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NTS

VARITECH RESOURCES LTD.

821264

Trading Symbol VSE: VAR

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ARC RESOURCE GROUP

BIG ONION JOINT VENTURE

Varitech Resources Ltd. is seeking a partner for the Big Onion project which is jointly owned with Sawyer & Associates of Vancouver, B.C.

The Big Onion Cu-Mo property, located in northern B.C., contains a combined hypogene and supergene deposit of 80 to 100 million tons grading 0.42% copper and 0.20% molybdenite.

There are several other targets adjacent to the deposit and elsewhere on the property indicated by rock and soil geochemistry and geophysical surveys which should contribute significantly to the above tonnage figure.

The enclosed information package on the Big Onion property includes:

i) a drilling report by E. McCrossan (1991),
ii) a regional geology map, table 2, and cross sections from E. McCrossan (1991),
iii) a table of drilling to December 31, 1976 by C.J. Sampson (1991),
iv) tables itemizing sectional reserve estimates by Canadian Superior Exploration Ltd. (Stock, 1977),
v) a summary of diamond drill hole results by G. Stock (1977),
vi) a summary of percussion drill hole results by G. Stock (1977),
vii) a comparison of percussion and diamond drilling assay results by G. Stock (1977),
viii) a paper by Dr. M.J.V. Beattie entitled the Cathode Copper Potential of the Big Onion Deposit (1991), and
ix) a report on the Preliminary Metallurgical Test Work for the Big Onion Deposit by Beattie (1991).

Supergene intersections during the 1991 diamond drilling program included 360 ft. grading 0.55% Cu, 310 ft. of 0.63% Cu and 120 ft. of 0.69% Cu.

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Further exploration work, with diamond drilling, is recommended for the Big Onion property to:

i) assess the SX-EW potential of the deposit,
ii) increase the ore reserves of the known mineralized zones,
iii) test for a fault displaced southern continuation of the deposit, and
iv) explore for other mineralized zones in the southwestern portion of the claim group.

We do not expect to retain a Net Smelter or Net Profit Interest and have composed a simple cash payments and expenditures schedule as follows:

Year	Payments	Expenditures	Interest Earned
1992	$ 25,000	$100,000	25%
1993	25,000	400,000	25%
1994	25,000		
1995	25,000		
1996	50,000		
1997	50,000		
1998	50,000		
1999	50,000		
2000	100,000		
2001	100,000		
	$500,000	$500,000	50%

Partial substitution of stock for cash would be considered.

If you have any questions or would like to view the detailed data call (604) 685-9700 or fax (604) 685-9744.

Sincerely,

VARITECH RESOURCES LTD.

Ed McCrossan F.G.A.C., P. Geo.

DRILLING REPORT

on the

BIG ONION PROPERTY

including the

LISA 1, LISA 5 and LISA 7

CLAIM GROUPS

OMINECA MINING DIVISION

NTS 93L/15W

48°48'N, 126°55'W

for

VARITECH RESOURCES LTD.

by

Ed McCrossan, F.G.A.C., P.Geo.

dated

November 29, 1991

Summary

The Big Onion property consists of the Lisa 1, Lisa 5 and Lisa 7 claim groups which are located approximately 16 km east - northeast of Smithers, B.C. and 50 km southwest of the Noranda Minerals Inc. Bell and Granisle deposits. Year round access to the property is along the well-maintained Babine Lake Road.

The Big Onion deposit, which consists of the Northeast, North and South Zones, is a calcalkaline Cu-Mo porphyry which also contains anomalous quantities of gold and silver. Potential reserves for the deposit, calculated by Canadian Superior Exploration Ltd. in the 1970's, are 80 to 100 million tons grading 0.42% copper and 0.020% molybdenite.

On the property, Hazelton volcanics and sediments of Jurassic age have been intruded by quartz feldspar and quartz diorite porphyries of late Cretaceous to early Tertiary age. Hypogene mineralization, consisting predominantly of chalcopyrite, is associated with the intrusions that were localized by northeast trending structures. Intense phyllic and propylitic alteration assemblages surround the deposit which has also undergone supergene (chalcocite) enrichment.

The 1991 diamond drilling program carried out on the Big Onion property by Varitech Resources Ltd. consisted of eight vertical holes of HQ diameter core totalling 5,562 ft. (1,696 m). It was successful in outlining supergene development in the North and South Zones, as well as, testing the depth of hypogene mineralization.

Supergene intersections were as much as 360 ft. grading 0.55% Cu and 0.02% MoS2. Other noteable intersections included 310 ft. of 0.63% Cu and 120 ft. of 0.69% Cu. The highest supergene assay was 1.57% Cu over 10 ft. and a total of twelve samples (10ft in length) taken from the supergene zone contained greater than 0.9% Cu. Precious metal results for the supergene material averaged 0.064 g/t Au and 1.0 g/t Ag. The best assay for gold was 0.305 g/t and for silver was 2.9 g/t over 10 ft. sample intervals.

Hypogene intersections were up to 480 ft. grading 0.27% Cu. Other notable intersections included 350 ft. of 0.27% Cu and 443 ft. of 0.23% Cu. Two holes were terminated within hypogene mineralization at depths of 733 and 750 ft.

Reserves of approximately 2 million tons grading 0.32% Cu and 0.013% MoS2 (0.25% Cu cut-off grade) were added to the known reserves of the Big Onion deposit by the 1991 drilling program. A supergene reserve estimate of 35 million tons grading 0.34% Cu was also made using both historical and current drill log data.

Further exploration work, including diamond drilling, is recommended for the Big Onion property to:

i) assess the SX-EW potential of the Big Onion supergene mineralization,
ii) increase the ore reserves of the known mineralized zones,
iii) test for a fault displaced southern continuation of the deposit, and
iv) explore for other mineralized zones in the southwestern portion of the claims.

There are three excellent targets adjacent to the main orebody, indicated by rock geochemistry and alteration anomalies, which should be drilled. These include the Northeast Zone, the area between the North and South Zones, and the Southwest target.

Another three areas of interest associated with significant structures and indicated by IP, aeromagnetic, rock geochemistry and/or rock alteration anomalies are located south of the main deposit in the southern half of the claim group. These anomalies should also be drill tested.

Finally, the entire southwestern portion of the claim block requires further exploration for the southern continuation of the orebody and other mineralized zones.

Preliminary metallurgical testing of the Big Onion supergene copper mineralization indicates that bacterial oxidation coupled with weak sulfuric acid leaching returns significant copper recoveries.

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Introduction

The Big Onion property consists of the Lisa 1, Lisa 5 and Lisa 7 claim groups which are located approximately 16 km east-northeast of Smithers, B.C. and 50 km southwest of the Noranda Minerals Inc. Bell and Granisle deposits.

The Bell Mine is a calcalkalic porphyry deposit which has produced approximately 65 million tons since 1972 from a reserve estimated at 116 million tonnes of 0.48% Cu and 0.35 g/t Au.

The Granisle Mine, another calcalkalic deposit, had a pre-production reserve estimate of 81 million tonnes grading 0.43% Cu, 0.13 g/t Au and 1.23 g/t Ag.

The Big Onion deposit which consists of the Northeast, North, and South Zones is also a calcalkalic porphyry and contains potential reserves of 80 to 100 million tons grading 0.42% copper and 0.020% molybdenite. Supergene material within the deposit averaged 0.064 g/t Au and 1.0 g/t Ag.

During 1991, Varitech Resources Ltd. diamond drilled 5,562 ft. (1,696 m.) of HQ diameter core to:

i) test for the possible upgrade of copper assays by using larger diameter core;
ii) test for the possible expansion of the orebody at depth;
iii) test for supergene copper mineralization and obtain material for metallurgical testing.

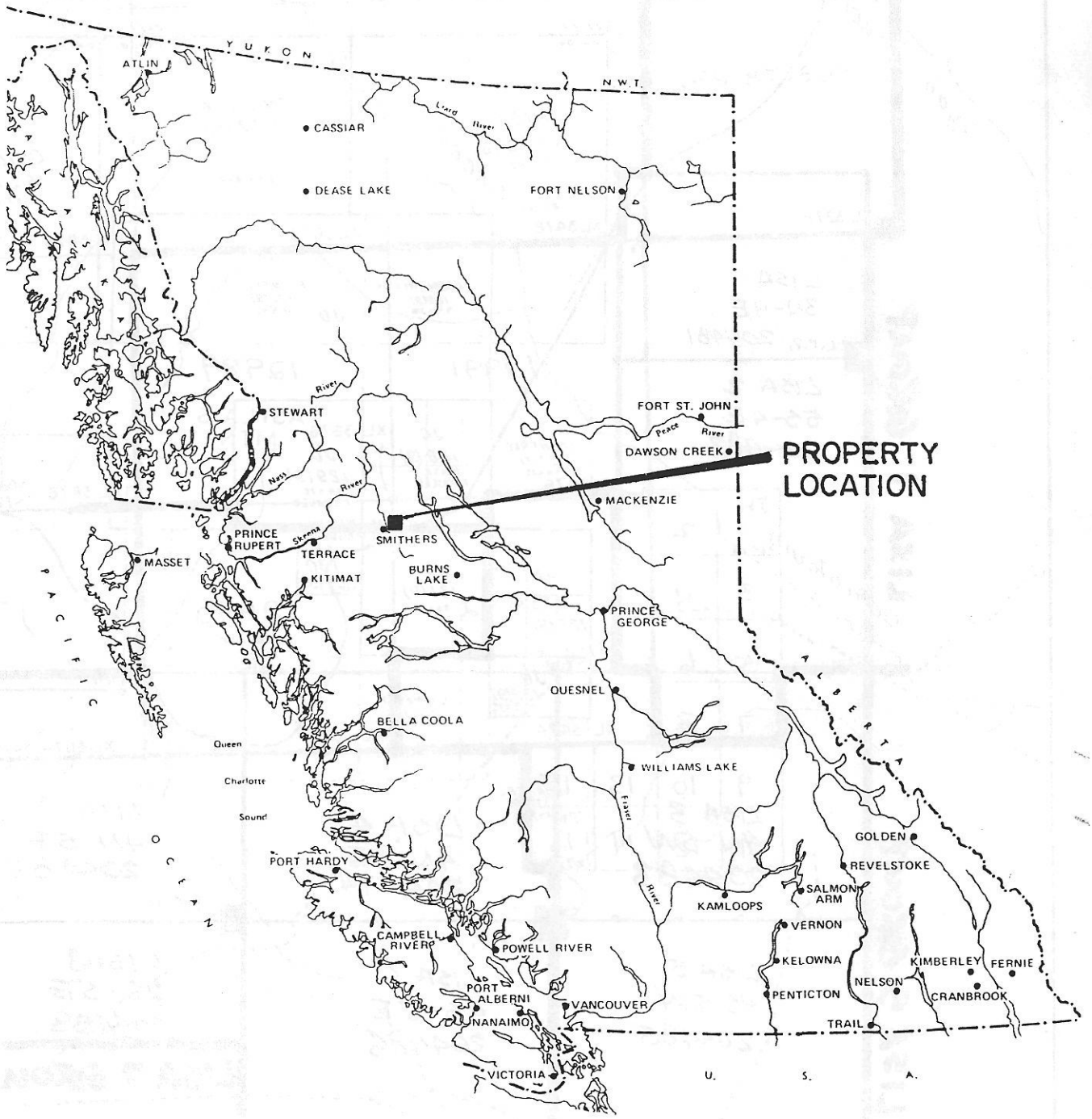
The Ministry of Energy, Mines and Petroleum Resources annual work approval number for the 1991 Big Onion Project is SMI91-0200273-288.

Location and Access

The Big Onion property is located at the southern end of the Babine Range approximately 16 km east-northeast of Smithers, B.C. (Figure 1).

Access to the property from Smithers is available along the well-maintained, all-weather Babine Lake gravel road which crosses the centre of the claims and continues northeast to Babine Lake.

The Big Onion copper deposit is situated on the southern flank of Astlais Mountain along Astlais Creek (Figure 3). A network of four wheel drive roads, developed during previous drilling programs, traverses up the creek valley and along the mineralized zones towards the top of Astlais Mountain to the northeast.



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VARITECH RESOURCES LTD.

BIG ONION PROJECT

LOCATION MAP

N.T.S. 93L-15W

OMINECA M.D., B.C.

0 100 200 400 KM.

Scale 1: 8,000,000	Date: August 1991
Drawn by: C.S.	Figure No.: 1

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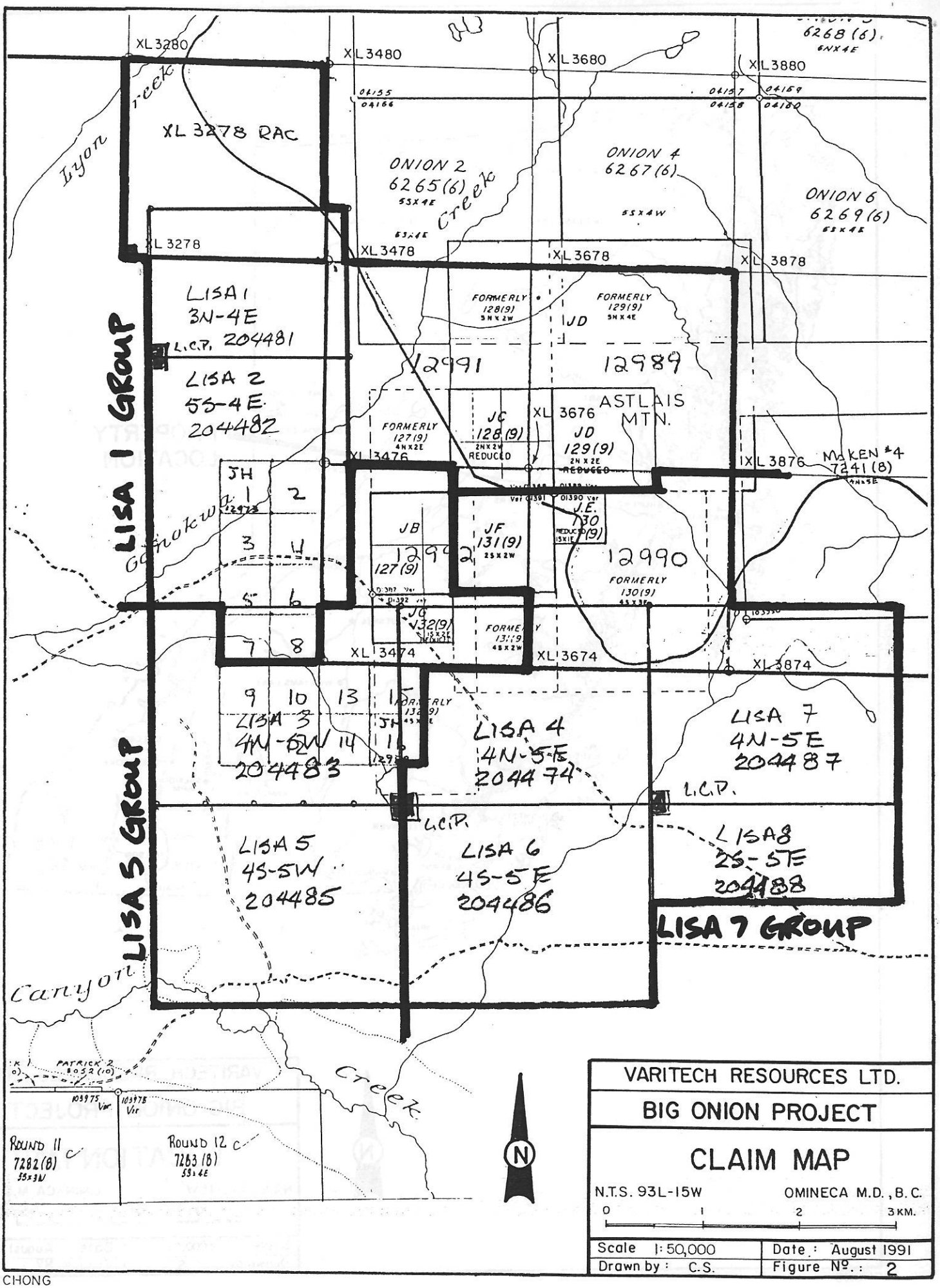

VARITECH RESOURCES LTD.	
BIG ONION PROJECT	
CLAIM MAP	
N.T.S. 93L-15W	OMINECA M.D., B.C.
0 1 2 3 KM.	
Scale 1:50,000	Date: August 1991
Drawn by: C.S.	Figure No.: 2

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Physiography and Climate

Topography on the Big Onion property varies from flat-lying swampy areas in the Canyon Creek valley, with an approximate elevation of 2,600 ft. (793 m.), to the alpine peaks and ridges of Astlais Mountain, which has an elevation of 6,041 ft. (1,840 m.).

Vegetation consists largely of mixed evergreen forest which has been logged by clear cutting along the foot of Astlais Mountain and burned by an old forest fire part way up the southern flanks.

Climate would be classified as cool temperate, with warm, dry summers and cold, snowy winters.

The main zones of copper mineralization within Astlais Creek valley are situated between 3,000 and 5,000 ft. (900 and 1,500 m.) in elevation and the majority of the orebody is located below the treeline which is at an elevation of 4,800 ft. (1,460 m.).

Claim Information

The Big Onion property consists of the Lisa 1, Lisa 5, and Lisa 7 claim groups which are currently held by Varitech Resources Ltd. under option agreements with Mindoro Corporation and Jack Hemelspeck Jr. The claims include 257 units covering 6,425 hectares in the Omineca Mining Division (Figure 2 and Table 1).

Table 1

Omineca Mining Division

Claim Name	Record #	# of Units	Expiry Date
JB	127	4	Sept. 18/94
JC	128	4	Sept. 18/94
JD	129	4	Sept. 18/94
JE	130	1	Sept. 18/94
JF	131	4	Sept. 18/94
JG	132	2	Sept. 18/94
JH 1-16	12973-12988	16	Feb. 16/94
XL3676 (RAC)	12989	16	Feb. 16/94
XL3674 (RAC)	12990	16	Feb. 16/94
XL3476 (RAC)	12991	16	Feb. 16/94

XL3474 (RAC)	12992	16	Feb. 16/94
XL3278 (RAC)	13223	16	Apr. 16/94
LISA 1	13214	12	Apr. 14/94
LISA 2	13215	20	Apr. 14/94
LISA 3	13216	20	Apr. 14/94
LISA 4	13217	20	Apr. 14/94
LISA 5	13218	20	Apr. 14/94
LISA 6	13219	20	Apr. 14/94
LISA 7	13220	20	Apr. 14/94
LISA 8	13221	10	Apr. 14/94

The Lisa 1 Group contains 96 units and includes the Lisa 1, Lisa 2, JC, JD, JH 1-8, XL3278, XL3476, and XL3676 claims.

The Lisa 5 Group contains 70 units and includes the Lisa 3, Lisa 5, JB, JG, JH 9-16, and XL3474 claims.

The Lisa 7 Group contains 91 units and includes the Lisa 4, Lisa 6, Lisa 7, Lisa 8, JE, JF, and XL3674 claims.

Exploration History

The original copper showings at the Big Onion property were discovered in 1917. In the early 1920's, two short adits were driven to test the North and South Zones.

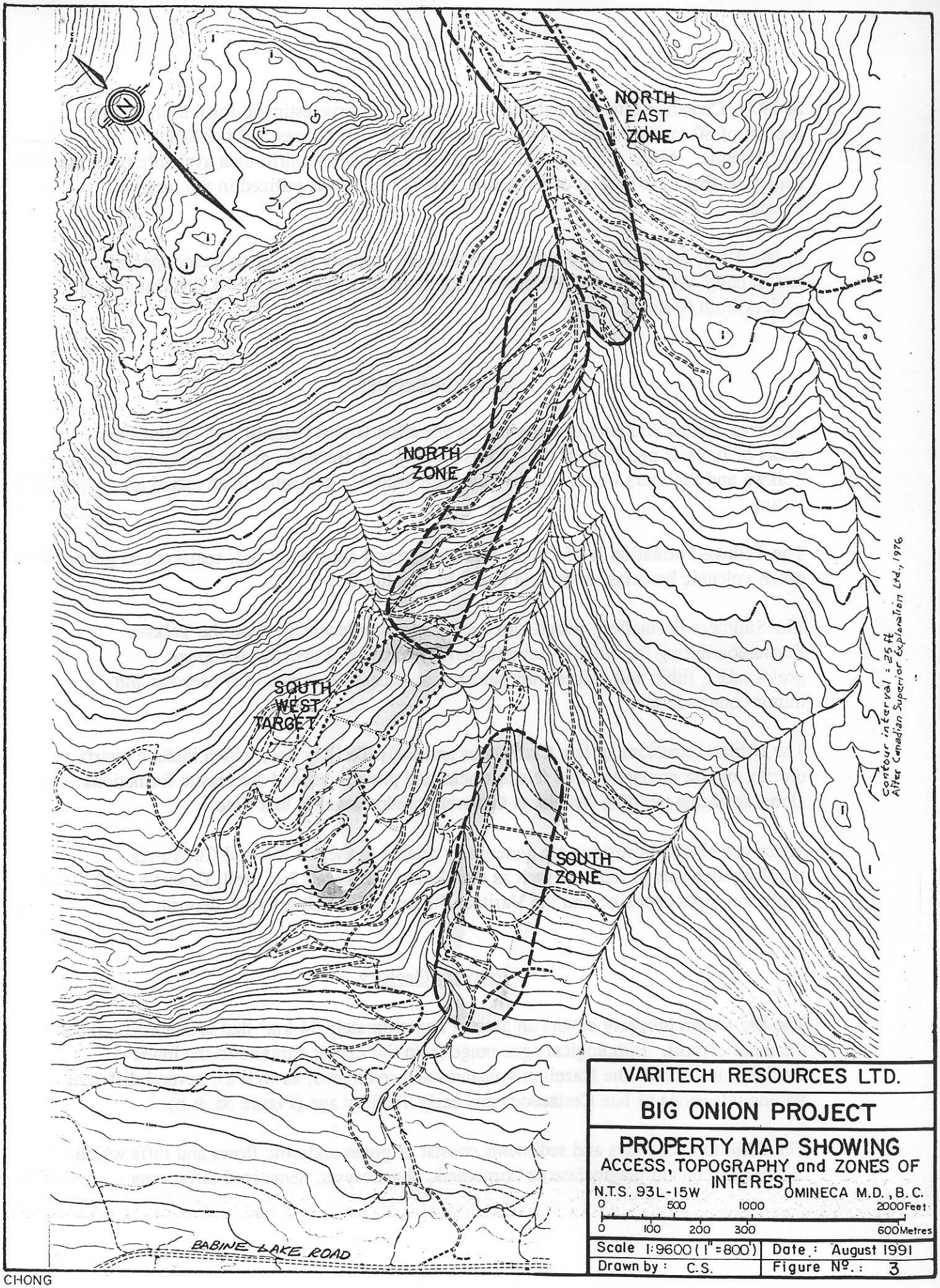
After that time, the property remained dormant until it was staked by Jack Hemelspeck Sr. in the early 1960's.

In 1964 and 1965, Noranda Exploration Co. Ltd. optioned the property and carried out mapping and sampling programs with limited geophysical surveying and 250 ft. (76 m.) of diamond drilling in two holes.

During 1966 and 1967, Texas Gulf Sulfur completed 3,993 ft. (1,217 m.) in 7 diamond drill holes as well as induced polarization and resistivity surveys.

In 1970 and 1971, Blue Rock-Cyprus Mining completed 24,134 ft. (7,358 m.) in 22 diamond drill holes.

From 1974 to 1977, Canadian Superior Exploration Ltd. extended geological and geophysical map coverage and drilled 16,410 ft. (5,003 m.) in 67 percussion holes (2" diameter) and10,029 ft. (3,058 m.) in 21 BQ diameter diamond core holes.



VARITECH RESOURCES LTD.

BIG ONION PROJECT

PROPERTY MAP SHOWING
ACCESS, TOPOGRAPHY and ZONES OF INTEREST

N.T.S. 93L-15W OMINECA M.D., B.C.

0 500 1000 2000 Feet

0 100 200 300 600 Metres

Scale 1:9600 (1"=800')	Date: August 1991
Drawn by: C.S.	Figure No.: 3

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In 1977, Canadian Superior calculated a potential reserve estimate for the Big Onion deposit of 80 to 100 million tons of ore grading 0.42% copper and 0.020% molybdenite. All of the combined percussion and diamond drill data available from the deposit at that time (a total of 54,816 ft. (16,712 m.)) was utilized in the reserve estimate.

In late 1990, Mindoro Corporation optioned the property from Jack Hemelspeck Jr. and in early 1991, Varitech Resources Ltd. acquired an interest in the Big Onion project from Mindoro Corp.

Regional Geology

The area east of Smithers is underlain by Hazelton Group volcanic and sedimentary rocks of Jurassic age (Figure 4). In this locality, the Hazelton group consists of the Telkwa and Smithers Formations which were probably deposited in an island arc setting.

The Telkwa Formation is of Lower Jurassic age and consists of red, maroon and grey-green volcanic breccias, tuffs, and basalt to rhyolite flows.

The Smithers Formation, which was deposited unconformably upon the Telkwa Formation during the Middle Jurassic period, consists of grey-brown-green greywackes, lithic and glauconitic sandstones, siltstones, shales, tuff breccias and minor conglomerate.

The Babine Intrusions of late Cretaceous and early Tertiary age, which include quartz diorite, quartz monzonite and felsite stocks and plugs, intruded the clastic formations along northeast trending structures that were predominant at that time.

These calcalkalic intrusions are genetically related to the Cu-Mo and Cu-Au-Ag porphyry deposits in the area such as the Noranda Minerals Inc. Bell, Granisle, and Morrison Lake deposits; and the Varitech Resources Ltd. Big Onion deposit.

Property Geology

The Big Onion property covers an area of approximately 54 km^2 that is centered around the main deposit. Lithological ages range from the Lower Jurassic to the lower Tertiary and include the Hazelton volcanics and sediments, as well as, several different Babine intrusions of late Cretaceous and early Tertiary age (Figure 5a & b).

The Hazelton volcanics and sediments consist of green andesitic flows and tuffs which commonly contain plagioclase or hornblende phenocrysts; hematized tuffaceous

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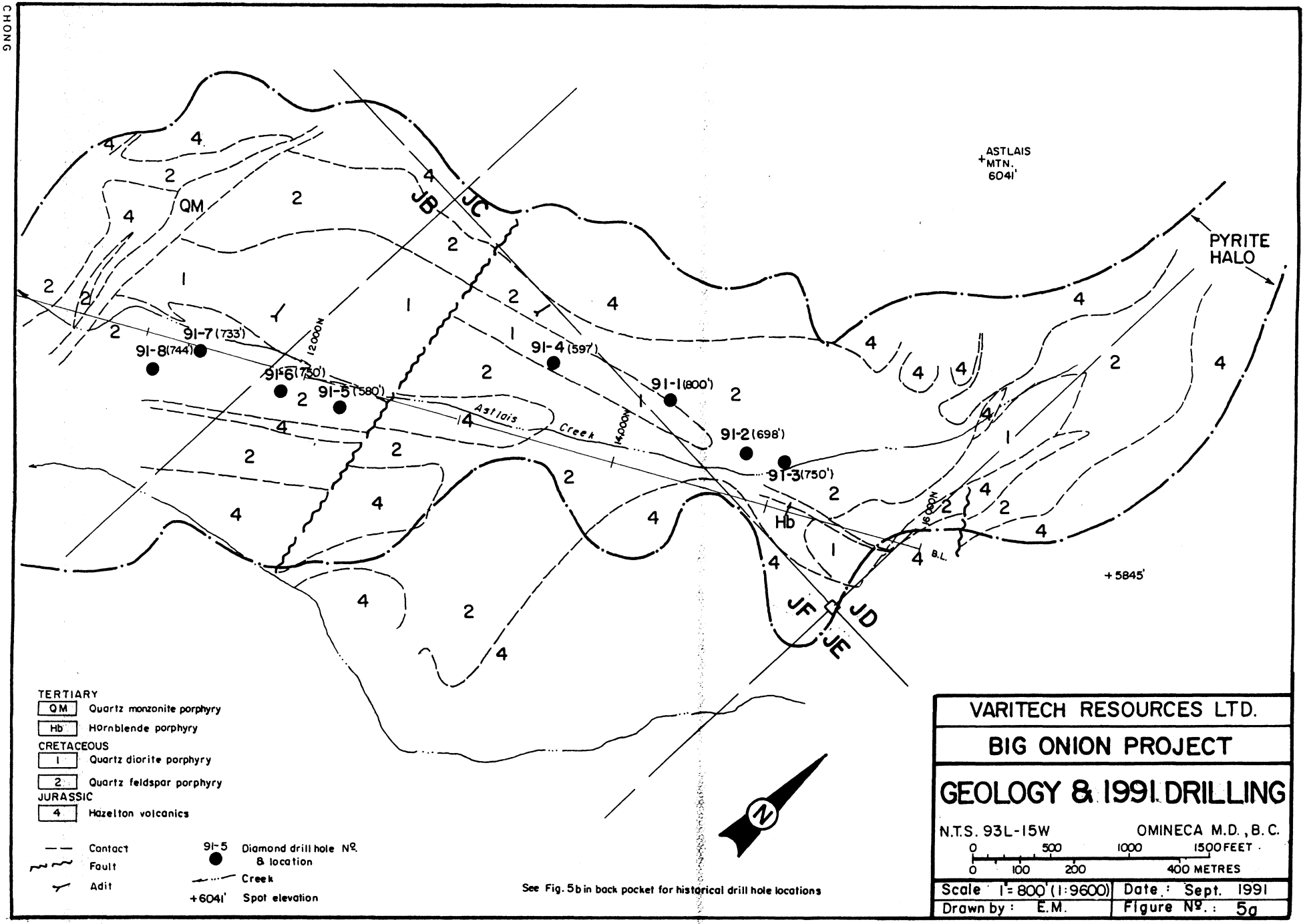

VARITECH RESOURCES LTD.

BIG ONION PROJECT

GEOLOGY & 1991 DRILLING

N.T.S. 93L-15W OMINECA M.D., B.C.

0 500 1000 1500 FEET

0 100 200 400 METRES

Scale 1"=800' (1:9600)	Date: Sept. 1991
Drawn by: E.M.	Figure No.: 5a

sandstones and siltstones; and black to grey mudstones and greywackes interbedded with lesser rhyolite and andesite flows and tuffs.

The Babine intrusions include quartz feldspar porphyry, plagioclase rhyolite porphyry, quartz diorite porphyry, and diorite.

The quartz feldspar porphyry (QFP) is restricted to the deposit area around Astlais Creek and contains plagioclase and quartz phenocrysts within an aphanitic groundmass of quartz and feldspar.

The plagioclase rhyolite porphyry (PRP) occurs along the southern perimeter of the property and is the probable source of the welded ash flow unit and rhyolitic flows that are present in the Lisa 3 and Lisa 5 claims.

The quartz diorite porphyry (QDP) intrudes the QFP along Astlais Creek and contains phenocrysts of plagioclase, hornblende and biotite within a fine grained groundmass of quartz and plagioclase.

Undivided diorites are the last Cretaceous event on the property and occur as stocks and plugs on the Lisa 3, Lisa 4, XL3476 and XL3676 claims.

A quartz monzonite porphyry (QMP) dyke, of early Tertiary age, intrudes a northerly trending structure within Astlais Creek which appears to displace the mineralized zone at that locality. The QMP contains fine grained plagioclase laths, fine to medium, grained biotite, and occasional quartz crystals within an aphanitic potassium feldspar matrix.

The dominant structural trend on the Big Onion property is northeast, including major structures along Ganokwa Creek, Astlais Creek, and McKendrick Creek.

Other important structures trend northerly, as well as west-northwesterly and north-northwesterly. The northerly structures are significant at the Big Onion deposit along Astlais Creek as they divide the North and South Zones, displace the deposit at its southwestern end, and appear to control or localize mineralization in the Northeast Zone.

The major northeast trending structure within Astlais Creek probably controlled the emplacement of the QFP and QDP intrusives, the related Cu-Mo mineralization, and the associated alteration.

Hydrothermal alteration within and around the Big Onion deposit includes phyllic, propylitic, and argillic zones with local silicification.

The deposit is contained within a quartz-sericite (phyllic) alteration assemblage which is surrounded by a propylitic zone whose outer periphery is defined by the limits of the pyrite halo.

Quartz-sericite alteration is contained within the QFP unit and is characterized by ubiquitous, fine grained sericite and local quartz stockworks. Intense sericitic replacement of the rock frequently occurs leaving only quartz eyes as recognizable remnants. Pervasive silicification is also occasionally present. Minor secondary biotite alteration was observed adjacent to fractures.

Propylitic alteration is well developed in the footwall andesites and is characterized by epidote, calcite, chlorite, and the weak sericitization of plagioclase. Within the QFP, the propylitic assemblage contains calcite and saussurite, while in the QDP, hornblende is altered to chlorite and plagioclase crystals are weakly sericitized.

Argillic alteration, consisting of moderate to pervasive kaolinite development, is associated with quartz stringers and fault zones.

Copper and molybdenum, with lesser gold and silver, porphyry mineralization is localized by steep northwesterly dipping shears along Astlais Creek.

Hypogene mineralization consists of disseminated and fracture controlled chalcopyrite and molybdenite which is predominantly associated with the QFP. The margins of the QDP and the footwall andesites are also mineralized, adjacent to contacts with the QFP.

The mineralization appears to be fault controlled and Stock (1977) describes three hydrothermal mineralizing events for the deposit:

i) quartz, sericite, pyrite $\pm$ chalcopyrite;
ii) quartz, sericite, chalcopyrite $\pm$ molybdenite;
iii) quartz, sericite, molybdenite.

Pyrite is also widespread within the deposit and locally attains concentrations of 10%. The dissolution and oxidation of pyrite by near surface groundwater produces sulphuric acid which has been essential for the development of a supergene enrichment zone.

The Big Onion deposit has undergone supergene enrichment over thicknesses of 360 ft. (110 m) in the North Zone and 250 ft. (76 m) in the South Zone.

Supergene mineralization consists of chalcocite with lesser covellite which replaces or coats chalcopyrite grains. Pyrite may also be tarnished with secondary copper mineralization.

Supergene development requires a hypogene source of copper as well as a permeable host rock that allows for the vertical percolation of acidified ground waters.

The sericitized and partly foliated QFP is both permeable and mineralized, hence the best supergene development is associated with this lithology.

The best supergene grades and thicknesses are found in the North Zone and Stock (1977) has suggested that a northerly trending fault between the North and South Zones has allowed for the relative uplift and erosion of some of the South Zones supergene mineralization.

Drill Hole Summaries

During the 1991 Big Onion diamond drilling program, eight vertical holes of HQ diameter core were drilled in the North and South Zones for a total of 5,562 ft. (1,696 m.).

The objectives of the program were to:

i) test for the possible upgrade of copper assays by using large diameter core;
ii) test for the possible expansion of the orebody at depth;
iii) test for supergene copper mineralization and obtain material for metallurgical testing.

Drill results are summarized in Table 2, cross sections are included in the text (Figure 6), drill logs are enclosed in the back pocket (Appendix I), and assay results are in Appendix II.

Diamond Drill Hole 91-1

The first hole was collared on line 14,300N in the North Zone and twinned Canadian Superior percussion drill hole (pdh) 75-76 and diamond drill hole (ddh) 76-8 (Figure 6a).

The overburden was penetrated for 10 ft. (3 m), the oxide zone or leached cap for 90 ft. (27 m), the supergene zone for 360 ft. (110 m) and the hypogene zone for 200 ft. (61 m).

The oxide zone was a shattered and friable QFP that had been oxidized (limonite coating fractures) and argillized. It contained traces of disseminated and fracture controlled pyrite and molybdenite.

The supergene zone included argillized and sericitized QFP & QDP, and chloritized andesitic volcanics. Pyrite, chalcopyrite, and molybdenite occurred as fine grained disseminations, fracture controlled concentrations, and in quartz veinlets. Chalcocite was the predominant secondary copper mineral replacing and/or coating disseminated and fracture controlled chalcopyrite grains. Sulphide volume attained 5% in some places. Limonitic vugs and fracture coatings were noted to depths of 300 ft. The average grades for the supergene zone were 0.355% Cu and 0.010% MoS2.

The hypogene zone consisted of sericitized QFP which contained pyrite, chalcopyrite, and molybdenite as disseminations, fracture related concentrations and in quartz veinlets. Sulphide volume ranged between 1 and 5%. Thin, irregular gypsum veinlets were also noted in this zone. The average grades for the hypogene zone were 0.292% Cu and 0.012% MoS2.

Fault zones were intersected between 65 and 85 ft., 134 and 138 ft., 150 and 153 ft., 210 and 215 ft., and 570 and 576 ft. These zones were strongly argillized and contained disseminated sulphides. Slip surfaces throughout the hole were smeared with sulphides, chlorite or sericite.

Assays from hole 91-1 were excellent with several 10 ft. intersections assaying greater than 0.6% Cu. Previous drill hole results, however, were not upgraded at this location with the HQ diameter core.

Diamond Drill Hole 91-2

The second hole was collared on line 14,800N in the North Zone and twinned Canadian Superior ddh 76-9 (Figure 6b).

The overburden was penetrated for 40 ft. (12 m), the leached cap for 40 ft. (12 m), the supergene zone for 310 ft. (95 m) and the hypogene zone for 118 ft. (36 m).

The leached cap consisted of a highly shattered and friable QFP containing argillic and limonitic alteration products. It contained disseminated pyrite and chalcopyrite; and some chalcocite at the bottom of the zone. Relict gypsum and quartz veinlets were also present.

The supergene zone included a thin panel of altered andesite but was predominantly argillized and/or sericitized QFP containing irregular quartz veinlets, pyritic fracture fillings and clay (and/or sulphide) slip surfaces and shears. Mineralization consisted of pervasive, disseminated chalcocite (up to 5%) and lesser pyrite and relict chalcopyrite as fine grained disseminations and vein selvage. The average supergene grades were 0.630% Cu and 0.020% MoS2.

Hypogene mineralization occurred in two separate zones in this hole. The upper zone extended for 30 ft. below the supergene zone and the lower zone was encountered at the bottom of the hole for 88 ft. Hypogene lithologies included chloritized and sericitized QDP and QFP which contained 1-2% of very fine grained pyrite and chalcopyrite as disseminations and fracture fillings. Gypsum and quartz veinlets were also present, as well as, occasional chlorite and/or sericite coated slip surfaces. The average grades for the upper hypogene zone were 0.271% Cu and 0.003% MoS2 and for the lower zone were 0.211% Cu and 0.007% MoS2.

Faulting was ubiquitous at the top of the hole and eleven separate fault zones were noted between 45 and 287 ft.

Assays for the supergene zone in hole 91-2 were excellent with several 10 ft. intersections containing greater than 1% total Cu. The previous Canadian Superior analyses for ddh 76-9 were upgraded by 20% with these results.

Diamond Drill Hole 91-3

The third hole was collared on line 15,000N in the North Zone and twinned Canadian Superior pdh 75-29 and ddh 75-58 (Figure 6c).

The overburden was intersected for 50 ft. (15 m), the leached cap for 70 ft. (21 m), the supergene zone for 360 ft. (110 m), and the hypogene zone for 270 ft. (82 m).

The leached cap or oxide zone was a strongly argillized and limonitic QFP containing relict quartz veinlets. Molybdenite minerlization occurred as fine grained disseminations and in the quartz veinlets.

The supergene zone was entirely within an argillized and sericitized QFP that was locally silicified. Chalcocite, chalcopyrite, and molybdenite occurred as very fine grained disseminations and the primary sulphides were also associated with quartz veinlets. Chalcocite was often present as a tarnish on chalcopyrite grains as replacement was not always complete. Fault zones with associated gouge and chalcocite (and/or chlorite and/or sericite) coated slip surfaces were numerous in the upper half of the zone. Total sulphide content ranged betwen 1 and 5% and the average grades for the supergene zone were 0.553% Cu and 0.024% MoS2.

The hypogene zone was in a chloritized and sericitized QDP containing irregular quartz-carbonate and gypsum veinlets. Mineralization consisted of chalcopyrite and pyrite as fine grained disseminations, stringers, and fracture fillings. Sulphide volume ranged between 0.5 and 1.5% and the average grades for the hypogene zone were 0.144% Cu and 0.007% MoS2.

Assays from hole 91-3 were also excellent with several 10 ft. intersections assaying greater than 0.6% Cu. Although this included 30 ft. of material over 1% Cu, overall results did not indicate an appreciable upgrade of previous Canadian Superior results.

Diamond Dril Hole 91-4

The fourth hole was collared on line 13,500N in the North Zone and twinned Canadian Superior pdh 75-26 and ddh 75-59 (Figure 6d).

The overburden was drilled for 10 ft. (3 m), the leached cap for 10 ft. (3 m), the supergene zone for 100 ft. (30 m), and the hypogene zone for 350 ft. (107 m).

The leached cap developed within an intensely fractured QDP containing limonitic, hematitic, chloritic, and sericitic alteration products. A trace of very fine grained chalcopyrite and pyrite occurred as disseminations and in quartz veinlets.

The supergene zone occurs below an upper hypogene zone and appears to be fault controlled. The fault bounded and sericitized QFP that comprises the zone contains 1-2% of very fine grained chalcocite, chalcopyrite, pyrite and molybdenite as fracture fillings, disseminations, coatings on slip surfaces, and in quartz veinlets. The chalcocite usually occurs as a tarnish on chalcopyrite grains. The average grades for the supergene zone were 0.534% Cu and 0.019% MoS2.

Two separate hypogene zones were intersected at this location. The upper zone persisted for 130 ft. at the top of the hole and the lower zone was encountered for 220 ft. below the supergene zone.

The upper hypogene zone was a chloritized and sericitized QDP which contained approximately 1% pyrite, chalcopyrite and molybdenite as very fine grained disseminations, thin fracture fillings, and in quartz veinlets. The average grades for the upper hypogene zone were 0.292% Cu and 0.007% MoS2.

The lower hypogene zone was a sericitized and locally silicified QFP that contained 1-4% sulphides as in the upper zone. Numerous faults and shears were noted in the upper portion of this zone. The average grades for the lower hypogene zone were 0.257% Cu and 0.017% MoS2.

Assays for hole 91-4 were excellent with hypogene values as high as 0.594% Cu and supergene results up to 0.701% Cu over 10 ft. sample intervals. The previous Canadian Superior results from ddh 75-59 were upgraded by 11% in the supergene zone of this hole.

Diamond Drill Hole 91-5

The fifth hole was collared on line 12,300N in the South Zone and twinned Canadian Superior pdh 75-15 (Figure 6e).

The overburden was penetrated for 60 ft. (18 m), the leached cap for 40 ft. (12 m), the supergene zone for 120 ft. (37 m) and the hypogene zone for 310 ft. (95 m).

The oxide zone (leached cap) was a shattered, argillized, and limonite stained QFP.

The supergene zone consisted of a fractured and shattered QFP containing argillic and sericitic alteration products. Mineralization included chalcocite, chalcopyrite, pyrite, and molybdenite as very fine grained disseminations, fracture fillings, and associated with quartz veinlets. Chalcocite development varied between a tarnish on and total replacement of chalcopyrite grains. Sulphide volumes were as high as 10% at the top of this zone. The average grades for the supergene zone were 0.689% Cu and 0.026% MoS2.

The hypogene zone included chloritized and sericitized QDP and QFP, as well as, a thick section of propylitically altered volcanics and fine grained sediments. Hypogene sulphide volume ranged between 1 and 6% and consisted of fine grained disseminations and fracture fillings of pyrite, pyrrhotite, chalcopyrite, and molybdenite. Within the volcanics, most of the mineralization was restricted to quartz-carbonate veins and fractures containing chlorite and epidote. The average grades for the hypogene zone were 0.210% Cu and 0.004% MoS2.

Assays from hole 91-5 were excellent with 30 feet of supergene material carrying greater than 0.9% Cu and hypogene results as high as 0.696% Cu over 10 ft. Previous drill results were upgraded by 16.5% in the supergene zone at this location.

Diamond Drill Hole 91-6

The sixth hole was collared on line 11,900 N in the South Zone and twinned Canadian Superior pdh 75-12 and ddh 75-60 (Figure 6f).

The overburden was drilled for 30 ft. (9 m), the leached cap for 10 ft. (3 m), the supergene zone for 200 ft. (61 m) and the hypogene zone for 100 ft. (30 m).

The oxide zone or leached cap was an argillized QFP containing limonite fracture coatings and vugs.

The supergene zone included moderately altered, but locally silicified, QFP and QDP. The QFP had sericite & molybdenite coatings on fracture and slip surfaces. The QDP had similair occurrences of chlorite and sericite, as well as, quartz-carbonate veinlets.

Mineralization consisted of fine grained disseminations and thin, irregular fracture fillings of chalcocite, pyrite, and chalcopyrite. Sulphide content was as high as 7% and the average grades for the supergene zone were 0.294% Cu and 0.025% MoS2.

The hypogene zone occurred within a propylitically altered andesitic tuff containing thin epidote fractures, drusy quartz veinlets, and later stage carbonate veinlets. Mineralization of pyrite, pyrrhotite, and chalcopyrite as fracture fillings and disseminations was relatively low grade.

Several minor faults were recorded in the supergene and hypogene zones with two notable structures occurring at 160 and 190 feet.

Due to local silicification and the associated reduction of permeability, the supergene assay results were not exceptional. However, forty feet of material contained more than 0.4% Cu and supergene grades were increased 38% above the Canadian Superior ddh 75-60 results.

Diamond Drill Hole 91-7

The seventh hole was collared on line 11,300N in the South Zone and twinned Canadian Superior pdh 75-7 (Figure 6g).

The overburden was penetrated for 10 ft. (3m), the leached cap for 30 ft. (9 m), the supergene zone for 250 ft. (76 m), and the hypogene zone for 440 ft. (134 m).

The leached cap was a shattered and argillized QFP with limonite coatings on fracture surfaces and drusy quartz veinlets. Very fine grained disseminations of relict sulphide grains were also present.

The supergene zone included argillized and sericitized QFP, as well as, propylitically altered Hazelton volcanics. Chalcocite occurred as very fine grained replacements at the top of the zone but decreased in volume with depth. The primary sulphides, including molybdenite, were present in concentrations of up to 5% as fine grained disseminations, fracture fillings, and in quartz $\pm$ carbonate $\pm$ chlorite $\pm$ epidote veinlets. Chlorite, epidote, sericite and molybdenite also occurred as smears on slip surfaces. The average grades for the supergene zone were 0.370% Cu and 0.020% MoS2.

The hypogene zone contained sericitized and locally silicified QFP, as well as, propylitically altered volcanics. Pyrite, chalcopyrite and molybdenite mineralization was present as in the supergene zone. Gypsum veinlets were also noted. The average grades for the hypogene zone were 0.229% Cu and 0.011% MoS2.

Three faults were intersected at the top of the hole with the most notable structure occurring between 180 and 184 feet.

Assays from 91-7 were excellent with 100 ft. of supergene material containing greater than 0.4% Cu and 100 ft. of the hypogene zone assaying over 0.3% Cu. Previous drill hole results, however, were not upgraded at this location.

Diamond Drill Hole 91-8

The eighth hole was collared on line 11,100N in the South Zone and twinned Canadian Superior pdh 75-4.

The overburden was intersected for 10 ft. (3m), the leached cap for 20 ft. (6 m), the supergene zone for 150 ft. (46 m) and the hypogene zone for 480 ft. (146 m).

The leached cap was an argillically altered QFP containing limonitic fracture coatings, quartz veinlets, and relict sulphides as disseminations and fracture fillings.

The supergene zone consisted predominantly of a shattered and propylitically altered volcanics cut by drusy quartz veinlets and narrow felsite dykelets. Chalcocite was present along fracture and slip surfaces and the primary sulphides occurred as fracture fillings, in quartz veinlets, and as minor disseminations. Sulphide content ranged between a trace and 4% and the average grades for the supergene zone were 0.296% Cu and 0.012% MoS2.

The hypogene zone contained a sericitized and locally silicified QFP, as well as, a propylitically altered volcanic tuff or flow. Pyrite and chalcopyrite mineralization occurred as fine grained disseminations, fracture fillings, and in quartz veinlets. Molybdenite was present as coatings on slip and fracture surfaces along with chlorite and sericite. Sulphide content was as high as 4% and the average grades for the hypogene zone were 0.269% Cu and 0.013% MoSz.

Assays from hole 91-8 were excellent with supergene results as high as 1.016% Cu and hypogene results up to 0.813 and 0.872% Cu for 10 ft. intervals. Previous drill results, however, were not upgraded at this location.

Ore Reserve Estimates

Reserves of approximately 2 million tons at 0.32% Cu and 0.013% MoS2 were added to the known reserves of the Big Onion deposit by the Varitech Resources 1991 diamond drilling program.

Sectional reserve estimates (with a cut-off grade of 0.25% Cu) were made using the Canadian Superior method of determining the product of cross sectional area x the horizontal distance between sections which was then divided by a tonnage factor of 10. Most of the reserve additions were within hypogene mineralization in the deeper portions of the orebody.

A supergene reserve estimate of 35 million tons at 0.34% Cu was made using a method analogous to that used in the ore reserve additions with the exception that simple rectangular volumes (200' x 200' x vertical) were calculated for each drill hole instead of sectional volumes. All historical and current drill logs were studied to determine chalcocite content (ie. supergene development) and a stripping ratio of approximately 0.5 / 1 was used. A lower cut-off grade of 0.15% total Cu was also used due to the relative ease of mining and heap leaching a supergene deposit.

Precious metal results for the supergene zone averaged 0.064 g/t Au and 1.0 g/t Ag. The best assay for gold was 0.305 g/t and for silver was 2.9 g/t over 10 ft. sample intervals.

Exploration Drill Targets

1. The Northeast Zone

The reserve of 12 million tons grading 0.42% Cu computed for the Northeast Zone is based upon 13 widely spaced drill holes, therefore infill drilling is warranted to better define this zone. The zone is also open to the north and east where the presence of altered QFP and molybdenum rock anomalies suggest that tonnage for the Northeast Zone could be significantly increased.

2. The Area between the North and South Zones

The area between lines 12,700N and 12,900N requires more drilling to test the mineralization indicated by pdh 75-45. Copper and molybdenum rock geochemical anomalies and sericitically altered QFP on surface also make this area a good target. Pdh 75-47 should be redrilled as it did not penetrate the leached cap.

3. The Southwest Target

Another area of favourably altered QFP with supergene development weakly indicated by previous percussion drilling lies between lines 12,000N and 13,000N just northwest of the main QDP intrusion. This area is also overlain by a molybdenum rock geochemical anomaly that is of equal magnitude to the molybdenum rock anomalies that overlie the North and South ore zones. Stock (1977) anticipated that diamond drilling would outline a zone containing approximately 0.35% Cu with associated molybdenite.

4. The Fault Displaced Southern Continuation of the South Zone

A Texas Gulf IP Survey (1966) revealed an anomaly located south of the South Zone which may represent the fault displaced southern continuation of the Big Onion deposit or another mineralized zone. The anomaly, which is located in the northwest corner of the Lisa 4 claim, was previously tested along its western margin by the Blue Rock Mining Corp. in 1970-71 with two diamond drill holes.

5. The Southwestern Portion of the Claim Block

The entire southwestern portion of the claim block (Lisa 1-8 claims) requires further exploration for the southern continuation of the orebody and other mineralized zones. Two IP anomalies traversing the boundary between the Lisa 3 and 5 claims were recommended for drill testing, with eight percussion drill hole locations, by Canadian Superior in 1977. The combined anomalies cover an approximate area of 2.5 km^2 over the southwestern extension of the Astlais Creek fault and are associated with peripheral aeromagnetic and rock alteration anomalies. Another interesting combination of anomalies occurs in the Lisa 7 claim where rock geochemical, alteration and aeromagnetic anomalies overlie a major structure and cover an approximate area of 2 to 3 km^2.

Conclusions and Recommendations

The Big Onion property consists of the Lisa 1, Lisa 5 and Lisa 7 claim groups which are located approximately 16 km east - northeast of Smithers, B.C. and 50 km southwest of the Noranda Minerals Inc. Bell and Granisle deposits. Year round access to the property is along the well-maintained Babine Lake Road.

The Big Onion deposit, which consists of the Northeast, North and South Zones, is a calcalkaline Cu-Mo porphyry which also contains anomalous quantities of gold and silver. Potential reserves for the deposit, calculated by Canadian Superior Exploration Ltd. in the 1970's, are 80 to 100 million tons grading 0.42% copper and 0.020% molybdenite.

The 1991 diamond drilling program carried out on the Big Onion property by Varitech Resources Ltd. consisted of eight vertical holes of HQ diameter core totalling 5,562 ft. (1,696 m). It was successful in outlining supergene development in the North and South Zones, as well as, testing the depth of hypogene mineralization.

Supergene intersections were as much as 360 ft. grading 0.55% Cu and 0.02% MoS2. Other noteable intersections included 310 ft. of 0.63% Cu and 120 ft. of 0.69% Cu. The highest supergene assay was 1.57% Cu over 10 ft. and a total of twelve samples (10ft in length) taken from the supergene zone contained greater than 0.9% Cu. Precious metal results for the supergene material averaged 0.064 g/t Au and 1.0 g/t Ag. The best assay for gold was 0.305 g/t and for silver was 2.9 g/t over 10 ft. sample intervals.

Hypogene intersections were up to 480 ft. grading 0.27% Cu. Other notable intersections included 350 ft. of 0.27% Cu and 443 ft. of 0.23% Cu. Two holes were terminated within hypogene mineralization at depths of 733 and 750 ft.

Reserves of approximately 2 million tons grading 0.32% Cu and 0.013% MoS2 (0.25% Cu cut-off grade) were added to the known reserves of the Big Onion deposit by the 1991 drilling program. A supergene reserve estimate of 35 million tons grading 0.34% Cu was also made using both historical and current drill log data.

Further drilling and exploration is highly recommended for the Big Onion property to:

i) increase the tonnage of known reserves,
ii) test for the fault displaced southern continuation of the deposit, and
iii) explore for other mineralized zones in the southwestern portion of the claim block.

There are three excellent targets adjacent to the main orebody, indicated by rock geochemistry and alteration anomalies, which should be drilled. These include the Northeast Zone, the area between the North and South Zones, and the Southwest target.

Another three areas of interest associated with significant structures and indicated by IP, aeromagnetic, rock geochemistry and/or rock alteration anomalies are located south of the main deposit in the southern half of the claim group. These anomalies should also be drill tested.

Finally, the entire southwestern portion of the claim block requires further exploration for the southern continuation of the orebody and other mineralized zones.

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plane. Although the anomalies are locally discontinuous they both indicate the presence of the underlying copper-molybdenum zone. The molybdenum anomaly is the more persistent of the two, and better delineates diamond drill targets, probably because of the lesser mobility of molybdenum compared with copper.

9. GEOPHYSICS

Extensive E.M., I.P. and magnetometer surveys were run on the property by Noranda, Texas Gulf and Blue Rock. By the time Canadian Superior became involved in the property, the extensive drilling and mapping had established location of the principal zones and mineralization and Canadian Superior confined its geophysical activities to an I.P. survey in order to delimit the extent of the pyrite halo. CSE recognized the correlation between magnetite and ore in the south zone and thus ran a magnetometer survey over the property. Most significant results of this were the recognition of the transverse structure dividing the North and South zone and a general delimiting of the Quartz Diorite Porphyry.

10. DRILLING

As shown in the following table, which is taken from Stock's 1977 report, 16,700 m. (54,816 ft.) of diamond and percussion drilling have been completed on the Big Onion property.

TABLE OF DRILLING TO DEC. 31, 1976

Company	Hole Designation	Dates	Diamond Footage	Percussion Footage	Cumulative Footage Total
Noranda	DDH	1964,1965	250	-	250
Texas Gulf	B.O.	1966,1967	3993	-	4,243
Blue Rock (Cyprus Mining)	C-	1970,1971	24,134	-	28,377
Canadian Superior Exploration	74-	1974	1,502	-	29,879

Canadian Superior Exploration	75-	1975	882	13,800	44,561
"	76-	1976	7,645	2,610	54,816
TOTALS			10,029	16,410	

All diamond drilling has todate been BQ size. Early diamond drill programmes, such as those by Texas Gold and Blue Rock apparently encountered significant problems with core recovery, leading to loss of copper values and resulting in lower apparent grade. Canadian Superior apparently solved the core recovery problem but when they compared results from diamond and percussion holes, found that the percussion results were consistently averaging 20% less than those obtained by diamond drilling. It appears likely therefore that the grade of the Big Onion mineralization as computed from drill results is considerably lower than the inplace grade.

11. ORE RESERVE CALCULATIONS

Canadian Superior Exploration in 1977 manually calculated geological reserves based on intersections from all drill programmes to that date. These are shown in tables 1 and 2. The calculations were based on extrapolation of mineralization to 150 m. (500 ft.) depth.

Can Sup noted that due to the shortage of drill hole data there are some areas within the zones of mineralization where there is little or no information, and in these areas projections and inferences have been made according to the geological model. This is particularly true of the northwest zone where drilling is very sparse. Can Sup calculated that the Big Onion as explored to 1977 is approximately 66 million tons. They calculated stripping ratios on four sections as follows:

Section	Stripping Ratio
11,100N	2.25
11,900N	2.28
12,900N	3.13
14,800N	1.71

TABLE I

CANADIAN SUPERIOR EXPLORATION LIMITED
BIG ONION PROJECT
DRILL INDICATED RESERVES

SECTION	AREA OF ORE (Cu)	Cu GRADE x AREA	AREA OF ORE (MoS_2)	MoS_2 GRADE x AREA	HORIZONTAL DISTANCE/10	TONNAGE	AVERAGE Cu	MoS_2 GRADE
10,900	66,528	21,594.87	57,024	1441.24	20	1,330,560	.32	.025
11,100	88,011	33,444.18	88,011	962.08	20	1,760,220	.38	.011
11,300	99,198	40,782.06	99,198	2793.58	20	1,983,960	.41	.028
11,500	84,150	32,031.45	84,150	3208.50	20	1,683,000	.38	.038
11,700	79,596	41,130.54	49,995	1228.78	20	1,591,920	.52	.025
11,900	93,258	37,639.80	80,784	1555.69	20	1,865,160	.40	.019
12,100	83,556	34,787.61	83,556	1606.77	20	1,671,120	.42	.019
12,300	127,215	67,976.37	27,215	4138.80	20	2,544,300	.53	.032
12,500	47,520	18,205.11	35,541	888.53	13	617,760	.38	.025
TOTALS	769,032	327,591.99	705,474	17,823.97	1730	15,048,000	.43	.025
12,700	21,483	8,870.40	21,483	530.14	17.5	375,952	.41	.025
12,900	50,985	24,521.31	50,985	1334.03	40	2,039,400	.48	.026
13,500	68,904	27,486.36	68,904	587.57	70	4,823,280	.40	.008
14,300	76,230	38,115.00	76,230	1067.22	55	4,192,650	.50	.014
14,600	52,173	16,926.03	44,946	1260.97	25	1,304,325	.32	.028
14,800	160,974	81,014.67	160,974	3617.86	20	3,219,480	.50	.022
15,000	191,229	87,336.81	191,229	1807.98	25	4,780,725	.46	.010
15,300	72,567	24,982.65	55,539	357.69	20	1,451,340	.34	.006
15,400	55,143	18,688.23	55,143	372.63	20	1,102,860	.34	.007
TOTALS	749,699	327,941.46	725,433	10,936.09	2925	23,290,012	.44	.015
CUMULATIVE TOTAL	1,518,720	655,533.45	1,430,907	28,760.06	4655	38,338,012	.43	.020

TABLE II

CANADIAN SUPERIOR EXPLORATION LIMITED
BIG ONION PROJECT
PROBABLE RESERVES

Section	Area of ore	Cu Grade x area	Horizontal Distance	Tonnage	Average Cu
10,900	-	-	-	-	-
11,100	20,295	6,370.65	20	405,900	.31
11,300	48,312	18,358.56	20	966,240	.38
11,500	58,311	23,509.53	20	1,166,220	.40
11,700	64,053	27,292.32	20	1,281,060	.43
11,900	8,415	2,187.90	20	168,300	.26
12,100	24,849	11,361.24	20	496,980	.46
12,300	10,296	2,986.84	20	205,920	.29
12,500	9,009	2,612.61	20	117,117	.29
Total	243,540	94,678.65		4,807,737	.39
12,700	-	-	-	-	-
12,900	26,136	8,025.93	17.5	457,380	.31
13,500	47,421	14,573.79	70	3,319,470	.31
14,300	15,741	5,981.58	55	865,755	.38
14,600	54,252	23,256.09	25	1,356,300	.43
14,800	4,059	2,475.99	20	81,180	.61
15,000	52,173	21,666.15	25	1,304,325	.42
15,300	69,102	26,258.76	20	1,382,040	.38
15,400	80,982	30,057.39	20	1,343,925	.37
Total	349,866	132,295.68		10,110,375	.38
Cumulative Total	593,406	226,974.33		14,918,112	.38
16,300 N'	82,665	39,674.40	80	6,613,200	.48
17,000 N'	97,614	38,209.00	45	1,719,405	.39
17,200 N'	88,011	33,742.20	25	2,200.275	.38
17,500 N'	76,626	41,825.50	25	1,915,650	.55
Totals	344,916	153,451.10		12,448,530	.44
Total Reserve	2,457,042	1,035,958.80		65,704,654	.42

BIG ONION PROJECT

DIAMOND DRILL HOLE SUMMARIES

NORANDA EXPLORATION (1964-1965)
(ASSAY INTERVALS ≥ 20 Feet @ 0.25% Cu)

DRILL HOLE	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL ft.	% Cu	% MoS_2	Au (oz/ton)	Ag (oz/ton)	Az/Dip
DDH-1	11160 N	9550 E	17	50	-	-	-	-	-	-	-	Vertical
DDH-2	10915 N	9975 E	52	200	52	150	98	.028	-	-	-	0°/45°
			total	250								

TEXAS GULF SULPHUR CO. (1966-1967)

BO-66-1			114	236	-	-	-	-	-	-	-	305°/60°
BO-66-2	11915 N	10495 E	34	405	-	-	-	-	-	-	-	325°/45°
BO-66-3	16485 N	9465 E	50	795	-	-	-	-	-	-	-	348°/45°
BO-66-4	15785 N	9450 E	55	641	-	-	-	-	-	-	-	340°/45°
BO-66-5	11315 N	9685 E	54	646	-	-	-	-	-	-	-	335°/45°
BO 67-1	13405 N	9665 E	25	764	no assays: visual estimate				0.01 Cu,	0.02 Mo		348°/45°
BO-67-2	14740 N	9760 E	20	506	no assays: visual estimate				0.05 Cu,	0.01 Mo		340°/45°
			total	3993								

BLUE ROCK MINING CORPORATION LTD. (CYPRUS) (1970-71)

C-1	10530 N	9430 E	17	1350	780	880	100	.47	-	-	-	100°/45°
					880	920	40	.28	-	-	-	
					980	1010	30	.43	-	-	-	
					1010	1040	30	.23	-	-	-	
					1040	1080	40	.32	-	-	-	
					1080	1110	30	.21	-	-	-	
					1110	1130	20	.44	-	-	-	
C-2	11530 N	8520 E	14	1616	800	830	30	.23	-	-	-	110°/45°
					860	910	50	.41	-	-	-	
C-3	11350 N	9715 E	60	968	-	-	-	-	-	-	-	290°/80°
C-4			52	102	-	-	-	-	-	-	-	150°/45°

BIG ONION PROJECT

DIAMOND DRILL HOLE SUMMARIES

BLUE ROCK MINING CORPORATION LTD. (CYPRUS) (1970-71)
(ASSAY INTERVALS ≥ 20 Feet @ 0.25% Cu)

DRILL HOLE	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL ft.	% Cu	% MoS_2	Au (oz/ton)	Ag (oz/ton)	Az/Dip
C-5	11755 N	9990 E	40	737	90	450	360	.59	.010(Mo)	-	-	300°/65°
					450	480	30	.20	.007(Mo)	-	-	
					480	560	80	.43	.014(Mo)	-	-	
C-6	12490 N	10010 E	100	752	110	150	40	.60	-	-	-	305°/60°
					520	540	20	.20	-	-	-	
					540	570	30	.34	-	-	-	
C-7	12030 N	9500 E	40	1148	70	100	30	.34	-	-	-	160°/45°
					550	570	20	.47	-	-	-	
					610	650	40	.32	-	-	-	
					650	720	70	.43	-	-	-	
					810	830	20	.28	-	-	-	
					860	880	20	.40	-	-	-	
					920	940	20	.21	-	-	-	
					940	970	30	.39	-	-	-	
C-8	12110 N	10810 E	28	2000	-	-	-	-	-	-	-	305°/45°
C-9	11825 N	8530 E	50	850	-	-	-	-	-	-	-	150°/45°
C-10	11015 N	9370 E	18	1207	-	-	-	-	-	-	-	142°/80°
C-11	12820 N	8880 E	70	826	70	90	20	.67	-	-	-	150°/60°
					130	170	40	.29	-	-	-	
C-12	15300 N	9700 E	85	1246	85	110	25	.49	-	-	-	119°/45°
					520	560	40	.22	-	-	-	
					560	580	20	.25	-	-	-	
					640	700	60	.42	-	-	-	
					700	720	20	.19	-	-	-	
					720	800	80	.42	-	-	-	
					830	850	20	.30	-	-	-	
					880	900	20	.36	-	-	-	

BIG ONION PROJECT

DIAMOND DRILL HOLE SUMMARIES

BLUE ROCK MINING CORPORATION LTD. (Continued)
(ASSAY INTERVALS ≥ 20 Feet @ 0.25% Cu)

DRILL HOLE	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL ft.	% Cu	% MoS_2	Au (oz/ton)	Ag (oz/ton)	Az/Dip
C-13	15090 N	8925 E	140	1516	270	290	20	.34	-	-	-	133°/50°
					390	420	30	.18	-	-	-	
					420	440	20	.78	-	-	-	
					1000	1020	20	.48	-	-	-	
					1020	1060	40	.23	-	-	-	
					1100	1120	20	.27	-	-	-	
					1380	1430	50	.38(?)	-	-	-	
C-14	16415 N	8640 E	62	1079	290	320	30	.22	-	-	-	109°/50°
					320	360	40	.35	-	-	-	
					500	660	160	.36	-	-	-	
					660	680	20	.23	-	-	-	
					720	740	20	1.02(?)	-	-	-	
C-15	15750 N	9105 E	54	1059	610	810	200	.48(?)	-	-	-	107°/50°
C-16	13420 N	8995 E	52	1026	380	430	50	.37	-	-	-	145°/45°
					670	720	50	.21	-	-	-	
					720	780	60	.31	-	-	-	
					800	820	20	.30	-	-	-	
C-17	14275 N	9065 E	121	1257	670	700	30	.23	-	-	-	127°/50°
					700	760	60	.25	-	-	-	
					760	780	20	.21	-	-	-	
					780	820	40	.29	-	-	-	
					820	860	40	.22	-	-	-	
					910	950	40	.21	-	-	-	
					950	980	30	.45	-	-	-	
C-18	10710 N	9130 E	35	1398	-	-	-	-	-	-	-	340°/85°
C-19	12750 N	11130 E	11	1116	-	-	-	-	-	-	-	Vertical
C-20	10325 N	9910 E	36	1186	-	-	-	-	-	-	-	85°/50°
C-24			70	607	-	-	-	-	-	-	-	103°/45°
C-27	15750 N	9105 E	59	1088	260	280	20	.82	-	-	-	80°/70°
					700	760	60	.37	-	-	-	
			total	24,134								

BIG ONION PROJECT

DIAMOND DRILL HOLE SUMMARIES

CANADIAN SUPERIOR EXPLORATION (1974-75)
(ASSAY INTERVALS ≥ 20 Feet @ 0.25% Cu)

DRILL HOLE	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL ft.	% Cu	% MoS_2	Au (oz/ton)	Ag (oz/ton)	Az/Dip
74-1	11500 N	10050 E	25	498	40	210	170	.49	.039+	-	-	Vertic
74-2	11240 N	10180 E	23	405	40	110	70	.49	.015	-	-	"
					250	300	50	.48	.012	-	-	"
74-3	11685 N	10310 E	21	301	-	-	-	-	-	-	-	"
74-4	11160 N	10025 E	21	298	30	50	20	.40	.076	-	-	"
					110	140	30	.23	.028	-	-	"
					140	170	30	.37	.010	-	-	"
					210	240	30	.37	.010	-	-	"
					240	270	30	.19	.005	-	-	"
					270	290	20	.45	.010*	-	-	"
			total	1502								
75-58	15030 N	9700 E	23	300	80	100	20	.26	.018	-	-	"
					100	300	200	.61	.013*	-	-	"
75-59	13480 N	9510 E	13	300	30	300	270	.38	.009*	-	-	"
75-60	11880 N	10125 E	16	282	40	60	20	.23	.022	-	-	"
					60	100	40	.33	.016	-	-	"
					100	120	20	.20	.028	-	-	"
					120	140	20	.34	.016	-	-	"
					260	282	22	.48	.020*	-	-	"
			total	882								

(*) Hole ends in ≥20 feet of grading ≥0.25% Cu.

(+) Hole ends in ≥20 feet of rock grading >0.20% Cu.

CANADIAN SUPERIOR EXPLORATION LIMITED
BIG ONION PROJECT
1976 DIAMOND DRILL SUMMARIES
0.25% Cu Cutoff

DDH NO.	LAT.	DEP.	OVB	LENGTH	FROM	TO	INTERVAL	% Cu	% MoS_2	Az/Dip
76-1	10,880 N	10180 E	20	256	50	170	120	.39	.021	0°/90°
76-2	11285 N	9845 E	65	505	110	220	110	.40	.031	-
					240	280	40	.26	.022	-
76-3	11700 N	9850 E	65	529	190	240	50	.48	.017	-
					280	390	110	.45	.012	-
					410	460	50	.37	.017	-
76-5	12300 N	10030 E	80	496	100	240	140	.67	.031	-
					260	370	110	.58	.042	-
					420	440	20	.40	.004	-
76-6	12100 N	9840 E	67	527	70	100	30	.31	.009	-
76-7	12920 N	9295 E	25	502	180	270	90	.59	.018	-
					300	330	30	.74	.003	-
					410	450	40	.32	.011	-
76-8	14245 N	9525 E	25	573	200	540	340	.50	.014	-
76-9	14790 N	9710 E	45	506	80	280	200	.58	.025	-
					300	440	140	.57	.030	-
76-10	14985 N	9500 E		641	110	250	140	.59	.008	-
					480	570	90	.33	.019	-
					590	610	20	.26	.009	-

CANADIAN SUPERIOR EXPLORATION LIMITED
BIG ONION PROJECT
1976 DIAMOND DRILL SUMMARIES
0.25% Cu Cutoff

DDH NO.	LAT.	DEP.	OVB	LENGTH	FROM	TO	INTERVAL	% Cu	% MoS_2	Az/Dip
76-11	14815 N	9315 E	35	626	170	270	100	.30	.006	0°/90°
					330	350	20	.29	.012	-
					480	500	20	.28	.020	-
					560	590	30	.47	.003	-
76-12	15400 N	9415 E	35	551	70	120	50	.38	.009	-
					500	520	20	.39	.013	-
76-13	14580 N	9505 E	35	726	130	150	20	.38	.016	-
					230	260	30	.31	.020	-
					370	410	40	.26	.039	-
					430	500	70	.28	.032	-
					520	710	190	.50	.020	-
76-14	15030 N	9890 E	75	506	75	110	35	.34	.012	-
					170	250	80	.34	.004	-
					380	410	30	.39	.003	-
					470	506	36	.37	.005	-
76-15	15420 N	9915 E	35	494	100	210	110	.39	.003	-
					270	310	40	.28	.001	-
TOTAL FOOTAGE				7645						

APPENDIX 2

SUMMARY OF PERCUSSION DRILL HOLE RESULTS
(AFTER STOCK G. 1977)

SAMPSON ENGINEERING INC.
2696 West 11th Avenue
Vancouver, B C V6K 2L6

BIG ONION PROJECT

PERCUSSION DRILL HOLE SUMMARIES

CANADIAN SUPERIOR EXPLORATION (1975)

(ASSAY INTERVALS ≥ 20 Ft. @ 0.25% Cu)

PDH NO.	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL (ft)	% Cu	% MoS_2	Au (oz/ton)	Ag (oz/ton)
75-1	10880 N	10180 E	10	210	20	170	150	.34	.027	T	0.02
75-2	10900 N	10000 E	60	300	60	100	40	.39	.027	T	T
					100	210	110	.21	.022	-	-
					210	270	60	.27	.020	T	T
75-3	11090 N	9840 E	10	300	-	-	-	-	-	-	-
75-4	11075 N	10210 E	30	250	40	250	210	.38*	.010	T	T
75-5	11110 N	10410 E	20	200	30	100	70	.38	.013	T	T
75-6	11480 N	10260 E	10	300	30	60	30	.38	.021	T	T
75-7	11325 N	10030 E	10	300	50	300	250	.44*	.028	T	.06
75-8	11890 N	10000 E	50	220	80	220	140	.36*	.018	T	.02
75-9	12080 N	10070 E	30	110	60	110	50	.44*	.031	NS	NS
75-10	11470 N	10525 E	20	300	-	-	-	-	-	-	-
75-11	11705 N	10105 E	20	240	50	100	50	.61	.068	T	.03
75-12	11880 N	10125 E	20	300	60	150	90	.51*	.020	T	T
					150	170	20	.22	.010	-	-
					170	210	40	.61	.024	T	T
					250	300	50	.27	.019	T	.02
75-13	12080 N	10330 E	20	160	50	110	60	.22	.006	-	-
					110	130	20	.26+	.006	-	-
75-14	12115 N	10180 E	20	200	20	80	60	.51	.039	T	.05
75-15	12310 N	10135 E	50	300	50	80	30	.24	.005	-	-
					80	300	220	.67*	.047	T	.02

(*) Hole ends in ≥ 20 feet of grading ≥ 0.25% Cu.

(+) Hole ends in ≥ 20 feet of rock grading > 0.20% Cu.

BIG ONION PROJECT

PERCUSSION DRILL HOLE SUMMARIES

CANADIAN SUPERIOR EXPLORATION (1975)

(ASSAY INTERVALS $\geq$ 20 Ft. @ 0.25% Cu)

PDH NO.	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL (ft)	% Cu	% MoS_2	Au (oz/ton)	Ag (oz/ton)
75-16	12360 N	9730 E	20	240	-	-	-	-	-	-	-
75-17	12120 N	9940 E	60	300	80	270	190	.34+	.011	T	.02
75-18	11500 N	10050 E	10	160	60	140	80	.40+	.037	T	.05
75-19	11730 N	9740 E	60	250	-	-	-	-	-	-	-
75-20	11520 N	9850 E	40	250	160	250	90	.27*	.042	T	.03
75-21	11750 N	9550 E	10	90	-	-	-	-	-	-	-
75-22	11590 N	9340 E	10	250	-	-	-	-	-	-	-
75-23	11780 N	9200 E	10	220	-	-	-	-	-	-	-
75-24	11550 N	8880 E	10	300	-	-	-	-	-	-	-
75-25	13540 N	9620 E	20	220	120	140	20	.66	.002	T	T
75-26	13480 N	9510 E	10	290	40	90	50	.22	.016	-	-
					90	290	200	.31*	.037	.005	.03
75-27	13630 N	9320 E	10	70	-	-	-	-	-	-	-
75-28	14650 N	9560 E	20	280	-	-	-	-	-	-	-
75-29	15030 N	9700 E	10	300	160	200	40	.31+	.027	T	.02
					200	260	60	.22	.021	-	-
					260	290	30	.26	.019	T	.02
75-30	14950 N	10000 E	50	300	80	300	220	.31*	.008	T	T
75-31	15100 N	9400 E	30	300	-	-	-	-	-	-	-
75-32	15440 N	9600 E	20	300	130	200	70	.27+	.012	T	T
75-33	16860 N	8880 E	0	300	-	-	-	-	-	-	-
75-34	16855 N	8455 E	0	300	140	170	30	.48+	.008	.005	.05
					190	240	50	.82	.009	.005	.05

(*) Hole ends in $\geq$ 20 feet of grading $\geq$ 0.25% Cu.

(+) Hole ends in $\geq$ 20 feet of rock grading $>$ 0.20% Cu.

BIG ONION PROJECT

PERCUSSION DRILL HOLE SUMMARIES

CANADIAN SUPERIOR EXPLORATION (1975)

(ASSAY INTERVALS ≥ 20 Ft. @ 0.25% Cu)

PDH NO.	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL (ft)	% Cu	% MoS2	Au (oz/ton)	Ag (oz/ton)
75-35	16640 N	8650 E	10	290	70	140	70	.39*	.004	.005	.02
					140	160	20	.18	.002	-	-
					160	300	140	.38	.006	.005	.02
75-36	16460 N	8870 E	10	300	-	-	-	-	-	-	-
75-37	16505 N	9040 E	10	300	30	300	270	.44*	.029	T	.03
75-38	16620 N	8870 E	10	200	-	-	-	-	-	-	-
75-39	15690 N	10060 E	10	220	110	170	60	.44+	.006	T	.02
75-40	15535 N	10040 E	20	300	70	120	50	.35*	.005	T	.02
					240	300	60	.28	.007	T	.02
75-41	12650 N	10000 E	75	250	-	-	-	-	-	-	-
75-42	12650 N	10230 E	20	250	-	-	-	-	-	-	-
75-43	13020 N	10030 E	120+	Aband.	-	-	-	-	-	-	-
75-44	12440 N	10370 E	20	160	-	-	-	-	-	-	-
75-45	12690 N	9830 E	20	250	70	90	20	.44*	.024	T	.03
					200	250	50	.40	.025	.005	.02
75-46	13025 N	9820 E	20	250	-	-	-	-	-	-	-
75-47	12900 N	9650 E	30	100	-	-	-	-	-	-	-
75-48	12925 N	9480 E	20	250	40	140	100	.40+	.034	T	.03
75-49	12925 N	9290 E	20	250	190	250	60	.54*	.012	T	.03
75-50	13320 N	9430 E	10	250	20	50	30	.43+	.004	.010	.09

(*) Hole ends in ≥ 20 feet of grading ≥ 0.25% Cu.

(+) Hole ends in ≥ 20 feet of rock grading > 0.20% Cu.

BIG ONION PROJECT

PERCUSSION DRILL HOLE SUMMARIES

CANADIAN SUPERIOR EXPLORATION (1975)

(ASSAY INTERVALS ≥ 20 Ft. @ 0.25% Cu)

PDH NO.	LAT.	DEP.	O/B (ft)	LENGTH	FROM	TO	INTERVAL (ft)	% Cu	% MoS_2	Au (oz/ton)	Ag (oz/ton)
75-51	14040 N	9720 E	20	130	-	-	-	-	-	-	-
75-52	14440 N	9725 E	20	250	70	140	70	.38+	.005	-	-
					140	170	30	.22	.002	-	-
					190	240	50	.35	.002	T	.02
75-53	14300 N	9840 E	40	250	-	-	-	-	-	-	-
75-54	13850 N	9520 E	20	240	40	60	20	.33*	.070	.005	.02
					60	90	30	.21	.014	-	-
					90	240	150	.40	.008	.005	.02
75-55	13630 N	9320 E	0	200	-	-	-	-	-	-	-
75-56	14240 N	9525 E	10	70	-	-	-	-	-	-	-
75-57	13800 N	9880 E	0	210	-	-	-	-	-	-	-
75-61			20	300	-	-	-	-	-	-	-

Total Percussion Drilling footage in 1975 was 13,800 ft.

(*) Hole ends in 20 feet of grading 0.25% Cu.

(+) Hole ends in 20 feet of rock grading 0.20% Cu.

CANADIAN SUPERIOR EXPLORATION LIMITED
BIG ONION PROJECT
1976 PERCUSSION DRILL SUMMARY
0.25% Cu Cutoff

PDH NO.	LAT.	DEP.	OVB	LENGTH	FROM	TO	INTERVAL	% Cu	% MoS_2	Az/Dip
76-16	10695 N	10215 E	60	300	-	-	-	-	-	0°/90°
76-17	12300 N	9940 E	30	280	100	280	180	.50	.033	-
76-18	12505 N	10130 E	40	280	120	280	160	.31	.025	-
76-19	12300 N	10245 E	20	290	50	100	50	.32	.041	-
					170	190	20	.29	.026	-
					230	290	60	.29	.010	-
76-20	12525 N	8975 E	10	300	-	-	-	-	-	-
76-21	12520 N	9170 E	10	300	250	270	20	.26	.006	-
76-22	12330 N	8955 E	10	260	-	-	-	-	-	-
76-23	12160 N	8975 E	10	300	30	70	40	.26	.021	-
76-24	12155 N	8800 E	10	300	-	-	-	-	-	-
	TOTAL FOOTAGE			2610						

APPENDIX 3

COMPARISON OF DIAMOND AND PERCUSSION DRILLING ASSAY RESULTS (AFTER STOCK G. 1977)

SAMPSON ENGINEERING INC.
2696 West 11th Avenue
Vancouver BC V6K 2L6

APPENDIX 3

COMPARISON OF PERCUSSION AND DIAMOND DRILL ASSAYS
RESULTS ON THE BIG ONION PROPERTY

COMPARISON OF COPPER ASSAYS

	PERCUSSION Assay	% Recovery	DIAMOND Assay	% Recovery	COMPARISON Length	POPULATION	POPULATION EXHIBITING the trend
<0.25% Cu	.14	100	.11	79	867	13	6.5
>0.25% Cu	.31	66	.47	100	895	10	7
Bulk Average	.23	79	.30	100	1762	9	7.5

COMPARISON OF MOLYBDENITE ASSAYS

<0.25% Cu	.015	100	.013	87	867	13	7
>0.25% Cu	.027	100	.017	63	895	10	9.5
Bulk Average	.022	100	.015	68	1762	9	7

BACON,
DONALDSON
& ASSOCIATES LTD.

12271 HORSESHOE WAY
RICHMOND. B.C. CANADA V7A 4Z1
TELEPHONE (604) 277-2322
FACSIMILE (604) 274-7235

May 3, 1991

File Number: MN1088

VARITECH RESOURCES LTD.
401 - 325 Howe Street
Vancouver, B.C.
V6C 1Z7

Attention: **Mr. B.J. Cooke**
President

Dear Brad,

Re: **Cathode Copper Potential of the Big Onion Deposit**

INTRODUCTION

At your request, I have prepared some projections regarding the economic potential of producing cathode copper from the Big Onion deposit. The analysis of the potential of this deposit is based on the information supplied by you and contained in a summary report regarding the Big Onion project, prepared in 1977 by Mr. Geoff Stock. As the ore reserves and grades have not been finalized and no metallurgical testwork has been performed on the deposit, the analysis is based on available information plus appropriate assumptions.

The mineralogy of the copper is indicated to consist primarily of chalcocite and covellite with minor chalcopyrite and bornite. It has been suggested that up to 80 million tons of this mineralization may exist with a grade of 0.6%. This combination of mineralogy, tonnage and grade has the potential for a very profitable heap leaching operation, using solvent extraction and electrowinning (SX-EW) to produce cathode copper.

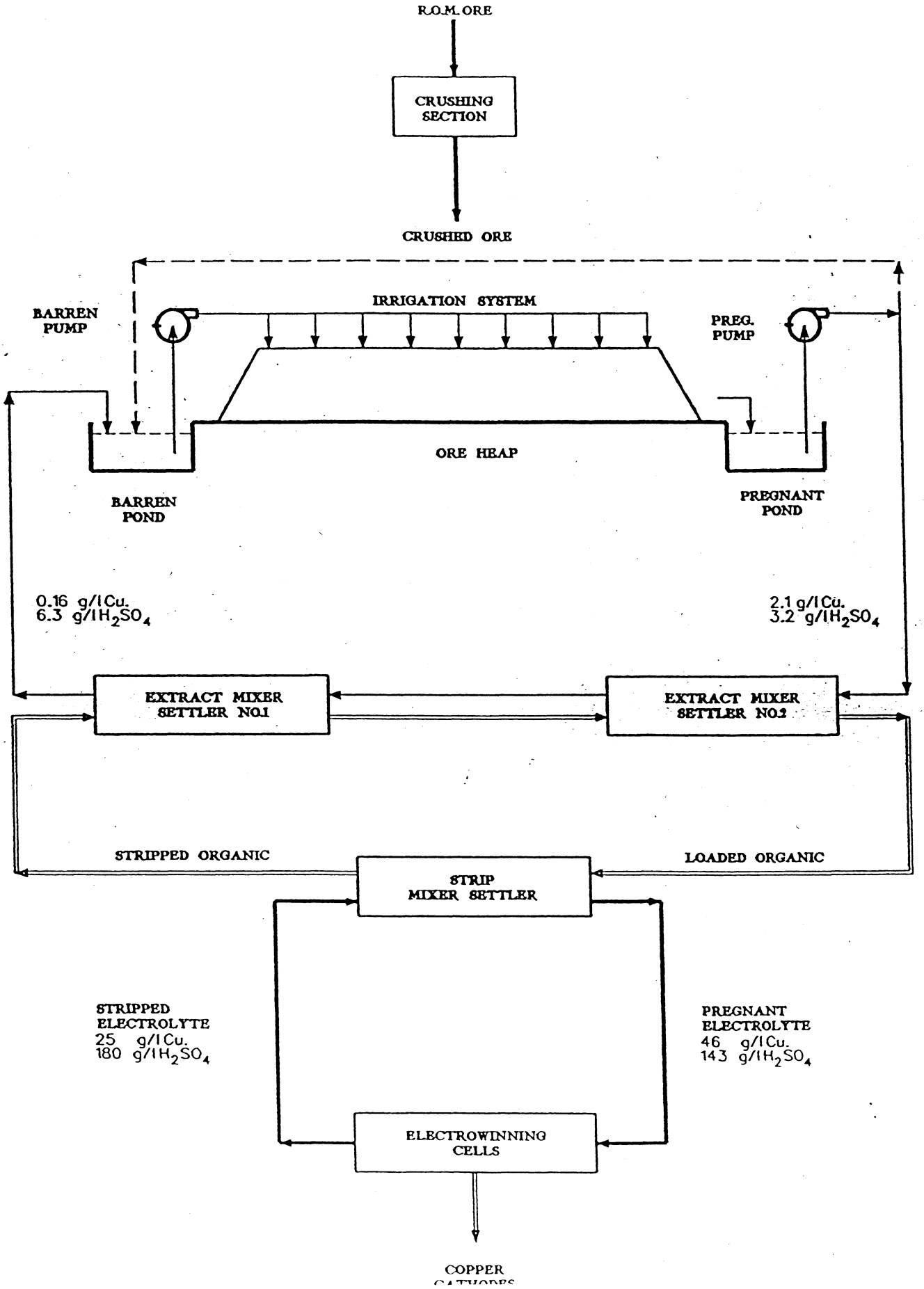
There are several advantages to the use of heap leaching together SX-EW technology. A significant advantage is that the capital cost of an SX-EW plant is much lower than that of a grinding and flotation plant having comparable copper production capability. At the same time, since high purity copper metal is produced rather than copper concentrates which have to be processed by a smelter, payment for the copper is received much sooner and often at a premium of up to 5 cents per pound of copper produced.

PROCESS DESCRIPTION (Figure 1)

Ore which is to be leached is mined and crushed prior to being placed in heaps. While run of mine ore can be leached directly, it has been determined through testwork for a number of deposits that it is generally cost effective to crush the material as fine as 2 cm prior to placing it on the heaps. Crushing the feed increases the rate of copper leaching as well as its ultimate extraction.

The crushed ore is placed in heaps that are in the order of 7 meters high on areas which have been prepared so that the leach solutions drain from the heaps towards central collection areas. Once the heaps have been prepared, a weak sulphuric acid solution is added to the top of the pile through a distribution system. As this acid percolates through the rock, it dissolves the copper minerals. The different copper minerals vary in the rate at which they will leach. Copper carbonates (malachite and azurite) and silicates (chrysocolla) dissolve very rapidly in sulphuric acid. For ores in which these minerals are the principal components, the leaching of a heap can be accomplished in 30 to 60 days. Simple copper sulphides such as covellite and chalcocite must oxidize before they will dissolve. This oxidation is accomplished by dissolved iron in the leach solutions, the iron being regenerated through contact with oxygen in the air. When these minerals are present, the construction of the heaps makes provisions for air circulation to maximize the leaching rate. The time required to achieve the maximum possible copper extraction in this case may be in the order of several months.

HEAP LEACH SX AND ELECTROWINNING



The maximum copper extraction to be achieved by heap leaching varies somewhat depending on the permeability of the rock and the nature of the copper mineralization. Through a combination of crushing the feed to the proper size and constructing the heap efficiently, a copper recovery of 70% should be readily achieved.

After the leach solutions have percolated through the heap they typically contain 0.5 - 2 g/L copper in addition to some impurities such as iron. These "pregnant" solutions are treated by solvent extraction to produce a solution containing very low levels of impurity and in the order of 40 to 50 g/L copper. This concentrated solution becomes the feed to the electrowinning circuit for cathode copper production. The copper sheets are periodically peeled from the stainless steel sheets on which they are plated and are ready for shipment to the end user of the copper.

The process of cathode copper production using heap leaching together with SX-EW technology is comparable to the use of heap leaching for gold production from low grade ores. The simplicity of the overall process for producing final metal with relatively low capital and operating costs makes it highly profitable compared to conventional flotation and smelting technology. There are now in the order of 30 operations using this technology throughout North America. In British Columbia, Gibraltar Mines uses the SX-EW process to recover copper from its low grade waste dumps. The plant operates year round to produce cathode grade copper from what was previously considered waste material. Bell Copper is presently also conducting studies to implement the process for their waste dumps.

ECONOMICS

The potential economic return to be achieved from the implementation of SX-EW technology at the Big Onion project has been determined using the following assumptions:

1. A plant having a rated capacity of 75,000 pounds per day of copper would be constructed. At a 95% availability this plant would produce 71,000 pounds per day, 365 days per year.

2. The capital cost for the installation would be $25 million CAN including preparation of leach pads. Recent advances in the construction of SX-EW plants are tending to reduce the capital cost significantly.

3. The copper grade is 0.6% Cu and the recovery is 70%. On this basis, over a 15 year period, the operation would process 43 million tons of ore.

4. The operating cost for the leaching and copper recovery operations is assumed to be 37 cents per pound of copper produced. Using a mining cost of $2.00 per ton of ore, the overall operating cost becomes 60.8 cents per pound copper produced. No stripping allowance has been made so that stripping is assumed to be a preproduction expense.

5. Cu price = $1.15 CAN per pound.

6. Depreciation = 30% on a declining balance basis.

7. Taxes = 50%.

Using these assumptions, the following returns are projected (all values in $ CAN):

Yearly Gross Revenue = $29.8 Million

Yearly Operating Profit = $14.0 million

DCF (15%) = $42.9 million
(25%) = $27.1 million (over 15 years)
(30%) = $22.5 million

IRR = 27% (based on 100% equity financing)

Payback period (at 15% discount rate) = 6 years.

SUMMARY

The use of SX-EW technology for the recovery of copper from solutions obtained by leaching the Big Onion ore appears to offer an attractive financial return. The mineralogy of the deposit makes it amenable to this process route. Additional development work to provide the data required for a full feasibility study should be undertaken.

Yours truly,
BACON, DONALDSON & ASSOCIATES LTD.

MB Beattie

Dr. M. J. V. Beattie, P.Eng.

MJVB:mls

M1088L01.MJB

BACON
DONALDSON
& ASSOCIATES LTD.

12271 HORSESHOE WAY
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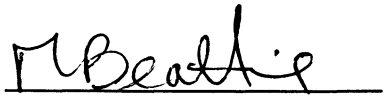
CANADA V7A 4Z1
TELEPHONE: (604) 277-2322
FACSIMILE : (604) 274-7235

PRELIMINARY METALLURGICAL TEST WORK ON A SAMPLE FROM THE BIG ONION DEPOSIT

Prepared for:

VARITECH RESOURCES LTD.
401 - 325 Howe Street
Vancouver, B.C.
V6C 1Z7

File Number: MN1196
December 11, 1991
WIP\MN\MN1196R1.MJB



Dr. M. J. V. Beattie, P.Eng.

1.0 INTRODUCTION

The Big Onion copper deposit is located near Smithers, B.C. The presence of chalcocite in addition to chalcopyrite in this deposit makes it a potential candidate for processing by heap leaching. The objective of the present test program was to determine on a preliminary basis the extraction rate and ultimate copper extraction which can be achieved by heap leaching of the Big Onion deposit.

The scope of the present test program was approved by Mr. Bradford J. Cooke of Varitech.

2.0 SUMMARY

The results of preliminary leaching tests with both ferric iron and bacteria present indicate a high initial rate of copper extraction followed by a more gradual rate of leaching. Over a 30 day leach period, a copper extraction of 66% was achieved.

The initial leaching rate of the material is very good, considering that about 80% of the copper exists as chalcopyrite. The high proportion of chalcopyrite in the sample results in slower leach kinetics than would be experienced with chalcocite alone. It is expected that a leaching time of 6 to 9 months would be required to achieve an extraction of 70 to 80%.

The extraction achieved with the material crushed to 1/4 inch is the same as for the pulverized samples, indicating that the copper is not locked within the gangue. The leaching of a coarser material should be tested in future programs.

3.0 DISCUSSION

3.1 Sample Description

A set of four plastic bags of drill core weighing 60 pounds in total was received at Bacon Donaldson on August 29, 1991. The core was crushed to minus 3/4 inch prior to being blended and split. One half of the sample was further crushed to minus 1/4 inch prior to being split into individual test charges.

The sample was analyzed as follows:

Total Cu	=	1.22%
Fe	=	1.44%
S Total	=	1.20%
S Sulphide	=	1.10%
Cu as Chalcocite	=	0.318%
Acid Consumption	=	6.9 kg H_2SO_4/tonne

A microscopic examination of the sample revealed about 80% of the copper to exist as chalcopyrite with the balance existing as chalcocite, in agreement with the assay results.

3.2 Shake Flask Leach Tests

A portion of the composite was pulverized to minus 200 mesh prior to being subjected to leaching tests. One test was conducted with an addition of ferric sulphate to observe the leaching profile in the absence of bacterial activity. The second test involved the addition of a bioleaching medium. The progress of the two tests is summarized as tests L2 and B1. The results are also presented

graphically as Figure 1. The tests with the ferric addition dissolved some of the copper immediately. Within one day, the test utilizing bioleaching had achieved the same extraction as the test with ferric addition only. For both tests, the extraction rate levelled out after the first five days, but copper extraction continued over the 30 day test period. The test with added bacteria extracted approximately 10% more copper than the test with added ferric only.

The rate of copper extraction after 30 days has decreased to the point where only a substantially longer leaching period such as 6 to 9 months can result in a significant increase in copper extraction. It is not possible to project from the present data to what the extraction might be after a period of some months. For other heap leaching operations, copper extractions are generally in the range of 60 to 70%.

3.3 Leaching of Crushed Sample

A bottle roll test was conducted on composite material crushed to minus 1/4 inch. The test details are included as Test No. L1. The test was initiated with 3 g/L ferric and was allowed to proceed by means of air oxidation from that point on.

The copper extraction rate over the 34 day period was more constant than that obtained for the pulverized sample. The extraction achieved at the end of 34 days was similar to that for the pulverized material, indicating that liberation of the copper minerals is not a limiting factor across the range of particle sizes tested. Future test programs should investigate the viability of leaching samples crushed to coarser sizes (say 3/4 inch).

SHAKE FLASK LEACH TEST REPORT

Project: MN1-196 **Test No:** B1 **Starting Date:** 26-Sep-91
Client: Varitech

Test Objective: To determine the amenability of the sample to bioleaching.

Sample: Chalcocite ore, dry, cone-crushed, then pulverized.

Particle Size: 100% -200 mesh.

Head Assays: % Fe= 1.44 % S (tot)= 1.20
% Cu= 1.21 % S (2-)= 1.10

Initial Conditions:

Flask Tare (g): 135.7 Solution Vol (mL): 75.4
Solids Wt (g): 8.0 Solution Wt (g): 74.8
Medium Vol (mL): 70.0 Slurry Wt (g): 82.8
Acid Add'n (mL): 0.4 Slurry Density (% w/w): 9.7
Test Wt (g): 218.5

Inoculum:

Volume (mL): 5.0 Sol Fe (g/L): 0.59
pH: 2.05 Sol Cu (mg/L): 600
ORP (mV): 450

Test Progress:

Date	Time	Hours	pH	ORP	H2SO4 Addn.		Test	Sample	Solution Analyses		Extraction	
					Cum 12N	Cons.	Wt	Vol	Fe(T)	Cu	Fe	Cu
				mV*	mL	kg/t	(g)	mL	g/L	mg/L	%	%
Sep-26	15:30	0.0	Start Acidif.		0.4	29	218.5					
Sep-26	16:30	1.0	2.11		0.5	37	221.8	1.0	0.09	72	3.6	2.8
Sep-27	16:30	25.0	2.22		0.5	37	218.5	1.0	0.03	310	-0.5	21.1
Sep-30	16:30	97.0	2.19	520	0.5	37	218.5	1.0	0.02	665	-1.1	49.1
Oct-02	16:30	145.0	2.16	543	0.5	37	218.5	1.0	0.04	720	0.2	54.0
Oct-04	16:30	193.0	2.23	581	0.6	44	218.5	1.0	0.06	765	1.5	58.3
Oct-07	16:30	265.0	2.09	604	0.6	44	216.4	1.0	0.15	805	7.2	60.4
Oct-09	16:30	313.0	2.07	610	0.6	44	218.9	1.0	0.14	825	7.0	64.9
Oct-11	16:30	361.0	2.08	615	0.6	44	219.7	1.0	0.16	810	8.5	65.2
Oct-16	16:30	481.0	2.10	656	0.6	44	218.5	1.0	0.24	835	13.7	67.0
Oct-23	16:30	649.0	2.13	649	0.6	44	218.2	1.0	0.30	820	17.8	66.5
Oct-30	16:30	817.0	2.11	636	0.6	44	218.5	1.0		820		67.6

* vs. Ag/AgCl reference

SHAKE FLASK LEACH TEST REPORT

Project: MN1-196 **Test No:** L2 **Starting Date:** 26-Sep-91
Client: Varitech

Test Objective: To determine the amenability of the sample to leaching by ferric sulfate.

Sample: Chalcocite ore, dry, cone-crushed, then pulverized.

Particle Size: 100% -200 mesh.

Head Assays: % Fe= 1.44 % S (tot)= 1.20
% Cu= 1.22 % S (2-)= 1.10

Initial Conditions:

Flask Tare (g): 137.5 Solution Vol (mL): 75.2
Solids Wt (g): 8.0 Solution Wt (g): 75.1
Medium Vol (mL): 0.0 Slurry Wt (g): 83.1
Acid Add'n (mL): 0.2 Slurry Density (% w/w): 9.6
Test Wt (g): 220.6

Leach Solution:

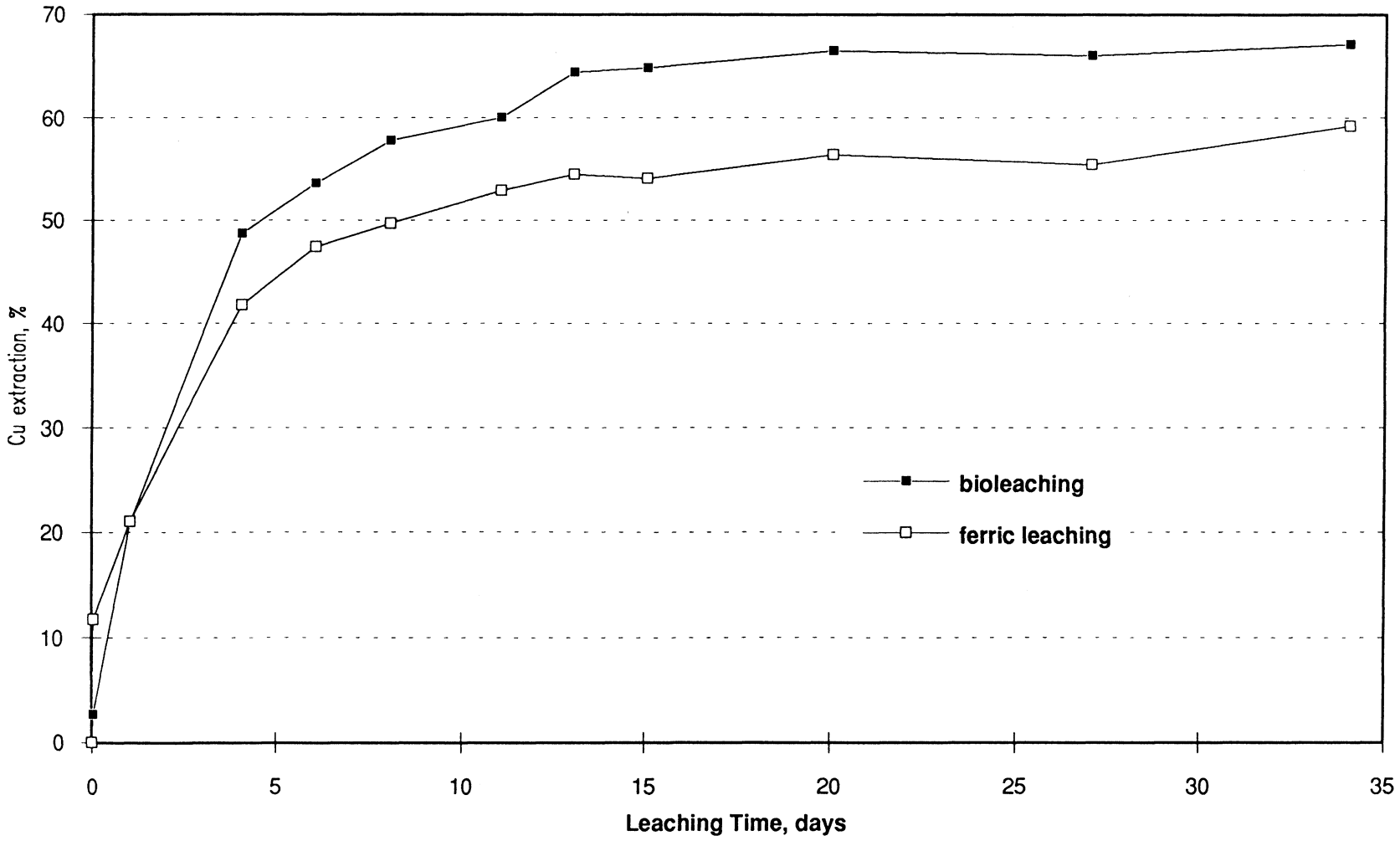
Volume (mL): 75.0 Sol Fe(T) (g/L): 3.12
pH: Sol Fe(3+) (g/L): 3.04
ORP (mV): Sol Cu (mg/L): 0

Test Progress:

Date	Time	Hours	pH	ORP	H2SO4 Addn.		Test	Sample	Solution Analyses			Extraction	
					Cum 12N	Cons.	Wt	Vol	Fe(T)	Fe(3+)	Cu	Fe	Cu
				mV*	mL	kg/t	(g)	mL	g/L	g/L	mg/L	%	%
Sep-26	15:30	0.0	Start Leach		0.2	15	220.6		3.12	3.04			
Sep-26	16:30	1.0	1.98	498	0.2	15	223.8	1.0	3.00		146	1.0	11.7
Sep-27	16:30	25.0	2.08	466	0.2	15	220.6	1.0	2.90		270	-11.2	21.0
Sep-30	16:30	97.0	2.33	438	0.3	22	220.9	1.0	2.50		535	-34.2	41.8
Oct-02	16:30	145.0	2.00	433	0.3	22	220.9	2.0	2.85	1.34	600	-9.0	47.4
Oct-04	16:30	193.0	2.03	431	0.3	22	220.8	1.0	2.70		615	-14.2	49.7
Oct-07	16:30	265.0	2.15	444	0.3	22	218.9	2.0	2.55	1.57	665	-25.8	52.9
Oct-09	16:30	313.0	2.13	450	0.3	22	220.9	1.0	2.35		650	-30.1	54.5
Oct-11	16:30	361.0	2.15	454	0.3	22	222.3	1.0	2.30		625	-28.5	54.1
Oct-16	16:30	481.0	2.04	472	0.3	22	220.6	1.0	2.05		660	-46.3	56.4
Oct-23	16:30	649.0	2.06	470	0.3	22	220.4	1.0	1.95		640	-51.3	55.4
Oct-30	16:00	816.5	2.04	468	0.3	22	220.6	1.0			680		59.2

* vs. Ag/AgCl reference

Acid Leaching of Pulverized Sample



BOTTLE ROLL LEACH TEST REPORT

Project: MN1-196 **Test No:** L1 **Starting Date:** 24-Sep-91
Client: Varitech

Test Objective: To determine amenability of crushed sample to acid leaching

Sample: Chalcocite ore, crushed to minus 1/4 inch

Particle Size: minus 1/4 inch

Head Assays: % Fe= 1.44
% Cu= 1.22
% S (tot)= 1.20
% S (2-)= 1.10

Initial Conditions:

Flask Tare (g): 1557.0
Solids Wt (g): 3503.0
Medium Vol (mL): 0.0
Acid Add'n (g 25 %): 424.5
Test Wt (g): 9011.0

Solution Vol (mL): 3951.0
Solution Wt (g): 3951
Slurry Wt (g): 7454.0
Slurry Density (% w/w): 47.0

Leach Solution

Volume (mL): 3951.0
pH:
ORP (mV):

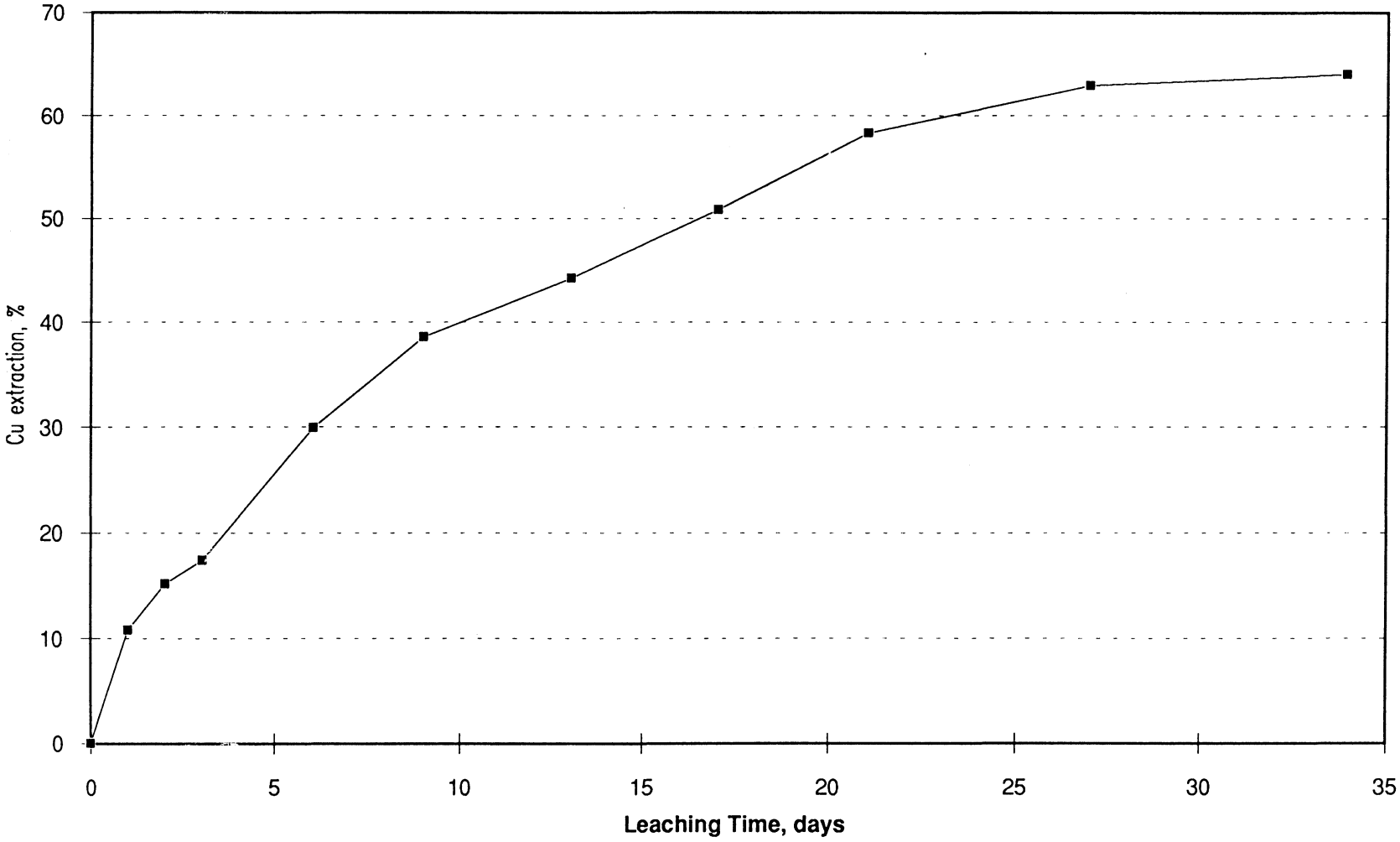
Sol Fe (g/L): 3.00
Sol Cu (mg/L): 0

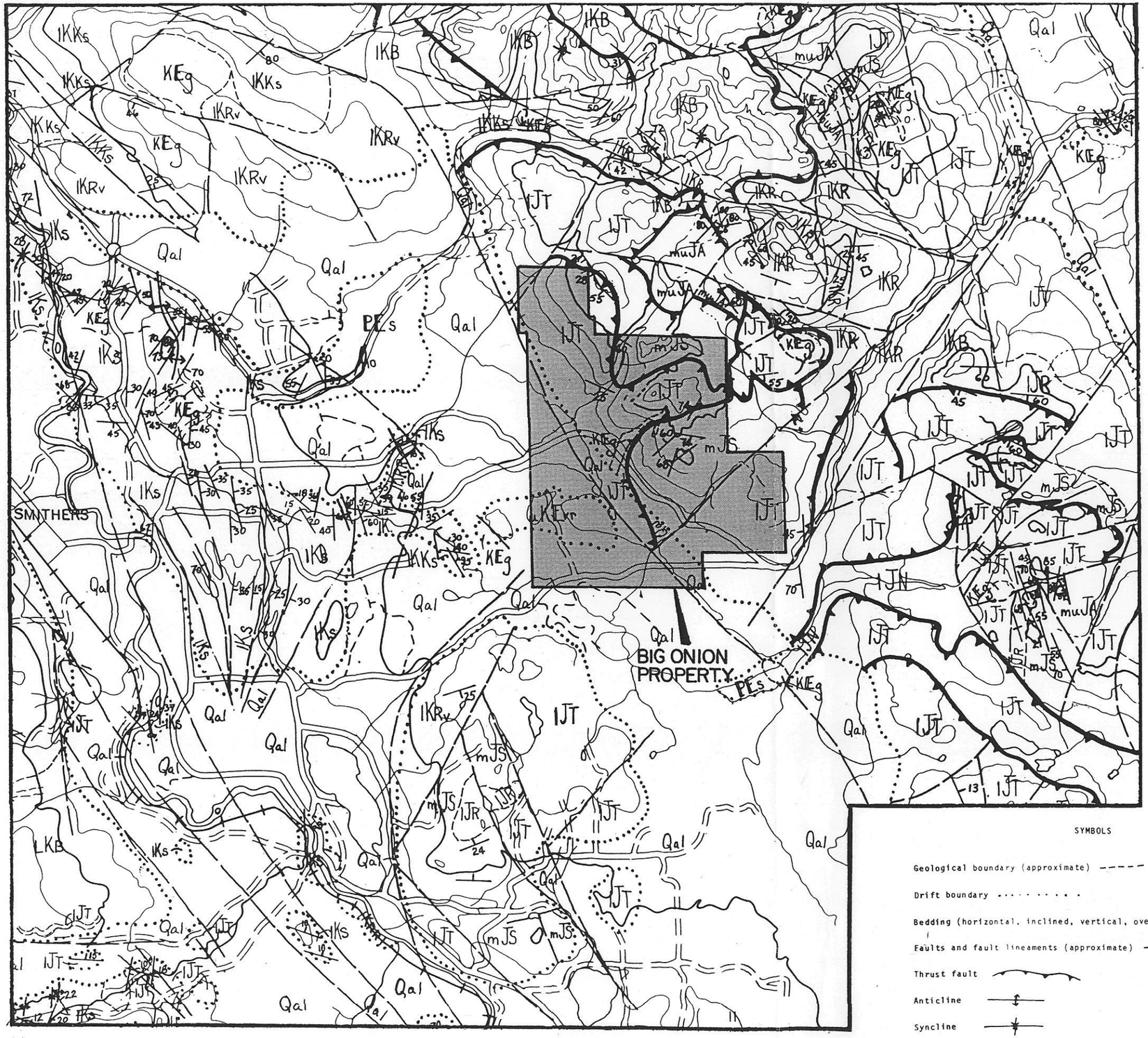
Test Progress:

Date	Time	Hours	pH	ORP	H2SO4 Addn.		Test	Sample	Solution Analyses			Extraction	
					Cum	Cons.	Wt	Vol	Fe(T)	Fe(3+)	Cu	Fe	Cu
				mV*	g	kg/t	(g)	mL	g/L	g/L	mg/L	%	%
Sep-24	10:30	0.0	1.50		106.0	30	9011.0	25.0					
Sep-25	11:00	24.5	1.40				8964.0	25.0			1180		10.8
Sep-26	11:00	48.5	1.40				8917.0	25.0			1680		15.2
Sep-27	11:15	72.8	1.50				8887.0	25.0			1920		17.4
Sep-30	11:00	144.5	1.50				8844.0	25.0			3340		29.9
Oct-03	10:30	216.0	1.50		108.0	31	8799.0	25.0			4360		38.6
Oct-07	11:00	312.5	1.65		114.8	33	8750.0	25.0	4.5		5040	9.4	44.2
Oct-11	11:00	408.5	1.80		125.9	36	8726.0	25.0	4.9		5800	12.3	50.8
Oct-15	11:00	504.5	1.80		136.3	39	9030.0	25.0	5.1		6130	16.9	58.3
Oct-21	10:00	647.5	1.95		154.6	44	9000.0	25.0			6640		62.9
Oct-28	08:00	813.5	1.75		167.6	48	8994.0	25.0	5.2		6720	18.1	64.0

* vs. Ag/AgCl reference

Acid Leaching of Crushed Sample





PLEISTOCENE AND RECENT

Qal alluvium, till, gravel

SUSTUT GROUP(?)

PALEOCENE AND EOCENE

PEs shale, acid tuff; minor greywacke, coal, conglomerate

LATE CRETACEOUS AND EOCENE

KEg undivided: quartz diorite, quartz monzonite and granodiorite, in part porphyritic, many small felsite plutons

SKEENA GROUP

ALBIAN AND/OR YOUNGER

IKB | IKv

IKB: BRIAN BORU FORMATION: vari-coloured pophyritic tuff, breccia, and flows

IKv: mainly coarse breccias of andesitic to dacitic composition

MIDDLE ALBIAN (mainly or entirely)

IKR | IKv

IKR: RED ROSE FORMATION : black to dark grey shale, chert pebble conglomerate; minor micaceous greywacke.

IKs: micaceous greywacke, black to dark grey shale; minor conglomerate and coal

HAUTERIVIAN(?) TO ALBIAN(?)

IKRv Rocky Ridge volcanics: dark green to rusty brown augite porphyry flows and breccias, rusty red tuff, and breccia, hornblende andesite, aphanitic basic flows

HAUTERIVIAN TO(?) ALBIAN

IKKs Kitsun Creek sediments: coarse to fine polymictic conglomerate, greywacke, dark grey shale, coal; minor rusty red tuff related to Rocky Ridge volcanics

UPPER BAJOCIAN TO LOWER OXFORDIAN

muJA ASHMAN FORMATION: dark grey to black shale, quartzose sandstone, greywacke, and chert pebble conglomerate

HAZELTON GROUP

LOWER BAJOCIAN TO LOWER CALLOVIAN

mJs SMITHERS FORMATION: grey-brown greenish-grey to drab grey greywacke, lithic sandstone, siltstone, shale, tuff breccia, grit, glauconitic sandstone; minor conglomerate

SINEMURIAN AND(?) LOWER PLIENSBACHIAN

IJT TELKWA FORMATION: variegated red, maroon, grey green breccia, tuff, and flows of basaltic to rhyolitic composition

N

AFTER GSC O.F. 351

SYMBOLS

Geological boundary (approximate) - - - - -

Drift boundary . . . . . .

Bedding (horizontal, inclined, vertical, overturned)

Faults and fault lineaments (approximate) — — — —

Thrust fault

Anticline

Syncline

VARITECH RESOURCES LTD.

BIG ONION PROJECT

REGIONAL GEOLOGY

N.T.S. 93L-15W OMINECA M.D., B.C.

0 1 2 3 6 KM.

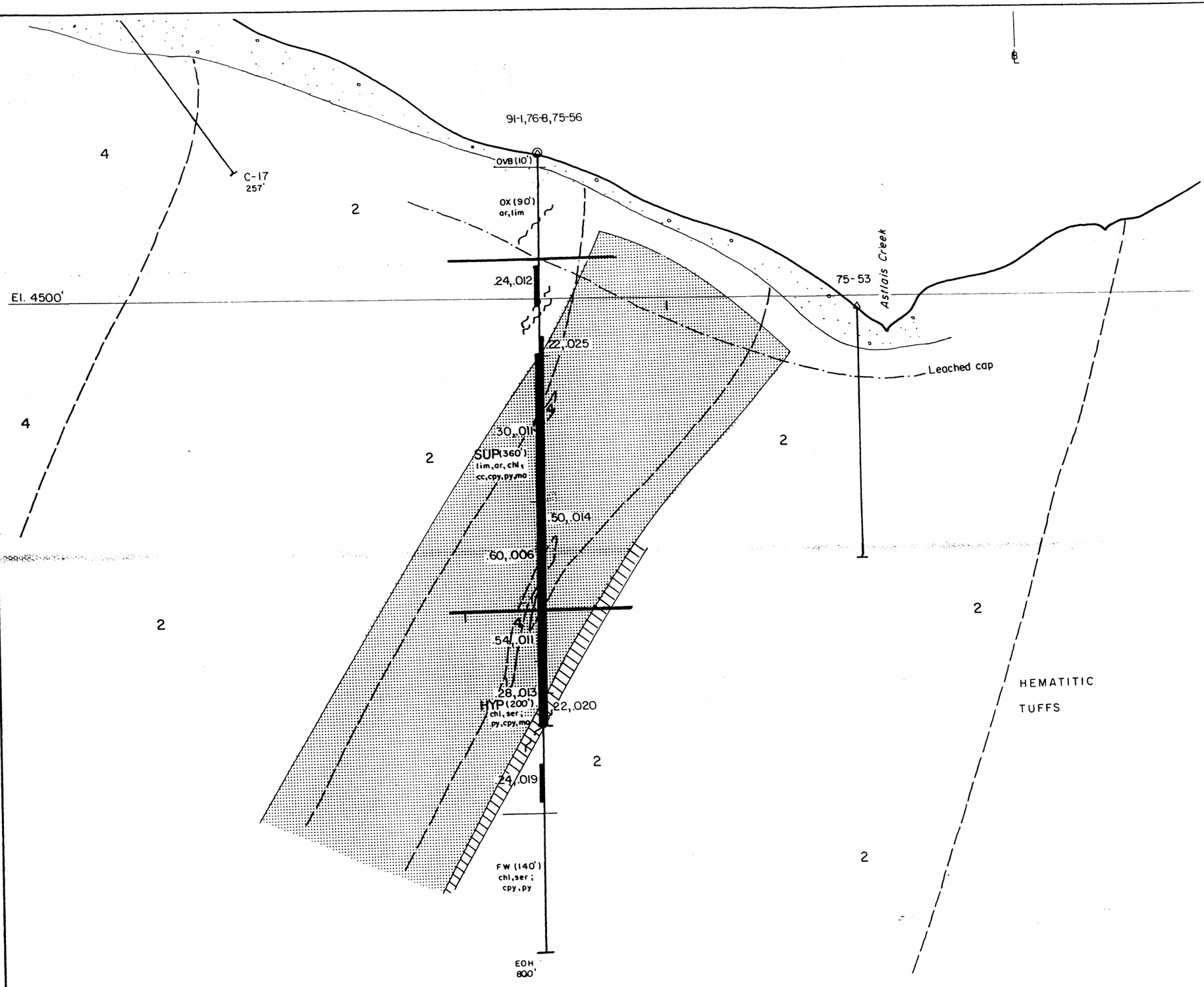
Scale 1:125,000	Date: August 1991
Drawn by: C.S.	Figure No.: 4

CHONG

Table 2

1991 Diamond Drill Summary

Hole # (HQ)	Sect. (N)	PDH # (2")	DDH# (BQ)	OB	Leached Cap	Supergene (% Cu, %MoS2)	Cu Upgrade	Hypogene (%Cu, %MoS2)	Footwall	EOH
91-1	14.3	75-56	76-8	10'	90'	360' (.355,.010)	-.072 (-16.9%)	200' (.292,.012)	140'	800'
91-2	14.8	-------	76-9	40'	40'	310' (.630,.020)	+.105 (+20%)	118 (.226,.007)	190'	698'
91-3	15.0	75-29	75-58	50'	70'	360' (.553,.024)	-.074 (-11.4%)	270' (.144,.007)	--------	750'
91-4	13.5	75-26	75-59	10'	10'	100' (.534,.019)	+.052 (+10.8%)	350' (.270,.014)	130'	597'
91-5	12.3	75-15	-------	60'	40'	120' (.689,.026)	+.097 (+16.5%)	310' (.210,.004)	50'	580'
91-6	11.9	75-12	75-60	30'	10'	200' (.294,.025)	+.082 (+38.4%)	100' (.113,.005)	410'	750'
91-7	11.3	75-7	-------	10'	30'	250' (.370,.020)	-.060 (-14.0%)	443' (.229,.011)	--------	733'
91-8	11.1	75-4	-------	10'	20'	150' (.296,.012)	-.099 (-25.1%)	480' (.269,.013)	84'	744'



LEGEND

- 1 Quartz diorite porphyry
- 2 Quartz feldspar porphyry
- 4 Andesite
- Copper zone
- Reserve additions
- Geological contact
- .41,.011 Assay - Cu %, Mo %
- Canadian Superior pit outline

OVB	Overburden
OX	Oxidized zone
SUP	Supergene zone
HYP	Hypogene zone
FW	Footwall
EOH	End of hole
lim	Limonite
ar	Argillic alteration
chl	Chloritic "
epi	Epidotic "
ser	Sericitic "
sil	Silicic "
cc	Chalcocite
cpy	Chalcopyrite
bn	Bornite
py	Pyrite
po	Pyrrhotite
mag	Magnetite
mo	Molybdenite

After Canadian Superior Exploration Ltd., 1976

- △ Percussion drill hole
- ○ Diamond drill hole

Reserves : .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

SECTION 14,300N

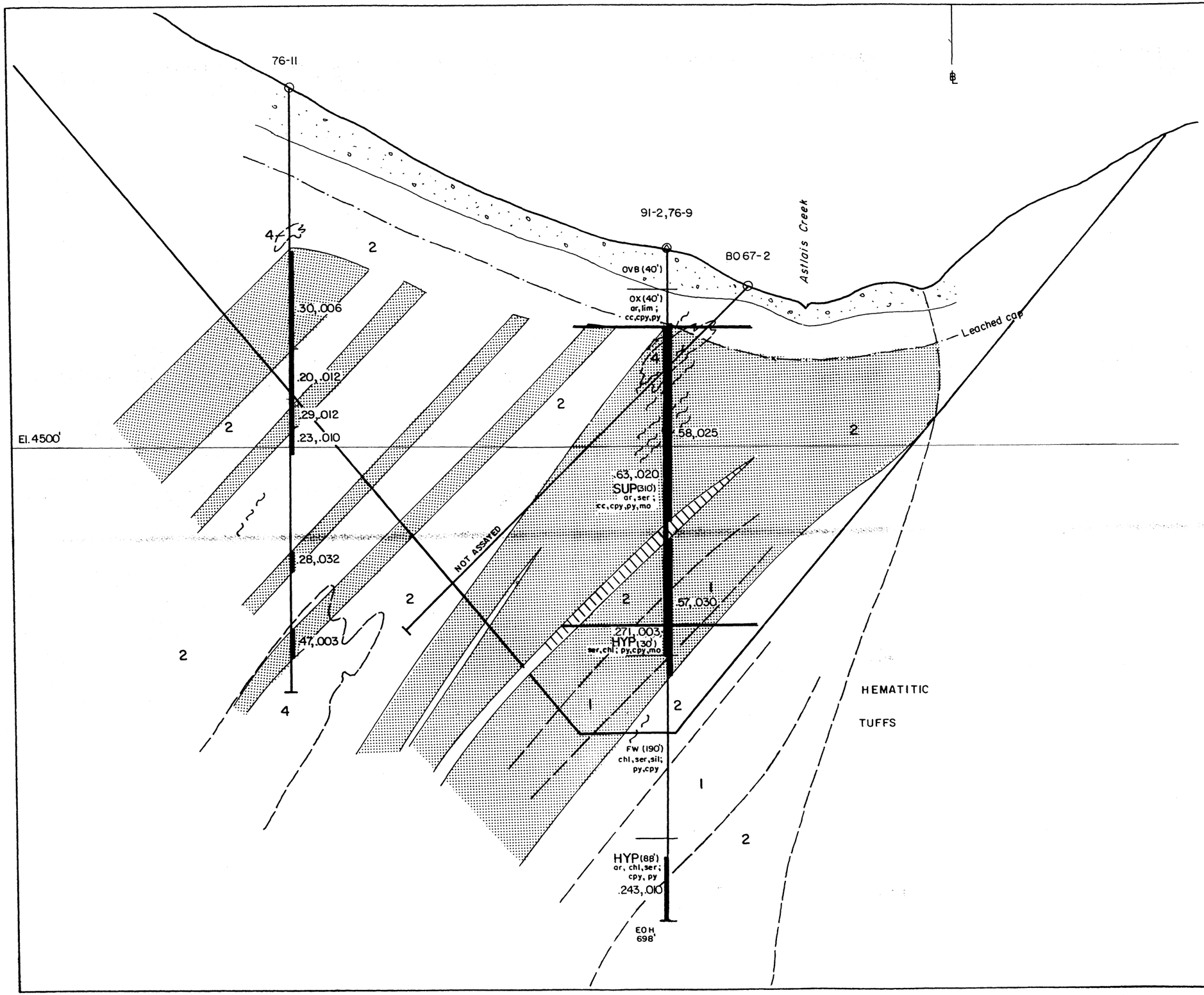
N.T.S. 93L-15W — OMINECA M.D., B.C.

0 100 200 Feet

0 10 20 40 60 Metres

Scale 1" = 100' (1:1200)	Date : Sept. 1991
Drawn by : E.M.	Figure No. : 6a

CHONG



LEGEND

- 1 Quartz diorite porphyry
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- .41, .011 Assay - Cu %, Mo %
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OVB	Overburden
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cpy	Chalcopyrite
bn	Bornite
py	Pyrite
po	Pyrrhotite
mag	Magnetite
mo	Molybdenite

After Canadian Superior Exploration Ltd., 1976

△ Percussion drill hole

○ Diamond drill hole

Reserves : .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

SECTION 14,800N

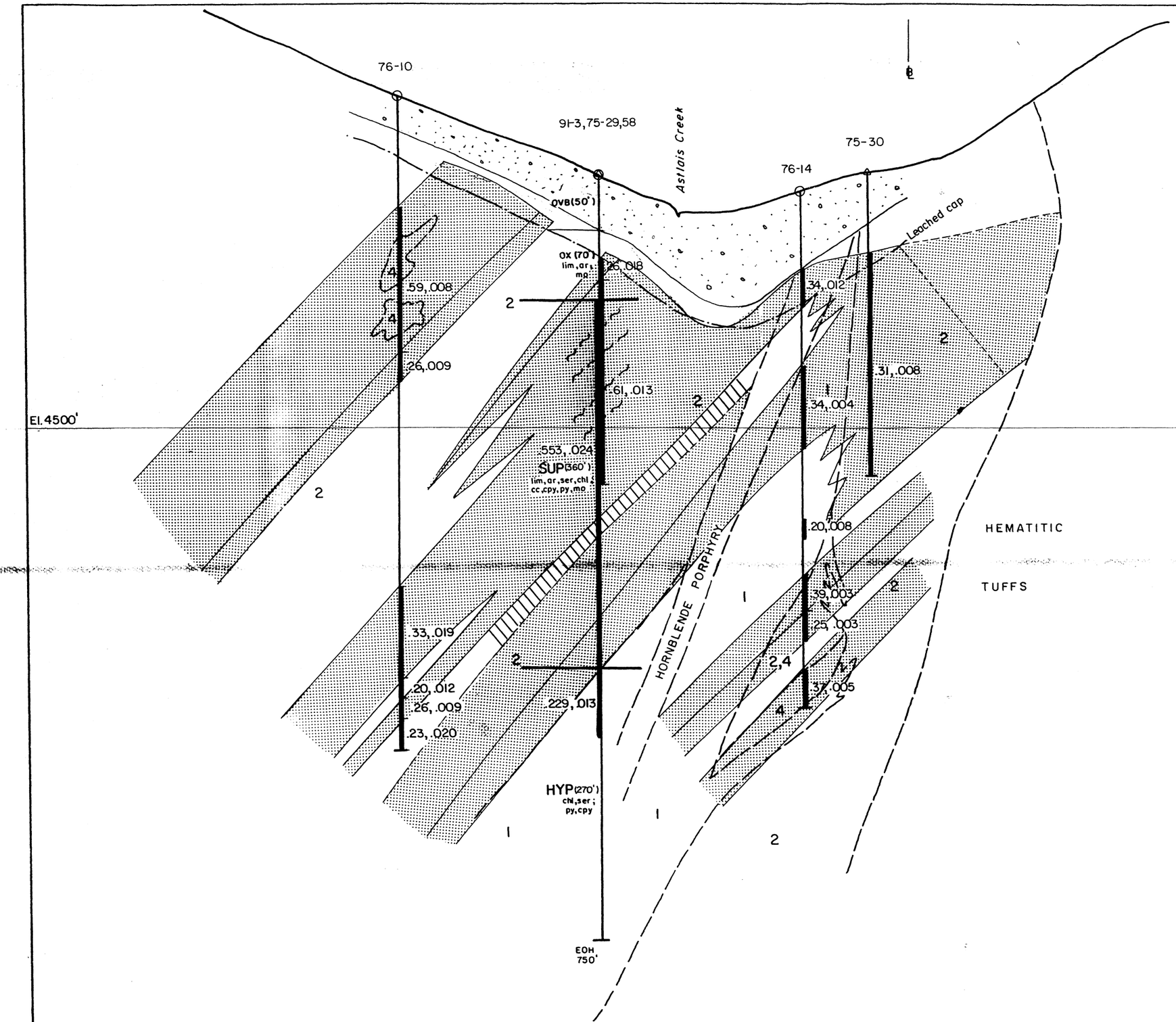
N.T.S. 93L-15W — OMINECA M.D., B.C.

0 100 200 Feet

0 10 20 40 60 Metres

Scale 1" = 100' (1:1200)	Date : Sept. 1991
Drawn by : E.M.	Figure Nº. : 6b

CHONG



LEGEND

- 1 Quartz diorite porphyry
- 2 Quartz feldspar porphyry
- 4 Andesite
- Copper zone
- Reserve additions
- Geological contact
- .41,.011 Assay - Cu%, Mo%
- Canadian Superior pit outline

OVB Overburden
OX Oxidized zone
SUP Supergene zone
HYP Hypogene zone
FW Footwall
EOH End of hole

lim Limonite
ar Argillic alteration
chl Chloritic "
epi Epidotic "
ser Sericitic "
sil Silicic "

cc Chalcocite
cpy Chalcopyrite
bn Bornite
py Pyrite
po Pyrrhotite
mag Magnetite
mo Molybdenite

After Canadian Superior Exploration Ltd., 1976

△ Percussion drill hole
○ Diamond drill hole

Reserves: .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

SECTION 15,000N

N.T.S. 93L-15W — OMINECA M.D., B.C.

0 100 200 Feet
0 10 20 40 60 Metres

Scale 1"=100' (1:1200)	Date: Sept. 1991
Drawn by: E.M.	Figure No.: 6c

CHONG

El. 4500'

91-4 ,75-26,59

75-25

OVB (10')
OX (10') lim,chl,ser ; py,cpy

HYP (130')
ar,chl ;
py,cpy,mo
.292,.007

38,.009

66 .002

534,.019

SUP (100')
ar, chl,ser;
cc,py,cpy,mo

N177

313,.021

HYP (220')
ar,chl,ser,sil;
py,cpy,mo
233,.014

NOT ASSAYED

B067-1
573'

FW (130')
chl,ser,sil;
py,cpy,mo

EOH
597'

Leached cap

Astlais Creek

1 2 4

LEGEND

- 1 Quartz diorite porphyry
- 2 Quartz feldspar porphyry
- 4 Andesite
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- Reserve additions
- Geological contact
- .41,.011 Assay - Cu %, Mo %
- Canadian Superior pit outline

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cpy	Chalcopyrite
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py	Pyrite
po	Pyrrhotite
mag	Magnetite
mo	Molybdenite

After Canadian Superior Exploration Ltd., 1976

△ Percussion drill hole

○ Diamond drill hole

Reserves : .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

SECTION 13,500N

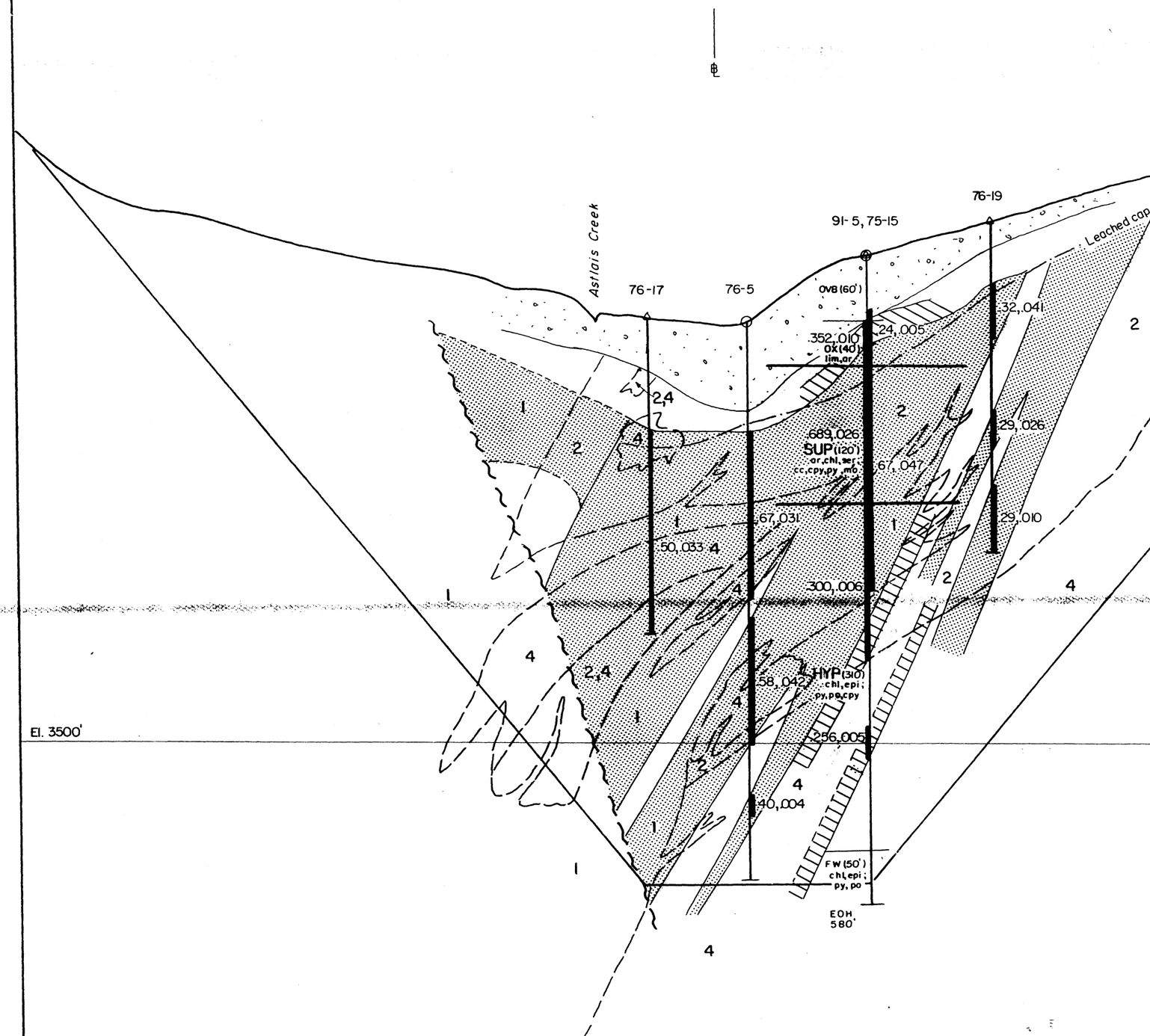
N.T.S. 93L-15W OMINECA M.D., B.C.

0 100 200 Feet

0 10 20 40 60 Metres

Scale 1" = 100' (1:1200)	Date : Sept. 1991
Drawn by : E.M.	Figure No. : 6d

CHONG



LEGEND

- 1 Quartz diorite porphyry
- 2 Quartz feldspar porphyry
- 4 Andesite
- Copper zone
- Reserve additions
- Geological contact
- 41,011 Assay - Cu %, Mo %
- Canadian Superior pit outline

OVB	Overburden
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sil	Silicic "
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cpy	Chalcopyrite
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py	Pyrite
po	Pyrrhotite
mag	Magnetite
mo	Molybdenite

After Canadian Superior Exploration Ltd., 1976

△ Percussion drill hole

○ Diamond drill hole

Reserves : .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

SECTION 12,300 N

N.T.S. 93L-15W

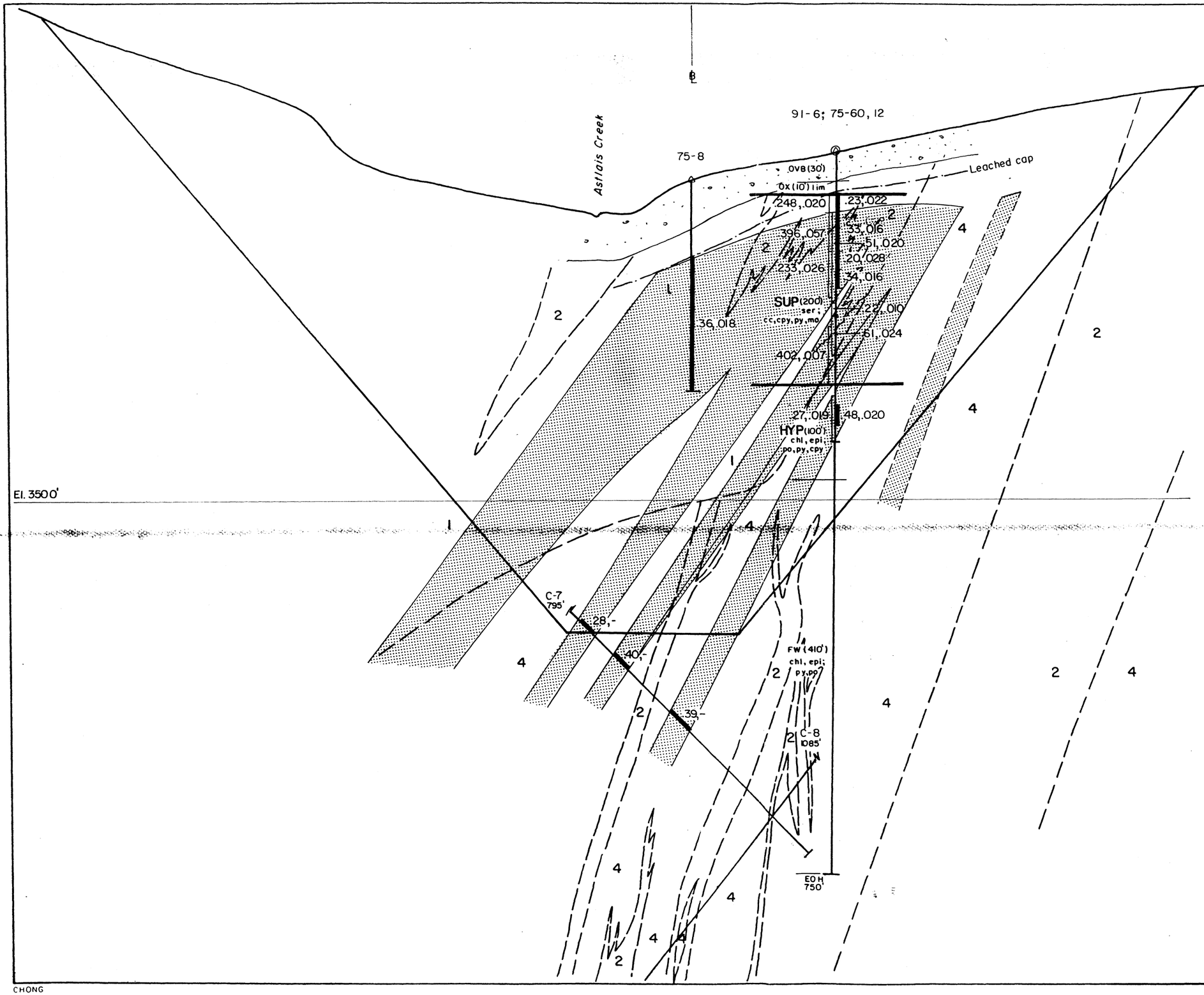
OMINECA M.D., B.C.

0 100 200 Feet

0 10 20 40 60 Metres

Scale 1" = 100' (1:1200)	Date : Sept. 1991
Drawn by : E.M.	Figure No. : 6e

CHONG



LEGEND

- 1 Quartz diorite porphyry
- 2 Quartz feldspar porphyry
- 4 Andesite
- Copper zone
- Reserve additions
- Geological contact
- .41,.011 Assay - Cu%, Mo%
- Canadian Superior pit outline

OVB	Overburden
OX	Oxidized zone
SUP	Supergene zone
HYP	Hypogene zone
FW	Footwall
EOH	End of hole
lim	Limonite
ar	Argillic alteration
chl	Chloritic "
epi	Epidotic "
ser	Sericitic "
sil	Silicic "
cc	Chalcocite
cpy	Chalcopyrite
bn	Bornite
py	Pyrite
po	Pyrrhotite
mag	Magnetite
mo	Molybdenite

After Canadian Superior Exploration Ltd., 1976

△ Percussion drill hole

○ Diamond drill hole

Reserves : .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

SECTION 11,900N

N.T.S. 93L-15W

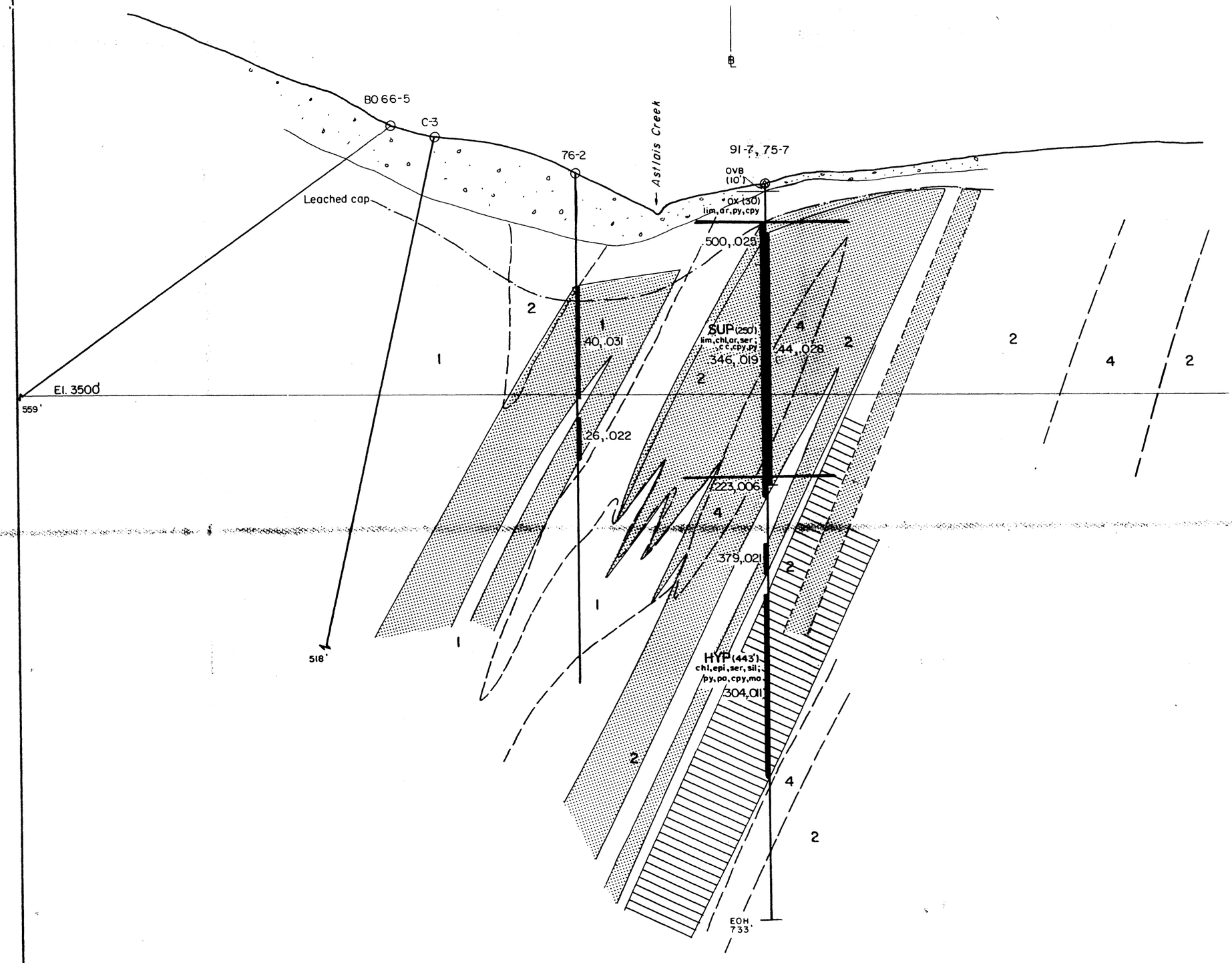
OMINECA M.D., B.C.

0 100 200 Feet

0 10 20 40 60 Metres

Scale 1"=100' (1:1200)	Date : Sept. 1991
Drawn by : E.M.	Figure No. : 6f

CHONG



LEGEND

- 1 Quartz diorite porphyry
- 2 Quartz feldspar porphyry
- 4 Andesite
- Copper zone
- Reserve additions
- Geological contact
- .41, .011 Assay - Cu %, Mo %
- Canadian Superior pit outline

OVB Overburden
OX Oxidized zone
SUP Supergene zone
HYP Hypogene zone
FW Footwall
EOH End of hole

lim Limonite
ar Argillic alteration
chl Chloritic "
epi Epidotic "
ser Sericitic "
sil Silicic "

cc Chalcocite
cpy Chalcopyrite
bn Bornite
py Pyrite
po Pyrrhotite
mag Magnetite
mo Molybdenite

After Canadian Superior Exploration Ltd., 1976

△ Percussion drill hole
○ Diamond drill hole

Reserves: .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

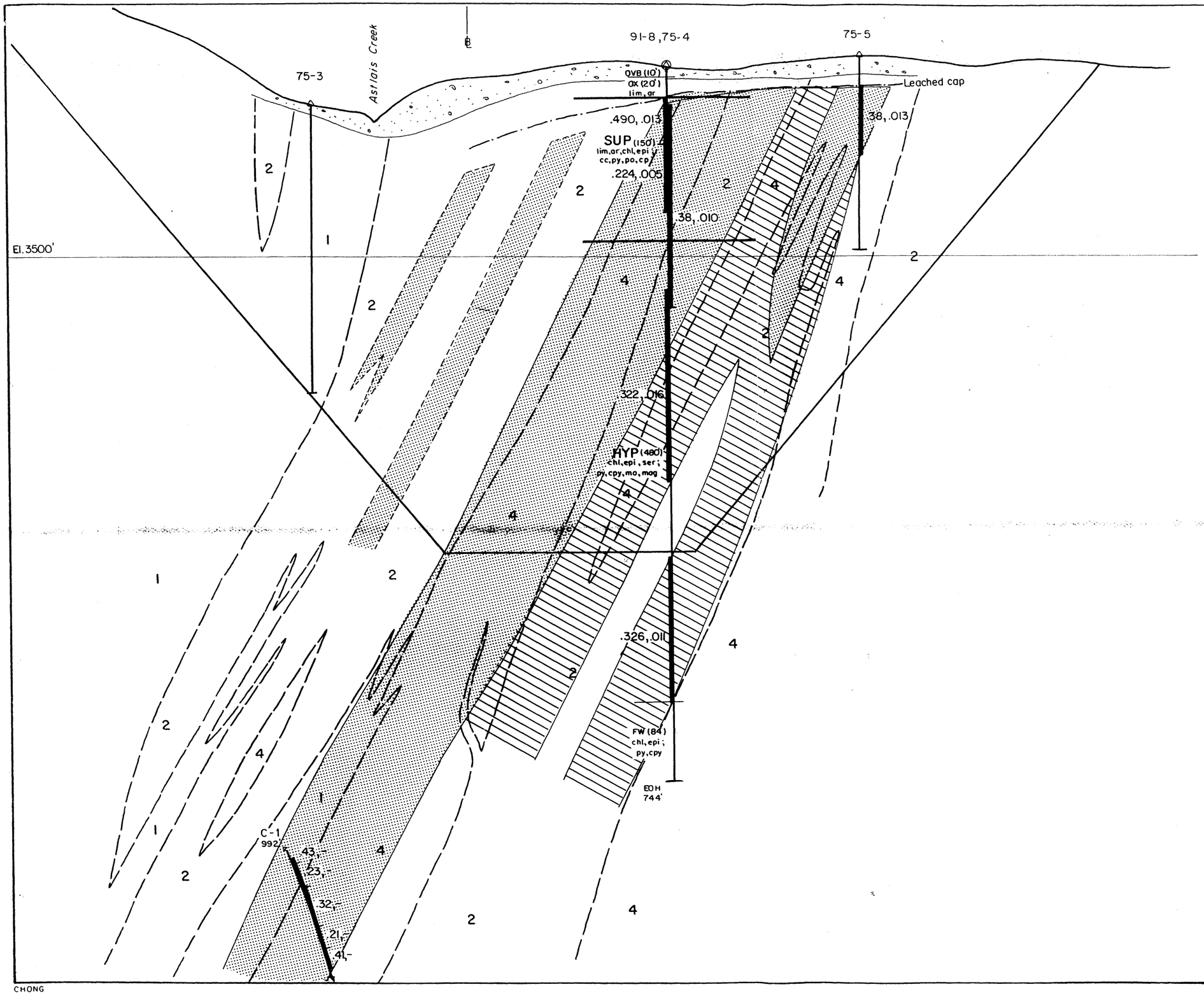
SECTION 11,300N

N.T.S. 93L-15W — OMINECA M.D., B.C.

0 100 200 Feet
0 10 20 40 60 Metres

Scale 1" = 100' (1:1200)	Date: Sept. 1991
Drawn by: E.M.	Figure No.: 6g

CHONG



LEGEND

- 1 Quartz diorite porphyry
- 2 Quartz feldspar porphyry
- 4 Andesite
- Copper zone
- Reserve additions
- Geological contact
- .41, .011 Assay - Cu %, Mo %
- Canadian Superior pit outline

OVB	Overburden
OX	Oxidized zone
SUP	Supergene zone
HYP	Hypogene zone
FW	Footwall
EOH	End of hole
lim	Limonite
ar	Argillic alteration
chl	Chloritic "
epi	Epidotic "
ser	Sericitic "
sil	Silicic "
cc	Chalcocite
cpy	Chalcopyrite
bn	Bornite
py	Pyrite
po	Pyrrhotite
mag	Magnetite
mo	Molybdenite

After Canadian Superior Exploration Ltd., 1976

△ Percussion drill hole

○ Diamond drill hole

Reserves : .25% Cu cut-off

VARITECH RESOURCES LTD.

BIG ONION PROJECT

SECTION 11,100 N

N.T.S. 93L-15W — OMINECA M.D., B.C.

0 100 200 Feet

0 10 20 40 60 Metres

Scale 1" = 100' (1:1200)	Date : Sept. 1991
Drawn by : E.M.	Figure Nº. : 6h

CHONG