-feldspar flooding adjacent fine fracture.				W	W 30%		10%		W-M 4/foot 20-30°		1/foot 70-80°	280	290	16425	.022	.001			"

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No.3

Property Bethlehem

Hole No. Beth.-Sheba 77-1

Logged by J. Bellamy

Date September 7, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Oiz. Veining	Aplitic Veins								
Fractures healed by chlorite				W	W-M 60%	W 25%	< 5%		35°			290	300	16426	.061	Tr.			95
				W-S	S 90%	M on fract.	< 5%	302' 4"	60 & 70° 25° shear		Strong zeolite veining	300	310	16427	.070	.010			95
Heavier epidote associated with chl-cc veins & zeolite-gypsum veins. 309'-370' feldspars sericitized & kaolinized. Strong alteration due to shearing & faulting				M-S	S-M- W 50%	S dis	< 10%	309' 8"	78° fracture sets		75° zeolite veining	310	320	16428	.019	Tr.			98
		1:1		M-S	M-S S	W	-		60°			320	330	16429	.109	Tr.			"
				S	S	W		336' 4"				330	340	16430	.180	Tr.			"
Strong zeolite veining & flooding - increased epidote - weak magnetite. Most anhedral mafics chloritized. Subhedral clumps partially chl. - visible magnetite in the mafics. Hematite staining on slickensides with ca-zeol.				S	S	M	?	336' 4"	strong shearing @ 40 & 90°	40° 60° c	cc veins 75-80°	340	350	16431	.026	Tr.			"
				W-S	S 75- 85%	W	10%	358' shear			1/4" @ 20° Bn	350	360	16432	.163	Tr.			95
				M-S	S on 70%	W fract.			75° sets 20° 50°		1/4" zeol veins weak flooding	360	370	16433	.057	Tr.			98
				W-M	W M	W		379' 1' shear @ 15°	weak 20° 40°	1/4" w/ epidote		370	380	16434	.014	Tr.			95
367' 6" zeolites. Biotite:hornblende 1:1 30% of mafics fine subhedral laths. Larger hornblendes poikilitic.	No visible sulphides			W-M	W-M on	W fract		381' fault			386' 1/4" MoS veins @ 40°	380	390	16435	.148	.009			85
392-436' Very fresh Quichen - not foliated - weakly magnetic. Biotite & hornblendes unaltered. The few fractures are calcite-zeolite healed.				W	W	-	-		Weak 60° dom. 40-50°			390	400	16436	.038	.007			98
				-	W							400	410	16437	.019	Tr.			
				-	W							410	420	16438	.037	Tr.			"

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 4

Property Bethlehem Hole No. Beth.-Sheba 77-1 Logged by J. Bellamy Date September 7, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
422' MoS <sub>2</sub> with calcite & epidote on 1/4" 30° fracture, also at 426'.				VW	W	W			Weak			420	430	16439	.034	.001			100
439-441' K-feldspar flooding with 4" of calcite-zeolite-epidote veining with heavy MoS <sub>2</sub> and magnetite.				W	W-Mon fracts.	W	W		60-70° zeolite healed			430	440	16440	.060	.042			98
455' Minor Bn on Chl healed fracture ~25°				W-M	W-M 10%	W	W	441' shear @ 50°	Mod 20°		Zeolites on 60° & 75° fracs.	440	450	16441	.304	.002			"
465 - 504' Core heavily sheared with strong calcite-zeolite veining and flooding. Heavy magnetite in mafics. Occasional large biotite books to 7 mm. Chlorite-kaolin-sericite & hematite staining on shears.				W-S	W-S	M		464' - 468' 75° shears	strong 30°, 75°		Heavy 470' 75° zeolite veining.	460	470	16443	.032	Tr.			95
473' 5" of vein breccia. Fragments are silicified with accompanying MoS <sub>2</sub> & epidote, & healed by zeolites & coarse calcite.		MoS <sub>2</sub>		M	H 40%	W		480' 90° floccing	"		2 types of zeolites	470	480	16444	.017	Tr.			"
504' - 532' Strong ca.-zeolite veining & flooding near veins 20 - 30°, 50 - 60°				M-S	S 80%	M	<5%	488' 90° shears	Moderate 60°			480	490	16445	.048	.010			98
				S	S			492' 3' shears @ 75°	"			490	500	16446	.121	.023			95
				M-S	S 75%	W	on 5% fracts.		"			500	510	16447	.042	.003			98
				M	S 50%	"		520' 1/4" @ 20° MoS <sub>2</sub>	20-30° @ 50°			510	520	16448	.022	Tr.			"
				W-M	W-M	"		532-36' shears @ 20-75°	20°			520	530	16449	.047	Tr.			"
				W-M	W-M	"		542' 5" shears	"			530	540	16450	.007	Tr.			"
				W-M	W-M	"			"			540	550	16451	.011	.010			"

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 5

Property Bethlehem

Hole No. Beth.-Sheba 77-1

Logged by J. Bellamy

Date September 7, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
Guichon, fine to medium grained, has some Chataway textures possibly Beth-Bethsaida from				W	W							550	560	16452	.008	Tr.			98
550-664'. Biotite: Hornblende 2:1				W-S	W-M	W		568-571'				560	570	16453	.044	.002			"
568-592' Strong shearing-alteration. Zeolite veining with MoS <sub>2</sub> on some shear surfaces 15-20°				M-S	S	M		575-581' sheared	strong 15-20°			570	580	16454	.125	.001			95
50°, strong slickensides on shear faces. MoS <sub>2</sub> @ 580', 590', 591', 608', 635', 646', 648'. No visible Bn or Cpy; rock weakly magnetic.				M-S	S	M	<10%		" 40°, 50°			580	590	16455	.029	.028			90
				W	M 60%	W						590	600	16456	.035	.015			98
				W-M	M 60%	W		606-09 sheared				600	610	16457	.107	.028			95
				M	M 50%			615' 1' crush zone	Moderate 30° 60°			610	620	16458	.020	Tr.			"
				W	W-M				20° 60° 75°			620	630	16459	.016	Tr.			98%
631-645' Strong zeolite veining with zeolite flooding in crushed zones; chl-sericite alt. only adjacent shear zones in any intensity.				W-S	S		10%	334' 1' shear	strong 30°, 40-50° MoS <sub>2</sub>			630	640	16460	.016	.005			85%
Very minor cpy in mafics.				W-M	M 70%		"	642' 4' shear zone	20-30° 60°	645' 1" vein 30° MoS <sub>2</sub>		640	650	16461	.066	.070			90
				W	W 80%		<5%		5/foot 20°, 40°			650	660	16462	.031	.002			98
664' Rock texture slightly different than Guichon in that large biotite books occur with the hornblende clumps and fine hornblende laths >15% to mafics.				W	W-S	W	"	664' 4" shear zone	40-50° 60°			650	670	16463	.065	.002			"
				W	W	W	"	677' shear				670	680	16464	.024	Tr.			"

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 6

Property Bethlehem

Hole No. Beth.-Sheba 77-1

Logged by J. Bellamy

Date September 7, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
				W-M	M-W	W		682' 1' shatter	Weak	Minor MoS <sub>2</sub> or cc veins silica @ 20° & 10°	683'	680	690	16465	.007	.001			98
699 - 716' Strong shearing with sections of chl-ser-kaolinite gouge. Zeolite flooding of crushed zones. No visible mineralization.				W	W 30%	W	5%	699' 5" shear zone	strong shearing 40'	healed fracture		690	700	16466	.032	.001			"
				W-S	M-S 70%	W-M		709-11' sheared	"			700	710	16467	.023	.002			95
				M-S	S 75%	M		718' 1' fault				710	720	16468	.007	.004			90
Rock type not Guichon, probably a Bethlehem-Bethsaida phase. Bimodal distribution of mafics				VW	W		10%		weak			720	730	16469	.014	.001			98
Large poikilitic hornblendes in clumps. Biotite in books with small anhedral laths of hornblende				VW	W		"	737' 1' shearing	30° 40-50° 60, 70°			730	740	16470	.021	.007			"
biotite. Mafic content <15% with 10% anhedral K-feldspar with 60% plagioclase-groundmass more coarse grained than Guichon-less mafic.				VW	W		"		30°	744' 1/8" MoS <sub>2</sub> vein @ 20°		740	750	16471	.138	.002			"
753 - 767' Strong faulting & shearing. Fractures calcite healed - a few zeolite veins. Biotites appear least affected by chl. alteration.				M-S	M 65%	W		753-55 Ca-Ser gouge	strong 20-30°			750	760	16472	.002	Tr.			95
				M-S	M 70%	M	"	760' 2" @ 80°	strong 50° 70°	762' 1/2" @ 20 Mo, Ep		760	770	16473	.005	Tr.			"
				W-M	W 25%	W	"	776-77 1" @ 20°	mod. 8/ft 40° 20' 65°			770	780	16474	.003	Tr.			"
				W-M	W			781' 1" @ 20°	weak 4/ft 20°	major. 10°+ 60°		780	790	16475	.012	Tr.			98
				W-M	M 40%		10%	791' shears @ 20-25°	"			790	800	16476	.004	Tr.			"
Good fresh Bethlehem granodiorite.				VW	W 25%		"		weak 30° 50°			800	810	16477	.001	Tr.			"

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 7

Property Bethlehem

Hole No. Beth.-Sheba 77-1

Logged by J. Bellamy

Date September 8, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
811 - 833' Rock textures obscured by intense alteration. Feldspars sericitized then altered to kaolin & calcite. Mafics first chloritized then leached to clays. Heavy hematite coatings on fractures. Strong calcite veining @ 15-60'				M-S	W-S				weak 20° 40°			810	820	16478	.023	Tr.			100
				I	S				822' 6" weak shear @ 60' 30° 55°			820	830	16479	.004	Tr.			98
				M	S		10%		830' 1' Ca-Ser gouge 50° Mod.			830	840	16480	.004	Tr.			"
838 - 871' Bethlehem section contains partially altered, crushed zones between mylonite fault zones but these zones are not heavily altered.				W	W-M				838' 6" strong gouge @ 60' 10° 50°	843' 1/4" @ 50°		840	850	16481	.010	Tr.			"
		minor MoS <sub>2</sub>		W-M	M	W on fract.			842' 8" 20° 30° gouge 40°	859' 1/4" @ 30° MoS <sub>2</sub>		850	860	16482	.059	.004			"
		876' minor MoS <sub>2</sub> or		W-S	S-M	W			861' 2" 20° gouge major			860	870	16483	.075	Tr.			95
		shear 881' minor MoS <sub>2</sub>		W	M		<10%		870' 6" mod. weak gouge 8-3/ft			870	880	16484	.084	.002			98
899 - 917' Rock heavily altered and shattered by faulting.				W	W-M	W-M			weak 10° 30° major 40°			880	890	16485	.052	.001			"
				W	W				900-01' weak shatt-ered 40° 50° 70°			890	900	16486	.025	Tr.			"
906-907' Aplite dyke possibly chilled contact of feldspar porphyry dyke.				S	S	on fract. W	35%		strong 20-30° 60°	906' 1' aplite vein		900	910	16487	.034	Tr.			95
907-917' Porphyry dyke. Differs from above Bethlehem in that (1) groundmass aphanitic; (2) has large ovoid Qtz eyes; (3) less mafics ~ 8%; (4) more K-feldspar ~ 35%. Phenos. rather than K-feldspar groundmass.				S	S	W	35%		"			910	917	16488	.049	Tr.			95
N.B. Actual depth of hole 905' due to use of														END OF HOLE					

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 1

Property	Sheba	Hole No.	B.S. 77-2	Bearing	270°	Elevation	4,095'	Logged by	J. Bellamy
District	Kamloops	Length	671' (661.3')	Dip	- 65° -70° at T.D.	Overburden	65'	Date	September 12, 1977
Commenced	September 9, 1977	Latitude	2015 S	Hor.Comp	226'	Recovery	97%		
Completed	September 15, 1977	Departure	10750 E	Vert.Comp	621'	Purpose			

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
GUICHON QUARTZ DIORITE																			
The quartz diorite is a medium-coarse grained hypidiomorphic granular diorite with some of the textures of Guichon and Bethlehem. Like Guichon it has 15% + anhedral-subhedral equigranular mafics mainly as fine laths & small biotite books. Larger poikilitic hornblende clumps & biotite books occur throughout. K-feldspar content varies with secondary flooding. Qtz ~10% occurs interstitial to the subhedral-euhedral feldspars.																			
0 - 65' OVERBURDEN																			
				W	W				Mod. zeolite healed	69' 1/4" @ 20°		65	70	16489	.015	Tr.			95
75' 1' quartz epidote flooding with later veining & staining by zeolites. Biotite: Hornblende 2:1		76' Mal.		W	W	W			4' foot	71' 1/4" @ 55°		70	80	16490	.027	Tr.			"
				W	W	W	10%		strong	20° 90°		80	90	16491	.009	Tr.			"
		94' Mal.		W	W	W		36' 4" crush	50° 20' 60°	77' 1/4" @ 75° - 20°		90	100	16492	.074	Tr.			70
				W	W	W			strong	90°		100	110	16493	.010	Tr.			75
				W	W	W			strong	75° 90°		110	120	16494	.008	Tr.			60

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 2

Property Sheba

Hole No. B.S. 77-2

Logged by: J. Bellamy

Date September 12, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
Rock fairly fresh-weakly mineralized & shattered by steep fractures. Very few zeolites or other secondary minerals healing fractures.				VW	W				strong 50° 85°			120	130	16495	.009	Tr.			85
Rock weakly magnetic.		134' Mal.		VW	W				"			130	140	16496	.008	"			90
The fresher rock has Guichon texture except for mafic (hornblende clumps) and a high biotite:		146' Mal.		VW	W	W		144' " @ 70°	"			140	150	16497	.051	"			65
hornblende ratio. Mafic content 15% +.		154' Mal.		VW	W				85° Mal.	154' 1/4" @ 22° Mal		150	160	16498	.024	"			90
K-feldspar content generally less than 5%.		@ 85°		VW	W				50° 70°			160	170	16499	.015	"			95
				VW	W				weak 55° 65° 80°			170	180	16500	.006	"			98
		181' Mal.		VW	VW				"			180	190	19001	.016	"			98
		188'																	
198' 3" zenolith.				VW	VW				30° minor weak			190	200	19002	.006	"			95
Fracturing very weak with occasional malachite staining on shear planes. Minor bleaching of feldspars & zeolite staining along fracture sets.				VW	VW		10%		50-60°		202' 1 cm @ 20 with CG. qtz.	200	210	19003	.011	"			100
Occasional hornblende clumps or zenoliths of + 1 cm. Later fractures calcite healed.		215' Mal.		VW	VW		"		55°			210	220	19004	.012	"			"
230' Fracture sets @ 75° healed with chl-ep.				VW	W	W-M on frac.	"		weak 55° minor	1/8" @ 75° 50°		220	230	19005	.030	"			"
Below 240' rock texture more leucocratic - may be due to fault alteration-and finer grained		230'																	
248' 1' clay-silica healed shatter zone.		234- 235' Mal.		W	W			235' 3 gauge Mal.	Mod.	234' 2 cm @ 15°		230	240	19006	.061	"			75
Opaline deposits have healed the fractures.				W	W	on frac.		240' 5' gauge	strong 20° 75°			240	250	19007	.012	"			95

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 3

Property Sheba

Hole No. B.S. 77-2

Logged by J. Bellamy

Date September 13, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
240 - 280' Although rock unaltered, it is fairly friable due to fine shatterings in some sections.				W-M	W	W		255' shattered	M, S 20° 50°			250	260	19008	.011	Tr.			95
				VW	W			264' 1" gouge @ 10' Mal.	75° - 85°	264' 8" @ 20°		260	270	19009	.017	"			"
Fractures - calcite-zeolite healed with minor zeolite flooding adjacent fractures.				VW	W	W	Mod on frac.		VW-M shattering			270	280	19010	.014	"			98
				VW	W	W	on frac.		55° 75° 85° 30° minor			280	290	19011	.013	.001			"
				VW	W				weak 2/5 foot @ 40°	293' 1/4" @ 40°		290	300	19012	.011	"			"
No visible sulphides. Good Guichon texture.				VW	W				55° 75°-80°	302' 1/4" @ 20° 306' 1/2" @ 30°		300	310	19013	.008	"			"
				VW	W	15%				314' 1/2" @ 20°		310	320	19014	.007	Tr.			"
				VW	W							320	330	19015	.007	.001			"
		MoS <sub>2</sub> in fault		VW-M	W-M	W-M		330' 1' gouge	strong			330	340	19016	.032	.003			95
				VW	W	15%			very weak			340	350	19017	.006	.001			98
Shearing along MoS <sub>2</sub> carrying quartz veins.		MoS <sub>2</sub>		VW	"		10%		" 45°	358.5' 1/2" @ 30' MoS <sub>2</sub>		350	360	19018	.004	.001			"
K-feldspar flooding and alteration increasing as is epidotization along fractures.		"		W	W	35%		363' shear	80° weak 30-35°	363' 1/2" @ 50' MoS <sub>2</sub>		360	370	19019	.012	.002			"
				W	W-M	W			50° - 55° 75°			370	380	19020	.013	.001			"

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 4

Property Sheba

Hole No. B.S. 77-2

Logged by J. Bellamy

Date September 14, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Otz. Veining	Aplitic Veins								
396 - 410' Quartz veining and aplite dyke swarms. Good MoS <sub>2</sub> & Bn with quartz. Strong zeolite and epidote flooding throughout shattered but healed diorite. Calc-zeolites on fractures with some hematite staining on shear planes. Visible magnetite in mafics.				W	M	M	15%	379' shears 70-80'	Mod. 40°, 75-80°			380	390	19021	.011	Tr.			98
		Mod. MoS <sub>2</sub>		M	S	4-S		406' 2" gouge @ 70°	M 50-60° major	396' 1/4" @ 30° MoS <sub>2</sub>	1-2/ft @ 1/2" @ 10-50°	390	400	19022	.031	.002			95
		MoS <sub>2</sub> Bn <sup>2</sup>		M-S	S	W		409' shear 50°	strong Mo-Fn 35°	409' 1/2" @ 30° MoS <sub>2</sub> Bn <sup>1</sup>	"	400	410	19023	.88	.003			"
				S	S			strong shears 75-85°	Mod.			410	420	19024	.012	Tr.			98
421' 1' quartz epidote flooding. Heavy hematite staining on shears.				M	S-M	M-S	10%	shears	" 40° 65°, 75°		420' 1/4" @ 30°	420	430	19025	.004	.001			95
				W	M-W	W	15%	frac.	mod. 30°, 55° 75-85°			430	440	19026	.003	.001			98
449 - 459' Strong K-feldspar flooding. Fractures chlorite-epidote or zeolite healed.				W	W	W	15%		mod. major 75-85° 6°			440	450	19027	.005	Tr.			"
				W-M	S	M	50%	frac.	"			450	460	19028	.025	Tr.			"
				W	M	W	40%		"			460	470	19029	.011	Tr.			"
				W	W	W	20%		weak 1/ft 20-30°, 55°	479' 1 cm @ 0° K-feld.		470	480	19030	.006	Tr.			"
				W	W	W	<5%	484' shatter zone	1/ft 30-80°			480	490	19031	.006	Tr.			"
The few quartz healed fractures in the Guichon are unmineralized.				W	W				"			490	500	19032	.005	.001			"
				W	W				"			500	510	19033	.007	Tr.			"

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 5

Property Sheba

Hole No. B.S. 77-2

Logged by J. Bellamy

Date September 15, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
FRESH GUICHON QUARTZ DIORITE				VW	W 10%		< 5%		VW 50° 65°, 80°			510	520	19034	.007	Tr.			98
				VW	W		"		"			520	530	19035	.008	Tr.			"
		minor Bn MoS <sub>2</sub>		VW	W		10%		weak 40°, 55°, 70°	534' 1/2" @ 45° Bn-MoS <sub>2</sub>		530	540	19036	.080	.002			"
Minor Cpy in fine quartz-chl. vein. K-feldspar confined to flooding along chl-calcite healed fractures.		MoS <sub>2</sub> Cpy		VW	W		"		"	540' 4 mm @ 40°		540	550	19037	.031	.001			"
564 - 568' Stronger chl, ser., ep. alteration associated with small fault zones.				VW	W		5%		"			550	560	19038	.014	Tr.			"
				VW	W-M	W-M	"		"			560	570	19039	.013	.001			"
580' Some secondary biotite along coarse-grained quartz veins in this section.				VW	W				40°			570	580	19040	.007	.002			"
				VW	W			584' 1' shatter zone	"	580' 1/2" @ 40°		580	590	19041	.012	Tr.			95
				VW	W				20-30° 40°			590	600	19042	.007	Tr.			98
602' 1' K-feldspar flooding with epidote veins. K-feldspar flooding along fractures & near quartz veins and aplitic veins.		606' MoS <sub>2</sub>		W	W	W-M	10%		35° 65° weak 40° 70°			600	610	19043	.017	.001			"
				W	W		15%		"	616' 1/2" veins @ 25°		610	620	19044	.026	Tr.			"
630 - 635' K-feldspar flooding.				W	W		10%		"			620	630	19045	.004	Tr.			"
632' 1 1/2' of strong argillic alteration. larger mafics only partially chloritized.				W-M	W	W	20%	330-32' shatter	35° 40° 75°			630	640	19046	.017	Tr.			95





DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 2

Property Bethlehem

Hole No. B.S. 77-3

Logged by J. Bellamy

Date September 21, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
107 - 114' 6' of core lost.				VW	W 15%		10%	135.6'				120	130	19058	.005	Tr.			98
116 - 118' 2' core lost in shattered fault zone, limonite on rock faces probably water course.				W	M 60%		15%	136' 2" @ 70°				130	140	19059	.045	Tr.			98
142 - 152' Fault zone with sections of gouge and total chl. alteration. Gouge mostly sericite, mod. argillic alteration. Diss. cpy.		Diss. Cpy.		W -I	S 90%		20%+	142-152'				140	150	19060	.440	.007			90
153.5' 1 1/2' coarse quartz flooding in sericite chl. matrix. Heavy diss. Bn and MoS <sub>2</sub> .		Bn MoS <sub>2</sub>		S -M	100% Arg.				weak	154' 1/2" @ 50°		150	160	19061	1.25	.023			80
158 - 165' All core lost, tube did not lock.		minor		S	"	"		174' 1' shatter & gouge	"	157' 1/2" @ 50°		160	170	19062	.61	.001			50
165 - 197' Intense chlorite & argillic-ser. alteration. Rock texture obscured by bleaching, alt. & leaching of mafics. Weak fracturing with many calcite veins 5-10/ft.	173' heavy MoS <sub>2</sub>	Diss. Cpy		"	"	"		178' 3" gouge	20-30°	170' 6" Qtz-MoS <sub>2</sub> Flood. @ 10°		170	180	19063	.90	.001			95
195' GUICHON QUARTZ DIORITE		"		"	"			190'	"			180	190	19064	.02	Tr.			98
204 - 230' Badly faulted and shattered Guichon with alteration zones above the larger fault zones.	195' MoS <sub>2</sub>			S -W	M -S		5%	2" sill gouge 10' & 50'	weak 2/ft @ 20, 50'	192' 1' Qtz @ 55', MoS <sub>2</sub>		190	200	19065	.52	.01			"
				W -S	S			700' shear @ 80'	strong shatt. 40' 85'	196' 1/4" @ 40' & 65', MoS <sub>2</sub>		200	210	19066	.06	.002			80
				W -M	M 40%	W		10' 4" gouge 15'	50° & 60°	209' 1/4" @ 45° MoS <sub>2</sub>		210	220	19067	.01	.001			75
				M	S			213' shatter gouge 40' 70'	15-30°			220	230	19068	.01	Tr.			50
				W	M 40%			238' shear @ 45'	60° 30°			230	240	19069	"	"			90
				W	M			248' shear @ 40°	Mod. 4/ft			240	250	19070	.01	"			95

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 3

Property Bethlehem

Hole No. BS 77-3

Logged by J. Bellamy

Date September 22

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recover
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
Fractures are chl. healed with occasional weak zeolite veining @ 80°.				W	W		10%		11, 10° 30-40° 75-80°			250	260	19071	.01	Tr.			30
Mafics mainly subhedral-euhedral hornblende laths. Rock weakly magnetic.				W	M 65%		10%		20° 80-90° 4/ft.			260	270	19072	"	"			95
Moderate emerald green sercite alteration adjacent fine chl. healed 60° fracture sets. Good Guichon texture. No visible sulphides.				VW	W 30%		"	shears @ 75°	30-40° 50° 80°			270	280	19073	"	"			98
				W-M 35%	"		20%		sets 60° weak			280	290	19074	"	"			"
				VW	"		15%		30° 40° 70°			290	300	19075	"	"			"
304 - 310' 1" xenoliths in the Guichon.				VW	W 5%				VW 1-2 ft 20° 50 & 60°			300	310	19076	"	"			90
				"	"	W on frag.			"			310	320	19077	"	"			100
				<5'	"				50' major 55° 70°			320	330	19078	"	"			100
				W	"				30-40°		Ca. zeol on 85° fract.	330	340	19079	.02	"			"
30° fracture sets chl. healed; visible magnetite in mafics.					"		<5%		4/ft 30°			340	350	19080	"	"			"
					W 10%				30° 55° ch healed			350	360	19081	.05	.001			"
				W	W- 35%				367' " shears 70-80° 90°			360	370	19082	.07	Tr.			"
Zeolite staining and flooding near calcite veins. Strong chl. on fractures.				W	M 50%		10%	381' 5" shears	Chl. M 5-7/ft shears			370	380	19083	.14	.001			95

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 4

Property Bethlehem

Hole No. B.S. 77-3

Logged by J. Bellamy

Date September 23, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Otz. Veining	Aplitic Veins								
Heavy alteration near 80-90°, faulting & low angle shear planes 15-30°.				M-S	S			390' 4" shear @ 50°	12/ft 30°			380	390	19084	.11	.015			95
389' 1/4" MoS <sub>2</sub> shear @ 15°.		396.6' MoS <sub>2</sub>		S-M	S		15%	394.5' 2" shat @ 40°	8/ft 55°		399' 1/2" @ 35°	390	400	19085	.26	.001			90
389-400' Shattered with gouge. Minor cpy. diss. in mafics. Bn on fractures. Mafics chloritized near chl healed fractures & ca-zeol veining. 2 - 3 calc.-zeolite veins/foot.		Dis. Cpy 1:10		W	M		20%	407' 85°	Mod. 70° 85-90°			400	410	19086	.02	"			95
				W	M		20%	418' 1" shatter @ 85-90°	70° 85-90°		420' 1/2" veins @ 70°	410	420	19087	.01	Tr.			"
				W	M	W-M on frac.			50° 80°			420	430	19088	"	"			"
Strong 15-30° fracture sets - chl. healed.		weak dis. cpy		W-M				434' 1 1/2" shatter @ 30°	15-20° frac ss @ 55°			430	440	19089	.04	"			"
446' 2' heavy ep. with 85° fracturing & calc. zeolite veining.		cpy on frac		W		W-M		450-85°	30°, 50° major, 85-90°		452' 1/4" @ 30° MoS <sub>2</sub>	440	450	19090	.037	"			"
		452' Diss MoS <sub>2</sub>		W	M		15%	458' shearing @ 65-75°	40° 65°			450	460	19091	1.06	.002			"
		470' "		W	M				50° 80-90°			460	470	19092	.205	Tr.			"
470 - 479' Strong fracturing @ 40° & 50°.		470' Bn MoS <sub>2</sub>		W-M	M		20%	470' 1' gouge @ 25°	1/4" 40° 55°		472' 10" vein @ 40°	470	480	19093	.75	.007			"
478.5 - 509.5' QUARTZ FELDSPAR PORPHYRY DYKE. Quartz, large anhedral-subhedral eyes to 1 cm. 20-25%. K-feldspar 5-10% subhedral.		471' 1/4" MoS <sub>2</sub>		W-M	M		40%		75° 30°		40° zeolite veins	480	490	19094	.105	.001			"
Feldspars - sub-euhedral plar. phases 4-8 at 70%. Mafics partly chloritized & epidotized, anhedral amphiboles and subhedral biotites,				W-M	M	M in 30°		479' shatter	strong 25-30°		75-30° zeols. @ 70° 30°	490	500	19095	.130	.002			90
509-511' strong low angle faulting		Bn		M-S	S		75%	509-50' gouge	strong shatter			500	510	19096	.042	.006			90

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No.5

Property Bethlehem

Hole No. B.S. 77-3

Logged by J. Bellamy

Date September 24, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spor	Faults	Fractures	Qtz. Veining	Aplitic Veins								
feldspars. Minor Bn in mafics. Groundmass 5% K-feldspar, quartz, hornblende.				I-W	S	M in surface		512-14 gouge 35-40°	strong 30°			510	520	19097	.018	.007			85
499 - 516' Intense shattering with sections of gouge - strong ser. alteration.		weak Cpy.			M	60%	"	shattering 80-90°	weak 50°			520	530	19098	.044	.001			98
539' Percentage of aphanitic grey-green matrix increases.		536' MoS <sub>2</sub> @ 60%		"	"	"	"	shattering 70-75°	weak			530	540	19099	.104	.002			"
545' Matrix 20%+. Fractures calcite healed.				W	"	on frac.		"	weak			540	550	19100	.052	.001			"
549.5' GUICHON QUARTZ DIORITE - sharp contact ~ 50°.				W-M	S	70%		553' 4' gouge 20, 50°	weak 40° 50°		552' 1' @ 40°	550	560	19101	.133	.006			"
552' 1' shattered aplitic dyke.		562' minor dis cpy		W	W	40%			"			560	570	19102	.084	"			"
Calcite or ca-zeolites healing steep fractures. Ep-chl. on vein margin. Some zeolite flooding near veins.				W-M	M	on frac.	15%	shears @ 75° 90°	" 75-90°			570	580	19103	.049	.001			98
				-	<5%				WV 100° 50°			580	590	19104	.042	.001			100
					"				"			590	600	19105	.020	"			"
				W	W	25%	W on frac.	minor shattering @ 80-90°	weak 15, 35°			600	610	19106	.021	Tr.			"
				W	W	20%	W		30° 55° weak			610	620	19107	.016	.001			"
622 - 627' Strong sericite alteration due to faulting.		627' minor Bn		W-M	S	S	W	622-27 gouge 30°	627' 30° 40° 65-70°	627' 2" quartz 30°		620	630	19108	.085	.007			98
		635' minor Bn ch		W	W	35%		635' " gouge 30°	"			630	640	19109	.067	.003			"

iract.

MoS<sub>2</sub>

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No.6

Property Bethlehem

Hole No. BS 77-3

Logged by J. Bellamy

Date September 26, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep.	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
645' 2" coarse granular quartz in chl-ep-hematite-sericite matrix adjacent MoS <sub>2</sub> healed shear at 30° to CA.				W	W 20%	W on frac.	5%	645' 1" gouge	Weak 40° 50° 65°			640	650	19110	.056	.035			100
No zeolites - fractures chl-healed.				W	"				weak 40-50° 2-3/ft			650	660	19111	.037	.001			"
671 - 673' 1/2" alteration halo around 85°.					"			671' 85° cc-healed shear	weak 30° 50-55°			660	670	19112	.012	Tr.			"
Calcite-chl-ser healed shear.				W	W 15%				"			670	680	19113	.022	.001			"
685' 1/4" calc-zeolite vein with 1/2" chl-ep-ser alteration halo @ 45° to CA. No visible mineralization.				W	W 15-20%	M on frac.		680' shear @ 40° chl-ep-ser cc.	"			680	690	19114	.062	"			"
				W	W				W 30° 45° 55°	ze-ep veing @ 75°		690	700	19115	.007	Tr.			"
				W	W 30%	M on frac.		706' 4" gouge @ 40°	35°-40° 55°			700	710	19116	.004	.001			98
Emerald green sericite adjacent steep shears ~ 85°.				W-M	M on frac.			712' 3" gouge 30°	S 85-90° 25° 35°			710	720	19117	.009	"			95
Bright orange and orange-pink zeolites on steep fractures.				W	W 20%	W on frac.	5%		weak 35° major 50° 3/ft	zeolites 85-90°		720	730	19118	.010	Tr.			100
				W	W 30%	W on frac.		735' 35° shears	35°			730	740	19119	.005	"			95
Casing removed				W	W 25%				weak 4-5/ft 20-30° 45°	740' ze veing 55-60°		740	747	19120	.029	.003			98
Actual depth 735.7'												END	OF	HOLE					



DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 2

Property Sheba

Hole No. BS-77-4

Logged by J. Bellamy

Date September 29, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep.	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
Quartz unaltered - 15% biotites altered to muscovite. K-feldspar cut by quartz-cal. veins.		20 <sup>o</sup> on shears		S	chl to ser		<40%	shatt. 55 <sup>o</sup> , 90 <sup>o</sup> shears	Mod 20-30 <sup>o</sup> 40 <sup>o</sup>	3" veins @ 40' w/		120	130	19131	.05	.001			95
133 - 135' Weakly altered Guichon		20 <sup>o</sup> Hem.		S	M-S		15%		"	calc. 136' @ 60'		130	140	19132	.07	Tr.			98
135 - 142' Guichon alt. - bleached, & mafics ser. & leached. Rock non magnetic.				W	W-M			143' 2" shatt. 148' 1'	Weak 20 <sup>o</sup> 30 <sup>o</sup> 65 <sup>o</sup>			140	150	19133	.06	Tr.			95
142 - 148' Fresh Guichon				W-M	M			gouge	55 <sup>o</sup> 90 <sup>o</sup>			150	160	19134	.04	.001			"
148 - 150' 2' chl-ser gouge.				W-M	M	70%													
150 - 179' Sections of strong K-feldspar flooding Zenoliths in Guichon. K-feldspar unaltered.				W	W	30%	50%	169' 2' gouge	Weak 40 <sup>o</sup> 3-4/ft			160	170	19135	.01	Tr.			98
179 - 245' Very fresh quartz diorite with Qtz. aplite veins @ 50 <sup>o</sup> -55 <sup>o</sup> . Most fractures zeolite healed.				W-M	M	40%		174' 2" @ 10 <sup>o</sup>	80 <sup>o</sup> 40 <sup>o</sup> 55 <sup>o</sup>			170	180	19136	.06	Tr.			"
				WV	W	<5%		178' 1' gouge	W 30 <sup>o</sup> 45-50 <sup>o</sup> WV			180	190	19137	.02	Tr.			100
							<5%		15 <sup>o</sup> 30-35 <sup>o</sup>		204' 3" @ 55 <sup>o</sup>	190	200	19138	.01	Tr.			"
							"		"		205' 1" @ 45 <sup>o</sup>	200	210	19139	.01	Tr.			"
				WV	W				15 <sup>o</sup> 55 <sup>o</sup>			210	220	19140	.02	Tr.			"
229 - 240' Mafics coarse grained possibly Chataway.				W	W	<20%	15%		30 <sup>o</sup> 50 <sup>o</sup>			220	230	19141	.01	Tr.			98
4" zeolite veins @ 35 <sup>o</sup> .				W	W-M		5%	shears @ 90 <sup>o</sup>	weak 30 <sup>o</sup> 50 <sup>o</sup>		236' 1" @ 45 <sup>o</sup>	230	240	19142	.01	Tr.			85
				W	W				"			240	250	19143	.01	Tr.			98

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No.3

Property Sheba

Hole No. BS-77-4

Logged by J. Bellamy

Date October 3, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep.	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
250 - 326' Coarse grained granodiorite possibly Chataway ~279' very coarse grained mafics. Hornblende:biotite 2:1 Strong 1/2" calc-zeolite veins @ 40°.				W	W		10%	150' 1' gouge 10S	30° 60°		258' 2" @ 55°	250	260	19144	.07	.005			90
				W	W		20%	262' 2" gouge	30-35°			260	270	19145	.02	.001			98
				W	W	W in zeolites	10%		weak 30-35° 50°			270	280	19146	.01	Tr.			"
				V	W	W on	15%		30-35° 60°			280	290	19147	Tr.	.001			"
307 - 312' Heavy K-feldspar flooding. Strong chl. with Bn & MoS <sub>2</sub> . Most fractures zeolite healed.				W	M	M on	15%		4-6/ft 30° 40° 55°			290	300	19148	.15	Tr.			"
		300' MoS <sub>2</sub>		W	40%	W		308' 2' chatter gouge	"			300	310	19149	Tr.	.003			"
326 - 340' Strong chl alteration, M-S sericite, heavy epidote, hematite staining & Bn-MoS <sub>2</sub> on fine quartz healed fractures.		MoS <sub>2</sub> Bn. 2		W	20%	W			weak 0° 40° 55°		314' 6" @ 40°	310	320	19150	.13	Tr.			"
		"	326	W	"	W	10%	329' 1' gouge MoS <sub>2</sub>	mod. 20-30° 55°			320	330	19151	.38	.003			"
340 - 342' Weakly altered granodiorite.		minor dis. Bn		W	M	M	"	90' shears chl-ca	strong 45-55°			330	340	19152	.10	.001			"
342 - 354' Heavily fractured & W-M propylitic alteration. Fracture sets @ 25-40°.		Disse. MoS <sub>2</sub>		W	M	W	15%	healed	strong 30° 20° 55°			340	350	19153	.23	Tr.			95
354 - 366' Weakly altered.				W	M	W	10%	352' 2' shatte	20-30° 65-75°			350	360	19154	.11	Tr.			"
366 - 416' Altered near shattered sections - zeolites on 15-25° fracture but otherwise is weakly altered.				W	M	W		35' chl shears	weak 20° 55°		356'	360	370	19155	Tr.	Tr.			"
		377' MoS <sub>2</sub>		W	M	M on		376' 2' shatte	strong 40° 15-25°		372' 35° 6" Qtz.	370	380	19156	"	"			"

fracts.

major

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 4

Property Sheba

Hole No. RS-77-4

Logged by J. Bellamy

Date October 3, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spor	Faults	Fractures	Qtz. Veining	Aplitic Veins								
				W	W 35%	M	5%		weak 30-40°			380	390	19157	Tr.	Tr.			98
Zeolite veining @ 20-35° 4/ft. Rock texture a coarse Guichon.				W	"	M		402' 2' shatter	weak 20-35° 50°			390	400	19158					"
				W-M	M 15%	M			M-S 20° 55°			400	410	19159					85
416 - 444' Strong shattering with sections of gouge. M alteration, most fractures unhealed except for a cal-chl. healed set at 55-60° & calcite @ 20°.				W	W 30%	M on frac.		417' 4" gouge 30°	15-25° 40°			410	420	19160					90
				W	S 20%	M on frac.		428' 6" gouge 55°	strong 30° 40°			420	430	19161					95
439' Zeolite flooding of groundmass.				W	M 15%	"		S shat. 437' 2" gouge 90°	20° 50° 90°			430	440	19162	↓				90
444 - 452' Intense shattering.				M	S 90%	"		441' 1" shear @ 40° 70°	40° 50° 70°			440	450	19163	.05				85
464 - 467' Shattered & altered granodiorite.				W-M	W-M 40%	M on frac.		452' 454' shear 15-20°	452' mod. 15-20°			450	460	19164	Tr.				90
467 - 513' Weakly altered but finely shattered Guichon. Calcite on the steep shatter zones calc-zeolites with chl-ep alteration halos on shallow 10-35° fracture sets. These later fractures & shatters cut quartz-aplite veins				W	W 30%	"		440' 464' 4" shatter	mod. 30° 45°	467' 1" @ 30°		460	470	19165					95
				W	W 25%				mod. 15-25° 40-65°			470	480	19166					"
				W	W 15%				weak 25-35° 50°			480	490	19167					98
				W	W	W-M		shat. 485' 60° 4/ft	15° 35° 45°	490' 1" @ 80° 1/2-2 1/2"		490	500	19168	↓				"
				W	W 60%	W		402' 1" gouge	mod. 2-9/ft 150°			500	510	19169	.06	↓			95

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 5

Property Sheba

Hole No. B S-77-4

Logged by J. Bellamy

Date October 4, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
513 - 522' Very strong faulting & shearing		516' 3" MoS <sub>2</sub> @ 10'	32	W-	S	W-		513-22'	strong shatt.			510	520	19170	.04	Tr.			90
513 - 549' Mod-strong chl alteration, K-felds & zeolite flooding. Heavy chl epidote on fractures & zeolite veining. Bn associated with stronger chloritization & chl-ep veins. MoS <sub>2</sub> associated w/ ser-chl gouge zones.		522' Dis. Bn		W-	S	M		1' gouge	strong MoS <sub>2</sub> shears			520	530	19171	.22	↓			95
Mafics very coarse grained - weakly poikilitic Ep-ser halos around calcite veins. Some late stage quartz veining-cutting zeolite flooding.		538' Bn		W	M	M	5-10'	45' & 80'	mod 25-35° 75° w/ chl.			530	540	19172	.13	↓			98
549 - 561' Rock - coarse grained.				W-	S	S	10-20%		chl.	zeolites	20-35°	540	550	19173	Tr.	.001			"
561 - 564' Fault - possibly related to aplitic veining, 561' 1' cal-ser-kaolin healed breccia.				W	W	M		561' 1' weak breccia cal.	20° & 35° 40°			550	560	19174	Tr.	Tr.			"
564 - 593' Fine grained mod. fractured qtz-diorite. Mod. zeolite flooding cal-ep veining. Chl-ep veining.				M	S	S	10%	564' 1' gouge	10° 55° 35°	564' Ep veins	1/2" @ 35°	560	570	19175	.04	.001			90
592 - 607' Mafics coarse grained. S K-spar flooding, S chl-ep veining with ser-chl-ep-hem alteration.		570' MoS <sub>2</sub> Bn		W	M	M		ca, chl ep.	mod. 15-20° 45°			570	580	19176	Tr.	Tr.			95
607-632' Mod-grained, calcite veined chl & ep veins, weak fractures.		frac.		W	M	E			mod. 4/ ft. 20- 25° 35°	584' 1/2" @ 45°		580	590	19177	"	"			98
632 - 641' Strong shattering, cal-ep veining-zeolite flooding and veining.				M-	S	S		602' 2' gouge	10° 25° 45° 55°			590	600	19178	"	.004			"
		Hem.		S-	S-	M		305' 1' strong gouge				600	610	19179	.04	.001			95
				W	M	Dis	30%	25' shear	weak 15° 30-40°			610	620	19180	Tr.	Tr.			98
				W-	M	M		630' shatter	mod. 10° 40°			620	630	19181	"	"			"
				M	S	M		635-41' shatter	strong 25-30° 40°			630	640	19182	"	"			90

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 6

Property Sheba

Hole No. BS-77-4

Logged by J. Bellamy

Date October 4, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
641 - 683' Quartz feldspar porphyry dyke.				W-M	S	S	20%	641' 3" strong gouge	M 30° S 40°			640	650	19183	Tr.	Tr.			90
641 - 650' Large, subhedral quartz & plagioclase phenos. in an aphanitic grey-green groundmass (20%). Mafics < 5% epidotized.				W	S	S	80%	656' 2" gouge	40° 60°			650	660	19184					95
Dyke shattered & ca-ep or calc-zeolite healed.		NVM		W	S	S	"	strong shattering	M 30° S 50° 60°			660	670	19185					90
670 - 676' Aplitic groundmass (5% orthoclase phenos-90% (possibly stained plag.)				W-S	S	S	"	60' & 90' "	S 25° 40°			670	680	19186					85
15% large qtz phenos - strong shattering. Strong mafic replacement by chl-ep.				W-M	S-W	S-M	15%	9" gouge	S 15-20° 50° 60°			680	690	19187					90
676-682' Grey green aphanitic matrix to 20%. Feldspars plagioclase.				W	M-S	S	"	shattered cal. healed	S 15-20° 50° 40°			690	700	19188		↓			95
682' 1' chilled aplitite margin.				M	"	frac.	15%	706-19' strong shattering	"			700	710	19189		.001			90
683' CHATAWAY GRANODIORITE				W	M	M on frac.	"	711' "	30-35° 50°		710' zeolite veins	710	720	19190		Tr.			85
683 - 706' Chl-ep healed fracture sets.				W	M	M on frac.	"	90' shears	10° 35-40° 65°		721' 1/2" @ 30°	720	730	19191		Tr.			95
719' Most K-feldspar secondary flooding adjacent fine micro fractures - qtz-ep & younger cal veins cut quartz-K-feldspar veinlets.				W	"	"	20%	"	"			730	740	19192		Tr.			90
		minor Bn		W	"	"	25%	4/ft	10° 45° 60°	1/16" @ 45° 70°	750' 1/2" @ 10° qtz-K-feld.	740	750	19193	✓	Tr.			95
		755' MoS <sub>2</sub>		W-M	M	"	15%	strong	15-20° 50°			750	760	19194	.09	.001			90
				W	M	"	10%	767' - 770' battered	M 15-20° 50-55°			760	770	19195	.01	.001			95

DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 7

Property Sheba

Hole No. BS-77-4

Logged by J. Bellamy

Date October 6, 1977

DESCRIPTION	SULPHIDES			ALTERATION				STRUCTURE		OTHERS		From	To	Sample No.	%Cu	%Mo			% Recovery
	Py: Cp	Bn: Cp	% Py	Ser.	Chl.	Ep.	K-spar	Faults	Fractures	Qtz. Veining	Aplitic Veins								
Alteration associated with structure.				M	M 50%	W	15%	775-775° 50° shear	strong 35-40° 0° 15°			770	780	19196	Tr.	.001			98
796 - 811' Zeolite staining or iron staining of feldspars masks amount of K-feldspar.		minor cp		W	M 50%	M on frac.	"	779-80° 783-85°				780	790	19197					"
				W	W-M	M dis.	20%	shears 65°	weak 0° 50° 35°			790	800	19198					"
				W	W-M 40%	"	25%	shears 75°	30° 50° 60°			800	810	19199					95
				W	W	M on frac.		814' 1° shatter	mod. "			810	820	19200					80
				W	W	"		819'	weak 30 40° 55-60°			820	830	19201		Tr.			95
				W	"	"		838-47° shatter 839' 1'	"			830	840	19202	.02	.001			"
Quartz-chl-ep-hem on 55° fracture sets.				W	"	"		gouge 839' 1'	strong 30° 40° 55-60°			840	850	19203	.02	.001			60
853 - 862' Strong shattering of the granodiorite due to steep fracturing - unhealed, chl-hem-ep on 60-80° fracture sets.				W	M 30%	W	15%	852' 1° shatter 90°	"		855' 1° @ 35° qtz-K-spar	850	860	19204	.02	.001			90
862 - 867' Heavy K-feldspar flooding. Heavy alteration - quartz-ser-chl around qtz-K-spar aplite veins. Hem-chl-ep on steep frac. sets.				W	"	W	40%	859' gouge on 60°	mod. 25° 40 80°		867' 2° @ 25°	860	870	19205	.02	.001			95
872 - 889' K-feldspar flooding increases. Heavy hematite on fractures and shears				W	"	M on frac.	"	shears 70-75° shears	"		875' 2° @ 40°	870	880	19206	.02	.001			98
882 - 884' Breccia - chl-ep ser healed.				M	S 40%	S on frac.	75%	shears @ 25°	strong 40°			880	890	19207	.07	.001			98
All casing pulled out. Actual Total Depth - 875'								885-90° 329'											

1' gouge

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**L. W. Saleken**  
Geologist

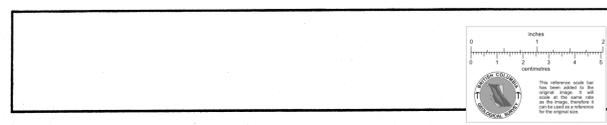
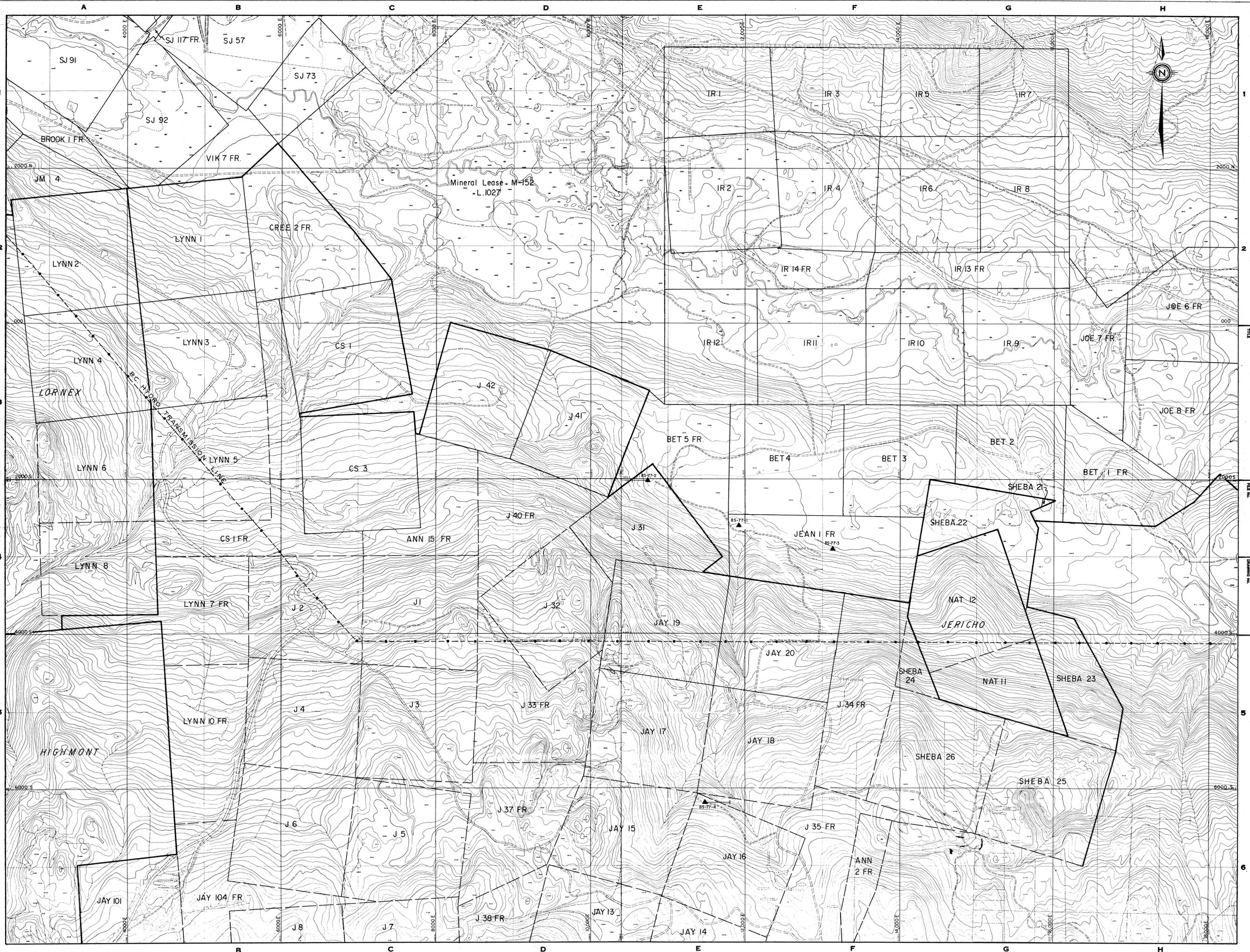
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**geotec**

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DATE REVISION	BY	DEPT. - EXPLORATION
		DRAWN BY - Allott / m.k.
		CHECKED - E.A.
		APPROVED -
		DATE - JUNE / 1977
		SCALE - 1" = 400' or 1:4800

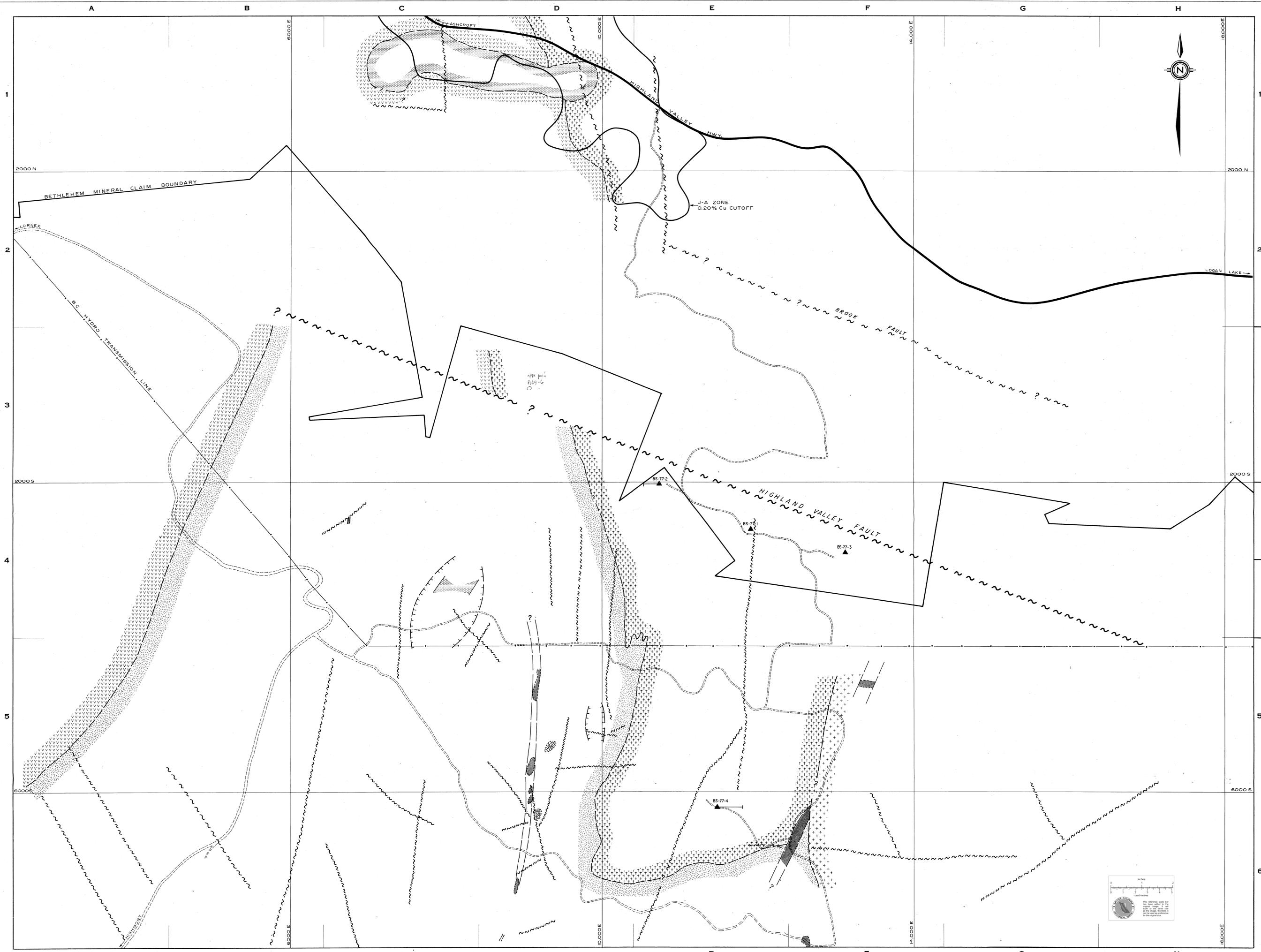
**Bethlehem  
Copper**

YAKUVEE BRITISH COLUMBIA

TITLE - BETHLEHEM / SHEBA DRILL PROGRAM  
MINERAL CLAIMS

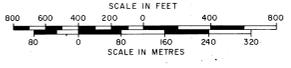
FILE NUMBER -

DRAWING NUMBER - BS-77-3



**LEGEND**

- |   |   |   |   |
|---|---|---|---|
| <ul style="list-style-type: none"> <li> GUICHON CREEK BATHOLITH</li> <li> BETHSAIDA PHASE</li> <li> QUARTZ FELDSPAR PORPHYRY DYKES</li> </ul> | <ul style="list-style-type: none"> <li> SKEENA VARIETY</li> <li> BETHLEHEM PHASE</li> </ul> | <ul style="list-style-type: none"> <li> HIGHLAND VALLEY PHASE</li> <li> GUICHON VARIETY</li> <li> CHATAWAY VARIETY</li> </ul> | <ul style="list-style-type: none"> <li> AREA WITH VEIN BRECCIAS</li> <li> AREA WITH NUMEROUS DYKES</li> <li> CONTACT-INFERRED</li> <li> FAULT - INFERRED</li> </ul> |
|---|---|---|---|



DATE REVISED	BY	DEPT. - EXPLORATION
Nov. 1977	J.R. Bellomy	DRAWN BY - A.H.G./M.K.
		CHECKED - E.A.
		APPROVED -
		DATE - NOV. 1977
		SCALE - 1" = 400' or 1:4800



TITLE - BETHLEHEM / SHEBA DRILL PROGRAM GEOLOGIC PLAN	
FILE NUMBER -	DRAWING NUMBER - BS-77-5