

830123

**PROSPECTING AND GEOCHEMICAL REPORT**

**ON THE**

**MAST 1 - 4 MINERAL CLAIMS**

**Hastings Arm  
Skeena Mining Division  
British Columbia**

**NTS: 103P/12W  
55°37.5' N 129°47' W**

**OWNER: RICHARD T. HEARD**

**AUTHOR: N.C. CARTER, Ph.D. P.Eng.**

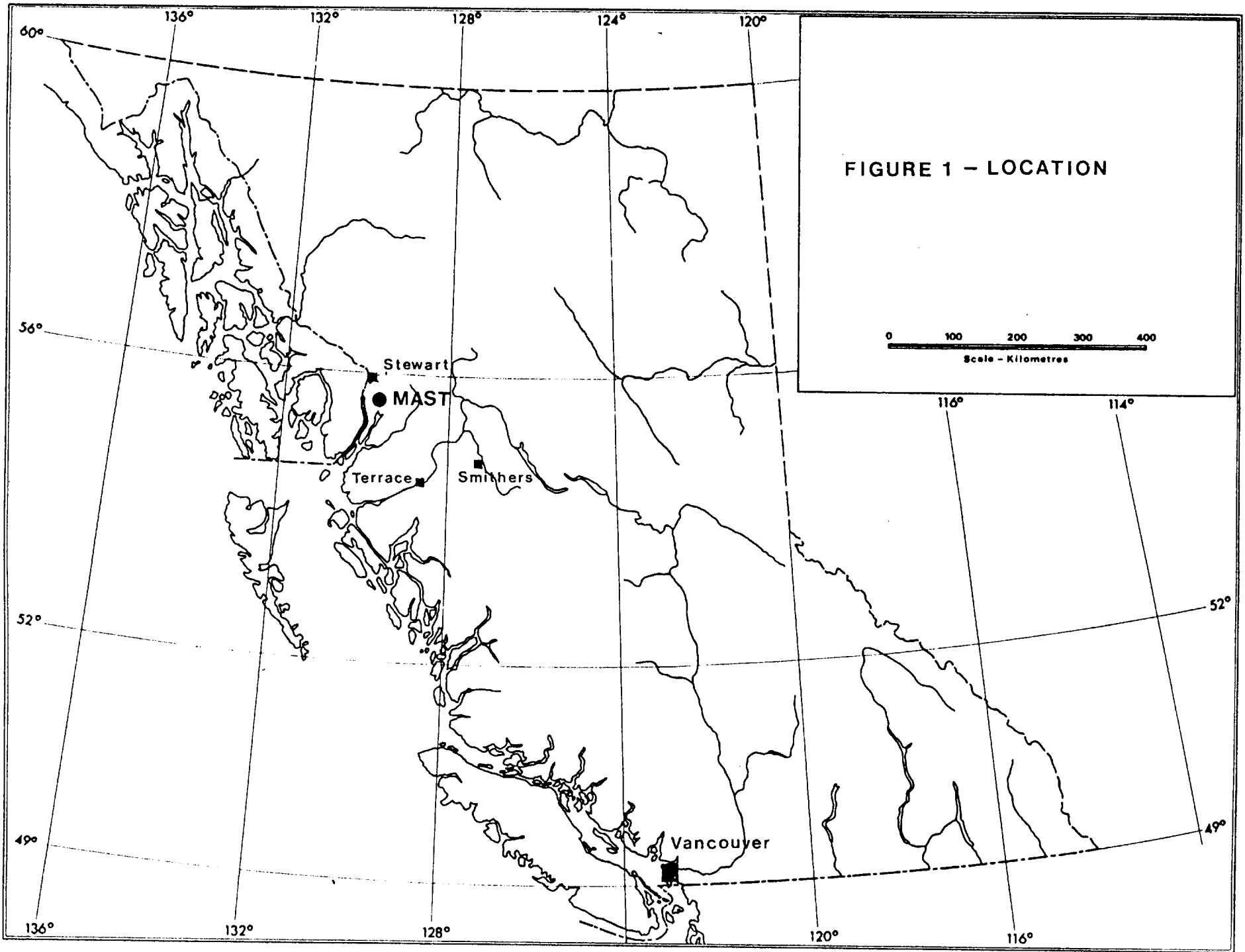
**DATE: May 7, 1999**

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## INTRODUCTION

### Location and Access

The MAST 1-4 mineral claims are situated on tidewater at the head of Hastings Arm some 37 km south-southeast of Stewart in northwestern British Columbia (Figure 1). The claims are on the east side of the inlet immediately south of the tideflats at the mouth of K'shwan River (Figure 2); the geographic centre of the property is at latitude 55°37.5' North and longitude 129°47' West in NTS map-area 103P/12W.

Access is by helicopter from Stewart or by boat from the end of road at Kitsault, on the south side of Alice Arm some 40 km southeast of the property (Figure 2). A cabin, in fair condition, is located on tidewater at the mouth of Granite Creek in the southern part of the MAST 2 claim (Figure 5).

### Mineral Property

The MAST property consists of four 2-post mineral claims registered in the name of Richard T. Heard (Figure 3). Details of the mineral claims are as follows:

<u>Claim Name</u>	<u>Units</u>	<u>Record Number</u>	<u>Date of Record</u>
MAST 1	1	323599	February 17, 1994
MAST 2	1	323600	February 17, 1994
MAST 3	1	323601	February 17, 1994
MAST 4	1	323602	February 17, 1994

During the 1998 work program, an inspection of the initial posts for MAST 1 and 2 claims indicated that claim tags had been removed. A statutory declaration to this effect was filed with the Mineral Titles office in Victoria September 21, 1998.

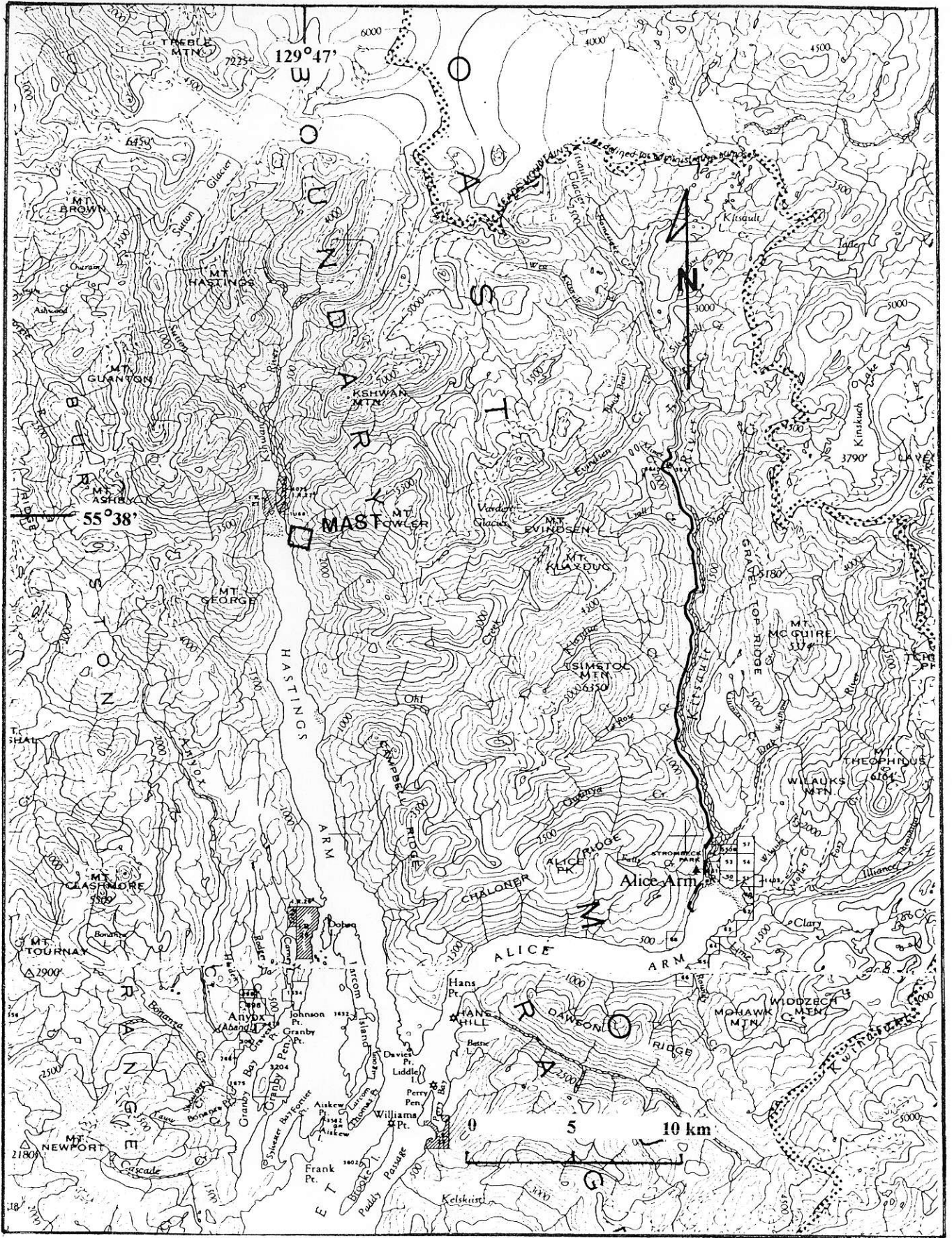
### History

Initial documented work in the area of the present MAST claims was conducted prior to 1934 and consisted of prospecting, the excavation of 22 hand trenches and the driving of two short adits plus bedrock sampling on what was known as the Mastodon property (Mandy, 1934). There is no record of further work subsequent to 1934, probably due to some confusion with respect to the precise location of the property. Prior to 1995, the property location on B.C. Minfile and other maps was shown as being 5 km south of the current claims.

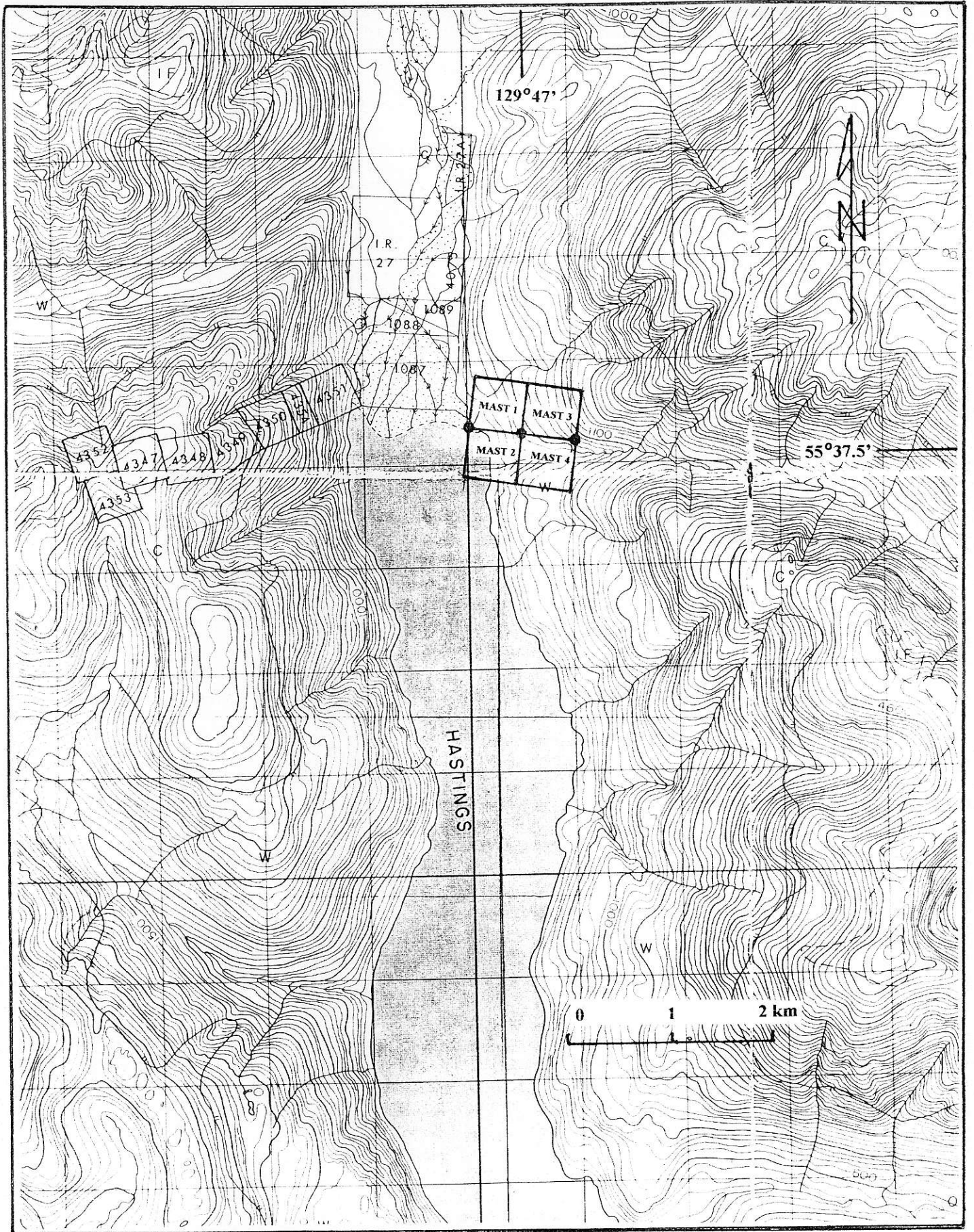
The current mineral claims were located in February of 1994 following a careful analysis of a report by J.T. Mandy in the 1934 Annual Report of the Minister of Mines for British Columbia. This report clearly indicated the location of the property as being immediately south of the confluence of K'shwan River and Hastings Arm. Limited work in September of 1994 (Carter, 1995) included an attempt to locate the original trail leading from the mouth of Granite Creek to the 1930's workings, limited prospecting and the collection and analysis of one bedrock sample.

No work was carried out between 1995 and 1997.





**FIGURE 2 - LOCATION - MAST PROPERTY**



**FIGURE 3 - MAST MINERAL CLAIMS**



## **Present Status**

The results of a 1998 program, consisting of prospecting and bedrock sampling which was carried out between September 10 and 12, 1998, are the subject of this report.

## **GEOLOGY AND MINERALIZATION**

### **Physical Setting**

The MAST mineral claims cover an area east of the head of Hastings Arm. Elevations range from sea level to about 440 metres at the northeast corner of MAST 3 claim (Figure 5). The topography within the area of the claims is generally subdued relative to most areas bordering Hastings Arm, the notable exception being the deeply incised canyon marginal to Granite Creek in the southern property area (Figure 5).

Climate is typical of areas at or near sea level in the north coast region of British Columbia. Mild, wet conditions predominate and the claims area features mature forest cover with locally dense undergrowth. Bedrock exposures are prevalent on some of the steeper slopes and marginal to drainages.

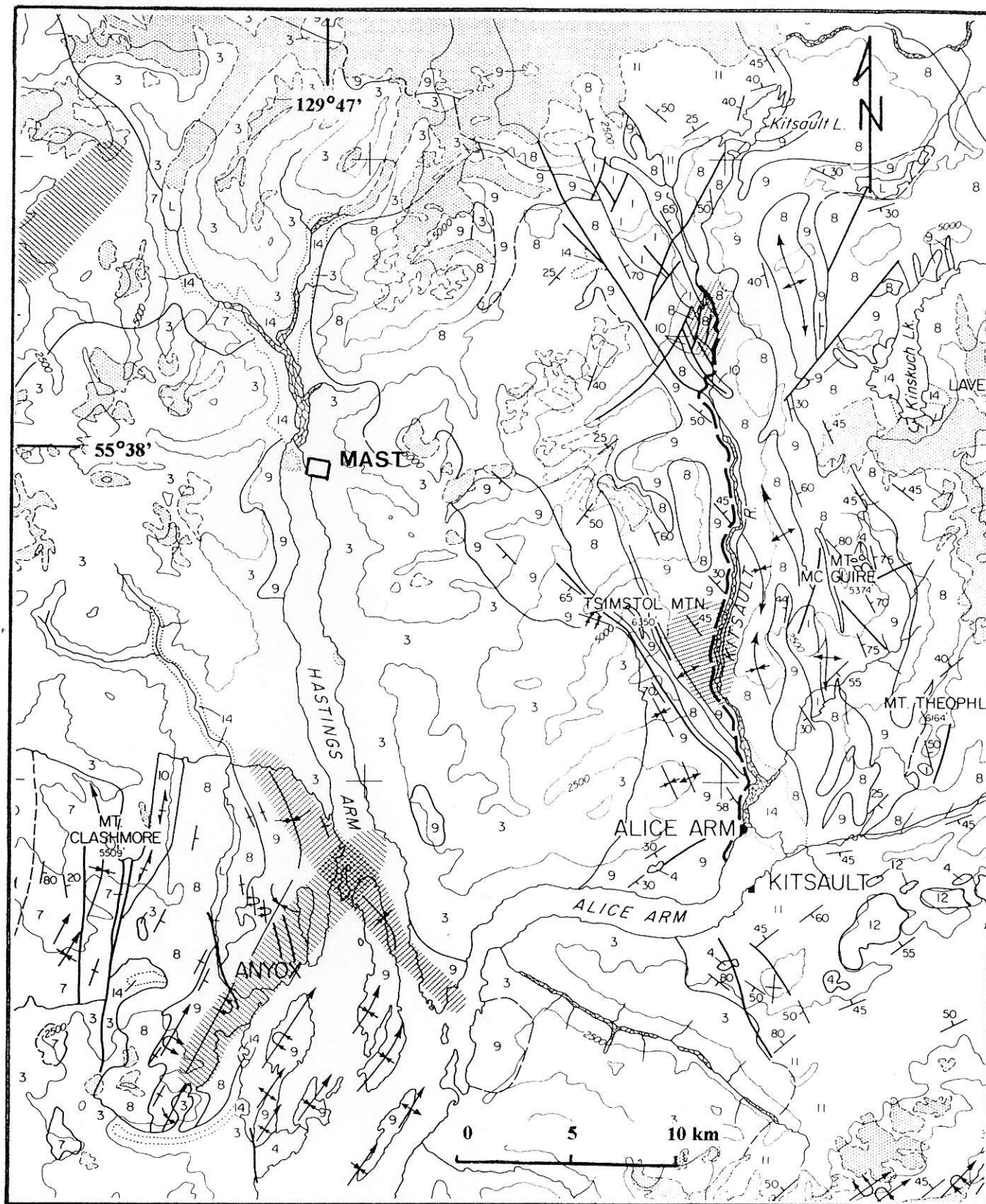
### **Regional Geological Setting**

As indicated on Figure 4, the MAST mineral claims are situated within and near the eastern margin of the Coast Belt or Coast Plutonic Complex.

Coast Belt in this area is comprised mainly of granitic rocks (biotite-hornblende granite, quartz monzonite, quartz diorite) of early Tertiary (Eocene) age. Within these areally extensive granitic rocks in the Hastings Arm - northern Observatory Inlet area are several roof pendants of older (Triassic - Jurassic) volcanics and sediments, the largest of which is the 400 square kilometres Anyox pendant (Figure 4). Recent investigations by the Geological Survey of Canada (Evenchick and Holm, 1997; Evenchick and Snyder, 1999) have been directed to further defining the external boundaries and internal geological relationships of the Anyox and other pendants in the area between Anyox and Stewart.

One of these roof pendants, on the west side of Hastings Arm opposite the MAST claims (Figure 4), is 20 square km in areal extent and consists mainly of north-striking, moderately west-dipping siltstones and lesser, intercalated volcanic rocks. These are intruded by aplite and granitic dykes and by narrow, northeast-striking basic dykes similar to those in the Anyox and Alice Arm districts to the south and east respectively. Migmatite zones are developed within highly contorted layered rocks near their contacts with enclosing Coast granitic rocks.

The MAST property is situated in a well known mineral belt midway between the Stewart and Anyox - Alice Arm mineral districts. Major past producing mines of the region include the Hidden Creek and Bonanza volcanogenic massive sulphide deposits near Anyox from which 25 million tonnes was mined with average recovered grades of 1.4% copper, 9.1 g/t silver and 0.17 g/t gold, the Dolly Varden and Torbrit silver deposits north of Alice Arm which yielded 1.3 million tonnes averaging 364 g/t silver, and the Kitsault porphyry molybdenum deposit south of Alice Arm which produced 13.5 million tonnes grading 0.114% molybdenum.



**FIGURE 4 - MAST PROPERTY - GEOLOGICAL SETTING**  
 (After Carter and Grove, 1972)

# LEGEND

## SEDIMENTARY AND VOLCANIC ROCKS

### QUATERNARY

#### RECENT

- 14

ALLUVIUM, SAND, GRAVEL, TILL
- 13

BASALT FLOWS, CINDER CONES, ETC.

#### PLEISTOCENE AND OLDER (?)

- 12

PLATEAU BASALTS, ETC.

### JURASSIC AND CRETACEOUS

#### UPPER JURASSIC-LOWER CRETACEOUS

- 11

SILTSTONE, GREYWACKE, SANDSTONE, CONGLOMERATE, MINOR LIMESTONE AND COAL

#### JURASSIC

- 10

CATACLASITE, MYLONITE, AND SCHIST (METAMORPHIC EQUIVALENTS OF MAINLY LOWER JURASSIC ROCKS) -- INCLUDING PHYLONITES, RED, GREEN, AND PURPLE MYLONITES AND BANDED ULTRAMylonITES, AND CHLORITE, BIOTITE AND SERICITE SCHISTS

#### MIDDLE AND UPPER JURASSIC

- 9

SILTSTONE, GREYWACKE, SANDSTONE, CONGLOMERATE, MINOR LIMESTONE

#### MIDDLE JURASSIC

- 8

GREEN, RED, PURPLE VOLCANIC TUFF AND BRECCIA, FELLOW LAVA, VOLCANIC SANDSTONE AND CONGLOMERATE, MINOR FLOWS

#### LOWER JURASSIC

- 7

GREEN, RED, AND PURPLE VOLCANIC BRECCIA, CONGLOMERATE AND SANDSTONE, GREYWACKE, ARGILLITE, CRYSTAL AND LITHIC TUFFS, SOME SILTSTONE, LIMESTONE, ANDESITIC AND BASALTIC FELLOW LAVA (a) HORNBLende SCHIST AND GREENSTONE, MIXED WITH DIORITIC ROCKS

#### TRIASSIC AND OLDER

- 6

MAFIC VOLCANIC ROCKS, LIMESTONE, MINOR GREYWACKE, VOLCANIC SANDSTONE, AND CHERT, (a) ACID METAVOLCANIC ROCKS (b) PHYLLITE, SLATE, CHLORITE, SERICITE, AND BIOTITE SCHISTS
- 5

GNEISS COMPLEX, ALMANDINE-AMPHIBOLITE FACIES -- GNEISS AND RELATED MIGMATITIC GNEISS, GRADATIONAL TO GNEISSIC DIORITE, QUARTZ DIORITE, AND GRANDIORITE

## INTRUSIVE ROCKS

### TERTIARY

#### OLIGOCENE AND YOUNGER (?)

- LAMPROPHYRE, BASALT AND ANDESITE DYKE SWARMS (ORIENTATION OF PATTERN INDICATES DYKE TRENDS)

#### EOCENE

- PORTLAND CANAL DYKE SWARM -- GRANITE, QUARTZ MONZONITE, GRANDIORITE EQUIGRANULAR TO PORPHYRITIC

- 4

ALICE ARM INTRUSIONS -- QUARTZ MONZONITE PORPHYRY, QUARTZ FELDSPAR PORPHYRY, QUARTZ DIORITE STOCKS, PLUGS AND DYKES

#### TERTIARY AND OLDER (?)

- 3

COAST PLUTONIC COMPLEX: GRANITIC ROCKS; QUARTZ DIORITE, GRANDIORITE, QUARTZ MONZONITE, LOCALLY FOLIATED AND/OR GNEISSIC, SOME GRANITIC MIGMATITE COMPLEXES, MINOR DIORITE AND GABRO

#### CRETACEOUS (?) AND/OR TERTIARY

- 2

AUGITE DIORITE, HORNBLende GRANDIORITE

#### JURASSIC AND CRETACEOUS (?)

- 1

FELDSPAR PORPHYRY, AUGITE PORPHYRY, HORNBLende DIORITE

### SYMBOLS

- GEOLOGICAL BOUNDARY, DEFINED, APPROXIMATE
- +

BEDDING (INCLINED, VERTICAL)
- +

CLEAVAGE, SCHISTOSITY, GNEISSOSITY (INCLINED, VERTICAL)
- +

LINATION (INCLINED)
- +

ANTICLINE, - HORIZONTAL AXIS, PLUNGING, OVERTURNED
- +

SYNCLINE, - HORIZONTAL AXIS, PLUNGING, OVERTURNED
- +

FAULT
- +

HIGHWAY
- +

SECONDARY ROAD
- +

GLACIER

**LEGEND for FIGURE 4**

The Red Mountain gold property, a recent discovery, is situated 40 km north-northeast of the MAST claims. Here, four en-echelon, northwest-trending sulphide zones are hosted by Jurassic volcanic rocks marginal to a granodiorite pluton. Reported reserves (Rhys et al, 1995) are 2.5 million tonnes grading 12.69 g/t gold and 38.1 g/t silver, of this 1.92 million tonnes grading 9.8 g/t gold are categorized as a mineable resource. Red Mountain is considered to have the potential to host between 2 and 3 million ounces gold.

### **Property Geology and Mineralization**

The MAST claims are mainly underlain by Coast granitic rocks. Within these, a west-northwest-trending, moderately north-dipping roof pendant of metamorphosed sedimentary rocks has been reported by Mandy (1934). This pendant, which has been described as being between 30 and 60 metres wide and intermittently exposed over an apparent strike distance of more than 800 metres.

As described by Mandy (1934), these partially digested metasedimentary rocks (migmatite?) are cut by quartz veins, quartz stockworks and silicified zones which are up to 2.5 metres wide and contain variable amounts of pyrite, sphalerite and galena. This alteration and mineralization was exposed in the early 1930's by 22 hand trenches and two short adits over an apparent zone length of 600 metres. (See Appendix II which contains a copy of Mandy's report and diagram which has been partially modified to show the approximate boundary of the current MAST mineral claims). Mandy's sampling indicated gold values ranging from trace to 11 g/t over a 0.5 metre width; several samples have values of 3.5 g/t gold over widths of between 0.3 and 1.5 metres.

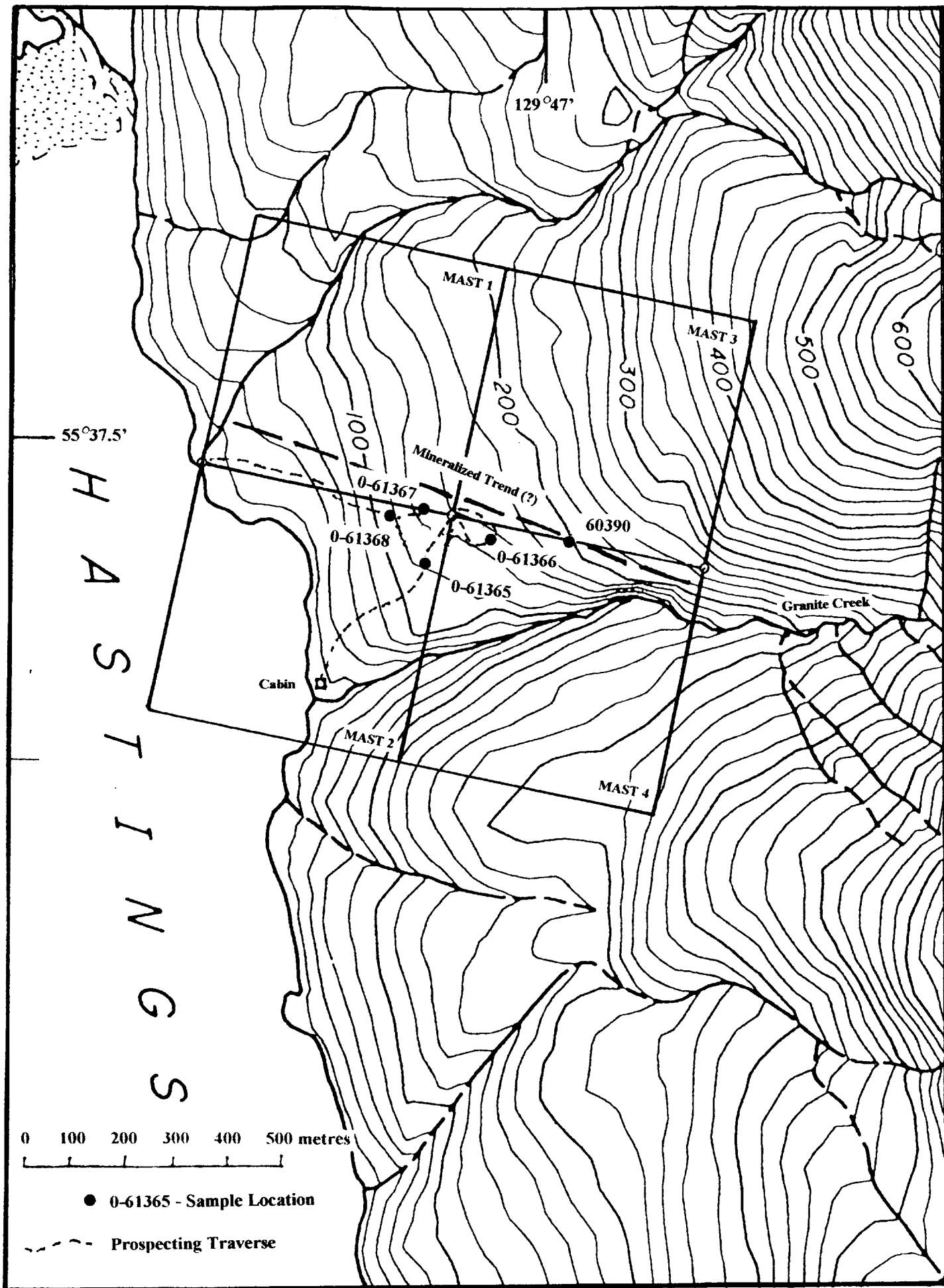
The approximate trend of the zone or mineralized trend is shown on Figure 5. Limited prospecting in 1994 along the claim location line included the collection of one sample (number 60390 - Figure 5) of silicified, granitized country rock containing finely disseminated pyrite, galena and sphalerite. Results obtained included 995 ppb gold, 37.1 ppm silver, 777 ppm copper, 8905 ppm lead and 1582 ppm zinc (Carter, 1995). This sample site is thought to be within, or marginal to the previously reported mineralized zone.

### **1998 PROGRAM**

Prospecting and bedrock sampling were carried out on parts of the MAST mineral claims on September 11, 1998. Access to the property was by helicopter and personnel involved in the exploratory program included the writer and R.T. Heard, P.Eng.

Work was directed to locating the previously reported mineralized zone which was believed to be situated on or close to the claim location line. A prospecting traverse originated from the cabin at the mouth of Granite Creek (Figure 5) and extended in a northeasterly direction up the prevailing slope to the area of the final claim post for MAST 1 and 2 claims and the initial post for MAST 3 and 4. Locations were established by way of hip chain and pocket altimeter.

Little or no bedrock was seen at lower elevations which feature open, mature forest cover. A prominent rock bluff at an elevation of 130 metres consists of near vertical surfaces of dark grey diorite gneiss featuring strong west-northwest-trending schistosity. Narrow quartz veins containing pyrite cubes parallel the plane of foliation. Grab samples of the quartz veins were collected from this area (sample number 0-61365 - Figure 5).



**FIGURE 5 - MAST Mineral Claims - Mineralized Trend and Sample Locations**

Sample 0-61366 was collected from a rocky bluff 100 metres east of the claim post at an elevation of 160 metres (Figure 5). Local diorite gneiss at this location is enveloped by massive leucocratic quartz monzonite which contains some silicified zones and 2 mm wide quartz-chlorite-filled fractures.

West of the claim post and along the claim location line at an elevation of 145 metres, rose quartz veins were noted in gneissic granitic rocks. Sample 0-61367 was collected from this locality (Figure 5), while sample number 0-61368 was from iron-stained massive to gneissic granodiorite 100 metres further west. Bedrock exposures between this sample site and the initial claim post on Hastings Arm consisted of medium-grained, equigranular, mesocratic hornblende-rich granodiorite.

Rock samples collected were submitted to Mineral Environment Laboratories in Smithers for sample preparation and subsequent analyses for 31 major and trace elements by ICP methods at the company's Vancouver laboratory. Gold was determined on a 15 gram split by atomic absorption. Complete results are contained in Appendix I; partial results are as follows:

<u>Sample Number</u>	<u>Gold(ppb)</u>	<u>Silver(ppm)</u>	<u>Copper(ppm)</u>	<u>Lead(ppm)</u>	<u>Zinc(ppm)</u>
0-61365	8	0.4	298	18	116
0-61366	2	<0.2	52	<2	47
0-61367	1	<0.2	52	<2	54
0-61368	1	<0.2	75	2	16

As indicated, no significant results were obtained from the four samples collected. The slightly elevated values obtained from sample number 0-61365 and the composition and structure of the rock hosting the quartz veins (strongly foliated diorite) are suggestive of an environment similar to that reported by Mandy for the main mineralized zone.

## CONCLUSIONS AND RECOMMENDATIONS

Original hand trenches and the two short adits driven to explore the gold-bearing zone described by Mandy (1934) were not found during the 1998 program. The trend of the zone is now thought to be mainly north of, and slightly oblique to the claim location line (Figure 5). The 1994 sample site (60390 - Figure 5) may well be on or marginal to the zone; further prospecting of this area in 1998 was not possible because of time constraints due to poor weather conditions.

The geological environment as described by Mandy (1934) is well worth pursuing and further work will be directed to the eastern property area to accurately locate and re-sample the original workings. It is worthy of note that the MAST mineral claims are in a highly prospective region noted for its number and diversity of mineral deposits.



**COST STATEMENT**Wages

- September 10 - 12, 1998 -

N.C. Carter - 1.0 day	\$500.00
R.T. Heard - 0.5 day	<u>\$250.00</u>
	\$750.00

Transportation

Helicopter - (Bell Long Ranger) - 1.0 hour @ \$1100/hour	\$1,100.00
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Support Costs

Hotel, meals (Smithers) - September 10,11,1998	\$150.62
--	----------

Analytical Costs

4 rock samples @ \$22.26/sample	\$89.04
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Report Preparation

N.C. Carter - 1.0 day @ \$500	\$500.00
Duplicating, word processing	<u>\$20.34</u>
	\$520.34

<b>TOTAL EXPENDITURES</b>	<b>\$2,610.00</b>
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**REFERENCES**

- Carter, N.C.(1995): Prospecting and Geological Report on the MAST Mineral Claims, Hastings Arm, Skeena Mining Division, British Columbia, BC Ministry of Energy and Mines Assessment Report 23890
- Carter, N.C. and Grove, E.W.(1972): Geological Compilation Map of the Stewart, Anyox, Alice Arm and Terrace Areas, BC Department of Mines and Petroleum Resources, Preliminary Map No.8
- Evenchick, C.A. and Holm, K.(1997): Bedrock Geology of the Anyox Pendant and Surrounding Areas, Observatory Inlet and parts of Hastings Arm, British Columbia *in* Current Research 1997-A, Geological Survey of Canada, p.11-20
- Evenchick, C.A. and Snyder, L.D.(1999): Geology of the Georgie River Area of Northwestern Nass River map-area, northwest British Columbia *in* Current Research 1999-A, Geological Survey of Canada, p.13-24
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- Rhys, D.A., Sieb, M., Frostad, S.R., Swanson, C.L., Prefontaine, M.A., Mortenson, J.K. and Smit, H.Q.(1995): Geology and Setting of the red Mountain Gold-Silver deposits, northwestern British Columbia *in* Porphyry Deposits of the Northwestern Cordillera of North America. edited by T.G. Schroeter, CIM Special Volume 46

**STATEMENT OF QUALIFICATIONS**

**R.T. HEARD, P.ENG.**

**Graduate - Haileybury School of Mines**

**Graduate - Geological Engineering, Montana Tech**

**Geological Engineer - United Keno Hill Mines, Elsa, Yukon; Occidental Coal, Red Deer, Alberta**

**Exploration Manager, Equity Silver Mines Ltd.**

**Consulting Geological Engineer - western Canada, United States, Mexico**

### **AUTHOR'S QUALIFICATIONS**

I, NICHOLAS C. CARTER, of 1410 Wende Road, Victoria, British Columbia, do hereby certify that:

1. I am a Consulting Geologist, registered with the Association of Professional Engineers and Geoscientists of British Columbia since 1966.
2. I am a graduate of the University of New Brunswick with B.Sc.(1960), Michigan Technological University with M.S.(1962) and the University of British Columbia with Ph.D.(1974).
3. I have practised my profession in eastern and western Canada and in parts of the United States and abroad for more than 30 years.
4. Field work on the MAST 1-4 mineral claims, as described herein, was planned and carried out by the writer in conjunction with R.T. Heard, P.Eng.

N.C. Carter, Ph.D. P.Eng.

Victoria, BC  
May 7, 1999

**APPENDIX I**  
**Analytical Results**



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## Geochemical Analysis Certificate

8S-0087-RG1

Company: R.T.HEARD JOINT VENTURES  
Project:  
Attn: Nick Carter / Terry Heard

Sep-22-98

We hereby certify the following Geochemical Analysis of 8 ROCK samples submitted Sep-14-98 by NICK CARTER.

Sample Name	Au-fire PPB	Pt-fire PPB	Pd-fire PPB
0-61365	8		
0-61366	2		
0-61367	1		
0-61368	1		

**R.T.HEARD JOINT VENTURES**

Attention: Nick Carter / Terry Heard

Project:

Sample: ROCK

**Mineral Environments Laboratories**

8282 Sherbrooke St., Vancouver, B.C., V5X 4E8

Tel (604) 327-3436 Fax (604) 327-3423

Report No : 8S0087 RJ

Date : Sep-22-98

**MULTI-ELEMENT ICP ANALYSIS**

Aqua Regia Digestion

Sample Number	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sn ppm	Sr ppm	Tl %	V ppm	W ppm	Y ppm	Zn ppm	Zr ppm
0-61365	0.4	0.88	<5	60	<0.5	<5	0.22	1	8	58	298	3.23	0.74	0.63	510	<2	0.05	38	770	18	5	5	<10	8	0.14	68	<10	3	116	2
0-61366	<0.2	1.07	<5	50	<0.5	<5	0.57	<1	7	30	52	2.38	0.31	0.50	345	<2	0.08	10	1070	<2	<5	3	<10	25	0.07	45	<10	3	47	2
0-61367	<0.2	0.98	<5	140	<0.5	<5	0.28	<1	7	84	52	2.34	0.83	0.67	455	<2	0.06	7	680	<2	5	4	<10	10	0.15	55	<10	4	54	2
0-61368	<0.2	0.43	<5	20	<0.5	<5	0.46	<1	8	30	75	2.93	0.03	0.11	150	2	0.07	4	960	2	<5	1	<10	21	0.07	16	20	4	16	2

**APPENDIX II**

**Report by J.T. Mandy - Mastodon Property  
- from Annual Report of the Minister of Mines for British Columbia, 1934**



Early in 1929 the *Bonanza* ore-body, about 3 miles southerly from Anyox, which had been under development for some time, was brought into production and an aerial tramway from this deposit to the smelter constructed. Although the structure of this ore-body is not quite clear, it appears to be a shear-zone in biotite and hornblende-schist (possibly an altered andesite) near the contact of this rock with argillite. As is the case with the *Hidden Creek* deposits, numerous dykes of basic, acid, and dioritic character cut through the formation in an east-west direction and intersect the ore-body. In the shaft on the north side of Bonanza creek a pronounced fault striking north-westerly and dipping 70 degrees south-westerly intersects the northerly continuity of the zone. The ore-zone seems to occupy a portion of a flat anticlinal fold striking north-south. The segment south of the fault, on which mining is being carried out, dips from 10 to 15 degrees west and steepens to a dip of about 30 degrees west about 500 feet southerly from the outcrop, at the same time diminishing in width and increasing in grade. To the east the structural continuity is not clear. This zone has been developed on both the north and south sides of Bonanza creek and shows widths of from about 10 to 90 feet, varying in accordance with the flattening or steepening of the dip. The best development of ore seems to occupy the central portion of the zone where there are ore-widths up to 70 feet, with the best grade developed along widths of from 10 to 40 feet on the foot-wall side. In the zone, bands of solid sulphides (pyrite with chalcopyrite) several feet in width are separated by belts of chloritic schists also containing ore. These sections of the best ore are irregular in shape and sometimes occupy the locality of "rolls" in the zone, which may also possibly be inter-zonal and unconformable to the walls of the zone.

On the south side of Bonanza creek the deposit has been developed and practically mined out for a horizontal length of about 1,660 feet. Along the westerly margins of these workings the westerly dip of the structure steepens, with a corresponding restriction of the walls, but ore is seen to occur in places from 3 to 4 feet thick in the floor of the workings. Further exploration for a westerly continuity of ore-bodies similar to those which have been mined, where the dip of the structure may flatten again, would seem to be warranted. It would also appear that some possibilities may exist on the east side of the underground workings along the upward continuity of the dip. The *Bonanza* ore-body has also been developed through an incline shaft on the north side of Bonanza creek to the fault for a length of about 650 feet. Between the workings on the north and south sides of the creek there is a distance of approximately 370 feet in which no mining has been carried out.

During 1934 the continued low copper price has adversely affected the Granby operations at Anyox and the bulk of the blister-output has necessarily been stored. A generally lower tenor of ore has been met by a slight increase of tonnage to the mill, which towards the end of the year was treating about 5,200 tons of ore per day. The bulk of the mining in the latter part of the year was carried out on No. 4 ore-body between the 525 and 700 levels. No new ore developments of importance have materialized in the mine during the year. The practice of breaking a large ore-tonnage in one blast has materially assisted in achieving low costs in this operation. In the early part of December one of these blasts involving 500,000 or more tons of ore, mainly in pillars and sills of old stopes in No. 1 and No. 5 ore-bodies between the 385-foot level and surface, was carried out.

Production from *Bonanza* was continued at the rate of approximately 300 tons of ore per day. Operations were also continued in the *Granby Point* mine, from which an appreciable tonnage of gold-bearing siliceous ore was produced. About 1,100 men are employed at Anyox, with a pay-roll of \$135,000 per month. In view of the discouraging low copper price and outlook for this metal, at a shareholders' meeting held in December the directors were empowered to cease operations at any time in accordance with their discretion.

#### Mastodon.

This group is owned by Carl Ecklund, J. Flynn, W. Eve, and associates, of Anyox, and is located on the east side of Hastings arm, about 12 miles northerly of the town of Anyox. It is reached by launch from Anyox to the cabin on the shore at Granite creek, from where a trail of about half a mile in length leads to the workings between 400 and 800 feet altitude. The property consists of ten claims comprising the *Mastodon Nos. 1 to 8* and the *Chieftain Nos. 1 and 2*. The mineral occurrence consists of a siliceous replacement in what appears to be a narrow belt of altered semi-digested sedimentaries contained in the granitic rocks of the batholith. The altered sedimentary belt is possibly 100 to 200 feet wide. The siliceous replacement is from about 1 to 6 feet in width.

mineralized in places with pyrite, some sphalerite, and occasionally small amounts of galena. The quartz in which the mineralization occurs has an erratic and lenticular distribution in the form of veins and veinlets, patches and blebs, in the zone. Prospecting has been carried out by twenty-two trenches and shallow cuts along a distance of about 2,700 feet between elevations 400 and 850 feet. The best developments of quartz and mineralization occur in the central section at about elevation 600 feet along a distance of about 600 feet. The geological, structural, and topographical conditions and values are indicated on the accompanying map.

This group of four claims is owned by J. Flynn and associates, of Alice Arm, and is situated at an elevation of about 3,300 feet on the eastern slope of Saddle mountain at the head of Hastings arm. The occurrence consists of an ill-defined, partially silicified structure in andesitic rock and mica-schist, in places carrying alteration products of epidote and garnet. Sparse mineralization of pyrite, pyrrhotite, with some galena and sphalerite in places, occurs along small sections of silicification in narrow and discontinuous fractures. In 1929 some spectacular finely divided gold was discovered in an isolated pocket in a small open-cut. During 1934 work was continued in several trenches and open-cuts along a distance of about 600 feet which showed some silicification and pyrite mineralization. Samples from the best mineralized of these showings only showed traces of gold and silver.

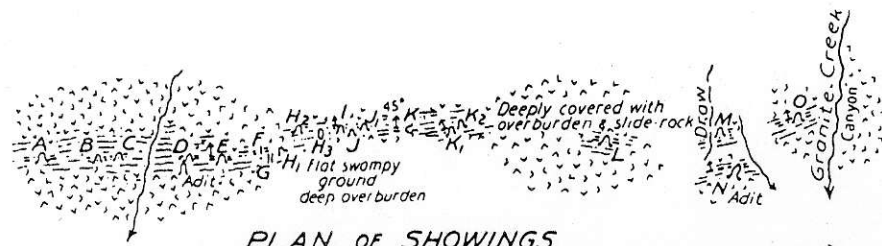
#### KITSALT RIVER SECTION.

**Esperanza Mines, Ltd. (N.P.L.).** This company is composed of 1,000,000 shares of \$1 par value, of which 510,050 are reported to have been issued. The head office is located at Victoria. The company controls the *Aldbaren*, *Black Bear*, and *I'll Chance It* Crown-granted claims and thirteen mineral claims held on location situated on Esperanza mountain, 1½ miles from the town of Alice Arm on the north side of the Dolly Varden Railway. The main showings are a series of erratic quartz veins carrying pockets and lenses of mainly silver-lead-zinc mineralization occurring in argillites of the Kitsault River formation between altitudes of about 300 and 2,000 feet.

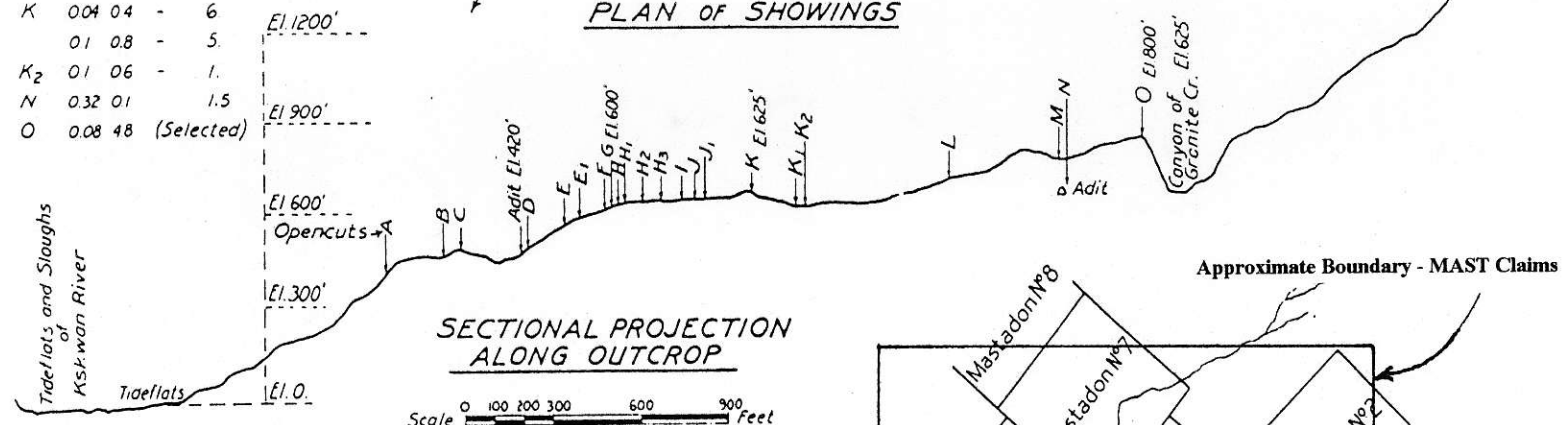
The main showings were opened up by nine adits and in former years were worked intermittently by the locators and lessees. Since 1916 the records show <sup>485</sup> 485 tons of ore have been shipped from the property, giving a net return of <sup>191</sup> 191 oz. of gold, <sup>2,200</sup> 2,200 oz. of silver, and some copper. Lead and zinc are also contained in the ore, but the base-metal content is not generally given in the smelter returns. This type of high-grade shipping-ore occurs in short and erratic lenses and was generally mined when it was located, with the result that the development of ore reserves has been handicapped. The veins occur in a series of argillites and sandstones and have a general north-easterly but varying strike and also display marked variation in dip. The best ore seems to occur where the veins are crenulated into a series of "rolls." These "rolls" seem to be best developed where the veins are transverse to the bedding of the formation, but the veins also follow the bedding in places. Mineralization consists of pyrite, arsenopyrite, galena, sphalerite, grey copper, with some ruby and native silver, mainly in a quartz gangue. In places scheelite is known to occur, but is probably not in sufficient quantity to be of commercial importance.

Mining has been carried out in a haphazard and intermittent manner and these operations are described in former Annual Reports. During 1934 the driving of the "Alice" adit at elevation 1,730 feet was continued for the purpose of intersecting the "Alice" vein outcropping at about 65 feet higher elevation. At the time of examination this adit had been driven in a winding direction for about 114 feet, with the face heading south 67 degrees west, which location should be about 50 feet to the projection of the vein at this level. The "Alice" vein has been traced by open-cuts and stripping between elevations 1,798 and 1,850 feet for a distance of about 700 feet, striking north 40 degrees west and dipping about 70 degrees to the south-west. Along this stretch the vein shows a width of from 6 to 36 inches and is composed of quartz, pyrite, galena, sphalerite, some grey copper, and possibly some ruby silver. A sample along 8 feet of the most easterly cut and across a width of 3 feet assayed: Gold, 0.10 oz. per ton; silver, 75 oz. per ton; lead, 0.2 per cent.; zinc, 2 per cent. A composite sample of the stripped vein exposed 50 feet westerly of this cut across widths of from 6 to 22 inches and along a length of 56 feet assayed: Gold, 0.04 oz. per ton; silver, 22.5 oz. per ton; lead, 0.5 per cent.; zinc, trace. It is understood that work on the crosscut adit to this vein ceased before the vein was intersected.

	Au	Ag	Cu	Width
	oz	oz	1/2	ft
H <sub>3</sub>	Tr.	Tr.	-	3.
I	0.02	12	-	5.
	Tr.	10	Nil	4.5
J	0.1	0.8	-	2.
K	0.04	0.4	-	6
	0.1	0.8	-	5.
K <sub>2</sub>	0.1	0.6	-	1.
N	0.32	0.1	-	1.5
O	0.08	48	(Selected)	



**PLAN OF SHOWINGS**



**SECTIONAL PROJECTION ALONG OUTCROP**

Scale 0 100 200 300 600 900 Feet

- Granitic rocks of Coast Range Batholith
- Zone of altered and hybrid roof-rock sediments (metamorphosed and semi-digested)

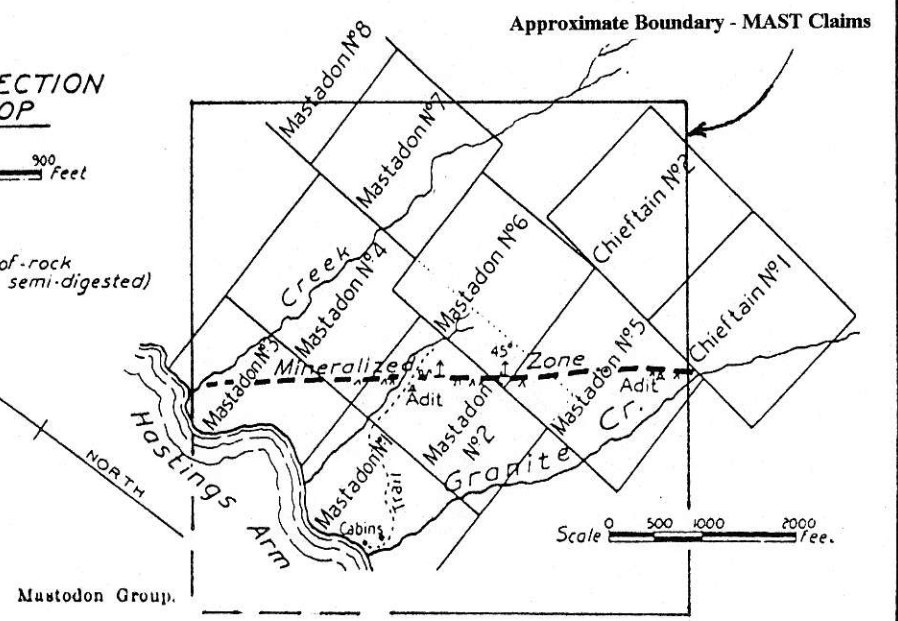


**SECTION ACROSS OUTCROP**

**MAST CLAIMS**

B.C. Department of Mines

(Minister of Mines Annual Report 1934)

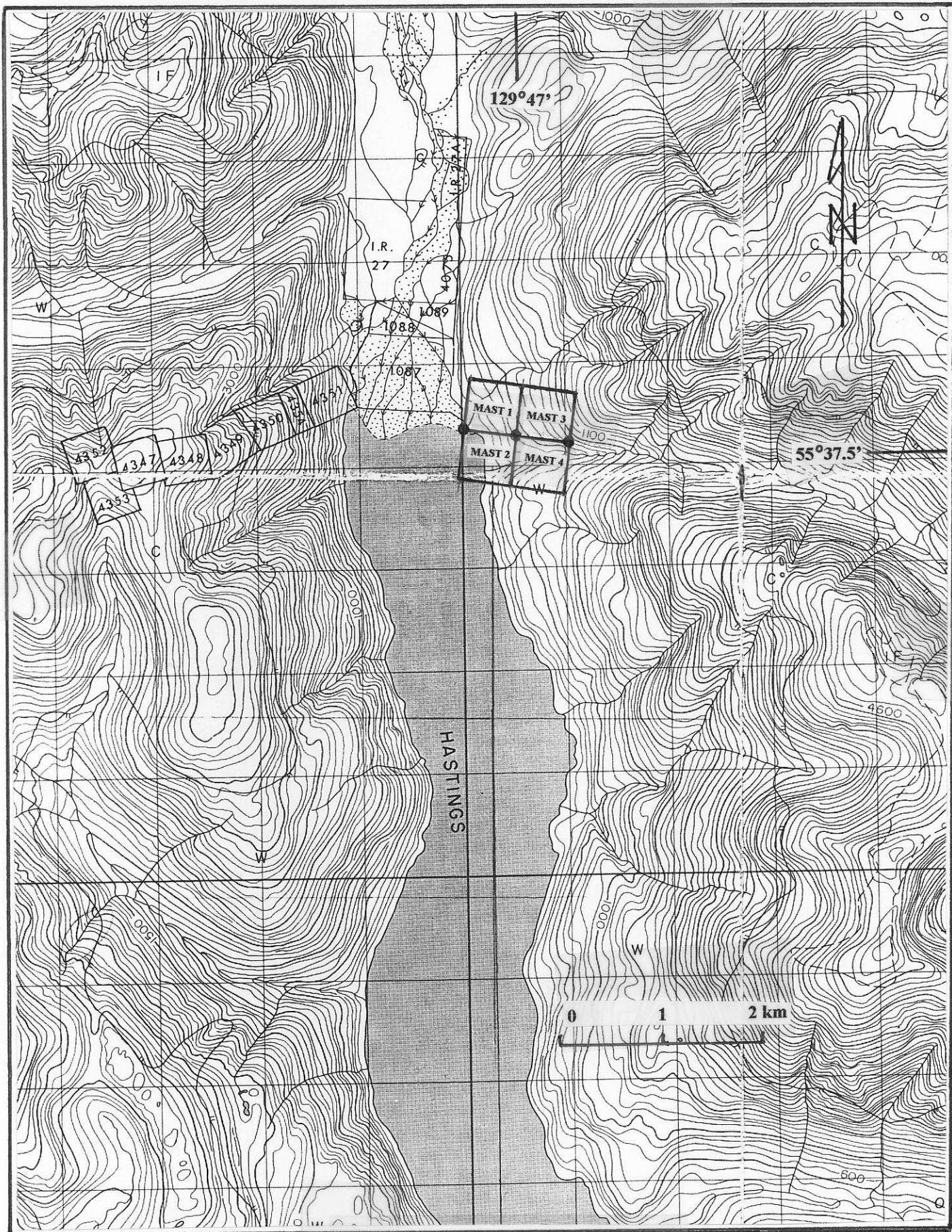


Scale 0 500 1000 2000 Feet

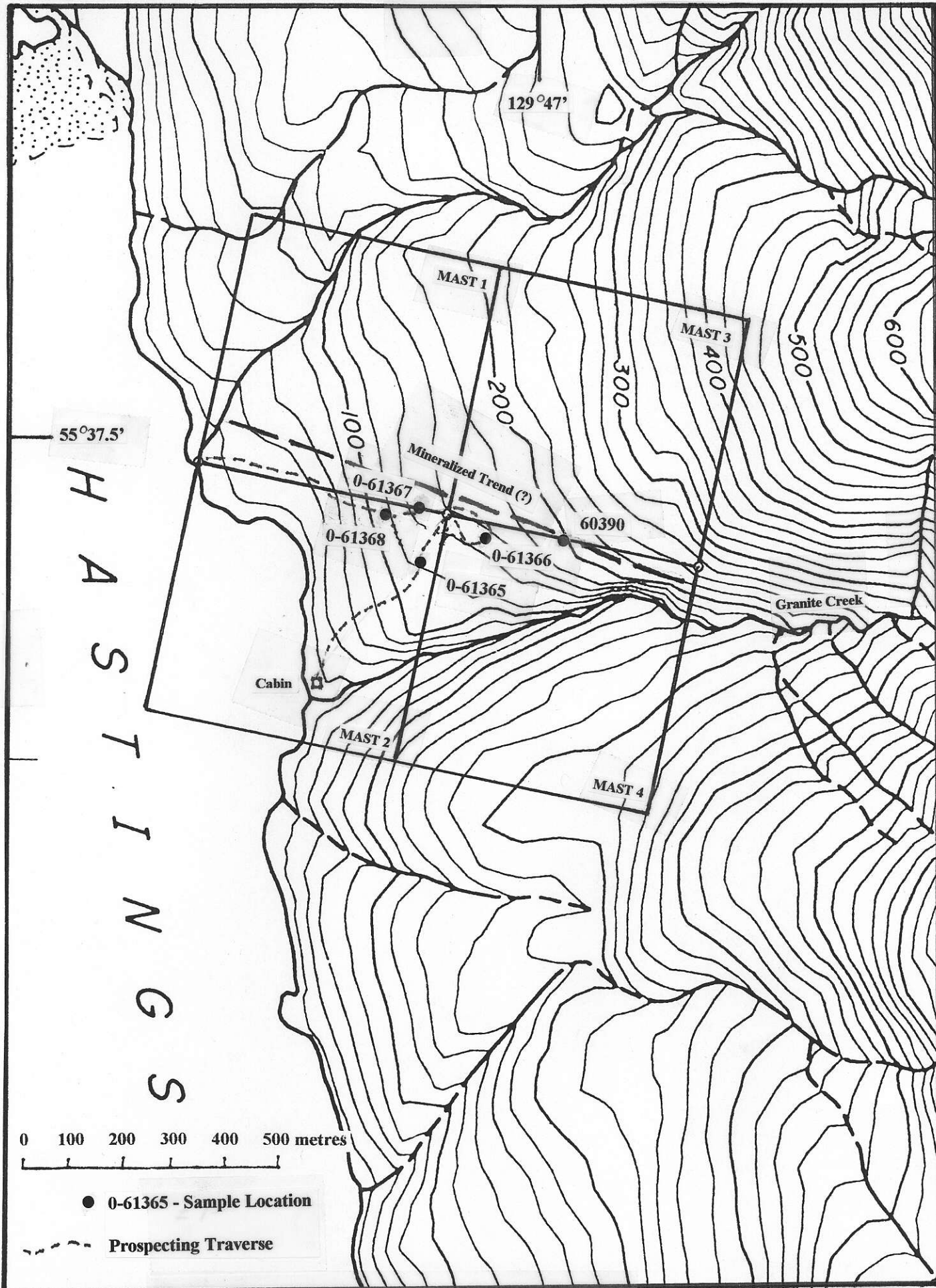
0 500 1000 metres

(Revised Plan Scale)





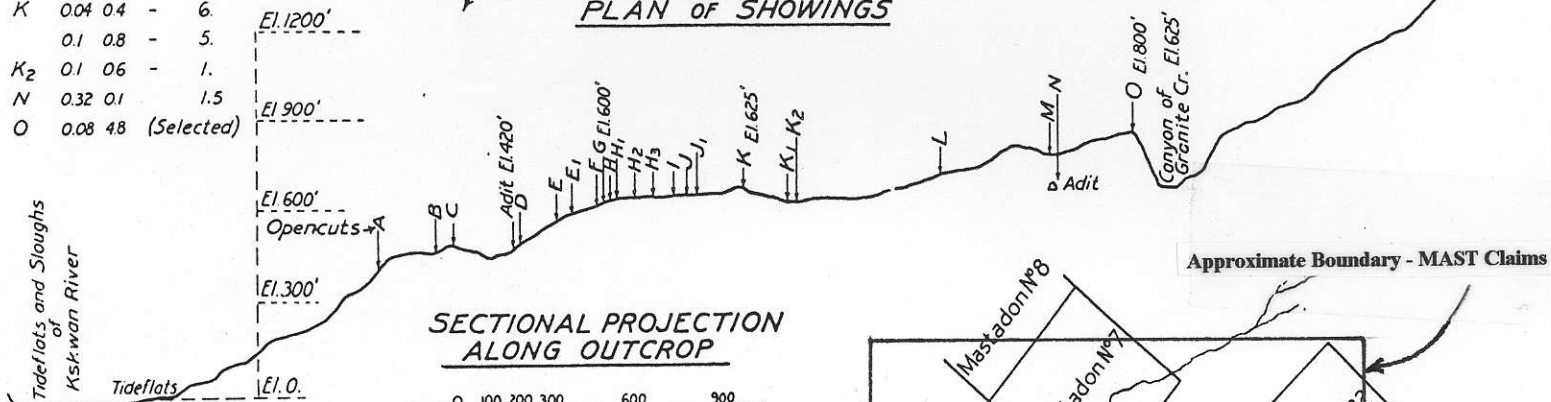
**FIGURE 3 - MAST MINERAL CLAIMS**





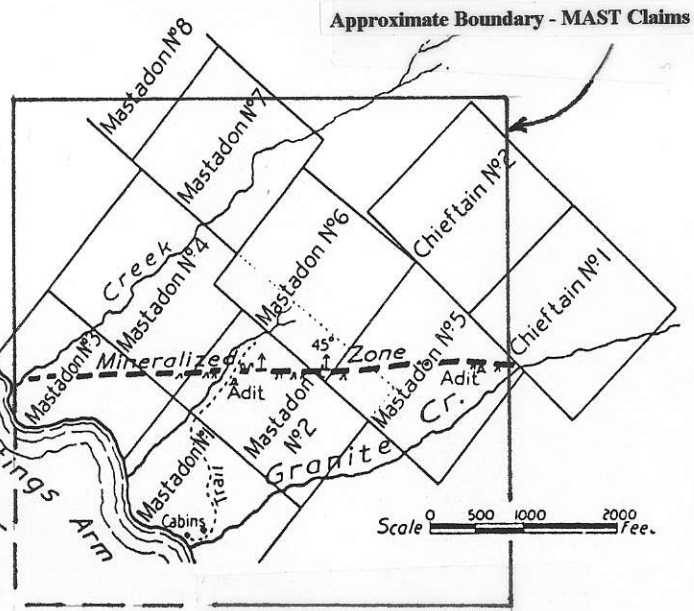
**FIGURE 5 - MAST Mineral Claims - Mineralized Trend and Sample Locations**



	Au oz	Ag oz	Cu %	Width Ft
H <sub>3</sub>	Tr.	Tr.	-	3.
I	0.02	12	-	5.
	Tr.	1.0	Nil	4.5
J	0.1	0.8	-	2.
K	0.04	0.4	-	6.
	0.1	0.8	-	5.
K <sub>2</sub>	0.1	0.6	-	1.
N	0.32	0.1	-	1.5
O	0.08	4.8	(Selected)	



 Granitic rocks of Coast Range Batholith  
 Zone of altered and hybrid roof-rock sediments (metamorphosed and semi-digested)



MAST CLAIMS

B.C. Department of Mines

(Minister of Mines Annual Report 1934)

Mastadon Group.

0 500 1000 metres

(Revised Plan Scale)

Early in 1929 the *Bonanza* ore-body, about 3 miles southerly from Anyox, which had been under development for some time, was brought into production and an aerial tramway from this deposit to the smelter constructed. Although the structure of this ore-body is not quite clear, it appears to be a shear-zone in biotite and hornblende-schist (possibly an altered andesite) near the contact of this rock with argillite. As is the case with the *Hidden Creek* deposits, numerous dykes of basic, acid, and dioritic character cut through the formation in an east-west direction and intersect the ore-body. In the shaft on the north side of Bonanza creek a pronounced fault striking north-westerly and dipping 70 degrees south-westerly intersects the northerly continuity of the zone. The ore-zone seems to occupy a portion of a flat anticlinal fold striking north-south. The segment south of the fault, on which mining is being carried out, dips from 10 to 15 degrees west and steepens to a dip of about 30 degrees west about 500 feet southerly from the outcrop, at the same time diminishing in width and increasing in grade. To the east the structural continuity is not clear. This zone has been developed on both the north and south sides of Bonanza creek and shows widths of from about 10 to 90 feet, varying in accordance with the flattening or steepening of the dip. The best development of ore seems to occupy the central portion of the zone where there are ore-widths up to 70 feet, with the best grade developed along widths of from 10 to 40 feet on the foot-wall side. In the zone, bands of solid sulphides (pyrite with chalcopyrite) several feet in width are separated by belts of chloritic schists also containing ore. These sections of the best ore are irregular in shape and sometimes occupy the locality of "rolls" in the zone, which may also possibly be inter-zonal and unconformable to the walls of the zone.

On the south side of Bonanza creek the deposit has been developed and practically mined out for a horizontal length of about 1,660 feet. Along the westerly margins of these workings the westerly dip of the structure steepens, with a corresponding restriction of the walls, but ore is seen to occur in places from 3 to 4 feet thick in the floor of the workings. Further exploration for a westerly continuity of ore-bodies similar to those which have been mined, where the dip of the structure may flatten again, would seem to be warranted. It would also appear that some possibilities may exist on the east side of the underground workings along the upward continuity of the dip. The *Bonanza* ore-body has also been developed through an incline shaft on the north side of Bonanza creek to the fault for a length of about 650 feet. Between the workings on the north and south sides of the creek there is a distance of approximately 370 feet in which no mining has been carried out.

During 1934 the continued low copper price has adversely affected the Granby operations at Anyox and the bulk of the blister-output has necessarily been stored. A generally lower tenor of ore has been met by a slight increase of tonnage to the mill, which towards the end of the year was treating about 5,200 tons of ore per day. The bulk of the mining in the latter part of the year was carried out on No. 4 ore-body between the 525 and 700 levels. No new ore developments of importance have materialized in the mine during the year. The practice of breaking a large ore-tonnage in one blast has materially assisted in achieving low costs in this operation. In the early part of December one of these blasts involving 500,000 or more tons of ore, mainly in pillars and sills of old stopes in No. 1 and No. 5 ore-bodies between the 385-foot level and surface, was carried out.

Production from *Bonanza* was continued at the rate of approximately 300 tons of ore per day. Operations were also continued in the *Granby Point* mine, from which an appreciable tonnage of gold-bearing siliceous ore was produced. About 1,100 men are employed at Anyox, with a pay-roll of \$135,000 per month. In view of the discouraging low copper price and outlook for this metal, at a shareholders' meeting held in December the directors were empowered to cease operations at any time in accordance with their discretion.

#### Mastodon.

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#### KITSAULT RIVER SECTION.

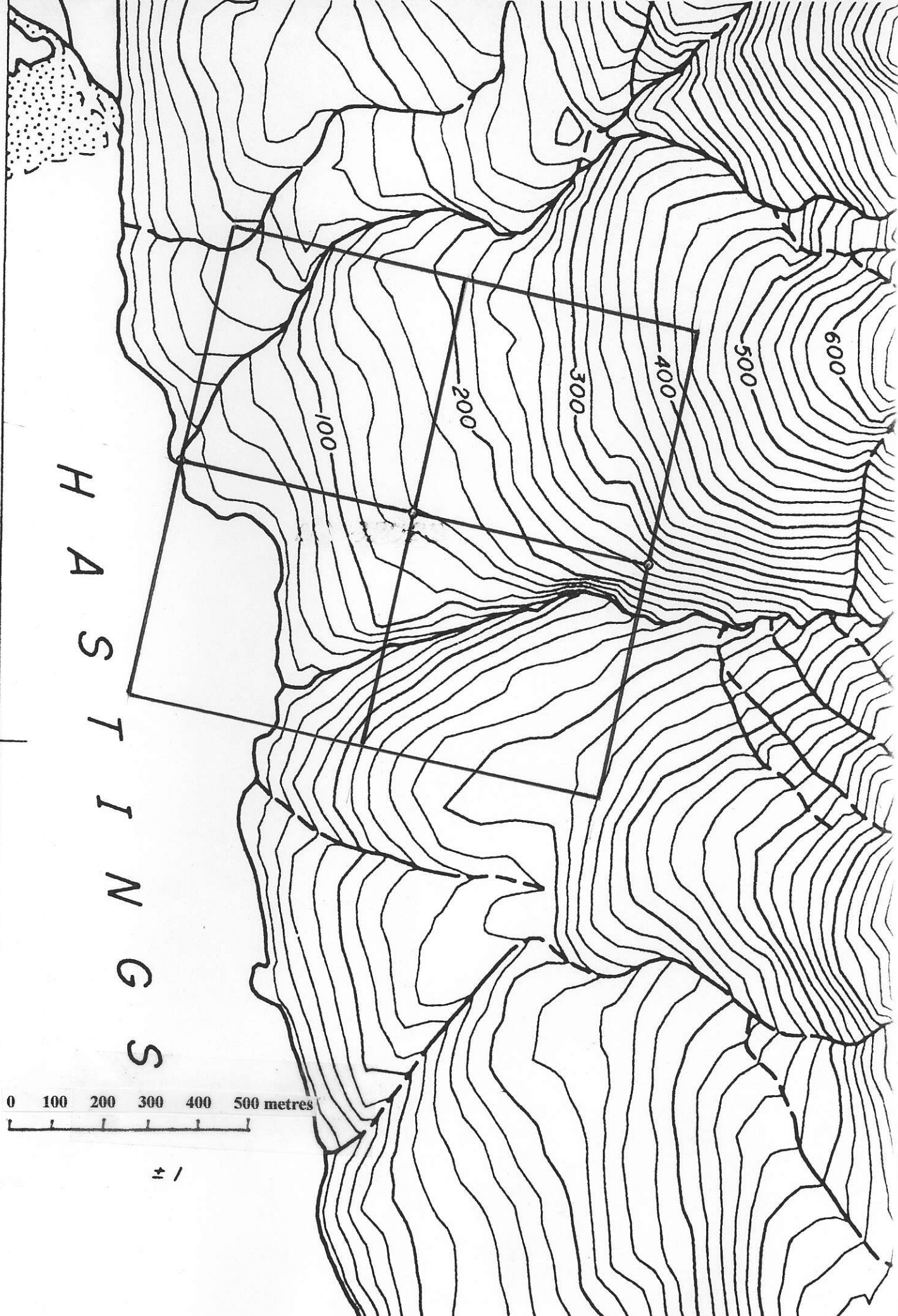
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The main showings were opened up by nine adits and in former years were worked intermittently by the locators and lessees. Since 1916 the records show <sup>487</sup> 487 tons of ore have been shipped from the property, giving a net return of <sup>121</sup> 121 oz. of gold, <sup>8,200</sup> 8,200 oz. of silver, and some copper. Lead and zinc are also contained in the ore, but the base-metal content is not generally given in the smelter returns. This type of high-grade shipping-ore occurs in short and erratic lenses and was generally mined when it was located, with the result that the development of ore reserves has been handicapped. The veins occur in a series of argillites and sandstones and have a general north-easterly but varying strike and also display marked variation in dip. The best ore seems to occur where the veins are crenulated into a series of "rolls." These "rolls" seem to be best developed where the veins are transverse to the bedding of the formation, but the veins also follow the bedding in places. Mineralization consists of pyrite, arsenopyrite, galena, sphalerite, grey copper, with some ruby and native silver, mainly in a quartz gangue. In places scheelite is known to occur, but is probably not in sufficient quantity to be of commercial importance.

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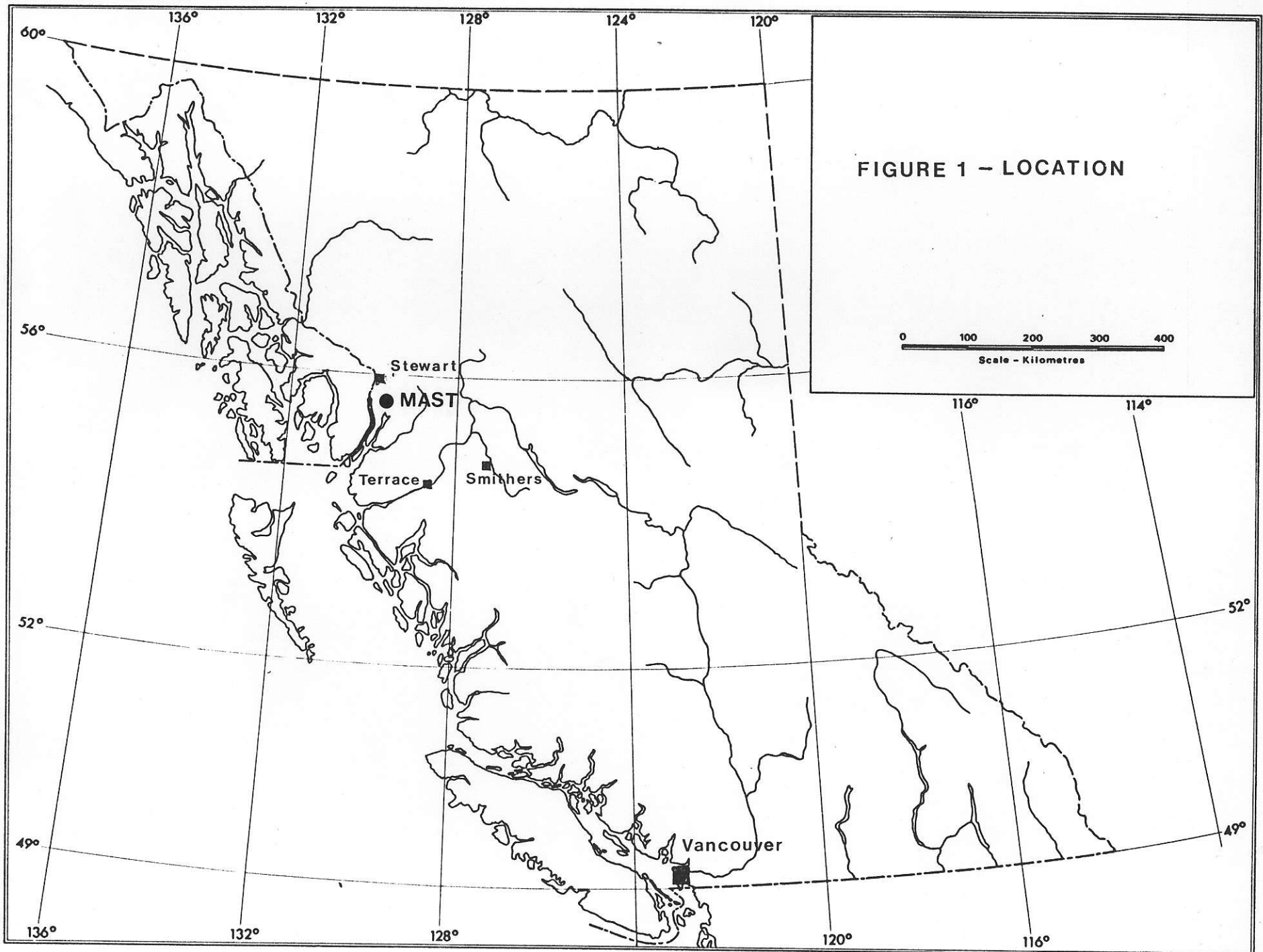
HASTINGS

164000

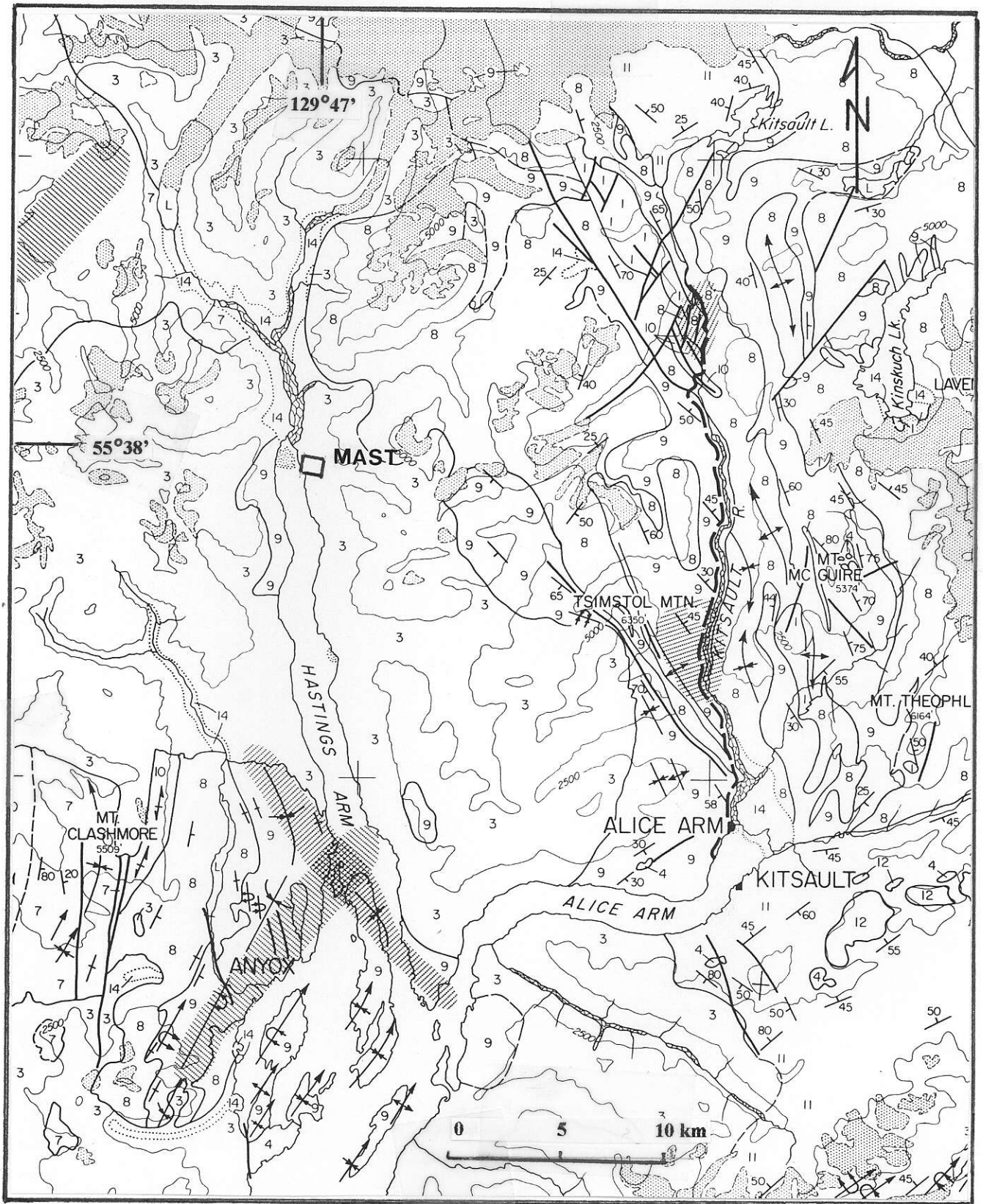
0 100 200 300 400 500 metres



1: /







**FIGURE 4 - MAST PROPERTY - GEOLOGICAL SETTING**  
 (After Carter and Grove, 1972)

# LEGEND

## SEDIMENTARY AND VOLCANIC ROCKS

### QUATERNARY

#### RECENT

14 ALLUVIUM, SAND, GRAVEL, TILL

13 BASALT FLOWS, CINDER CONES, ETC.

#### PLEISTOCENE AND OLDER (?)

12 PLATEAU BASALTS, ETC.

### JURASSIC AND CRETACEOUS

#### UPPER JURASSIC-LOWER CRETACEOUS

11 SILTSTONE, GREYWACKE, SANDSTONE, CONGLOMERATE, MINOR LIMESTONE AND COAL

#### JURASSIC

10 CATACLASITE, MYLONITE, AND SCHIST (METAMORPHIC EQUIVALENTS OF MAINLY LOWER JURASSIC ROCKS) -- INCLUDING PHYLLONITES, RED, GREEN, AND PURPLE MYLONITES AND BANDED ULTRAMYLONITES, AND CHLORITE, BIOTITE AND SERICITE SCHISTS

#### MIDDLE AND UPPER JURASSIC

9 SILTSTONE, GREYWACKE, SANDSTONE, CONGLOMERATE, MINOR LIMESTONE

#### MIDDLE JURASSIC

8 GREEN, RED, PURPLE VOLCANIC TUFF AND BRECCIA, PILLOW LAVA, VOLCANIC SANDSTONE AND CONGLOMERATE, MINOR FLOWS

#### LOWER JURASSIC

7 GREEN, RED, AND PURPLE VOLCANIC BRECCIA, CONGLOMERATE AND SANDSTONE, GREYWACKE, ARGILLITE, CRYSTAL AND LITHIC TUFFS, SOME SILTSTONE, LIMESTONE, ANDESITIC AND BASALTIC PILLOW LAVA (a) HORNBLende SCHIST AND GREENSTONE, MIXED WITH DIORITIC ROCKS

#### TRIASSIC AND OLDER

6 MAFIC VOLCANIC ROCKS, LIMESTONE, MINOR GREYWACKE, VOLCANIC SANDSTONE, AND CHERT, (a) ACID METAVOLCANIC ROCKS (b) PHYLLITE, SLATE, CHLORITE, SERICITE, AND BIOTITE SCHISTS

5 GNEISS COMPLEX, ALMANDINE-AMPHIBOLITE FACIES -- GNEISS AND RELATED MIGMATITIC GNEISS, GRADATIONAL TO GNEISSIC DIORITE, QUARTZ DIORITE, AND GRANODIORITE

## INTRUSIVE ROCKS

### TERTIARY

#### OLIGOCENE AND YOUNGER (?)

LAMPROPHYRE, BASALT AND ANDESITE DYKE SWARMS (ORIENTATION OF PATTERN INDICATES DYKE TRENDS)

#### Eocene

PORTLAND CANAL DYKE SWARM -- GRANITE, QUARTZ MONZONITE, GRANODIORITE EQUIGRANULAR TO PORPHYRITIC

4 ALICE ARM INTRUSIONS -- QUARTZ MONZONITE PORPHYRY, QUARTZ FELDSPAR PORPHYRY, QUARTZ DIORITE STOCKS, PLUGS AND DYKES

#### TERTIARY AND OLDER (?)

3 COAST PLUTONIC COMPLEX (GRANITIC ROCKS); QUARTZ DIORITE, GRANODIORITE, QUARTZ MONZONITE, LOCALLY FOLIATED AND/OR GNEISSIC, SOME GRANITIC MIGMATITE COMPLEXES, MINOR DIORITE AND GABBRO

#### CRETACEOUS (?) AND/OR TERTIARY

2 AUGITE DIORITE, HORNBLende GRANODIORITE

#### JURASSIC AND CRETACEOUS (?)

1 FELDSPAR PORPHYRY, AUGITE PORPHYRY, HORNBLende DIORITE

### SYMBOLS

GEOLOGICAL BOUNDARY, DEFINED, APPROXIMATE

BEDDING (INCLINED, VERTICAL)

CLEAVAGE, SCHISTOSITY, GNEISSOSITY (INCLINED, VERTICAL)

LINATION (INCLINED)

ANTICLINE, - HORIZONTAL AXIS, PLUNGING, OVERTURNED

SYNCLINE, - HORIZONTAL AXIS, PLUNGING, OVERTURNED

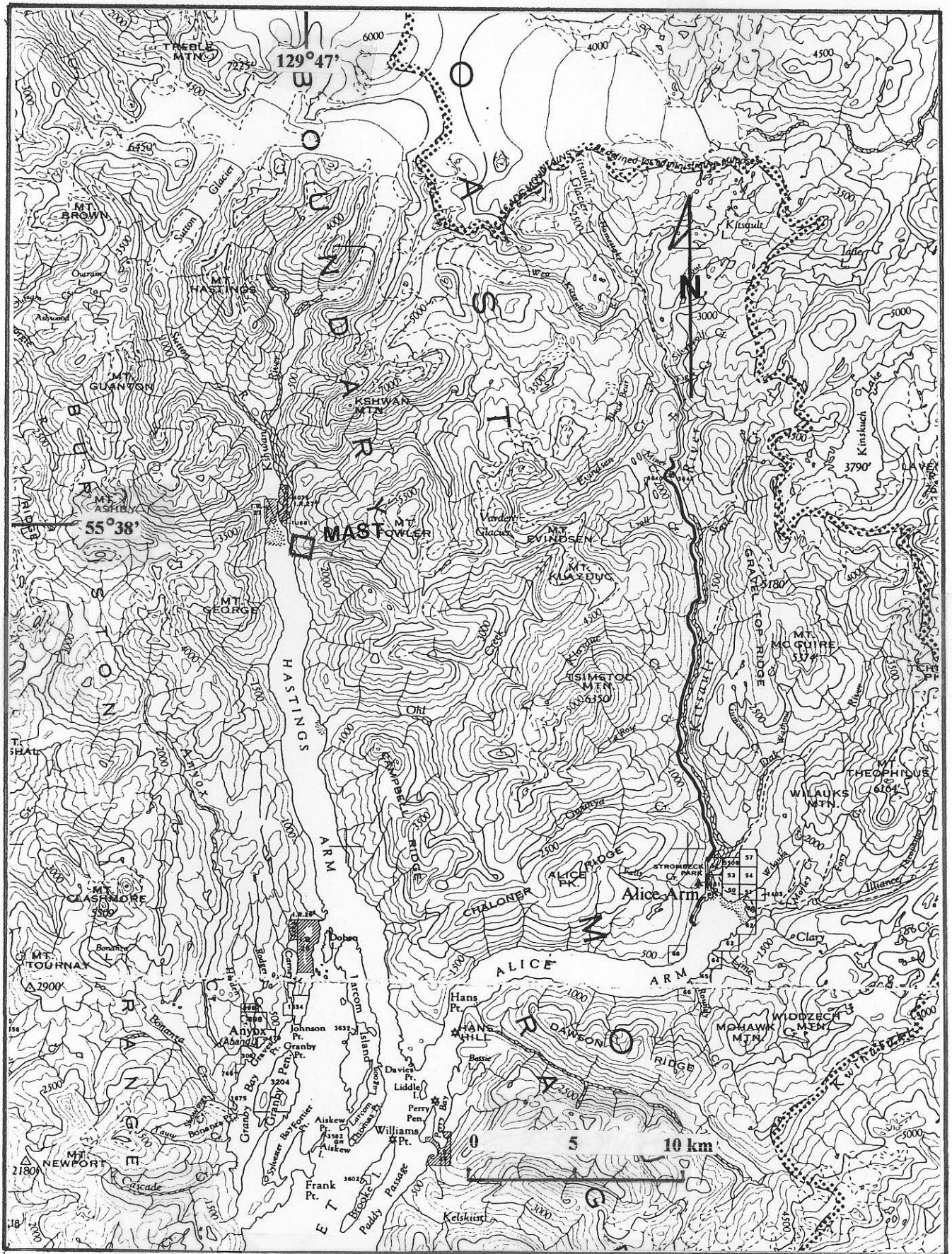
FAULT

HIGHWAY

SECONDARY ROAD

GLACIER

**LEGEND for FIGURE 4**



**FIGURE 2 - LOCATION - MAST PROPERTY**