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GEOLOGY AND MINERALIZATION OF THE DOVE PROPERTY AND AREA NEAR MOUNT WASHINGTON VANCOUVER ISLAND, B. C.

CLAIMS: Ideal 1 through Ideal 9

LOCATION: N.T.S. 92F/11E and 92F/14E
49° 45' N latitude
125° 13' W longitude
12 to 23 kms NW of Courtenay
Vancouver Island, B. C.

OWNER OF CLAIMS: Joseph Paquet
1425 North Island Highway
Campbell River, B. C.

OPERATOR OF CLAIMS: Westmin Resources Limited
904 - 1055 Dunsmuir Street
Vancouver, B. C.

REPORT BY: Gary Benvenuto
Geologic Consultant
for:
Westmin Resources Limited

December 1986

GEOLOGICAL BRANCH
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SUMMARY AND RECOMMENDATIONS

Introduction

The Dove property consists of 132 claim-units in the Ideal 1 through 9 claims staked by Joseph Paquet under an option agreement with Westmin Resources Limited in 1986, to explore for gold mineralization. The claims appear to encompass a somewhat similar structural - lithologic setting as that at Mount Washington a few kilometers to the west, where there are four main deposits of gold currently being explored.

The Dove property is 12 to 23 air-kilometers northwest of Courtenay, located on central, northeastern coast of Vancouver Island, B. C. It covers the gently, northeast to east sloping, lower flanks of Mount Washington, which have an extensive blanket of glacial till. There is an extensive network of primary and secondary logging roads, many of which are passable.

Geology

The property is underlain predominantly by basaltic flows, pillow breccias and glass-shard hyaloclastites of the Triassic Karmutsen Formation. In the southeastern part of the property, the basalts are unconformably onlapped from the northeast by gently northeast-dipping sandstones and siltstones with thin intervals of argillite, shale and coal, of the upper Cretaceous Comox Formation. In the Murex Creek basin, conglomerates of the Comox Formation overlie the basalts. In the northeast corner of the Ideal 4 claim, an area of at least 0.4 x 1 km is underlain by poorly exposed meta-quartzo-feldspathic sandstone?, meta-argillaceous siltstone and meta-argillite which are locally pyritic. These rocks may have been in the footwall of the now-eroded southwesterly extension of the Constitution Hill Tertiary sill.

The Dove property is located between two major Tertiary intrusive bodies of seriate porphyritic (feldspar, hornblende, quartz) dacite to quartz diorite. The southeast part of the property covers a portion of the southwest arm of the U-shaped Constitution Hill sill within the Comox Formation, about 100 m above its unconformity with the Karmutsen Formation. On Mount Washington, 1 to 4 kms west of the property, the Tertiary intrusive centre comprises a complex series of stocks and dykes in the Karmutsen Formation, and gently dipping sills in the overlying Comox Formation. Steep-sided intrusive bodies locally have marginal diatreme or collapse(?) breccias. The western Ideal 4 claim covers the easternmost part of a 350 m wide lens? of Tertiary intrusive flanked by the Murex intrusive breccia. Twelve Tertiary quartz diorite dykes, 0.9-28 m wide, were located on the property. Most occur in the Karmutsen Formation at or about 100 to 500 m from the unconformity with the Comox Formation.

The property is 3 kms east of the Mount Washington copper mine which produced 396,100 tons of ore, between 1965 an 1967, from two open pits, grading 1.16% Cu, 0.01 oz Au/t and 0.5 oz Ag/t. The ore consisted of a flat-lying, 1.5 m (to 6.1 m) thick, complex, sheeted quartz vein structure with chalcopyrite, bornite, arsenopyrite, pyrite, sphalerite and minor tetrahedrite. The vein occurs within a series of quartz diorite sills with a few intersill intervals of argillite of the Comox Formation, and is underlain by extensive, low-grade (0.1-0.5%) copper mineralization. The Meadows zone (Lakeview/West grid area), 500-600 m west of the open pits is being actively explored by Better Resources Ltd. It comprises a shallow, 3 to 5.8 m thick, gently west-dipping zone of vuggy quartz veins with pyrite and arsenopyrite in a succession of siltstone, quartzite and argillite of the Comox Formation, locally with quartz diorite sills. The zone contains up to 0.352 oz Au/t and 1.0 oz Ag/t over 5.4 m. It lies on the westerly dip projection of the open pit area mineralization. The Murray vein (Domineer zone) is about 350 m southeast of, and on strike with the open pit mineralization. It comprises a tabular zone, dipping 10 to 40° west, of sericite-quartz-clay-altered Tertiary intrusive breccia with a stockwork of quartz veins with pods and lenses of pyrite, arsenopyrite, chalcopyrite and minor sphalerite, realgar and molybdenite. This zone contains an average of 0.8% Cu, 0.5% Pb, 0.5% Zn, 3.4 oz Ag/t and 0.46 oz Au/t over 0.6 m. The Murex breccia, 1 to 2 kms west of the Dove property, is currently being drilled by Better Resources Ltd. This summer, they intersected 15.9 m with 0.174 oz Au/t in the breccia.

Property Mineralization

The most important occurrence of gold mineralization was discovered by Joseph Paquet in 1986, along Murex Creek in the south-central Ideal 3 claim. It comprises a 1 to 8 cm thick, gently (10°) northwest-dipping shear zone in conglomerate of the Comox Formation, about 1 m above its unconformity with the Karmutsen Formation. The shear zone contains quartz + calcite veinlets to 1.5 cm, to locally 4 cm thick, with pyrite, sphalerite, galena? and chalcopyrite. A composite of grab samples of the veinlets, where 1 to 3 cm thick, contained 0.288 oz Au/t, 24.6 ppm Ag (0.7 oz/t), with about 0.05% Cu, 0.8% Pb, 1.2% Zn and 0.4% As. This occurrence somewhat resembles the gold showing at the road quarry in the Lupis 1 claim, 2.3 kms to the southeast. These two showings and the gold-bearing quartz vein structures on Mount Washington, indicate that gently dipping structures at or near the Comox Formation/Karmutsen Formation unconformity are important in localizing gold mineralization and represent a major type of exploration target on the property.

Three occurrences of realgar + arsenopyrite (+ stibnite?) bearing carbonate veins in the Karmutsen Formation, within and proximate to the Dove property, suggest that east-westerly striking shear-fracture-ankerite? alteration zones, within which these veins occur, may have potential for hosting gold mineralization. There is a close association between arsenopyrite and gold at all of the major occurrences of gold in the area. The three occurrences are: 1) McKay Creek, in the east-central Ideal 5 claim, of two calcite veins, 18 and 70 cm thick, with realgar, arsenopyrite? and/or stibnite?; 2) Wolf Creek, in the Wolf claim, of calcite veins and lenses to 1.8 m thick, with lenses of massive realgar to 0.23 x 1.2 m; and 3) 'Paquet' Creek in Ideal 2 claim near the contact with Tertiary quartz diorite, of a 35 cm thick shear zone with realgar-carbonate veinlets and a 1.5 cm thick, massive realgar veinlet. Moderately to steeply, southerly dipping, ankerite? alteration - shear zones may constitute a second type of exploration target for gold mineralization.

Mesoscopic Structural and Aerial Photograph Lineament Analysis

An analysis of 177 joints, shear zones, veinlets and dykes measured on the Dove property, show they have a wide, complex diversity of orientations. Joints, and shear zones and veinlets which tend to form along joints, considered as a whole, can be grouped into 15 sets on the basis of their orientation.

Analysis of 591, aerial photograph lineaments on and near the property, and 118 lineaments on Mount Washington in the open pit area, show a similar diversity of trends. These fall into at least eleven main sets, which have been correlated with the sets of mesoscopic structures. Sixteen percent of the lineaments have trends from 270 to 289°, sub-parallel to the realgar-carbonate veins in ankerite? alteration-shear zones in the area, and which may also constitute favourable zones for gold mineralization. The lineaments of this set have a widely scattered distribution. An airborne EM survey may be successful in identifying conductive structures associated with lineaments in this set, that warrant exploration for gold.

A somewhat distinctive pattern of lineaments occurs in the open pit area on Mount Washington. The area with the most similar pattern of lineaments associated with the contact between the Comox Formation and Tertiary intrusives, is located in the northeast corner of the Ideal 4 claim and west-central Wolfjack claim.

RECOMMENDATIONS

The following is a list of four, general recommendations for further exploration surveys on the Dove property. They are based on the results of my reconnaissance geologic mapping and prospecting on the property and a review of descriptions of the nature of gold mineralization on Mount Washington.

1. Conduct I.P.-resistivity and magnetometer surveys around the Murex Creek gold showing in the Ideal 9 claim to trace the mineralized shear zone along its shallow dip and strike projections. Then test the projections with a minimum of two to four, short diamond drill holes to determine if the mineralized shear is thicker at depth or along strike.

2. Conduct I.P.-resistivity and magnetometer surveys in the northern Ideal 4 claim, to test conductive rocks and structures in the swampy, gently sloping, till cover area (about 1 x 2 kms) around the tailings pond. This area appears to be underlain by sedimentary rocks of the Comox Formation, including pyritic meta-quartzo-feldspathic sandstones? and meta-argillaceous sandstones that may have undergove contact metamorphism. These rocks might have been in the footwall of a now-eroded southwest extension of the Constitution Hill Tertiary sill?, that is in contact with these rocks to the northeast. The gold-bearing vein structure mined on Mount Washington is located near the footwall of a series of Tertiary sills. Test any conductive zones by trenching where feasible, or with a diamond drill.

3. Conduct soil sampling (Au, Ag, Cu, Pb, Zn, As, and Sb), I.P.-resistivity and magnetometer surveys over the overburden-covered Comox Formation, immediately northeast of its contact with the southwestern arm of the Constitution Hill sill, in the northeast corner of Ideal 4 claim.

4. Conduct an airborne EM (Dighem or ?) and magnetometer survey over all of the property, along a grid with closely spaced lines (100 m), trending north-south. The purpose of this survey is to determine whether there are east-westerly trending, conductive structural zones, parallel to the realgar-carbonate vein, shear zones in McKay and 'Paquet' creeks, particularly in the areas of extensive cover of glacial till and areas underlain by the Comox Formation.
I.P.-resistivity and magnetometer surveys should be conducted over any airborne geophysical anomalies (especially those conductive zones associated with a linear, magnetic "high" or "low").

INTRODUCTION

Location and Access

The Dove property is located in the Nanaimo Mining Division, 12 to 23 air kilometers northwest of Courtenay, situated midway along the northeastern coast of Vancouver Island, B. C. (Figure 1).

The property is reached from Courtenay via the paved Duncan Bay Main logging haulage road to the Tsolum Main road (which leads to the road to the Mount Washington ski hill), for access to the southern part of the property, or to the Rossiter Main road, for access to the northern part (Figure 2). The older logging road, #101, passes through the property, connecting the Tsolum and Rossiter Main roads. There is a complex network of old logging roads within the property, but many of these are impassable because of washouts.

Physiography

The property is located on the coastal lowlands between Mount Washington, which rises to 1590 m, 4 kms west of the property, and Constitution Hill, rising to 580 m, 3 kms to the east. The property spans the area from 1 km north of McKay Creek, to the north, to 2 kms south of Dove Creek, to the south, and is about 1 km southwest of Wolf Lake.

Most of the property is characterized by gentle, northeasterly to easterly facing slopes, with overall gradients of 3 to 7°, but locally with steeper slopes of 12 to 30°. Elevations in the north part of the property range from 520 m in the west to 150 m in the east; in the south part they range from 915 m in the west to 425 m in the east.

Glacial till forms extensive cover over bedrock over most of the property. The areas of low relief commonly contain swamps, ponds and small lakes. Exposures of bedrock are common only in the Ideal 3 claim and in all the major creeks traversing the property. Elsewhere they are generally widely scattered, have low relief and appear glaciated with glacial striations that have an average trend of 100°.

Second and third stage forest growth covers all of the property. Trees may range in age from 10 to 30 years, and consist of Douglas fir, cedar, hemlock and balsam. Alder, cottonwood and maples grow in some of the creek valleys and along old logging roads. Undergrowth is generally thick, comprising huckleberry, salal and willow.

Summary of 1986 Work Program

Geologic mapping, rock sampling and prospecting were carried out on the Dove property, by myself, between October 3 and 19, 1986, for a total of 17 field days. The purpose of this preliminary, reconnaissance-scale work was to determine the overall distribution of the various lithologic units on the property, prospect for gold, and attempt to locate structures and alteration zones favourable to gold mineralization. On this basis, a program for further exploration of specific areas and structures has been recommended.

A total of 15.5 kms were traversed along creek beds, which generally provide mostly accessible exposures of bedrock that are nearly continuous where the creeks have gradients of about 3° or more, but lacking where the gradient is less.

CLAIMS INFORMATION

Dove property (92 F/11 and 92 F/14; Nanaimo Mining Division)

The Dove property consists of 132 claim-units contained within the Ideal 1 through 9 claims (Figure 3), staked and owned by Joseph Paquet of 1425 North Island Highway, Campbell River, B.C. V9Z 2E4. The Ideal claims were staked under an option agreement with Westmin Resources Limited in 1986.

The information on the IDEAL claims is as follows:

IDEAL 1	record #2388(6), recorded: June 2, 1986 due: June 2, 1987, 16 units
IDEAL 2	record #2389(6), recorded: June 3, 1986 due: June 3, 1987, 20 units
IDEAL 3	record #2390(6), recorded: June 3, 1986 due: June 3, 1987, 20 units
IDEAL 4	record #2391(6), recorded: June 3, 1986 due: June 3, 1987, 20 units
IDEAL 5	record #2392(6), recorded: June 3, 1986 due: June 3, 1987, 9 units
IDEAL 6	record #2393(6), recorded: June 4, 1986 due: June 4, 1987, 9 units
IDEAL 7	record #2411(6), recorded: June 13, 1986 due: June 13, 1987, 6 units
IDEAL 8	record #2454(7), recorded: July 29, 1986 due: July 29, 1987, 20 units
IDEAL 9	record #2440(7), recorded: July 29, 1986 due: July 29, 1987, 12 units

Claims Adjoining Dove Property to East

The following information was compiled by Richard Walker on the claims that adjoin the Dove property along its east side:

Lupus 1 [1656(2)], Lupus 3 [1668(3)], Lupus 4 [2046(2)]: staked by Carl G. Verley, recorded on February 28, 1984, March 13, 1984?, and February 21, 1985, respectively. The Lupus 3 claim is a 4W x 2S unit claim that is located between the Ideal 1 and 7 claims. The Lupus claims are owned by Proquest Resource Corp. but under option to Better Resources Ltd.

Wolf [1296(11)]: staked by Peter Peto, recorded on January 24, 1983. The claim was sold to St. James Minerals Ltd. of 715-475 Howe Street, Vancouver, on March 20, 1986.

Wolfjack: recorded on March 11, 1986, owned by Marek Nowak, of 234-1021 Howay Street, New Westminster, B. C.

Anderson 1 [2292(3)]: recorded on March 10, 1986; staked and owned by Noel F. Williams of Piercy Road RR4, Courtenay, B. C. V9N 7J3. This claim adjoins the southwest corner of the Ideal 3 claim to the south.

HISTORY OF EXPLORATION AND DEVELOPMENT ON MOUNT WASHINGTON AND AREA

This summary of exploration in the Mount Washington area is based on a review of a variety of reports, including company reports, reports in the property files in Victoria, assessment reports, and news releases.

1940: O. M. and R. D. McKay discovered and staked several gold-bearing veins on the central and western arms of Mount Washington.

1940: D. F. Kidd trenched the Murray vein, 650 m southwest of McKay Lake (Figure 4). The vein is about 0.9 m thick, and consists of a sericitized and silicified zone with erratic, sulphide pods of pyrite, arsenopyrite, chalcopyrite and minor sphalerite. It contains an average of 0.403 oz Au/t and 6.77 oz Ag/t over 0.94 m.

1944-45: "Springer interests" excavated additional trenches across, and drove a short adit into the Murray vein.

1956: Mt. Washington Copper Co. Ltd., excavated trenches and drilled 152 m in the lower Murex basin.

1965-67: Mt. Washington Copper Co., Ltd. developed their property and produced 396,095 tons of ore from two open pits (see Figure 4), with a grade of 1.16% Cu, 0.01 oz Au/t, and 0.5 oz Ag/t.

1967-69: Mt. Washington Copper conducted geological mapping, soil sampling, and EM and I.P.-resistivity surveys on the Litchie claims south of Anderson Lake. These claims are now covered by the southeast corner of the Ideal 3, northwest corner of the Ideal 2, and Anderson 1 claims. In 1969, one diamond drill hole, 30.8 m deep, was collared about 1.15 kms southwest of Anderson Lake, to test a steep-dipping shear zone with chalcopyrite. No mineralization was encountered in the drill hole.

<u>1968-69</u>: Marietta Resources Co. Ltd., under a lease agreement with Mt. Washington Copper Co., conducted geological mapping, geophysical (magnetometer - ground and airborne, and I.P.-resistivity) and soil sampling (2134 samples) surveys over an area 4.3 x 7.4 kms, centred on the Murex Breccia. In 1969, they drilled 15 holes, totalling 2005 m in length, to test geophysical anomalies, surface mineralization and geologic models. No significant mineralization was intersected in holes testing geophysical anomalies. Those testing depth projections of surface mineralization intersected sub-economic grades of copper. Four of the holes were in the Murex Creek - tailings pond area, just inside the west-central part of the Dove property (see Figure 4). These are as follows:

<u>DDH 69/3</u>: to test an I.P. anomaly; 305 m long, -70°S; intersected Karmutsen Formation with chalcopyrite in fractures.

<u>69/4</u>: to test part of a large airbourne and ground survey magnetic anomaly; 305 m long, -70°/026°; intersected Karmutsen Formation with chalcopyrite in fractures and veinlets.

<u>69/5</u>: to test an I.P. anomaly; 150 m long, -90°; intersected Karmutsen Formation.

<u>69/7</u>: to test part of a large airborne and ground survey magnetic anomaly; 305 m, long, -90°; intersected Tertiary quartz diorite with disseminated and fracture-bound sulphides.

The remainder of the drill holes were collared on or near Tsolum Main road at Murex Creek (southwest, main fork) and 0.8 to 1.2 kms northwest of Murex Creek. No assays for gold are shown in the summary drill logs.

1969: Marietta Resources relinquished their lease on the property, and title reverted to Mt. Washington Copper Co.

1972-75: Esso Minerals Ltd. optioned the Mount Washington property and conducted geologic mapping, an I.P. survey (12.1 km of grid line), geochemical soil, silt and water surveys 5000? samples along 241 kms of grid line), and drilled 7 holes, totalling 857 m in length. Five holes were drilled to test the Meadows zone west of the open pits (see Figure 4): the holes were 25.6 to 40.2 m long, 22.9 m to 45.7 m apart, and tested 158.5 m of strike-length of the zone. The core was not assayed for gold.

1978: Esso Minerals conducted a heap-leaching test of low-grade, copper bearing rock after outlining about 0.5 to 1 million tons grading about 0.5% Cu.

1979: Veerman-Botel Ltd. (of Vancouver) obtained the precious metal rights on part of the Mount Washington property.

1982: Esso Minerals dropped their option on the Mount Washington property.

1983: Better Resources Ltd. optioned the precious metal rights on part of Mount Washington, from Veerman-Botel Ltd.

1984: Better Resources drilled about 15 short holes in the Meadows zone. Most of these drill holes intersected the gold-bearing vein structure, but gold concentrations were variable and not very encouraging.

1983-84: Placer Development Ltd. conducted very small-scale silt sampling (7 panned concentrates and 12 bulk samples) and soil sampling (10 samples) surveys on the MG claim (now the Wolfjack claim), along three creeks, and in the southwest part of the claim, respectively. Anomalous gold (170 to 430 ppb) was detected in two silt samples from 'Paquet' Creek and two samples from the creek 0.75 km to the southeast of 'Paquet' Creek. Ten soil samples were collected along a line centred on a float cobble of arkosic sandstone with a 3-6 mm thick, chalcopyrite-arsenopyrite-quartz veinlet (containing 860 ppb Au, 123.5 ppm Ag, and 1.3% As). No anomalous soil samples were collected.

<u>1986</u>: Better Resources excavated trenches and drilled 14 holes through the Lakeview/West grid area (i.e. Meadows zone). The holes were collared along three lines, at 45.7 to 61 m centres, in an area of 107 x 229 m. In addition, they are conducting a drill program in the Murex breccia, 3.6 kms to the east of the Meadows zone. The results of the drill program are summarized in the section on economic geology of Mount Washington.

REGIONAL GEOLOGY

In the Mount Washington - Constitution Hill area, Triassic basaltic rocks of the Karmutsen Formation are unconformably overlain by upper Cretaceous, sedimentary rocks of the Comox Formation of the Nanaimo Group. The Karmutsen and Comox Formations, at and proximate to the unconformity between them, are intruded by a complex series of bodies of Tertiary intrusive rocks (Figure 4). These rocks have been affected by Tertiary faulting, the nature of which is poorly understood.

The Karmutsen Formation comprises a complexly interlayered succession of thick, massive, basaltic flows, locally pillowed flows, broken and whole pillow breccias, glass shard hyaloclastites, and minor? agglomeratic lapilli tuff.

The Comox Formation is generally, gently (5 to 15°) northeasterly dipping in the Constitution Hill area, but gently (8 to 10°) southerly to westerly dipping in the Mount Washington area. The Formation comprises a locally developed basal conglomerate and thick sections of bedded, feldspathic sandstones and siltstones with thin intervals of argillite, carbonaceous shales and coal. On Mount Washington the Comox Formation is up to 275 m thick (Carson, 1960).

A Tertiary quartz diorite stock in the McKay Lake - McKay Creek area has a K-Ar date of 35 $\pm$ 6 my (Carson, 1972). The Tertiary intrusives form relatively restricted stocks and dykes in the Karmutsen Formation, but form sills, tongue-shaped loccoliths and irregular bodies, as well as dykes in the overlying Comox Formation. On Mount Washington there are also two main bodies of Tertiary diatreme to collapse, intrusive breccias.

The Tertiary intrusives comprise feldspar, hornblende (and locally quartz) porphyritic dacite that grades through seriate porphyry into fine to medium grained quartz diorite. The dacite porphyry typically is light grey and contains abundant oligoclase to labradorite phenocrysts to 9 mm but averaging 1-2 mm long, and abundant hornblende phenocrysts. Quartz phenocrysts are locally present; biotite and potash-feldspar are not uncommon. The matrix consists of fine grained quartz, plagioclase and hornblende (Carson, 1972).

At Constitution Hill, located 1 to 2 kms east of the Dove property, dacitic seriate porphyry to quartz diorite forms a northeast-trending, bulbous laccolith (Carson, 1972) that intrudes the gently northeast-dipping Comox Formation. The laccolith? appears U-shaped because? a window of Comox Formation underlying the intrusive is exposed just southwest of Wolf Lake, The laccolith is about 3.5 to 5.5 kms wide, 10 kms long and up to at least 490 m thick. Carson (1972) concluded that this body of intrusive is laccolithic because of the presence of the Comox Formation in a creek valley 2.5 kms southeast of Constitution Hill, which he concluded overlies the intrusive. However, an air photograph interpretation of this area suggests an alternative explanation: the Comox Formatin may underlie the intrusive in the hanging wall of a east-west trending, inferred, reverse fault that has uplifted the Comox Formation and intrusive south of the fault.

At Mount Washington, 4 kms west of the Dove property, Carson (1972) shows the complex series of Tertiary intrusives as comprising a steep-dipping, 1 x 2 km stock intruding the Karmutsen Formation in the McKay Lake area, with marginal breccias, and largely concordant sills or laccoliths, 6 to 46 m thick, intruding the gently dipping Comox Formation sedimentary rocks southwest of the stock. The Murray diatreme breccia occurs near the southwestern margin of the stock, about 0.5 - 1.2 kms northwest of the top of Mount Washington. It is oval-shaped in plan-view, with surface dimension of 240 x 760 m, and pipe-shaped in cross-section, extending at least 215 m to depth. A similar-appearing breccia occurs within the Karmutsen Formation, in the Murex Creek - old mill site area. Here, the breccia appears to form a gently dipping lens (Carson, 1962), up to 350 m wide, flanking an east-southeast trending body of seriate porphyritic dacite about 3 kms. long. The Murray and Murex breccias consist of angular and rounded fragments of dacite porphyry, Comox Formation sandstone, siltstone, and shale and rare volcanics of the Karmutsen Formation, and broken and unbroken crystals of plagioclase, quartz and hornblende in a comminuted matrix (50%) of similar, but much finer grained material with biotite, epidote, sericite, chlorite, hematite, magnetite, pyrite, pyrrhotite, minor molybdenum, chalcopyrite, covellite, bornite and sphene (Carson, 1960). The breccias commonly are crudely layered and resemble conglomerates. In addition, there are collapse? breccias (the Washington breccia) that have sharp, near vertical contacts with the older Murray breccia to the west, but have an indistinct, possibly gradational contact with the brecciated western border of the main stock to the east. The Washington breccia consists of closely packed, slab-like, angular, bleached sedimentary rocks of the Comox Formation highly altered to clay minerals or pale chlorite, and dacite porphyry fragments that are equant and in part rounded. The matrix is dark bluish grey and highly magnetic. Spaces between fragments are commonly filled with a green amphibole. Magnetite replaces the finer material of the matrix and fringes of the fragments, and occurs as small veinlets. Fractures cutting the breccia commonly contain chalcopyrite and malachite (Carson, 1960).

There were several pulses of Tertiary intrusion at Mount Washington because the main porphyry sills there are cut by similar, but fresher appearing porphyries (Carson, 1972).

Contact metamorphism is visible for less than 3 m beyond the main Tertiary stock on Mount Washington. Dykes and sills emanating from the stock apparently little affected host rocks. Contact metamorphic effects include recrystallization of the argillaceous matrix of sandstones of the Comox Formation to biotite and chlorite. In McKay Creek, the Karmutsen basalt contain up to 20% magnetite over a width of 4.6 m, adjacent to the main stock (Carson, 1960).

Quartz-sericite-biotite-chlorite alteration occurs along gently dipping zones of strongly fractured or brecciated rocks, containing flat-lying sheet-like or irregular-shaped bodies of white quartz containing gold and sulphides (the Murray Vein and Meadows zone on Mount Washington). However, only quartz-sericite alteration shows a close genetic relationship to gold-copper mineralization in the Mount Washington area. Most of the sheared and brecciated rocks in fault zones in the Mount Washington area are silicified (Carson, 1960).

PROPERTY GEOLOGY

Introduction

The Dove property spans a large portion of the area between the Tertiary intrusive centre at Mount Washington, to the west, and the large intrusive body in the Constitution Hill area. The property is underlain by basaltic rocks of the Karmutsen Formation which is unconformably onlapped, from the east, by sedimentary rocks of the Comox Formation. The southeastern part of the property covers a portion of the southwestern flank of the Constitution Hill intrusive body.

The detailed distribution of the rocks underlying the property is poorly constrained because most of the exposures of bedrock in areas of low topographic relief occur within the six main creeks that cut through extensive areas of glacial till. Geologic contacts exposed in creeks have been extrapolated through areas of overburden on the basis of air photograph interpretation.

The nature of structures involving rocks on the property is poorly understood due to the paucity of layering and marker units in the Karmutsen Formation, the extensive blankets of glacial till and unexposed contacts between the various lithologic units. Overall, it appears that the Comox Formation is gently (10-15°) northwest-dipping and unconformably overlying the Karmutsen Formation with an unknown internal structure. The Constitution Hill Tertiary intrusive appears to form a thick, gently northeast dipping (40°) sill or laccolith intruding the Comox Formation, very approximately 100 m above the unconformity between the Comox and Karmutsen Formations. However, in the southeastern part of the property, in the area of 'Pacquet' Creek, the Constitution Hill intrusive appears to have a steeply to moderately, easterly dipping contact with the Karmutsen Formation.

Lithology

Detailed observations on the various lithologies exposed on the property were not made during my reconnaissance-scale mapping and prospecting. The descriptions below may or may not characterize the overall lithologies.

Karmutsen Formation

The Karmutsen Formation consists of thick, basaltic flows with intervals of pillowed basalt, basaltic flow or pillow breccia, agglomeratic lapilli tuff, and massive hyaloclastite.

Basaltic flows are very dark grey to medium to dark grey-green to dark (blue-green-) grey-brown on a fresh surface. The basalt is variably, amygdaloidal, feldspar to feldspar-mafic porphyritic and microporphyritic, and very finely to very, very finely crystalline to metavitric. Locally, the basalt comprises finely crystalline feldspar, hornblende and pyroxene (?). The basalt is commonly moderately to strongly magnetic, but locally weakly to non-magnetic. The prominent, positive airborne magnetic anomaly between the tailings pond and the old mill site (about 2.5 x 3.5 kms in area) appears to reflect the presence of an extensive unit of very strongly magnetic basalt. Amygdules are filled with either epidote, quartz, chlorite or various combinations of these minerals. Epidote or chlorite-filled amygdules locally contain minor, very fine grained chalcopyrite. Locally, 1-3%, very finely disseminated magnetite(?) or elsewhere, pyrrhotite is apparent in the basalt. Very locally(?), the basalt contains 0.5%, very fine, disseminated chalcopyrite.

The flow or pillow breccias contain 10 to 25%, broken and whole pillow and broken flow(?) fragments of amygdaloidal to highly amygdaloidal basalt. The matrix, at least locally, comprises hyaloclastite consisting of glass shards, and crystal and lithic fragments. he fragments vary in size up to 10-15 cm diameter to locally, 30 x 60 cm. Locally, intervals of pillow breccia contain purple to dark grey-purple fragments with white rims. Agglomeratic lapilli tuffs contain sub-angular to irregular and angular, basaltic clasts, locally to commonly dark purple-grey with white rims, with a matrix of glass shards.

Hyaloclastites consist of glass shards with minor to a few percent, basaltic fragments to 20 cm diameter.

The basalt is generally(?), strongly hematite-weathered or altered at the unconformity with the overlying Comox Formation. Locally, basaltic rocks are cut by shear-fracture zones that are the loci of strong ankerite(?) alteration.

The basalts are commonly cut by joints lined with variable proportions of pyrite, pyrrhotite and magnetite, locally with patches of chalcopyrite. Criss-crossing, chlorite-filled fractures are also relatively common.

Comox Formation of the Nanaimo Group

The Comox Formation exposed along Dove and 'Paquet' creeks, consists of sandstone to siltstone with thin intervals of argillite, carbonaceous shale and coal. In Murex Creek, it consists of boulder, cobble and pebble conglomerate. In the area 0.2 to 1 km east of the tailings pond, the Formation comprises meta-quartzo-feldspathic sandstone and meta-argillaceous siltstone.

The sandstones are thin to medium-thick bedded and cross-bedded. Thin-section examination of sandstones from Mount Washington by Carson (1960) indicates they consist of strained quartz grains (45%), clouded feldspar grains, fragments of chert, shale, basic volcanic rocks, and granite (15% average). The matrix is sericite, chlorite, biotite, iron oxides, pyrite, organic material, and minor apatite, zircon and sphene. The sandstone very locally contains calcareous concretions.

Siltstones are dark grey on a fresh surface, and laminated to banded. In one place, siltstone contains 15%, iron-carbonate concretions with 2%

fracture pyrite. Carbonaceous shales and siltstones locally contain pyrite nodules.

The argillites are slaty, very thin bedded to laminated to massive. Thin-sections of argillite from Mount Washington by Carson (1960) indicate it consists of quartz grains (25%), chlorite (20%), sericite (20%), biotite (25%) and pyrite (10%).

Coal to carbonaceous shale intervals occur throughout sandstone and siltstone sections. The intervals vary from 15 cm to 4 m thick, and are commonly the locus of shearing.

The conglomerate exposed along Murex Creek varies from granule, pebble and cobble conglomerate to boulder conglomerate. Clasts are rounded to sub-rounded, and less commonly sub-angular to sub-rounded. They consist of a variety of basaltic rocks derived from the Karmutsen Formation. Commonly, the conglomerate contains 10 to 60%, purplish clasts, locally in a purplish matrix. The conglomerates appear clast-supported, which distinguish them from pillow breccias within the Karmutsen Formation, which are matrix-supported. The matrix appears to consist of crystal fragments and lithic? sandstone, locally with a very irregular network of an opaque white material (1-2%) between fragments. The conglomerate contains minor intervals of sandstone to siltstone.

Meta-quartzo-feldspathic sandstone? with intervals of pyritic, meta-argillaceous? siltstone? is exposed in area of low relief just southwest of the northwesternmost part of the Constitution Hill intrusive body (northeastern Ideal 4 claim). The exact nature of these rocks is uncertain because the sandstone? resembles a highly quartz porphyritic dacite or a strongly sausserite-altered aplite. However, Carson (1960) describes a rock that "obviously results from silicification and recrystallization of a sandstone", found near the basal unconformity of the Comox Formation, that appears to resemble this sandstone?. On a fresh surface, the meta-sandstone varies from very light tan, to medium grey to medium-dark orange-brown to dark grey-green (and chlorite-altered). It contains about 20 to 30%, fine, quartz grains in a sub-opaque white, very strongly sausserite-altered matrix. It is commonly rusty weathering. The sandstone? contains 0.5 to 3-5%, very fine to fine, disseminated pyrite as very irregular grains or in patches, and locally to 1-2%, very fine, disseminated pyrrhotite. One piece contained 0.5-1%, irregularly disseminated chalcopyrite.

The meta-argillaceous siltstone? to sandstone? outcrops in two places. It is very rusty weathering, and is medium to very dark grey to near black on a fresh surface. It contains a few to 20-30%, quartz grains, 1-2% hornblende? grains, surrounded by soft, sericite? - altered feldspar?. In the north-central Ideal 4 claim, a cut along the #101 road exposes meta-sandstone? that grades in and out of a 2 m wide interval of meta-argillaceous sandstone?. This interval contains about 5-15%, ultrafine grained pyrite with a sieve-like texture (around quartz and feldspar? grains) and 1-2%, very fine grained, irregularly disseminated chalcopyrite. A grab-sample (#103) from this interval yielded 0.09% Cu, 309 ppm Zn, 1.4 ppm Ag, 120 ppm Ni, 197 ppm Co, 112 ppm As, and 0.001 oz Au/t. In the southeast corner of the Ideal 4 claim on the #101 road, there is an exposure of meta-argillaceous siltstone with very locally, 1-2%, very fine grained, irregularly disseminated pyrite?. A grab sample (#129) of this rock yielded 76 ppm As and 4 ppb Au. A whole rock ICP analysis gave, in %: 72.9 SiO_2, 13.5 Al_2O_3, 3.2 Fe_2O_3, 1.0 MgO, 0.5 CaO, 1.9 Na_2O, 2.2 K_2O, 0.7 TiO_2, 0.02 P_2O_5, 0.03 MnO, 0.01 Cr_2O_3, 731 ppm Ba and 3.7 L.O.I. This moderately soft rock contains a surprisingly high amount of silica in that quartz was not apparent in the rock.

Rocks of the Comox Formation contain a complex array of well developed joints, including an anastomotic fracture cleavage sub-parallel to bedding. Hematitic joints are common. Rusty joint surfaces are common where joints cut argillaceous siltstone, argillite, carbonaceous shale and coal.

The Comox rocks are cut, as the Karmutsen Formationm, by fracture-shear zones within which strong ankerite? + hematite alteration and narrow (1-5 cm) iron-carbonate $\pm$ calcite veinlets occur.

Tertiary Intrusive Rocks

The northeast corner of the IDEAL 4 claim and the northeast half of the Ideal 2 claim cover part of the southwestern flank of the Constitution Hill Tertiary sill or laccolith. In addition, the westernmost part of the IDEAL 4 claim covers the eastern part of a Tertiary intrusive body, about 250-450 m wide, consisting of quartz diorite flanked, in part by the Murex intrusive breccia. A dozen Tertiary dykes were encountered on the property during reconnaissance mapping. Most of these occur in the Karmutsen Formation about 100 to 500 m from the unconformity with the Comox Formation. Five dykes of porphyritic dacite to quartz diorite occur in scattered locations in the southwestern part of the property, where four intrude the Karmutsen Formation and one intrudes the Comox Formation. Two of these dykes have strongly sheared contacts and are strongly ankerite?-altered. The remainder of the dykes were located in the headwaters of Wolf Creek in the eastern part of the Ideal 7 claim. There, eight dykes from 0.9 to 28 m wide intrude the Karmutsen Formation, about 300 to 700 m west of the northwest corner of the Constitution Hill sill.

The Tertiary intrusive rocks vary from a seriate porphyritic dacite? to quartz diorite?. Textures are generally poorly distinct due to strong sausserite? alteration of the feldspars. On a fresh surface, the intrusive varies from sub-opaque light tan to tan-grey to light to medium grey. Seriate porphyritic dacites contain sausserite?-altered feldspar phenocrysts up to 3 x 5 mm, about 5-10%, chlorite?-altered mafic phenocrysts to 2 x 6 mm, locally sub-aligned, and locally?, 1-3% quartz phenocrysts and grains up to 2 x 2 mm. The groundmass contains 5-20%, translucent grey, quartzose, aphanitic material. The seriate porphyry appears to grade into fine to medium crystalline, quartz diorite with a decrease in aphanitic groundmass and increase in crystal size.

Locally, the Tertiary intrusive contains up to 1-2%, irregularly, patchy, disseminated pyrite and fracture-pyrite. There are several occurrences of the intrusive with minor to 1%, fine to medium grained, disseminated, pyrrhotite. One occurrence is cut by joints with 1-2%, fine grained chalcopyrite, and patches of pyrrhotite. Generally?, the intrusive is non-magnetic, but locally varies from weakly to moderately magnetic.

The Tertiary dykes exposed in the upper (southern) part of McKay Creek commonly contain 1-2%, quartz veinlets, hairline to 2 cm thick, in a complex, criss-crossing array. Contacts between the dykes and basaltic flows of the Karmutsen Formation are planar to irregular with embayments into the basalt up to 75 cm or more, along joints?. Dyke contacts here are difficult to trace because they appear jumbled by a complex series of small-scale faults. Locally, the dykes contain a few percent basaltic xenoliths up to 12 x 20 cm or more in area. One, 90 cm thick dyke resembles aplite which also resembles the meta-quartzo-feldspathic sandstone? in the northeastern part of the Ideal 4 claim. The aplite? comprises either fine grained, strongly sausserite?-altered feldspar, quartz (25%) and mafics, or is quartz, (mafic) porphyritic, with an aphanitic or very fine grained groundmass. None of the dykes along Wolf Creek have distinct variations in textures at their margins that suggest significant quenching at dyke contacts.

A portion of the Murex breccia is exposed in cuts along the road to and about 300 m east of the old mill site, 650 m west of the Ideal 7 claim. Here, the breccia contains about 80-90% fragments that are all angular, poorly sorted and vary in size from 2 x 2 mm to 40 cm diameter. The predominant (90%) fragment-type is seriate porphyritic, feldspar, (hornblende, quartz) dacite? or quartz diorite. These contain very strongly sausserite?-altered feldspar, about 3-6% hornblende grains to 2 x 3 mm and about 1%, quartz grains. The intrusive rock fragments are very weakly to weakly magnetic. Smaller fragments generally are weakly brecciated, with discontinuous, criss-crossing, chlorite?-filled fractures. The second most abundant type of fragment consists of white, finely crystalline, aplite? comprising strongly sausserite?-altered feldspar and 25%, quartz cystals. About 2-3% of the fragments consist of a very dark brownish grey, strongly, magnetic, moderately soft (sericite?-altered), aphanitic rock that may be fragment of the margins of the Tertiary intrusive or altered fragments of Karmutsen basalt. These contain about 2-3%, very, very fine grained, disseminated magnetite?, and vary up to 12 x 20 cm + in size.

The Murex breccia contains a matrix (10-20%) of near black, opaque white spotted, feldspar, (quartz) porphyritic, very finely to finely crystalline, feldspar-(mafic-quartz-) micro-quartz diorite. The matrix contains minor, quartz phenocrysts to 1 mm diameter. It is non-magnetic, but appears to contain about 1% of a very, very fine, disseminated sulphide(?).

A grab sample from this roadcut of Murex breccia (#162A) contained background concentration levels of Cu, Pb, Zn, Ag, As (6 ppm) and Au (5 ppb).

ECONOMIC GEOLOGY AND MINERALIZATION: MOUNT WASHINGTON AND WOLF LAKE AREAS

Mount Washington

Low grades of chalcopyrite mineralization with pyrite and pyrrhotite are common in the fringes of diatreme bodies on Mount Washington. Higher grade Au, Cu ± Ag mineralization occurs in semi-massive sulphide pods within flat to shallow dipping quartz veins and irregular bodies of quartz. The veins occur in Tertiary intrusive rocks and in the Comox Formation where it contains a series of Tertiary sills, at or near the unconformity between the Comox and Karmutsen Formations.

According to Carson (1960), there are three structural environments of mineralization at Mount Washington: 1) the unconformity between the Comox and Karmutsen Formations, which is succeptible to dilation; 2) wide, steep-dipping faults or fracture zones; and 3) systems of smaller scale fractures, especially flat-lying ones, surrounding the main, Tertiary intrusive stock (McKay Lake area).

The following list of sulphides and oxides, and their mode of occurrence at Mount Washington, is from Carson (1960) (in order of decreasing abundance). Pyrrhotite and pyrite are closely associated with chalcopyrite and are especially common in quartz veins and silicified, brecciated rocks. Magnetite occurs as small specks in many quartz veins, but in large quantities within the matrix of the Washington breccia. Chalcopyrite occurs as open-spacing fillings in brecciated pyrite-arsenopyrite-quartz rocks, as layers alternating with pyrrhotite in banded massive sulphide occurrences, and as disseminations and veinlets throughout various lithologies near some Tertiary intrusions and some faults. Arsenopyrite is in abundance only in brecciated, sulphide zones or in quartz veins. Molybdenite occurs as coatings on sheared fractures cutting "crackle breccias" within or near the borders of the main Tertiary stock. Sphalerite fills fractures within the quartz-pyrite-arsenopyrite rocks, and occurs as blebs within chalcopyrite. Galena occurs in small amounts in veins. Bornite occurs locally as replacement of pyrite and chalcopyrite in veins; it is replaced by chalcocite and covellite, in places. Tetrahedrite-tennantite? occurs as blebs within pyrrhotite, chalcopyrite and gangue minerals. Wehrite (Bi_3Te_2 + Ag and S) and hessite (Ag_2Te) occur in a few small veinlets cutting banded chalcopyrite and pyrrhotite. No native gold was identified by Carson. Chalcocite, covellite, native copper, malachite, molybdenite?, realgar and/or orpiment occur as supergene minerals and/or alteration products.

There appears to be three main deposits of mineralization at Mount Washington. Comprehensive and detailed descriptions of the deposits are lacking in the reports, publications and other information I have reviewed. The following descriptions are based on those given in reports and diamond drill hole logs by Esso Minerals Canada, Ltd.

Mount Washington Copper Mine Pit Area

This area is located on the northeastern slope of Mount Washington, 0.5 to 1.2 kms west of McKay Lake. The pit area consists of a 460 x 915 m zone of biotite-altered quartz diorite sills within the Comox Formation. The sills contain minor disseminated realgar and arsenopyrite-bearing veinlets. A small proportion of the sills contain quartz-pyrite-chalcopyrite-(molybdenite-) veinlets in sheet-like, sericite-alteration zones. In 1965-67, 396,095 tons of ore were produced by Mount Washington Copper Co. from two open pits. The ore graded 1.16% Cu, 0.01 oz Au/t and 0.5 oz Ag/t. It consisted of a 1.5 m (locally to 6.1 m) thick, comb-quartz vein containing chalcopyrite, bornite, arsenopyrite, pyrite, sphalerite and minor tetrahedrite. The vein is flat-lying and overlies a zone of extensive low-grade copper mineralization (0.1-0.5%). It occurs in a succession of quartz diorite, "siliceous diorite" and diorite with minor, inter-sill layers of argillite to 4.4 m thick. The "siliceous diorite" contains 76-90% SiO_2, is garnetized and carries chalcopyrite, bornite, magnetite, pyrite and pyrrhotite. This ore zone lies along the northwesterly projection of the Murray vein.

Murray Vein

The Murray vein (also known as Domineer zone) is located approximately 750 m southwest of McKay Lake and about 350 m southeast of the pit area [based on supposition that this vein correlates to the No. 1 vein discussed by Carson, 1960, and shown on his Map #2 (Figure 4)]. The vein occurs in a tabular zone of kaolinite-sericite-quartz-altered, Tertiary, Washington intrusive breccia that dips 10 to 40° west (or 30°NW according to Carson, 1960). The vein actually comprises a stockwork of quartz veins, veinlets, pods and lenses containing pyrite, arsenopyrite, chalcopyrite and minor sphalerite, realgar and molybdenite. Chip sampling by Cominco in 1945 indicates the vein-structure, exposed along a 32.6 m long trench, contains an average of 0.8% Cu, 0.5% Pb, 0.5% Zn, 3.4 oz Ag/t and 0.46 oz Au/t over an average thickness of 0.61 m.

Meadows Zone

The Meadows zone is located on the opposite west side of Mount Washington from the Murray vein (Figure 4). It may be that the Meadows zone, the Murray vein and the pit area quartz-sulphide veins all lie along one, gently dipping, tabular zone occurring at elevations between 4,300 and 4,600 feet (1311 and 1402 m).

Diamond drill core logs by Esso Minerals (1974) indicates the Meadows zone comprises a shallow, gently westerly dipping interval of vuggy, quartz-veined, quartzite (Comox Formation) with up to 20%, deeply weathered (limonitic) pyrite and arsenopyrite. The interval is about 3 to 5.8 m thick and occurs about 3 to 6 m below the gently, west-dipping surface slope. It occurs within an interbedded succession of layers, 2.4 to 9.1 m thick, of siltstone, quartzite and argillite of the Comox Formation, locally containing sills of quartz diorite. The mineralized interval is underlain by sedimentary rocks with 1 to 10%, disseminated, fracture, stringer and patchy pyrite, pyrrhotite and minor chalcopyrite and arsenopyrite.

Recent drilling of the Meadows zone conducted by Better Resources was reported in the September 16, 1986 issue of the George Cross Newsletter. They drilled 14 holes in an area 107 x 229 m, they call the Lakeview/West grid area. Assays from six holes they reported varied fromm 0.143 oz Au/t and 1.09 oz Ag/t over 1.5 m to 0.68 oz Au/t and 2.7 oz Ag/t over 1.83 m. One of the six holes contained 0.352 oz Au/t and 1.0 oz Ag/t over 5.4 m. Better Resources reported the mineralized zone has a north-south stike-length of about 915 m. They also reported the results of a drill hole located 3.54 kms southeast of the Meadows zone. This hole tested the "Murex zone" which may be the Murex breccia located 3.5 kms east of the Meadows zone (about 1.8 kms west of the Ideal 7 claim). It intersected 15.9 m with 0.174 oz Au/t, including 6.8 m with 0.313 oz Au/t. The Murex breccia was drilled by Murietta Resources in 1969, but their core was not assayed for gold.

Wolf Lake Area

There are two occurrences of realgar-bearing carbonate veins and an occurrence of a high-grade, gold-silver bearing quartz-sulphide vein, proximate to the eastern boundary of the Dove property, that warrant description.

Rock Quarry (Lupus or Lake) Au, Ag, Zn, As Showing

This showing is located in the Lupis 1 claim held by Proquest Resource Corp. (under option to Better Resources), in a road quarry on the Royston-Duncan Main road, 400 m northwest of Wolf Lake, and 1.6 kms east of the IDEAL 1 claim (Figure 4). A brief examination of the showing, suggests it consists of about 2 m wide interval of weakly to strongly altered basalt of the Karmutsen Formation containing a series of shallow-dipping, co-planar veinlets and veins up to about 10-15 cm thick. The veins comprise quartz with pyrite, arsenopyrite, sphalerite and minor chalcopyrite. An assay of a grab sample reported by Proquest Resources (1984), yielded 2.045 oz Au/t, 3.35 oz Ag/t, 0.6% Cu, 0.07% Pb, 7.2% Zn and 6.1% As.

This showing appears to be located about 100 m or so west of the (unexposed) unconformity between the Karmutsen Formation and the Comox Formation, and about 300 m west of the Constitution Hill Tertiary sill.

Wolf Creek Realgar Occurrence

This occurrence of realgar in calcite veins is located 0.9 kms east of the Ideal 1 claim, in Wolf Creek, about 750 m west of its confluence with Wolf Lake (Figure 4), in the Wolf claim owned by St. James Minerals Ltd. The veins occur in a northeast-trending (060°), steeply southeast dipping, shear-breccia zone cutting basaltic rocks of the Karmutsen Formation about 200 m northwest of the unconformity between it and the Comox Formation (air photograph interpretation) and, about 550 m north of the northwest end of the Constitution Hill Tertiary sill. I did not visit this occurrence, but description by Hurst (1927) suggests that it closely resembles that of realgar-stibnite?-calcite veins in McKay Creek, east-central Ideal 5 claim, 3.5 kms west-northwest of the Wolf Creek occurrence (described in a following section).

The Wolf Creek shear-breccia zone varies from 0.6 to 3.7 m wide and is at least 76 m long. The zone is carbonate-altered and contains lenses and veins of calcite up to 1.8 m wide. The calcite veins and lenses contain numerous angular fragments of shattered basalt, and locally, lenses of massive realgar. The largest lens of realgar is 0.23 x 1.2 m. Very thin veinlets of arsenopyrite occur locally in the basalt. There are no reports of gold occurring in the zone.

'Paquet' Creek Realgar-Carbonate Veinlet - Shear Zone

This showing is located in 'Paquet' Creek which drains northeasterly through the Wolfjack claim into Wolf Lake. The claim map indicates it is only about 125 m north of the Ideal 2 claim but the location of the legal corner post of the Wolfjack claim indicates the showing is about 150 m south of the north border of the Ideal 2 claim (R.R. Walker, personal communication, 1986). Realgar occurs in both basalt of the Karmutsen Formation and seriate porphyritic quartz diorite? of Tertiary age at and proximate to the southwesterly contact of the major, northwest-trending body of quartz diorite southwest of Wolf Lake. Realgar occurs in ankerite? ($\pm$ calcite) veinlets in joints, sheared joints and a major? shear zone that strikes about 110°.

In 'Paquet' Creek, realgar occurs in the southwesternmost 100 m of the quartz diorite body, with increasing frequency as the contact with the Karmutsen Formation to the southwest is approached. Realgar or orpiment occurs in at least 30 joints and sheared joints that comprise a criss-crossing set of east-west striking joints (about 275 to 280°) and northwest-striking joints (about 320 to 335°) with steep, north to northeast dips. Joints with different orientations do not appear to contain realgar except locally. For example, a prominent sheared joint with a 4 mm thick, carbonate veinlet along it, strikes 355° and dips 35°E, and contains realgar only where intersected by the steeply dipping joints. Realgar or orpiment forms minor to 50% concentrations along joints, sheared joints, and joints with 0.2 to 2.5 cm thick ankerite? + calcite veinlets (locally with 1%, disseminated pyrite and minor arsenopyrite?). The realgar forms patches on joints and within the centre of sheared joints, and irregularly disseminated needles within carbonate veinlets.

At 50 m northeast of the southwest contact of the quartz diorite body one of the realgar-bearing veinlets was sampled for analyses. Here, a 0.5 to 2.5 cm thick calcite veinlet with rusty walls, contains about 5-8%, very fine to fine needles and laths of irregularly disseminated realgar. The veinlet strikes 345° and dips 70°NE. Grab samples of the whole veinlet (#95A1) yielded 11 ppm Cu, 234 ppm Pb, 19 ppm Zn, 0.7 ppm Ag, 4 ppb Au, with 16,709 ppm As, and 523 ppm Sb. This veinlet-joint splays downwards into a sheared joint that is 12 cm northeast and parallel to the veinlet joint. The splay contains a veinlet of magnetite? and arsenopyrite (about 80% total, very fine grained) with a groundmass of calcite (2-5%) and quartz (5-7%, medium grained, generally within the centre of the veinlet). The veinlet is 0.1 to 3.5 cm thick and contains (#95A2): 4 ppm Cu, 8 ppm Pb, 125 ppm Zn, 0.1 ppm Ag, 1 ppb Au, 46,215 ppm As and 56 ppm Sb. These veinlets occur within a 5-6 m wide interval (dyke?) of seriate porphyritic (feldspar) dacite? with about 5-8%, aphanitic, quartzose groundmass.

I was unable to resolve the exact nature of the quartz diorite/Karmutsen Formation contact. On the south wall of the creek (the creek makes a sharp bend to a westerly trend at the contact area), medium grey-green, non-magnetic, seriate porphyritic (feldspar) dacite? intrusive is in contact with dark green-grey, strongly magnetic, porphyritic to amygdaloidal basalt. On the north wall and in the footwall of a prominent shear zone with realgar, which the creek follows here, the contact is within an interval of strong ankerite? alteration. Here, weathered intrusive is in contact with glass shard hyaloclastite. The contact appears to strike 325°? and dips, perhaps vertically.

A massive realgar veinlet occurs in the footwall of a prominent shear zone exposed locally, about 6 to 35 m west of the Karmutsen/intrusive contact. Though it appears the shear zone must cut across the contact, the amount of offset could not be determined. The creek forms a deep incision along the shear zone, but at 35 m west of the contact, there is a steep rise and the shear zone strikes into overburden. The shear zone strikes 096° and dips 55°S. Slickensides in one place suggest dip-slip (trending 185°, plunging 50°S), with the hanging wall down relative to the footwall. The basalt in both the hanging wall and footwall of the shear zone is moderately to strongly ankerite?-altered, and sub-opaque medium grey on a fresh surface. The rocks in the footwall appear to comprise amygdaloidal basalt to the west and hyaloclastite to the east; there appears to be remnants of a narrow dyke of feldspar porphyritic dacite? along the footwall. In the hanging wall there is amygdaloidal basalt. The shear zone is generally covered with soil and rock, but in one place is 35 cm thick. Here, it consists of strongly sheared and fractured basalt which is somewhat rusty. A soft, black material commonly occurs on shears within the zone. Realgar forms, overall about 1-3% within the shear zone. It occurs in discontinuous, lensy veinlets and as patches on shears. Along the footwall of the shear zone there is a massive realgar veinlet, 1 to 1.5 cm thick, in contact with lensy, ankerite? (+ calcite) veinlets to 1.2 cm thick and locally, grey quartz lenses to 1.5 cm thick, with 5% realgar. All are cut with shears lined with a black mineral. The veinlets contain minor, fine to very fine grained, disseminated pyrite. A chip sample (#96A) across the 35 cm thick shear zone with realgar veinlets, yielded: 173 ppm Cu, 13 ppm Pb, 71 ppm Zn, 0.6 ppm Ag, 57 ppb Au, 36,081 ppm As and 95 ppm Sb.

MINERAL OCCURRENCES ON THE DOVE PROPERTY

Introduction

The most significant occurrence of gold on the Dove property was located along Murex Creek in the Ideal 9 claim by Joe Paquet in 1986. It comprises 0.288 oz Au/t in a 0.5 to 4 cm thick, quartz + calcite veinlet that dips 10°NW in the basal conglomerate of the Comox Formation. The veinlet also contains silver (24.9 ppm), sphalerite, galena?, chalcopyrite, arsenopyrite and pyrite. It occurs along a sheared joint? with ankerite? + black mineral alteration within the wall rocks.

Reconnaissance-scale prospecting on the property in October, 1986, resulted in the location of occurrences of weakly anomalous concentrations of gold and/or arsenic. These occurrences appear to fall into three categories:

1. Ankerite? alteration and ankerite? or calcite veins in shear-fracture zones cutting basalts of the Karmutsen Formation and conglomerate of the Comox Formation. Four of seven of these zones sampled contain weakly anomalous gold (13 to 77 ppb); three of these contain weakly anomalous arsenic (56 to 161 ppm). In McKay Creek two calcite veins contain realgar, arsenopyrite? and stibnite?. The zones are from 0.2 to 4 m wide and strike from 185° to 310°, and dip from 25°NE to vertical to 50°SE.

2. Quartz veinlets with chalcopyrite ± pyrrhotite with anomalous Ag, Au (and locally, As, Zn, Co, Ni and Bi), in joints and sheared joints cutting basalts of the Karmutsen Formation. The five veinlets sampled contain from 34 to 203 ppb Au, 1.0 to 15.3 ppm Ag and 0.4 to 10.5% Cu. One veinlet-shear zone contains 2.43% Zn (and dips 30°N). The veinlets are 1 to 8 cm thick and strike from 235 to 280° and dip 80°NW to 30°N. These veinlets do not appear to represent important indicators of Tertiary age gold mineralization and, may in fact, be pre-Cretaceous. The high concentrations of copper and silver and low concentrations of gold in these veinlets are characteristic of many

veins in the Karmutsen Formation that are unrelated to Tertiary intrusions.

3. Rusty fracture-shear zones with pyrrhotite and weakly anomalous arsenic, cutting basalts of the Karmutsen Formation. Two such zones occur in Murex Creek: one with 549 ppm As, the other with 209 ppm As and 179 ppm Sb. Their significance is unknown.

The individual occurrences of mineralization in first category are described briefly below. The Murex Creek gold showing and the McKay Creek As-Sb-calcite vein occurrence are described in detail in the following section. Occurrences in the second and third categories are described in detail in the sample description list in the Appendix (see #49A; 128A, B; 129 A, B; and 169A: category 2; #51A and 52: category 3).

Mineral Occurrence Descriptions

Murex Creek Au-Ag-Sph-Gn-Cpy-Py-Quartz Veinlet

The Murex Creek showing is located in the easternmost of the three branches of the creek, in the south-central Ideal 3 claim about 2.7 kms northwest of the north end of Wolf Lake. It was located by Joe Paquet in 1986, along the west wall of the creek, about 87 to 133 m north of a bridge along the Rossiter Main road.

The showing consists of a narrow (about 1 to 8 cm) shear zone within Comox Formation conglomerate that contains gold, silver, pyrite, sphalerite, galena?, and chalcopyrite within and proximate to quartz and quartz + calcite veinlets that parallel the shear. The shear is recessive and exposures of the shear-veinlet zone are confined to several locations.

The shear zone consists of micro-brecciated and sheared basalt (clasts and matrix derived from the Karmutsen Formation) that contains a few percent, paper thin, irregular stringers of a black, ultra-fine grained (very locally, fine grained) mineral. Locally, the black alteration is nearly pervasive and the altered rock relatively hard. The shear zone contains a co-planar veinlet, generally 0.5 to 1.5 cm, locally to 4 cm thick, of milky white to locally clear quartz. The quartz is medium to coarsely crystalline forming crystals elongated perpendicular to the veinlet contacts. Locally, the quartz veinlet contains lenses up to 1.2 cm thick, of white calcite.

Pyrite forms about 1 to 15% of the shear-veinlet zone. It is very fine to medium grained and occurs as irregular pods and irregularly disseminated grains and lenses within the quartz veinlet where it very locally is associated with about 1 to 2% (of the veinlet), very fine to fine grained sphalerite. Pyrite also occurs in the altered, sheared basalt, where it forms very irregularly distributed stringers and lenses up to 5 to 6 mm thick.

The shear zone also contains a few percent lenses of iron carbonate + calcite (± quartz), up to 2 to 5 mm thick.

The shear-veinlet strikes about 220 to 240° and dips about 10 to 20° to the northwest, parallel to a prominent joint set in the conglomerate. The shear surface is somewhat wavy. The shear-veinlet appears to occur 0.5 to 1 m or more above the unconformity between the basal, Comox Formation conglomerate and the underlying massive, amygdaloidal basalt of the Karmutsen Formation.

A chip sample (#29A) across the veinlet-sulphide-shear zone, exposed about 125 m north of the bridge, consisting of grabs of the whole zone along about 1 m of the zone, where it is 1 to 3 cm thick, yielded 541 ppm Cu, 8,218 ppm Pb, 11,764 ppm Zn, 24.6 ppm Ag (about 0.7 oz/t) and 0.288 oz Au/t, with 3,879 ppm As, 15 ppm Sb and 50 ppm Cd.

The basaltic conglomerate in the hanging wall of the shear zone is very strongly iron-carbonate? altered to an opaque light tan-grey color, at least 12 cm above the shear. The rock contains a few percent, irregular, stringer-like veinlets of iron-carbonate and up to 1%, irregular, criss-crossing, discontinuous fractures filled with an ultra-fine black mineral. A chip sample across 12 cm (#29B) in the immediate hanging wall of the shear yielded: 262 ppm Cu, 146 ppm Pb, 338 ppm Zn, 2.3 ppm Ag, 50 ppb Au, and 90 ppm As.

At least 30 cm into the footwall of the shear zone, the conglomerate appears weakly to moderately iron-carbonate altered to a light tan-grey color. The rock contains about 1 to 3%, irregular, criss-crossing, stringer-like, hairline to 2 mm thick fractures filled with an ultra-fine to locally fine grained, black mineral. Locally, the footwall basalt is nearly (80%) pervasively altered to a black color with the remainder comprising carbonate-altered breccia fragments (to 5 mm diameter). In one place, there is a 3 to 20 cm thick zone of sub-pervasive, black alteration that strikes 150° and dips about 90°; at a high angle to the veinlet-shear zone, where it appears to terminate. A chip sample (#29C) across a 30 cm interval in the immediate footwall of the veinlet-shear zone, yielded in ppm: 400 Cu, 45 Pb, 111 Zn, 45 As, 2.5 Ag and 21 ppb Au.

The alteration and nature of mineralization at the Murex Creek showing somewhat resemble that at the rock quarry showing in the Lupis 1 claim, 1.6 kms east of the Ideal 1 claim and 2.3 kms southeast of the Murex Creek showing. The rock quarry showing, however, occurs in basalt of the Karmutsen Formation, and consists of a series of co-planar veinlets and veins, whereas the Murex Creek showing occurs in the Comox Formation and consists of a single veinlet. Rocks exposed 3 or 4 m above and below the Murex Creek veinlet do not appear to contain additional mineralization. However, the immediate, northwesterly, down-dip projection of the veinlet should be tested with a diamond drill hole to determine whether mineralization is more extensive down-dip.

Ankerite?-Alteration-Veinlet-Shear-Zone-Fracture Zones:

#33A: is located in Murex Creek, central Ideal 9 claim, and cuts conglomerate of the Comox Formation. This zone is 1.5 m wide, strikes 265° and dips 90°. It contains 1% ankerite? veinlets to 0.7 cm thick. This zone contains weakly anomalous silver (1.8 ppm).

#39A: is located in Murex Creek, north-central Ideal 9 claim, and cuts Comox Formation conglomerate. The zone is 1.5 m wide and strikes 040° and dips 70°SE. Ankerite? alteration is accompanied by hematite. It is centred on a 12-16 cm wide interval with ankerite? (+ calcite) veinlets 0-5 cm thick and locally quartz veinlets to 1.3 cm thick. A chip sample across 5.5 cm containing a 1.3 cm thick quartz veinlet and a 2 cm thick ankerite? veinlet, yielded 31 ppm Pb, 151 ppm Zn, 0.7 ppm Ag and 77 ppb Au.

#60: is located in McKay Creek in the northwest corner of Ideal 1 claim and cuts basaltic agglomeratic lapilli tuff of the Karmutsen Formation. The zone is 25 cm thick, and strikes 030° and dips 50°SE. It is marked by strong shearing and contains up to 25%, stringers and laminations of hematite in clay-weathered, ankerite?-altered basalt. The zone contains 161 ppm As and 26 ppb Au.

#73A: is located in the western fork of Murex Creek in the northeast corner of the Ideal 6 claim and cuts basalt of the Karmutsen Formation. The zone is about 2 m wide with a 15 cm wide shear zone in the centre; it strikes 310° and dips 25°NE. The shear zone contains basalt altered by a very fine grained, black mineral and 3-5%, stringer-like ankerite? veinlets, to 0.8 cm thick, very locally with a few grains of chalcopyrite and minor quartzose zones. A 15 cm wide chip sample contained 538 ppm Cu, 87 ppm As and 21 ppb Au.

Of the remaining four ankerite? alteration-vein-shear-fracture zones cutting the Karmutsen Formation that were sampled, three do not contain anomalous concentrations of metals. They are described in detail in the sample description list in the Appendix (samples 186 A1, A2; 190A, B and 191). The fourth zone in McKay Creek is described below:

#67: McKay Creek, calcite-realgar-arsenopyrite?-stibnite? veins

Two main veins, 70 cm and 18 cm thick, occur 2.7 m apart in an ankerite? + calcite alteration and shear zone cutting broken (and whole), basaltic pillow breccia (with a glass shard matrix) of the Karmutsen Formation. The veins are exposed in the bottom of McKay Creek, 2040 m (along the creek), to the southwest of the bridge on the Rossiter Main road in east-central Ideal 5.

The veins and shear zone strike 105° and dip 70°SW. The zone consists of from south to north:

1. 50 cm (exposed) of strongly sheared, carbonate-altered basalt.
2. Calcite-realgar-arsenopyrite?-stibnite? vein, 70 cm thick. The northern 30 cm of the vein actually consists of a series of lensy, sheeted veinlets that appear ribbon-like, and that are locally separated by lenses of altered basalt. Within the 30 cm interval, a 6 cm sub-interval contains "patches" of realgar strung out along the centres of 2 or 3 lenses of calcite. The remainder of the 30 cm interval of calcite contains about 0.25% realgar as disseminated needles. The northernmost 7 cm of the 30 cm interval contains about 3-4%, irregular lenses of massive, very fine to fine grained arsenopyrite? and/or stibnite? up to 8 mm thick. These lenses are parallel to the vein walls. The main calcite vein also contains rare?, irregular patches to 1 to 2 cm diameter of very fine grained magnetite?. A chip sample across the 70 cm wide calcite vein-veinlet zone (#67B1) yielded in ppm: 11 Cu, 2 Pb, 25 Zn, 0.5 Ag, 4 ppb Au, 2924 As and 1.71% Sb.

3. A 2.7 m wide interval of moderately to strongly calcite + ankerite?-altered basaltic pillow breccia. On a fresh surface the basalt is opaque light grey. The basalt is moderately to locally strongly sheared, with shears that are anastomotic and

appear dark brown on a washed surface. Locally, the shears contain lenses of grey calcite to 1 cm thick. The basalt contains minor patches of fuchsite? alteration. The northernmost part of the interval is marked by a 0 to 20 cm thick zone of basalt with up to 4, anastomotic calcite veinlets to 2 cm thick with minor realgar. A chip sample (#67B2) across the 2.7 m wide interval, yielded in ppm: 188 Cu, 3 Pb, 63 Zn, 0.1 Ag, 5 ppb Au, 74 As and 48 Sb.

4. A calcite-realgar-arsenopyrite? vein 7 to 28 cm thick that occurs within a 35-50 cm wide interval of sheared, carbonate-altered basalt with up to 10 or more, anastomotic, lensy calcite veinlets up to 1-2 cm thick, separated by lenses of dark rusty brown weathering basalt. The main vein contains minor to very locally, 2%, stringers to 3 mm thick, of massive? arsenopyrite? that is very, very fine grained and contains hairline stringers of pyrite. The main vein also contains about 0.1-0.5% disseminated needles of realgar to 8 mm long. The realgar commonly occurs along zones that yield a faint, flourescent orange tint to the calcite. A chip sample (#67B3) across the vein where it is 18 cm thick yielded in ppm: 30 Cu, 3 Pb, 23 Zn, 0.2 Ag, 3 ppb Au, 1156 As, and 53 Sb.

5. 1 m interval of basalt that is strongly sheared and strongly carbonate-altered.

The south branch of McKay Creek follows the shear zone for about 180 m. However, there are only two partial exposures of the shear zone along the creek which runs into overburden to the west. The shear zone occurs within an expansive area of Karmutsen Formation and does not appear to be proximate to any body of Tertiary intrusive rock.

MESOSCOPIC STRUCTURE AND AERIAL PHOTOGRAPH LINEAMENT ANALYSES

Introduction

Measurements were taken on the orientation of joints, dykes, mineralized veinlets, shear zones and bedding during reconnaissance-scale mapping. The purpose was to determine preferred, mean orientations of zones of dilation, their relationship to various types of mineralized structures and, to aid in the categorization of various sets of aerial photograph lineaments. The end result of the analysis is to determine if there are preferred orientations for mineralized structures and whether air photograph lineaments with these orientations can be identified for further exploration. Although the approach is rather straight forward, and the nature of the structures is rather uncomplex, the wide range of orientations of structures result in a complicated picture, based on preliminary data. The greatest deficiencies in the data are the lack of information obtained on the sense of offset along shear zones and, of course, the small number of occurrences of mineralized structures. The first deficiency results from the fact that slickensides in sheared rocks are relatively rare.

Mesoscopic Structures: Data Presentation and Conclusions

Equal-area stereograms have been constructed to show the pole to the plane of the individual structures measured as follows:

Figure 5 shows the poles to bedding plane measurements taken in the Comox and Karmutsen Formations. The Comox Formation is broadly folded, but because it generally has gentle dips, definition of a fold axis is difficult. The approximate fold axis shown (130°/plunging 30°SE) is perpendicular to the great circle that comes most close to passing through the majority of the poles to bedding.

Figure 6 shows the poles to joints and shear zones with a) realgar-bearing carbonate veinlets and b) with sulphide-bearing veinlets in the various lithologies and Tertiary dyke contacts.

Figure 7 shows the great circles representing the arithmethic average of the members of individual sets of realgar-carbonate veinlets and quartz-sulphide veinlets that appear in Figure 6. The relatively small number of measurements show that there are four sets of orientations for realgar-carbonate veinlets and four relatively distinctly different sets for quartz-sulphide veinlets. Tertiary dykes, however, have orientations that in a general sense are parallel to most of the sets of realgar-carbonate veinlets and quartz-sulphide veinlets. On the basis of strike alone the veinlets fall into three sets: those striking east-west (240 to 280°), those striking northwesterly (330°) and those striking northerly (00-08°).

Figure 8 shows the poles to joints, carbonate veinlets, realgar-carbonate veinlets, quartz-sulphide veinlets, Tertiary quartz diorite and aplite dykes and mafic dykes, cutting the various lithologies including Tertiary intrusives. Veinlets occurring in shear zones are shown in Figure 9. A preliminary stereogram shows there are little if any significant differences between the orientations of joints, veinlets and dykes for the various lithologic units. The figure shows that veinlets and dykes have the same distribution of orientations overall as the joints which conforms with field observations.

Figure 9 shows the poles to shear zones and faults and distinguishes those containing realgar-carbonate veinlets and quartz-sulphide veinlets and those accompanied by ankerite? alteration and veinlets. A preliminary stereogram shows that there are no apparent, significant differences in the orientations of the various types of shears between the various lithologic units.

Figure 10 combines the stereograms in Figures 8 and 9 and shows the poles to joints, dykes, shear zones and faults. Structures containing realgar-carbonate or quartz-sulphide veinlets and/or associated ankerite? alteration are distinguished by separate symbols. The most striking feature of this stereogram is the wide diversity in orientation of the shears and joints. Furthermore, shears tend to show the same distribution of orientations as the joints which suggests they form along pre-existing joints. This conclusion agrees with field observations. However, there are two sets of joint and veinlet orientations which do not appear to be preferred orientations of shears: those striking about a mean orientation of 124°/90° dip and those about 328°/83°SE dip. This may be a result of the small amount of data on shears because 38% of the air photograph lineaments measured have trends that are northwesterly (from 290 to 329°) which suggests that this is an important direction of shearing and faulting.

In Figure 11 the poles to all shears, joints, veinlets and dykes shown in Figure 10 are contoured. The purpose of this diagram is to attempt to delineate the various sets of structures and define their mean orientation. Grouping of all the various types of structures for this purpose appears warranted because field observations suggest veinlets, dykes and shear zones tend to form along and parallel to prominent joints. I hoped that synthesis of all the structural data in this manner would help simplify the analysis of the apparently wide diversity in the orientations of mineralized structures. However, it appears that this diversity characterizes the structures and is not purely a function of irregularities at sites of data collection. Table 1 tabulates the mean orientations and ranges of orientations for 15 sets of joints, veinlets and shears, defined from the contoured stereogram. More data on orientations of these structures might simplify this relatively complex distribution. The table shows that 30% of the structures measured have three preferred orientations: 124° strike/90° dip; 96°/70°S; and 353°/17°E. The apparent, high proportion of shallow dipping structures reflects, in part, my bias in collecting data on these structures because they appear to most often host mineralized veins.

Aerial Photograph Lineaments: Data Presentation and Conclusions

Air photograph lineaments were identified on 1968, 1:16,000 scale (approximately), B.C. photographs of the Dove property and proximate areas. A tracing of these is shown in reduced form (Figure 12). A Rose diagram (Figure 13) shows the frequency distribution (5° intervals) of the trends of the lineaments shown in Figure 12, for the various lithologic units within which they occur (where known). Table 1 lists the mean trend of the 11 sets of lineaments defined from their frequency distribution.

There are a number of weaknesses inherent in this lineament analysis which limit its applicability. Firstly, there is extensive areas of glacial till which may mask structures in underlying bedrock and may contain lineaments that do not reflect structures in bedrock. These areas may be contain mineralized structures that show no topographic expression. Secondly, gently dipping structures, which may be an important host for gold mineralization, generally cannot be expected to have topographic expression. Thirdly, the majority of lineaments occur in the Karmutsen Formation (57% of the total), whereas only 20% occur in areas underlain by the Comox Formation, which may have more potential for hosting gold mineralization. And finally, the nature of the structures causing the individual lineaments is, in most cases, unknown, and may be complex. For example, the southern fork of Murex Creek (central Ideal 1 claim) is strikingly linear with a north-south trend. A traverse along the creek indicates that the trend of the creek does not reflect the presence of a single, controlling structure. Rather, the creek follows a variety of structures in succession: ankerite?-altered shear zones, prominent, steep-dipping joints, and not uncommonly, the strike (or dip) of gently dipping joints. This feature characterizes several other creeks but which have overall surfaces traces that are a composite of short, linear jogs of varying trends.

The Rose diagram (Figure 13) shows that there is a wide diversity in trends of lineations and, therefore, it is difficult to define distinct sets of trends for them. The majority of lineaments (53%) have trends between 270° and 329°, the highest proportion of which have trends between

AIR PHOTO LINEAMENTS:																						
Mount Washington					Dove Property					Joints + Shears + Veinlets					Quartz-Sulphide Veinlets							
Set #	Centre°	Range°	#Meas	% of T	Set #	Centre°	Range °	#Meas	% of T	Set #	Mean	Range	#Meas	% T	Set #	Average	Range	#Meas	Set #	Average	Range	#Meas
					1	72	65-80	66	11	6	63/ 82SE	60- 68/75SE-85NW	7	4								
					1	"	"			7	75/ 72SE	71-78/-	4	2								
					1	"	"			11	255/ 70NW	249-266/63N-85S	7	4	1	248/76NW	235-265/50-85NW	6				
5	55	45- 70	23	20	2	55	50-59	38	6	5	50/ 85SE	44- 55/80SE-90	9	5								
					3	40	35-44	28	5	4	37/ 78SE	30-41/65SE-70NW	9	5								
4	30	20- 40	16	14	3	"	"			10	224/ 76NW	214-235/68NW-90	7	4								
										(2	16/ 90	10- 21/80W-80E	8	4.5								
					4	22	20-24	10	2	(3?	25/ 48SE	20- 30/42-53SE	5	3								
					5	12	10-14	13	2	2	16/ 90		8	4.5								
					6	352	350-354	11	2	1	350/ 64E	3-339/55-78E	9	5	2	00/82E?	165/70NE & 195/85W	2				
3	322	315-340	16	14	7	322	315-329	62	10.5	15	328/ 83SE	324-332/78SE-90	7	4					1	331/79NE	320-345/70-85NE	4
					8	312	305-314	58	10	9	124/ 90	114-131/80SW/80NE	21	12								
2	292	280-300	15	13	9	302	290-304	102	17	9	"	" " "	"	"								
"	"	"	"	"	10	282	275-289	63	11	8	96/70S	88-107/64S-80N	17	9.6					3	281/90	275-290/55S-82W	5*
1	267	255-274	20	17	11	272	270-274	24	4	8	"	" "	"	"					3	"	" "	
					?					12	173/20W	159-185/18-24W	4	2	29	240/10NW						
					?					13	247/21NW	235-256/17-28NW	8	4.5	49	280/30NW		2				
					?					14	353/17E	50-282/7-28E	14	8					2	8/33E	020-355/30E-35E	2
TOTALS			102 of 118	87				475 of 591	80.5				136 of 177	76.6					10			11

*includes #67: McKay Creek occurrence (105°/70°S) and #96A: 'Paquet' Creek occurrence (096°/55°S)

TABLE 1: Sets of aerial photograph lineaments (trends), of joints, shears and veinlets (strike and dip), of quartz-sulphide veinlets (strike and dip), and of realgar-carbonate veins (strike and dip).

290° and 304° (17% of the total). Lineaments with trends between 335° to 0° to 35° are relatively uncommon (15% of the total). Lineaments with trends between 295° and 305° are the most common (13% of the total).

Figure 12 also shows that the trends of lineaments in areas underlain by individual lithologic units (Karmutsen and Nanaimo Formations, and Tertiary intrusives) are not substantially different from trends in the other lithologic units. Furthermore, there is a wide diversity in trends of lineaments for each of the lithologic units.

Comparison of Trends of Mesoscopic Structures and Aerial Photograph Lineaments

Figure 14 is a stereogram showing the mean orientations (and range of strikes) of the 15 sets of joints, veinlets and shears, the realgar-carbonate veinlets, the quartz-sulphide veinlets and mean trends of the 11 sets of aerial photograph lineaments. The purpose of this stereogram is to attempt to match sets of mesoscopic structural trends with sets of aerial photograph lineament trends, then match mineralized structural trends with specific sets of lineaments. Correlations of the various sets are shown in Table 1. Considering the wide diversity of strikes and trends, there is a rather close agreement between mesoscopic structures and lineaments. No attempt was made to correlate the three sets of shallow-dipping mesoscopic structures with sets of aerial photograph lineaments because of the wide variation in strikes these mesoscopic structures have and because most of the lineaments appear to follow more steeply dipping structures.

It appears to me from preliminary data that the most significant structures related to Tertiary age gold mineralization, which might be identified by an aerial photograph lineament analyses are the carbonate veins with realgar and locally, stibnite? and arsenopyrite?, that occur in ankerite? alteration-shear-fracture zones, exemplified by the Wolf Creek, McKay Creek and 'Paquet' Creek occurrences. Structures similar to the gently dipping shear zone that contains the gold-bearing quartz vein at the Murex Creek showing, probably must be identified by another means because of its shallow dip. It is uncertain whether the three ankerite? alteration-veinlet-shear-fracture zones and the five quartz-chalcopyrite ± pyrrhotite veinlets located on the property, that contain weakly anomalous concentrations of gold are related to Tertiary mineralization. They lack, in general, anomalous concentrations of As, Sb, Pb and Zn which appear to occur with Tertiary mineralization. Thus, a preliminary stage in this analysis entails identification of lineaments trending parallel to the major occurrences of realgar-carbonate veins.

The main occurrences of realgar-carbonate veins strike from 275 to 290° (and dip 55°S to 82°N). These correlate to the joint-veinlet-shear zone set #8 (Table 1) with a mean strike of about 276°, but range from 268 to 287°. This set, in turn, correlates with two aerial photograph lineament sets, #10 and 11, which have trends that range from 270° to 289°. Lineaments with trends that fall within this range are delineated on Figure 12. There are about 95 lineaments out of a total of 591 plotted, that are in this range. They show a widely scattered distribution and are more numerous, as other lineaments, in areas of thin overburden and more extensive outcrop. It is clearly necessary to utilize further criteria to distinguish prospective, gold-bearing structures from amongst this relatively large group of lineaments. An airborne EM survey might distinguish those lineaments associated with conductive structures which warrant exploration.

An aerial photograph lineaments analysis was also made of Mount Washington in the area of the open pits and Murray vein (Figure 15). The purpose of this analysis was to determine whether there is a set of lineaments with a trend that is distinctively different either in trend or in abundance from those of lineaments on the Dove property, which then might serve as a guide to areas that would warrant further exploration. Five sets of lineament trends were defined in the Rose diagram (Figure 13) and correlated with lineament sets on the Dove property (Table 1). The most notable result of this analysis is that the set (#1) of lineaments on Mount Washington with the mean tend of 267° is somewhat more abundant there than the corresponding sets (#11 and part of #1) on the Dove property, which has a mean trend of 272° (set #1, Mount Washington, with a range of

255-274°, forms 17% of the total lineaments versus 12% for the same range in trends of lineaments on the Dove property). This appears to confirm the importance of east-west striking structures that contain realgar-carbonate veinlets.

The final stage in the lineament analysis is to determine whether the pattern of distribution of the lineaments in the immediate area of the Mount Washington Copper open pit mines and the Murray vein has an analogous counterpart on the Dove property lineaments. Four features of the Mount Washington area are considered important for locating analogous areas: 1) the north-northeasterly lineaments that pass through and near McKay Lake; 2) the east-west lineaments in Tertiary intrusive that are located just west of the two pits; 3) the two northwest-trending lineaments just southeast of the Murray vein; and 4) the Tertiary intrusive/Comox Formation contact where the intrusive overlies the Comox Formation. The only area I was able to identify that encompasses these features to some degree, is located between Wolf Creek and 'Paquet' Creek, in the northeast corner of the Ideal 4 claim and westernmost-central Wolfjack claim. Figure 16 shows the lineaments in the Mount Washington open pit - Murray vein area and lineaments and the intrusive/Comox Formation contact in the Wolf Creek - 'Paquet' Creek area. Clearly the simlarities between the two areas are not strongly developed, but on the other hand may not be totally superficial. The intrusive/Comox Formation contact in this area may warrant exploration.

COST STATEMENT

A) Wages

1) G. Benvenuto, 1986, Sept. 23-26, 28; Oct. 2-20, 23-28; Nov. 20-29; Dec. 1-9. Total worked 37.2 days @ $190/day — $ 7,068.00

2) R. Walker, Senior Supervision @ $275/day 1986, Sept. 23, 24; Oct. 2; 3 days — 825.00

3) P. Ferguson, Typist, 1987 August 25 — 150.00

B) Subsistence (G. Benvenuto) Sept. 23-30, Oct. 2-19 — 362.00

C) Tranportation

1) Truck rental Sept. 23 - Oct. 19; 24 days — 961.00
2) Gasoline — 111.00
3) Ferry (4 x $19.00) — 76.00
4) Delivery service — 22.00

D) Field Supplies — 65.00

E) Telephone — 63.00

F) Reproduction of reports maps and photos — 243.00

G) Analyses 61 rock samples analyzed for Au and 30 element ICP @ $15.66 each — 955.00

$10,901.00

Proportion to Dove Group (Ideal 2, 3, 4, 7 & 8 = 86 units) — $7,10[illegible].00
Proportion to McKay Group (Ideal 1, 5, 6, 9 = 46 units) — $3,8[illegible]0.00

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CERTIFICATE

I, Gary L. Benvenuto, of the City of North Vancouver, hereby certify that:

1. I am a consulting geologist with an office and residence at 4699 Strathcona Place, North Vancouver, B. C., V7G 1H1.

2. I graduated with a BSc. degree in geology from California State University at Los Angeles, California in 1972, and with a PhD. degree in geology from Queen's University at Kingston, Ontario in 1978.

3. I am a fellow of the Geological Association of Canada.

4. I have practised exploration geology with Cominco Ltd. from May to October, 1979, and with Westmin Resources Ltd. from January, 1980 to April, 1985, and have practised as a consulting exploration geologist from May, 1985 to present.

5. This report is based on geologic mapping on the Dove property between October 3 and 19, 1986.

6. I consent to the use of this budget in connection with a Prospectus or Statement of Material Facts.

December 8, 1986
North Vancouver, B.C.

Gary Benvenuto, PhD.

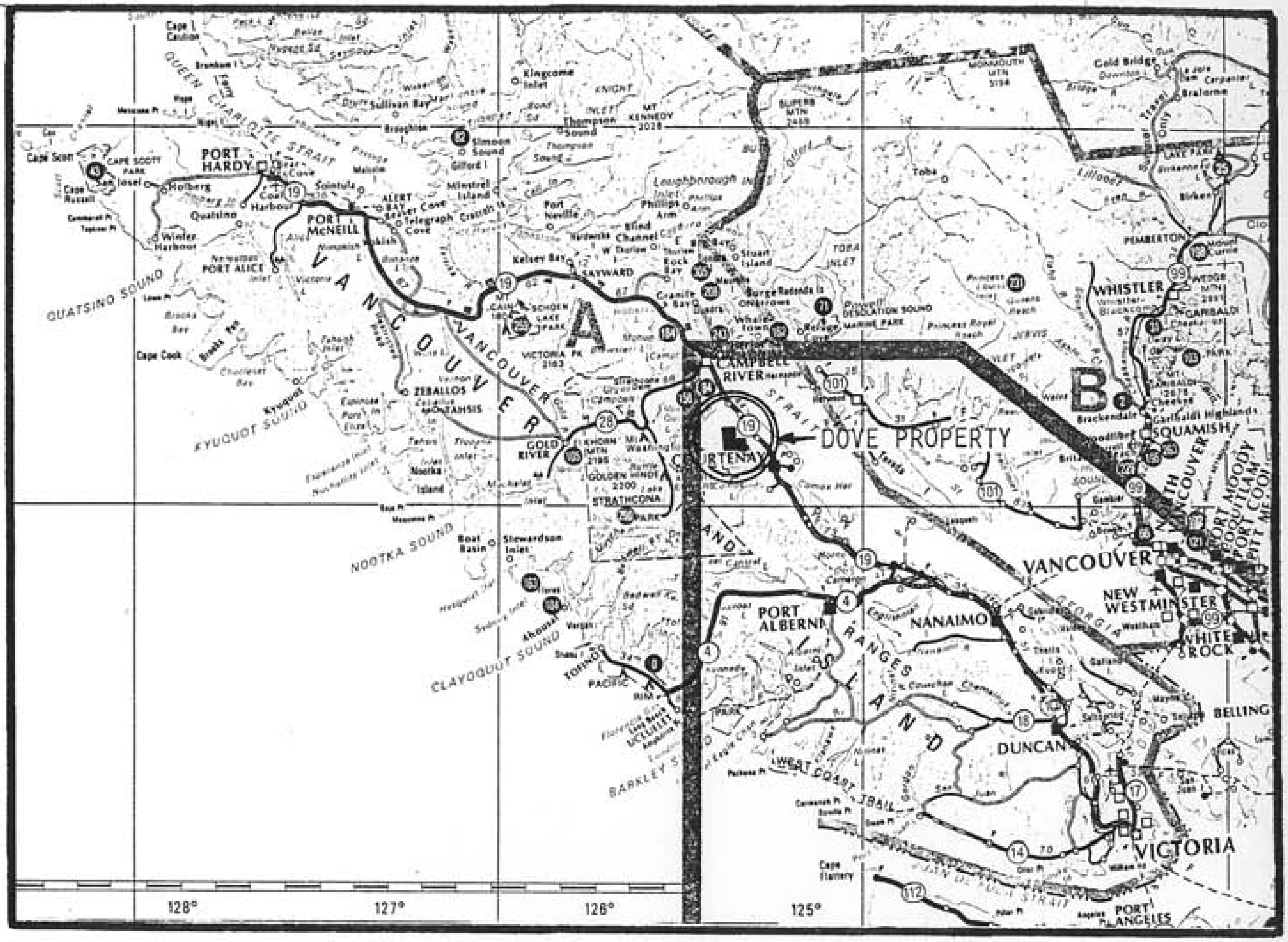


FIGURE 1: Map of Vancouver Island, B.C., showing location of Dove property.

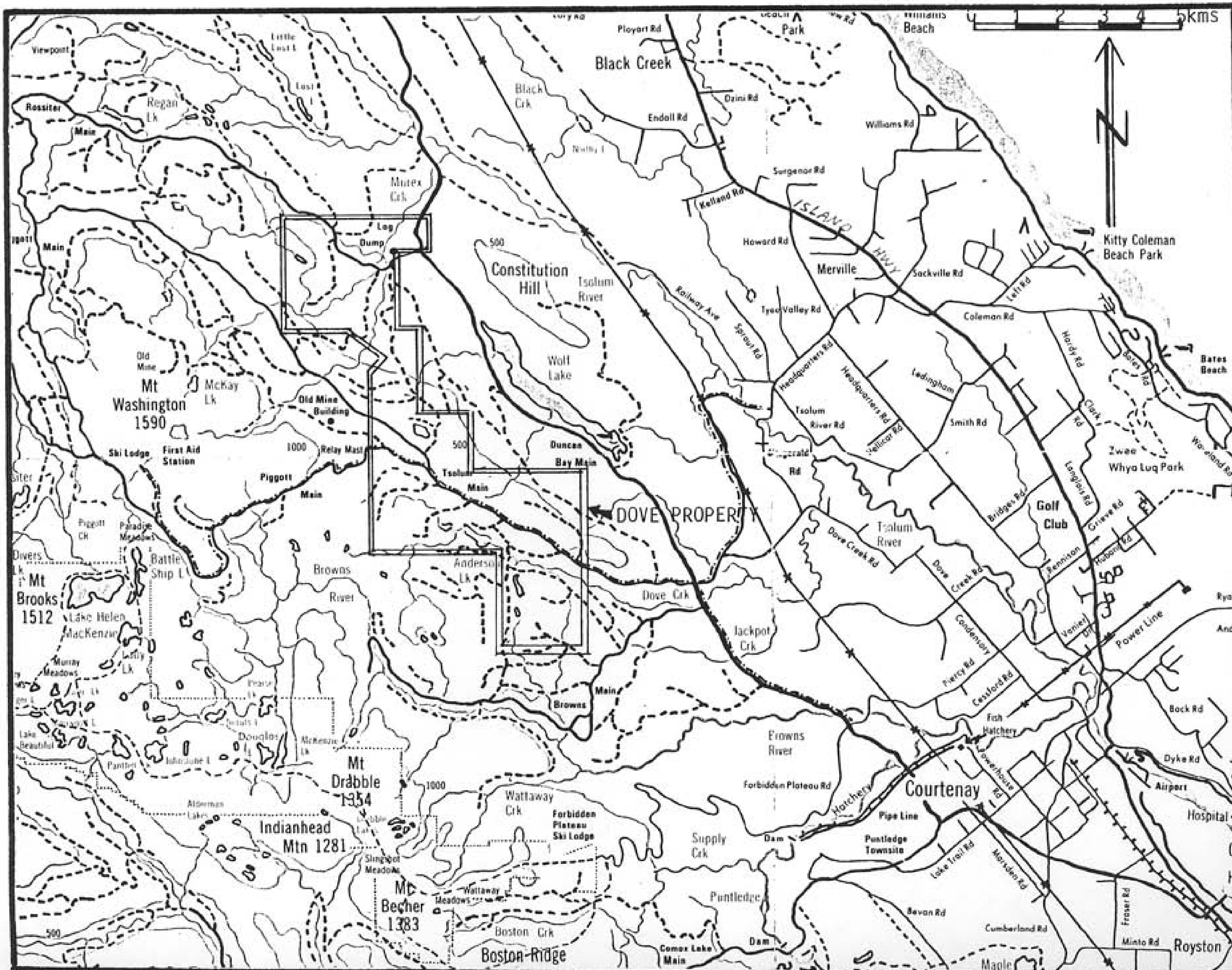


FIGURE 2: Map showing road access to the Dove property near Courtenay. B.C.

(55)

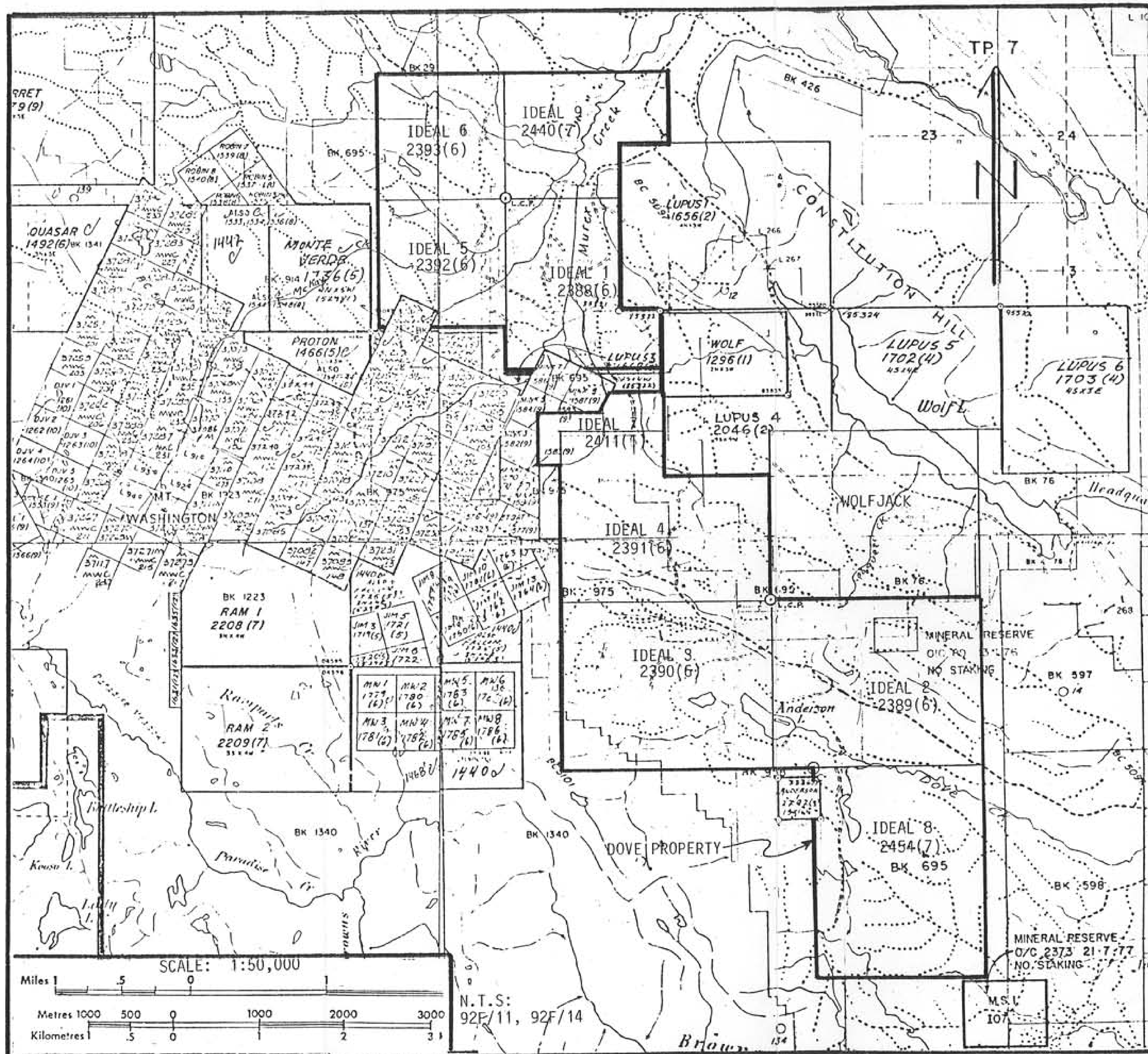


FIGURE 3: Claims map of Dove Property and Mount Washington area, N.T.S. 92 F/11 and 92F/14. Drafted by G. Benvenuto, December, 1986.

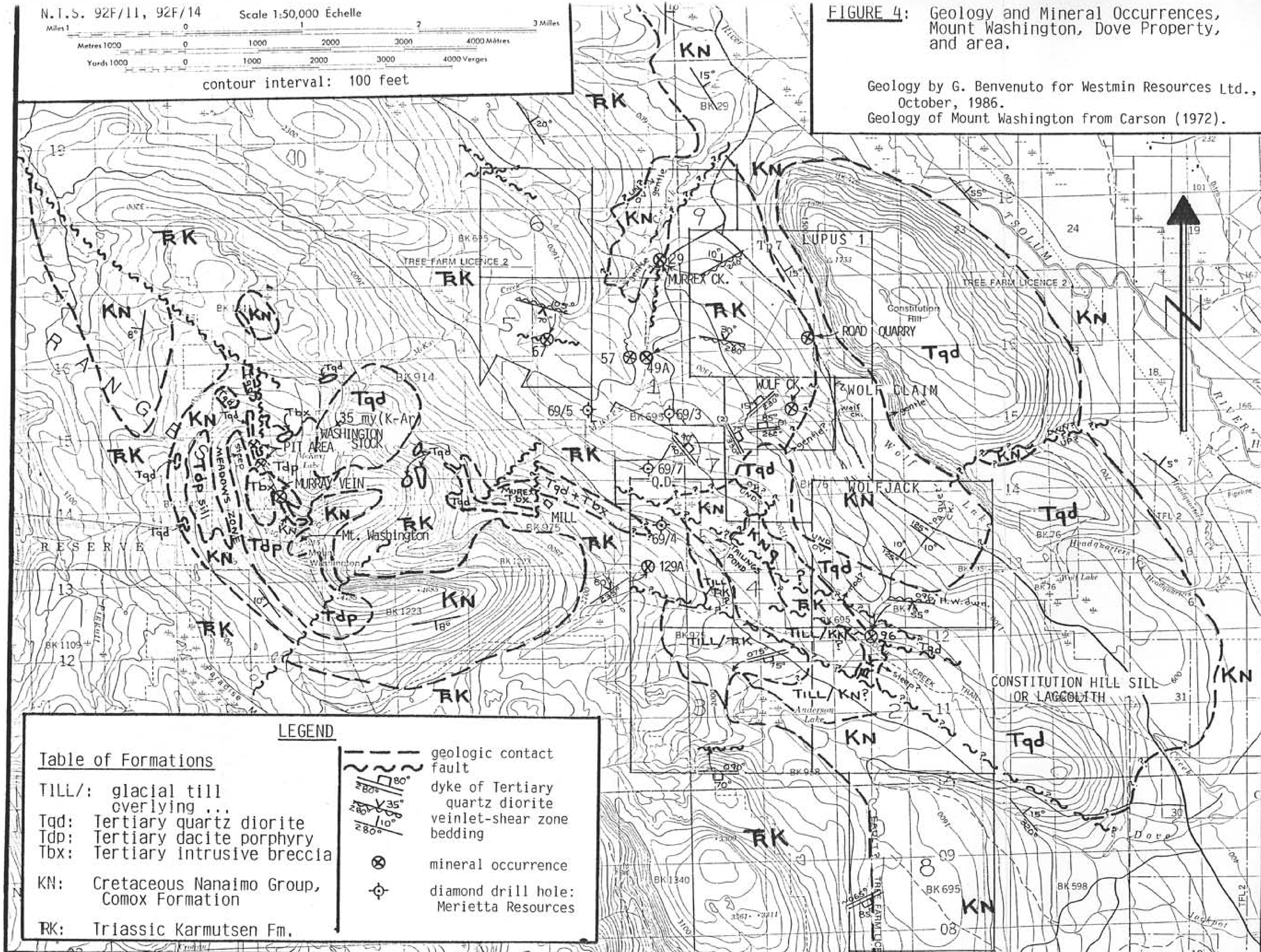


FIGURE 4: Geology and Mineral Occurrences, Mount Washington, Dove Property, and area.

Geology by G. Benvenuto for Westmin Resources Ltd., October, 1986.
Geology of Mount Washington from Carson (1972).

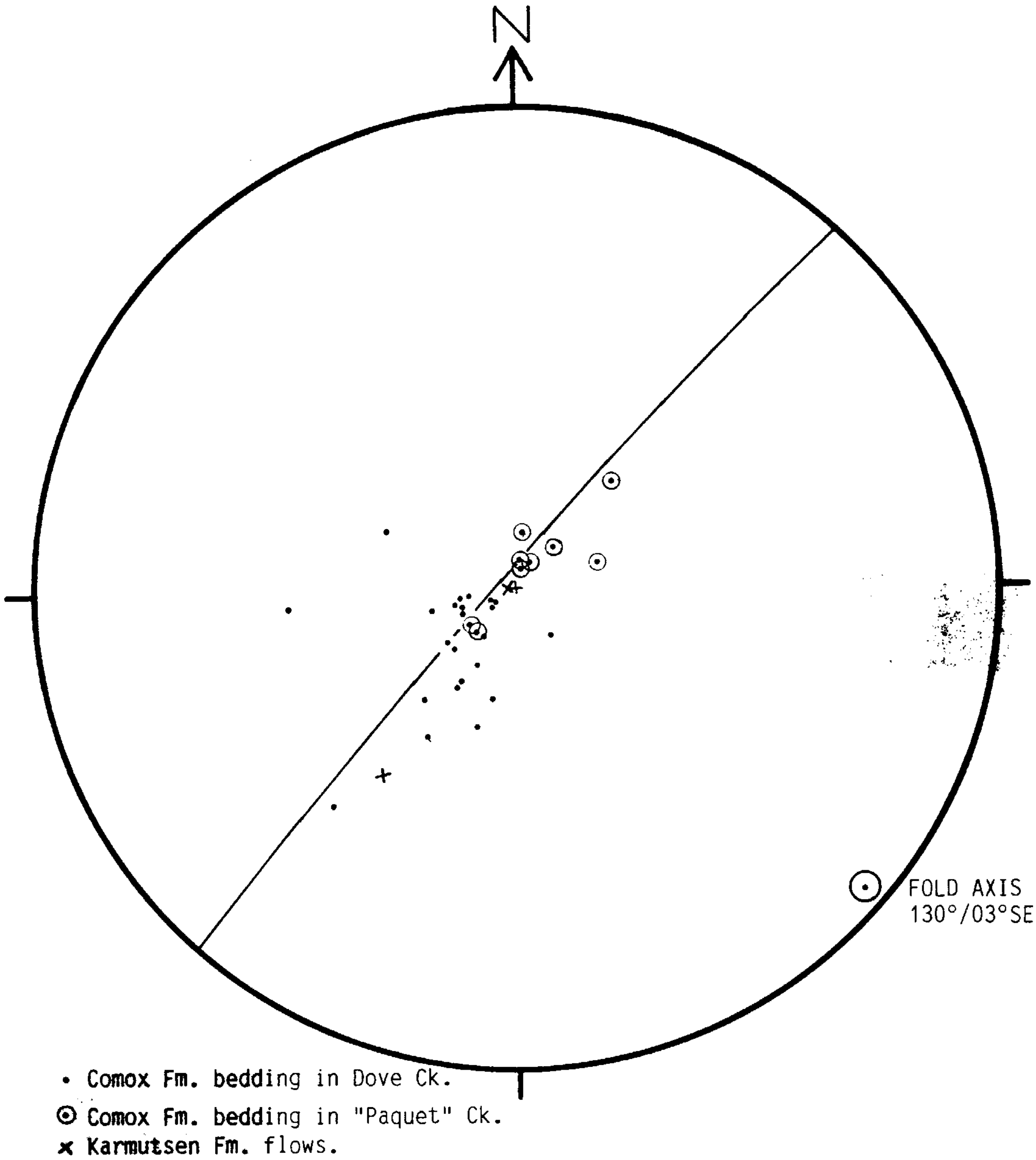
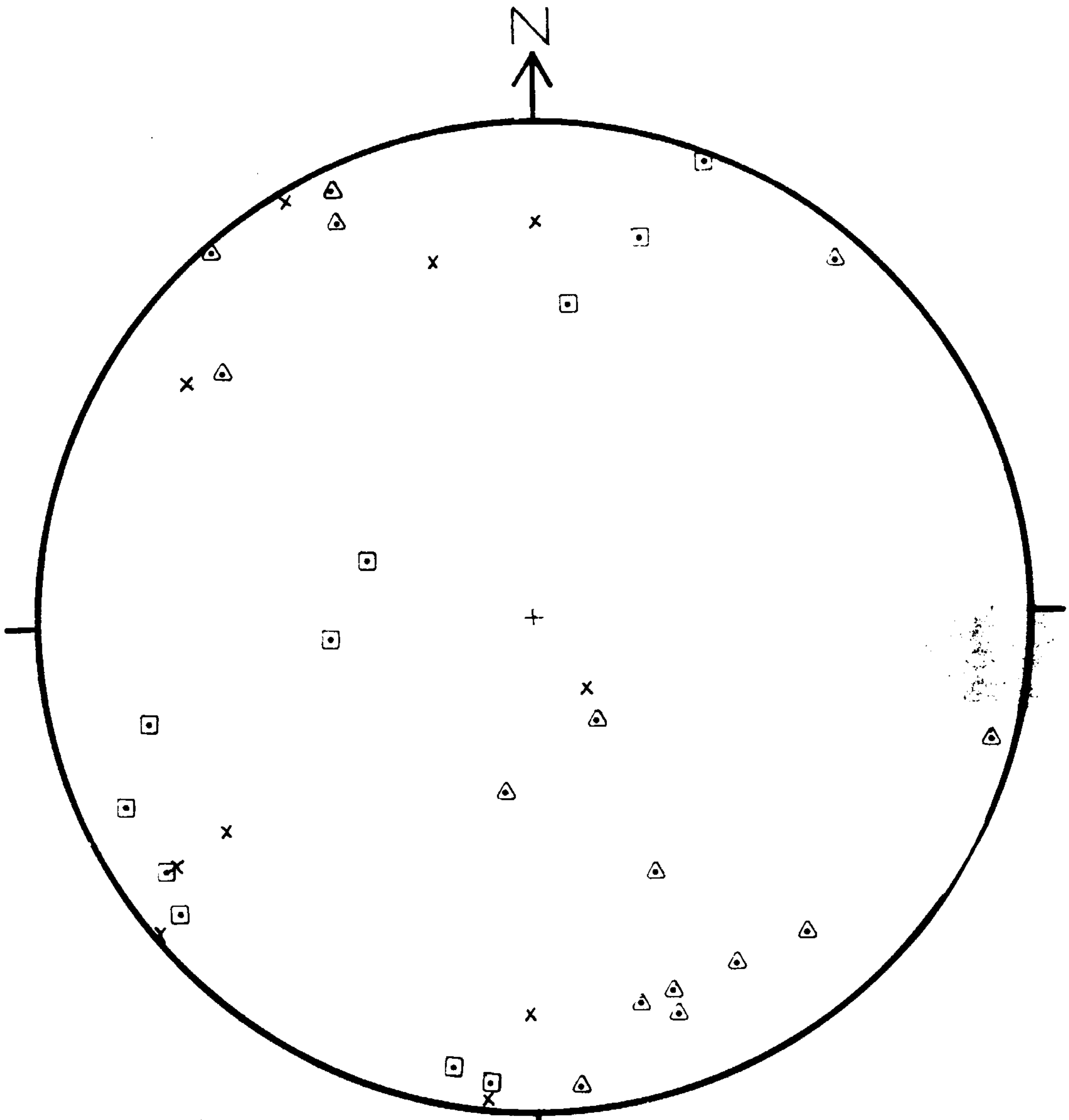


FIGURE 5: Equal area stereogram of 35 poles to bedding in the Comox Formation and flows in the Karmutsen Formation. Also shown is the inferred axis of folding at a right angle to the great circle through the poles to bedding.



⊡ realgar-carbonate veins, veinlets.(11).
△ quartz±Pyrrh.±Py.±Cpy. veinlets (16).
x Tertiary quartz diorite dykes (10).

FIGURE 6: Equal area stereogram showing the poles to realgar-carbonate veins and veinlets, and quartz-sulphide veinlets and Tertiary quartz diorite dykes.

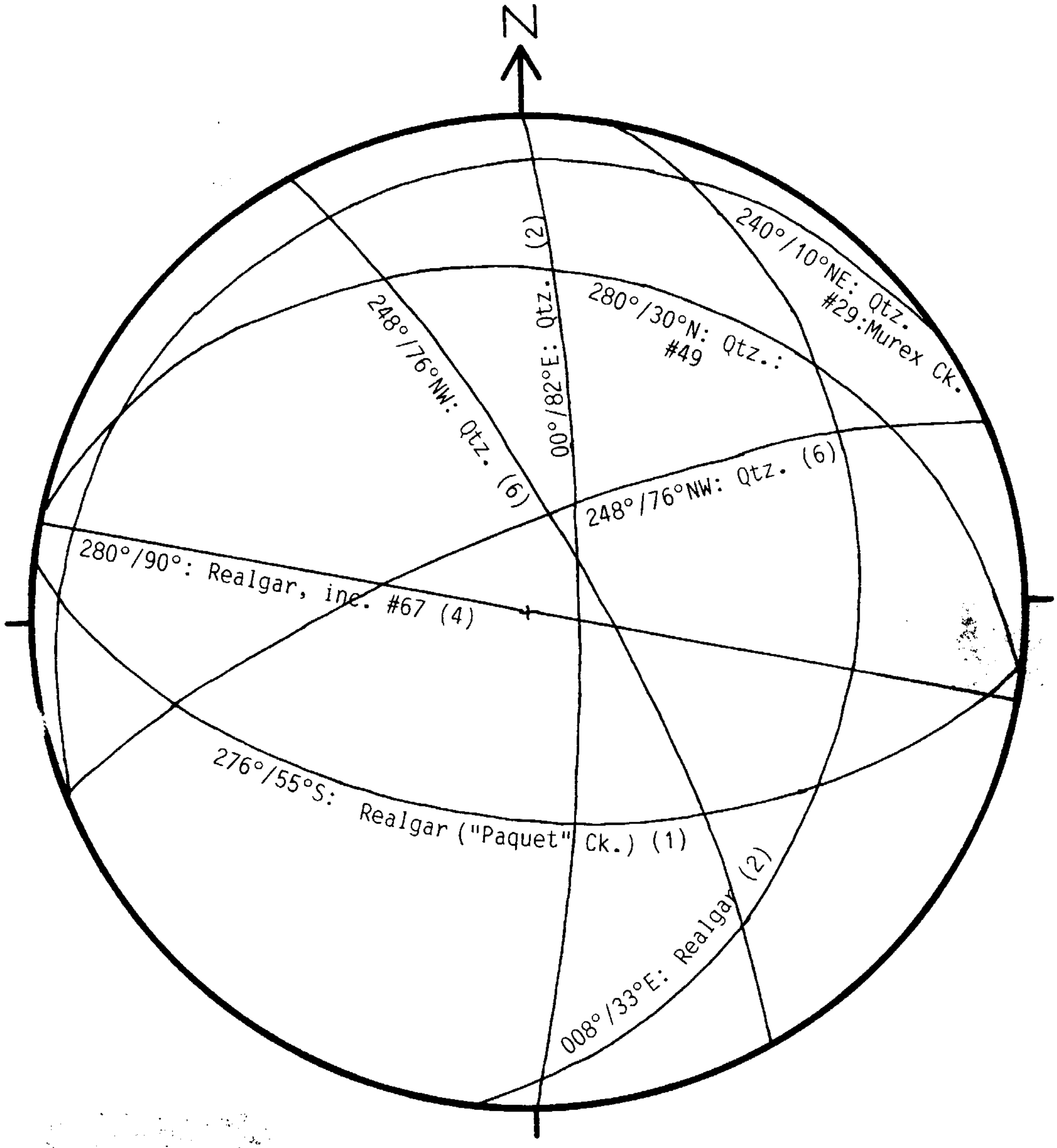
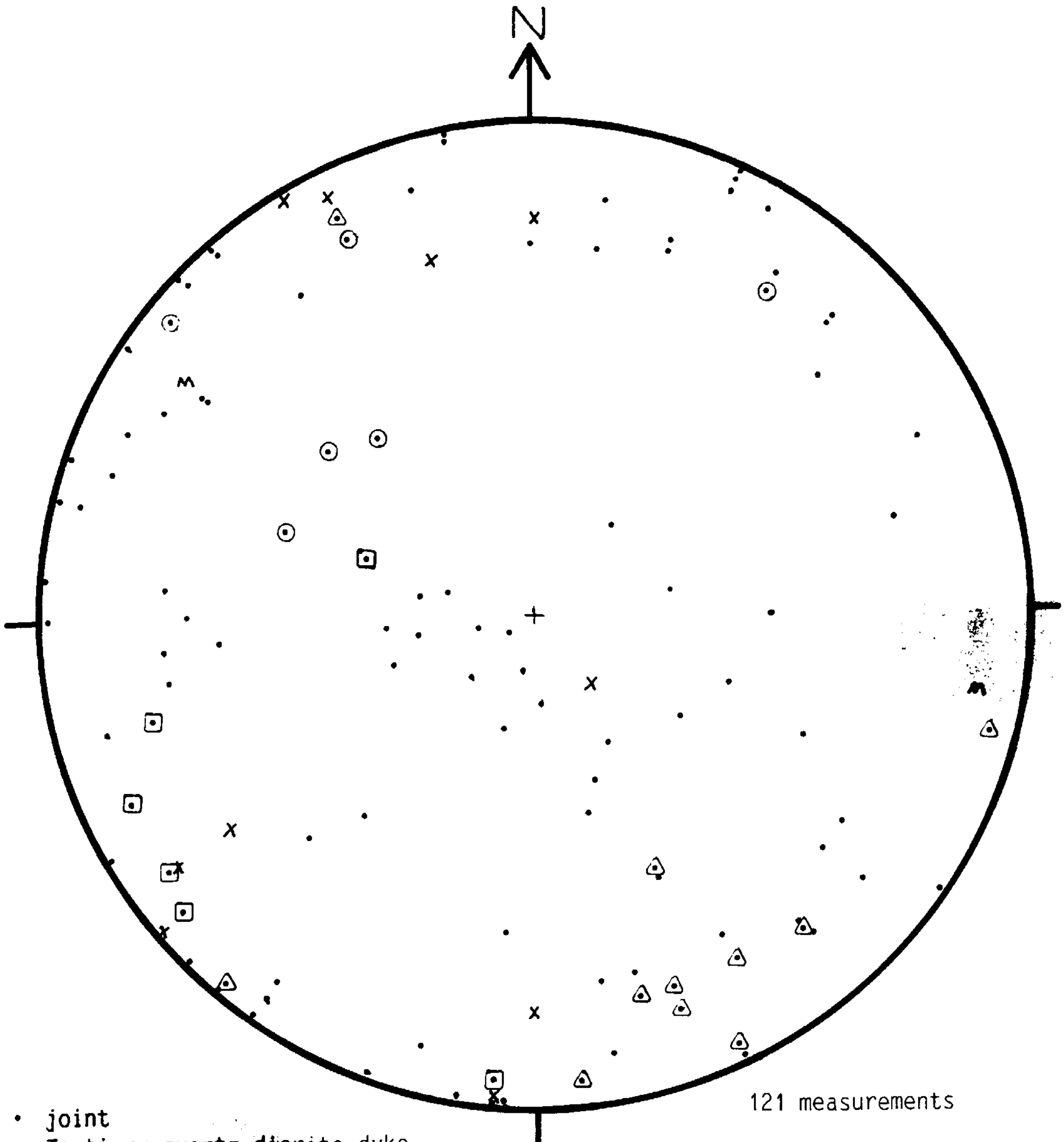
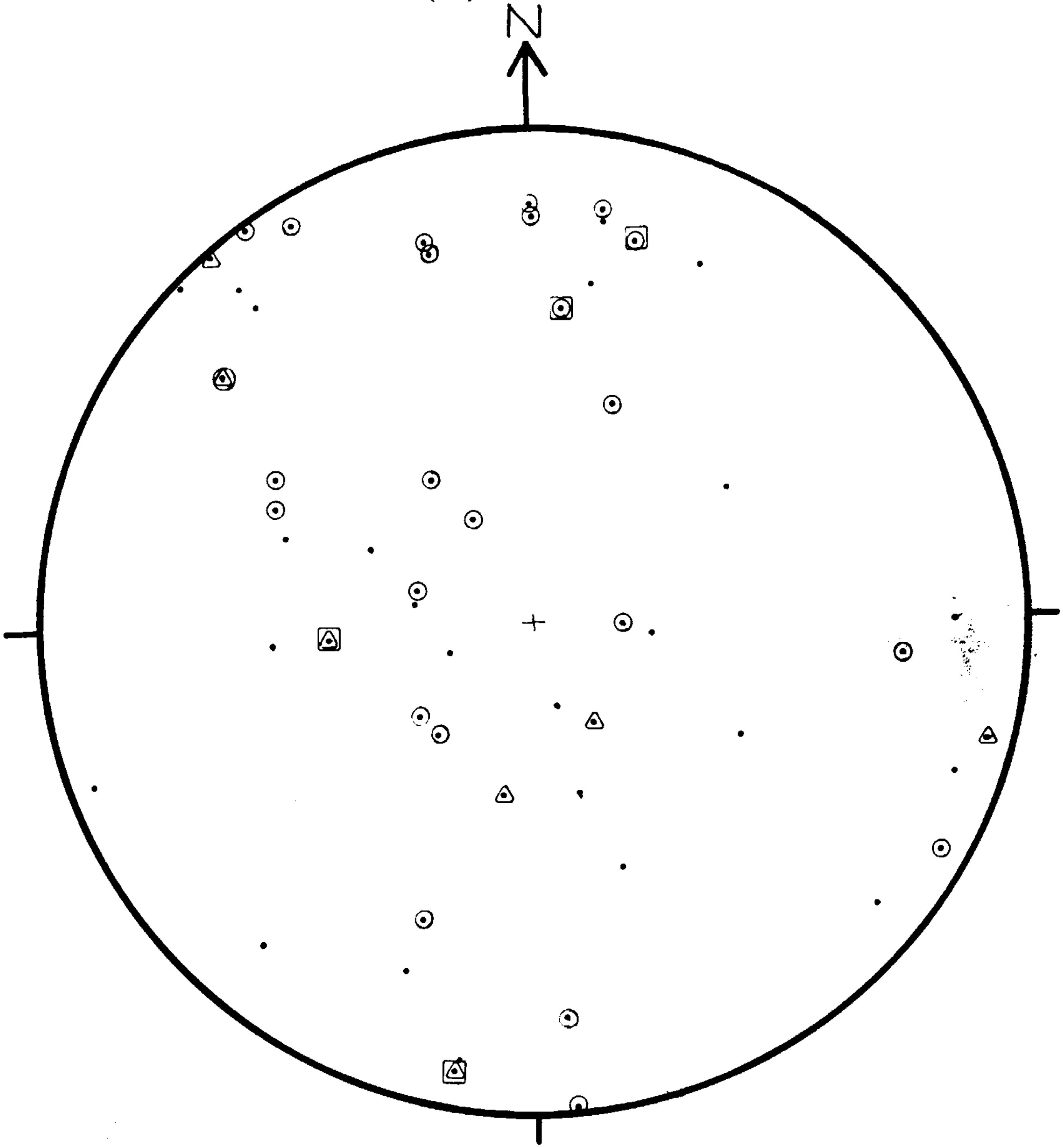


FIGURE 7: Equal area stereogram showing the great circles for the arithmetic average strike and dip for the various sets of realgar-carbonate veinlets and veins and quartz-sulphide veinlets on the Dove property. The number of veinlets in each set is shown in parentheses.



- • joint
- x Tertiary quartz diorite dyke.
- M mafic dyke.
- ○ with ankerite? ± calcite veinlet.
- □ with realgar-carbonate veinlet.
- △ with quartz±pyrrhotite±pyrite veinlet.

FIGURE 8: Equal area stereogram of the poles to joints, veinlets (not including those in shear zones) and dykes on the Dove property.



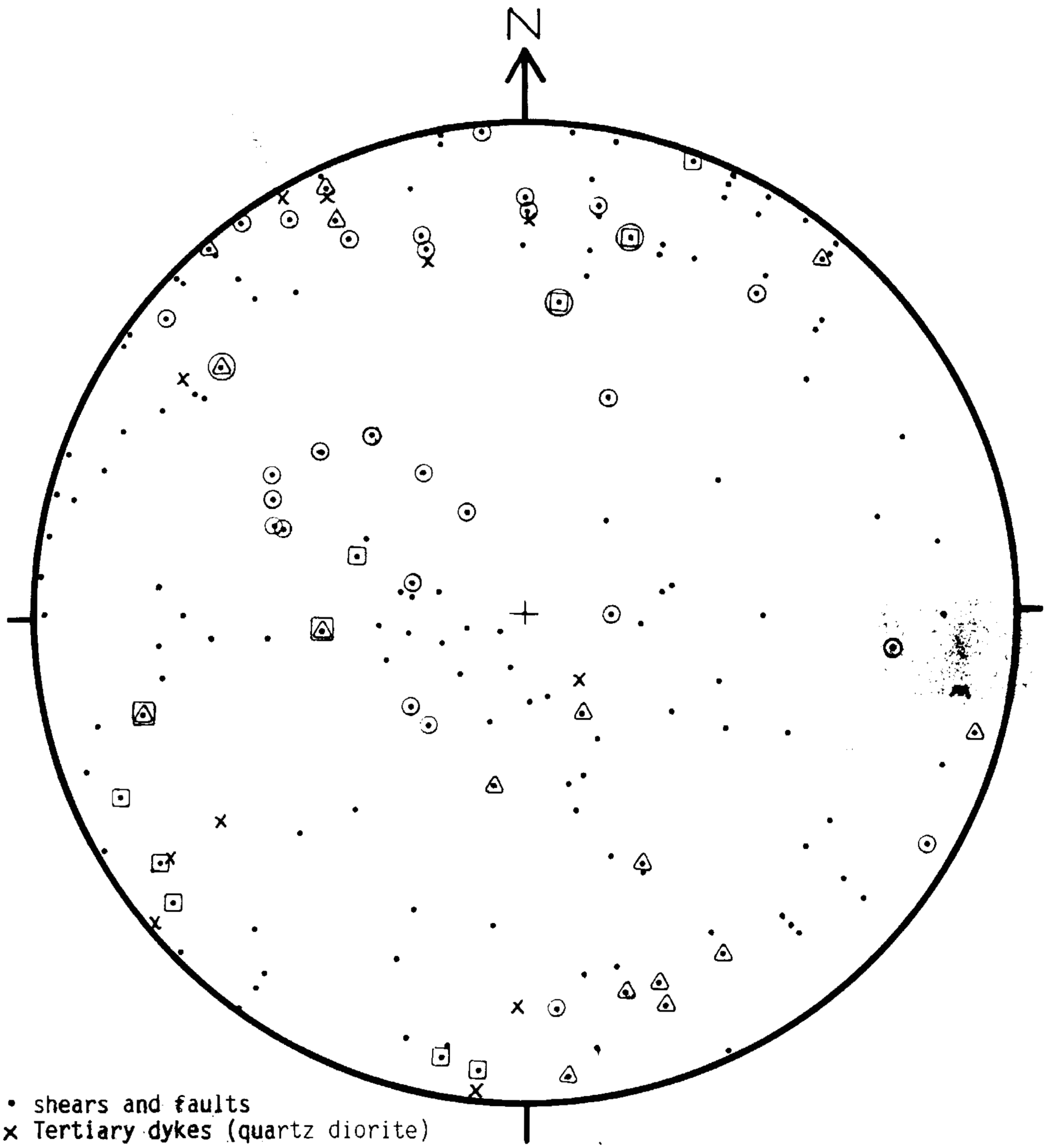
• pole to shear zone or fault

○ with ankerite? alteration ± Carbonate veinlets ± hematite alteration.

□ with realgar-carbonate veins or veinlets.

△ with quartz±pyrite±pyrrhotite veinlets.

FIGURE 9: Equal area stereogram of poles to shear zones and faults on the Dove property.



• shears and faults
x Tertiary dykes (quartz diorite)
ʍ Mafic dykes
○ with Fe-carbonate ±calcite veinlets/±ankerite? alteration
□ with realgar in carbonate veinlets
△ with quartz±pyrrhotite±pyrite±chalcopyrite veinlets/± carbonate alteration.

FIGURE 10: Equal area stereogram showing the poles to all (177) joints shear zones, veinlets and dykes measured on the Dove property. The poles are contoured in Figure 11.

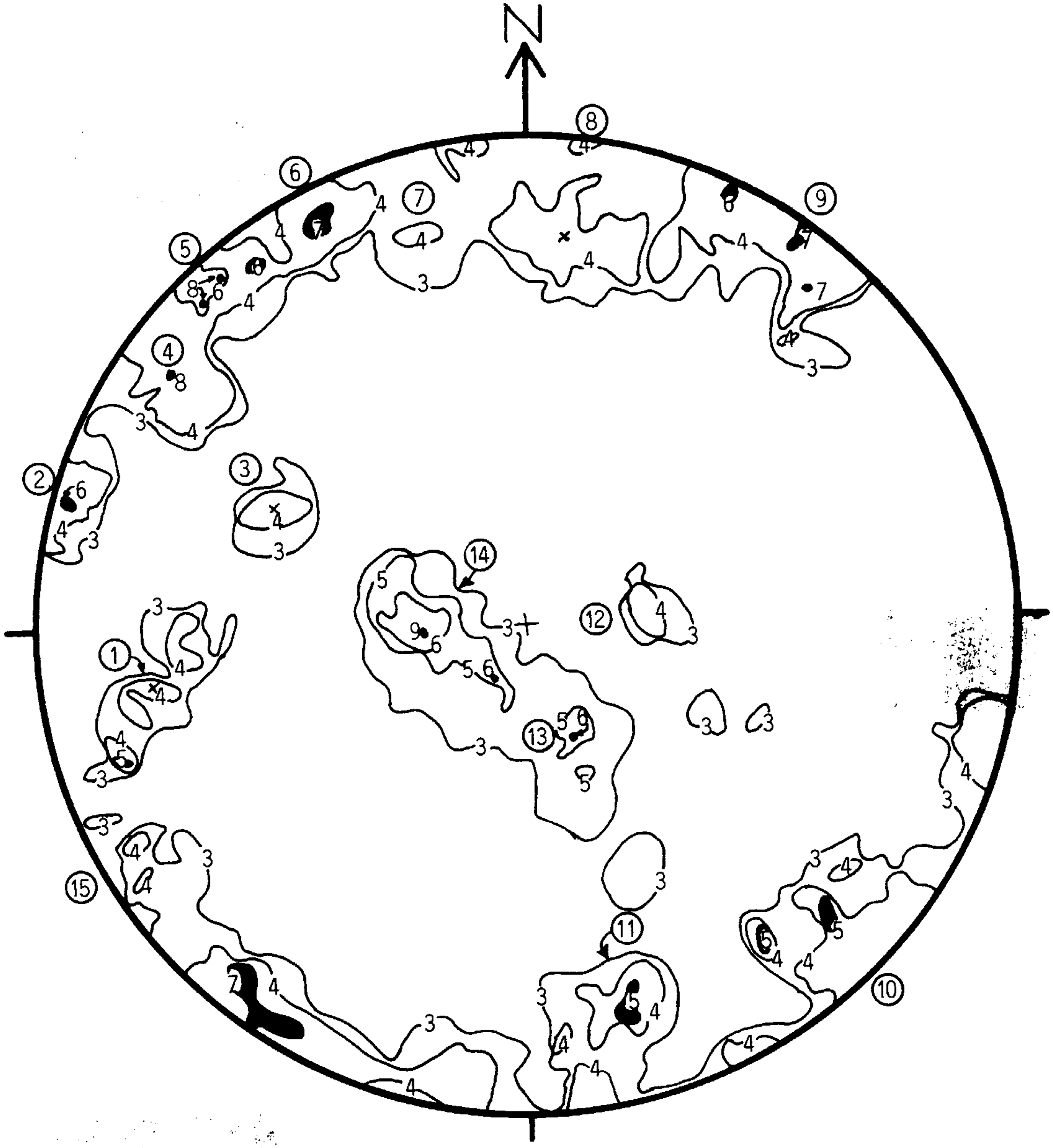


FIGURE 11: Equal area stereogram showing the contoured poles (177) to joints, shears, veinlets and dykes on the Dove property. The contour intervals are the number of poles per 1% area. The mean orientation of the 15 sets of mesoscopic structures (circled numbers) are defined here and tabulated in Table 1.

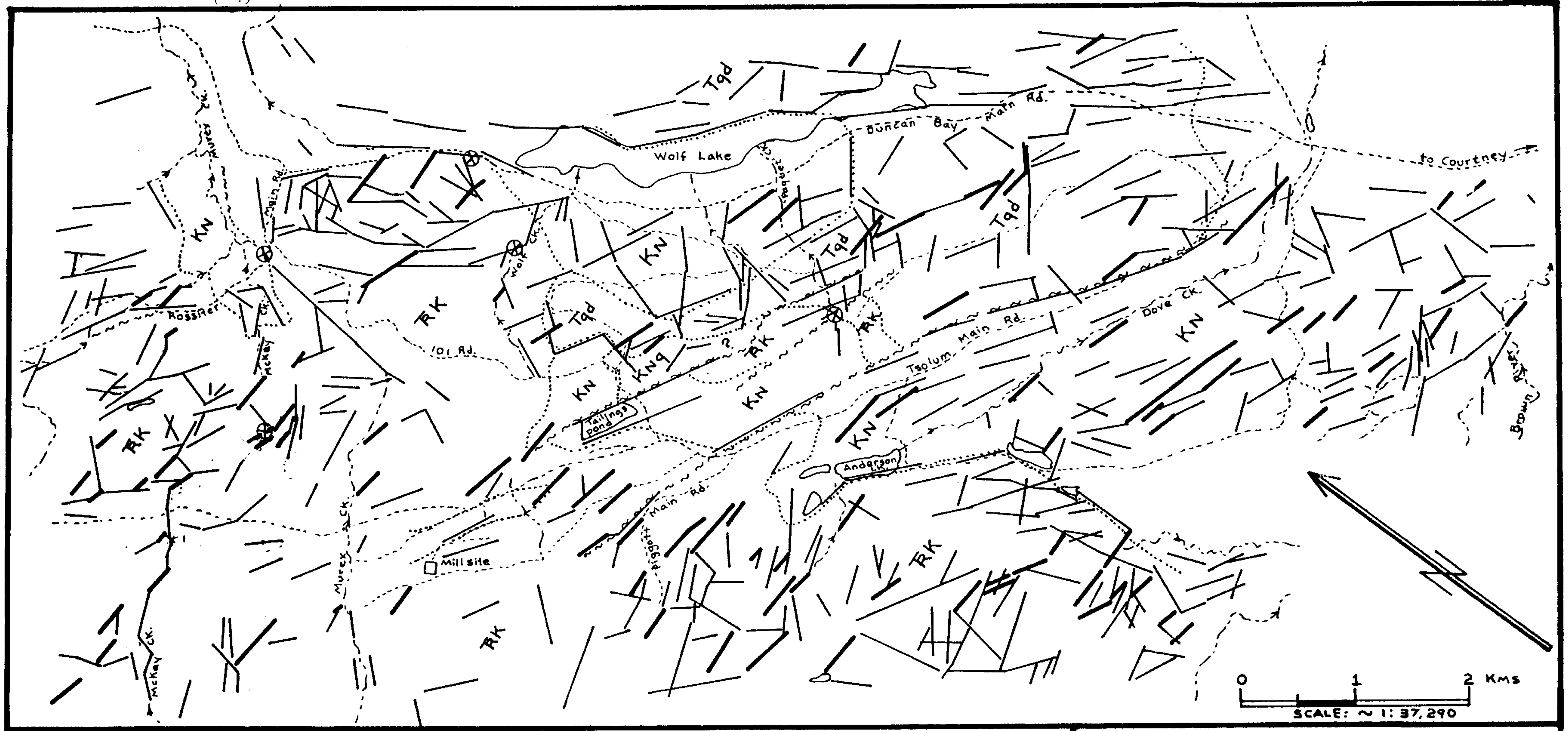


FIGURE 12: aerial photograph lineaments of Dove property and area.

LEGEND

- air photo. lineament
- air photo. lineament with trend between 270 and 290°
- lithologic unit contact
- fault: inferred or known.
- road
- creek
- Tqd Tertiary quartz diorite
- KN Cretaceous Nanaimo Gp., Comox Fm.
- RK Triassic Karmutsen Fm.
- ⊗ mineral occurrence

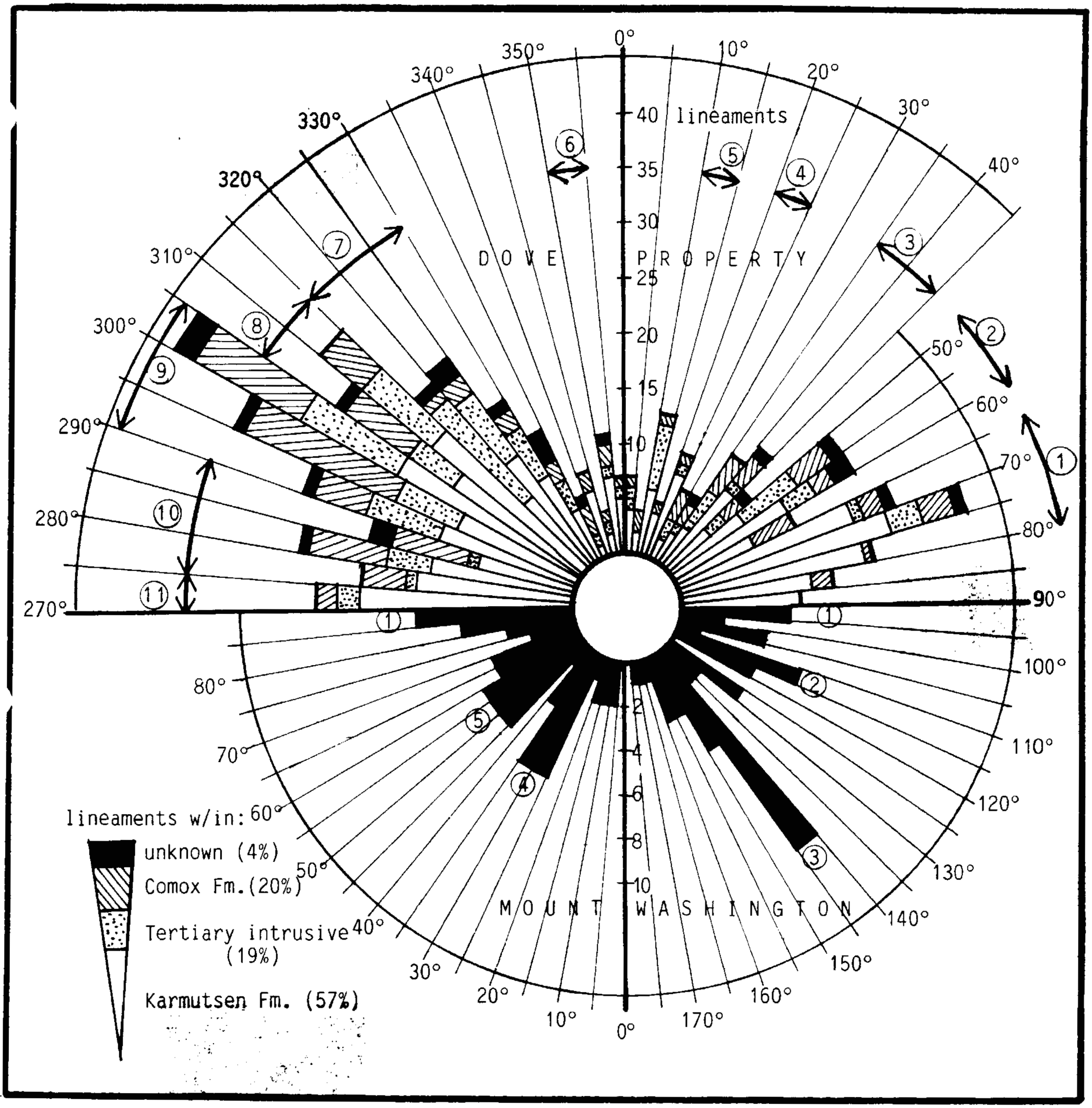
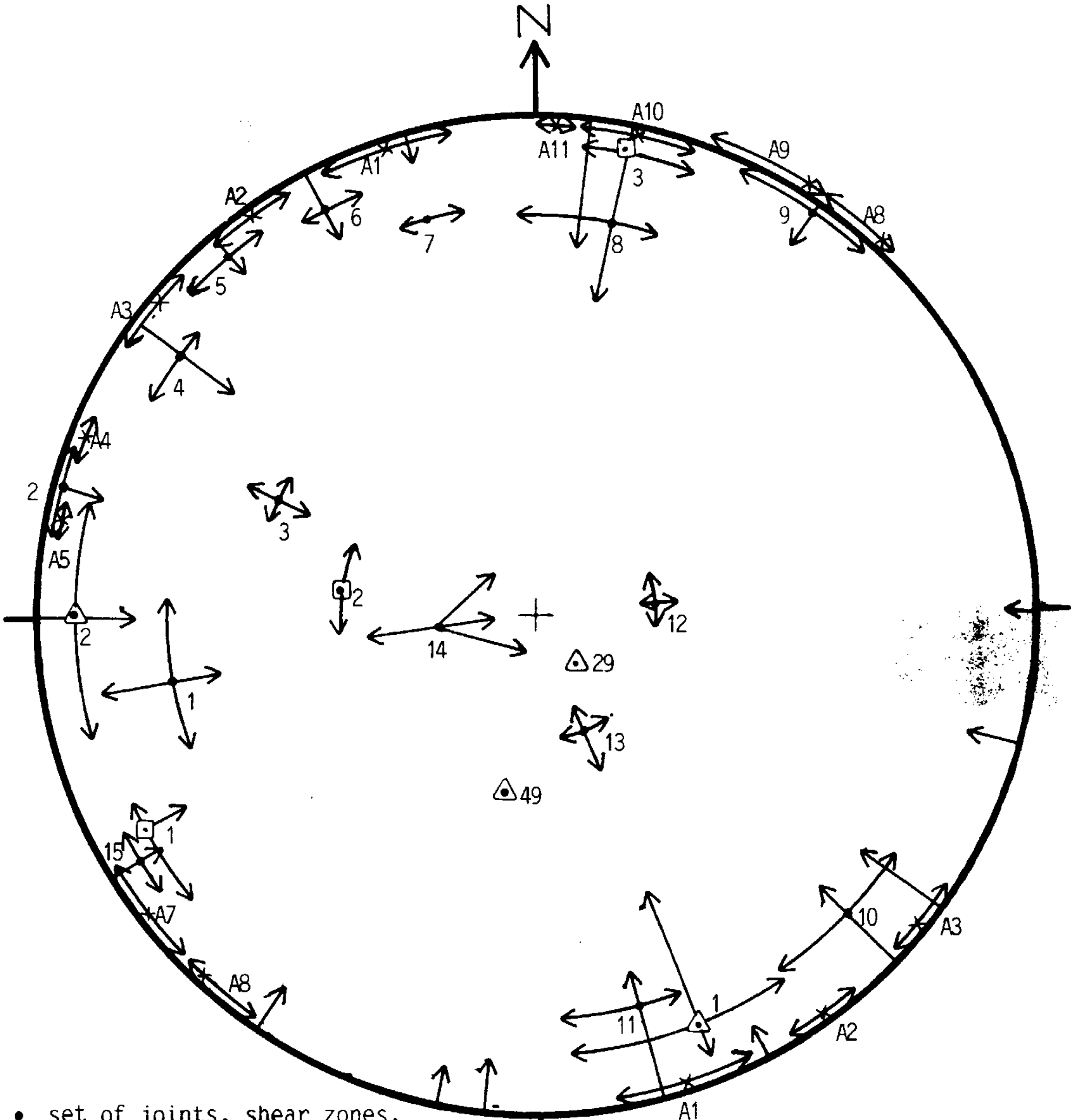


FIGURE 13: Rose diagram of the frequency (number of lineaments) distribution of the trends (for 5° intervals) of 591 aerial photograph lineaments on and proximate to the Dove property (upper half of diagram) and 118 lineaments on Mount Washington in the area of the copper mine. The diagram shows various sets of lineaments defined (circled numbers) and listed in Table 1.



• set of joints, shear zones, veinlets, dykes (pole).

⊡ set of realgar-carbonate veins (pole).

⧊ set of quartz-sulphide veinlets (pole).

A8 set of air photo. lineaments listed in Table 1

× mean of air photo. lineament set (pole; assumed vertical dip)

FIGURE 14: Stereogram showing the mean and the range (arrows) of strikes and dips of the various sets of mesoscopic structures, and the "mean" and range of trends of sets of aerial photograph lineaments for the purpose of correlation between mesoscopic structure sets and lineament sets listed in Table 1.

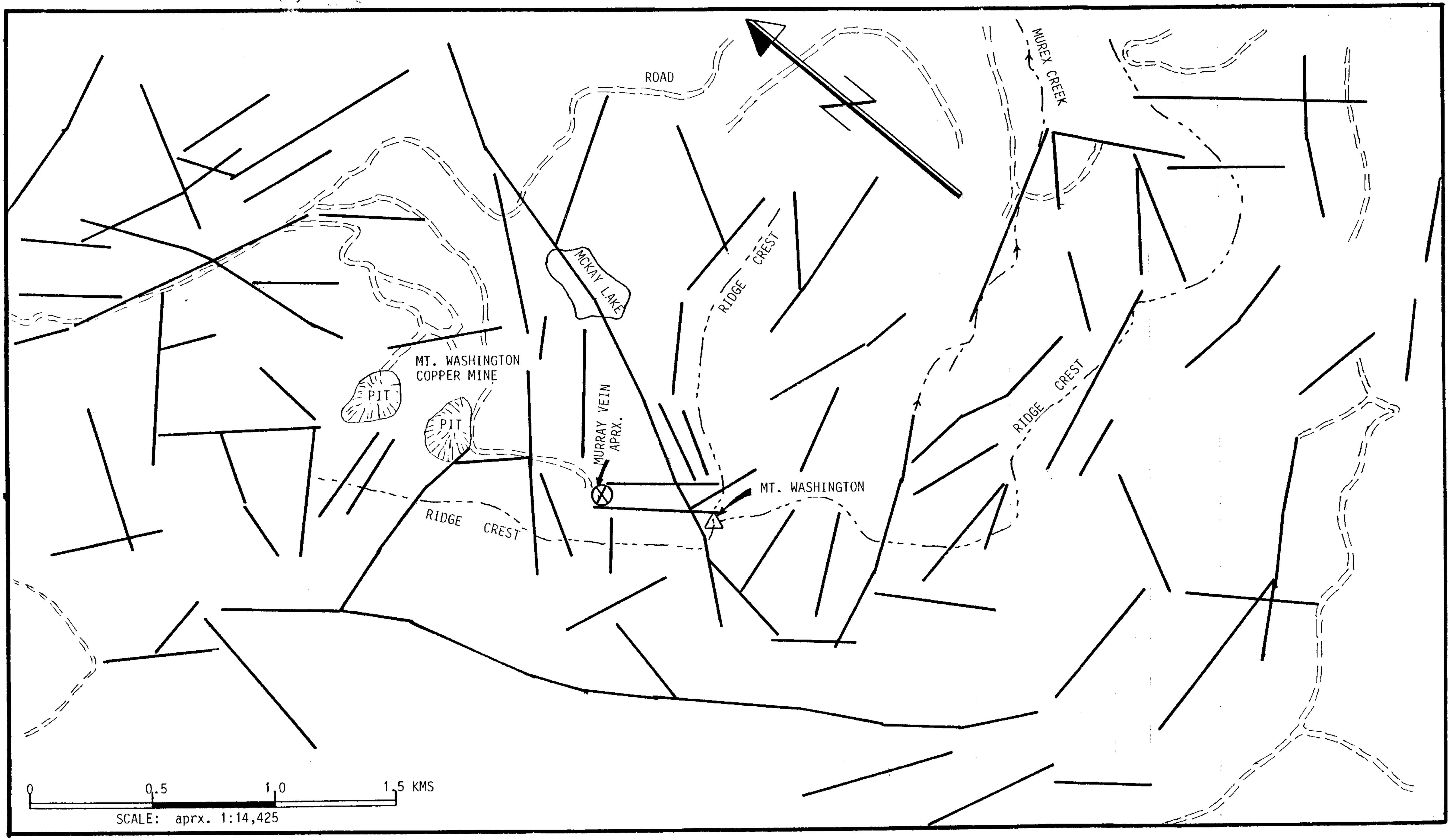


FIGURE 15: Aerial photograph lineaments in the area of Mount Washington copper mine.

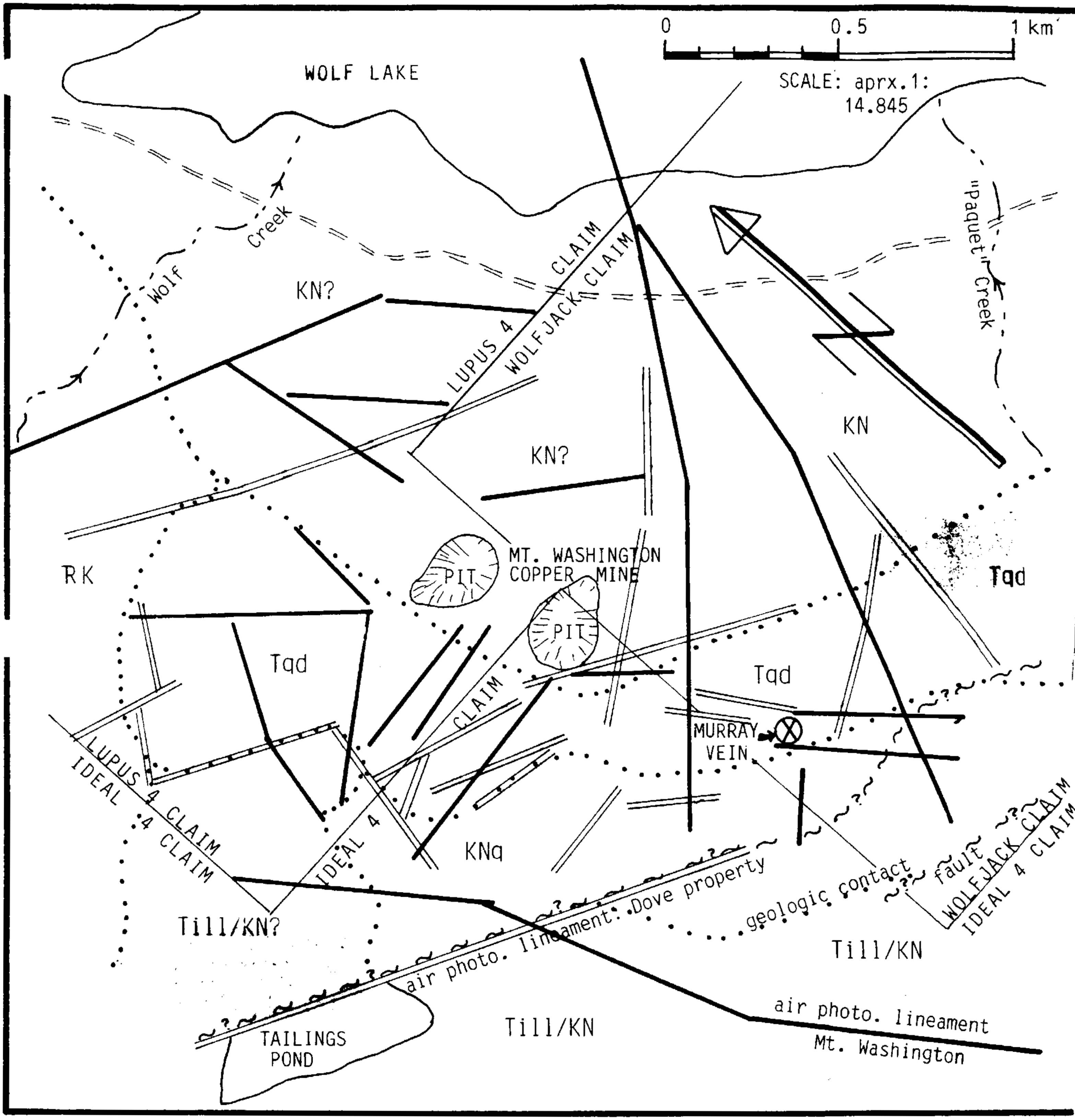


FIGURE 16: Aerial photograph lineaments of the Mount Washington Copper Mine area superimposed on lineaments of the Ideal 4 and Wolfjack claims area. Comparison suggests the Comox Formation (KN) in the northeast corner of the Ideal 4 and southwest corner of the Wolfjack claim near the contact with the Tertiary quartz diorite (Tqd) warrants further exploration.

APPENDIX A

DESCRIPTIONS OF ROCK SAMPLES COLLECTED FOR ANALYSES, DOVE PROJECT, MOUNT WASHINGTON AREA, OCTOBER, 1986

APPENDIX A

ROCK SAMPLE DESCRIPTIONS: Dove Project, Mount Washington Area, collected by G. Benvenuto, October 3-19, 1986.
(all analyses in ppm, except Au - in ppb)

Sample #2A: Float: sandstone? with pyrrhotite and cpy: feldspar? crystal fragment (very fine) sandstone; very rusty weathering, weakly magnetic; sub-opaque dark grey; strongly sericite?-altered. Approx. 1-3%, very fine to fine, diss. and fracture-pyrrh.; approx. 0.5%, very fine, diss. and frcr. (stg.-like) cpy. Minor, opaque, creamy tan, ultrafine grained, sph?? in frcr. Rx. mod. soft. Rubble probably from within large slump blocks of Nanaimo sandstone; could be bed?, greater than or equal to 50 cm thick. Grab sample composite. Located: Dove Ck., 1.2 kms SE of SE corner of Ideal #2 claim.
582 Cu, 100 pb, 86 Zn, 2.3 Ag, 33 Au.

Sample #3A: Float: dacite?: w/ Pyrrh and cpy: Dac.? very rusty, aphanitic?, dark grey, mod. soft, strongly sericite?-altered. W/ 2-3% Pyrrh. (0-3%, very fine diss. + 0-3%, along very thin, co-planar stgs.). Approx. 0.1% Cpy, (very fine grained, diss. along stgs.) 1 band, 2 cm thick w/ approx. 10-15%, ultrafine, pyrite? Grab from cobble 9 x 12 x 17 cm. Located: Dove Ck., in claim south of Ideal #2, and 2.1 kms. SE of Anderson Lk.
1790 Cu, 111 Co.

Sample 29A: Murex Creek showing: Fe-carb.-Py (± Sph) veinlet-shear zone. 0.5 to 3 cm thick shear zone containing white to clear grey quartz veinlets, loc. with calcite in centre. Shear zone of strongly sheared, calcite ± Fe carb.? altered basaltic conglomerate with few %, paper thin, irregular stgs. of black, ultrafine grained mineral (loc.

pervasive, black alteration). Py. as irregular pods and diss. grains and lenses in quartz veinlets, very loc. with up to 1-2%, very fine to fine, sphalerite. Py. also occurs as 1 to 15%, very irregularly distributed stgs. and lenses up to 5-6 mm thick in altered basalt; Py. very fine to medium grained. Zone strikes 240°/dips 10° NW. Grab sample composite along 1 m exposure, gen. 1 to 3 cm thick. Location: south-central Ideal #9 claim, along easterly branch of Murex Creek, 120 m north of bridge along main haulage road.
541 Cu, 8218 Pb, 11,764 Zn, 24.9 Ag, 0.288 oz Au/t, 3879 As, 50 Cd, 15 Sb.

Sample 29B: Carbonate-altered basalt in hanging wall of sulphide-quartz veinlet shear (#29A). 12 cm (+) zone of very strongly, Fe-carb? altered basaltic conglomerate with a few %, irregular, stringer-like veinlets and zones of carb.; also to 1% black mineral filled, discontinuous, irregular fractures. Chip across 12 cm. Same location as #29A.
262 Cu, 146 Pb, 338 Zn, 2.3 Ag, 50 Au, 90 As.

Sample 29C: Carbonate-altered basalt in footwall of sulphide-quartz veinlet shear zone of #29A. Zone of weak to moderate Fe-carb.? alteration (basalt light tan-grey). Zone contains overall approx. 1-3%, irregular, criss-crossing, stringer-like, hairline to 2 mm thick fractures filled with black, ultrafine to very locally, fine grained, mineral, and locally as pervasive (80%) alteration in brecciated-appearing basalt. Chip sample across 30 cm in immediate footwall of #29A. Same location as #29A.
400 Cu, 45 Pb, 111 Zn, 2.5 Ag, 21 Au, 45 As. (See whole rock analyses.)

Sample 33A: Ankerite? alteration fracture and shear zone cutting Nanaimo cobble conglomerate; at south edge of zone, approx. 30 cm zone of moderate fracturing and shearing. Basaltic conglomerate weakly ankerite?-altered: matrix is opaque white with black speckles; clasts are medium grey to light pinkish tan to locally black. Zone with about 1%, Fe-carbonate veinlets to 0.7 cm thick, gen. parallel to zone (strike 265°/dips 90°). Chip across 1.5 m. Loc. in Murex Creek, central Ideal 9 claim at confluence with middle and easterly branches. No anomalous metals.

Sample 39A: Quartz + Fe-carbonate veinlets in ankerite? alteration zone: 1.5 m wide shear and fracture zone with ankerite? alteration of Nanaimo Gp. boulder and cobble and pebble conglomerate. In centre of zone, 12-16 cm wide interval of strong shearing and strong ankerite and hematite alteration with lensy, white Fe-carbonate (± calcite) veinlets commonly 1-5 cm thick; locally parallel, white quartz veinlets to 1.3 cm thick. Chip across 5.5 cm width containing 1.3 cm thick, quartz veinlet and 2 cm thick Fe-carbonate veinlet (strikes 040°/dips 70° SE). Located in Murex Creek, north-central Ideal 9 claim, 600 m NE of confluence with McKay Creek.
31 Pb, 151 Zn, 77 Au.

Sample 49A: Quartz-pyrrhotite-cpy-veinlet-shear zone in massive basalt of Karmutsen Formation. Zone recessive; about 6-6.5 cm thick. Zone contains about 80-90%, quartz as white; irregular, sheared and brecciated veinlet and lenses to 1.5 cm thick. Quartz contains very irregularly distributed pyrrhotite or pyrrh. + Cpy or Cpy. as irregular grains and patches and stringers along fractures com. parallel to zone. Located on east wall of easterly branch of Murex Creek, north-central Ideal #1 claim, about 1670 m south of confluence with middle branch.
0.42% Cu, 20 Pb, 2.43% Zn, 5.6 Ag 0.002 oz Au/t, 394 As, 151 Cd.

Sample 52: Rusty fracture zone within basalt of Karmutsen Formation: zone about 15 m wide. Basalt moderately to locally strongly fractured with abundant rusty fractures locally with patches of pyrrhotite and pyrite. Contact relationship obscure but in approx. centre of zone, a prominent fracture-shear striking 025°/dipping 30°SE. Chip across 12 m wide part of zone (measured parallel to creek). Located in easterly branch of Murex Creek, 817 m south of confluence with middle branch, central Ideal #1 claim, 217 m south of #49A.
549 As, 17 Sb, 2 Au.

Sample 51A: Rusty shear zone cutting basalt of Karmutsen Formation: 55-105 cm wide. Zone consists of anastomotic shears (about 5% of zone) about 0.5 to 12 cm wide, locally with calcite veinlets to 1 cm thick. Basalt within zones of strong shearing, medium grey altered and with 1-3%, very, very fine, disseminated pyrrhotite, and sub-zones up to 1 cm thick with about 50%, very fine to fine, pyrrhotite along stringers. SE bounding shear strikes 050°/dips 75°SE; NW bounding shear strikes 045°/dips 90°. Chip across 55 cm wide part of zone. Loc. 27 m north of sample #52.
154 Zn, 209 As, 179 Sb, 4 Au.

Sample 57: Boulder of massive pyrrhotite + chalcopyrite: very rusty weathering, sub-angular boulder, 18 x 35 x 38 cm, probably weathered from till. Pyrrh.: fine to coarse grained, very strongly microbrecciated or cut by micro-fracture cleavage filled with clear quartz?. Cpy. forms about 1-2%, as irregular, disseminated patches, commonly to 2 x 3 mm. Minor irregular patches of clear white, soft mineral, locally coarsely crystalline with 1 + good cleavage. Chip across 10 cm width of boulder. Located on old, washed out logging road parallel to and 300 m west of easterly branch of Murex Creek, central Ideal #1 claim.
0.98% Cu, 5.6 Ag, 0.001 oz Au/t, 249 Ni, 355 Co, 300 As.

Sample 60: Ankerite?-hematite-clay-alteration shear zone cutting Karmutsen Formation basaltic agglommeratic lapilli tuff (hyaloclastite). 25 cm thick zone of strong shearing and up to 25%, stringers and laminations of hematite in opaque white, clay weathered rock. No veinlets apparent. Shear strikes 030°/dips 50°SE. Chip across 25 cm thick shear zone. Located on McKay Creek, 812 m from bridge, in NW corner of Ideal #1 claim.
161 As, 26 Au.

Sample 67A: Calcite (+ realgar) vein in prominent shear zone. White calcite vein (lens-shaped?) 5 to 15 cm thick x 1.5 m strike-length (exposed) within sheared, Fe-carbonate? + calcite-altered Karmutsen Formation broken pillow breccia (basaltic). Shear and vein strikes 105°/dips 70°S. Calcite vein contains minor to about 0.25%, bright, flourescent orange realgar and irregularly disseminated needles and rectangular grains and as one discontinuous lens to 6 mm x 15 cm long. Minor fractures in calcite with very dark grey, ultrafine material. Chip across 15 cm thick vein. Located on McKay Creek (south branch), at 2040 m SW (along ck) from bridge, in east-central Ideal #5 claim.
5366 As, 4 Au.

Sample 67B1: Calcite (+ realgar + arsenopyrite) vein, in major shear zone of Fe-carbonate? + calcite-altered, basaltic pillow breccia of Karmutsen Fm. (same shear zone as #67A). Southern 40 cm of 70 cm thick vein relatively massive. Northern 30 cm of vein consists of lensy veinlets of calcite with ribbon-like structure, and lenses of carbonate-altered basalt, and one 6 cm interval with patches of realgar to 4 mm wide, strong out along centres of 2 to 3 lenses of calcite. In northermost 7 cm of vein, about 3-4%, irregular lenses of massive, very fine to fine grained arsenopyrite? parallel to vein, up to 8 mm thick.

Rare? irregular patches to 2 cm of very fine magnetite?. Southern 40 cm of vein with about 0.25% disseminated, needles of realgar. Vein and shear strikes 105°/dips 70°S. Chip across 70 cm thick vein. Adjoins #67B2, located to north. Located 24 m west of #67A.
2924 As, 1.71% Sb, 4 Au.

Sample 67B2: Sheared, Fe-carbonate?-calcite-altered basaltic broken pillow breccia in major shear zone (same as #67A and 67B1). Basalt is opaque light grey. Minor patches of weak? fuchsite? alteration. Basalt moderately to locally strongly sheared; cut by anatomotic shears. Chip sample across 2.7 m wide interval between samples #67B1 and 67B3.
188 Cu, 74 As, 48 Sb, 5 Au.

Sample 67B3: Calcite (+ realgar + arsenopyrite) vein: adjoins #67B2 located to south. Occurs in 35-50 cm wide interval of sheared, carbonate-altered basalt with 10+, anastomotic, lensy calcite veinlets to 1-2 cm thick (on both sides of main calcite vein. Calcite vein 7 to 18 cm thick. Contains minor to very locally 2%, stringers to 3 mm thick of massive, very, very fine, arsenopyrite? with hairline stringers of pyrite. Vein with about 0.1 to 0.5%, disseminated needles, to 8 mm long of realgar, commonly along zones that yield pale flourescent orange tint to calcite. Chip across 18 cm thick vein. Same location as #67B1 and 67B2.
1156 As, 53 Sb, 3 Au.

Sample 73A: Shear zone with ankerite? alteration cutting basalt of Karmutsen Fm. Shear zone up to 15 cm thick between shear splays. Ankerite? alteration in hanging wall and footwall of shear, up to about 1 m. Within shear zone, bsalt altered to very, very fine grained black material, with about 3-5%, irregular, stringer-like, white Fe-carbonate

veinlets to 8 mm thick, which very locally contain 1 or 2 grains (fine) of chalcopyrite, minor quartzose zones or veinlets. Shear strikes 310°/dips 25°NE; parallels prominent joint set. Chip across 15 cm shear zone. Located in east-draining, western fork of Murex Creek (north of McKay Cr.), 329 m west of bridge on Regan Lake Main road, NE corner, Ideal 6 claim.
538 Cu, 37 As, 21 Au.

Sample 95A1: Calcite-realgar veinlets: 0.5 to 2.5 cm thick; anastomotic; with rusty selvages. Calcite contains about 5-8%, very fine to finely crystalline needles to laths of realgar, irregularly disseminated. Veinlet occurs in sheared joint in feldspar, hornblende, seriate porphyritic dacite? (Tertiary), striking 345°/dipping 70°NE. Chip samples across 2.5 cm. Located in 'Paquet' Creek, southwest corner of Wolfjack claim, 490 m up creek to south from bridge on Wolf Main road.
234 Pb, 16,709 As, 523 Sb, 4 Au.

Sample 95A2: Magnetite(?) + arsenopyrite? + quartz (+ calcite) veinlet in seriate porphyritic dacite? (Tertiary): very rusty weathering, with about 80% magnetite (very, very fine to very fine grained) with about 2-5%, calcite matrix. Quartz is medium grained, forming about 5-7%, "disseminated" grains in centre of veinlet. Veinlet occurs in shear joint that splays from that of #95A1, located 12 cm to SW. Veinlet joint strikes 340°/dips 70°NE. Chip sample across 3.5 cm thick veinlet (which varies from 1 mm to 3.5 cm). Located 12 cm NE of #95A2.
125 Zn, 46,215 As, 56 Sb, 1 Au.

Sample 96A: Realgar + iron-carbonate (+ calcite + quartz) veinlets in shear-alteration zone cutting ankerite?-altered amygdaloidal basalt of Karmutsen Fm., just west of Karmutsen Fm/Tertiary porphyritic dacite? contact. Shear zone poorly exposed, in one place consists of somewhat rusty, strongly sheared and fractured, ankerite?-altered basalt. Soft black material common along shears. Overall approx. 1-3% realgar veinlets and lenses (sheared veinlets?) and patches. Thickest realgar veinlet at footwall of shear zone: about 1 to 1.5 cm thick with lenses of iron-carbonate (+ calcite) to 1.2 cm thick and locally with quartz lenses (with about 5% realgar) to 1.5 cm thick; all cut by black material-lined shears; minor fine to very fine grained, disseminated pyrite in realgar veinlet. Shear zone strikes 096°/dips 55°S, with slickensides that trend 185° and plunge 50°S, and that suggest hanging wall down relative to footwall. Chip across 35 cm shear zone. Located in 'Paquet' Creek in southwest corner of Wolfjack claim; 570 m up creek to south of bridge on Wolf Main road, and 83 up creek from #95A1.

173 Cu, 0.6 Ag, 36,081 As, 95 Sb, 57 Au.

Sample 101: Meta-quartzo-feldspathic sandstones? with pyrrhotite + chalcopyrite: medium grey, fine grained, sericite?-altered feldspar and about 20-30% quartz. About 3-5% pyrrh. in irregular, disseminated patches, to 5 x 5 mm, sieve-like, very fine grained, locally with very fine grained cpy (overall about 0.5%). About 0.5%, discontinuous, hairline fracture-pyrrh. Grab sample with 5% pyrrh. Located in roadcut on 101 Road about 430 m north of tailings pond, north-central Ideal 4 claim. Meta-sandstone immediately? overlies Tertiary intrusive body in Ideal 4 claim.

0.09% Cu, 1.0 Ag, 0.001 oz Au/t.

Sample 103: Meta-argillaceous quartzo-feldspathic sandstone? with pyrite (± pyrrhotite + chalcopyrite): 2 m interval of very strongly sericite (+ chlorite?-) altered, very rusty weathering with about 5-15% pyrite and 1-2% chalcopyrite.

Pyrite ultrafine grained, with sieve texture [around? quartz (about 25%) and feldspar]. Cpy very fine grained, irregularly disseminated. Interval grades? (contact relationships poorly exposed) in both directions into meta-sandstone? with about 0.5%, very fine, disseminated pyrite (± pyrrh.). Grab sample with about 15% pyrite an 1-2% chalcopyrite (and non-magnetite). Located about 255 m south of #101 on 101 Road, north-central Ideal 4 claim. 0.15% Cu, 13 Pb, 309 Zn, 1.4 Ag, 0.001 oz Au/t, 120 Ni; 197 Co, 112 As.

Sample 108: Tailings from Mount Washington Copper Mine mill: grabs along about 5 m interval at dam-head of tailings pond, in northwestern Ideal 4.
14 Mo, 307 Cu, 7 Pb, 14 Zn, 3.1 Ag, 74 Au, 354 As, 12 Sb.

Sample 125: Pyritic? meta-argillaceous? siltstone? of Nanaimo Group?: very rusty weathering; fresh color: very dark grey to near black; moderately soft; mostly granular-appearing, fine-grained, sericite?-altered feldspar grains, with about 1-2% hornblende? grains and possibly few %, quartz? grains. Commonly, 1-2% rimonitic dits. Very locally 1-2% very irregularly disseminated pyrite? grains (very, very fine grained). Rock when crushed a medium grey. Not apparently graphitic. Grab sample. Location: 101 M Road, southeast corner Ideal 4, about 250 m SE of Tertiary intrusive outcrop.
76 As, 4 Au. (see whole rock analyses)

Sample 128A: Quartz + chalcopyrite veinlet in angular float boulder of Karmutsen Fm. basalt. Veinlet 1.5 to 2.3 cm thick, composed of white, coarsely crystalline, locally drussy quartz with about 1-2%, chalcopyrite (irregularly distributed in veinlet where fine to coarse grained (to 3 x 7 mm) and locally as smudges on sheared walls of veinlet. Cavities in quartz filled or coated with very,

very fine grained pyrite??. Grabs of whole veinlet. Veinlet may occur along joint cutting basalt. Located in ditch beneath road cut of Karmutsen Fm. basaltic flows?, along Mount Washington Main road (#62), west-central Ideal 4 claim.
1.03% Cu, 4 Pb, 311 Zn, 15.3 Ag, 0.001 oz Au/t, 62 Co.

Sample 128B: Float cobble of quartz vein with chalcopyrite: angular cobble, 8 x 10 x 20 cm, of very rusty weathering, somewhat weathered, strongly brecciated quartz (locally drussy). Contains about 2-4% chalcopyrite (predominately) and chalcocite? and Cu-stain. Chalcopyrite irregularly distributed as irregular patches and grains. One irregular lens of mostly chalcocite (+ cpy), 1 x 3 cm or longer. Grab sample. Located 4 m NW of #128A, in road ditch.
10.54% Cu, 711 Zn, 25.0 Ag, 0.006 oz Au/t, 511 Co, 206 Bi.

Sample 129A: Quartz + pyrrhotite (+ chalcopyrite) vein: 4 to 6 cm thick. Pyrrhotite: about 10-15%, locally to about 30%, fine to medium grained, irregularly distributed (fracture?-controlled). About minor to 1-2% chalcopyrite as patches on irregular fractures, more common in centre of vein. Quartz is white and moderately to strongly brecciated. Grabs from whole vein in boulder weathered from outcrop. Occurs in Karmutsen Fm. basaltic broken pillow breccia. Vein strikes 235°/dips 80°NW. Located in roadcut on Mount Washington main road (#62), extreme west-central Ideal 4 claim.
0.45% Cu, 19 Pb, 1.0 Ag, 117 Ni, 315 Co, 104 As, 0.001 oz Au/t.

Sample 129B: Pyrrhotite + chalcopyrite in silicified? basalt of Karmutsen Fm. in hanging wall of quartz vein (#129A). Interval approx. 14 cm wide of very strongly silicified basalt with about 10-15% (or more) pyrrhotite (very fine

to fine grained, irregularly disseminated, sieve-like, possibly micro-fracture controlled) and about 1-2% chalcopyrite (very fine to fine grained, irregularly disseminated) and about 1% fracture-pyrrhotite + chalcopyrite. Chip sample across 14 cm. Location same as #129A.
0.15% Cu, 56 Ni, 109 Co, 42 As, 0.001 oz Au/t.

Sample 162A: 'Murex' intrusive breccia: approx. 80-90% fragments; 10-20% groundmass. Fragments up to 40 cm + diameter, down to 2 x 2 mm; all angular, poorly sorted. Fragments predominantly (90%) seriate porphyritic, feldspar, [hornblende (quartz)], quartz diorite? (very strongly sausserite?-altered; 3-65 hornblende to 2 x 3 mm; approx. 1% quartz crystals; very weakly to weakly magnetic; smaller fragments generally weakly brecciated with discontinuous, criss-crossing, chlorite??-filled fractures). Fragments secondarily aplite? [white, finely crystalline feldspar + quartz (about 25%)]. Thirdly, (less than 2-3%), near black, aphanitic intrusive? (strongly magnetic, moderately soft [strongly sericite?-altered); 2-3% very, very fine, disseminated magnetite?; brownish tinge; in fragments to 12 x 20 cm). Groundmass: feldspar (quartz) porphyritic, very finely to finely crystalline, feldspar-(mafic-quartz-) micro-quartz diorite? (near black, opaque white spotted, non-magnetic, minor quartz phenocrysts to 1 mm diameter, 1% very, very fine disseminated sulphide?). Grab sample. Location: about 800 m west of Ideal 4, roadcut along road to Mount Washington Copper Mines mill site.
5 ppb Au.

Sample 168: Quartz diorite? with fracture-chalcopyrite: diorite seriate porphyritic, feldspar (+ hornblende + quartz). Fresh color to medium grey; moderately soft and moderately sericite?-altered; weakly magnetic; to 1% very fine

disseminated pyrrhotite. Abundant joints with patchy very, very fine grained pyrrhotite locally with up to 1-2% fine grained chalcopyrite. Grab sample. Location: East branch of Murex Cr., at approx. west (-central) boundary of Ideal 4 claim, 514-517 m (outcrop) south of Tsolum Main road. Karmutsen Fm. basalt occurs 1-2 m to south and 9 m to north; intrusive probably part of dyke.
11 Mo, 170 Cu, 5 As, 1 Au.

Sample 169A: Quartz + pyrrhotite + chalcopyrite veinlet: 1 to 2 cm thick. White quartz contains minor to 2%, chalopyrite, genrally fracture-controlled + minor to few % pyrrhotite. Pyrrhotite and chalcopyrite more common along sheared walls of veinlet. Veilet occurs along somewhat irregular (dip), prominent joint striking 245°, diping 50°NW, in Karmutsen Fm. basalt. Grab samples of veinlet. Location: 29 m south of #168 in east branch Murex Ck., west-central boundary of Ideal #4.
0.85% Cu, 175 Zn, 4.5 Ag, 55 Au.

Sample 179: Pyritic quartz sandstone from Nanaimo Gp.: angular float from ballast. 4 cm thick interval of very fine grained pyrite (about 15%) between very fine quartz grains; occurs within near black, very fine grained, quartz sandstone with an opaque, pastel pinkish-lavender mineral ? between grains. Grab sample including pyritic interval and 5 cm width of non-pyritic sandstone. Location: 18 road, just east of creek 10 m, between 18C and 24 roads, 1 km south of south-central border Ideal #8 claim (outside property).
4 Au.

Sample 186A1: Ankerite? alteration-shear zone at dyke contacts on southeast side of zone, 5 to 17 cm thick interval of strongly breccated, strongly ankerite?-altered, amygdaloidal basalt of Karmutsen Fm. Interval contains

about 10%, ankerite? between fragments of basalt. Fragments lensy where interval narrows. Interval with about 1%, hairline to 0.5 mm thick fractures filled with ultrafine, black mineral, forming complex, criss-crossing network. Zone strikes 075°/dips 70°SE. Chip-sample across 17 cm. Located in creek bottom, 327 m north of #58 road, in northeast Ideal #3 claim.
1 Au.

Sample 186A2: Black coloured altered basalt of Karmutsen in ankerite? alteration-sheared dyke contact zone. Located immediately southeast of #186A1. 60 cm wide zone of moderately to very weakly weathered, very dark grey, altered, soft basalt: non-calcareous. Cut by 1-2%, irregular, criss-crossing to branching, ankerite? veinlets to 8 mm thick. Chip sample across 60 cm. Same location as #186A1. To southeast of #186A2, is 2 m wide, strongly to very strongly, ankerite?-altered, light to medium grey, soft rock (dacite??) cut by 2%, ankerite? veinlets to 1 cm thick. Rock appears aphanitic and feldspar porphyritic.
3 Au.

Sample 190A: Ankerite? vein in alteration-fracture-shear zone cutting amygdaloidal basalt of Karmutsen Fm. Vein generally 5-11 cm thick. Ankerite? opaque very light (tan-) grey on fresh surface, fine? grained, and with about 1%, criss-crossing, hairline fractures filled with black mineral (ultafine). Vein grades to northeast into #190B. Chip across 11 cm thick vein. Located in creek bottom, 8 m northwest of bridge on 53E road, about 100 m southeast of small lake in southeast Ideal #8 claim. Vein strikes 210°/dips 85° NW.
2 Au.

Sample 190B: Ankerite? veinlets in ankerite? alteration-fracture-shear zone cutting Karmutsen Fm. basalt: 9 cm thick interval of

very strongly fractured and ankerite? altered basalt with 5-8%, lensy, ankerite? veinlets to 6 mm thick. Basalt medium grey; cut by 0.5%, hairLine, criss-crossing and branching fractures filled with black mineral. About 0.5-1%, irregularly disseminated, discontinuous fracture-pyrite (Basalt ouside zone, contains fracture-pyrite commonly). Interval grades to southwest into #190A (same attitude). Chip-sample across 9 cm. Location same as #190A.
56 As, 3 Au.

Sample 191: Ankerite? vein-ankerite? alteration-fracture-shear zone: zone about 1.4 m wide in basalt of Karmutsen Fm., consisting of from west to east: 70 cm of very strongly fractured and ankerite?-altered basalt; 40 cm wide interval comprising an ankerite "vein" (flooded interval) with 15-30%, angular, blocky to lensy, ankerite?-altered basalt to 14 cm thick. Ankerite? is opaque, very light (tan-)grey, fine? grained. Basaltic fragments are weakly translucent medium grey, and contain about 0.5-1%, very irregularly distributed, disseminated, fine to medium grained, and stringer-like, fracture-bound pyrite; also rare laminations to 2 mm thick, with about 5%, very, very fine grained, disseminated, steel-grey mineral. Minor, irregular, hairline fractures filled with black mineral. To east of vein interval, about 30 cm of ankerite?-altered basalt (not included in chip-sample). Chip-sample across 1.1 m wide zone. Vein strikes 185°/dips about 65°W. Location under east end of bridge, in creek about 12 m east of #190.
129 Zn, 13 Au.

<u>Sample DV1</u>: Murex Creek showing: quartz vein with minor galena and 5% sphalerite; 2.5 cm thick; flat-lying. Same location as #29.
429 Cu, 7312 Pb, 21524 Zn, 15.1 Ag, 0.049 oz Au/t, 3162 As, 95 Cd, 2 Sb.

<u>Sample DV2</u>: Quartz vein float: 2% galena, 15% sphalerite, 5% pyrite and few % arsenopyrite. From Murex Creek bank about 100 m north of #DV1.
2605 Cu, 13116 Pb, 99999 Zn, 91.3 Ag, 4.347 oz Au/t, 24028 As, 1370 Cd, 102 Sb.

<u>Sample DV3</u>: Sheared, chloritic basalt with carbonate + realgar veinlets. Minor pyrite. Grab sample from Paquet Creek fault zone. Same location as #96A.
17 Cu, 93 Pb, 222 Zn, 0.7 Ag, 270 ppb Au, 2350 As, 31 Sb.

<u>Sample DV4</u>: Same as #DV3.
286 Cu, 34 Pb, 599 Zn, 2.1 Ag, 154 ppb Au, 3784 As, 15 Sb.

APPENDIX B

GEOCHEMICAL, ASSAY AND WHOLE ROCK ANALYSES CERTIFICATES FOR ROCKS FROM THE DOVE PROPERTY, 1986

ACML ALYTICAL LABORATO 3 LTD. 852 E.HASTINGS ST.VANC(:R B.C. V6A 1R6 HONE 253-3158 DATA LINE 251-10

GEOCHEMICAL/ASSAY CERTIFICATE

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: ROCK CHIPS AU* ANALYSIS BY AA FROM 10 GRAM SAMPLE. AU* ANALYSIS BY AA FROM 10 GRAM SAMPLE.

DATE RECEIVED: OCT 16 1986 DATE REPORT MAILED: Oct 22/86 ASSAYER. D. Toye ...DEAN TOYE. CERTIFIED B.C. ASSAYER.

WESTMIN RESOURCES PROJECT - DOVE FILE # 86-3225 PAGE 1

SAMPLE#	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Au*	Cu	Au
	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	%	PPM	PPM	%	PPM	%	PPM	%	%	%	PPM	PPB	%	OZ/T
2A	1	582	100	86	2.3	59	46	372	3.52	34	5	ND	1	28	1	2	2	34	.42	.016	2	20	.21	57	.13	8	1.35	.17	.17	1	33	-	-
3A	11	1790	20	28	.4	106	111	143	8.68	44	5	ND	1	3	1	2	2	34	.08	.017	2	20	.16	19	.01	7	.54	.03	.14	1	1	-	-
29A	8	541	8218	11764	24.9	33	29	861	10.89	3879	5	8	2	22	50	15	2	44	2.45	.020	2	29	.69	13	.01	8	.89	.01	.09	1	8900	-	-
29B	1	262	146	338	2.3	46	26	1377	5.07	90	5	ND	1	22	2	2	2	98	3.60	.032	2	129	1.80	19	.01	8	2.41	.01	.13	1	50	-	-
29C	1	400	45	111	2.5	57	35	1366	5.26	45	5	ND	3	55	1	2	2	129	7.96	.040	4	154	2.87	20	.02	8	2.98	.01	.09	1	21	-	-
33A	1	16	20	107	1.8	56	31	1784	8.45	18	5	ND	2	34	2	2	2	204	4.48	.048	2	74	2.10	14	.03	16	.90	.01	.04	1	8	-	-
39A	2	21	31	151	.7	25	17	1304	4.27	41	5	ND	4	61	1	2	2	75	12.93	.006	2	16	2.04	14	.01	7	.24	.01	.03	1	77	-	-
49A	13	4063	20	21883✓	5.6	14	77	397	15.15	394	5	ND	1	5	151	16	2	29	.98	.005	6	11	.50	1	.01	7	.56	.01	.02	1	-	.42	.002
51A	1	50	14	154	.3	50	25	680	5.42	209	5	ND	1	24	1	179	2	179	1.22	.075	2	39	1.79	9	.30	33	2.22	.13	.04	1	4	-	-
52	1	87	12	84	.1	51	27	835	6.77	549	5	ND	1	45	1	17	2	230	1.56	.073	7	48	2.43	12	.30	12	3.95	.30	.04	3	2	-	-
57	1	9116	26	40	5.6	249	355	265	46.07	300	5	2	3	2	5	2	2	1	.11	.024	3	4	.11	4	.01	2	.11	.01	.02	1	-	.98	.001
60	1	140	15	80	.2	32	31	1021	7.36	161	5	ND	3	30	1	3	2	86	7.70	.042	7	22	.94	28	.01	26	.62	.01	.12	1	26	-	-
67A	2	18	7	61	.3	2	2	1292	1.30	5366	5	ND	1	126	1	5	6	5	37.76	.005	2	1	.05	1	.01	4	.04	.01	.01	1	4	-	-
67B1	2	11	2	25	.5	7	4	1368	4.87	2924	8	ND	3	77	1	14539✓	4	7	24.95	.009	2	4	.16	2	.01	6	.06	.01	.03	3	4	-	-
67B2	1	188	3	63	.1	40	21	719	3.24	74	5	ND	3	36	1	48	2	41	10.24	.034	3	52	.68	10	.02	14	.83	.02	.13	1	5	-	-
67B3	1	30	3	23	.2	9	4	1292	2.73	1156	5	ND	1	83	1	53	5	12	33.22	.007	2	6	.13	1	.01	4	.10	.01	.04	1	3	-	-
73A	1	538	7	51	.8	27	22	2174	6.71	87	7	ND	4	34	2	2	2	50	17.16	.048	8	11	.31	27	.01	11	.26	.01	.11	1	21	-	-
95A1	2	11	234	19	.7	1	9	335	14.01	16709	5	ND	2	9	1	523	2	14	2.77	.020	5	5	.04	16	.01	8	.81	.01	.03	1	4	-	-
95A2	1	4	8	125	.1	1	1	788	1.76	46215	6	ND	3	91	1	56	4	8	23.55	.010	2	3	.22	20	.01	9	.13	.01	.02	1	1	-	-
96A	4	173	13	71	.6	63	31	1410	6.12	36081	5	ND	1	19	1	95	2	95	3.18	.035	6	57	.54	16	.01	13	.40	.01	.09	1	57	-	-
101	1	880	7	52	1.0	16	21	138	4.60	26	5	ND	2	5	1	4	2	25	.09	.030	2	13	.80	25	.01	10	.96	.04	.08	1	-	.09	.001
103	1	1459	13	309	1.4	120	197	481	17.88	112	5	ND	3	4	3	2	5	80	.46	.167	2	30	1.60	9	.07	11	2.41	.02	.13	1	-	.15	.001
108	14	307	7	14	3.1	12	15	90	3.51	354	5	ND	1	9	1	12	6	27	.14	.057	2	30	.35	32	.02	5	.81	.04	.20	9	74	-	-
125	1	39	7	50	.1	5	6	221	2.42	76	5	ND	2	4	1	2	2	16	.14	.013	2	13	.55	37	.10	7	.89	.02	.11	1	4	-	-
128A	4	10276✓	4	311	15.3	7	62	222	3.43	7	5	ND	1	14	3	2	2	73	.36	.011	2	44	1.07	14	.17	5	1.16	.07	.14	1	-	1.03	.001
128B	11	91519✓	5	711	25.0	3	511	40	8.09	2	5	ND	1	1	6	2	206	3	.01	.001	3	1	.02	2	.01	7	.09	.01	.01	1	-	10.54	.006
129A	1	4335	19	65	1.0	117	315	97	31.11	104	5	ND	2	1	3	2	9	2	.02	.008	4	3	.07	1	.01	2	.05	.01	.01	1	-	.45	.001
129B	1	1455	10	48	.2	55	109	283	12.29	42	5	ND	1	8	2	2	2	163	.29	.031	3	96	1.85	20	.15	6	2.01	.06	.27	1	-	.15	.001
162A	1	57	4	71	.1	12	6	103	2.61	6	5	ND	1	33	1	2	2	57	.38	.050	2	28	.76	44	.15	5	1.32	.14	.56	1	5	-	-
STD C/AU-R	21	60	37	132	6.9	67	29	1007	3.93	40	18	8	32	47	18	15	19	61	.48	.106	35	59	.88	178	.08	37	1.72	.06	.13	12	485	-	-

— Assay required for correct result —

(17)

ACME ANALYTICAL LABORATORIES LTD. 852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6 PHONE 253-3158 DATA LINE 251-1011

GEOCHEMICAL/ASSAY CERTIFICATE

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: ROCK CHIPS AU* ANALYSIS BY AA FROM 10 GRAM SAMPLE.

DATE RECEIVED: OCT 21 1986 DATE REPORT MAILED: Oct 28/86 ASSAYER D. Toye ...DEAN TOYE. CERTIFIED B.C. ASSAYER.

WESTMIN RESOURCES PROJECT - DOVE FILE # 86-3331 PAGE 1

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB	Cu %
* HAR-1	2	418	10	88	.6	50	26	1341	8.42	104	5	ND	1	30	1	2	2	190	4.88	.073	12	64	1.32	11	.01	2	.43	.06	.04	1	8	-
* HAR-2	2	127	6	87	.2	75	28	1271	6.70	7	5	ND	1	22	1	2	2	131	1.80	.052	7	154	3.03	21	.02	2	2.98	.06	.08	1	3	-
* HAR-3	3	996	8	108	.3	74	30	1301	8.81	2	5	ND	2	29	1	2	2	232	1.93	.075	7	115	2.34	16	.77	2	3.22	.07	.02	1	5	-
168	11	170	2	12	.2	10	8	117	1.05	55	5	ND	1	89	1	2	2	14	1.12	.053	2	10	.20	10	.04	2	1.33	.24	.01	1	1	-
169A	8	7754	4	175	4.5	56	31	235	3.37	8	5	ND	1	10	2	2	2	33	.22	.010	2	25	.47	5	.06	2	.67	.06	.02	1	55	.85
179	1	61	10	2	.1	5	1	18	13.03	80	5	ND	1	1	1	2	2	3	.01	.001	2	4	.01	5	.01	2	.10	.02	.01	1	4	-
186A1	1	22	4	94	.1	40	25	918	8.42	24	5	ND	1	24	1	2	2	78	2.05	.076	5	21	1.45	23	.01	2	2.67	.06	.10	1	1	-
186A2	2	35	7	66	.2	32	22	1673	6.77	29	5	ND	1	38	1	2	2	80	7.73	.040	9	48	1.84	16	.01	2	1.20	.06	.05	1	3	-
190A	4	45	4	16	.2	5	3	2134	6.93	21	5	ND	1	46	1	2	2	16	16.49	.003	9	2	4.92	5	.01	2	.06	.07	.01	1	2	-
190B	4	56	5	22	.5	21	12	1651	6.21	56	5	ND	1	36	1	2	2	47	9.40	.036	8	7	2.91	9	.01	2	.16	.06	.08	1	3	-
191	2	33	11	129	.5	23	8	769	2.43	14	5	ND	3	42	1	5	2	28	.39	.072	11	20	.42	169	.07	5	1.65	.03	.20	1	13	-
STD C/AU-R	21	59	40	129	6.8	66	27	970	3.95	39	18	7	33	46	17	15	21	62	.48	.100	35	56	.88	174	.08	36	1.73	.08	.13	13	490	-

* Tsolum River

(18)

ACME ANALYTICAL LABORATORIES LTD.
852 E. HASTINGS, VANCOUVER B.C.
PH: (604)253-3158 COMPUTER LINE: 251-1011

DATE RECEIVED OCT 29 1986
DATE REPORTS MAILED Nov 3/86

ASSAY CERTIFICATE

SAMPLE TYPE : PULP
AU** BY FIRE ASSAY

ASSAYER D. Toye DEAN TOYE , CERTIFIED B.C. ASSAYER

WESTMIN RESOOURCES PROJECT DOVE FILE# 86-3225 R PAGE# 1

SAMPLE	Zn %	Sb %	Au** oz/t
29A	-	-	.288
49A	2.43	-	-
67BI	-	1.71	-

ACME ANALYTICAL LABORATORIES LTD. 852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6 PHONE 253-3158 DATA LINE 251-1011

WHOLE ROCK ICP ANALYSIS

A .1000 GRAM SAMPLE IS FUSED WITH .60 GRAM OF LIBO2 AND IS DISSOLVED IN 50 MLS 5% HNO3.
- SAMPLE TYPE: ROCK CHIPS

DATE RECEIVED: OCT 16 1986 DATE REPORT MAILED: Oct 22/86 ASSAYER. D. Toye. .DEAN TOYE. CERTIFIED B.C. ASSAYER.

WESTMIN RESOURCES PROJECT - DOVE FILE # 86-3225 PAGE 1

SAMPLE#	SiO2 %	Al2O3 %	Fe2O3 %	MgO %	CaO %	Na2O %	K2O %	TiO2 %	P2O5 %	MnO %	Cr2O3 %	Ba PPM	Loi %	Sum
29C	46.73	11.64	8.73	5.18	11.20	.65	1.10	1.08	.10	.20	.03	189	13.1	99.78
125	72.94	13.54	3.24	1.04	.46	1.90	2.15	.68	.02	.03	.01	731	3.7	99.85

(20)

ACME ANALYTICAL LABORATORIES LTD. 852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6 PHONE 253-3158 DATA LINE 251-1011

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: ROCK CHIPS

DATE RECEIVED: NOV 27 1986 DATE REPORT MAILED: Dec 3/86 ASSAYER. D. Toye. .DEAN TOYE. CERTIFIED B.C. ASSAYER.

WESTMIN RESOURCES PROJECT - DOVE FILE # 86-3845 PAGE 1

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM
DV-1	6	429	7312	21524 ✓	15.1	32	16	1175	6.21	3162	5	2	1	14	95	2	2	61	3.12	.014	5	61	1.06	9	.01	9	1.30	.08	.07	4
DV-2	21	2605	13116 ✓	99999 ✓	91.3 ✓	7	8	295	19.39	24028 ✓	5	101 ✓	1	2	1370	102	38	4	.01	.001	12	3	.02	4	.01	2	.04	.05	.03	1

✓ Assay required for correct result

(21)

ACME ANALYTICAL LABORATORIES LTD.
852 E. HASTINGS, VANCOUVER B.C.
PH:(604)253-3158 COMPUTER LINE:251-1011

DATE RECEIVED NOV 27 1986
DATE REPORTS MAILED Dec 3/86

ASSAY CERTIFICATE

SAMPLE TYPE : ROCK - CRUSHED AND PULVERIZED TO -100 MESH.
AU BY FIRE ASSAY

ASSAYER ______________ DEAN TOYE . CERTIFIED B.C. ASSAYER

WESTMIN RESOURCES PROJECT DOVE FILE# 86-3845 PAGE# 1

SAMPLE	Sample wt. gm	Au-100 oz/t	Native Au mg	Average oz/t
DV-1	635	.047	.05	.049
DV-2	385	4.245	1.35	4.347

ACME ANALYTICAL LABORATORIES LTD. 852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6 PHONE 253-3158 DATA LINE 251-1011

GEOCHEMICAL/ASSAY CERTIFICATE

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: ROCK CHIPS AU* ANALYSIS BY AA FROM 10 GRAM SAMPLE. AU** BY FIRE ASSAY

DATE RECEIVED: NOV 27 1986 DATE REPORT MAILED: Dec 2/86 ASSAYER. D. Toye. DEAN TOYE. CERTIFIED B.C. ASSAYER.

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SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB	Au** OZ/T
DV-3	2	17	93	222	.7	4	.5	1834	2.13	2350	5	ND	1	57	1	31	2	9	20.08	.012	10	1	.34	13	.01	12	.14	.12	.05	1	270	-
DV-4	5	286	34	599	2.1	31	17	2744	9.14	3784	5	ND	1	47	5	15	2	94	9.37	.013	23	45	1.69	6	.01	12	.31	.12	.02	1	154	-

(23)

APPENDIX C

ANALYTICAL PROCEDURES FOR ROCK SAMPLES

Analytical Procedures for Rock Samples.

Analyses of rock samples were performed by Acme Analytical Laboratories Ltd. of 852 E. Hastings Street, Vancouver, B.C. All samples were crushed to 0.48 cm, then a 0.23 kg split pulverized to -100 mesh size. A 0.5 g split was digested with 3 mls of a 3:1:2 mixture of $HCl-HNO_3-H_2O$ at 95° for one hour and diluted to 10 ml with water. This digestion is nearly total for the base metals, partial for the rock forming elements and very slight for refractory elements. The solutions were analyzed for 30 elements by inductively coupled plasma atomic emission spectroscopy (I.C.P./A.E.S.).

In addition, 29 of the samples were analyzed for gold (reported in ppb) by atomic absorption. A 10.0 g split of the pulverized rock was ignited at 600° C, digested with hot aqua regia, extracted by MIBK, then analyzed by graphite furnace atomic absorption.

Nine rock samples with significant concentrations of chalcopyrite were assayed for gold and copper, in addition to 30 element I.C.P. A 10.0 g split of pulverized rock was fused with a Ag inquart with fire assay fluxes. After cupulation, the dore bead was dissolved and analyzed by A.A. Results are reported in oz/t.

Two rock chip-samples were analyzed for the major elements by the whole rock I.C.P. technique to determine the chemical nature of alteration apparent in these rocks. Sample 29C comprises carbonate-altered basalt (Karmutsen Formation) in the footwall of the quartz-sulphide vein-shear zone at the Murex Creek showing. Sample 125 appears to consist of meta-argillaceous siltstone of the Nanaimo Group. This analysis entails fusion of a 0.1 g split of pulverized rock with $LiBO_2$ then dissolution in 50 mls of 5% HNO_3. The solution is then analyzed by the I.C.P. technique and major element concentrations reported in oxide percentages.

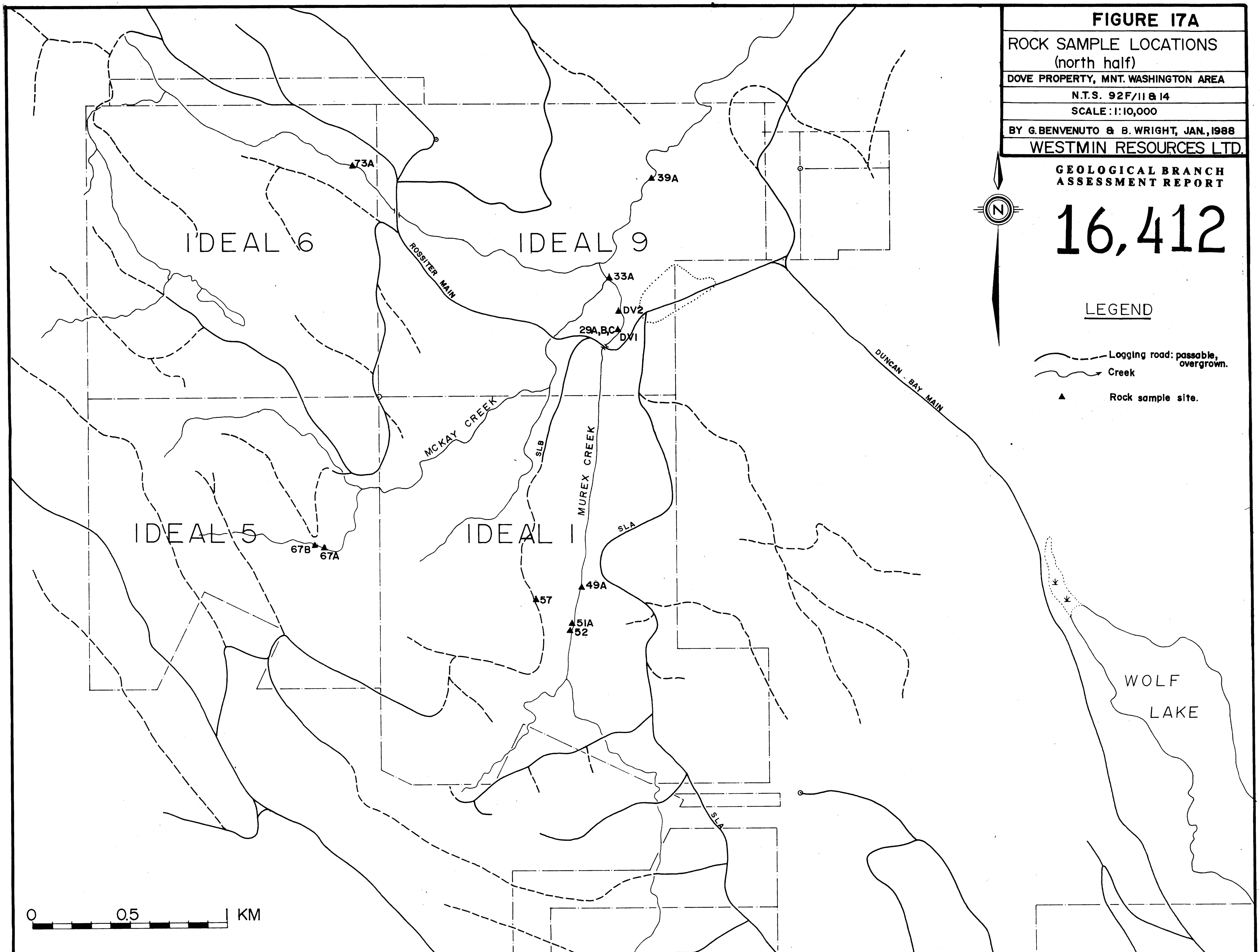
FIGURE 17A
ROCK SAMPLE LOCATIONS
(north half)
DOVE PROPERTY, MNT. WASHINGTON AREA
N.T.S. 92F/11 & 14
SCALE: 1:10,000
BY G. BENVENUTO & B. WRIGHT, JAN., 1988
WESTMIN RESOURCES LTD.
GEOLOGICAL BRANCH
ASSESSMENT REPORT
16,412
LEGEND
Logging road: passable, overgrown.
Creek
Rock sample site.
N
IDEAL 6
IDEAL 9
IDEAL 5
IDEAL 1
ROSSITER MAIN
DUNCAN - BAY MAIN
MCKAY CREEK
MUREX CREEK
SLB
SLA
WOLF LAKE
73A
39A
33A
DV2
29A,B,C
DV1
67B
67A
57
49A
51A
52
0
0.5
1 KM

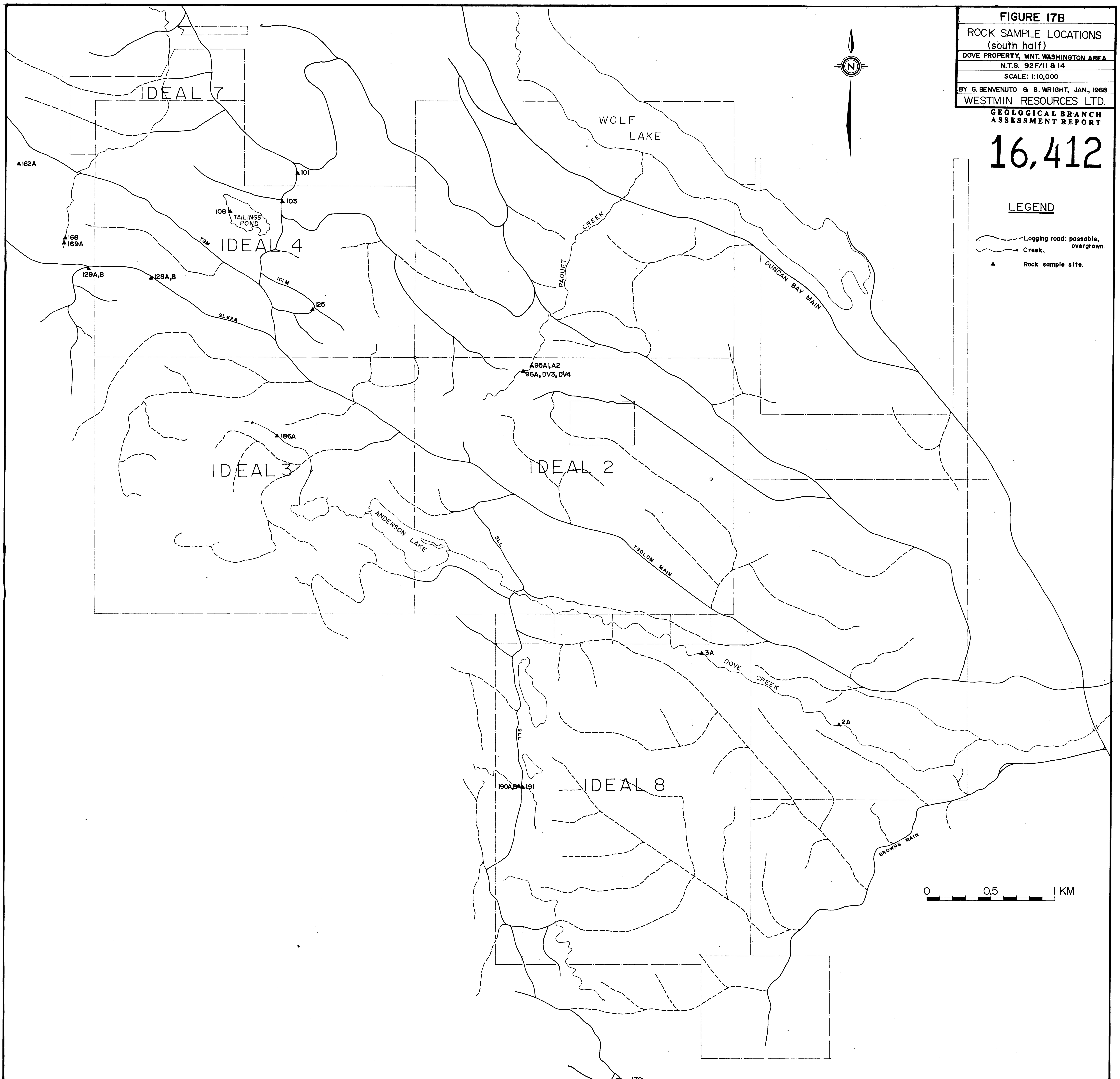
FIGURE 17B
ROCK SAMPLE LOCATIONS
(south half)
DOVE PROPERTY, MNT. WASHINGTON AREA
N.T.S. 92F/11 & 14
SCALE: 1:10,000
BY G. BENVENUTO & B. WRIGHT, JAN., 1988
WESTMIN RESOURCES LTD.
GEOLOGICAL BRANCH
ASSESSMENT REPORT
16,412
N
LEGEND
Logging road: passable, overgrown.
Creek.
Rock sample site.
0
0.5
1 KM
IDEAL 7
IDEAL 4
IDEAL 3
IDEAL 2
IDEAL 8
WOLF
LAKE
PAQUET
CREEK
DUNCAN BAY MAIN
TAILINGS
POND
ANDERSON LAKE
TSOLUM MAIN
DOVE
CREEK
BROWNS MAIN
TSM
101 M
SL62A
SLL
162A
168
169A
129A,B
128A,B
101
103
108
125
95A1, A2
96A, DV3, DV4
186A
3A
2A
190A,B
191
179