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REPORT ON PHASE I GEOLOGICAL AND GEOCHEMICAL EXPLORATION OF THE CANON AND OLSEN CLAIMS (CANON GROUP) ALBERNI MINING DIVISION, B.C. NTS 92F/2 49°03'N LAT. 124°38'W LONG. FOR GOLDENROD RESOURCES AND TECHNOLOGY INC. JULY 29, 1985 N.O. WILLOUGHBY, B.Sc. T. NEALE, B.Sc. T.G. HAWKINS, P.Geol.

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Section 2

## GEOLOGICAL BRANCH ASSESSMENT REPORT

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#### SUMMARY

Phase I exploration of the Goldenrod Resources & Technology Inc. Canon Group property by MPH Consulting Limited has been completed within budget and on schedule except for a delay due to late snow conditions. The work was carried out from May 14 to June 30, 1985 and consisted of geological mapping, rock sampling, and prospecting as well as grid soil sampling.

The property is underlain by mafic volcanic rocks in the southeastern and southwestern areas and by intrusive rocks in the central area. The mafic volcanics are probably correlative with the Karmutsen Formation of the Vancouver Group, as whole rock analyses indicate that they are tholeiitic basalts. A narrow band of dacite situated within mafic volcanics is either a flow or a sill. A thin intraformational layer of limestone also occurs within mafic volcanics. Diorite, quartz diorite, and minor feldspar porphyry and quartz-feldspar porphyry of the Lower to Middle Jurassic Island Intrusions intrude the mafic volcanics. A well developed northeast-trending joint system is developed in all rock types on the property. Four major lineaments, possibly representing regional joints or fracture zones, also trend northeast across the property. Most veining on the property also trends northeast.

The Canon Au (-Zn) vein, discovered by MPH personnel in 1985, occurs in one of the regional joint/fracture systems. Grab samples from the vein have returned values of up to 2.63 oz Au/ton, 1.89 oz Ag/ton, 22,600 ppm Zn, 760 ppm Pb, and 700 ppm Cu. The Canon vein occurs in diorite, averages 5 cm in width and has been traced for 25 m. Samples of pyrite-pyrrhotite ± chalcopyrite-bearing mafic volcanic float (8763, 9834) taken near the

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Canon vein returned results of 520 ppb Au and 110 ppb Au. Sample 8763 also contained 54 ppm Ag, 24,612 ppm Cu, 65 ppm Mo, and 1910 ppm Zn. Disseminated and stringer pyrite pyrrhotite mineralization occurs in altered mafic volcanics over a strike length of about 600 m in the southern area of the Olsen claim. Locally, within this area, massive bands of pyrite, pyrrhotite, and chalcopyrite or of magnetite, up to 1 cm wide, were noted. Samples of mineralized volcanics returned high to anomalous Ba, Cu, and Cr results, but no anomalous Au or Zn results.

Whole rock geochemical analyses indicate the mafic volcanics to be high-iron tholeiitic basalts. Alteration features commonly associated with syngenetic volcanogenic deposits were not indicated.

Geochemical soil sampling on a grid established over topographically suitable portions of the Canon Group property outlined three main zones of anomalous results. Zone 1 contains strong coincident Zn and Ag anomalies and a smaller, partially coincident Cu anomaly. The zone measures 700 m long by 150-450 m wide and is open to the northwest. Zone 2 consists of a strong Cu anomaly with a coincident smaller Zn anomaly and isolated associated anomalous Ag values. This zone, which measures approximately 750 m long by 100-250 m wide, is open to the northwest and southeast. Zone 3 is a complex zone with a Cu anomaly and several smaller parallel Ag anomalies and isolated anomalous Zn values. It measures 550 m long by 50-300 m wide and is not open on either end.

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Insufficient data exists to fully explain the source of the anomalies in the three zones, however, the following suggestions



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presented as guides to future work. Zone 1 is believed to reflect underlying stratiform sulphide mineralization in Karmutsen volcanics, Zone 2 may reflect mineralized quartz vein(s) or structural feature(s), Zone 3 may be due to a combination of stratiform sulphide mineralization in volcanics and skarn mineralization at the limestone-volcanic contact.

Before any further work is carried out on the property, contact should be initiated with Imperial Metals Corp. with regards to the area of the Canon Group to which they hold the base metal rights (see section 2.0 for details of base metals rights).

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In view of the favourable results from Phase I exploration, a Phase II program consisting of detailed geological, geophysical, and geochemical surveys is recommended at an estimated cost of \$28,000. If warranted by favourable results from Phase II exploration, a Phase III program of trenching and diamond drilling is recommended at an estimated cost of \$130,000.

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Statement of Expenditures and List of Personnel

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#### 1.0 INTRODUCTION

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This report represents the compilation of Phase I exploration field work carried out by MPH Consulting Limited at the request of Goldenrod Resources and Technology Inc. on the Canon Group during the periods of May 14 to May 19, 1985 and June 17 to June 30, 1985. The split time period was the result of adverse and seasonally late snow conditions which hampered access to the higher elevations of the property.

The Phase I exploration program consisted of geological mapping, rock sampling, and prospecting covering the entire property, and a soil sampling survey on a grid placed over the more topographically suitable area of the property. Cliffs and extremely steep slopes limited the size of the grid and, indeed, locally precluded geological mapping and sampling.

A total of 69 rock samples was collected and geochemically analyzed for Au and by 30-element ICP. Thirty-five of the samples were also analyzed for Ba. Whole rock analyses were carried out on 18 samples.

The grid, consisting of 11.45 line km of flagged lines spaced 100 and 200 m apart, yielded 198 soil samples taken at 25 and 50 m intervals.

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#### 2.0 PROPERTY LOCATION, ACCESS, TITLE

The Canon Group is located approximately 23 km south-southeast of Port Alberni on NTS mapsheet 92F/2, centred at latitude 49°02'N and longitude 124°38'W in the Alberni Mining Division of British Columbia (Figures 1 and 2).

Access to the property is gained by following the north-south Port Alberni-Bamfield road to the Corrigan Creek Road. Approximately 5 km up the Corrigan Creek Road, an old overgrown railway grade provides foot access to the Canon claim. The southwestern corner of the Canon claim may be reached by foot from the Corrigan Creek Road at a point another 2 km along the road from the old railway. No roads occur on either of the claims. Access to the highest parts of the claims is by helicopter.

A base camp in the southern portion of the Olsen claim was set up and supplied by helicopter for Phase I work, as foot access is impractical for supplying a camp.

Claim information is summarized as follows:

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<u>Claim Name</u>	Record No.	<u>Units</u>	Anniversary Date	Year Registered
Olsen	1224	6	May 6, 1987	1981
Canon	1225	20	May 6, 1986	1981

Both claims are owned by Nexus Resource Corporation. Goldenrod Resources and Technology Inc. is the operator of the property by virtue of an option agreement with Nexus. The claims were grouped as the Canon Group by Notice to Group #1085 on May 5, 1985.



Base metal rights to the Olsen claim and the northeastern portion of the Canon claim are held by Imperial Metals Corp. under option from Fording Coal Ltd. as this area lies within a portion of the old E&N Land Grant which was not relinquished by the grantees (Figure 2).

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#### 3.0 PREVIOUS WORK

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Recent government geological work in the area includes mapping by J.E. Muller and D.J.T. Carson (1969), and J.E. Muller (1977, 1980, 1982).

During the years 1963 to 1966, Gunnex Ltd. carried out a regional mapping program over a large portion of the E&N Land Grant, with limited prospecting and silt sampling. They compiled a list of all known mineral occurrences in the area and visited many of them. A grab sample of a quartz vein mineralized with chalcopyrite and pyrrhotite and hosted by diorite (Mount Olsen showing) assayed 1.52% Cu, 0.5 oz Ag/ton, and 0.02 oz Au/ton. The Mount Olsen showing occurs on the Canon claim.

The Canon Group property was visited on September 4, 1983 by MPH Consulting Limited to prepare a preliminary assessment for Nexus Resource Corporation (Willoughby and Hawkins, 1983). A number of rock samples was collected and lithogeochemically analyzed. Results included 250 ppb Au, 11.6 ppm Ag, and 500 ppm Cu from a quartz vein hosted by diorite and 13,200 ppm Cu, 260 ppm Zn, 180 ppb Au, 40 ppm Ag from a massive sulphide lens containing 10-20% chalcopyrite and up to 30% pyrite. The massive sulphide lens is 3 m by 0.5 m in size and is hosted by mafic volcanic rocks on top of Mount Olsen.

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Assessment work carried out by MPH Consulting Limited on the Canon Group for Nexus Resource Corporation in April 1985 consisted of reconnaissance geological mapping and rock sampling with limited silt sampling (Neale and Hawkins, 1985). Rocks belonging to the



Karmutsen Formation, Island Intrusions, and Quatsino Formation were mapped on the property. A strongly pyritic quartz vein hosted by diorite which returned assay values of 2.63 oz Au/ton and 1.89 oz Ag/ton was discovered by an MPH worker (Canon Au vein). Geochemical values of 22,600 ppm Zn (2.26%), 760 ppm Pb, and 700 ppm Cu were also obtained from the quartz vein. Deep snow cover did not permit any attempts to trace the vein, although a gossanous zone approximately on strike with the vein and 100 m upslope returned assay values of 0.012 oz Au/ton and 0.43 oz Ag/ton. It is not known whether this vein is the same as the previously-reported Mount Olsen showing (see Section 4.8 for description of Mt. Olsen showing). Four silt samples taken north of the main creek were somewhat anomalous in Zn or Cu, possibly reflecting upslope mineralized zones.

## 4.0 REGIONAL GEOLOGY

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The Port Alberni-Nitinat River area is underlain predominantly by eugeosynclinal sequences of volcanic and sedimentary rocks of the Upper Paleozoic Sicker Group, the Triassic Vancouver Group and the Lower Jurassic Bonanza Group. These Groups were subsequently intruded by the Island Intrusions dioritic to granodioritic rocks during Middle to Upper Jurassic times (Figure 3).

#### 4.1 Sicker Group

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The oldest rocks in the area are those of the Sicker Group. Muller (1980) proposed the following subdivision of the Group from youngest to oldest: Buttle Lake Formation, Sediment-Sill Unit, Myra Formation, and Nitinat Formation.

The Nitinat Formation (Unit 1) consists predominantly of basic volcanic rocks, most commonly flow-breccias, including some massive flows and rare pillow basalts or agglomerates. Locally, medium grained, generally massive basaltic tuff is interbedded with the flows. The flow-breccia is composed of fragments of basalt up to 30 cm in length containing uralite phenocrysts and black or white amygdules, both from 1 mm to more than 1 cm in size, in a matrix of finer grained, similar basalt(?). Thin sections show that the uralite is replacing diopside. Uralitized gabbroic rocks underlie and intrude the volcanics and are believed to represent feeder dykes, sills, and magma chambers to the volcanics. The Nitinat Formation may be distinguished from the similar Karmutsen Formation by the usual lack of pillow basalts, the abundance of uralite phenocrysts, the pervasive shear foliation, and lower greenschist or higher metamorphic grade.



The Myra Formation (Unit 2) unconformably overlies the Nitinat In the Nitinat-Cameron River area the Myra Formation Formation. is made up of a lower massive to widely banded basaltic tuff and breccia unit, a middle thinly banded pelitic albite-trachyte tuff and argillite unit, and an upper thick bedded, medium grained albite-trachyte tuff and breccia unit. In the lower unit, crudely layered, mottled maroon and green volcaniclastic greywacke, grit, and breccia are succeeded by beds of massive, medium grained dark tuff up to 20 m thick interlayered with thin bands of alternating light and dark, fine grained tuff with local fine to coarse breccias containing fragments of Nitinat Formation volcanics. The middle unit is comprised of a sequence of thinly interbedded, ' light feldspathic tuff (albite trachyte or keratophyre composition) and dark marine argillite which has the appearance of a graded greywacke-argillite turbidite sequence. In the upper part of the middle unit, sections of thickly bedded to massive black argillite occur. The upper unit contains fine and coarse crystal tuffs in layers up to 10 m thick, with local rip-up clasts and slabs of argillite up to 1 m in length as well as synsedimentary breccias of light coloured volcanic and chert fragments in a matrix of black argillite.

The type locality of the Myra Formation is Myra Creek, at the south end of Buttle Lake, about 90 km northwest of the Canon Group. There, volcaniclastic rocks consisting dominantly of rhyodacitic or rhyolitic tuff, lapilli tuff, breccia, and some quartz porphyry and minor mafic flows and argillite (Upper Myra Formation) are host to Westmin Resources' Myra, Lynx, Price, and H-W massive sulphide (Cu-Zn-Pb-Au-Ag-Cd) deposits.



Muller (1980) estimated the thickness of the Nitinat Formation at about 2000 m and that of the Myra Formation at 750 to 1000 m. Both the Nitinat and Myra Formations were dated as Devonian and/or older by Muller (1980).

The <u>Sediment-Sill Unit</u> contains thinly bedded to massive argillite, siltstone, and chert with interlayered sills of diabase. It is transitional between the Myra and Buttle Lake Formations. It is not mapped within the report map area.

The <u>Buttle Lake Formation</u> (Unit 3) consists of a basal green and maroon tuff and/or breccia overlain by coarse grained crinoidal and calcarenitic limestone, fine grained limestone with chert nodules and some dolomitic limestone. Lesser amounts of argillite, siltstone, greywacke, or chert may also be present.

The Buttle Lake Formation is up to 466 m thick. The age of the formation, on the basis of fossil dating appears to be Middle Pennsylvanian, but could possibly be as young as Early Permian (Muller, 1980).

#### 4.2 Vancouver Group

The <u>Karmutsen Formation</u> volcanic rocks (Unit 5) overlie the Buttle Lake Formation limestone paraconformably to form the base of the Vancouver Group. They are the thickest and most widespread rocks on Vancouver Island. The formation, which is well exposed southeast of Port Alberni, consists mainly of dark grey to black pillowed basalt, massive basalt, and pillow breccia. Flows are



commonly aphanitic and amygdaloidal. Pillowed volcanics generally occur toward the base of the section.

Conglomerate containing clasts of Sicker Group rocks and jasperoid tuff form basal sections in the Nitinat-Horne Lake area.

Karmutsen Formation rocks are generally relatively undeformed compared to Sicker Group rocks and are dated Upper Triassic and older.

Massive to thick bedded limestone of the <u>Quatsino Formation</u> (Unit 6) occurs south of Mount Spencer. The limestone is black to dark grey and fine grained to micro-crystalline. In the vicinity of intrusive rocks, coarse grained marble is recognized. Thin bedded limestone also occurs in the formation. Fossils indicate an age of Upper Triassic (Muller and Carson, 1969).

#### 4.3 Bonanza Group

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The <u>Bonanza Group</u> (Unit 8) stratigraphy varies considerably from place to place, as it represents parts of several different eruptive centres of a volcanic arc. Basaltic, rhyolitic, and lesser andesitic and dacitic lava, tuff, and breccia with intercalated beds and sequence of marine argillite and greywacke make up the Bonanza Group. The Bonanza volcanics are considered to be extrusive equivalents of the Island Intrusions and to be of Early Jurassic age.



#### 4.4 Nanaimo Group

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Upper Cretaceous Nanaimo Group sedimentary rocks are scattered throughout the area. Extensive exposures occur near Port Alberni, Patlicant Mountain, and south and northwest of Mount Moriarty. The formations present comprise the basal portions of the Nanaimo Group.

The <u>Comox Formation</u> (Unit 11) consists mainly of quartzofeldspathic, cross-bedded beach facies sandstone and lesser conglomerate. Numerous intercalations of carbonaceous and fossiliferous shale and coal are characteristic.

The <u>Haslam Formation</u> (Unit 12) is a near shore littoral depositional facies unit characterized by massive bedded fossiliferous sandy shale siltstone and shaly sandstone.

Interbedded coarse clastic conglomerate, pebbly sandstone and arkosic sandstone of the <u>Extension-Protection Formation</u> (Unit 13) are beach and deltaic sands. Minor shale and coal are reported.

## 4.5 Intrusive Rocks

<u>Gabbro, Peridotite, Diabase</u> (Unit 4). Mafic and ultramafic rocks of Triassic or Permian age are scattered throughout the area. A large band is exposed approximately 8 km north of Port Alberni.

Although mapped as intrusive, some of these rocks may be basal flow units of the Karmutsen Formation.



<u>Island Intrusions</u> (Unit 9). Exposures of mainly quartz diorite and lesser biotite-hornblende granodiorite occur throughout the area and are assigned an age of Middle to Upper Jurassic. Intrusive contacts with Sicker and Bonanza Group volcanic rocks are characterized by transitional zones of gneissic rocks and migmatite although contacts with Karmutsen Formation volcanic rocks are sharp and well defined. Skarn zones are reported at the contact of Island Intrusion rocks with Quatsino Formation limestone and less frequently with Buttle Lake Formation limestone.

<u>Tertiary (Catface or Sooke) Intrusions</u> (Unit 21). Sills and stocks of mainly hornblende-quartz diorite and dacitic hornblendefeldspar porphyry plus lesser leucocratic quartz monzonite intrude Nanaimo Group sedimentary rocks and Sicker Group rocks in the area.

#### 4.6 Structure

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The Buttle Lake Arch, Cowichan-Horne Lake Arch and Nanoose Uplift are north-northwesterly trending axial uplifts and are believed to be the oldest structural elements in south central Vancouver Island. Uplifting occurred before the late Cretaceous, and possibly before the Mesozoic (Muller and Carson, 1969). Sicker Group volcanic and sedimentary rocks occur at the core of these uplifts.

Asymmetric southwest verging anticlinal structures characterized by sub-vertical southwest limbs and moderately dipping northeast limbs are reported at Buttle Lake and in the Cameron-Nitinat River area. Intense shearing and metamorphism to chlorite-actinolite



and chlorite-sericite schist occurs in steep and overturned limbs of folds. Overlying Buttle Lake Formation limestones are relatively undeformed except where they are thin.

Vancouver Group units are not as intensely folded; gentle monoclinal and domal structures have been mapped. However, Karmutsen Formation volcanic rocks locally conform to the attitude of underlying Myra and Buttle Lake Formations (Muller, 1980).

Some early Mesozoic faulting occurred in the area prior to emplacement of Island Intrusions. Middle to Upper Jurassic intrusive activity (Island Intrusions) occurred along northwesterly trends.

Extensive west-northwest trending faulting occurred during the Tertiary and is best illustrated by large displacements of Nanaimo Group sediments. The north trending Alberni Valley fault is traced over 45 miles and displaces a section of Karmutsen Formation approximately 5,000 feet (Muller and Carson, 1969).

#### 4.7 Economic Setting

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The Sicker Group, and to a lesser extent the Vancouver and Bonanza Groups, have been explored intermittently since the 1890's for gold and base metal mineralization.

Until recently, deposits of copper and gold-silver in quartz veins and shear zones hosted by mafic to intermediate volcanic rocks and base metal plus gold-silver skarn deposits were the most widely



recognized economic and subeconomic metal concentrations in the Port Alberni area. Placer mining for gold was carried out during the 1940's in various localities, especially in the China, Mineral and Corrigan Creeks area.

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Situated on the eastern part of the Canon claim is the Mount Olsen showing (Cu, Ag, Au). Chalcopyrite-pyrrhotite mineralization occurs in a quartz vein hosted by diorite belonging to the Island Intrusions. A grab sample assayed 1.52% Cu, 0.5 oz Ag/T and 0.02 oz Au/T.

A grab sample from an old trench on top of Mount Olsen, containing massive sulphide mineralization hosted by Karmutsen mafic volcanics returned values of 13,200 ppm Cu, 180 ppb Au, 40.0 ppm Ag, 260 ppm Zn and trace lead.

Other nearby mineral occurrences are the WWW Mine, (Corrigan Creek Mine), the Black Panther Mine and the Black Lion Showing.

The WWW Mine is a past-producing mine consisting of quartz veins hosted by Island Intrusions diorite and granodiorite. The WWW Mine produced 116 tons of ore grading 4.0 oz Au/ton, 4.3 oz Ag/ton, 0.23% Cu, and 1.1% Pb and is located 1.5 km west of the Canon Group.

The Black Panther Mine is a quartz vein deposit hosted by a shear zone at the contact between Sicker Group andesite and Island Intrusions diorite. It is located 7 km north of the Canon Group.



Production of 1,890 T of ore yielded 509 oz Au, 953 oz Ag, 12,319 lbs Pb, 498 lbs Cu and at least 4,478 lbs Zn. The Black Lion showing, situated 6 km northeast of the Canon Group is geologically similar to the Black Panther. A grab sample assayed 1.2 oz Au/ton.

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Five past producing mines occur in the Port Alberni area. The Thistle Mine produced 2,760 oz Au, 2,120 oz Ag and 681,425 lbs Cu from 6,920 T of ore. It was originally considered to be a skarn deposit (Stevenson, 1944; Carson, 1968). Disseminated and massive sulphide mineralization occurs as lenses and bands within pyritic quartz-sericite schist and at the contact of quartz-sericite schist with chloritized mafic volcanic rocks (Sicker Group). Disseminated sulphide mineralization occurs throughout the host rocks. The deposit is now believed to be of syngenetic-volcanogenic origin. It is located 7.5 km north of the Canon Group.

The Havilah Mine (1,046 T produced 259 oz Au, 1,404 oz Ag) and the Vancouver Island Gold Mine (483 T produced 384 oz Au, 52 oz Ag) are quartz vein deposits hosted by andesite and andesite tuff of the Sicker Group and are located 10 km and 17 km, respectively, north of the Canon Group.

The other two past-producers are the Black Panther and WWW Mines, discussed above.

Significant base metal and gold deposits and occurrences in the Canon Group area are summarized below, and illustrated on Figure 4.

#### 4.8 Mineral Occurrences

1. Mount Olsen Showing (Cu Ag Au)

#### Location:

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Situated on the Canon Claim, north of Mount Olsen

#### Geology:

Chalcopyrite and pyrrhotite mineralization occur in a 2 ft wide quartz vein within dioritic rocks close to a contact with Vancouver Group volcanic rocks.

Economic Features:

A grab sample assayed 1.52% Cu, 0.5 oz Ag/T, 0.02 oz Au/T.

#### History:

Undated: Unknown; old workings reported in the area. 1963-1965: Gunnex Ltd.; mapping, prospecting 1983-1985: Nexus Resource Corporation; mapping, rock sampling,

silt sampling in the area of the Olsen showing, however, the showing itself was not relocated.

References:

Minfile 092F381





## 2. Andy (Arland's Showing) (Cu Mo)

Location:

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1 km south-southwest of the Canon Group.

Geology:

Chalcopyrite, minor molybdenite, pyrrhotite and pyrite are associated with quartz hornblende veinlets in fracture fillings and disseminations in a stockwork structure in granodiorite.

Economic Features:

No results reported from any of the work done.

History:

- Undated: Unknown; an adit was driven to intersect the Cu-Pb-Zn occurrence.
- 1964-70: Noranda Exploration Co. Ltd.; Prospecting, silt sampling, soil sampling, EM, mag, IP, 19 DDH for 7333'.

References:

- 1) MMAR 1895-654, 1966-76, 1967-76, 1968-104
- 2) GEM 1969-220, 1970-289
- 3) Minfile 092F217

3. Golden Slipper Au Ag Cu

Location:

Approximately 1.5 km southwest of the Canon claim.



## Geology:

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Not reported, however the area is currently mapped as being underlain by diorite (Island Intrusives).

## Economic Features:

Ore is reported to have carried an average value of \$40.00 (1900 dollars) per ton in gold, silver and copper.

#### History:

1899-1900: C. Soll, H. McCoy, H.S. Cow; 16' shaft and 40' tunnel.

#### References:

- 1) MMAR 1899-785, 1900-920
- 2) GSC Map 1963-49
- 3) Minfile 092F149

#### 4. Golden Rule (Au Ag Cu)

#### Location:

1.5 km southwest of the Canon claim.

#### Geology:

Not reported, however the area is currently mapped as diorite (Island Intrusives).

#### Economic Features:

A galena bearing vein, 2.5 ft in width is exposed, having an average value of \$17.50 per ton in gold, silver and copper (1900 dollars).



#### History:

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1899-1900: H.S. Law; no work reported.

#### References:

1) MMAR 1899-785, 1900-920

2) Minfile 092F218

#### 5. WWW (3-W, Corrigan Creek Mine) (Au Ag Pb Cu)

#### Location:

1.5 km west of the Canon Group.

#### Geology:

Tongues of granodiorite alternate with masses of hybrid diorite; both rock types have been cut by feldspar porphyry dykes. Two quartz veins occupy fissures and contain pockets of pyrite, galena, and sphalerite. Another quartz vein is a mineralized gouge zone that does not everywhere contain quartz.

#### Economic Features:

No. 1 vein measures 300 feet long by 4 to 10 inches wide and is exposed in one adit, four open cuts. A channel sample near the adit assayed 6 oz Au/T, 4 oz Ag/T over 4 inches (1935).

No. 2 vein measures 160 feet long by 8 inches wide. A channel sample assayed 7.3 oz Au/T, 5.3 oz Ag/T over 10 inches (1935).

No. 3 vein measures 308 feet long by 2 to 14 inches wide. A channel sample assayed 1.3 oz Au/T, 0.9 oz Ag/T over 14 inches



(1935). Grab samples assayed 7.25 oz Au/T; and 0.18 oz Au/T, 0.2 oz Ag/T (1964).

A recently discovered(?) vein measures 1,000 feet long by 2 inches to 2 feet wide. The best grab sample assayed 1.7 oz Au/T, 3.99 oz Ag/T (1970). A grab sample taken by MPH in 1983 returned 18,000 ppb Au, 3,060 ppm Pb, 12,000 ppm Zn, 11.2 ppm Ag.

Production:

1899-1941: A total of 116 T of ore was mined, yielding 471 oz Au, 500 oz Ag, 2424 lb Pb, and 538 lb Cu.

History:

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1898-1899: Various owners; staking, prospecting, one adit driven.

1930-1935: Franklin River Gold Mines Ltd.; development, some mining.

1940's: Various; prospecting, sampling.

1963-1964: Gunnex Ltd.; prospecting, sampling.

1970: John Cotowick; limited mining operations.

1974: Corrigan Creek Gold Mines Ltd.; geological mapping (surface and underground), geophysics, trenching, stripping, 50' underground work.

References:

1)	MMAR	1898-1132, 1899-607, 1906-198, 1921-206, 1922-228,
		1926-295, 1927-341, 1930-291, 1932-203, 1933-250,
		1935-F49, 1940-27, 1941-27, 1944-59
2)	GEM	1970-289, 1974-172
3)	BCDM	Bull 1 p132
4)	AR	2771
5)	GSC	P 68-50 p38
		Map 1963-49
6)	The Min	er Oct. 1935
7)	Minfile	092F141, 092F085

## 6. Mary Group Occurrence (Cu Zn Pb Ag Au)

## Location:

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2 km north of the Canon Group, south of Mount Spencer.

## Geology:

Chalcopyrite, bornite, malachite, pyrrhotite plus sphalerite mineralization occurs in quartz veins, sheared andesite (Vancouver Group) and feldspar porphyry plus skarn in Vancouver Group limestone (Quatsino Formation).

#### Economic Features:

Five main zones of mineralization. Showing 1 is 200 feet long by 50 feet wide; best channel sample assayed 0.33% Cu over 3 feet.

Showing 2 is 1 foot wide; a grab sample assayed 1.2% Cu, 0.58 oz Ag/T.

Showing 3, mineralized skarn, is approximately 10 feet wide; the best grab sample assayed 0.45% Cu, 3.3% Zn, 0.34 oz Ag/T. The best channel samples assayed 2.61% Zn, 0.29% Cu over 5 feet; 2.23% Zn, 0.33 oz Au/T over 2 feet; and 6.03% Zn, 0.59% Cu over 2.5 feet.

Showing 4 is 16 feet long by 15 feet vertical; Cu, Zn assays were low.

Showing 5, massive pyrrhotite, minor chalcopyrite is 60 feet long by 4 to 6 feet wide; a grab sample from a 1 foot wide quartz vein assayed 2.72% Cu, 6.22% Pb, 0.65% Zn, 28.9 oz Ag/T; a grab sample



of massive pyrite in quartz assayed 0.20 oz Au/t, 25.3 oz Ag/T.

Gold Valley Resources Ltd. reports surface assays of up to 5.57% Cu over 23 feet.

The Summit Pass Mining Corp. report of 1979, apparently based largely on Cominco's work, mentions the following mineralization: a zone 200-400' wide by 1200 feet long with disseminated to massive pyrrhotite, pyrite, and chalcopyrite to 2 feet thick along fractures and joint surfaces; pods and disseminations of chalcopyrite and pyrrhotite in discontinuous lenses in a zone 50 feet by 1000 feet; and massive sulphides (Cu-Ag-Mo) in narrow veins in volcanics; plus five other lesser mineralized zones. As well, Gunnex's DDH 66-7 is reported as having cut 81 feet averaging 1.22% Cu and 0.066% MoS<sub>2</sub> from 151 to 232 feet.

History:

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- 1964-66: Gunnex Ltd.; prospecting, detailed mapping, trenching and pitting, soil sampling, magnetometer, EM, SP, IP surveys, 8 AX DDH totalling 3064 feet.
- 1967: Cominco Ltd.; geological mapping, horizontal loop EM, magnetometer, 4 AX DDH totalling 1503', 5 Winkie DH totalling 411'.

1976: Gold Valley Resources Ltd.; 3 DDH totalling 852'.
1979-81: Summit Pass Mining Corp.; prospecting, summary of previous work.

References:

- 1) GCNL Aug. 20, 1976; Jan. 19, 1977
- 2) MMAR 1966-75, 1967-76



3)	GEM	1976-E111
4)	AR	6134, 8177
5)	GSC	P 68-50 p38
6)	Minfile	0928207

#### 7. Starlight (Au)

#### Location:

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Approximately 4 km west-northwest of the Canon claim.

## Geology:

Very fine-grained free gold is associated with galena which is finely disseminated through extensively altered (silicified, pyritized, carbonatized) diabase (Karmutsen volcanics??).

#### Economic Features:

A large sample assayed \$40.00 per ton in gold (1895 dollars, i.e. about 2 oz Au/T). The "orebody" is reported to have been exposed (by blasting?) for a width of 7 feet without any well defined walls.

History:
1895: Unknown; blasting(?)

References:

1)	GSC	Map 1963-49
2)	MMAR	1895-653

3) Minfile 092F216

#### 8. Black Lion (Au Ag)

#### Location:

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6 km northeast of the Olsen claim.

#### Geology:

Quartz stringers containing pyrite, galena and gold, occur in a carbonatized shear zone which follows an andesite-diorite contact (the southerly extension of the <u>Black Panther</u> (#9) shear zone).

#### Economic Features:

Quartz-sulphide stringers 1 to 1.5 feet wide occur in altered andesite. The best grab sample assayed 1.2 oz Au/T. Grab sample assays ranged from 0.27 to 0.43 oz Au/T (1941).

#### History:

1941: Bralorne Mines Ltd.; prospecting, open cuts.

1942-64: Some diamond drilling is reported to have been done sometime during this period.

1964-65: Gunnex Ltd.; silt sampling and prospecting in the general area.

References:

1)	MMAR	1944-147,159
2)	GSC	P 68-50 p38
		Map 49-1963
3)	AR	7857, 9639
4)	Minfile	092F085

#### 9. Black Panther (Au Ag Pb Zn Cu)

#### Location:

7 km northeast of the Olsen claim.

## Geology:

Ribbon-quartz lenses containing variable amounts of sulphides, mainly pyrite with minor galena and sphalerite occur in a shear zone which follows the contact of andesite lava (Nitinat Formation) on the west and diorite breccia (Island Intrusions) on the east. The wall-rock of the shear is strongly altered by ankeritic carbonate for widths of a few inches to 30 feet which locally is cut by numerous quartz stringers.

#### Economic Features:

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The shear zone has been traced for at least two miles but the best mineralization is at the Black Panther workings where quartz lenses are one inch to three feet thick and up to 40 feet long. Four samples containing "heavy sulphides" from the 2700 and 2790 adits assayed from 2.30 to 2.88 oz Au/ton. A 1964 assay from the dump is reported as 1.16 oz Au/ton, 2.1 oz Ag/ton, 0.14% Cu, and 1.73% Pb.

Production in 1947, 1948, and 1950 totalled 1890 tons which yielded 509 oz Au, 953 oz Ag, 498 lb Cu, and 12,319 lb Pb, and at least 4478 lb Zn.

#### History:

1936: Claims first staked, upper adits driven shortly thereafter.1939: Walter Harris; prospecting, drifting, cross-cutting (presumably those adits referred to above).



- 1941: Pioneer Gold Mines of B.C. Ltd.; drove the 2700 (Main) adit and the 2450 adit (about 1200 feet of drifting, crosscutting, and raising), 1631 feet of diamond drilling.
- 1944-48: Nitinat Golds Ltd. (became Nitinat Mines Ltd. in 1947); built a 25 ton flotation mill, mining, shipped 68.5 tons of concentrate.
- 1962: Hunting Survey Corp.; regional aeromagnetic survey, geological mapping at the workings.

1964-65: Gunnex Ltd.; visited the workings, took a rock sample.

#### References:

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- 1) MMAR 1939-88, 1941-71, 1944-157, 1945-114, 1947-182
- 2) GSC P68-50 p38
  - Map 49-1963
- 3) Minfile 092F084

#### 10. B and K (Au Ag)

#### Location:

7 km northeast of the Olsen claim.

#### Geology:

Many widely scattered narrow quartz veins containing pyrite, and minor galena, sphalerite, and chalcopyrite with Au and Ag values occur in andesite tuffs and flows, basalt, and local black chert; often in shear zones. A zone of strongly carbonatized andesite 6 to 25 feet wide contains minor pyrite, galena, and sphalerite in narrow veinlets. In the southern workings, veins are surrounded by a strong ankeritic carbonate alteration zone.



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Economic Features:

The "high-grade" vein has been exposed in open cuts for 130 feet and is 5 to 8 inches wide. A sample assayed at 3.84 oz Au/ton, 3.2 oz Ag/ton, 0.06% Cu over 5 inches. (This vein may originally have been located on the <u>Golden Eagle</u> property, and is now part of the <u>Black Panther</u> property.)

A vein near the north end of the workings varies from 2 to 6 inches to a 6 foot stringer zone in width. Assays of 2.56 and 2.26 oz Au/ton are reported.

A sample from quartz nodules containing galena and pyrite from an open cut on two parallel shears, each 18 inches wide, ran 0.82 oz Au/ton and 0.7 oz Ag/ton.

No assays are reported from the carbonatized zone. Many other quartz veins, from a hairline to 8 inches wide, for which no assays are available, occur within an area about 1250 feet long.

#### History:

1938-40: Angus Beaton, Ed Keisig; staked claims, prospecting,
17 open cuts and trenches, stripping.
1964-65: Gunnex Ltd.; prospecting and silt sampling in the general area.

References:

- MMAR 1944-151
   GSC P68-50 p38 Map 49-1963
- 3) Gunnex #13
- 4) Minfile 092F081
# 11. Thistle (Au Ag Cu)

#### Location:

7.5 km north of the Canon Group.

# Geology:

The area is underlain by a belt of upper Sicker Group volcanic rocks folded into a large complex anticline. The mine is located within a package of rocks known as the Flow Complex (probably correlative to Muller's Sediment-Sill Unit) which unconformably(?) underlies the Buttle Lake Formation. The Mine Flow Unit of the Flow Complex hosts the mine and 15 of 16 additional Cu and/or Au showings on the property.

At the mine, a highly variable succession of basaltic flows, flow breccias, and massive to bedded and graded tuffs and cherty tuffs is mapped.

Mineralization is found within relatively thin stratabound to cross-cutting? intervals of moderate to very strong chlorite alteration of the basaltic host rocks. Sericite-epidote alteration also occurs, but apparently is not associated with mineralization.

The ore consists of gold-bearing pyrite-chalcopyrite (and local magnetite) in quartz-calcite gangue occurring in 3 or 4 main stratabound? zones of discontinuous anastomosing veins and vein-lets to massive to semi-massive beds?.

The Thistle Mine was reported by early workers to be a skarn deposit in altered limestone intruded by fine-grained diorite.



# Economic Features:

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The ore occurs in layers 5 to 45 cm thick. Assays from 1983 sampling of the old workings range from 3.8-11.8% Cu, 0.14-2.16 oz Au/T, and 0.39-1.04 oz Ag/T. Older reports indicate that ore was found in lenses up to 18' by 25' in size. Diamond drilling in 1984 (NW of the mine) yielded assays ranging from 0.046 oz Au/T to 0.284 oz Au/T over massive sulphide intersections of 2-27 cm. The best assay was 0.514 oz Au/T over 20 cm of chloritic basalt including 2 cm of massive pyrite.

History:

1896: First staked.

- 1899: A. Watson et al; lower adit (500 adit) driven 65 feet but hadn't intersected ore that was 6 to 8 feet wide on surface, upper adit (300 adit) driven 90 feet but also hadn't intersected an orebody. A pit on one of the surface showings.
- 1901: Alberni Gold and Copper Co. Ltd.; roadbuilding, development work.

1902: J.M. Watson; granted Crown Grant L.91G.

1927: A. Watson et al; a 25 foot tunnel with a 20 foot crosscut, all in ore (300A adit?).

1938-40: United Prospectors Ltd.; shipments of ore were made from open cuts and glory holes and the old dumps.

1941-42: Vancouver Island Diamond Drilling and Exploration Co.; 1789 tons ore ore mined, shut down July 25, 1942.

1944: The workings existing on the property included four adits totalling 527 feet, and 18 by 25 foot stope 60 feet long, two glory holes totalling about 6000 cubic yards, and several open cuts. Owned by United Prospectors Ltd., but no work done since 1942.

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1962: Hunting Survey Corp.; regional aeromagnetic survey, geological mapping at the mine area.

- 1964-65: Gunnex Ltd.; visited the area, but no mapping done, silt sampling and prospecting in the general area.
- 1965: Vananda Explorations Ltd.; magnetometer, SP, and geochemical surveys, 4 diamond drill holes totalling 1745 feet.
- 1979: Kargen Development; linecutting, soil sampling.
- 1982: McQuillan Gold; airborne EM and magnetometer surveys, soil sampling, rock sampling, trenching, EM survey.
- 1983-84: Westmin Resources Ltd.; geological mapping, rock sampling (for assay, whole rock geochem, and thin sections), and prospecting.

References:

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1) MMAR	1899-778, 1901-1097, 1902-307, 1927-340, 1928-366,
•	1930-291, 1939-40,88, 1940-73, 1941-71, 1942-66,
	1944-154-157, 1965-238
2-5) AR	8088, 9126, 10237, 11064
6-7) GSC	P68-50 p38
	Map 49-1963

- 8) Gunnex #10
- 9) Minfile 092F083
- 10) Nexus Resource Corporation;

News Release dated November, 1983.

# 12. Golden Eagle (Au)

# Location:

9.5 km northeast of the Olsen claim.



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# Geology:

A vein of ribbon-quartz cuts a small intrusion of feldspar porphyritic diorite and contains pyrite, minor sphalerite, galena, chalcopyrite and arsenopyrite (about 10% total sulphides) and gold values. Sicker Group volcanics and bedded cherts occur in the area.

# Economic Features:

The vein varies from a few inches to 8 feet in width, averaging about 3.5 feet, and has been traced in outcrop for 400 feet along strike and 325 feet vertically. An assay of \$56 Au/ton, 3 oz Ag/ ton, and 1% Cu is reported (1899), and assays of up to \$103 Au/ton are reported to have been obtained in 1894. A tunnel 500 feet below the surface showing never intersected the vein despite being driven 1500 feet beyond the estimated intersection point of 600 feet.

# History:

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- 1892: The discovery of 2 quartz veins by prospectors searching for the source of the China Creek placer gold prompted the original claims to be staked.
- 1893-1902: Various individuals and/or companies; 4 adits totalling 205 feet in upper workings, an adit driven at a lower level to avoid snowslides from 1896-1902 reached 2100 feet without intersecting mineralization, "development work" of an unspecified nature.
- 1964-65: Gunnex Ltd.; prospecting and silt sampling in the general area. Also visited the lower adit and a showing near Summit Lake (B and K?) where rock samples were taken.



# References:

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1)	MMAR	1893-1080, 1894-773, 1895-651, 1896-7, 556,
		1897-566, 1898-1132, 1899-607, 779, 785, 1902-230,
		1944-G150
2)	AR	10194
3)	GSC	P68-50 p38
		Map 49-1963, 17A
4)	Gunnex	#12
5)	Minfile	092F080
13.	BDQ (A	Au Ag Cu)

#### Location:

7 km northwest of the Canon claim.

# Geology:

Not reported, however the area is mapped as diorite and quartz diorite (Island Intrusions).

Economic Features: Production in 1940 amounted to 1 ton of ore yielding 2 oz Au, 5 oz Ag, and 24 lb Cu.

# History:

Not known.

# References:

- 1) MMAR 1940-A27
- 2) BCDM Index No. 3 to Publications of the BCDM p188
- 3) Minfile 092F348



# 14. <u>COR 6</u> (Cu Au)

#### Location:

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8.5 km northwest of the Canon claim.

# Geology:

Quartz veins in biotite-granodiorite and Karmutsen volcanics carry chalcopyrite. Gossanous patches in the volcanics carry pyrite veinlets 3-6 mm in width.

# Economic Features:

Assays range from 0.002-0.06 oz Au/T and from 0.02-0.21% Cu.

#### History:

1975-77: Focus Resources Ltd.; geological mapping (1:480 and 1:12,000), trenching.

#### **References:**

1)	AR	5400, 6676
2	EBC	1975-E94, 1977-E109
3)	Minfile	092F399

#### 15. Star of the West (Au)

## Location:

8 km northwest of the Canon claim.



# Geology:

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A drift follows a quartz carbonate vein striking 055°, dipping 40° SE, which varies in width from 0.15-1.0 m, and is hosted by Karmutsen volcanics. Sulphide mineralization is sparse along the vein, and consists of pyrite and chalcopyrite.

# Economic Features:

The vein is 5 feet wide (1895 report). A one ton shipment returned \$10 in Au (i.e. about 0.5 oz Au/T).

## History:

1974-77: Focus Resources Ltd.; geological mapping (1:480 and 1:12,000), trenching.

#### References:

1)	MMAR	1895-653, 1896-5, 1897-569, 1923-247, 1933-252
2)	EBC	1975-E94, 1977-E109
3)	BCDM	Bull 1 p5
4)	GSC	Map 1963-49
5)	AR	5400
6)	Minfile	092F215



# 5.0 1985 PHASE I EXPLORATION PROGRAM

# 5.1 Work Completed

A cut and chained baseline was established, commencing in the south-central portion of the Olsen claim, just south of the main creek (BL0+00, L0+00) and extends from L6+00E to L10+00W. Due to terrain difficulties, the baseline was offset 50 metres to the north at L0+00 in order to extend the grid westward. The offset portion of the baseline is designated Tieline 0+50N and extends from L1+00E to L10+00W. The baseline and tieline are on a bearing of 319° and total 1.6 km in length.

Flagged grid lines were established by hipchain and compass at right angles to the baseline/tieline. From L6+00E to L2+00W, grid lines are placed at 100 m intervals with sampling stations at 25 m intervals along each line. Beyond L2+00W, only even numbered gridlines are placed at 200 m intervals with sampling stations at 50 m intervals. Grid lines were extended to property boundaries or as far as the terrain allowed. A total of 9.85 line km of grid lines was established.

The configuration of the grid is shown on Figures 5 and 6.

Geological mapping was carried out over both claims using topographic maps (1:50,000), air photos and the cut and flagged grid for control. Prospecting was conducted mainly in areas of known mineralization.



A total of 30 rock samples was collected in the June program and analyzed geochemically for Au and by 30 element I.C.P. A total of 35 rock samples collected during the May program was analyzed geochemically for Au and Ba. Samples selected for whole rock analysis total 18, of which 2 were collected in May.

Gold, barium and whole rock analyses were carried out by Rossbacher Laboratory Ltd., Burnaby, B.C. I.C.P. analyses were performed by Acme Analytical Laboratories, Ltd., Vancouver and Chemex Labs Ltd., North Vancouver.

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The northeastern faces of Mount Olsen and the adjoining northwest ridge are essentially vertical cliff faces and could not be mapped or prospected.

Due to the rugged terrain of the property, the bulk of the soil sampling was performed on the Olsen claim and the northern quarter of the Canon claim.

A total of 198 soil samples was collected on the grid. Soils were analyzed geochemically for Ag, Zn and Cu. The analytical work was carried out by Rossbacher Laboratory Ltd.

Care was taken to select, where possible, soil samples from the "B" horizon. Areas of outcrop, cliff faces and scree or talus slopes hampered the sampling program. A total of 106 sample sites on the grid could not be sampled for these reasons.

It is not possible to extend the grid onto Mount Olsen and environs due to steep slopes and cliffs.



Only two silt samples were collected, which were subsequently sent to Rossbacher Laboratory Ltd. for Au analysis.

# 5.2 Geological Mapping and Sampling

#### 5.2.1 Property Geology

The Canon Group property contains approximately 60% outcrop, defined mainly by two northwest trending mountain ridges in the northeast (1,040 m elevation) and southwest (Mount Olsen 1,280 m elevation) portions of the property. Extensive outcrop also occurs across the southern quarter of the Olsen claim and more or less connects the adjacent ridges.

#### Mafic Volcanic Rocks

Aphanitic to fine-grained green to dark green mafic volcanic rocks (Unit 1) are the predominant lithology on the property and may be correlative with the Vancouver Group Karmutsen Formation.

Strongly chloritized sulphide-rich aphanitic rocks occur along the main creek of the Olsen claim. Occasional light green to white angular patches, up to 2 cm diameter and containing hornblende phenocrysts, apparently represent highly epidotized/saussuritized rock. Although sulphides most commonly occur as disseminations, some narrow stringers (pyrrhotite, pyrite) or sulphide-bearing fractures are evident and usually are accompanied by siliceous alteration halos. In some cases, the rock is brecciated, characterized by irregular, white to light green, siliceous fragments up

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to 1 cm in diameter. Gossan surface staining is characteristic. Occasional narrow bands of massive magnetite are found in the vicinity of especially rich sulphide sections (iron formation, interflow sediment?).

Mafic volcanics along the northeastern outcrop ridge weather light brown in many cases owing to pervasive carbonatization. The fresh rock is coloured various shades of green and is generally aphanitic but is definitely fine-grained in places. Fine-grained varieties are lighter in colour with scattered pyroxene/epidote phenocrysts within a poorly defined chloritic, saussuritic, feldspar groundmass. Occasional calcite amygdules were noted. Calcite/ankerite veining is particularly well developed on the top of the ridge.

A narrow (approximately 2 m wide) band of brown, highly vesicular basalt occurs along the north contact of mafic volcanics with limestone (Unit 2).

Mafic volcanics on the Mount Olsen ridge differ from the rest of the property in that pervasive schistosity is characteristic. The rocks are less carbonatized than observed on the northeast ridge and less chloritized than the rocks on the valley. Disseminated pyrite is common.

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Narrow exposures of an aphanitic to porphyritic white to greyish white, to light grey green dacite sill or flow (Unit 1a) occur within mafic volcanics close to dioritic intrusive rocks.



Phenocrysts of altered feldspar comprising up to 5% of the rock are locally visible. The rock is apparently somewhat silicified. Up to 1% disseminated pyrite was noted in the rock in the southeastern area of the Olsen claim. The unit outcrops along the southwest bank of the creek from L3+00E to L1+00W.

#### Limestone

Light grey to grey weathering, massive to bedded and infrequently laminated limestone (Unit 2) is apparently interbedded with the mafic volcanic rocks. This is consistent with observations made by Souther (1977) and by Muller (1977). Bedding attitudes indicate that the unit dips to the northeast, however, top-determining criteria are absent. On fresh surfaces, the rock is dark grey to black and recrystalline, possibly indicating that it was originally a micritic limestone. Scattered calcite-replaced fossil fragments have been located in the limestone. The unit was traced across the entire length of the Olsen claim (1500 m). This unit was identified as Quatsino Formation limestone in a previous report (Neale and Hawkins, 1985).

#### Intrusive Rocks

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Fine- to medium-grained, white to grey and grey green weathering diorite (Unit 3a) intrudes mafic volcanic rocks on the Olsen claim and in the central area of the Canon claim. It is white to grey green on fresh surfaces.

The rock contains from 5-30% hornblende as discrete grains and interstitial (plagioclase) feldspar. Leucocratic varieties were also noted. Minor disseminated pyrite occurs in places.



Quartz diorite (Unit 3b) outcrops in the southeastern corner of the Olsen claim and also to the south and is in joint or fault/ fracture contact with diorite. The rock contains up to 10% quartz grains although some may be altered feldspars.

For the most part, dioritic rocks are massive. However, flow-like foliation is locally present at the intrusive contact with host mafic volcanics. Occasional assimilation effects are also notable in the contact zone, namely mafic volcanic xenoliths or mafic-rich zones in diorite.

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Mafic volcanic segments rafted up by intrusion frequently abut or coat the sides of topographically higher diorite outcrops.

These contact features are best observed in the vicinity of the baseline and L1+00W south to L3+00E.

Intrusive relationships also are observed on the northeast side of Mount Olsen's northwest arm. Here, basalt xenoliths are enclosed by diorite below (northeast of) the contact and dioritic dykes intrude basalt above (southwest of) the contact.

Feldspar porphyry and quartz-feldspar porphyry (Unit 3c) occur as phases within diorite and possibly as dykes northwest of Mount Olsen, just northeast of the northwest arm. The rock is light grey to grey on both fresh and weathered surfaces and contains 10-25% feldspar phenocrysts plus 5% quartz phenocrysts. Phenocrysts are generally less than 5 mm in diameter.

Feldspar porphyry sills or dykes were noted in mafic volcanics on L6+00W.



All intrusive rocks (Units 3a, 3b, 3c) are probably related to Lower to Middle Jurassic Island Intrusions.

# Structural Geology

Mafic volcanic rocks are strongly to moderately foliated and trend approximately north-northwest. Dips are steep (mainly to the northeast) to vertical.

Bedding or lamination in limestone  $(S_0)$  indicates that it is shallowly dipping to the northeast and striking subparallel to local foliation. There are no features to indicate tops of bedding.

Interestingly, a pervasive joint orientation in mafic volcanics is approximately equivalent to observed bedding of limestone. The two feldspar porphyry sills (or dykes) intruding mafic volcanics on L6+00W also have similar orientations. The implication is that the volcanic rocks are also bedded.

Four major northeast trending airphoto lineaments correspond on surface to deep, straight, narrow clefts and gorges and may represent regional joints or fracture/fault zones. Horizontal fault displacements are not indicated.

Mesoscopically, closely spaced northeast trending joints pervade all rock types across the entire property. Most quartz, calcite and quartz-carbonate veins follow this joint orientation.



Volcanic rocks on Mount Olsen are strongly sheared subparallel to  $S_1$  and may be described as schistose. Relatively good schistosity is developed along the northwest arm. This style of schistosity does not occur elsewhere on the property.

Aside from brecciation of the mafic volcanic rocks, there is little evidence for a major fault structure running the length of the main creek (as mapped by Gunnex Ltd. in 1965). The diorite and limestone which meet at the creek on the southeast corner of the Olsen claim, are also relatively undisturbed. Brecciation and fracturing of the volcanic rocks may be a result of diorite intrusion.

There is no evidence of fold closures on the claims. Possibly the diorite intrusion was emplaced along some line of weakness; for example, a fault plane or trace or a fold axis.

# 5.2.2 Mineralization

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During the course of geological mapping and prospecting, all mineralized quartz veins and mafic volcanic rocks encountered were grab sampled and analyzed geochemically for Au. Samples returning high geochemical Au values were fire assayed as a check. Thirty of the rock samples were also analyzed by 30-element ICP. Analytical procedures are summarized in Appendix IV. Certificates of analysis are included in Appendix III, while rock sample descriptions and lithogeochemical results are listed in Appendix II. Rock sample locations are shown on Figure 5.



# Quartz Veining

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The Canon gold-bearing quartz vein, discovered by MPH Consulting Limited personnel in April 1985 (Neale and Hawkins, 1985), was re-located and resampled. The Canon vein may be the same vein, or an extension of, the vein which is reported as the Mt. Olsen showing in older reports. See section 4.8 for a description of the Mt. Olsen showing.

The vein trends 040° and dips 60° southeast and occurs in the gut of a fracture/fault zone of similar trend and which has incised the northwest arm of Mount Olsen to a depth of approximately 100 m (Figure 5). The vein averages 5 cm in width and is exposed over a 25 m strike length.

It consists of white to blue grey, fine- to medium-grained quartz and contains up to 50% pyrite masses and blebs, 1-2% blue grey sphalerite blebs plus lesser chalcopyrite, covellite, malachite and azurite. It is vuggy in places.

The vein is somewhat cherty towards the margin. The host diorite is strongly silicified and epidotized to a distance of approximately 2 m on either side of the vein. The altered zone was referred to as rhyolite dykes in a previous report (Neale and Hawkins, 1985).

Analyses of quartz vein material returned 67,000 ppb Au (sample 9830) and 2,280 ppb Au (sample 9830a). A grab sample of host pyritic diorite (9831) returned 90 ppb Au. Previous analyses (check fire assays in parentheses) were 73,500 ppb Au (2.63 oz



Au/T), 42.5 ppm Ag (1.89 oz Ag/T), 22,600 ppm Zn, 760 ppm Pb, 700 ppm Cu for quartz vein material and 4,300 ppb Au, 3.6 ppm Ag, 5,600 ppm Zn, 42 ppm Pb, 472 ppm Cu for host diorite wallrock (Neale and Hawkins, 1985).

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Gossan stained, fractured, mafic volcanic rocks are exposed 100 m above (south of) and on strike with the quartz vein zone. A grab sample of mafic volcanic float from the scree slope below (north of) the vein and containing 20% combined pyrite and pyrrhotite, returned 110 ppb Au (sample 9834) as well as 1193 ppm Cu, 60 ppm Zn, 1.4 ppm Ag, 114 ppm Co. A grab sample of a pyrite-pyrrhotiteand chalcopyrite-bearing mafic volcanic boulder just southeast of the Canon vein returned 520 ppb Au (sample 8763) in addition to 54 ppm Ag, >9999 ppm Cu, 1910 ppm Zn, 65 ppm Mo, 156 ppm Co, 20 ppm Cd. These factors suggest a continuation of gold mineralization upslope, south of the vein.

Grab samples of two narrow (<8 cm) north-northeast trending quartz veins located northwest of Mount Olsen and hosted by mafic volcanics returned 20 ppb Au each (samples 8788, 8791). The veins contain hematite, minor disseminated pyrite and traces of malachite. Although the gold values are not high, the veins trend subparallel to the local pervasive jointing/fracturing, the Canon gold vein and the Olsen copper showing (see section 3.0 for description).

A 10 cm wide north-northwest trending quartz vein in diorite returned 30 ppb Au from a grab sample (sample 8797).

# Karmutsen-hosted Sulphide Mineralization

Extensive sulphide mineralization (pyrite, pyrrhotite, chalcopyrite) hosted by mafic volcanics is located in the vicinity of



Tie-line 0+50N between lines 2+00W and 4+00E. Excellent continuous exposure occurs along the main creek between lines 0+00 and 2+00E.

The mineralization consists primarily of disseminated and stringer pyrite ± pyrrhotite which may comprise up to 10% of the host rock. Minor disseminated chalcopyrite is also noted. Both disseminated and stringer style mineralization are accompanied by white to light grey-green coloured epidote-saussurite alteration, imparting a clastic appearance to the rock in which irregular, angular white patches occur within a darker, more mafic or chloritic host. These patches measure up to 4 cm in diameter.

Irregular dark green to black chloritized patches measuring up to 2 cm in diameter commonly contain masses of pyrite, pyrrhotite ± magnetite which are strongly magnetic.

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Narrow bands (up to 1 cm) of pyrite, pyrrhotite and chalcopyrite were identified in a few places. Massive brown weathering magnetite bands (up to 1 cm) were also noted. Pyritized joint planes are common.

No anomalous gold values were encountered. Most samples returned high to anomalous Ba, Cu, and Cr results. Zinc values are not anomalously high.

Copper mineralization (pyrite, chalcopyrite, malachite) hosted by brecciated mafic volcanic rocks and a quartz stockwork is located on Mount Olsen (Olsen copper showing). The showing was previously visited and sampled by MPH Consulting Limited in 1983 (Willoughby



and Hawkins, 1983). A 1983 sample returned values of 13,200 ppm Cu, 260 ppm Zn, 180 ppb Au, and 40 ppm Ag. The Olsen copper showing occurs in one of the 4 major northeast trending joint or fracture systems which cross the property.

# 5.2.3 Lithogeochemistry

Whole rock lithogeochemical sampling of mainly mafic volcanics was used to determine the geochemical affinity (either tholeiitic or calc-alkaline) of the rocks, to aid in their classification (basalt, andesite, dacite, rhyolite) and to hopefully establish enrichment/depletion in elemental oxides, factors generally used to detect alteration features characteristic of known massive sulphide mineralization.

Rock samples that were first analyzed geochemically for gold were subsequently analyzed by ICP for metallic elements (Cu, Zn, Ba etc., in ppm) and non-metallic elements (Ca, P, K, in %) from which potentially economic or anomalous elemental concentrations are highlighted.

Whole rock analyses are included in Appendix III. Analytical procedures are summarized in Appendix IV.

Pertinent whole rock data is plotted on a Jensen cation triangular diagram (Appendix V). The Jensen Plot is a convenient and rapid method of volcanic rock classification. Aside from designating volcanic geochemical fields (tholeiitic vs calc-alkaline), specific rock type (i.e. basalt, dacite) is also determined.

Anomalous ICP geochemical results are briefly discussed.

# Results and Interpretation

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The majority of the whole rock analyses of mafic volcanic rocks plot within the high-iron tholeiitic basalt field which is characteristic of Vancouver Group Karmutsen Formation basaltic rocks.

Samples with relatively high loss on ignition (LOI) include samples 85 CO-6,-7,-15, 8733, 8734 and, as should be expected, show marked departures from the majority. LOI is a measure of the CO<sub>2</sub>, H<sub>2</sub>O content of the rock and is an indication of the degree of post-depositional (meteoric) alteration.

The high  $Al_{2}O_{3}$  contents of samples 8733, 8734, however, may indicate sericitization. The MgO value of sample 85CO-7 may indicate chloritization.

The whole rock data does not indicate alteration features that may be taken to be attendant to syngenetic, exhalative massive sulphide mineralization (enrichment in MgO, Fe<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O and depletion in Na<sub>2</sub>O and CaO) and mineralized Karmutsen basalts show normal lithogeochemistry.

Sample 85CO-8 is indicated to be calc-alkaline andesite. The rock, which occurs close to a feldspar porphyry sill, may be affected by the intrusion or perhaps itself is a part of the sill.

Sample 85CO-4 is from a felsic sill and plots in the calc-alkaline field on the dacite-rhyolite boundary.

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Samples 85CO-2, 11, 14 represent various phases of the diorite.

A summary descriptive list of the rock samples and their geochemical characteristics is provided in Table 1.

# **ICP** Analyses

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ICP results indicate that the mineralized quartz veins (Canon vein, etc.) contain above background contents of Cu, Cd, Ag  $\pm$  As, Bi, Mo, Sb, W in addition to the high Au and Zn. The sulphide-rich zone of Karmutsen basalts contains elevated contents of Cu, Cr  $\pm$  Ba, Ag, Sr, V. Samples of mafic Karmutsen volcanics away from the sulphide-rich zone contain some high Cr, Mn, Ni, V  $\pm$  As, Cu values.

Full ICP results are included in Appendix III.



# TABLE 1. WHOLE ROCK SUMMARY

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Sample No.	Field Classification	Character	Whole Rock Classification	Geochemical Field
85CO-1	mafic volcanic	fg-aphanitic, 2% po±py	high iron basalt	tholeiitic
85CO-2	dacite, diorite	porphyritic, £1% py	dacite	tholeiitic
85C0-3	diorite/mafic volcanic contact	granular	high iron basalt	tholeiitic
85C0-4	dacite sill	cherty	dacite- rhyolite	calc-alkaline
85CO-5	mafic volcanic	fg-aphanitic, pyritic	high iron basalt	tholeiitic
85CO-6	mafic volcanic	fg, massive	high iron basalt	tholeiitic
85CO-7	mafic volcanic	fg, massive	high magnesium basalt	tholeiitic
85CO-8	mafic volcanic	fg-aphanitic 3% po, py	andesite	calc-alkaline
85CO-9	mafic volcanic	fg-aphanitic, 10% po, py±mte	high iron basalt	tholeiitic
85CO-10	mafic volcanic	fg-aphanitic, 10% po, py±mte	high iron basalt	tholeiitic
8500-11	diorite/mafic volcanic contact	mg, foliated, banded; minor py	dacite- andesite	tholeiitic
85C0-12a	mafic volcanic	fg, 20% py, po	high iron basalt	tholeiitic
85CO-12b	mafic volcanic	fg, carbonatized	high iron basalt	tholeiític
85CO-13	mafic volcanic	close to Cu- stained outcrop	dacite- andesite	tholeiitic
85C0-14	diorite		dacite	tholeiitic
8500-15	mafic volcanic	close to Canon Au vein	high iron basalt	tholeiitic
8734	mafic volcanic	amygdaloidal	high iron basalt	tholeiitic
8753	mafic volcanic	fg-aphanitic	high iron basalt	tholeiitic

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# 5.3 Soil Geochemistry

Detailed soil sampling was carried out over the southeast portion of the Olsen claim where considerable apparently stratiform sulphide mineralization was detected during prospecting.

Samples were collected every 25 m on grid lines with a line separation of 100 m. A total of 4.68 line km of detailed sampling was carried out.

The remainder of the accessible area of the property was covered by reconnaissance sampling with 50 m station spacing on grid lines 200 m apart. A total of 4.87 line km of reconnaissance soil sampling was completed.

Owing to terrain difficulties, it was not possible to extend the soil sampling grid to the vicinity of the Canon gold-bearing quartz vein.

In addition to soil sampling, two stream sediment samples were collected.

Soil samples were geochemically analyzed for Ag, Cu, and Zn. Silt samples were analyzed for Au. Analytical procedures are summarized in Appendix IV; geochemical results are tabulated in Appendix III. Soil geochemical data are plotted on a 1:2500 scale grid map (Figure 6).

Although the large number of missed samples due to outcrop and/ or terrain difficulties and the fact that part of the grid was



sampled on a reconnaissance scale makes reliable contouring of the soil geochemical data awkward, an attempt was made. The contoured geochemical soil anomalies are shown on Figure 6.

# Results and Interpretation

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Frequency histogram plots for copper and zinc and cumulative frequency plots for Cu, Ag, and Zn are included in Appendix VI.

Cumulative frequency plots were used to determine anomalous values of Cu, Ag, and Zn in soils. In view of the indications of multiple populations, the 90th percentile value is considered to be the lower limit of anomalous results. The 95th percentile value is considered to be very anomalous, while the 97.5th percentile value is considered to be extremely anomalous. Anomalous values are summarized below:

	<u>Cu</u> (ppm)	<u>Ag</u> (ppm)	<u>Zn</u> (ppm)
anomalous	145	0.52	125
very anomalous	191	0.78	163
extremely anomalous	234	1.04	195

Three main zones of anomalies are detected in the soil geochemical data (Figure 6).

#### Zone 1 Zn-Ag (-Cu)

Zone 1 measures approximately 700 m long by 150 to 450 m wide. It trends NW-SE and is open to the NW and appears to widen to the NW.



This zone consists of anomalous to extremely anomalous Zn values extending from L4+00W to L10+00W with coincident very to extremely anomalous Ag values on L4+00W and L6+00W. Extremely to very anomalous Ag values are partially coincident with the Zn anomaly on L10+00W. A smaller Cu anomaly, partially coincident with the Zn anomaly occurs from L10+00W to L8+00W, while a small Cu anomaly occurs just south of the Zn-Ag anomaly on L4+00W. Peak values in Zone 1 are 336 ppm Zn, 2.2 ppm Ag, and 250 ppm Cu.

Zone 1 occurs just downslope from a band of intraformational limestone in Karmutsen volcanics. The anomalous values may, therefore, indicate that the limestone is (skarn?) mineralized. No evidence of mineralized limestone was located anywhere on the property, however, either in outcrop or in float. The anomalous zone occurs in an area of little outcrop and widely spaced soil samples.

#### Zone 2 Cu-Zn

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Zone 2 measures approximately 750 m long by 100 to 250 m wide and trends WNW-ESE at a slight oblique angle to the trend of geology. The zone is open at both ends.

This zone contains extremely anomalous Cu values from L2+00W to L6+00W with anomalous Cu values extending to L8+00W. The eastern boundary of the Cu anomaly is uncertain due to the large number of stations not sampled on L2+00W and L4+00W. An area of anomalous to very anomalous Zn values is coincident with the



southwestern edge of the Cu anomaly. Small Ag anomalies occur at the northwestern end of Zone 2 and just northeast of the southeastern end of the Zone. Peak values in Zone 2 are 276 ppm Cu and 216 ppm Zn.

The Canon Au (-Zn) vein occurs at the southwestern end of L6+00W about 220 m beyond the edge of Zone 2. As the Zone 2 Cu-Zn anomaly runs at right angles to the strike of the vein it seems unlikely that they are related. The sample at L2+00W, 2+00S which returned 254 ppm Cu and 216 ppm Zn is located about 20 m north of a quartz vein in diorite which returned a value of 30 ppb Au (sample 8797). Possibly the Zone 2 anomalies are caused by mineralized quartz vein(s) or breccia zone(s) in diorite. Little or no outcrop occurs within Zone 2, and soil samples are widely spaced.

# Zone 3 Cu- Ag

Zone 3 measures approximately 550 m long by 50 to 300m wide. It trends roughly WNW-ESE and is not open at either end.

This zone is more complex than Zones 1 and 2. It consists of anomalous to very anomalous Cu values from L2+00E to L2+00W, with the most numerous and most anomalous Cu values on L1+00W and L2+00W. On L1+00E and 2+00E anomalous to very anomalous Ag values are recorded. The Cu anomaly is coincident with part of this Ag anomaly. Two spot Zn highs also occur on L2+00E. Peak values in Zone 3 are 302 ppm Cu and 1.2 ppm Ag.



A small coincident Ag and Cu anomaly occurs on L0+00, northeast of Zone 3; a Cu anomaly occurs on L3+00E southeast of Zone 3; and a Ag anomaly occurs on L4+00W north of Zone 3.

The Zone 3 Cu anomaly appears to follow the northeastern bank of the main creek very closely. This area is underlain by Karmutsen volcanics. The Zone 3 Ag anomaly occurs over, and upslope from the limestone horizon. The Cu-Ag anomalies could be related to (skarn?) mineralization of the limestone, but the fact that the Ag anomaly extends uphill from the limestone suggests the presence of a separate or additional zone of mineralization. The southwestern end of the Ag anomaly is adjacent to (northwest of) exposures of sulphide-rich Karmutsen mafic volcanics.

None of the three anomalous zones can be adequately accounted for at this time. More detailed soil sampling is required to fully outline the anomalies, especially in Zone 2. Detailed geological mapping and sampling of the available outcrops in the anomalous zones will also be required. As little outcrop is found in Zones 1 and 2, geophysical surveys over the anomalies may aid in determining their cause. Hand trenching may be useful, but overburden is likely to be up to several metres deep in most areas.



#### 6.0 RECOMMENDED WORK PROGRAM

#### 6.1 Plan

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The Phase II program is designed to follow up the encouraging results of Phase I geological and geochemical work with detailed geology, geophysics, and geochemistry. Phase II is designed to provide targets for Phase III trenching and diamond drilling.

Detailed geological mapping, sampling, and prospecting will be carried out in all major northeast trending joint or fracture/ fault zones, as these zones appear to have some control on mineralized quartz veins on the property. Detailed geological work will also be carried out around all known showings.

Additional geochemical soil sampling will be carried out in the areas of anomalous zones 1 and 2, which were sampled on a reconnaissance scale only during Phase I; and over the projected extension of the Canon Au(-Zn) vein. Grid lines 3+00W, 5+00W, 7+00W, and 9+00W will be added to the grid and soil sampled at 25 m intervals. The grid lines previously sampled at 50 m intervals (4+00W, 6+00W, 8+00W, 10+00W) will have extra samples collected to provide 25 m sample spacing. A small, detailed soil sampling grid will be established to test for a northeastern extension of the Canon vein. L 6+00W will be used as a baseline for this grid, with north-south grid lines 50 m apart extending 50 m on either side of the "baseline." Soil samples will be collected at 10 m intervals on the grid lines.

Magnetometer and VLF-EM surveys will be carried out over the soil sampling grid with readings taken every 25 m to assist in geological interpretation of overburden-covered areas and to locate



structures and/or zones of mineralization. A small test IP survey will be carried out over grid lines with anomalous soil geochemistry and/or evidence of sulphides in outcrop. A total of about 3.5 line km of IP will be carried out over lines 10+00W, 6+00W, 1+00W, and 1+00E.

Contingent upon favourable results from Phase II, Phase III will consist of trenching and sampling of showings and/or geochemical and geophysical anomalies followed by 600 m of diamond drilling on the highest priority targets.

The following detailed cost estimate is for Phase II geological, geophysical, and geochemical work. A provisional cost estimate for Phase III work is also provided, however the detailed Phase III budget and schedule will be dependent upon the results of Phase II.

# 6.2 Budget

# Phase II

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Mobilization/Demobilization			<b>\$</b> 750
Personnel			
Geologist 10 days	@ \$325	\$3,250	
Soil Samplers/Geophysical	Technicians (2)		
10 days	@ 200	4,000	
			7,250
Support Costs			
Camp Costs 30 man days	@ \$ 40	1,200	
Helicopter 4 hrs	@ 400	1,600	
Communications 10 days	@ 25	250	
Supplies		250	
		<u> </u>	3.300

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Equipment Rental			
Magnetometer and Base S	tation Receiver		
10 day	s @ \$150	\$1,500	
VLF-EM Receiver 10 day	s @ 25	250	
			1,750
Analyses			
150 soils (Cu Ag Zn)	@ 4.05	607	
50 rocks (Au Ag Cu Zn)	@ 9.40	470	
			1,077
IP Survey			
3.5 line km	@ 1,000	3,500	
Report		1,500	
			5,000
	•		
Consulting/Supervision			
2 days @ \$450		900	
Expenses		200	
			1,100
Report Writing			
Geologist 5 day	s @ 325	1,625	
Drafting 30 hrs	@ 18	540	
Materials		750	
			2,915
			23,142
Administration @ 15% (on \$	8,117)		1,218
			24,360
Contingency @ 15%			3,654
	Total, s	ay	\$28,000
			an a
Phase III			
Trenching (including perso	nnel, drill,		
powder, assays)			3,000
Diamond Drilling (includin	g helicopter, ge	ologist,	
assays, report) 600 m	@ \$165	а. А.	99,000
			102,000

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Carried Forward	d			\$102,000
Administration	Q	15%	(on say, \$75,000)	11,250
				113,250
Contingency	@	15%		16,988
			Total, say	\$130,000

# 6.3 Schedule

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The following table summarizes the projected time requirements for completion of Phase II exploration of the Canon Group. Phase III is estimated to require six weeks to complete.

Week	1	2	3
Mobilization			
Geology, Prospecting			
Soil Sampling	<b></b>	Andrean Anna Anna Anna Anna Anna Anna Anna A	
Magnetometer, VLF-EM		an a	
IP	with an appropriate sectory of the state of the		
Analyses			
Consulting	. energieren		
Demobilization			
Report			

# TABLE 2



# 7.0 CONCLUSIONS

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- The Canon Group is underlain by tholeiitic basalts of the Upper Triassic Karmutsen Formation and by dioritic to quartz dioritic rocks of the Lower to Middle Jurassic Island Intrusions. An intraformational layer of limestone occurs within the Karmutsen volcanics.
- 2. A well-developed northeast-trending joint system cutting all rock types on the property has been identified. Four major northeast-trending regional joints or fracture/fault systems are inferred from airphoto lineaments to cross the property.
- 3. The Canon Au(-Zn) quartz vein has been traced for 25 m. It trends northeasterly, averages 5 cm in width and is hosted by diorite. Assays of up to 2.63 oz Au/ton and 1.89 oz Ag/ton have been obtained from grab samples of the vein, as well as results of up to 22,600 ppm Zn, 760 ppm Pb, and 700 ppm Cu.
- 4. The Canon vein occurs in one of the four major northeast trending joints or fracture/fault systems on the property. Two other narrow quartz veins which returned anomalous gold values occur in smaller northeast trending joints. There appears to be a structural control on (gold-bearing) quartz veins on the property.
- 5. Grab samples of float believed to be derived from an exposure of gossanous Karmutsen Formation volcanics occurring near the Canon vein returned high results. Sample 9834 returned 110 ppb Au, 1193 ppm Cu while sample 8763 returned 520 ppb Au, 54 ppm Ag, 1910 ppm Zn, 65 ppm Mo, and more than 10,000 ppm Cu.

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A zone of mineralized Karmutsen volcanics centred at about L1+00E, 0+50N is exposed for about 600 m and returned values of up to 1.2 ppm Ag, 804 ppm Cu, 122 ppm Zn, 420 ppm Ba, and 10 ppb Au. The host rocks were in part brecciated, but sulphide mineralization is believed to be syngenetic and stratiform, and not structurally controlled.

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- 6. Whole rock geochemical analyses of mafic volcanic rock indicates that they are high-iron tholeiitic basalts which signifies that they belong to the Karmutsen Formation.
- Geochemical soil sampling located three 7. main zones of anomalous concentrations of Cu and/or Zn and/or Ag. Zone 1 (Zn-Ag) is interpreted as being caused by stratiform sulphide mineralization. Zone 2 (Cu-Zn), which trends slightly oblique to the local geological trend, is interpreted to reflect an underlying mineralized quartz vein or structural zone. Syngenetic sulphide mineralization within a lithological unit is also a possibility as the source of anomalous soil values. Zone 3 (Cu-Ag) may be due in part to stratiform sulphide mineralization in Karmutsen volcanics. Skarn-type mineralization at the contact of volcanics and limestone could also be responsible for some of the anomalous results. Zone 3 is more complex than Zones 1 and 2 and two different types of underlying mineralization could be the reason for its complexity.
- 8. Further exploration including soil sampling, VLF-EM, and magnetometer surveys and detailed geological mapping, sampling, and prospecting followed by trenching and diamond drilling is required to evaluate the economic potential of the Canon Group property.

# 8.0 RECOMMENDATIONS

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The following recommendations are made to further evaluate the potential of the property to host economic precious metal and/or massive sulphide mineralization.

- It is recommended that Imperial Metals Corporation be approached with respect to the area of the Canon Group to which they hold the base metal rights, prior to initiating further exploration work.
- 2. Detailed geological mapping, sampling, and prospecting of all major northeast trending joint or fault/fracture zones, one of which is known to host the Canon Au-Zn-Cu quartz vein, is recommended.
- 3. It is recommended that lines 3+00W, 5+00W, 7+00W, 9+00W be added to the grid and soil sampled to test the continuity of soil geochemical anomalies detected to date and to allow more accurate delineation of anomaly boundaries.
- 4. It is recommended that a small soil sampling grid be established to test for a northeasterly extension of the Canon Au (-Zn) vein. L6+00W from TL0+50N to 4+00S is to be used as the baseline. North-south grid lines 50 m apart will extend 50 m on each side of the "baseline," with soil sample stations at 10 m intervals.
- 5. A ground magnetometer and VLF-EM survey over the western portion of the grid is recommended to allow a geological

interpretation of the overburden covered areas of the property.

6. IP surveying of grid lines which show anomalous soil geochemistry and/or good sulphide distribution in outcrop is recommended. Two complete lines are recommended; L10+00W and L6+00W, as well as the northern halves of L1+00E and L1+00W.

Respectfully submitted MPH CONSULTING LIMITED

N.O. Willoughly

N.O. Willoughby, B.Sc.

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T. Neale, B.Sc.



July 29, 1985 Vancouver, B.C.

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# CERTIFICATE

I, N.O. Willoughby of 651 Cosburn Ave., Toronto, Ontario certify that:

- I hold a Bachelor of Science degree (Honours) in Applied Geology from Carleton University, Ottawa, Ontario.
- That I have practised as a geologist in mineral exploration over the past fourteen years.
- 3. I have based my conclusions and recommendations contained in this report on my experience and knowledge of the geology of the area and on observations made while on the property during May and June, 1985.
- 4. I hold no interest, directly or indirectly in this property other than professional fees, nor do I expect to receive any interest in the property or in Goldenrod Resources and Technology Inc. or any of its subsidiary companies.

A-O. Willowy Rby

N.O, Willoughby, B.Sc.(Hon.)

Vancouver, B.C. July 29, 1985

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#### CERTIFICATE

I, T. Neale, do hereby certify:

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- That I am a graduate in geology of The University of British Columbia (B.Sc. 1978).
- That I have practised as a geologist in mineral exploration for seven years.
- 3. That the opinions, conclusions, and recommendations contained herein are based on field work carried out by others on the property in May and June 1985, on library research, and on my experience in the area.
- 4. That I own no direct, indirect, or contingent interest in the area, the subject property, or shares or securities of Goldenrod Resources and Technology Inc. or associated companies.

Nele

T. Neale, B.Sc.

Vancouver, B.C. July 29, 1985

#### CERTIFICATE

- I, T.E. Gregory Hawkins, do hereby certify:
- 1. That I am a Consulting Geologist with business offices at 301-409 Granville St., Vancouver, B.C. V6C 1T2.
- 2. That I am a graduate in geology of The University of Alberta, Edmonton (B.Sc. 1973), and of McGill University, Montreal, (M.Sc. 1979).
- 3. That I have practised within the geological profession for the past twelve years.
- 4. That I am a Fellow of the Geological Association of Canada and a Professional Geologist registered in the Province of Alberta.
- 5. That the opinions, conclusions and recommendations contained herein are based on field work carried out on the property in May and June 1985, and supervised by me.
- 6. That I own no direct, indirect, or contingent interests in the area, the subject property, or shares or securities of Goldenrod Resources and Technology Inc. or associated companies.



Vancouver, B.C. July 29, 1985

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# APPENDIX I

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STATEMENT OF EXPENDITURES AND LIST OF PERSONNEL



### LIST OF PERSONNEL AND STATEMENT OF EXPENDITURES

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The following expenses have been incurred on the Canon Group of claims as defined in this report for the purposes of mineral exploration between the dates of May 14 and June 30, 1985.

N.O. Willoughby, B.Sc.							
Geologist	17	days	@	\$325		\$5,525	
T. Kraft, B.Sc.							
Geologist	11	days	@	250		2,750	
R. Krause, B.Sc.							
Geologist	11	days	@	250		2,750	
G. Cope, B.Sc.							
Field Assistant	14	days	@	175	· .	2,450	
K. Barron, B.Sc.							
Field Assistant	14	days	@	175		2,450	
W.G. Hoiles							
Project Co-ordinator	4	days	Q	300		1,200	
T. Neale, B.Sc.							
Geologist	5	days	@	325		1,625	
T.G. Hawkins, P.Geol.							
Consulting Geologist	4	days	@	450		1,800	
							\$20,550.00
Truck, Camp, Radio Renta	1						2,500.00
Expediting Charges							440.00
		· . ·					
Expenditures:							
Groceries, Accommodat	tior	ו				1,024.01	
Transportation (gas,	fei	cry,					
helicopter)						4,353.27	
Supplies						143.09	



Analyses			
Maryses			
35 rocks @ \$ 9.25 (Au, Ba)	\$ 323.7	5	
34 rocks @ 5.95 (Au)	202.3	<b>)</b>	
2 rocks @ 6.20 (Cu, Ag, Z	n) 12.4	0	
2 rocks @ 11.50 (Ag, Zn as	say) 23.0	<b>)</b>	
3 rocks @ 6.00 (Au assay)	18.00	) )	
68 rocks @ 6.00 (ICP)	408.00	<b>)</b>	
18 rocks @ 20.00 (whole roc	k) 360.00	)	
8 thin sections @ \$6.00	48.00	)	
1 polished thin section @ \$	18.00 18.00	)	
198 soil samples @ \$4.05 (Cu	,Ag,Zn) <u>801.9</u>	<u>)</u>	
		\$2,215.35	
Report Costs (typing, drafting,	copying)	873.37	
Miscellaneous (freight, etc.)		100.20	
		8,709.29	
Administration @ 15%		1,306.39	
			\$10,015.68
Report - 6 copies @ \$82.50			495.00

Total

\$34,000.68

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# APPENDIX II

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ROCK SAMPLE DESCRIPTIONS AND LITHOGEOCHEMICAL RESULTS



## Rock Sample Descriptions and Lithogeochemical Results

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Sample#	Description	<u>Cu</u> ppm	<u>Zn</u> ppm	<u>Ag</u> ppm	<u>Au</u> ppb
8719	Hornblende feldspar porphyry, slightly chlori- tized crystals 0.5 cm, fine grained, greenish matrix. Crystals mainly feldspar, minor quartz and hornblende.	11	70	0.2	10
8720	Small gossan (limonite, goethite). Quartz- chlorite vein and 6 cm pods, pyritized.	393	50	1.8	10
8721	Quartz vains in diarite Small gaggan follows	416	50	9 6	90
8722	vaine Cossen is mainly limonite minor blue	726	120	6 4	20
8723	staining may be agurite. Voing are legally	317	110	1 0	10
0723	vuggy/drusy. Total sulphides about 5% py, sphalerite, chalcopyrite.	517		1.0	10
8724	Diorite is silicified proximal to veins $(1/2 m)$ .	131	160	0.2	10
8725	Pyritic diorite near felsite(?) dyke. Pyrite is blebby (<5%) with small quartz stringers.	570	110	1.4	10
8726	Quartz vein, diorite wallrock has gossan staining. Vein 3 cm wide.	5	150	0.2	10
8727	Float, possibly dirty chert horizon, dark grey weathers preferentially in discontinuous lami- nae. Some bands appear to be iron formation (maroon and hard).	21	10	0.2	10
8728	Possible slump deposit, angular fragments, lapilli size to 14 cm. Fragments are mainly volcanic with stringer veins running throughout.				10
	Cherty fragments are pyritized, blebby with small stringers, (1.5x.5 cm).				
8729	Float, extremely vuggy (40%). Some pyrite still visible, disseminated and 'worm-like.'	146	40	0.2	10
8730	Physitia dyka(2) within intermediate volume	140	60	0.2	10
31	Large goesan follows din of the dybe Dybe is	150	60	0.2	10
51	now 30-40% limonite, 15-25% calcite.	100	00	0.4	10
8732	Fine grained, chloritized intermediate volcanic. Small gossans following quartz/carbonate veins. Vuggy and primarily limonite.	19	80	0.2	10
8733	Carbonstized volgenie acrosses voislate and	1.1.	60	0.2	10
2/55,	carbonatized voicanic, carbonate veiniets and	44 50	00 60	0.4	10
34	pode •	54	00	0.4	10



Sample#	Description	<u>Cu</u> ppm	<u>2n</u> ppm	<u>Ag</u> ppm	<u>Au</u> ppb
8763	Massive sulphide boulder, cpy, py, po. Highly chloritized Karmutsen? volcanics.	>99999	1910	54	520
8764	Rhyolite dyke, 4 m wide. 1-2% disseminated fine py. Mesocratic to leucocratic. Aphanitic. Within Karmutsen volcanics.	99	140	0.2	10
8765	Shear zone in diorite, 2-3% disseminated fine pyrite.	79	80	0.2	10
8766	Gossan zone on diorite 1-2% disseminated fine pyrite.	5	60	0.2	10
8767	Extremely mafic Karmutsen.	7	40	0.2	10
8768	Shear zone in Karmutsen. 2-3% disseminated fine pyrite. Abundant limonite.	749	50	0.2	10
8769	l m wide gossan hosted in Karmutsen volcanics. Thin 2-3 mm wide, milky white quartz veins. 2-3% disseminated py, po, primarily along fracture surfaces.	427	80	0.2	10
8770	Altered metavolcanics, 2-3% disseminated py, po. Gossan zone 5 m wide.	396	40	0.2	10
8771	Diorite, 2-3% disseminated fine and medium grained euhedral pyrites.	176	50	0.2	10
8772	Altered Karmutsen, close to diorite contact. 2-3% disseminated py, po.	262	40	0.2	10
8773	Altered Karmutsen, 2-3% disseminated py, po, primarily along fracture surfaces.	284	20	0.2	10
8774	Feldspar porphyry dyke, 30 cm wide, 1-2% dissem- inated py along fractures. Hosted in diorite.	88	70	0.2	10
8775	Altered diorite(?), 3-5% disseminated pyrite (fine to coarse). 2 m wide gossan zone.	220	140	0.2	10
8776	Diorite, 1-2% disseminated fine pyrite.	94	40	0.2	10
8777	Amygdaloidal metavolcanic, calcite fills the amygdules. 1-2% disseminated fine pyrite. Gossan stain.	87	30	0.2	10
8778	Andesitic-dacitic breccia of Karmutsen volcanics	. 172	70	0.2	10

MPH

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Sample#	Description	<u>Cu</u> ppm	<u>Zn</u> ppm	<u>Ag</u> ppm	<u>Au</u> ppb
8779	Dacite	147	60	0.2	10
8780		10	100	0.2	10
8782		147	70	0.2	10
8784 (85C0-1)	Fine grained to aphanitic, dark green mafic volcanic (Karmutsen) with 2% stringers, blebs, disseminations of po, py.	255	50	0.2	10
8785 (85C0-2)	Fine grained feldspar porphyritic, light grey to light grey-green dacite with ≤1% blebs, disseminations of py.	80	230	0.4	10
8786	Aphanitic light grey-green to white rhyclite with≤1% disseminated py.	57	50	0.2	10
8787	Chlorite amygdaloidal mafic volcanic (Karmutsen).	392	60	0.2	10
8788	Mafic volcanic (Karmutsen) with 10% quartz- pyrite bands.	4031	180	4.4	20
8789	Brecciated mafic volcanic (Karmutsen) with 10% quartz-pyrite bands.	381	70	0.4	10
8790	Quartz vein with 3% py; hematite and vuggy.	272	70	0.4	10
8791	Quartz vein with 2% pyrite, malachite ± hematite.	2052	160	5.0	20
8792	Rusty mafic volcanic and quartz vein in float.	699	80	1.2	10
8793	Mafic volcanic float containing 5% stringers, disseminations of po, py.	238	70	0.6	10
8794	Mafic volcanic (Karmutsen) with 5% py, po.	287	70	0.6	10
8795	Mafic volcanic (Karmutsen) containing 2-3% disseminated po, py.	207	80	0.2	10
8796	Rusty diorite boulder/float with vuggy quartz veining, 5% masses, blebs, disseminations py, po.	432	50	0.4	10
8797	Quartz vein with disseminated po.	620	30	3.4	30
8798	Karmutsen basalt containing 5% blebs, patches, disseminations of po, py, cp.	405	30	0.6	10

King tan



Sample#	Description	<u>Cu</u> ppm	<u>Zn</u> ppm	<u>Ag</u> ppm	<u>Au</u> ppb
8799	Karmutsen basalt containing 20% blebs, patches, disseminations of po, py.	223	30	0.4	10
8800 (85C0-9)	Karmutsen basalt-dark green, fine-grained with occasional feldspar phenocrysts; chloritic, local epidote/saussurite; at least 40% sulphides (20% pyrrhotite, 15% pyrite, 15% sphalerite or magnetite, $\geq$ 3% chalcopyrite); some banding of sulphides and chlorite ( $\leq$ 1 cm).	804	30	0.2	10
8800a	Karmutsen basaltsame as 8800 except mineral- ization is more disseminated.	712	30	0.2	10
9808	Talus 40 cm wide boulder, with approximately 50% massive sulphides in aphanitic basalt. Predominantly pyrite in stringers. Minor chalcopyrite.	3955	250	9.4	20
980 <b>9</b>	Mineralized cobble-size talus, predominantly bull-quartz with pyrite blebs. Sulphides approximately 15%. Minor bornite.	826	50	2.6	10
9810	Strongly porphyritic diorite. 2 mm plagioclase crystals comprise 10-20% of rock and sit in a grey aphanitic groundmass. Pyrite is present along fracture fillings and comprises ≠1-2% (Unit 3-c on map)	560	150	1.0	10
9811	Exposure of light grey-green basalt/andesite. Fine-grained, uniform texture. Quartz stringers and fracture fillings. Disseminated pyrites (1 mm) to 2%, some rimmed by hematite. Weathers to creamy grey-white.	35	50	0.2	10
9812	Float boulder of massive basalt, vesicular in places. Approximately 40% pyrite in dissemi- nations and 3-5 mm cubes. Minor malachite. Boulder appears derived from outcropping rock upslope 5 metres, which is mineralized but too friable to provide a good sample. Float sample is heavily weathered.	1119	70	1.4	10
9813 9814 (8500-125	Mafic volcanic with massive po, py and magnetite bands.	716 622	30 20	0.4	10 10



Sample#	Description	Cu ppm	Zn ppm	<u>Ag</u> ppm	<u>Au</u> ppb
9830	Quartz veinwhite to greyish, fine sugary texture, vuggy; contains lenses and pockets of fine to coarse euhedral pyrite (3-50%), occasional chalcopyrite (up to 3%) and sphaler- ite (1-5%). Sphalerite occurs mainly in pyrite- poor sections.	584 Assa 0.7 1.6 2.9	6720 1ys: 76% Cu 58 oz 95 oz	54.0 Ag/to Au/to	>67000 on on
9830a	Quartz veinorangey to pinkish, coarser than 9830, somewhat vuggy; contains large dissemi- nated pyrite cubes. Strongly oxidized and gossan stained.	1953 > Assa 2.6 0.5 0.0	•9999 1ys: 54% Z1 58 oz )5 oz	15.4 n Ag/to Au/to	2280 on on
9831	Diorite-wallrock of 9830. Light grey-green to white, silicified and chloritic, some scattered sericite, pyrite, and iron oxide; weathers gossanous yellow-orange.	237	3240	1.0	90
9832	Quartz veinyellow-orange (stained), to white and light grey, sugary texture, in part vuggy; contains minor large disseminated pyrite cubes; possibly some carbonate.	274	170	7.6	20
9833	Float talus at bottom of chute. Aphanitic dark grey metavolcanic with approximately 50% sulphides. Predominantly pyrite in blebs and stringers with subordinate pyrrhotite. Minor chalcopyrite noted in blebs.	230	20	0.2	20
9834	Float talus at bottom of chute. Aphanitic dark green metavolcanics with approximately 20% pyrite in 5 mm blebs.	1193	60	1.4	110
9835	Float talus at bottom of chute. Appears to be a portion of a quartz vein with veinlets of pyrrhotite, subordinate pyrite and minor chalcopyrite. Veinlets are hairline to 1-2 mm and cut across vein material.	1199	70	1.6	10
9836	Float talus at bottom of chute. Aphanitic meta- volcanic with approximately 30% pyrite in blebs and stringers.	195	30	0.2	10
9837	Float talus at bottom of chute. Aphanitic meta- volcanic, approximately 30% pyrite in blebs and stringers.	165	1.0	0.2	10

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# APPENDIX III

# CERTIFICATES OF ANALYSIS/ASSAY



CERTIFICATE OF ANALYSIS

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2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL: (604) 299 - 6910

TO : PROJ TYPE	MPH CONSULTI 301-409 GR VANCOVUER, ECT: V202 OF ANALYSIS:	NG LT) ANVILI B.C. Geoci	D _E ST., HEMICAL			CERT INVO DATE FILE PAGE	IFICATE#: ICE#: ENTERED: NAME: #:	85112 5233 85-06-06 MPH85112 1	•	
PRE FIX	SAMPLE	NAME	PPM Ba	PPB Au						
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Т	3	8722	260	20						
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Т		8724	300	10						
n T		8725	240	10						
T		8726	220	10						
		8727	540	10						
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2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

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2225 S. SPRINGER AVENUE BURNABY, B.C. V58 3N1 TEL : (604) 299 - 6910

# ROSSBACHER LABORATORY LTD.

CERTIFICATE OF ANALYSIS

TO:MPH CONSULTING LTD.CERTIFICATE#:95175.D301-407 GRANVILLE STREETINVOICE#:5400VANCOUVERB.C.DATE ENTERED:AUGUST 9,1985PROJECT:V202FILE NAME:MPH85175.DTYPE OF ANALYSIS:ASSAYPAGE #:1

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2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

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2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

TO : MPH 30 V PROJECT: TYPE OF 4	CONSULTING LTD D1-409 GRANVILL ANCOUVER, B.C. V 202 <b>ANALYSIS:</b> ASSAY	E STRE	ΞT		C I F F	CERTIFIC NVOICE DATE EN TILE NAM PAGE # :	CATE#: #: TERED: ME:	85163 <b>528</b> JUNE MPH85 1	<b>2</b> 30, 19 163	85	
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# ROSSBACHER LABORATORY LTD.

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#### CERTIFICATE OF ANALYSIS

2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

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CERTIFICATE#: 85175.B

DATE ENTERED: JULY 12.1985

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TO : MPH CONSULTING LTD. 301-409 GRANVILLE ST. VANCOUVER.B.C. PROJECT: V202 TYPE OF ANALYSIS: ASSAY PRE 7. 7

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Certified by

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# CERTIFICATE OF ANALYSIS

2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

То	: MPH 30	CONSUL 1-409	_TINC GRAM	3 LTD. VVILLE	STREET
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CERTIFICATE#: INVOICE#:	85163 5279
DATE ENTERED:	JUNE 28, 1985
FILE NAME:	MPH85136
PAGE # :	1

PRE FIX	SAMP	LE NAME	PPM Cu	PPM Ag	PPM Zn	
n S	0+00	W ON	12	0.2	22	
j s		25N	4	0.4	14	
8	بېغې يېږ يې يېغې	50N	8	0.2	10	
<u> </u>	0400	EW /5N	22	0.2	28	
			18	0.2	16	
NA S		250N	128	0.2	82	
5		2/5N	80	0.4	92	
<b>N</b> S		SOON	130	U.6	68	
5		325N	158	0.6	/4	
5		<u>350N</u>	80	<u>(), 4</u>	/0.	
<b>S</b>		375N	44	0.2	54	
r i S		400N	68	0.4	60	
S		425N	76	0.2	58	
8		475N	126	0.2	82	
<u> </u>	1+0	DE SON	46	1.0	44	
U.S.		75N	126	0.4	70	
S		100N	52	0.6	52	
S		125N	150	0.4	74	
J S		150N	146	0.6	124	
K S		225N	44	0.4	98	
S		250N	20	0.2	146	and the second
n s		275N	64	0.2	. 52	
S		300N	44	O.4	42	
S		350N	60	0.2	56	
S		<u>375N</u>	114	O.4	84	
S		500N	70	0.4	72	
S	2+0	OE BL	26	0.4	38	
S		0+75N	82	0.2	74	
n s		1+00N	66	0.6	72	
έ <b>∖</b> S		1+25N	194	0.6	160	
S		1+50N	52	0.2	96	
S S		1+75N	38	0.2	130	
S		2+00N	94	0.4	54	
S S		2+25N	32	0.2	36	RECEIVED JUN 2 0 1903
S		2+50N	136	1.2	98	
ns .		2+75N	38	<u>°.6</u>	50	
S		3+25N	86	0.4	64	· · · · · · · · · · · · · · · · · · ·
S		3+50N	66	0.6	68	
r S		3+75N	106	0.6	72	
19	2+00	)E 4+25N	76	0.2	56	Λ
				CERTIF	IED BY	: Ansbach,
<b>N</b>						



#### CERTIFICATE OF ANALYSIS

TO: MPH CONSULTING LTD. 301-409 GRANVILLE STREET VANCOUVER. B.C. PROJECT: V 202 TYPE OF ANALYSIS: GEOCHEMICAL

2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

CERTIFICATE#:	85163
INVOICE#:	5279
DATE ENTERED:	JUNE 28, 1985
FILE NAME:	MPH85136
PAGE # :	2
==================	
	No.

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PRE FIX	SAMPLE NAME	PPM Cu	PPM Ag	PPM Zn	
n s	2+00E 4+50N	42	0.2	44	
S .	4+75N	40	0.2	46	
S	5+00N	32	0.4	42	
9	5+25N	114	0.4	46	
្ទុ្ទ	<u>5+50N</u>	82	0.2	52	
S (S	5+75N	64	0.2	60	
S	6+00N	68	0.2	62	
n S	0+255	40	0.2	66	
S	3+00E 0+75N	54	0.2	36	
<u> </u>	<u>1+50N</u>	60	0.2	78	۲۹۹۹ Ա ՀԱԴԱՅԱՆԱԻԱՆԱՅԱՆԱՆՆՆՆԱ ՀԱԱՅՅԱՅԱՆԱՆԱՆԱՅԱՆԱԴԱՅԻՆ ԵՎԱՆԱՅԵՆԸԻՆՆՆՆՆԱՅԱՅԱՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆՆ
s S	1+75N	142	0.2	68	
S	1+100N	26	0.2	34	
S	2+00N	76	0.2	74	
S	2+25N	78	0.2	74	
<u>n s</u>	2+50N	88	0.2	60	
U S	2+75N	62	0.2	50	
G	3+50N	44	0.2	38	
n S	3+75N	62	0.2	62	
) S	4+00N	278	0.2	76	
<u>** S</u>	4+25N	68	0.2	42	
S	4+50N	60	Ö.2	40	
S S	4+75N	102	0.2	60	
S	5+00N	66	0.2	44	
S	5+25N	52	0.2	30	
<u>1</u> S	5+50N	104	0.2	60	
S	4+00E 1+50N	74	0.2	72	
S S	2+75N	50	0.2	48	
S	3+00N	110	0.2	54	
5	5+00E 75N	48	0.2	58	
U S	100N	132	0.8	48	
S	125N	86	0.2	48	
s S	150N	38	0.4	32	
S	6+00E 50N	20	0.4	22	
<b>S</b>	100N	54	0.8	42	

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CERTIFIED BY :



CERTIFICATE OF ANALYSIS

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2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

TO : MPH CONSULTING LTD.	CERTIFICATE#: 85175	
301-409 GRANVILLE STREET	INVOICE#: 5304	
VANCOUVER, B.C.	DATE ENTERED: JULY 9, 1985	
PROJECT: V 202	FILE NAME: MPH85175	
TYPE OF ANALYSIS: GEOCHEMICAL	PAGE # : 1	
		-

PRE	SAMPL	E NAME	PPM Cu	PPM Ag	PPM Zn						
S	L1+OOW	TL 50W	190	0.2	106					 	
S		0+75N	132	0.2	48						
I S		1+00N	90	O.4	46						
9		1 + 25N	232	0.2	74						
S		1+50N	302	0.2	118		 			 	
n s		1+75N	150	0,.2	116						
J S		2+00N	124	0.2	66						
S.		2+25N	86	0.2	74						
s S		2+50N	156	0.2	66						
<u>S</u>	L1+00W	<u>2+75N</u>	142	0.2	54		 			 	<del></del>
S S		3+00N	124	0.2	52						
5		3+25N	92	0.2	<u> </u>						
15		3+50N	98	0.2	58						
		3+/3N	140	0.2	/8						
		4+00N	10	0.2	44		 	*****		 ******	
n P		4+20N	104	V. 2	6 <u>/</u>						
		4+30N 4+75N	84	0.2	70						
- 0 0		47/JN 5.00N	- 70	0.2	70						
no. Mic		STOON STOON	00	0.2	- /						
	F T + 777104	STEDN	170	0.2	7 <u>7</u> /		 			 	
		5+75N	120	0.2	/			÷			
		6+00N	11/1	0.2	74						
n -	1.2+004	2+509	10	0.2	14						
N's	han dia	7+005	254	0".2 0 4	214						
S		0+755	28	0.8	30		 	······································			
ាទ	2	0+508	38	0.6	28						
S		0+255	88	0.2	54						
S		0+00BL	6Ö	0.2	40						
n, S	L2+00W	0+25N	34	0.2	34						
S	ala 1977 - 1977 - 1978 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 19	0+50N	68	0.2	50	*****		****		 	
S		0+75N	230	0.4	80						
S		1+25N	96	0.2	54						
្ដីន		1+50N	76	0,2	44						
<b>S</b>		1+75N	84	0.2	68						
8		2+00N	74	0.2	66				*************************	 	
n S		3+00N	46	0.2	58						
S		3+25N	116	0.2	106						
S		4+25N	104	0.2	116					1	
n S	L2+00W	4+50N	62	0.2	62					//	

CERTIFIED BY :



RO	CERTIFI	ER L	ABC OF	ANAL	ORY YSIS	LTD.	2225 S. SPRINGER AVENU BURNABY, B.C. V5B 3N TEL : (604) 299 - 691
TO :	MPH CONSULT 301-409 G VANCOUVER ECT: V 202 OF ANALYSIS	ING LTD. RANVILLE , B.C.	STRE	ET		CERTIFICATE#: INVOICE#: DATE ENTERED: FILE NAME: PAGE # :	85175 5304 JULY 9, 1985 MPH85175 2
FIX	SAMPL	E NAME	PPM Cu	PPM Ag	PPM Zn		
 S	L2+00W	4+75N	100	0.2	78		
S		5+00N	134	0.2	72		
J S	L3+00E	1+005	34	0.2	28		
5	L4+00W	3+509	102	0.2	82		
		3+008	276	0.2	156		
J 5.		1+005	110	0.2	92		
5		0+505	118	0.2	88		
		0+00BL	110	0.2	64 00		•
0		1±00N	07 07	0.0	84		
- <u> </u>			70 07	0.2	<u>70</u> 64		
7 c		2+00N	104	0.2	79		
G		2+50N		0 2	80		
s		3+00N	210	0.2	82		
<u>,</u> S		3+50N	122	0.2	92		
S	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	4+00N	60	0.8	128	,	·
* s		4+50N	104	0.2	96		
S		5+00N	130	0.2	90		
S		5+50N	72	0.2	54		
S		6+00N	108	0.2	68		
S	L6+00W	5+508	44	0.2	56		
٦.S		5+009	78	0.2	82		
S		4+008	244	0.2	164		
S		3+508	104	0.2	112		
5		3+005	230	0.2	156		
S.		2+509	140	0.2	102		
35		2+008	124	0.2	82 100		
5		1+308	140	0.2	100		
0		14002	104 77	0.2	74		
	ي و و و و و و و و و و و و و و و و و و و	1+50N	00	<u>0.2</u> 0.7	120		
0		17JON 2450N	70 90	0.2	194		
$\int \mathbf{s}$		3+00N	tin sin An An	1.7	186		
Ĵŝ		3+50N	92	0.8	254		
S		4+00N	80	0.2	100		
75	*******	4+50N	64	0.2	102		
S		5+00N	78	0,4	100		
S		5+50N	36	0.2	40		
. 9		6+00N	54	0.6	84		
1 c	1.4+004	4+50N	52	0.2	46		

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2225 S. SPRINGER AVENUE BURNABY, B.C. V5B\_3N1 TEL: (604) 299 - 6910

CERTIFICATE#: 85175

5304

DATE ENTERED: JULY 9, 1985

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FILE NAME: MPH85175

INVOICE#:

PAGE # :

#### CERTIFICATE OF ANALYSIS

TO : MPH CONSULTING LTD. 301-409 GRANVILLE STREET VANCOUVER, B.C. PROJECT: V 202

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UTYPE OF ANALYSIS: GEOCHEMICAL

PRE FIX	SAMPLI	E NAME	PPM Cu	PPM Ag	PPM Zn	
 S	L6+00W	7+00N	60	0.2		
18	L8+00W	5+508	24	0.2	44	
u s		4+505	188	0.6	126	
5		4+005	90	0.2	100	
<u>15</u>		3+505	80	0.4	<u>68</u>	
. 2		34005	04	V. Z	170	
_0 		27008	74	0.2	100	
		1+509	144	0.2	100	
d q		1+005	114	0.2	80	
S		0+505	144	0.2	84	
$\gamma_{\rm S}$		0+081	102	0.2	84	
s		0+50N	122	0.2	74	
S	* . · · ·	1+00N	110	0.2	82	
- S		1+50N	190	0.2	122	
S		2+00N	92	0.2	134	<b></b>
s .		2+50N	128	0.4	192	
S		3+00N	250	0.2	118	
<b>S</b> -		3+50N	44	0.2	72	
j s		4+00N	82	0.2	72	
S		4+50N	84	0.2	72	
<b>1</b> S		5+00N	30	0.2	30	
S		5+50N	44	0.2	42	
S		6+00N	36	0.2	36	
S	L10+00W	4+005	36	0.2	38	
1 S		3+758	52	0.2	46	
JS		3+005	50	0.2	118	
5		2+505	48	0.2	114	
3 B		2+005	48	0.2	118	
		1+508	40	0.2	106	
. D 		1+005	90 - 54	0.2	148	
		0+008	04 24	0.2	110	
		0450N	20 92	0.2	24 44	
 			70	0.2	70	
u P F		1+50N	170	0 2	114	
S		2+00N	94 24	0.2	134	
S S		2+50N	66	1.4	238	
S		3+00N	74	2.2	336	
Πs		3+50N	88	1,4	218	Λ
¥=====						
		•	Í	CERTIE	IED RY	: 1 1/2 shade



#### **PROSSBACHER LABORATORY LTD.** 2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 CERTIFICATE OF ANALYSIS TEL: (604) 299 - 6910 TO : MPH CONSULTING LTD. CERTIFICATE#: 85175 301-409 GRANVILLE STREET INVOICE#: 5304 VANCOUVER. B.C. DATE ENTERED: JULY 9, 1985 PROJECT: V 202 FILE NAME: MPH85175 TYPE OF ANALYSIS: GEOCHEMICAL PAGE # : 4 \*\*\*\*\* \_\_\_\_\_\_\_\_\_\_\_ PRE PPM PPM PPM FIX SAMPLE NAME Αg Cu Zn 1 \_\_\_\_ S L10+00W 4+00N 86 0.8 90 S L10+00W 4+50N 70 1.2 82 S 32 0.8 5+00N 64 S 5+50N 30 72 1.0 72 8509 1.2 94 A 52 8510 1.0 122 \_\_\_\_\_ CERTIFIED BY :



# APPENDIX IV

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# ANALYTICAL PROCEDURES

# MPH

#### ANALYTICAL PROCEDURES

#### Geochemical Analyses

Rock Preparation

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Samples are dried, crushed to minus one-quarter inch, split, and pulverized to minus 100 mesh.

Barium Analysis

A 0.50 gram sample is repeatedly digested with HCl04-HNO3 and HF.

The solution is analyzed by atomic absorption spectroscopy.

Gold Analysis

A 10.0 gram sample is roasted at 550°C and dissolved in Aqua Regia. The resulting solution is subjected to a Methylisobutyl Ketone extraction, which extract is analyzed for gold using atomic absorption spectroscopy.

ICP Analysis

A 0.40 gram sample is digested in Aqua Regia and then diluted to 20 ml. The solution is analyzed by Inductively Coupled Plasma Spectroscopy (ICP).

Whole Rock Analysis

A 0.10 gram sample is fused with Lithium Metaborate, and dissolved in HNO<sub>3</sub>. The solution is analyzed by atomic absorption for SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, MgO, CaO, Na<sub>2</sub>O, K<sub>2</sub>O, TiO<sub>2</sub>, P<sub>2</sub>O<sub>5</sub>, and MnO.



#### Soil and Silt Preparation

Samples are dried, and sifted to minus 80 mesh, through stainless steel, or nylon screens.

Ag Cu Zn Analysis

A 0.5 gram sample is digested for four hours with a 15:85 mixture of Nitric-Perchloric acid.

The resulting extract is analyzed by Atomic Absorption spectroscopy, using background correction where appropriate.

Assays

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Rock Preparation

Samples are dried, crushed to minus one-quarter inch, split, and pulverized to minus 100 mesh.

Gold Wet Assay

A 1 assay ton sample is digested in Aqua Regia to dissolve the Au. The Au is extracted from solution into Methylisobutyl Ketone and analyzed by Atomic Absorption spectroscopy.

Fire Assay

A 0.5-1 assay ton sample is fused with appropriate flux. The resulting lead button is cupelled to obtain a Au-Ag bead which is weighed and then dissolved in HNO3 to separate the Au from Ag. The Au is then weighed to determine its quantity.



## APPENDIX V

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# WHOLE ROCK ANALYSIS EVALUATION





(See following page for rock names.)




### APPENDIX VI

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STATISTICAL ANALYSIS OF SOIL GEOCHEMISTRY



### STATISTICAL REPORT

TO : MPH CONSULTING LTD. 301-409 GRANVILLE STREET VANCOUVER, B.C. ELEMENT & UNIT: Cu PPM

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PROJECT:V 200DATE:JULYFILE:MPH80SAMPLE TYPE:SOIL

V 202 JULY 24,1985 MPH85163/175 SOIL

BURNABY, B.C. V5B 3N1

TEL : (604) 299 - 6910

	CLASS INTERVAL	CLASS FREQUENCY	RELATIVE FREQUENCY%	CUMULATIVE FREQUENCY%	CLASS MEAN
ل ال	0 - 13	4	2.02	2.02	9.00
<b>F</b> 3	14 - 26	7	3,54	5.56	22.86
	27 - 39	16	8.08	13.64	34.00
لحسيا	40 - 52	23	11.62	25.26	46.61
	53 - 65	17	8.59	33.85	59.29
	66 - 78	27	13.64	47.49	72.07
	79 - 91	26	13.13	60.62	84.92
	92 - 104	22	11.11	71.73	99.00
	105 - 117	11	5.56	77.29	111.45
	118 - 130	14	7.07	84.36	125.71
ال ن	131 - 143	9	4.55	88.91	137.56
	144 - 156	6	3.03	91.94	148.33
	157 - 169	1	0.51	92.45	158.00
الحسا	170 - 182	1	0.51	92.96	170.00
	183 - 195	4	2.02	94.98	190.50
E A	196 - 208	0	0.00	94.98	0.00
	209 - 221	1	0.51	95.49	210.00
it	222 - 234	-3	1.52	97.01	230.67
~	235 - 247	1	0.51	97.52	244.00
1	248 - 260	2	1.01	98.53	252.00
أهر خ	261 - 273	O	0.00	98.53	0.00
	274 - 286	2	1.01	99.54	277.00
e a l	287 - 299	O	0.00	99.54	0.00
	300 - 312	1	0.51	100.00	302.00

	NUMBER OF SAMPLES:	198	
2	ARITHMETIC MEAN :	90.21	
à	STANDARD DEVIATION :	53.37	
	MINIMUM VALUE :	0.00	
	MAXIMUM VALUE :	302.00	
	DETECTION LIMIT :	1.00	PPM









2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

#### STATISTICAL REPORT

To: MPH CONSULTING LTD. 301-409 GRANVILLE ST. VANCOUVER.B.C. Project: Date:

Sample Type: Soil

V202 AUGUST 27,1985

Element: Ag

No.

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	CLASS INTERVAL	CLASS FREQUENCY	RELATIVE FREQUENCY%	CUMULATIVE FREQUENCY%	CLASS MEAN
n	0.0 - 0.2	148	71.84	71.84	0.20
an in	0.3 - 0.4	27	13.11	84.95	0.40
	0.5 - 0.6	15	7.28	92.23	0.60
(Car	0.7 - 0.8	8	3.88	96.11	0.80
	0.9 - 1.0	2	0.97	97.08	1.00
, i	1.1 - 1.2		1.46	98.54	1.20
	1.3 - 1.4		0.97	99.51	1.40
	1.5 - 1.6	о <sup>с</sup>	0.00	99.51	0.00
	1.7 - 1.8	0	0.00	99.51	0.00
. التي	1.9 - 2.0	0	0.00	99.51	0.00
-	2.1 - 2.2	<b>1</b> .	0.49	100.00	2.20
		For Statis	tics	For All Data	

1	Number of Samples:			206						206	
j	Arithmetic Mean :			.32						N.A.	
	Standard Deviation	:		. 27						N.A.	
-	Minimum Value :			.2						.2	
	Maximum Value :			2.2						2.2	
الخد	Range :		. 2	 999	999	PPM	1		.2 -	2.2	PPM

#### File(s) used for Statistics:

MPH85082

MPH85163.A

MPH85175





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### STATISTICAL REPORT

2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910

TO : MPH CONSULTING LTD.		PROJECT:	V 202
301-409 GRANVILLE	STREET	DATE:	JULY 24, 1985
VANCOUVER, B.C.		FILE:	MPH 85163/175
ELEMENT & UNIT: Zn	PPM	SAMPLE TYPE:	SOIL

	CLASS INTERVAL	CLASS FREQUENCY	RELATIVE FREQUENCY%	CUMULATIVE FREQUENCY%	CLASS MEAN	
<u> </u>	0 15		1.52	1.52	12.67	
F	16 - 30	10	5.05	6.57	25.80	
	31 - 45	23	11.62	18.19	39.83	
فحسنه	46 - 60	35	17.68	35.87	52.91	
	61 - 75	46	23.23	59.10	69.28	
	76 - 90	29	14.65	73.75	82.07	
	91 - 105	15	7.58	81.33	98.27	
	106 - 120	14	7.07	88.40	114.14	
	121 - 135	8	4.04	92.44	127.50	
the second s	136 - 150	3	1.52	93.96	143.33	
	151 - 165	4	2.02	95.98	159.00	
-	166 - 180	• • • • • • • • • • • • • • • • • • •	0.00	95.98	0.00	
	181 - 195	$\mathbf{z} = \mathbf{z}$	1.01	96.99	189.00	
1	196 - 210	1	0.51	97.50	196.00	
	211 - 225	2	1.01	98.51	217.00	
	226 - 240	<b>1</b> , $1$ , $1$ , $1$	0.51	99.02	238.00	
1.1.1	241 - 255	1	0.51	99.53	254.00	
S., 3	256 - 270	$\mathbf{O}$	0.00	99.53	0.00	
<i>~</i> 3	271 - 285	0	0.00	99.53	0.00	
	286 - 300	o de la companya de la	0.00	99.53	0.00	
	301 - 315	0	0.00	99.53	0.00	
	316 - 330	• • • • • • • • • • • • • • • • • • •	0.00	99.53	0.00	
	331 - 345	$\mathbf{I}_{\mathbf{r}} = \mathbf{I}_{\mathbf{r}} + \mathbf{I}_{\mathbf{r}}$	0.51	100.00	336.00	

	NUMBER OF SAMPLES:	198	
p a	ARITHMETIC MEAN :	78.91	
	STANDARD DEVIATION :	44.28	
	MINIMUM VALUE :	0.00	
	MAXIMUM VALUE :	336.00	
	DETECTION LIMIT :	1.00	PPM



### STATISTICAL REPORT

٥ro : MPH CONSULTING LTD. 301-409 GRANVILLE STREET VANCOUVER, B.C. ELEMENT & UNIT: Zn PPM

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PROJECT	:
DATE:	
FILE:	
SAMPLE	TYPE

V 202 JULY 24, 1985 MPH 85163/175

SOIL

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2225 S. SPRINGER AVENUE BURNABY, B.C. V5B 3N1 TEL : (604) 299 - 6910







## APPENDIX VII

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ABBREVIATIONS USED IN MINERAL OCCURRENCES REFERENCES



## Abbreviations Used in Mineral Occurrences References

. M

AR	B.C. Ministry of Energy, Mines, and Petroleum Resources Assessment Report
BCDM	British Columbia Department of Mines
Bull	Bulletin
EBC	Exploration in British Columbia; B.C. Ministry of Energy, Mines and Petroleum Resources
GCNL	George Cross Newsletter
GEM	Geology, Exploration and Mining in British Columbia; B.C. Department of Mines and Petroleum Resources
GSC	Geological Survey of Canada
Gunnex	Mineral Occurrences, E&N Land Grant, Vancouver Island, B.C.; Gunnex Ltd., 1966
Minfile	B.C. Ministry of Energy, Mines and Petroleum Resources Minfile, Feb. 2, 1984
MMAR	B.C. Ministry of Mines Annual Report
P	Paper



	LEGEND
	GEOLOGY
JURAS	SIC
LO 3	WER TO MIDDLE JURASSIC
	3c Feldspar Porphyry to Hornblende — Feldspar Porphyry ± minor quartz.
TRIASS MI	DDLE ? AND UPPER TRIASSIC
2 VA	NCOUVER GROUP Limestone,-massive,grey to black,abundant carbonate veinlets; as interbeds in Karmutsen Formation basalt.
1	Karmutsen Formation — Basalt,minor tuff; green to dark green,aphanitic to fine grained,occasionally amygdaloidal; generally carbonatized.
۱a	Dacite — Rhyolite sill or dyke — white to buff, aphanitic to feldspar porphyritic.
	SYMBOLS
	Claim boundary (approximate)
	Geological contact (approximate)
	Area of outcrop
x	Small outcrop
m?m	? Fault (approximate, assumed)
S <sub>0</sub>	Strike and dip of bedding (tops not indicated)
S₁ ← → S₁	Strike and dip of foliation, cleavage (inclined, vertical)
<u>80°</u>	Strike and dip of jointir.g
40°	Strike and dip of quartz veining
8510	Silt sample, location and number
8776	Rock sample, location and number
85C0-2	Rock sample, location and number, whole rock analysis
•	Mineral occurrence
	- Old railroad
1	Soll sampling grid
ру	Pyrite
Ср	Chalcopyrite
bo	Bornite
qv	Quartz vein
mal	Malachite ASSESSMENT REPORT
	T.E. Gregory Hawkins T.E. Gregory Hawkins Data of the formula of
	TO TO PRACTICATION OF THE STATE
	GOLDENROD RESOURCES AND TECHNOLOGY INC.
	GEOLOGY OF CANON GROUP ALBERNI MINING DIVISION
	Project No: V 2.02 By: N. 0. W.   Scale: L: 5.000 Drawn: L.S.
	Drawing No: 5 Date: JULY, 1985.
	MPH MPH Consulting Limited





LEGEND

Grid line with soil sample stations. 14 NS

Cu Soil geochemical values in ppm. Ag Zn No sample Showing Approximate property boundary.

GEOCHEMICAL CONTOURS

	Cu (	A g (•••••) ppm	Zn (- ppm
anomalous	145	0-52	125
very anomalous	191	0.78	163
extremely anomalous	234	I · 04	195

- - - - - )

Topographic contour interval 40 metres.

