

830491

**GEOLOGICAL REPORT**

**ON THE**

**MACKTUSH PROPERTY**

**Alberni Inlet  
Alberni Mining Division  
Vancouver Island  
British Columbia**

**Latitude 49°08' North  
Longitude 124°52' West  
NTS 92F/2W**

**FOR**

**SYMC RESOURCES LTD.**

**BY**

**N.C. CARTER, PH.D. P.ENG.  
July 10, 1991**

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## INTRODUCTION

SYMC Resources Ltd. owns the Macktush property which consists of <sup>7</sup>~~10~~ Modified Grid mineral claims and is situated south of Port Alberni on Vancouver Island.

This report, prepared at the request of SYMC Resources Ltd., is a revision of an earlier report by the writer dated July 16, 1990. The previous report was based on examinations of parts of the Macktush property carried out by the writer April 26 and June 20, 1990, and on results of exploration work and other studies undertaken on the property since 1982. The writer also logged and sampled one previous diamond drill hole. The 1990 report and the present one include a compilation of previous surface sampling and diamond drilling prepared by John Wilson, FGAC, who also supervised a survey of part of the property.

Since completion of the July 1990 report, Mr. Wilson has re-logged available diamond drill core from three holes completed in 1987. These data have been incorporated into this report. Recent excavator trenching in three areas of the property was inspected by the writer June 10, 1991.

## LOCATION AND ACCESS

The Macktush property is situated between ~~10 and~~ 15 km south of Port Alberni on southern Vancouver Island (Figure 1). The mineral claims are located on the west side of Alberni Inlet X

immediately north of Macktush Creek (Figure 2) in NTS map-area 92F/2W. The geographic centre of the property is at latitude  $49^{\circ}08'$  North and longitude  $124^{\circ}52'$  West.

Access to the property is by highway and road from Port Alberni by way of MacMillan Bloedel Limited Sproat Lake Woodlands Division Main roads along Cous and Macktush Creeks or a shore road along Alberni Inlet (Figure 2).

The mineral claims are situated in an active logging area and access to most parts of the property is afforded by numerous logging roads.

#### MINERAL PROPERTY

The Macktush property consists of <sup>7</sup>~~10~~ Modified Grid mineral claims (<sup>99</sup>~~159~~ units) located in the Alberni Mining Division. <sup>(4-post)</sup>  
<sup>(Fig 3)</sup>

<sup>Since several of new spots on the property, still in process, allowed to</sup>  
<sup>lapid.</sup> Three ~~of the~~ claims, COPPER 300, 400 and 500 were ~~recently~~ relocated. No claim posts or lines on the Macktush property have

been examined by the writer but the claims are believed to have been located in accordance with procedures as specified in the Mineral Tenure Act Regulations of the Province of British Columbia. According to Mineral Titles maps, some overlapping of several of the claims is evident. <sup>(Fig 3)</sup> ~~The configuration of the mineral claims is shown on Figure 3 and details are as follows:~~

*of the claims*

- Alberni -

<u>Claim Name</u>	<u>Record Number</u>	<u>Units</u>	<u>Expiry Date</u>
COPPER 100 #	1909 200210	12	October 31, 1993-96
COPPER 101 #	1910 200211	9	October 31, 1992 95
COPPER 102 #	1911 200212	16	October 31, 1992 95
COPPER 103 #	1912 200213	12	October 31, 1992 95
COPPER 104 #	1913 200214	20	October 31, 1992 95
COPPER 105 #	1914 200215	20	October 31, 1992 95
COPPER # 50	2474 200279	10	February 13, 1992 96
	<u>Tag Number</u>		
COPPER 300	111153	20	June 19, 1992
COPPER 400	111152	20	June 19, 1992
COPPER 500 ←	<del>111154</del>	20	June 26, 1992
	310677		

June 27/94

### PHYSICAL FEATURES

Mineral claims comprising the Macktush property cover an area of moderate to steep relief west of Alberni Inlet (Figure 3).

Elevations range from sea level to 960 metres in the western <sup>property</sup> claims area.

Steeper slopes are found north of Macktush Creek, west of Alberni Inlet and marginal to a number of drainages flowing east to Alberni Inlet. Active logging is underway in most parts of the claims area and bedrock is well exposed along logging roads, major drainages and some of the steeper slopes.

The climate is typical of the southwest coast of Vancouver Island with abundant rainfall in the fall and winter months. Mild winters allow for work on the property most months of the year.

**HISTORY**

The earliest record of prospecting and mining activity west of Alberni Inlet dates back to the turn of the century when copper-gold vein occurrences near the head of the Inlet were investigated and some 1900 tonnes of material containing copper-silver-gold were mined from the Three Jays skarn deposit south of Nahmint River. Sporadic exploration work, directed to several copper and/or precious metal prospects, has continued to the present ~~time~~.

The current Macktush property includes a number of gold-silver-copper bearing quartz veins. The majority of these have been located by work over the past several years but at least one was explored a number of years ago by several pits and two short adits. Remains of an old cabin (now destroyed) attest to this earlier work and an old claim post with a claim tag characteristic of those in use up to the mid-1940's was observed adjacent to one of the known quartz veins. There are no records of this earlier work; references included in the B.C. Ministry of Energy Mines and Petroleum Resources Minfile (92F - Alberni, June 1990) description of the Macktush property pertain to descriptions of the regional geological setting.

The old workings on one of the vein structures were re-discovered by principals of SYMC Resources Ltd. in April of 1981. Mineral claims were located and work through 1986 included

*A no. of 2-post.*

prospecting, trenching and sampling. Ten diamond drill holes, totalling more than 900 metres, were completed in 1987 and 1988.

Preliminary metallurgical test work was carried out in 1988 (Broughton,1988) as were initial investigations pertaining to a possible tailings impoundment area (Palmer and Skirmer,1988) and potential mining methods. This work was undertaken in response to recommendations of the British Columbia Mine Development Steering Committee which had received a preliminary prospectus from SYMC Resources Ltd. earlier that year.

A survey of surface workings and drill hole collars on the main quartz vein structure was supervised by John Wilson, FGAC, in January of 1990 and a compilation of results of exploration work was completed by Wilson in April of that year. The writer completed a report on the property in July,1990 (Carter,1990) and three 1987 diamond drill holes were re-logged by Mr. Wilson in late 1990.

Additional excavator trenching was completed on two of the known quartz vein structures in early 1991.

#### **REGIONAL GEOLOGY AND MINERALIZATION**

Vancouver Island makes up the southern part of the Insular belt, the westernmost tectonic subdivision of the Canadian Cordillera. The southern Insular belt is dominated by Paleozoic and Mesozoic volcanic-plutonic complexes and lesser sedimentary

rocks which are overlain on the east coast of Vancouver Island by clastic sedimentary rocks of late Cretaceous age. Tertiary basic volcanic rocks are prevalent in the south Island area and granitic intrusions of similar age are widespread along the west coast of the Island.

Vancouver Island hosts a variety of mineral deposit types which include volcanogenic massive sulphides at Buttle Lake and near Duncan which are hosted by late Paleozoic Sicker Group volcanic rocks. The Island Copper deposit near Port Hardy is a porphyry copper-molybdenum deposit with significant by-product gold which is related to Mesozoic subvolcanic intrusions. Iron-copper skarns, hosted by late Triassic limestones marginal to granitic intrusions, are numerous in the central and northern Island areas.

The west coast and central parts of Vancouver Island are noted for gold-bearing vein deposits. Many of these are at least spatially related to Tertiary granitic intrusions and examples include the Zeballos camp and deposits in the Kennedy Lake, Alberni Inlet and Mount Washington areas.

The oldest rocks exposed near Alberni Inlet are late Paleozoic Sicker Group volcanic and sedimentary rocks which underlie the northern part of the Cowichan structural uplift (Figure 4). Three volcanic formations comprise most of the Sicker Group in this area (Massey and Friday, 1989). From oldest



to youngest these include a basal pillow basalt with minor felsic units, an intermediate fragmental andesite and an upper volcanoclastic-epiclastic sequence. The youngest sequence of the Sicker Group is comprised of cherty sediments, limestones, siltstones and sandstones.

Mesozoic volcanic and sedimentary rocks overlie Sicker Group rocks and include late Triassic Karmutsen Formation andesite and basalt pillow lavas, pyroclastics and massive flows and early Jurassic Bonanza Group fragmental andesites and lesser sedimentary rocks. Where complete Mesozoic sections exist, the Karmutsen Formation and Bonanza Group are separated by Quatsino Formation calcareous and clastic sedimentary rocks.

The Mesozoic sequences underlie much of the area west of Alberni Inlet (Figure 4) where they are intruded by granodiorites and quartz diorites of the Middle Jurassic Island Intrusions.

Youngest layered rocks include late Cretaceous Nanaimo Group clastic sedimentary rocks which underlie the fault-bounded Alberni valley (Figure 4). These are intruded by hornblende-feldspar porphyry dykes and sills of probable Tertiary (Eocene?) age (Massey and Friday, 1989).

The dominant northwest structural trend of the Alberni Inlet area is reflected by the Cowichan structural uplift, the elongate nature of Island Intrusion plutons and the distribution

of late Cretaceous sediments in the northwest trending Alberni valley. Regional northwest trending thrust faults mark the boundaries between Sicker Group and younger rocks east of Alberni Inlet (Massey and Friday,1989).

Various styles of mineralization are recognized in the Alberni Inlet area (Muller and Carson,1969; Massey and Friday,1989). These include volcanogenic massive sulphide occurrences in the lower volcanic unit of the Sicker Group, porphyry copper and/or molybdenum mineralization associated with Island Intrusions granitic rocks and iron-copper skarn deposits and occurrences in Mesozoic sedimentary and volcanic rocks, some of which have yielded limited production in the past. The best example of one of these is the Three Jays prospect on the west side of Alberni Inlet. According to Wahl(1980), much of the copper mineralization at this prospect may be related to shear zones.

Considerable work has been done in recent years investigating similar styles of mineralization at the head of east-flowing tributaries of Cous Creek (Figure 4). Here, discontinuous massive sulphide lenses and pods containing copper, silver and gold values are developed in Karmutsen andesite flows near their contact with Island Intrusions granitic rocks and adjacent to felsic dykes of probable Tertiary age (Sookochoff,1986; Laanela,1987).

Other known deposit types west of Alberni Inlet include a number of copper occurrences in fracture zones in Karmutsen Formation volcanic rocks, examples of which include one prospect near Alberni Inlet 5 km north of the Macktush property and several occurrences immediately south of Macktush Creek. The latter prospect features pyrrhotite, pyrite and chalcopyrite in shear zones and in lenses in Karmutsen volcanics from which some silver values have also been reported (Stewart,1983).

The most common mineral deposit types in the Alberni Inlet area are gold-bearing quartz-sulphide veins and fissure zones. These are widespread in the Franklin River-China Creek area east of Alberni Inlet where they are spatially and possibly genetically related to a north trending belt of Tertiary feldspar porphyry intrusions (Carson,1969).

Gold-bearing quartz-sulphide veins also occur in shear zones in Karmutsen Formation basalts west of Alberni Inlet. Examples include the Ferguson prospect south of Two Rivers Arm on Sproat Lake and the Raven and Dauntless prospects due west of Port Alberni and 7-10 km north of the Macktush property. Gold values at these prospects is associated with quartz veins containing chalcopyrite, pyrite and pyrrhotite (LeRiche and Hopkins,1988).

## PROPERTY GEOLOGY AND MINERALIZATION

The Macktush property is underlain by late Triassic Karmutsen Formation basaltic pillow lavas and andesites which are in contact with granodiorites and quartz diorites of the Middle Jurassic Island Intrusions in the central property area.

As indicated on Figure 4 these granitic rocks, which underlie much of the eastern half of the property, are part of an elongate pluton which extends southeasterly from Sproat Lake through the property area and across Alberni Inlet.

According to recent mapping by Sutherland Brown and others (1986), the contact between the Karmutsen volcanics and Island Intrusions extends in a southeasterly direction through the claims just below the height of land (Figure 5). Tholeiitic pillow lavas are the dominant rock type west of the contact while andesitic varieties underlie the southwestern claims area along Macktush Creek.

Granitic rocks of the Island Intrusions, where observed by the writer in the central property area, include medium to coarse grained grey quartz diorite and granodiorite. Some potassium feldspar stringers were noted locally as were northwest trending 15 cm wide aplite dykes.

The contact between the granitic and volcanic rocks in the central property area is irregular with numerous inclusions of Karmutsen pyroxene porphyry flows and bleached andesites.

Known mineralization on the property includes a small iron-copper skarn zone in Karmutsen volcanics in the central property area and porphyry style mineralization in at least two <sup>localities.</sup> ~~areas~~ of ~~the property.~~ Examples of the latter include molybdenite in quartz veinlets and fractures in Island Intrusion<sup>s</sup> granodiorite exposed in road cuts along Alberni Inlet in the eastern claims and disseminated chalcopryrite in K-feldspar altered diorites <sup>in north of the present ~~the~~ property ~~body.~~</sup> ~~the northern part of the property~~ (Figure 5).

A number of gold-bearing quartz-sulphide veins in various parts of the claims area constitute the most significant mineralization found to date. A number of these veins occur within a 0.5 square km area in the western part of the COPPER 102 mineral claim (Figure 5) marginal to the contact between Karmutsen volcanics and Island Intrusion granitic rocks.

As indicated on Figure 6, most of the known veins strike northeasterly and dip moderately to steeply southeast. The strike direction is normal to the overall trend of the Island Intrusions contact which parallels the regional trend and the distribution of veins in this area is about equally divided between volcanic and granitic host rocks.

Vein widths range from 0.30 to several metres with an overall average of about 1.3 metre. Vein contacts are commonly sheared with 7-30 cm wide gouge zones developed in both foot- and hangingwall host rocks. Quartz stringers in wallrocks were

observed marginal to several of the vein exposures. This feature is particularly evident at the northeast end of the 130 metre long trench (Figure 6) where 0.30 metre wide quartz veins within a 3-7 metre wide zone of shearing are separated by wedges of altered volcanic and granitic rocks. Narrow basic dykes parallel the northeast shear direction and cut both the veins and wallrocks. Elsewhere, inclusions of volcanic rocks are present near quartz veins hosted by granitic rocks and the southwest trench on the main quartz vein structure exposes a 1.4 metre wide quartz vein with a quartz diorite footwall and an andesitic hangingwall.

Most vein structures display multiple stages of quartz veining. Colloform banding is common as are drusy cavities. Sulphide mineralization within the veins includes fine to medium grained pyrite, pyrrhotite and chalcopyrite.

→ A number of the known quartz vein exposures occur along apparently persistent northeast structures. <sup>IP</sup> These include the Fred vein (Figure 6) which has an apparent strike length of at least 130 metres; (the quartz veining in the long trench to the southwest may represent an extension of this structure or a parallel one.)

The structure containing the Red vein (Figure 6) apparently extends several hundred metres down a northeast trending draw based on recent excavator trenching. Other exposures of quartz

veins near the known southwestern limits of the Red vein may represent parts of more continuous, parallel zones.

### *Surface Sampling*

A number of surface samples have been collected from various exposures by principals of SYMC Resources Ltd., Provincial Government geologists and the writer. Locations are shown on Figures 6 and 7 and analytical data are contained in Appendix I. Results for sites indicated on Figure 6 are as follows:

*Original  
of samples  
- following  
page.*

<u>Site</u>	<u>Number</u>	<u>Width(m)</u>	<u>Gold(oz/ton)</u>	<u>Silver(oz/ton)</u>	<u>Copper(%)</u>
1	130	Grab	0.318	0.31	0.42
	20773	1.1	0.073	0.20(ppm)	88(ppm)
2	20774	1.0	696(ppb)	0.30(ppm)	37(ppm)
3	E19511	Grab	0.192	1.56	0.57
4	E19510	Grab	0.166	1.23	0.42
5	E19509	Grab	0.074	0.76	1.12
	20775	Chips	817(ppb)	1.40(ppm)	26(ppm)

Recent excavator trenching along the trend of the Red vein 50 metres <sup>at sample</sup> northeast of Site 1 (Figure 6) has exposed a zone <sup>and along strike from</sup> of shearing in granitic rocks striking 040 and dipping steeply east. The zone, exposed along the logging road over a width of more than 6 metres, features multiple, narrow quartz veins with finely disseminated pyrite.

<sup>1991</sup> The probable extension of the same zone <sup>was</sup> ~~has been~~ exposed by trenching along the lower logging road 350 metres northeast of, and 130 metres vertically below, the previously described exposure (Figure 6). Here, the zone is developed in dioritic rocks over a similar 6 metre width striking 035° and dipping 60 - 80° east. Margins of the zone are marked by 1 metre wide grey,

clay-rich gouge zones which contain quartz veins (Wilson, 1991). Dioritic rocks within the shear zone are deeply weathered and contain up to 3% disseminated pyrite. Ten chip samples, collected from a continuous line within and adjacent to the shear zone by Wilson (1991), yielded low gold, silver and copper values.

The Fred vein (Figure 6), apparently the original zone discovered years ago, is exposed in two short adits (now caved) and three pits as shown on Figure 7. The width of the vein, <sup>structural</sup> which strikes ~~east-northeast~~ <sup>060 to 080°</sup> and dips steeply south, ranges from 0.75 to more than 3 metres. Sample results for those sites indicated on Figure 7 are as follows:

Location	Number	Width(m)	Gold(oz/ton)	Silver(oz/ton)	Copper(%)
1 (Vein)	101	0.91	0.303	0.12	0.01
(Wall)	102	0.46	0.173	0.71	0.05
2 (Vein)	50	2.13	0.303	0.01	0.01
3 (Vein)	104	3.66	0.416	2.21	0.78
4 (Vein)	1003	0.76	0.218	1.43	1.34
5 (Vein)	1	4.88	0.952	0.34	0.60
(Vein)	20772	1.20	0.659	8.1(ppm)	1286(ppm)

Most of the foregoing sample locations, widths (where applicable) and results are as provided by SYMC Resources Ltd. and refer to samples collected on the company's behalf between 1983 and 1987. Note that all of the SYMC samples shown on Figure 6 are grabs or more properly, character samples of vein material. Sample number 20772 (and 20773-20775 - previous table) refer to samples collected by the writer in June of 1990. Results of sampling by B.C. Ministry of Energy Mines and



Petroleum Resources geologists at the lower adit include values of 4910 ppb gold, 3 ppm silver and 0.16% copper from a 1 metre chip sample and 7100 ppb gold, 34 ppm silver and 0.62% copper from a composite grab sample (H.P. Wilton, personal communication).

→ ~~Recent~~ Excavator trenching <sup>in 1991 & 1993</sup> in the area of the lower adit (Figure 7) ~~has~~ exposed a parallel, 1 metre wide quartz vein containing disseminated pyrite and chalcopyrite 2 metres into the footwall from the main vein structure exposed in the adit portal.

#### ***Diamond Drilling***

As noted previously, 10 BQ-size diamond drill holes were completed on the Macktush property in 1987 and 1988. Most of the core recovered was stored on the property. Sections of three 1987 holes, drilled on the Fred vein (DDH 87-01, -03 and -08), were split and sampled under the direction of Frank C. Loring, P.Eng. Core boxes containing split core sections from holes 87-01 and 87-03 and most of hole 88-05 (not logged or sampled until June, 1990) were stored in Port Alberni. Core from the other six holes drilled was tipped while unattended at the field site before any logging or sampling was done and unfortunately, is of little or no value in its present condition. These six holes included two shallow inclined holes on the Red vein, two inclined holes near the southwest end of

the large trench and two drilled to test parts of the Fred vein (H. McMaster-SYMC Resources Ltd.-personal communication).

Diamond drill cores from four inclined holes, totalling 321 metres and drilled to test the Fred vein, are in reasonably good order. These were drilled at  $-45^{\circ}$  along  $330^{\circ}$  azimuths and tested the Fred vein along its exposed strike length to vertical depths of between 20 and 40 metres. Drill hole locations are shown on Figure 7 and sections, after those originally prepared by John Wilson, FGAC, are illustrated on Figure 8. Surveyed locations of the holes are as follows:

<u>Hole Number</u>	<u>North</u>	<u>East</u>	<u>Elevation(m)</u>
DDH87-01	2679.5	1165.5	683.0
DDH87-03	2787.4	1253.4	597.8
DDH88-05	2770.8	1238.5	607.8
DDH87-08	2725.0	1188.5	644.0

Results of core sampling for the three 1987 holes were provided by SYMC Resources Ltd. The writer logged and sampled DDH88-05 and the drill log and analytical data for this hole and analytical data provided by SYMC are contained in Appendix II.

Because of some uncertainties in establishing precise sample intervals for holes 87-01, -03 and -08, Mr. John Wilson undertook re-logging of these holes in December, 1990. Further information concerning the sample intervals was obtained from Mr. Frank C. Loring, P.Eng. Mr. Wilson's diamond drill core logging report, including drill logs for the aforementioned three holes, is contained in Appendix II.

The Fred quartz vein structure was intersected in the 4 holes drilled and results confirmed a southerly dip of between 60 and 80 degrees. Core lengths of vein material ranged from 1.14 metres in the most westerly hole (DDH87-01) to 3.81 metres in DDH87-03 near the known eastern limits of the structure.

Geological relationships noted by the writer in DDH88-05 are believed to be representative of the Fred vein in the area drilled and they generally confirm relationships noted in surface exposures. The hole was collared in generally fresh, medium grained, grey quartz diorite locally cut by 0.5-5 metre wide, post-mineral basic dykes with chilled margins. Some 15 metres above the quartz vein intersection, the quartz diorite features an increasing number of quartz-carbonate-pyrite stringers plus increased silicification and argillic-carbonate alteration. Disseminated pyrite and pyrrhotite is also a feature of more intensely altered zones and inclusions of Karmutsen volcanic rocks are evident. A 2 metre length of quartz vein, intersected between 47.5 and 49.5 metres, exhibits multiple stages of veining, drusy cavities and disseminated pyrite, pyrrhotite and chalcopyrite. An 8 metre section of variably altered quartz diorite, with 0.5 metre Karmutsen volcanic inclusions and a basic dyke, follows the quartz vein intersection with the hole terminating at 60 metres in relatively unaltered quartz diorite.

Sampling of drill cores from the four holes drilled on the Fred vein yielded the following results:

<u>Hole No.</u>	<u>Interval(m)</u>	<u>Length(m)</u>	<u>Au(oz/ton)</u>	<u>Ag(oz/ton)</u>	<u>Cu(%)</u>
DDH87-01	109.58-110.72	1.14	0.174	0.06	0.03
DDH87-03	33.50-34.29	0.79	0.112	0.48	0.80
	36.58-40.39	3.81	1.290	5.04	0.95
DDH87-08	71.63-72.88	1.25	0.290	0.05	0.03
DDH88-05	47.22-48.80	1.58	0.006	0.09	0.02
			(219ppb)	(3.0ppm)	(190ppm)

### ***Bulk Sampling***

Four 6-8 kg samples were collected from the Fred vein in 1988 and submitted to Coastech Research Inc. for preliminary metallurgical testing. Average head grades of a composite sample were 0.126 oz/ton gold and 0.29 oz/ton silver. Test work on the composite sample included standard flotation, gravity concentration and cyanidation procedures.

Results of the test work indicated that good recoveries for gold, silver, and copper could be obtained by initial gravity concentration to recover free milling coarse gold followed by froth flotation to produce a sulphide concentrate containing copper and precious metals.

### **CONCLUSIONS**

The Macktush property includes a number of gold-bearing quartz-sulphide veins. Work to date in the central property area, which includes mechanical trenching and diamond drilling, has partially defined several vein structures with apparent good

gold grades over reasonable widths. Recent excavator trenching indicates that structures containing these quartz veins may extend several hundred metres along strike. Further work is warranted to test these zones along strike and to depth.

*Add*  
*Comments* → Limited sampling of several of the veins indicates a wide variation in gold content. While this is a characteristic feature of deposits of this type, it does emphasize the need for detailed sampling to determine average grades.

As noted previously, most of the known quartz veins strike northeasterly, normal to the regional structural trend as reflected by the northwest trending contact between the Island Intrusions and Karmutsen Formation volcanic rocks. The quartz veins in the central property area are marginal to this contact which is considered to be prospective for the discovery of additional gold-bearing veins throughout the claims area.

Other styles of mineralization known on the Macktush property include iron-copper skarns and porphyry copper and molybdenum. Further investigation is necessary to determine the significance of these.

The Macktush property merits additional work as detailed in the succeeding section.

**RECOMMENDATIONS**

A two-phase work program is recommended for the Macktush property with the principal emphasis of the Phase I program being directed to additional diamond drilling of the Fred vein structure. This work should include  $-60^{\circ}$  holes drilled from the four original drill sites, followed by infill drilling at 20 metre spacings between drill sites with two holes at  $-45^{\circ}$  and  $-60^{\circ}$  drilled from each site. Step-out holes, northeast and southwest of the strike length defined to date, are also recommended as are two deeper holes to test the vein at vertical depths in the range of 75 metres. This program of about 15 holes totalling 1700 metres is designed to thoroughly test the continuity of grade and structure within and adjacent to the known limits of the Fred vein. Three inclined holes of 100 metres each are recommended to test the Red vein structure between the two recently trenched areas.

As previously noted, a number of additional gold-bearing quartz veins are known in the vicinity of the Fred and Red veins. In order to determine precise locations of these and other structures, a topographic map on a scale of 1:5000 should be prepared utilising available colour air photography and the existing survey control in the area of the Fred vein. It is intended that such a map would cover the entire property area with more detailed (1:1000) coverage prepared for the area of

the Fred and Red veins. These topographic maps would provide a base for geological mapping and sampling of vein structures.

It is also recommended that a picket line grid be established with a baseline parallel to the trend of the Fred vein and cross lines at 100 metre spacings with 25 metre stations. It is intended that this grid, totalling 20 km, would cover the area of the Island Intrusions - Karmutsen Formation contact over much of the COPPER 102 claim. The grid would be used for tying in drill holes prior to a proper survey and for conducting orientation VLF-EM and magnetometer geophysical surveys.

The other known vein structures, should be further investigated by excavator trenching followed by detailed mapping and sampling.

Phase II work would consist principally of additional diamond drilling where warranted by results of first phase drilling and by results of detailed sampling of other vein structures. Additional trenching may also be required as part of the Phase II program.

Phase III work is envisioned as including preliminary feasibility work which would be contingent on the results obtained from the first two phases. This work might consist of definition drilling and metallurgical test work of bulk samples.