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GEOLOGICAL, GEOPHYSICAL, AND AIR PHOTO INTERPRETATION REPORT

ON THE CHU CLAIM

1. Located Approximately 25 km SW of Kamloops, B.C.
2. Kamloops Mining Division
3. NTS Map 92I/10
4. UTM Grid Reference:
   10U CK 676000 5607000
5. Latitude: 50 Deg. 35.5 Min. N
   Longitude: 120 Deg. 31 Min. W
6. Work done during June 1992
7. Owner/Operator: Rhino Resources Inc.

By

Dr.A.B.L.Whittles, P.Eng.
(Geonics Consulting Services Ltd.)
(Director, Rhino Resources Inc.)

November, 1992

GEOLOGICAL BRANCH
ASSESSMENT REPORT

22,699

TABLE OF CONTENTS

LIST OF FIGURES

ASSESSMENT REPORT SUMMARY

The CHU Claim was examined geologically during four days in June 1992, and a number of samples were collected.

Concurrently, an air photo study was initiated to evaluate the larger scale features in and around this claim.

A geophysical analysis of some previously published air magnetic maps was also completed.

Outcrops containing sulfide mineralization (primarily pyrite and chalcopyrite) were discovered during the field work.

The CHU Claim appears to be located over an upthrust block of Paleozoic Cache Creek Group sedimentary rocks, thinly covered by Nicola Group volcanic rocks.

The claim is cut by a number of prominent fractures, including a major north to south fault on the western side. This fault may have acted as a control structure for intrusive activity, including the emplacement of plutons, and mineralizing solutions with the accompanying alteration.

The exploration models developed suggest that porphyry type copper-gold deposits (in intrusive stocks), and gold-silver vein deposits (in Cache Creek Group rocks) are potential targets on the CHU Claim, particularly to the east of the large north-south fault.

PART 1: INTRODUCTION

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1.1 PROPERTY LOCATION, ACCESS AND DESCRIPTION

The CHU Claim is located 25 km. S.W. of the town of Kamloops (see Figures 1 and 2).

Access is attained by leaving Kamloops on the Cocahalla Highway, branching off on Highway 1 and travelling to the Cherry Creek Rd cutoff, then turning south. One then travels 3 km south to the Dominic Lake Rd intersection, turns left (south-eastward), then travels 2 km to a branch road that also turns left (eastward). This dirt track turns sharply south and is followed 4 km. south to the CHU Claim. Refer to Figure 2.

The claim group topography is fairly flat on the west, rising perhaps 200m along the eastern claim boundary. For the most part, the relief is moderate.

Tree cover is moderate, and the bush is fairly open. Open meadows are common.

1.2 OWNERSHIP

The CHU Claim is owned by Rhino Resources Inc. and consists of sixteen (4X4) mineral claim units, record number 200587 (see Figure 3).

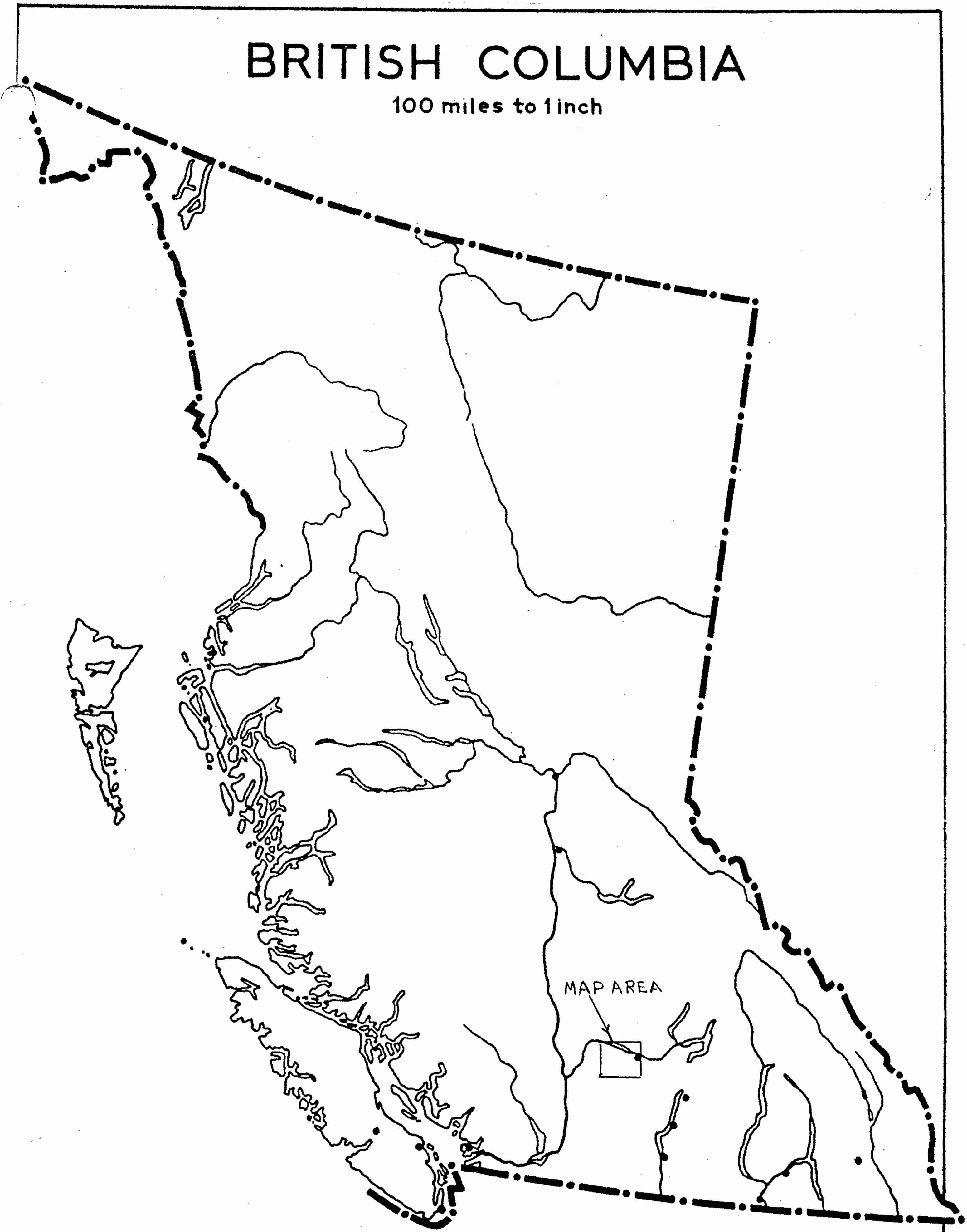


Figure 1: Map of British Columbia

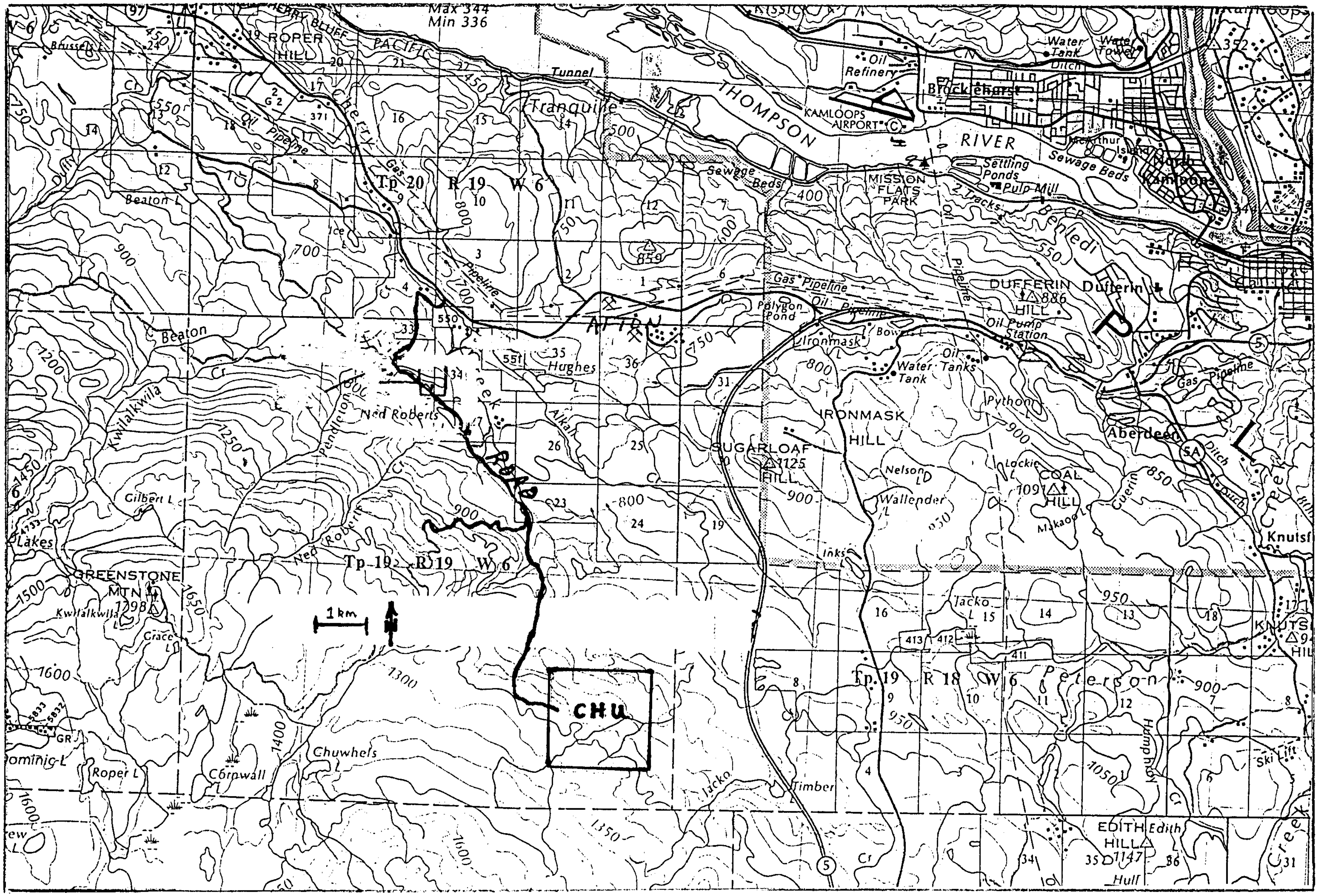


Figure 2: Map of the Kamloops Area

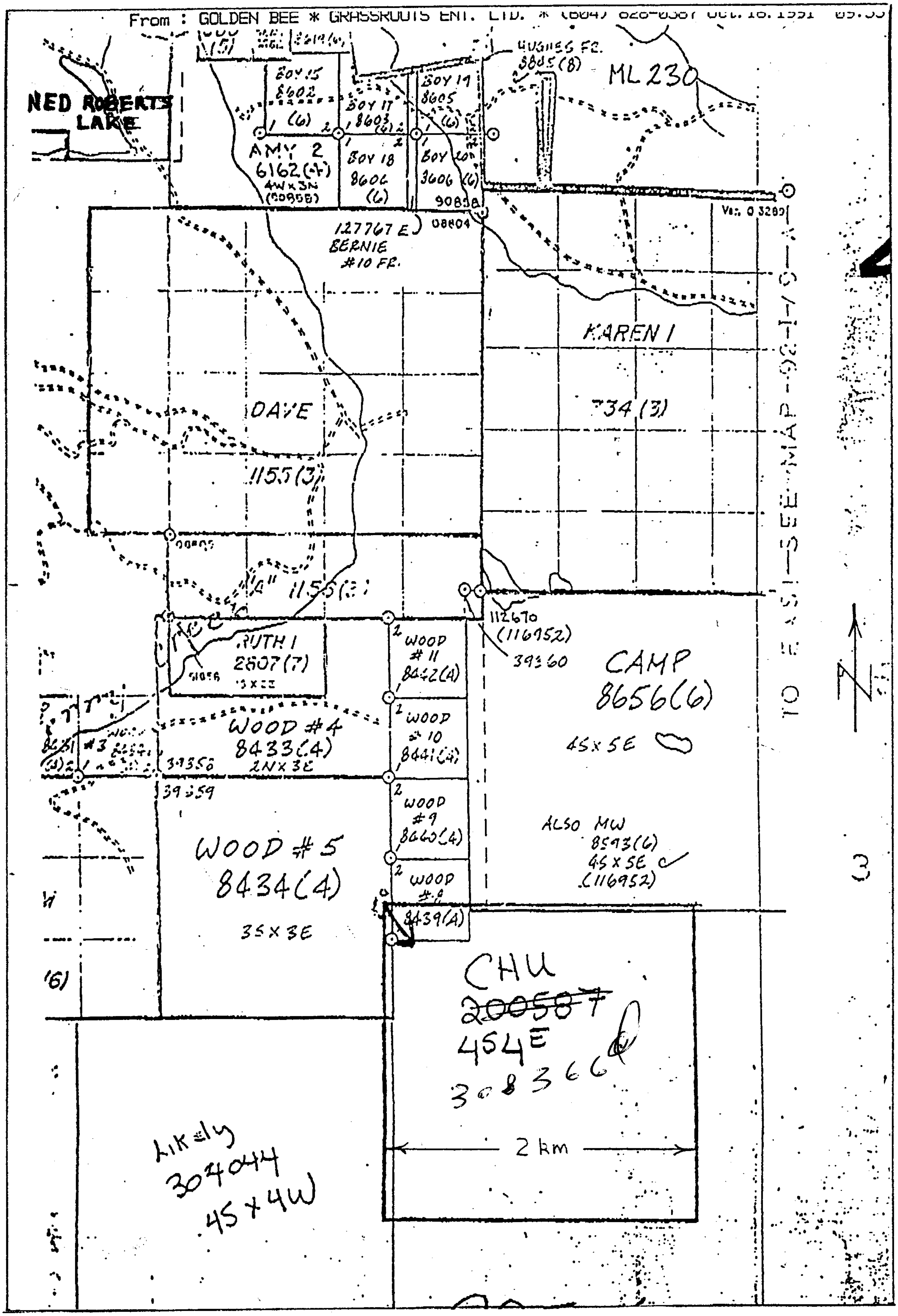


Figure 3: Location of the CHU Claim

PART 2: SUMMARY OF PREVIOUS WORK

PART 2: SUMMARY OF PREVIOUS WORK

2.1 HISTORICAL OVERVIEW

Work in this area started before the turn of the century, and has continued until the present.

Minor production was recorded on several properties prior to the opening of the Afton Mine. The Iron Mask and Frin orebodies produced over 180,000 tons averaging 1.5% copper (plus silver and gold) between 1904 and 1928. The Copper King Mine produced 7500 tons averaging 3% copper and 0.14 oz./ton gold.

The Afton orebody was discovered in 1971 and developed into a major open pit mine in 1977. This mining has continued until recently. Start up reserves (Kwong, 1987) were about 31 million tons of 1% copper, 0.6 gram/tonne gold, and 4.2 grams/tonne silver.

Exploration work has continued all around the Iron Mask Batholith, with numerous assessment reports being available.

A dozen or so gold-silver properties have been explored in the Cache Creek Group rocks (Cockfield, 1961), and some production was reported. Gold assays of over 1 oz. per ton, and silver assays of over 30 oz. per ton were reported.

2.2 OVERVIEW OF PREVIOUS EXPLORATION ACTIVITY

A variety of publications and reports are available for the area in which the CHU Claim is staked.

Kwong (1987), recently published a detailed study of the geology of the Iron Mask Batholith.

The Federal Government released aeromagnetic maps of the area in 1968.

A number of B.C. Assessment Reports covering ground near the CHU Claim were reviewed. A brief discussion of a number of these reports follows.

Assessment Report # 4214 (Prendergast,1973), carried out magnetic, I.P., and soil sampling programs. These programs identified several good copper and I.P. anomalies.

Assessment Report # 10550 (England,1982) unidentified a number of NW trending VLF electromagnetic conductive zones.

Assessment Report # 11248 (Tulley,1982) discussed results similar to the two preceding reports.

Assessment Report # 11550 (Tulley, 1983) reported that three VLF-EM conductors were found with trends varying from N/S to NNE. These were in contrast to the NW trend of the geology, with the main rocks being andesite and volcanic tuffs of the Nicola Group. The author of this report thought that Jurassic Coast Intrusion rocks (granite, granodiorite, diorite, felsic dykes, and mafic dykes) might be present and accompanied by folding, faulting, and shearing. Detailed geochemical (ICP) results gave copper and arsenic anomalies with N/S to NE (minor) trends. There were no silver or antimony anomalies.

PART 3: GENERAL GEOLOGY

PART 3: GENERAL GEOLOGY

3.1 REGIONAL GEOLOGY

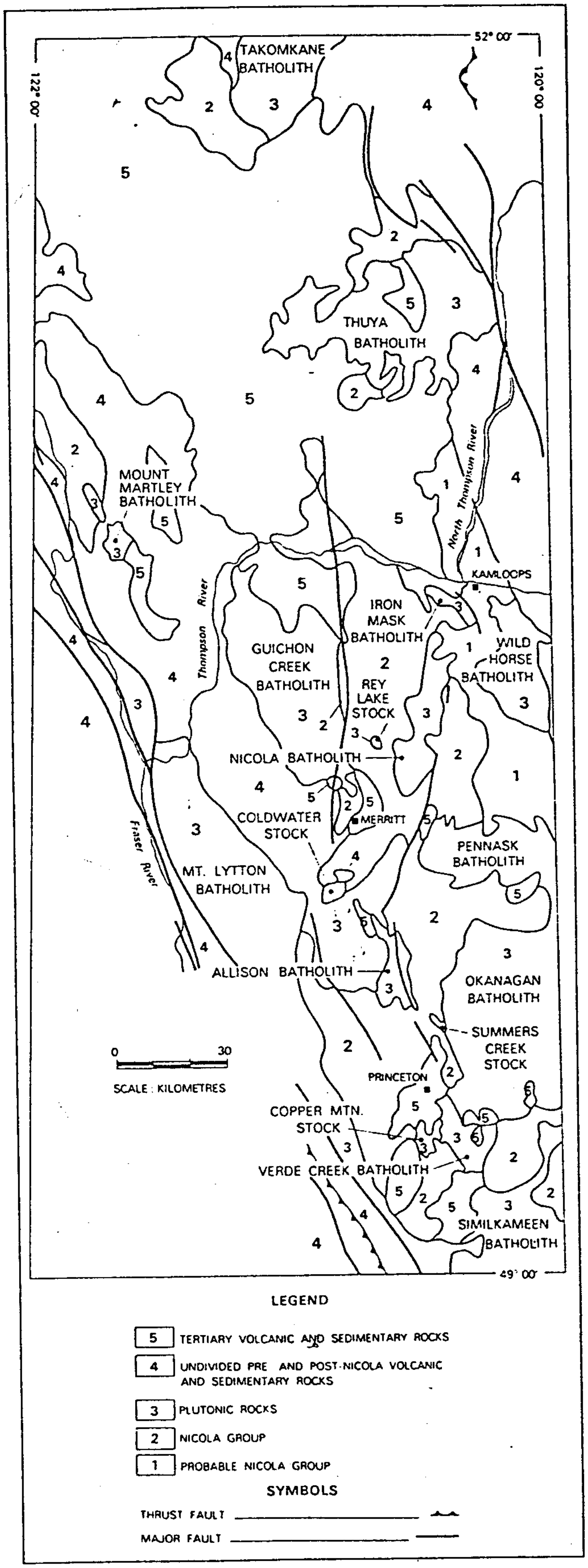
There are a variety of geological information sources available, many of which may found in the bibliography of Kwong (1987). Additional information was obtained from Duffell and McTaggart (1952), Cockfield (1961), Holcapek (1970) and Reed (1976). Leitch (1961) produced a one page map and rock description that summarizes the geology from Cache Creek, to the Highland Valley, to Merritt, and to Kamloops, with particular reference to the many copper deposits in the mapped area.

The CHU Claim lies in the southern part of the Quesnel Trough, which is also known as the Nicola Belt see Figure 4). As Kwong (1987) notes "The Quesnel Trough, located in the Intermontaine structural belt of British Columbia, is 1200 kilometers long, 30 to 60 kilometers wide and consists of Lower Mesozoic volcanic and related rocks enclosed between older rocks. It is much invaded by batholiths and smaller intrusions and is copper rich."

The Nicola Belt (Quesnel Trough) extends 200 km south of Lake Kamloops to the International Boundary. The most important pre-Tertiary rocks in this belt are Late Triassic volcanic and sedimentary rocks of the Nicola Group. Structurally the Nicola Belt is divided into a number of northerly trending blocks by several large, high-angle, northerly trending faults (Figure 4). These faults are interpreted to be basement structures which controlled the distribution of volcanic centers and flanking sedimentary basins. Four major plutonic events have occurred in the belt, at 200 million years ago (Ma), 160 Ma, 100 Ma, and 50-70 Ma. See Figure 4.

Cockfield (1961) has provided a regional geological map (Figure 5).The following general observations can be made for this area.

(1)The Cenozoic era is represented by both sedimentary and volcanic rocks (see Figure 4), with the Valley Basalt and Kamloops Group volcanic rocks occurring most recently.
(2)The Mesozoic era is represented by thick accumulations of volcanic rocks, extensive areas of intrusive rocks, together with minor amounts of interbedded sedimentary rocks. The Iron Mask Batholith, the nearest major intrusive feature in the vicinity of the CHU Claim, is one of the larger alkaline plutons of the 200 Ma age group. It is situated along the southwest side of a regional northwest trending fracture zone, and is itself cut by numerous northwesterly faults. This batholith, and other alkaline plutons in the same group, are the likely centers of the Nicola volcanism.



Geological Survey of Canada. Map 232A

Figure 4: Generalized Geology of South Central B.C.

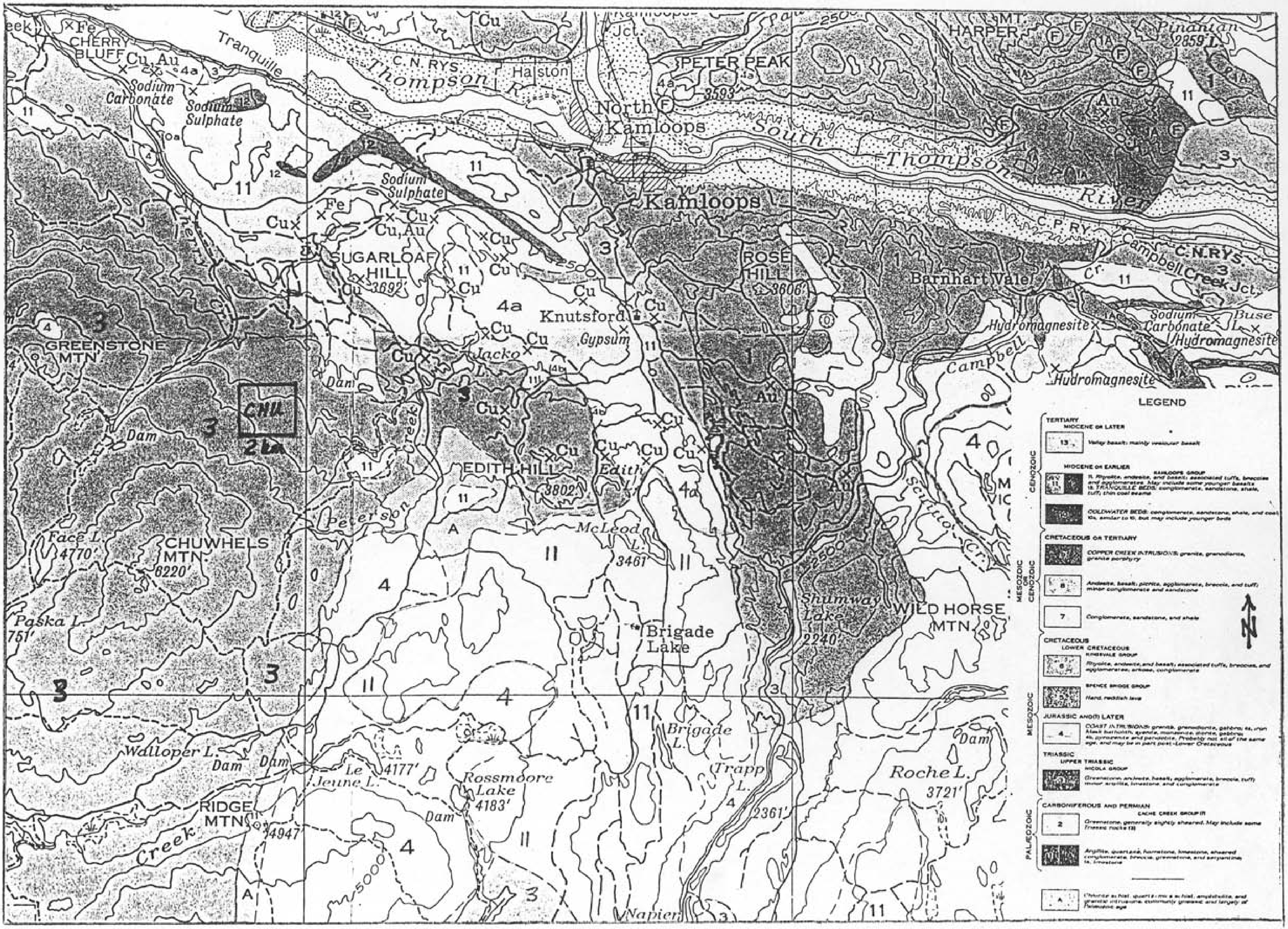


Figure 5: Regional Geological Map (Part of Nicola Map Area)

(3)The Paleozoic era rocks consist of a group of sedimentary, igneous intrusive and igneous extrusive varieties, that outcrop chiefly in the northeast and southeast parts of the Nicola Map Area. These rocks are part of the Cache Creek Group and have not been found yet (with the possible exception of one sample-see Section 4.3.4)in the CHU Claim area. Cache Creek Group rocks are found just to the east of Kamloops, and some metamorphosed varieties are shown to be directly south of Kamloops and the east of the CHU Claim.

Figure 6 represents a simplified summary of the various rock units identified in this region.

Cockfield (1961) gives complete descriptions of the various rock formations, and the reader is referred there for the details. In the following sections of this report only those formations likely to be encountered in the CHU Claim area are discussed in more detail. These formations include the Valley Basalts, Kamloops Group, Coast Intrusions, the Nicola Group, and the Cache Creek Group.

3.2 VALLEY BASALTS

These rocks are described as generally grey to black, fresh appearing, and vesicular, but in places are dense. The composition is essentially plagioclase feldspar and augite with small amounts of brown interstitial glass. The texture is aphanitic. The flows seem to be essentially horizontal.

There is one outcrop of this formation just to the northwest of the CHU Claim, that is easily seen on the air photos, and easily confused as a mine dump! Ground examination was required to make this differentiation.

3.3 KAMLOOPS GROUP

3.3.1 General

Early Tertiary sedimentary and volcanic rocks of the Kamloops Group uconformably overlie the Nicola rocks and the Iron Mask Batholith in the CHU Claim area. These include the strictly sedimentary rocks of the Coldwater Formation, and the mixed tuffaceous/sedimentary rocks of the Tranquille Formation.

No sedimentary rocks were found on the CHU Claim.

3.3.2 Volcanic Rock Descriptions

As can be seen on Figure 4 there are a variety of volcanic rocks in the Kamloops Group, and these have a wide range of colors: from white, through various shades of red, pink, mauve, brown, buff, grey, and green to black.

FIGURE 6. SIMPLIFIED KAMLOOPS AREA STRATIGRAPHY

AGE	ROCK TYPES	FORMATION NAMES	GROUP NAMES
Q	Unconsolidated stream, delta, and glacial sediments		
--------------- Unconformity (Uplift and Erosion) ---------------			
mT-uT	Vesicular Olivine Basalt	Valley Basalts	
--------------- Angular Unconformity ---------------			
eT	Rhyolite,Andesite, Basalt,Tuffs, Breccias, Agglomerates	Kamloops Volcanics	Kamloops
	Sandstone,Shale, Coal,TUFFS, Conglomerate	Tranquille	Kamloops
-------------- Angular Unconfromity ? --------------			
	Sandstone,Shale, Coal,Conglomerate	Coldwater	Kamloops
----------- Angular Unconformity with the Nicola Group-----------			
K	Rhyolite,Andesite Basalt,Agglomerate, Breccia,Tuff,Arkose, Conglomerate		Kingsvale
----------- Angular Unconformity with the Nicola Group-----------			
J-lK?	Granodiotite, Quartz Monzonite	Coast Intrusions	(Wild Horse &) (Nicola Batholiths)
uTr-lJ	Syenite,Monzonite, Granodiorite, Diorite,Gabbro, Pyroxinite	Coast Intrusions	(Guichon Creek &) (Iron Mask) (Batholiths)
------------------------- Nonconformity-------------------------			
uTr	Greenstone,Andesite, Basalt,Agglomerate, Breccia,Tuff,minor Argillite,Limestone, and Conglomerate		Nicola
--------------- Disconformity to Paraconformity ---------------			
Carb-Perm	Greenstone,slightly sheared Argillite, Quartzite,Serpentinite, Limestone,Conglomerate, and Breccia		Cache Creek
------------------------------ ? ------------------------------			
Paleozoic?	Chlorite Schist, Quartz Mica Schist, Amphobolite,and Granitic Intrusions		Cache Creek ?

The textures are usually fine grained, but can range to coarsely porphyritic, and occasionally may resemble fine grained plutonic rocks, although when examined under the microscope will exhibit a fine grained interstitial groundmass which commonly has marked flow lines. The phenocrysts are feldspar, hornblende, or biotite.

Breccias, agglomerates, and grey to buff colored tuffs, vesicular and non vesicular lavas are less common. In places amygdules and masses of agate or chalcedony occur with the flows.

Holcapek (1970) has provided a more detailed description of the layers within the Kamloops volcanic rocks, as observed just to the north of the CHU Claim, around Ned Roberts Lake.

(1) Basalt: upper bed, yellow to dark brown to black, fine grained with euhedral phenocrysts of plagioclase and clinopyroxene, occasional small vugs present.

(2) Rhyolite: pinkish to brownish weathering, fine grained, containing less than 10% mafics which are strongly weathered and cannot be positively identified. A whitish weathering may also occur due to the breakdown of orthoclase. This rock type could be, in part, intrusive.

(3) Basalt: lower bed, same in general appearance to the upper bed, but contains large phenocryst of clinopyroxene - up to 3 cm in size.

3.4 KINGSVALE GROUP

These rocks are rare in the map area, but are reported in the vicinity of Kamloops Lake. These rocks may be practically indistinguishable from the Nicola greenstones, but they can carry fragments believed to be derived from the Iron Mask Batholith.

3.5 COAST INTRUSIONS

3.5.1 General

Several large batholiths are found in the Kamloops map area, as well as numerous smaller plutonic bodies, including the Iron Mask Batholith just to the north of the CHU Claim.

The composition is generally granodiorite to quartz diorite, but locally gabbro or even ultrabasic rocks occur. Small amounts of orthoclase may occur, but most of the feldspars are plagioclase. The ferromagnesian minerals are biotite, hornblende, or pyroxene.

3.5.2 Iron Mask Batholith

3.5.2.1 General

This pluton is the closest one to the CHU Claim identified on the various geological maps (see Figure 7).

The rocks of this pluton are medium grained, grey or greenish grey, in some places red and in others very dark in color, marked by phases that are rich in ferromagnesian minerals.

The rocks show considerable alteration.

The composition ranges from syenite to ultrabasic types. An intermediate type make up most of the batholith, but an acidic type, a basic type, and a hydrothermally altered type also occur. All are deficient in quartz (Cockfield ,1961, reported quartz in only one of 22 samples). Magnetite and apatite are present in most of the rocks, which are diorites and gabbros. Augite and hornblende are common. The acidic type contains 30 to 45 % orthoclase, quartz is generally absent (syenites and monzonites). The basic rocks are pyroxenites (approximately 85% augite, 5% hornblende, 10% magnetite), or peridotite (approximately 25% pyroxene, the rest mostly serpentine, magnetite, and kaolin).

According to Kwong (1987):

> "The multiphase batholith is believed to have been emplaced in a subvolcanic environment. All components except the Picrite unit are thought to be genetically related. Their distribution is largely controlled by major systems of northwesterly, northerly, and northeasterly trending fractures and faults. Most units show some degree of alteration and/or contamination which may be intense locally. Weak to moderate saussuritization is ubiquitous in all batholithic rocks while potassium feldpathization is more prominent in rock of the Cherry Creek unit. Rock units and varieties are mainly distinguished in the field by original textures which, in most cases, are still visible despite alteration."
>
> "The Iron Mask Batholith consists of two related plutons, namely the Iron Mask pluton and the Cherry Creek pluton, formerly believed to be a single connected body. The Iron Mask pluton comprises four major, successively emplaced units designated as the Iron Mask Hybrid (first), Pothook, Sugarloaf, and Cherry Creek units (last emplaced). Locally, an additional Picrite unit also occurs which is probably not genetically related to the batholith. The smaller Cherry Creek pluton consists entirely of the Cherry Creek unit. Isotopic dates (194 to 204+/-6 Ma) indicate that all of these units are of Late Triassic or earliest Jurrasic age."

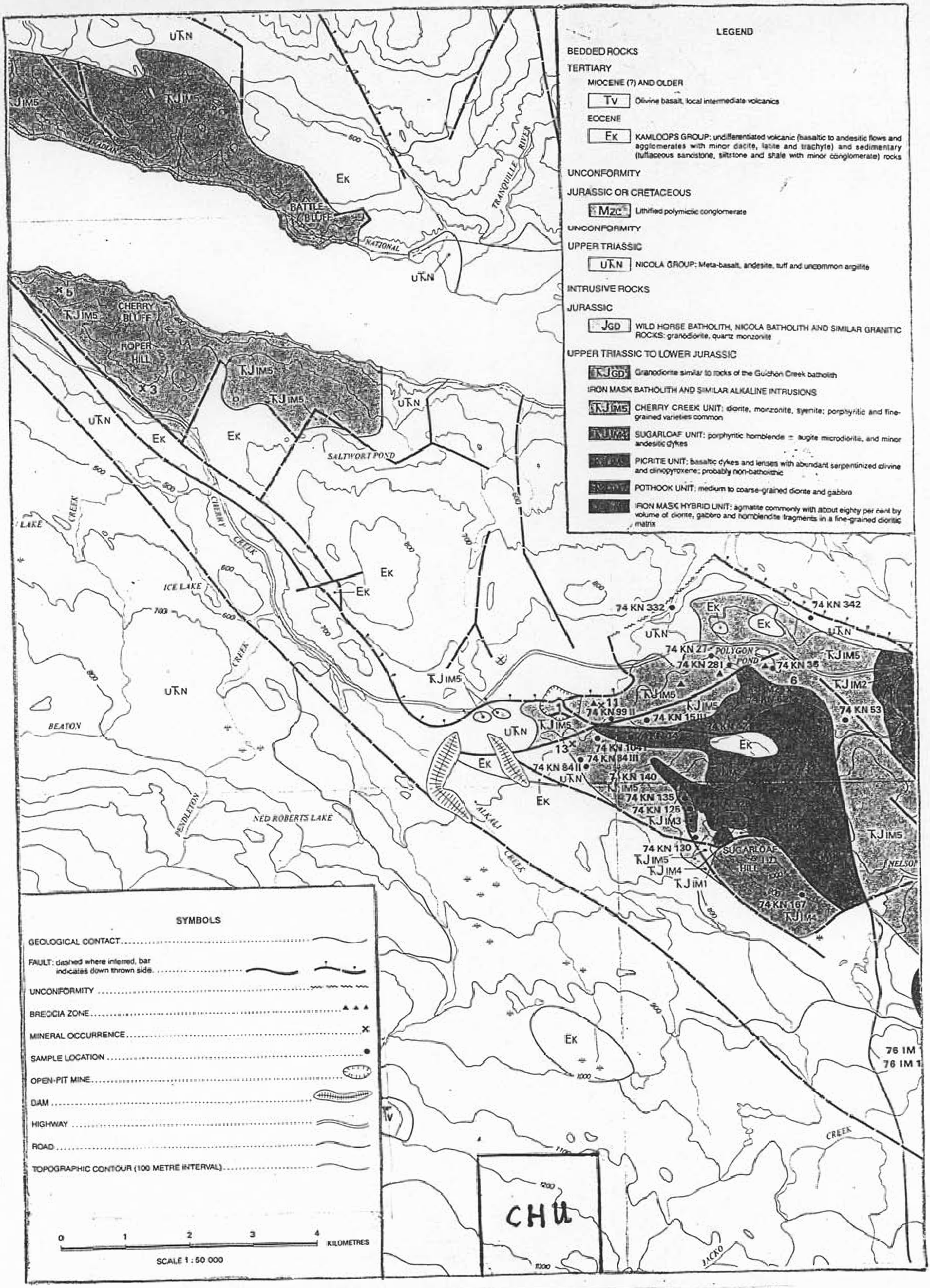


Figure 7: Geological Map of the Iron Mask Batholith

3.5.2.2 Pluton Units Structures, Compositions and Relationships

Kwong (1987) describes these features as follows.

(1) Cherry Creek Unit (Youngest)

The Cherry Creek unit is the most widely distributed phase of the batholith, constituting the entire Cherry Creek pluton and about 50% of the exposure of the Iron Mask pluton. The unit consists of rocks with range in composition from diorite, monzonite, syenite, to their porphyritic and fine grained equivalents, and breccias. These rocks are believed to represent small, localized, differentiating offshoots intruded into widely varied physical and chemical environments during the latest stages of evolution of the batholith.

(2) Sugarloaf Unit

The Sugarloaf unit occurs mainly along the southwest side of the Iron Mask pluton and as small enclosed bodies in the southern half. Rocks of this unit are mainly porphyritic with hornblende, minor clinopyroxene, and plagioclase in a greyish green matrix. They have a fairly uniform diorite - andesite composition. Note that THE FINE GRAINED VARIETIES ARE NOT READILY DISTINGUISHED FROM THE NICOLA VOLCANIC FLOWS.

(3) Picrite Unit (Age Uncertain)

The Picrite unit consists of rocks of basaltic composition with abundant clinopyroxene and serpentinized olivine phenocrysts up to 5 mm, and is appreciably magnetized. Because this rock has been observed far from the Iron Mask it is probable that it is not part of the batholith (a Valley Basalt ?).

(4) Pothook Unit

This unit occurs mainly in the northwestern half of the Iron Mask pluton, appearing frequently as narrow, gradational zones between the Iron Mask Hybrid and Cherry Creek units. Rocks of this unit are uniformly of dioritic composition, and of medium to coarse grained texture.

(5) Iron Mask Hybrid Unit (oldest)

This unit forms the spine of the Iron Mask pluton, accounts for 40% of its exposures, and consists of fragments of diorite, gabbro, hornblendite, and xenoliths of Nicola volcanic rocks in a dioritic matrix.

3.5.2.3 Rock Descriptions

According to Holcapek (1970) the descriptions of the most important unit in this vicinity are as follows.

(1) Coarse Grained Batholithic Rocks

(a) Pyroxenite: (Edith Lake Area) This is a heavy grey green rock of crystalline appearance and is strongly magnetic. Pyroxene, hornblende, and magnetite are the main minerals. Dioritic and gabbroic rock rich in pyroxene are present in the same region.

(b) Gabbro and Diorite: These are not readily differentiated except under a microscope. The rocks have a variable appearance due to changes in grain size and mafic mineral content. Weathering is dark brown to light grey. The fresh surface is a uniform dark grey green or white and dark speckled. Biotite shows as glistening flakes. The rock is commonly magnetic. An inconsistent banding is developed in places and inclusions are common.

(c) Monzonite: This rock type is more uniform than diorite and has a distinct pink color which is due to the feldspars, including orthoclase. The monzonite is in part an alteration product of the diorite. It is relatively non-magnetic.

(2) Fine Grained Batholithic Rocks

(a) Cherry Creek Rocks: These rocks are of dioritic and monzonitic composition and are named microdiorite or micromonzonite or microgranodiorite to distinguish them from their coarser grained counterparts. All the rocks are grey, white to pink in color. The mean grain size is 1 mm but a porphyritic tendency is present. A perceptible foliation is common and marked by bladed crystals of pyroxene and hornblende. Inclusions of chloritic rock fragments may be present (up to 2 cm in size).

(b) Sugarloaf Diorite: These rocks are dark to light green, well crystallized, containing approximately 15% quartz, euhedral plagioclase, up to 10% euhedral augite, less than 1% sugary light green transparent olivine.

3.6 NICOLA GROUP

3.6.1 General

These volcanic rocks comprise a number of diverse types, but may largely be termed greenstones.

According to Cockfield (1961):

> "The Nicola rocks vary from fine-grained or nearly aphanitic types to very coarsely porphyritic rocks. Green or greenish grey types predominate, but various shades of purple, red, or brown, also occur, together with rocks that are dark or nearly black. Associated with the lavas are tuffs, breccias, and agglomerates that also vary in color and appearance. Among the lavas the most common type is a grey-green to bright green fine grained rock that shows much alteration to chlorite, calcite, and epidote. A very similar rock carries phenocrysts of hornblende, which in many instances has developed by uralitic alteration of augite, and is now partly altered to chlorite. The feldspars usually show advanced alteration, but where determinable are generally andesine. Secondary calcite and quartz are common, and epidote is commonly abundant. The rocks are presumably altered from hornblende and augite andesites. Grey, purple, and red types show little variation in composition from the others, but the groundmass of the purple and red rocks is impregnated with iron oxide."
>
> "The group also includes a number of feldspar porphyries, with feldspar crystals ranging from minute size to others with ragged crystals nearly half an inch long."
>
> "Amygdaloidal types are common in both fine-grained and porphyritic rocks, the amygdules being composed of chlorite calcite, quartz and chalcedony."
>
> "The breccias also vary widely in appearance.------- A very common type of breccia consists of a fine-grained rock carrying widely scattered, small, angular fragments of red or purple lavas."
>
> "Bed of tuff occur at several localities in the rocks of the Nicola group, and it is chiefly on these, and on intercalations of sedimentary beds, that data were obtained on the attitudes of the rocks. The tuffs appear to be more prevalent in the upper parts of the section, and are exceptionally well developed in the vicinity of Meander Hills. ------- They are fine-grained, well-bedded rocks, that are generally grey, green, or black."

> "Only minor amounts of sedimentary rocks occur with the volcanic rocks of the group within the map area. The most prominent of these is limestone, which occurs at a number of widely scattered localities."

Leitch (1961) also comments on these limestones:

> "The limestones are not highly developed or widespread, but they are believed to be important as favorable locations for concentrations of minerals."

According to Kwong(1987):

> "The two plutons of the Iron Mask Batholith are emplaced in the Upper Triassic strata of the Nicola Group. In the vicinity of the batholith, the Nicola Group is dominated by volcanic and volcanoclastic sedimentary rocks. They are generally recognized by albitization of feldspars, occurrence of patchy epidote, and/or rare hematite alteration."
>
> "On the southwestern flank of the Iron Mask pluton, well-indurated, massive and bedded tuff, breccia, and interbedded flows and flow breccia are prominent. All of these rocks are weakly metamorphosed and most of them show a fairly uniform green-grey colour. On the northeast flank, less well-indurated and less altered tuff and tuff breccia predominate. However, adjacent to the intrusive contact, these rocks are also well-indurated and epidotized and are locally mineralized with sulfides. Fragments found in the tuff breccia include some belonging to the intrusive Cherry Creek unit. This apparently contradictory observation is readily explained if the batholithic rocks and the Nicola volcanic rocks are comagmatic and coeval, such that during the evolution of the common parent magma, the prevalence of an intrusive phase or its volcanic equivalent is dependent on whether or not the magma reached the surface."
>
> "At the southeastern tip of the Iron Mask pluton and locally along the southwestern flank, the Nicola rocks comprise distinctive porphyritic augite-hornblende basalt, very similar to varieties of the Sugarloaf unit that occur along the southwest flank of the pluton. Locally, basaltic breccia that is porphyritic with 10 to 25 % olivine and augite phenocrysts is also prominent. North of Hughes Lake near the northwestern end of the pluton, the volcanic breccia contains occasional argillite and limestone blocks. Adjacent

> to the Cherry Creek pluton farther north, rocks of the Nicola Group consist mainly of porphyritic plagioclase andesite with occasional interbedded tuffs."

It is not clear whether the argillite and limestone mentioned in the foregoing paragraph belongs to the Cache Creek Group, or not.

According to Holcapek (1970), in the vicinity of Ned Roberts Lake (just to the north of the CHU Claim) one can distinguish three beds within the Nicola Group volcanic rocks:

(a) Andesite: upper bed, fine grained sugary texture containing up to 60% epidote and minor pyroxene.
(b) Andesite: grey to dark green, strongly serpentinized and chloritized pyroxene more abundant, epidote less than 10%.
(c) Andesite: lower bed, light green to dark , containing dark grey fragments, chloritized and serpentinized, but less strongly, up to 30% epidote present.

3.7 CACHE CREEK GROUP

According to Cockfield (1961), the Cache Creek Group rocks consist of argillite, quartzite, hornstone, limestone, conglomerate and breccia, greenstone and tuff, amphibolite, gneiss, and schist.

Much of this group is composed of hard, dark grey to black argillites that in places are silicified into dense rocks similar to hornfels.

Limestone occurs in a number of localities, and is generally grey to white, with obscure bedding.

Biotite slates, and mica and chlorite schists, are in places closely associated with the Cache Creek Group rocks and are considered by Cockfield (1961) to be part of this group.

3.8 GEOLOGY ADJACENT TO THE CHU CLAIM

All the published maps place the CHU Claim in an area completely covered by (undifferentiated) Nicola Group greenstones; however, several other rock type are possible: Valley Basalts, Kamloops Group rocks, the Coast Intrusions, and Cache Creek Group rocks.

The Cache Creek Group could immediately underlie the claim and might be exposed by folding, uplift, or erosion.

3.9 ALTERATION

According to Holcapek (1970), alteration minerals appear to be epidote , calcite, white albite, pink K-feldspar, biotite, and magnetite. Calcite and epidote are the most common and at least a trace of chalcopyrite usually accompanies them.

According to Cockfield (1961):

> "Although the alteration is in certain instances intense in the general vicinity of the orebodies, it does not appear to be confined to the immediate wall-rocks, and some intensely altered rock occurs at considerable distances from known orebodies. The alteration involves the albitization of plagioclase feldspar, with the development of carbonates, chlorite, and epidote. The altered rocks are associated with bands of albite that are more probably the result of the albitization of the wall-rocks with the leaching of the dark minerals rather than the intrusion as dykes. The amount of albite in the slides of altered rock examined by Matthews ranged from 67 to 86 %. Calcite and siderite are common, and form as much as 6% of the rock. Chlorite and epidote make up from 8 to 26%, the former replacing augite and hornblende and the latter occurring in the same manner but usually irregularly distributed with no apparent relationships to the earlier minerals. Apatite also appears in small quantities in the altered rocks."

> "Although the alteration is not invariably closely related to the orebodies, it is sufficiently diagnostic to be used to some extent as an indicator that orebodies are near by, and thus in prospecting and development work would afford a somewhat larger target than the orebodies themselves."

3.10 STRUCTURAL GEOLOGY

3.10.1 Regional Trends

The most dominant structural trend in the vicinity of the Iron Mask Batholith is northwesterly, a trend that shows in the exposure of the Iron Mask Batholith, geochemical data and geophysical data (Whittles,1990); however, this shifts to a more dominant north/south trend as one goes to the south.

A structural point of interest is noted in Cockfield (1961):

> "A few miles to the south of Kamloops the trend of the folds in the Triassic rocks swings to the northwest. The Iron Mask batholith is apparently intruded into one limb of a syncline in the rocks of the Nicola group, the axis of which runs northwesterly towards Kamloops Lake."

The exact location of this syncline is not spelled out but an examination of the Cockfield (1961) geological map suggests a syncline exists immediately to the southwest of the town of Kamloops, with a much larger anticline adjacent, and to the southwest, of this syncline. This pattern is also supported by the measurements of bedding in the Nicola Group just to the north of the CHU Claim (Holcapek,1970 - see Section 3.10.2 following). Another anticline can be inferred on the other side of the syncline (to the northeast) extending to the east of Kamloops. The whole pattern is, however, much disturbed by the Coast Intrusive rocks.

Large regional faults are also known to control regional trends. As noted on Figure 4, and Section 3.1, north trending faults are very prominent.

More locally, but still part of a large scale pattern, strongly expressed northwest trending faults are inferred adjacent to the Iron Mask Batholith (Kwong, 1987). It is suggested that these faults may have exercised considerable control on the intrusion of the plutons making up the batholith.

3.10.2 More Localized Features

According to Holcapek (1970), near Ned Roberts Lake to the north of the CHU Claim, the following local features were noted:

(1) Bedding:

> "The bedding within the Nicola Group trends nearly east/west and dips at 60 degrees north."

(2) Foliation:

> "Foliation was observed along most of the shears and can extend up to four feet on either side of the shear. The strike of the foliation is northwesterly and dips are vertical. These attitudes are parallel to the main shearing direction."

(3) Jointing:

> "The most pronounced jointing directions are north 20 to 0 degrees east and vertical."

FIGURE 8

CLASSIFICATION OF MINERAL DEPOSITS OF THE KAMLOOPS AREA

Metalliferous Deposits

- Placer gold deposits
- Hardrock gold and silver deposits
  - Stump Lake area
  - Swakum Mountain area
  - Vein deposits in the rocks of the Nicola Group surrounding the Iron Mask Batholith
  - Gold-silver deposits in rocks of the Cache Creek Group
  - Gold-silver deposits in and around small bodies of intrusive rocks
- Silver-lead-zinc deposits
- Mercury deposits
- Copper deposits
  - Associated with the Iron Mask Batholith
  - Highland Valley camp
  - Other copper deposits
- Iron deposits
  - Vein deposits
  - Bog-iron deposits
  - Contact metamorphic deposits

Industrial Mineral Deposits

Coal Deposits

(4) Shearing and Faulting:

> "The rhyolites are in general strongly brecciated and sheared, but outcrops are too small and too weathered to obtain directions."
>
> "A strong shear up to 50 feet wide is exposed in the eastern part of the property. It strikes S40W, vertical. This trend is about parallel to the shear exposed on the Afton Mines property to the east of the old workings."

Very pronounced north/south faults, with dips to the east, were observed on air photos in the vicinity of Ned Roberts Lake (see Whittles, 1990).

3.11 MINERALIZATION

3.11.1 General

Deposits of gold, silver, lead, zinc, copper, mercury, tungsten, iron, industrial minerals (such as gypsum and salt), and coal have been found in the Kamloops map area.

Figure 8 provides a classification of these deposits (from Cockfield, 1961).

3.11.2 Type and Form of Mineralization

In a regional sense, porphyry copper mines in the Quesnel trough include, from north to south, the Bell, Granisle, Gibratar, Afton, the Highland Valley deposits, Brenda, Ingerbelle, and Copper Mountain.

(1)Porphyry Copper Deposits

Cockfield (1961) has summarized those characteristics of the deposits associated with the Iron Mask Batholith just to the north of the CHU Claim:

> "Copper deposits are found around the periphery of the Iron Mask Batholith from Edith Lake to Sugarloaf Hill on the one side and from Separation Lake (about two miles northeast of Edith Lake) to near Cherry Bluff on the other. A few occur in the central part of the batholith. Many are situated in the batholithic rocks, and some in the intruded rocks at the borders of the plutonic mass. They are impregnations, veins, stockworks, and mineralized shear zones in the country rock, and some of the impregnation deposits appear to have no solution channels. The principal copper minerals are chalcopyrite and bornite, with some chalocite, cuprite, azurite, and malachite. Chrysocolla and lead minerals have

also been reported. Magnetite and pyrite are common; hematite is less common. Quartz is generally present only in minor amounts, but calcite is common. Gold values are generally low, but a few of the deposits carry good gold values."

"---- these deposits ---- occur within the hydrothermally altered rocks of the batholith, however, would suggest that they are connected with the very late phases of the intrusion and consolidation of this rock, or that they come from a deep-seated magmatic source not exposed at the locality."

(2) Gold-Silver Deposits

The gold-silver deposits within the Cache Creek Group rocks are similar to those in the volcanic rocks surrounding the Iron Mask Batholith (Cockfield, 1961). They are quartz veins and mineralized shear veins carrying gold, silver, pyrite, chalcopyrite, arsenopyrite, pyrrhotite, tetrahedrite, galena, sphalerite, and molybdenite. Several deposits occur in close association with small intrusive bodies, occurring as wide veins in the intrusive rock as well as the surrounding host rocks.

3.11.3 Alteration and Mineralization

Intense rock alteration is a general guide to the likelihood of strong or widespread mineralization. Refer to Section 3.9.

3.11.4 Mineralization and Structure

Structural conditions undoubtedly play a major role in the localization of sulfides (northerly and northeasterly-trending zones).

3.11.5 Mineralization and Rock Type

According to Kwong (1987):

"Mineralization, particularly of iron and copper, is almost ubiquitous in the Iron Mask Hybrid unit. In fact, except where Nicola xenoliths are predominant, all rock varieties in the unit contain magnetite which is often more than 10 percent by volume. The Iron Mask mine, a former copper producer, is located in this unit, but is also associated with picrite."

"The Pothook unit is locally mineralized with copper and iron. Magnetite occurring in uniformly dipping veins is prominent south and southeast of the Afton deposit."

"Several copper occurrences are hosted by the Sugarloaf rocks. For example, the Ajax property east of Jacko Lake is located within brecciated and albitized Sugarloaf rocks."

"Copper and minor iron mineralization is prominent in the Cherry Creek unit, particularly in zones of intense brecciation associated with alkali metasomatism. Afton Mine, for example, lies at the western termination of a narrow, 4-kilometer-long, easterly trending zone of intense intrusive brecciation that is located at the northern edge of the Iron Mask pluton. The brecciation is considered to have resulted from high-level venting events. Similar breccia, consisting largely of Cherry Creek fragments, has also been observed on the Kimberly copper property northwest of Knutsford and at the extreme southeastern tip of the Iron Mask pluton."

PART 4: CURRENT WORK AND RESULTS

PART 4: CURRENT WORK AND RESULTS

4.1 PRELIMINARY AIR PHOTO ANALYSIS

4.1.1 Instrumentation

A Sokkisha MS-27 Mirror Stereoviewer with 1.8 power lenses was used to view the complete overlapping stereo photo pair. 3 power and 8 power binocular attachments were used for much more detailed examinations of certain features, and to confirm the continuation of some of the longer structural features.

4.1.2 Procedures

The analysis for these claim groups was based primarily upon BC flight lines BC5188 (photos 045 and 046), BC5739 (photos 099 and 100), BC86031 (photos 068, 069, and 070).

The general principles involved in air photo analysis and interpretation may be found in Ray (1960), Miller and Miller (1961), Lottman and Ray (1965), Avery (1970), Sabine (1978), Swain and Davis (1983), or Seigel and Gillespie (1983).

Whittles (1984 and 1987) provides a summary of the techniques used.

4.1.3 Preliminary Analysis

Several different features may be seen on Figure 9, based on flight line BC5188.

(1) North of the CHU Claim

At this location, the trends are dominantly northwest to southeast. The feature NE-2 Cherry Creek, is an example of a feature not in this direction, but which is very strong. There is also one very strong north trending feature (NF-1), that appears to be a near vertical fault with the upthrown side to the east (see Section 4.4.2 (4) for an explanation of this conclusion). Further north NF-1 is also occupied by Cherry Creek. Thus at the location of the CHU Claim, the underlying rocks of the Cache Creek Group could be brought close to the surface. NF-1 can also be interpreted as continuing to the north into the vicinity of the Afton Mine. This is slightly offset by later northeast faults.The fault NF-1 could act as a conduit for mineralizing solutions.

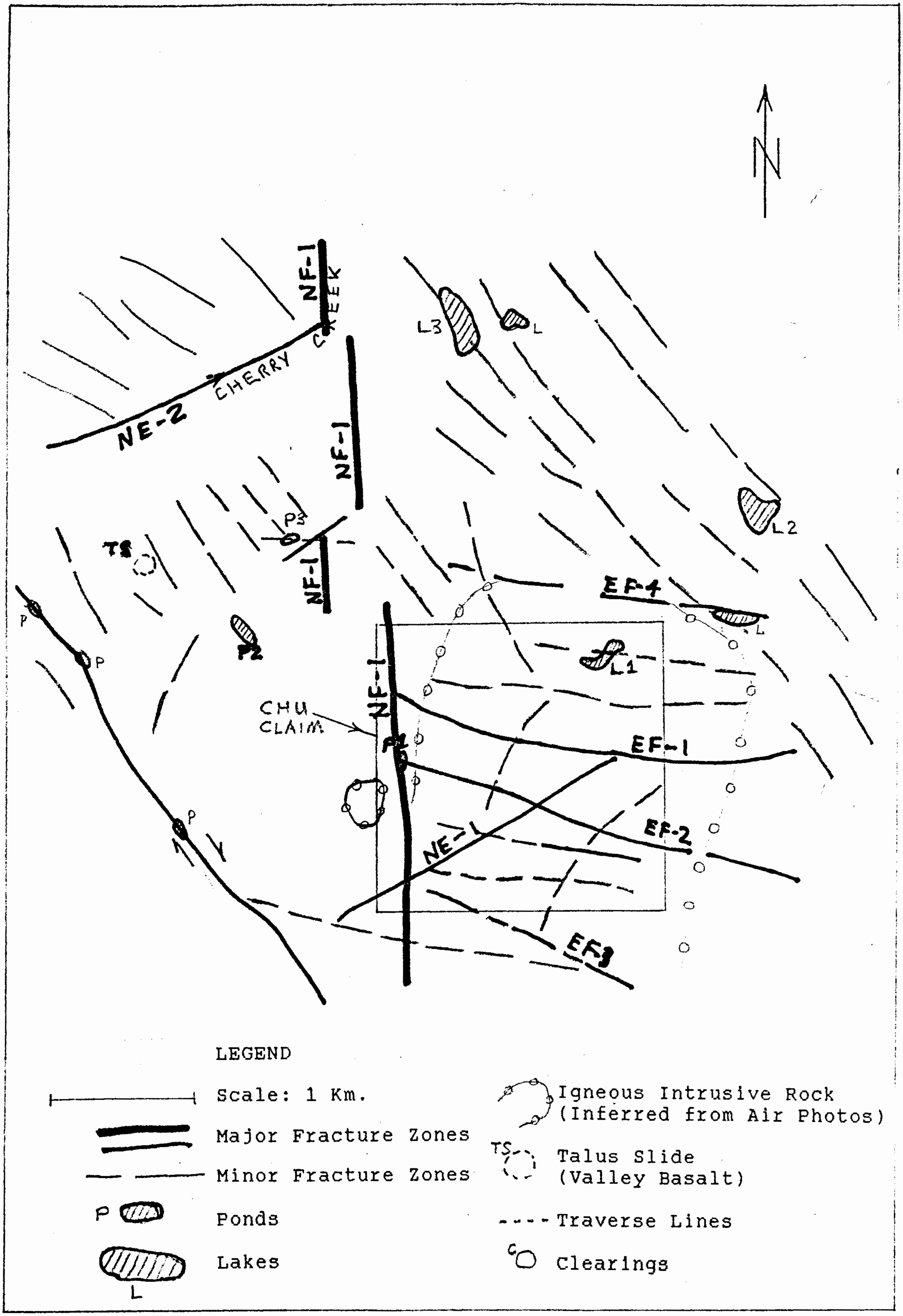


Figure 9: Preliminary Air Photo Analysis

(2) Western Border of the CHU Claim

A small circular feature can be seen midway along the western CHU Claim border. This, and the irregular topographical features (as marked by the dashed line on Figure 9), that cover much of the claim, could be interpreted as the surface expression of underlying intrusive bodies.

(3) Trends on the CHU Claim

The main trends here are not northwest as in most of the surrounding areas, but almost east to west (or slightly south-southeast). There are occasional northeast features, one quite strongly expressed in the topography. The abrupt change in trend is quite suggestive of a change in underlying geology. See also Section 4.4.2.

4.2 GEOLOGICAL MAPPING

A rapid reconnaissance survey was carried out along and adjacent to the strongest easterly feature (EF-1, Figure 9) which bisects the CHU Claim. This is the second strongest feature on the claim. The strongest feature (NF-1) could not be examined because it is filled with overburden and shallow ponds and swamps.

The traverses are shown on Figure 10, based on the air photos of flight line BC86031.

In general, rocks along the mapped line fit the description of the Nicola Group volcanics, but there appeared to be a difference in character as one moves from the east to the west side of the claim. More sulfides and rock alteration are present near air photo fault NF-1, and less as one moves out to the east. The samples at the extreme east end of the claim (see Section 4.3) were a dark grey-green, commonly with a chloritic alteration; samples found near fault NF-1 also showed this chloritic alteration of the pyroxenes and amphiboles, but contained more epidote and calcite. Some local exceptions were noticed (e.g. samples KC92W-8,9,10) near other east to northeast trending fractures (see Figure 9) which could also be acting as conduits for mineralizing solutions.

4.3 SAMPLE PREPARATION, EXAMINATION AND DESCRIPTION

4.3.1 General Procedures

Summaries of detailed visual, physical property, and field observations are provided in Section 7.5 for a number of key samples collected during the field work.

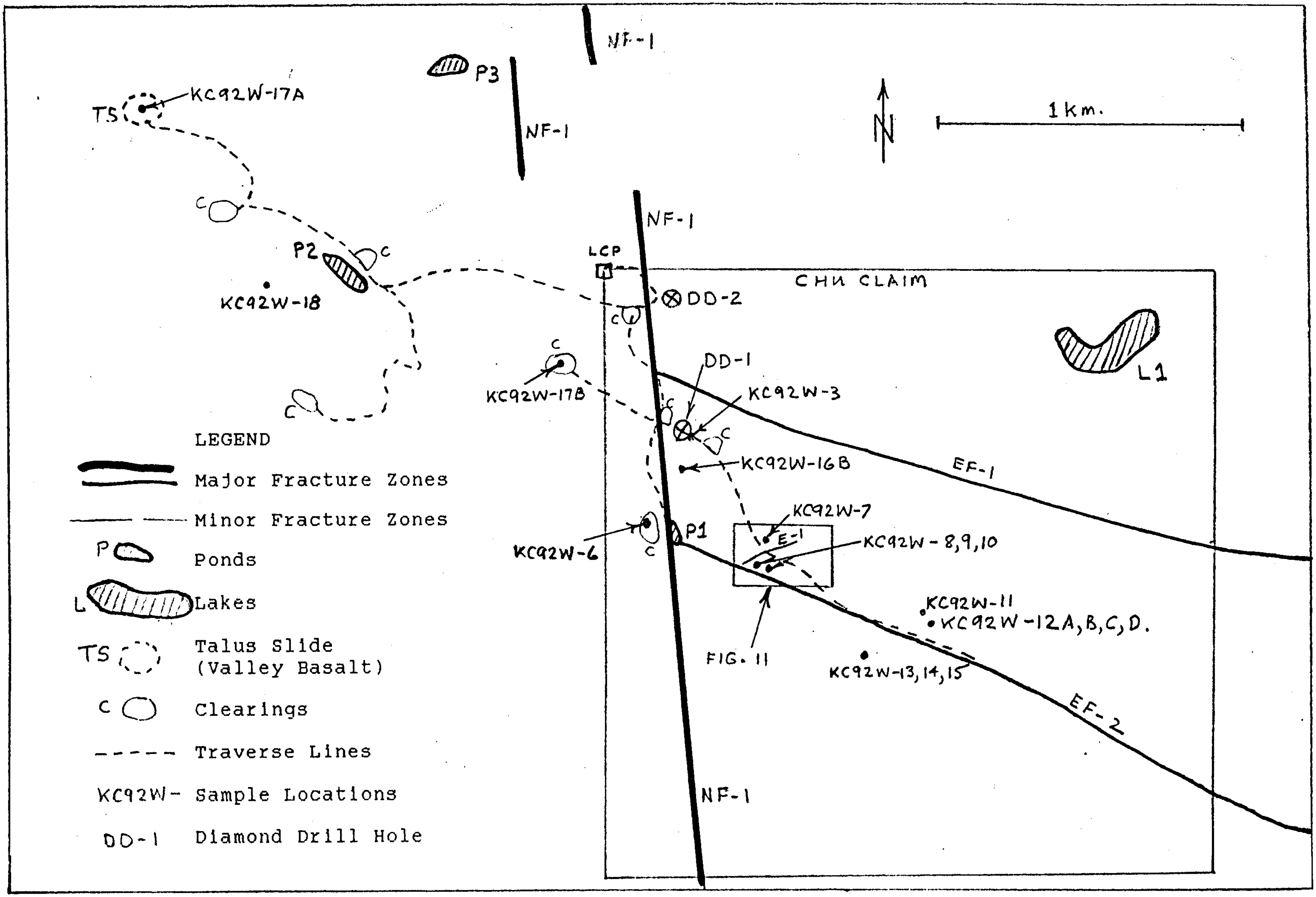


Figure 10:Traverse Line and Sample Location Map

All samples were closely examined with a hand lens, hardness testers, etc., and a zoom microscope using 6 to 60 magnification. Several samples were slabbed on a diamond saw so that the structure could be more easily examined at the higher powers.

The samples were then divided into three groups:

4.3.2 Samples with Metallic Mineralization
4.3.3 Highly Altered Rock Samples
4.3.4 Unmineralized, Unaltered to Weakly Altered Rock Samples

4.3.2 Samples with Metallic Mineralization

These may be summarized as follows (page numbers refer to the rock identification sheets in Section 7.5).

Sample Number	Page	Rock Type	Sulfide Content
KC92W-3	MI-1	Porphyritic Andesite	0.1% to 5%
KC92W-16A	MI-2	Porphyritic Andesite	0.1%

These samples were notable for their much brighter green color and large percentage of epidote. They appear much more altered than samples to the east, and are visibly mineralized with pyrite and chalcopyrite.

4.3.3 Highly Altered Rock Samples

These may be summarized as follows.

Sample Number	Page	Rock Type	Alteration Type
KC92W-9	MI-3	Porphyritic Andesite	Propylitic
KC92W-10	MM-1	Altered Foliated Andesite	Propylitic
KC92W-7	AR-1 & I-1	Porphyritic Andesite	Propylitic
KC92W-17B	AR-2 & I-5	Tuff	Propylitic
KC92W-16B	AR-3 & I-8	Quartz Diorite?	Intermediate Argillic to Propylitic
KC92W-6	AR-4 & I-9	Porphyritic Andesite	Propylitic

Sample KC92W-9 and -10 were obtained from an area of tension gash quartz and epidote veins in a minor shear zone (E-1), south of, but adjacent to the shear zone EF-1 (see Figures 9, 10 & 11).

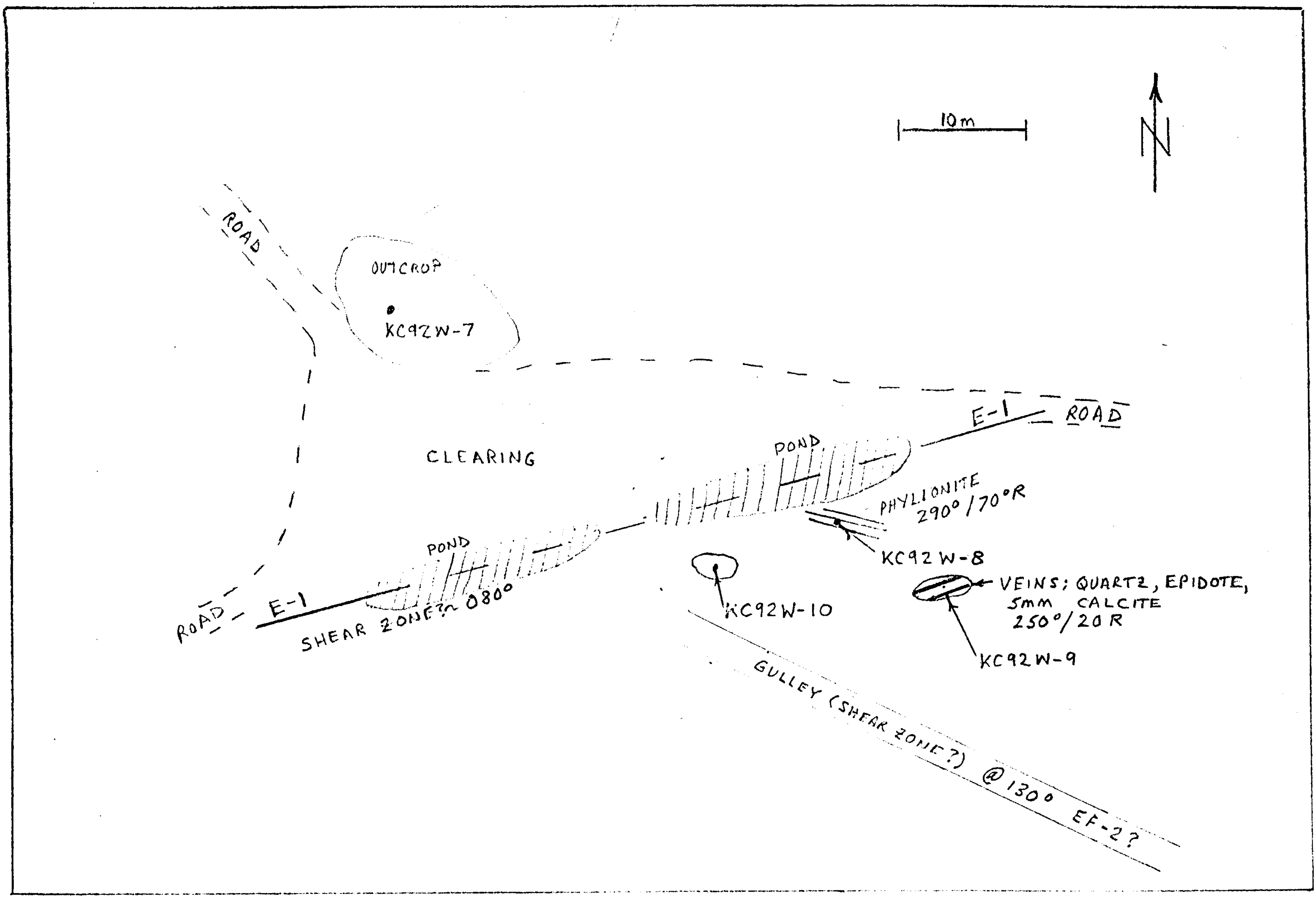


Figure 11:Map of Shear Zone E-1

The host rock was a weakly foliated dark grey-green andesite that was locally flooded with calcite, quartz and epidote. The slightly metamorphic character appears to be the result of the pressure of shearing movement along E-1, altered by mineralizing, but non-metallic, solutions. This effect is similar to that noted by Holcapek (1970 - see Section 3.10.2 (2) of this report). Sample KC92W-8 discussed in the following Section 4.3.4 is closely related to these two samples.

Sample KC92W-7 was obtained near E-1, but further away than the preceding two samples. It is more strongly altered than most samples that lie further to the east, but not as strongly as the preceding two samples.

Sample KC92W-6 is closest to NF-1 and is one of the more strongly altered samples of this group. It also shows an occasional grain of pyrite.

Sample KC92W-16B has some very igneous intrusive characteristics. It appears to be almost totally crystalline, without a significant aphanitic groundmass, but is quite fine grained. There is only a small percentage of mafic minerals present. Many of the crystals appear altered, indistinct and are white (albite?). A large percentage of calcite is also present, and the rock has a strong clay smell. Consequently, the alteration type appears to be beyond the propylitic level shown by all the other samples. The rock appears to have undergone the albitization of the previously existing calcium plagioclase feldspars. This sample gives support for the concept of intrusive activity and mineralizing solutions along fault NF-1. This is an area that will require a more detailed ground examination.

Sample KC92W-17B was obtained slightly to the west of the CHU Claim. The sample shows alteration similar to that of Sample KC92W-6; this alteration is likely to be directly related to mineralizing solutions from fault NF-1. Both samples are likely to be representative of rock found on the downthrown (west) side of NF-1, and should not be as altered as those on the east side.

4.3.4 Unmineralized, Unaltered to Weakly Altered Rock

Sample Number	Page	Rock Name	Magnetic?	Rock Type
KC92W-11	I-2 M-2	Uncertain	No	Dyke? Vein? Metamorphic?
KC92W-12A	I-3	Porphyritic Andesite	Weakly	Igneous Intrusive
KC92W-17A	I-4	Basalt	Yes	Igneous Extrusive
KC92W-18	I-6	Porphyritic Andesite	No	Igneous Extrusive
KC92W-13 & -15	I-7	Porphyritic Andesite & Basalt	No	Igneous Extrusive
KC92W-8	M-1	Phyllonite	Weakly	Metamorphic

Sample KC92W-8 is closely related to KC92W-9 & -10 noted in Section 4.3.3, but does not show their degree of alteration. All seem to be the result of shearing pressures along E-1.

Sample KC92W-11 is an anomaly and would require more field work to establish it's character. It may be a dyke or a vein, but is unusual in it's felsic granular nature, having the appearance of a quartzite (Cache Creek Group or the possibly related metamorphic rocks?).

Samples KC92W-12A, -18, -13, -15, are relatively unaltered, although they do show some chloritic alteration as do most rocks in the map area. Very minor epidote, calcite, quartz and some pyrite are also present.

Sample KC92W-17A was collected well outside of the CHU Claim. It is a very fresh looking piece of Valley Basalt.

4.4 GEOPHYSICAL ANALYSIS

4.4.1 VLF-EM Information

A number of northwest, north to south, and north-northwest trends were noted in previous assessment reports (see Section 2.2). These agree in general with the air photo trends discussed in the previous section, but one has to remember that most surveys used the Seattle Washington VLF transmitter station, located to the southwest, and hence favoring the northerly to northeasterly features.

4.4.2 Air Magnetic Maps

Portions of two air magnetic maps (GSC Maps 5217G, Cherry Creek and 5216G, Kamloops) were analyzed to give additional information in the process of choosing exploration models. These maps (Figure 12) show the following features.

(1) Intrusive Rocks

The nearby Iron Mask Coast Intrusive zones are marked by strong magnetic highs (3000 to 5000 gammas), and are strongly oriented in a northwesterly direction, which parallels the outcrops of these rocks.

The Coast Intrusive Rocks shown on Cockfield's (1961) geological map in the southeast corner of air magnetic map 5217G (120 deg. 50 min. to 121.00 deg., and 50 deg. 30 min. to 50 deg. 35 min.) have a magnetic signature very similar to that of the volcanic rocks discussed in (3) following.

(2) Metamorphic Rocks

Immediately to the west of McLeod Lake (Figure 12), an irregular series of highs (2000-3000 gammas) and lows are found in the same location as metamorphic Paleozoic rocks on Cockfield's (1961) geological map. These rocks may be metamorphosed Cache Creek Group sedimentary rocks and support the model discussed in (5), and Section 5.1.2, following.

(3) Volcanic Rocks

These include the magnetic signatures of the Nicola Group Volcanic rocks (which are mapped as overlying the CHU Claim), Kamloops Group volcanic rocks, and volcanic rocks of uncertain age (rock type 8 of Cockfield, 1961).

These rocks all show the usual irregular bullseye patterns (with highs of 4000 gammas, and lows of 2000 gammas). The trends are mostly northerly, but some show north-northwest, and others northeast tendencies.

Most of the Valley Basalt outcrops are strongly magnetic and show as target - like anomalies.

(4) Structural Features

These features (on Figure 12) are a composite of inferred features from the air photos,magnetic maps (using trends and lows), topographical features (creek bed trends, spring fed? lakes), and some structural features of Kwong (1987).

Note that the most northerly of the northwest trending features is made up by joining two of Kwong's (1987) inferred fault lines, but ignoring his more southerly continuation at the location marked by (--?--?--). Kwong's inferred continuation is not supported by either magnetic or topographical features.

The south central, north trending fault of Kwong (1987) is likewise not expressed magnetically, nor topographically.

Three more northwest trending faults can be inferred from magnetic trends and lows, as well as the locations of lakes.

Three northeast trending features, along with the northwestern trending features seem to mark off a magnetic (low) basin, in which the CHU Claim is located.

Two north trending features are present to the northwest of the CHU Claim-one penetrating the west edge of the claim as inferred from the air photos, the other further to the northwest, faulted into two segments. Fault movements can be inferred as the east sides of the faults being the upthrown sides. This type of movement would be required to bring the Cache Creek rocks near to the surface under the CHU Claim.

(5) Summary of Magnetic Map Features Around the CHU Claim

As can be seen on Figure 12, the magnetic map around the claim is significantly different from most of the surrounding map area (particularly that to the west, north, and south). The magnetic map is essentially flat from Cherry Creek on the west to the Stake and McConnell Lakes to the east. There is a slight low on Cherry Creek, and a slight east-west high trend across the CHU Claim.
The only comparable magnetic signature is found in the Cache Creek Group outcrop zones to the east of Kamloops (Cockfield, 1961, and GSC Magnetic Map 5216G).
As noted in (2) earlier, the metamorphic rocks to the southeast of the CHU Claim magnetic basin are possibly metamorphosed Cache Creek Group rocks.

THESE FEATURES STRONGLY SUGGEST THAT THE MAGNETIC LOW BASIN IN WHICH THE CHU CLAIM IS LOCATED, REPRESENTS AN UPTHROWN BLOCK OF CACHE CREEK SEDIMENTARY ROCK BENEATH A THIN MANTLE OF NICOLA GROUP VOLCANICS.

There is only very limited evidence for intrusive igneous rocks underlying the claim.

PART 5: INTERPRETATION

PART 5: INTERPRETATION

5.1 EXPLORATION MODELS

5.1.1 Model I: Fault Controlled Mineralization

In this model the main north to south feature on the CHU Claim (NF-1) is considered to be a long term, deep fault, that has acted as the main structural control of intrusive activities and mineralizing solutions in the vicinity of the CHU Claims. The fault is assumed to be near vertical, with the upthrown side to the east.

The support for this model is as follows.

(1) This fault appears to proceed all the way north to the Iron Mask Batholith and intersect it in the vicinity of the Afton Mine.
(2) To the north of the CHU Claim (on the Wood Claim), diamond drill holes adjacent to NF-1 have intersected a strongly altered bleached zone with secondary calcite and some native copper.
(3) On the CHU Claim the most intensely altered samples are found nearest to NF-1.
(4) On the CHU Claim the most pervasively mineralized samples were found nearest NF-1.
(5) As one moves east from NF-1 the country rock (away from secondary fractures such as E-1) is a less altered darker green rock.
(6) The only rock approaching an intrusive variety (KC92W-16B) was found adjacent to NF-1.
(7) A very circular topographical feature can be seen (on the air photos) that is on the west boundary of the CHU Claim and so adjacent to NF-1. This could be an intrusive plug although it has not yet been examined on the ground.
(8) The slight magnetic high on Figure 12 (air magnetic map 5217G) is in the right location to support (7).

There does not appear to be any evidence available at this time that does not support this model, although either:

(1) the intrusive activity is minor (no large magnetic anomalies), or
(2) the plutons are relatively small and located between the air flight lines along which the magnetic measurements were taken, or
(3) the plutons are highly altered (a conclusion supported by sample KC92W-16B, Section 4.3.3).

This model could be combined with the following Model II.

5.1.2 Model II: Cache Creek Rocks Closely Underlying The CHU

In this model, the CHU Claim would be lying over largely sedimentary rocks of the Cache Creek Group, thinly covered by volcanic rocks of the Nicola Group. Two mechanisms could be responsible for this uplift.

(1) The axis of an anticline (discussed in Section 3.10.1) may underlie the claim.
(2) The large faults discussed in Section 4.4.2 may have upwardly block faulted the underlying sedimentary rock.

One should note that the Paleozoic Cache Creek Group rocks could be mineralized by the later Coast Intrusive activity, particularly any limestone beds that are present.

This model is supported by the following.

(1) The geological map pattern and other geological information (see Section 3.10.1) suggests a series of anticlinal and synclinal structures.
(2) Alternatively, the large faults (see Sections 4.4.2 and 3.10.1) inferred from magnetic and other data have the right pattern to have resulted in an uplifted block of underlying Paleozoic, non magnetic, sedimentary rock being brought close to the surface.
(3) The magnetic map pattern reflects the generally non-magnetic character of sedimentary rocks.

It should be noted, however, there is a negative side.

(1) No clearly identified Cache Creek Group rocks have been found in the area traversed, with the possible exception of KC92W-11.
(2) No Cache Creek rocks are reported or mapped by previous workers.
(3) Diamond drill holes 1-3 km. northwest of the CHU Claim did not encounter Cache Creek Group sedimentary rocks even at a depth of 200m. (It should be pointed out, however, that these holes were located to the west of NF-1 and in the inferred downthrown side: the Cache Creek Group rocks would be more deeply buried there).

5.1.3 Model III: Intrusive Rocks Underlying The CHU Claim

In this model intrusive rocks similar to the Iron Mask Batholith rocks would be present immediately under the claim, lightly covered with Nicola Group volcanics.

The evidence that supports the model is as follows.

(1) The air photos show a distinctive break with the surrounding patterns, with an irregularly fractured topographical expression, typical of igneous intrusive rocks.
(2) Certain circular features on the west side of the claim show a typical plutonic pattern.
(3) There appears to be at least some evidence for the surface presence of igneous intrusive rocks where one would expect these: at the lower elevations, and adjacent to NF-1. (See sample KC92W-16B, Section 4.3.3).

On the debit side one must note the following.

(1) No unambiguous examples of intrusive rocks were found in place in the areas examined. Even sample KC92W-16B is very fine grained, with crystals < 0.5 mm, and many seem to be altered and indistinct, which may be masking an aphanitic matrix.
(2) No published geological maps indicate the presence of intrusive rocks near or on the CHU Claim.
(3) The air magnetic maps do not support the presence of extensive unaltered intrusive rock plutons under the CHU Claim. In fact, these maps show a surprisingly uncharacteristic (for this map area) flat magnetic response. One should, however, point out that extensive alteration could remove much of the magnetic mineralization.

5.2 SUMMARY OF EXPLORATION MODELS

Model I, or a combination of Models I and II, provide the best exploration models for the CHU Claim with the information presently collected, and should guide future exploration plans.

5.3 MINERAL POTENTIAL

Either of the two types of mineral deposits discussed in Section 3.11.2 could be encountered on the CHU Claim.

Porphyry copper-gold deposits might be found in altered plutons, particularly along fault NF-1, but possibly at any location on the CHU Claim.

Gold-silver quartz veins might be encountered in underlying Cache Creek Group sedimentary rocks, if these are, in fact, present under the CHU Claim.

PART 6: RECOMMENDATIONS

PART 6: RECOMMENDATIONS

6.1 SURVEY RECOMMENDATIONS

6.1.1 A survey grid (100m spacing between lines, with 50m stations) should be established across the property with the lines running west to east.
6.1.2 The grid should start to the west of NF-1, at or east of, the western CHU Claim boundary.
6.1.3 The grid should be completed all along NF-1 first, before being extended further to the east.

6.2 AIR PHOTO RECOMMENDATIONS

6.2.1 A more detailed air photo/geological interpretation on regional (high altitude) and property (low altitude) scales is recommended, since the current work was of a preliminary nature.

6.3 GEOLOGICAL RECOMMENDATIONS

6.3.1 A geological map of the whole claim should be produced, on the scale of 1:1000, particularly around NF-1.
6.3.2 Variations in the alteration levels of the rocks should be carefully noted to see if the preliminary pattern suggested in this report is valid.

6.4 GEOCHEMICAL RECOMMENDATIONS

6.4.1 A complete rock geochemical survey (31 element ICP) should be carried out over the entire claim area, and appropriate geochemical maps prepared. Special attention should given to areas along NF-1.
6.4.2 Soil sampling surveys should be conducted along NF-1, NE-1 and the other prominent fracture zones on the map area.

6.5 GEOPHYSICAL RECOMMENDATIONS

6.5.1 VLF-EM surveys should be conducted across the fault NF-1 along its length, using lines 600m long along the west to east grid lines (300m on each side of the fault). Stations of 10m should be used.
6.5.2 Test I.P. surveys could be conducted at zones along NF-1 where the VLF-EM response is the largest.
6.5.3 S.P. data should also be obtained in conjunction with the I.P. surveys to help separate out the glacial clay effects, and outline those areas with the more massive sulfide content.

6.5.4 A radioactivity (scintillation counter) survey might be tested to see if K-feldspar alteration is present (at the present time there is only evidence for albitization).

6.6 DRILLING RECOMMENDATIONS

6.6.1 If funding is available, two preliminary drill hole sites could be completed to test the exploration models, even prior to the foregoing recommendations. Depths of 200m are recommended, unless the results are encouraging. One should be placed near sample location KC92W-16B, the other in the northwest corner of the CHU Claim, but east of NF-1.

6.6.2 Follow up drilling should of course be budgeted for to explore any anomalous geophysical and geochemical zones discovered in those surveys.

PART 7: SUPPORTING INFORMATION

7.1 REFERENCES

Avery (1970)	" Interpretation of Aerial Photographs " by T.E.Avery, Bugress Pub.
Cockfield (1961)	" Geology and Mineral Deposits of the Nicola Map-Area, British Columbia " by W.E.Cockfield, GSC Memoir 249,a reprint of a 1948 Report.
Duffell and McTaggart (1952)	" Ashcroft Map-Area, British Columbia" by S.Duffell and K.C.McTaggart, GSC Memoir 262.
England (1982)	" Assessment Report on a VLF Electromagnetic Survey on the Greg mineral Claim. " by R.J.England B.C. Assessment Report No.10550
Holcapek (1970)	" Geological, Geophysical, and Geochemical Report on the Kon and Win Mineral Claims for Concorde Explorations Ltd." by F.Holcapek, B.C., Assessment Report No. 2262
Kwong (1987)	" Evolution of the Iron Mask Batholith and its Associated Copper Mineralization " by Y.T.J.Kwong, B.C. Mineral Resources Division Bulletin 77.
Lattman and Ray (1965)	" Aerial Photographs in Field Geology " by L.H.Lattman and G.Ray, Holt Pub.
Leitch (1961)	" Copper Fields of the Interior Plateau" by H.C.B.Leitch, Map and description prepared for VI-CO Corporation Ltd., Vancouver, B.C.
Miller and Miller (1961)	" Photogeology ", by V.C.Miller and C.F.Miller, McGraw Hill Pub.
Prendergast (1973)	" Report on the Magnetometer, I.P. and Geochemical Surveys on the Rich Group, Cherry Creek Area, Kamloops. " by J.B.Prendergast, B.C. Assessment Report No.4214

Ray (1960) " Aerial Photographs in Geological Interpretation and Mapping " by R.G.Ray, U.S.G.S. Paper 373.

Reed (1976) " Geological, Geochemical, and Geophysical Report on the Hughes 1-6 Mineral Claims " by A.J.Reed, B.C. Assessment Report No.5852.

Sabins (1978) " Remote Sensing " by F.F.Sabins Jr. Freeman Pub.

Siegal and Gillespie (1980) " Remote Sensing in Geology " by B.S.Siegal and A.R.Gillespie.

Swain and Davis (1978) " Remote Sensing - The Quantitative Approach " edited by P.Swain and S.Davis,McGraw Hill.

Tulley (1982) " Assessment Report on a combined Magnetometer, VLF-Electromagnetic and Geochemical Soil Sampling Survey on the Paye Mineral Claim. " by D.W.Tulley, B.C. Assessment Report No.11248.

Tulley (1983) " Assessment Report on the Hank I Mineral Claim, Cherry Creek Area, Kamloops. " by D.W.Tulley, B.C. Assessment Report No.11550

Whittles (1984) " Air Photo and Geophysical Interpretation Report on the Lost Canyon Group " by Dr.A.B.L.Whittles, B.C. Dept. of Mines Assessment Report.

Whittles (1987) " Air Photo and Geophysical Interpretation Report No.1, Robie Creek Properties, Boise, Idaho " by Dr.A.B.L.Whittles, Rhino Resources Inc. (Vancouver B.C.) Report.

Whittles (1990) " Geological, Air Photo Interpretation Geochemical, and Geophysical Report on the Ned Claim " by A.B.L.Whittles, B.C. Assessment Report.

7.2 COST STATEMENT

7.2.1 Field Work

(1) Field Engineer (June 22,23,24,25,1992 @ $500/day)	2000.00
(2) Field Helper (1/2 day)	50.00
(3) Accommodation and meals (4 days @ $50/day)	200.00
	2250.00

7.2.2 Study, Preparation, and Report Writing

(1) Study of the geology,preparation of samples (2 days)	1000.00
(2) Air photo analysis (2 days)	1000.00
(3) Geophysical analysis (1/2 day)	250.00
(4) Interpretation and report writing (3 days)	1500.00
(5) Preparation of maps and diagrams (2 days)	1000.00
	4750.00

7.2.3 Other Costs

(1) Travel (including ferry)	200.00
(2) Word processing	150.00
(3) Duplicating, blueprints	25.00
(4) Recording fees (16 claim units @ $10 for 3 years	480.00
(5) Equipment rental	100.00
(6) Air photos and maps	50.00
	1005.00

TOTAL	8005.00
CLAIMED FOR ASSESSMENT	4800.00

7.3 RESUME OF TECHNICAL AND FIELD EXPERIENCE OF DR.A.B.L.WHITTLES

(1) University training at the University of B.C. and the University of Toronto, with the completion of a PhD in Physics (Geophysics Section) in 1964, from the University of B.C.

(2) 25 years teaching at the B.C. Institute of Technology, Malaspina College, and the University of B.C., of a variety of geological, geophysical, physics, and electronics courses.

(3) Consulting experience during the past 27 years with companies in Canada and the U.S., including field supervision and interpretation.

(4) Currently Head, Department of Geology, Malaspina College, Nanaimo, B.C.

(5) Registered with the Association of Professional Engineers and Geoscientists of B.C., since 1986.

7.4 ENGINEERS' DECLARATION

The reader of this report should be aware that the writer, Dr.A.B.L.Whittles, is a Director of Rhino Resources Inc. and holds shares in that company. Rhino Resources Inc. is the owner of the CHU Claim, the subject of this report.

Signed
ABL Whittles
(Dr.A.B.L.Whittles, P.Eng.)

7.5 Visual Examination Summary Sheets of Rock and Mineral Samples

MINERALIZED IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU / KAMLOOPS

PAGE: MI - 1

SAMPLE REFERENCE NUMBER: KC 92 W - 3

DATE: JULY 4/92

ECIFIC LOCATION OF SAMPLE: STATION RL1-92-10 + 120 m E. ON SOUTH SIDE OF LOGGING ROAD, 5m FROM ROAD

SAMPLE MODE: [✓ IN SITU] FLOAT

SAMPLER: B. WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): RUSTY GREY-GREEN

COLOUR (FRESH): LIGHT GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC [✓ PROPHYRITIC] GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: [✓ HARD] (≥5) SOFT (~3)

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN:

TOTAL PERCENTAGE DARK MINERALS: %

FELDSPARS:	TYPES:	K-FELDSPAR	[✓ PLAGIOCLASE]
	PERCENTAGE:	%	? %
	GRAIN SIZE:	mm	≤ 1 mm
	COLOUR:		CLEAR/GREEN?
	STRUCTURE:		BLADED

FERROMAGNESIANS:	TYPES:	[✓ AMPHIBOLES]	PYROXENES	/	
	PERCENTAGE:	20 %	%	%	%
	GRAIN SIZE:	≤ 1.5 mm	mm	mm	mm

QUARTZ PRESENT?: YES [✓ NO]

PERCENTAGE: %

GRAIN SIZE: mm

OTHER PRIMARY MINERALS:

PERCENTAGE: % %

GRAIN SIZE: mm mm

ROCK ALTERATION: POSSIBLE PROPLYTTIC

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR

OTHER MINERALIZATION:	[✓ CP/PY]	[✓ EP?]			
PERCENTAGE:	* %	LARGE %?	%	%	%
GRAIN SIZE:	< 0.2 mm	< 0.01 mm	mm	mm	mm
GRAIN SHAPE:	IRREG/CUBIC	MASS.			

HER FEATURES: * DISS ~ 0.1% ; TO 5.0% ON FRACTURE SURFACES

PROBABLE FORMATION: NICOLA GROUP VOLCANICS

AGE: R̄/J

APPROXIMATE FIELD NAME: PORPHYRITIC ANDESITE ([illegible])

MINERALIZED IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU / KAMLOOPS, BC

PAGE: MI -2

S PLE REFERENCE NUMBER: KC92W-16A

DATE: JULY 4/92

PECIFIC LOCATION OF SAMPLE: 30 TO 40 m E OF KC92W-3, 100 m E OF MAJOR N/S FAULT.

SAMPLE MODE: [✓ IN SITU] FLOAT

SAMPLER: B. WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): DARK TO LIGHT GREY/GREEN

COLOUR (FRESH): LIGHT GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC [✓ PROPHYRITIC] GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: [✓ HARD (>5)] SOFT (~3)

HCl REACTION: STRONG [✓ WEAK] POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: > ONLY ON SOME FRACTURE FACES WITH CALCITE

TOTAL PERCENTAGE DARK MINERALS: %

FELDSPARS:

TYPES:	K-FELDSPAR	[✓ PLAGIOCLASE]
PERCENTAGE:	%	%
GRAIN SIZE:	mm	1 mm
COLOUR:		CLEAR
STRUCTURE:		

FERROMAGNESIANS:

TYPES:	AMPHIBOLES	PYROXENES		
PERCENTAGE:	10 %	%	%	%
GRAIN SIZE:	≤1.0 mm	mm	mm	mm

QUARTZ PRESENT?: [✓ YES] NO

PERCENTAGE: MINOR %

GRAIN SIZE: 1.0 mm

OTHER PRIMARY MINERALS:

PERCENTAGE: % %

GRAIN SIZE: mm mm

ROCK ALTERATION: PROPYLITIC, WITH VERY THIN QZ-CARBONATE VEINS (~0.1 mm) AND ACCOMPANYING SULFIDES.

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR

OTHER MINERALIZATION:

	[✓ CP/PY]	[✓ EP]			
PERCENTAGE:	* %	LARGE % ?	%	%	%
GRAIN SIZE:	<0.2 mm	— mm	mm	mm	mm
GRAIN SHAPE:					

HER FEATURES: * DISS ~0.1%. SOME FLOW BANDING. QUARTZ FLOAT (MASSIVE - 2 CM PIECES) FOUND NEARBY.

PROBABLE FORMATION: NICOLA GROUP VOLCANICS

AGE: R̅/J

APPROXIMATE FIELD NAME: PORPHYRITIC ANDESITE

MINERALIZED IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, B.C. **PAGE:** MI -3

SAMPLE REFERENCE NUMBER: KC92W-9 **DATE:** SEPT/92

ECIFIC LOCATION OF SAMPLE: SEE FIGURES 10 & 11, ABOUT 10m SE OF SAMPLE KC92W-8.

SAMPLE MODE: [✓ IN SITU] FLOAT **SAMPLER:** ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): DARK GREY/MED BROWN **COLOUR (FRESH):** LIGHT GREY GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY [✓ APHANITIC] CLASTIC PROPHYRITIC GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE [✓ WEAK] STRONG VERY STRONG

ROCK HARDNESS: HARD (≥5) [✓ SOFT (~3)]

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN: NOT EVEN IN VEINS

TOTAL PERCENTAGE DARK MINERALS: ____ %

FELDSPARS: TYPES: K-FELDSPAR PLAGIOCLASE

PERCENTAGE: ____ % ____ %

GRAIN SIZE: ____ mm ____ mm

COLOUR: ____ ____

STRUCTURE: ____ ____

APHANITIC

FERROMAGNESIANS: TYPES: AMPHIBOLES PYROXENES ____ ____

PERCENTAGE: ____ % ____ % ____ % ____ %

GRAIN SIZE: ____ mm ____ mm ____ mm ____ mm

QUARTZ PRESENT?: [✓ YES] NO **OTHER PRIMARY MINERALS:** ____ ____

PERCENTAGE: * % SEE BELOW PERCENTAGE: ____ % ____ %

GRAIN SIZE: ____ mm GRAIN SIZE: ____ mm ____ mm

ROCK ALTERATION: MOST FERROMAGNESIANS CONVERTED TO CHLORITE. WALLROCK AROUND VEINS* ONLY WEAKLY ALTERED (EPIDOTE) & SLIGHTLY LEACHED.

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? YES NO

IF YES, GIVE PAGE: AR

OTHER MINERALIZATION: QUARTZ EPIDOTE ANKERITE? ____ ____

PERCENTAGE: LARGE * % * % ? % ____ % ____ %

GRAIN SIZE: <2 mm <2 mm ____ mm ____ mm ____ mm

GRAIN SHAPE: (EUHEDRAL TO MASSIVE) ____ ____ ____

THER FEATURES: * VEINS: ATTITUDE 250/20°R. NON MAGNETIC, ALTHOUGH VEINS & ROCK ARE SLIGHTLY STAINED BROWN, NO SULFIDES WERE VISIBLE. (ANKERITE?)

PROBABLE FORMATION NICOLA GROUP VOLCANICS **AGE:** $\overline{R}$

APPROXIMATE FIELD NAME: TENSION GASH VEINS

(CLOSELY RELATED TO KC92W-10, P. MM-1)

MINERALIZED METAMORPHIC ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS

PAGE: MM - 1

SAMPLE REFERENCE NUMBER: KC 92 W - 10

DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURES 10 & 11. 10m SE OF NARROW SWAMP ORIENTED 080°, JUST TO SW OF SAMPLE KC92W-8; AND ON STRIKE

SAMPLE MODE: [✓ IN SITU] FLOAT

SAMPLER: ABC WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MEDIUM BROWN

COLOUR (FRESH): MEDIUM GREY

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

ROCK TEXTURE: FOLIATED NON-FOLIATED SLIGHT FOLIATION

IF FOLIATED: [✓ APHANITIC] VERY FINE-GRAINED FINE TO MEDIUM AND COARSE

IF FOLIATED: [✓ ORIENTED PLATY MINERALS] ORIENTED NEEDLE-LIKE/OR BLADED CRYSTALS MINERALS SEGREGATED INTO LAYERS

IF NON-FOLIATED: APHANITIC GRANULAR GRANOBLASTIC ________

ROCK STRENGTH: LOOSE FRIABLE [✓ WEAK] STRONG VERY STRONG

ROCK CLEAVAGE: NONE FAIR GOOD VERY POOR TO NONE

ROCK HARDNESS: HARD (≥5) [✓ SOFT (~3)] ________

HCl REACTION: [✓ STRONG] WEAK POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: IN ALTERED POCKETS

OVERALL MINERALOGY: [✓ MULTI-MINERALIC] MONO-MINERALIC

MINERALS: ________ ________ ________ ________ ________

PERCENTAGE: ____% ____% ____% ____% ____%

GRAIN SIZE: ____mm ____mm ____mm ____mm ____mm

ROCK ALTERATION: LOCALLY FLOODED WITH CALCITE, MINOR QUARTZ + EPIDOTE MOST FERROMAGNESIAN PHENOCRYSTS CONVERTED TO CHLORITE

IS THERE AN ALTERED ROCK SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR ____

OTHER MINERALIZATION: SULFIDES (MOSTLY PYRITE) HEMATITE? ________ ________

PERCENTAGE: MINOR % ____% ? % ____% ____%

GRAIN SIZE: ____mm ____mm ____mm ____mm ____mm

GRAIN SHAPE: IRREGULAR GRAINS ________ ________ ________

OTHER FEATURES: ON HANDLENS SCALE CALCITE APPEARS PINK; HOWEVER, UNDER THE MICROSCOPE THE PINK COLOR CAN BE SEEN TO BE DUE TO ORANGY RED (HEMATITE? ANKERITE?) STAIN

NON-MAGNETIC

PROBABLE FORMATION NICOLA GROUP VOLCANICS

AGE: TR

APPROXIMATE FIELD NAME: ALTERED, FOLIATED, ANDESITE

ALTERED ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, B.C. PAGE: AR - 1

SAMPLE REFERENCE NUMBER: KC92W-7 DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURES 10 AND 11

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER: ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): LIGHT BROWN COLOUR (FRESH): LIGHT/MED GREEN/GREY

DOMINANT GRAIN SIZE: GLASSY APHANITIC FINE(S) MEDIUM COARSE(P) V. COARSE

ORIGINAL ROCK TYPE: [✓ (IGNEOUS) INTRUSIVE] [✓ (IGNEOUS) EXTRUSIVE] SEDIMENTARY METAMORPHIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: HARD (≥5) SOFT (~3)

IS ORIGINAL ROCK TEXTURE PRESERVED? [✓ YES] NO

HCl REACTION: STRONG [✓ WEAK] POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: DISSEMINATED

HAS ANOTHER ROCK SHEET BEEN FILLED OUT? [✓ YES] NO

IF YES, GIVE PAGE: [✓ I - 1] S M

ALTERATION MINERALS:	QUARTZ	K-FELDSPAR	ALBITE	PYRITE
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

(HABITS: DISSEMINATED(D), ENVELOPE [HALO](E), PERVASIVE(P), VEIN(V), SELVEGE(S).)

ALTERATION MINERALS:	SERICITE	PHLOGOPITE	BIOTITE	CHLORITE
AMOUNT:				20-25%
GRAIN SIZE:	mm	mm	mm	0.5-1 mm
HABIT:				D

ALTERATION MINERALS:	CLAYS	CARBONATES	EPIDOTE	ZEOLITES
AMOUNT:		5%?	10%	
GRAIN SIZE:	mm	1 mm	1-3 mm	mm
HABIT:		D	D	
TYPE:		CALCITE		

ALTERATION MINERALS:				
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

OVERALL ALTERATION TYPE: SILICIFICATION POTASSIC ALBITIZATION ADVANCED ARGILLIC SERICITIC (PHYLLIC) INTERMEDIATE ARGILLIC [✓ PROPYLITIC/OR CHLORITIC] ZEOLITIC ALTERATION

OTHER FEATURES:

PROBABLE FORMATION OF ORIGINAL ROCK: PORPHYRITIC ANDESITE (NICOLA GROUP) AGE: TR

POSSIBLE TYPE OF MINERAL DEPOSIT:

ALTERED ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS PAGE: AR - 2

SAMPLE REFERENCE NUMBER: KC92W-178 DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: WEST OF NF-1, FIGURE 10

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER: ARL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MED GREY/GREEN BROWN COLOUR (FRESH): LIGHT GREY /GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC FINE(S)] MEDIUM COARSE(P) V. COARSE

ORIGINAL ROCK TYPE: (IGNEOUS) INTRUSIVE [✓ (IGNEOUS) EXTRUSIVE] SEDIMENTARY METAMORPHIC

ROCK STRENGTH: LOOSE FRIABLE [✓ WEAK STRONG] VERY STRONG

ROCK HARDNESS: HARD (>5) [✓ SOFT (~3)]

IS ORIGINAL ROCK TEXTURE PRESERVED? [✓ YES] NO

HCl REACTION: [✓ STRONG] WEAK POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: FAIRLY PERVASIVE

HAS ANOTHER ROCK SHEET BEEN FILLED OUT? [✓ YES] NO

IF YES, GIVE PAGE: [✓ I-5] S M

ALTERATION MINERALS:	QUARTZ	K-FELDSPAR	ALBITE	PYRITE
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

(HABITS: DISSEMINATED(D), ENVELOPE [HALO](E), PERVASIVE(P), VEIN(V), SELVEGE(S).)

ALTERATION MINERALS:	SERICITE	PHLOGOPITE	BIOTITE	[✓ CHLORITE]
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				
ALTERATION MINERALS:	CLAYS	[✓ CARBONATES]	[✓ EPIDOTE]	ZEOLITES
AMOUNT:		VARIABLE	UP TO 25%	
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				
TYPE:		PINK CALCITE		
ALTERATION MINERALS:				
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

OVERALL ALTERATION TYPE: SILICIFICATION POTASSIC ALBITIZATION ADVANCED ARGILLIC SERICITIC (PHYLLIC) INTERMEDIATE ARGILLIC [✓ PROPYLITIC/OR CHLORITIC] ZEOLITIC ALTERATION

OTHER FEATURES: SMALL (1-2mm) CALCITE + QUARTZ VIENLES
MINOR SILVERY GREY METALLIC HEMATITE

PROBABLE FORMATION OF ORIGINAL ROCK: NICOLA GROUP. AGE: TR

POSSIBLE TYPE OF MINERAL DEPOSIT:

ALTERED ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, BC PAGE: AR -3

SAMPLE REFERENCE NUMBER: KC 92 W-16 B DATE: SEPT /92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURE 10. ; APPROX 100m EAST OF MAJOR N/S FAULT

SAMPLE MODE: [✓ IN SITU] [✓ ?] FLOAT SAMPLER: ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): BROWNISH GREEN COLOUR (FRESH): LIGHT GREY/GREEN

DOMINANT GRAIN SIZE: GLASSY APHANITIC [✓ FINE(S)] MEDIUM COARSE(P) V. COARSE

ORIGINAL ROCK TYPE: [✓ (IGNEOUS) INTRUSIVE] [✓ ?] (IGNEOUS) EXTRUSIVE SEDIMENTARY METAMORPHIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: [✓ HARD (≥5)] SOFT (-3)

IS ORIGINAL ROCK TEXTURE PRESERVED? [✓ YES] NO BUT CRYSTALS INDISTINCT

HCl REACTION: [✓ STRONG] WEAK POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: SOMEWHAT PERVASIVE, BUT STRONG ON FRACTURE FACES

HAS ANOTHER ROCK SHEET BEEN FILLED OUT? [✓ YES] NO

IF YES, GIVE PAGE: [✓ I -8] S M

ALTERATION MINERALS:	QUARTZ	K-FELDSPAR	[✓ ALBITE] ?	PYRITE
AMOUNT:			✓	
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

(HABITS: DISSEMINATED(D), ENVELOPE [HALO](E), PERVASIVE(P), VEIN(V), SELVEGE(S).)

ALTERATION MINERALS:	SERICITE	PHLOGOPITE	[✓ BIOTITE] ?	[✓ CHLORITE] ?
AMOUNT:			?	<2%
GRAIN SIZE:	mm	mm	mm	<0.5 mm
HABIT:				D
ALTERATION MINERALS:	[✓ CLAYS]	[✓ CARBONATES]	EPIDOTE	ZEOLITES
AMOUNT:	?	LARGE		
GRAIN SIZE:	? mm	0.5 mm	mm	mm
HABIT:	D			
TYPE:	?	CALCITE?		
ALTERATION MINERALS:				
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

REPLACING FELDSPARS?

OVERALL ALTERATION TYPE: SILICIFICATION POTASSIC ALBITIZATION ADVANCED ARGILLIC SERICITIC (PHYLLIC) [✓ INTERMEDIATE ARGILLIC PROPYLITIC/OR CHLORITIC] ZEOLITIC ALTERATION

OTHER FEATURES: THE INDISTINCT NATURE OF CRYSTALS, WHITE COLOR, CLAY SMELL, CALCITE, ETC STRONGLY SUGGESTS THE ALBITIZATION OF PREVIOUSLY EXISTING Ca FELDSPARS

PROBABLE FORMATION OF ORIGINAL ROCK: NICOLA? COAST INTRUSIONS? AGE: ₮R-J

POSSIBLE TYPE OF MINERAL DEPOSIT: DISSEMINATED

ALTERED ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS PAGE: AR-4

SAMPLE REFERENCE NUMBER: KC92W-6 DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURE 10

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER: A&L WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MED BROWN/GREEN COLOUR (FRESH): LIGHT GREY-GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC FINE(S)] MEDIUM COARSE(P) V. COARSE

ORIGINAL ROCK TYPE: (IGNEOUS) INTRUSIVE [✓ (IGNEOUS) EXTRUSIVE] SEDIMENTARY METAMORPHIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: [✓ HARD (≥5)] SOFT (~3)

IS ORIGINAL ROCK TEXTURE PRESERVED? [✓ YES] NO

HCl REACTION: [✓ STRONG WEAK] POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: SEE p. I-9

HAS ANOTHER ROCK SHEET BEEN FILLED OUT? [✓ YES] NO

IF YES, GIVE PAGE: I-9 S M

ALTERATION MINERALS:	QUARTZ	K-FELDSPAR	ALBITE	PYRITE
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

{HABITS: DISSEMINATED(D), ENVELOPE [HALO](E), PERVASIVE(P), VEIN(V), SELVEGE(S).}

ALTERATION MINERALS:	SERICITE	PHLOGOPITE	BIOTITE	[✓ CHLORITE]
AMOUNT:				20%
GRAIN SIZE:	mm	mm	mm	0.5-2 mm
HABIT:				D
ALTERATION MINERALS:	CLAYS	[✓ CARBONATES]	[✓ EPIDOTE]	ZEOLITES
AMOUNT:		20%?	20%	
GRAIN SIZE:	mm	<1 mm	<1 mm	mm
HABIT:		D	D	
TYPE:		CALCITE		
ALTERATION MINERALS:				
AMOUNT:				
GRAIN SIZE:	mm	mm	mm	mm
HABIT:				

OVERALL ALTERATION TYPE: SILICIFICATION POTASSIC ALBITIZATION ADVANCED ARGILLIC SERICITIC (PHYLLIC) INTERMEDIATE ARGILLIC [✓ PROPYLITIC/OR CHLORITIC] ZEOLITIC ALTERATION

OTHER FEATURES: OCCASIONAL GRAIN OF PYRITE

PROBABLE FORMATION OF ORIGINAL ROCK: NICOLA GROUP VOLCANICS AGE: $\overline{\text{R}}$

POSSIBLE TYPE OF MINERAL DEPOSIT:

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, B.C. PAGE: I-1

SAMPLE REFERENCE NUMBER: KC92W-7 DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGS 10 AND 11 . 7

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER: A&L WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): LIGHT BROWN COLOUR (FRESH): LIGHT/MED GREEN/GREY

DOMINANT GRAIN SIZE: GLASSY APHANITIC FINE(S) MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC [✓ PROPHYRITIC] GRANULAR PEGMATITIC

ROCK TYPE: [✓ PLUTONIC] [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: HARD (≥5) SOFT (~3)

HCl REACTION: STRONG [✓ WEAK] POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: DISSEMINATED

TOTAL PERCENTAGE DARK MINERALS: %

FELDSPARS: TYPES:	K-FELDSPAR	PLAGIOCLASE
PERCENTAGE:	%	? %
GRAIN SIZE:	mm	0.5-1.5 mm
COLOUR:		CLEAR/WHITE
STRUCTURE:		

FERROMAGNESIANS: TYPES:	~~AMPHIBOLES~~	PYROXENES →	CHLORITE	
PERCENTAGE:	20-25 %	%	20-25 %	%
GRAIN SIZE:	0.5-1.0 mm	mm	0.5-1.0 mm	mm

QUARTZ PRESENT?: YES [✓ NO] OTHER PRIMARY MINERALS:

PERCENTAGE:	%	PERCENTAGE:	%	%
GRAIN SIZE:	mm	GRAIN SIZE:	mm	mm

ROCK ALTERATION: ABUNDANT EPIDOTE & CHLORITE & SOME CALCITE

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? [✓ YES] NO

IF YES, GIVE PAGE: AR-1

OTHER FEATURES: APPEARS TO HAVE INCLUSIONS OF GABBRO. NON MAGNETIC

PROBABLE FORMATION NICOLA GROUP VOLCANIC AGE: TR

APPROXIMATE FIELD NAME: ALTERED PORPHYRITIC ANDESITE

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, B.C

PAGE: I – 2

SAMPLE REFERENCE NUMBER: KC92W – 11

DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: HIGH LAND EAST MIDDLE OF CHU CLAIM, SEE FIGURE 10

SAMPLE MODE: [✓ IN SITU] ? FLOAT

SAMPLER: ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): WHITE/LIGHT GREY

COLOUR (FRESH): WHITE/YELLOW-BROWN SPOTS

DOMINANT GRAIN SIZE: GLASSY APHANITIC [✓ FINE(S)] MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC PROPHYRITIC [✓ GRANULAR] PEGMATITIC

VERY SUGARY APPEARANCE

ROCK TYPE: [✓ PLUTONIC] VOLCANIC FLOW PYROCLASTIC

ROCK CLASS: [✓ FELSIC] INTERMEDIATE MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: [✓ HARD] (≥5) SOFT (~3)

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN:

TOTAL PERCENTAGE DARK MINERALS: 0 %

FELDSPARS:

	K-FELDSPAR	PLAGIOCLASE
TYPES:	K-FELDSPAR	PLAGIOCLASE
PERCENTAGE:	? ← ~~%~~ 40%	→ ? %
GRAIN SIZE:	0.05-0.2 mm	mm
COLOUR:	CLEAR TO WHITE	
STRUCTURE:		

FERROMAGNESIANS:

TYPES:	AMPHIBOLES	PYROXENES		
PERCENTAGE:	%	%	%	%
GRAIN SIZE:	mm	mm	mm	mm

QUARTZ PRESENT?: [✓ YES] NO

PERCENTAGE: 40? %

GRAIN SIZE: 0.05 - 0.2 mm

OTHER PRIMARY MINERALS: MUSCOVITE

PERCENTAGE: % 20? %

GRAIN SIZE: mm 0.05 mm

ROCK ALTERATION: NONE APPARENT

IS THERE ~~AN ALTERED~~ ANOTHER ROCK SAMPLE SUMMARY SHEET? [✓ YES] NO

IF YES, GIVE PAGE: ~~AR~~ M-2

OTHER FEATURES: A TRACE OF MOLYBDENITE(?) ON SOME FRACTURE FACES. ALSO SOME HEMATITE, NON-MAGNETIC. SEEMS TO BE PRESENT AS A THIN LAYER OR A DYKE.

PROBABLE FORMATION

AGE: ?

APPROXIMATE FIELD NAME: APLITE DYKE ? / QUARTZ/FD/SERICITE VEIN?

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, B.C.

PAGE: I-2

SAMPLE REFERENCE NUMBER: KC 92 W-12 A

DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURE 10

SAMPLE MODE: [✓ IN SITU] FLOAT

SAMPLER: ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MED/BROWN/GREY/GREEN

COLOUR (FRESH): MED GREEN

DOMINANT GRAIN SIZE: GLASSY APHANITIC [✓ FINE(S)] MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC [✓ PROPHYRITIC] GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: HARD (≥5) SOFT (~3) ~4

HCl REACTION: [✓ STRONG] WEAK POWDER ONLY [✓ NONE] – IN BULK ROCK

IF HCl YES, GIVE PATTERN: IN VEINLETS

TOTAL PERCENTAGE DARK MINERALS: %

FELDSPARS: TYPES: K-FEELDSPAR [✓ PLAGIOCLASE]

	K-FELDSPAR	PLAGIOCLASE
PERCENTAGE:	%	✓ %
GRAIN SIZE:	mm	≤1 mm
COLOUR:		CLEAR
STRUCTURE:		

FERROMAGNESIANS: TYPES: [✓ AMPHIBOLES] PYROXENES [✓ CHLORITE]

	AMPHIBOLES	PYROXENES	CHLORITE	
PERCENTAGE:	>5 → >10 % (AS PHENOCRYSTS)		≥5 → >10 %	%
GRAIN SIZE:	0.5-2 mm	mm	0.5-2 mm	mm

QUARTZ PRESENT?: YES NO

OTHER PRIMARY MINERALS: MAGNETITE

	QUARTZ		MAGNETITE	
PERCENTAGE:	%	PERCENTAGE:	? %	%
GRAIN SIZE:	mm	GRAIN SIZE:	? mm	mm

ROCK ALTERATION: CHLORITE REPLACES MOST FERROMAGNESIANS, SOME EPIDOTE ALSO PRESENT, MOSTLY IN MAFIC INCLUSIONS

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR

OTHER FEATURES: SOME NARROW (1-2mm) CALCITE + QUARTZ (MINOR) VEINLETS EPIDOTE-RICH MAFIC INCLUSIONS. MINOR PYRITE ASSOCIATED WITH QUARTZ VEINLET. SAMPLE IS WEAKLY MAGNETIC

PROBABLE FORMATION NICOLA GROUP

AGE: TR

APPROXIMATE FIELD NAME: PORPHYRITIC ANDESITE

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS PAGE: I-4

SAMPLE REFERENCE NUMBER: KC'92 W – 17A DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SLIDE AREA

SAMPLE MODE: IN SITU FLOAT SAMPLER:

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): COLOUR (FRESH):

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY [✓ APHANITIC] CLASTIC PROPHYRITIC GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC INTERMEDIATE [✓ MAFIC ULTRA-MAFIC]

ROCK STRENGTH: LOOSE FRIABLE [✓ WEAK STRONG] VERY STRONG

ROCK HARDNESS: HARD (≥5) SOFT (~3) ~4

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN:

TOTAL PERCENTAGE DARK MINERALS: %

FELDSPARS: TYPES:	K-FELDSPAR	PLAGIOCLASE
PERCENTAGE:	%	? %
GRAIN SIZE:	mm	mm
COLOUR:		
STRUCTURE:		

OCCASSIONAL PHENOCRYSTS

FERROMAGNESIANS: TYPES:	AMPHIBOLES	PYROXENES	OLIVINE	
PERCENTAGE:	? %	? %	MINOR %	%
GRAIN SIZE:	mm	<0.12 mm	TO 4 mm	mm

IRREGULAR, GEMMY MASSES

QUARTZ PRESENT?: YES [✓ NO] OTHER PRIMARY MINERALS:

PERCENTAGE: % PERCENTAGE: % %

GRAIN SIZE: mm GRAIN SIZE: mm mm

ROCK ALTERATION:

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR

OTHER FEATURES: MODERATELY TO STRONGLY MAGNETIC

PROBABLE FORMATION VALLEY BASALT AGE: T

APPROXIMATE FIELD NAME: BASALT

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS PAGE: I - 5

AMPLE REFERENCE NUMBER: KC92W - 17B DATE: SEPT/92

PECIFIC LOCATION OF SAMPLE: TO WEST OF NF-1, FIGURE 10

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER: ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MED GREY/GREEN/BROWN COLOUR (FRESH): LIGHT GREY/GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC FINE(S)] MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY [✓ APHANITIC CLASTIC] PROPHYRITIC GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] [✓ PYROCLASTIC] ?

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE [✓ WEAK STRONG] VERY STRONG

ROCK HARDNESS: HARD (≥5) SOFT (~3)

HCl REACTION: [✓ STRONG] WEAK POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: FAIRLY PERVASIVE IN SOME SAMPLES

TOTAL PERCENTAGE DARK MINERALS: ____ %

FELDSPARS: TYPES: K-FELDSPAR PLAGIOCLASE
PERCENTAGE: ____ % ____ %
GRAIN SIZE: ____ mm ____ mm
COLOUR: ____ ____
STRUCTURE: ____ ____

TOO FINE GRAINED TO DETERMINE

FERROMAGNESIANS: TYPES: AMPHIBOLES PYROXENES ____ ____
PERCENTAGE: ____ % ____ % ____ % ____ %
GRAIN SIZE: ____ mm ____ mm ____ mm ____ mm

QUARTZ PRESENT?: YES NO OTHER PRIMARY MINERALS: ____ ____
PERCENTAGE: ____ % PERCENTAGE: ____ % ____ %
GRAIN SIZE: ____ mm GRAIN SIZE: ____ mm ____ mm

ROCK ALTERATION: SOME SAMPLES HIGHLY ALTERED WITH PERVASIVE EPIDOTE, CALCITE, CHLORITE + MINOR QUARTZ; SOME ONLY SHOWING CHLORITE ALTERATION

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? [✓ YES] NO

IF YES, GIVE PAGE: AR - 2

OTHER FEATURES: THE HIGHLY ALTERED PIECES HAVE PINK CALCITE VERY SIMILAR TO DRILL CORE MATERIAL FARTHER NORTH ON THE WOOD CLAIMS

NON-MAGNETIC

PROBABLE FORMATION NICOLA GROUP AGE: TR ?

APPROXIMATE FIELD NAME: (HIGHLY) ALTERED TUFF

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS

PAGE: I - 6

SAMPLE REFERENCE NUMBER: KC92W-18

DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURE 10. TO WEST OF CHU CLAIM

SAMPLE MODE: [✓ IN SITU] FLOAT

SAMPLER:

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MED BROWN TO GREEN GREY

COLOUR (FRESH): LIGHT GREY GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC [✓ PROPHYRITIC] GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] [✓ PYROCLASTIC]

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK STRONG VERY STRONG

ROCK HARDNESS: HARD (≥5) SOFT (~3) ~4

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN:

TOTAL PERCENTAGE DARK MINERALS: %

FELDSPARS: TYPES:	K-FELDSPAR	PLAGIOCLASE
PERCENTAGE:	%	%
GRAIN SIZE:	mm	mm
COLOUR:		
STRUCTURE:		

VISIBLE PHENOCRYSTS CONVERTED TO

FERROMAGNESIANS: TYPES:	AMPHIBOLES	PYROXENES	CHLORITE	
PERCENTAGE:	10 %	%	%	%
GRAIN SIZE:	1 mm	mm	mm	mm

QUARTZ PRESENT?: YES [✓ NO]

PERCENTAGE: %

GRAIN SIZE: mm

OTHER PRIMARY MINERALS:		
PERCENTAGE:	%	%
GRAIN SIZE:	mm	mm

ROCK ALTERATION: SOME EPIDOTE (WITH MINOR QUARTZ) + AMPHIBOLES CHANGED TO CHLORITE. MINOR CALCITE

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR

OTHER FEATURES: NON-MAGNETIC

PROBABLE FORMATION NICOLA GROUP VOLCANICS

AGE: Tr

APPROXIMATE FIELD NAME: PORPHYRITIC ANDESITE

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, B.C PAGE: I - 7

MPLE REFERENCE NUMBER: KC92W - 15 + 13 DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: ON MOUNTAIN TOP SW OF KC92W-12 (SEE FIGURE 10)

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER:

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MED GREEN/GREY COLOUR (FRESH): LIGHT TO MED GREEN/GREY

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC [✓ PROPHYRITIC] GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC [✓ INTERMEDIATE MAFIC] ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK STRONG VERY STRONG

ROCK HARDNESS: HARD (≥5) SOFT (~3)

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN:

TOTAL PERCENTAGE DARK MINERALS: ____ %

FELDSPARS:	TYPES:	K-FELDSPAR	PLAGIOCLASE
	PERCENTAGE:	%	%
	GRAIN SIZE:	mm	mm
	COLOUR:		
	STRUCTURE:		

FERROMAGNESIANS:	TYPES:	AMPHIBOLES	PYROXENES	[✓ CHLORITE]	
	PERCENTAGE:	%	%	%	%
	GRAIN SIZE:	mm	mm	mm	mm

QUARTZ PRESENT?: YES [✓ NO] OTHER PRIMARY MINERALS: [✓ MAGNETITE]

PERCENTAGE: ____ % PERCENTAGE: ____ % ____ %

GRAIN SIZE: ____ mm GRAIN SIZE: ____ mm ____ mm

ROCK ALTERATION: FERROMAGNESIONS CONVERTED TO CHLORITE

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR

OTHER FEATURES: MODERATELY MAGNETIC, ESPECIALLY MORE MAFIC PARTS; A 2CM CALCITE/ANKERITE/MINOR QUARTZ/MINOR HEMATITE VEIN SHOWING WALLROCK SELVEGE FOUND AS FLOAT AT THIS SITE

PROBABLE FORMATION NICOLA GROUP VOLCANICS AGE: TR

APPROXIMATE FIELD NAME: PORPHYRITIC BASALTIC ANDESITE

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS, BC PAGE: I -8

SAMPLE REFERENCE NUMBER: KC92W- 16B DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURE 10, APPROX 100 M EAST OF MAJOR N/S FAULT

SAMPLE MODE: [✓ IN SITU] [✓ ?] FLOAT SAMPLER: ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): BROWNISH GREEN COLOUR (FRESH): LIGHT GREEN/GREY

DOMINANT GRAIN SIZE: GLASSY APHANITIC [✓ FINE(S)] MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC PROPHYRITIC [✓ GRANULAR] PEGMATITIC

ROCK TYPE: [✓ PLUTONIC] ? VOLCANIC FLOW PYROCLASTIC

ROCK CLASS: [✓ FELSIC] INTERMEDIATE MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: [✓ HARD (≥5)] SOFT (~3)

HCl REACTION: [✓ STRONG] WEAK POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: SOMEWHAT PERVASIVE, BUT STRONG ON FRACTURE FACES

TOTAL PERCENTAGE DARK MINERALS: < 2 %

FELDSPARS:		
TYPES:	K-FELDSPAR	[✓ PLAGIOCLASE ?]
PERCENTAGE:	%	90 %?
GRAIN SIZE:	mm	< 0.5 mm
COLOUR:		WHITE
STRUCTURE:		

TRY STAINING TEST?

FERROMAGNESIANS:				
TYPES:	AMPHIBOLES	PYROXENES	BIOTITE ? CHLORITE ?	
PERCENTAGE:	%	%	< 2 %	%
GRAIN SIZE:	mm	mm	< 0.5 mm	mm

VERY SMALL INDISTINCT IRREGULAR MASSES

QUARTZ PRESENT?: [✓ YES] [✓ ?] NO OTHER PRIMARY MINERALS:

PERCENTAGE: < 5 % [✓ ?] PERCENTAGE: % %

GRAIN SIZE: < 0.5 mm GRAIN SIZE: mm mm

ROCK ALTERATION: MANY CRYSTALS SEEM INDISTINCT. MUCH CALCITE PRESENT, CLAY SMELL. THIS STRONGLY SUGGESTS THE ALBITIZATION OF PREVIOUSLY EXISTING Ca FELDSPARS.

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? [✓ YES] NO

IF YES, GIVE PAGE: AR - 3

OTHER FEATURES: WAS THIS AN OUTCROP, OR A LARGE BURIED BOULDER, OR A LARGE INCLUSION? COULD BE SIMILAR TO THE SUGARLOAF DIORITES (SECTION 3.5.2.3 (2)(b).

PROBABLE FORMATION NICOLA GROUP? COAST INTRUSIONS? AGE: R-J

APPROXIMATE FIELD NAME: FINE GRAINED QUARTZ DIORITE (ALTERED)?

IGNEOUS ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS PAGE: I — 9

SAMPLE REFERENCE NUMBER: KC92W — 6 DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURE 10

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER: AGL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MED. BROWN GREEN COLOUR (FRESH): LIGHT GREY-GREEN

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC FINE(S)] MEDIUM COARSE(P) V. COARSE

TEXTURE: GLASSY APHANITIC CLASTIC [✓ PROPHYRITIC] GRANULAR PEGMATITIC

ROCK TYPE: PLUTONIC [✓ VOLCANIC FLOW] PYROCLASTIC

ROCK CLASS: FELSIC [✓ INTERMEDIATE] MAFIC ULTRA-MAFIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK HARDNESS: [✓ HARD (≥5)] SOFT (~3)

HCl REACTION: [✓ STRONG]—[✓ WEAK] POWDER ONLY NONE

IF HCl YES, GIVE PATTERN: DISSEMINATED, ASSOCIATED WITH FERROMAGNESIANS? STRONG ON SOME FRACTURE FACES

TOTAL PERCENTAGE DARK MINERALS: 20 %

FELDSPARS: TYPES:	K-FELDSPAR	PLAGIOCLASE
PERCENTAGE:	%	%
GRAIN SIZE:	mm	mm
COLOUR:		
STRUCTURE:		

FERROMAGNESIANS: TYPES:	AMPHIBOLES	PYROXENES	[✓ CHLORITE]	[✓ EPIDOTE]
PERCENTAGE:	%	%	20 %	20 %
GRAIN SIZE:	mm	mm	0.5-2 mm	<1 mm

QUARTZ PRESENT?: YES NO OTHER PRIMARY MINERALS:

PERCENTAGE:	? %	PERCENTAGE:	%	%
GRAIN SIZE:	mm	GRAIN SIZE:	mm	mm

ROCK ALTERATION: AMPHIBOLES CONVERTED TO CHLORITE, PLAGIOCLASE? CONVERTED TO EPIDOTE + CALCITE?

IS THERE AN ALTERED ROCK SAMPLE SUMMARY SHEET? [✓ YES] NO

IF YES, GIVE PAGE: AR — 4

OTHER FEATURES: OCCASIONAL GRAIN OF PYRITE

PROBABLE FORMATION NICOLA GROUP VOLCANICS AGE: TR

APPROXIMATE FIELD NAME: PORPHYRITIC ANDESITE

METAMORPHIC ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS PAGE: M - 1

SAMPLE REFERENCE NUMBER: KC92W - 8 DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURES 10 & 11, 10m SE OF NARROW SWAMP ORIENTED ~ 080°

SAMPLE MODE: [✓ IN SITU] FLOAT SAMPLER: ABL WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): MEDIUM BROWN COLOUR (FRESH): MEDIUM GREY

DOMINANT GRAIN SIZE: GLASSY [✓ APHANITIC] FINE(S) MEDIUM COARSE(P) V. COARSE

ROCK TEXTURE: [✓ FOLIATED] NON-FOLIATED

IF FOLIATED: [✓ APHANITIC] VERY FINE-GRAINED FINE TO MEDIUM AND COARSE

IF FOLIATED: [✓ ORIENTED PLATY MINERALS] ORIENTED NEEDLE-LIKE/OR BLADED CRYSTALS MINERALS SEGREGATED INTO LAYERS

IF NON-FOLIATED: APHANITIC GRANULAR GRANOBLASTIC

ROCK STRENGTH: LOOSE FRIABLE [✓ WEAK] STRONG VERY STRONG

ROCK CLEAVAGE: NONE FAIR GOOD WEAK

ROCK HARDNESS: HARD (≥5) [✓ SOFT (~3)]

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN:

OVERALL MINERALOGY: [✓ MULTI-MINERALIC] MONO-MINERALIC

MINERALS: SOME CHLORITE REPLACED AMPHIBOLES

PERCENTAGE: ? % % % % %

GRAIN SIZE: ? mm mm mm mm mm

ROCK ALTERATION: MINOR EPIDOTE, VISIBLE FERROMAGNESIAN MINERALS REPLACED BY CHLORITE.

IS THERE AN ALTERED ROCK SUMMARY SHEET? YES [✓ NO]

IF YES, GIVE PAGE: AR

OTHER FEATURES: FAIRLY MAGNETIC

PROBABLE FORMATION NICOLA GROUP VOLCANICS AGE: [illegible]

APPROXIMATE FIELD NAME: FOLIATED ANDESITE (PHYLLONITE)

METAMORPHIC ROCK SAMPLE SUMMARY SHEET

PROJECT: CHU CLAIM, KAMLOOPS　　PAGE: M-2

SAMPLE REFERENCE NUMBER: KC92W-11　　DATE: SEPT/92

SPECIFIC LOCATION OF SAMPLE: SEE FIGURE 10, HIGH LAND, EAST MIDDLE OF CHU CLAIM.

SAMPLE MODE: [✓ IN SITU]? FLOAT　　SAMPLER: A&L WHITTLES

(IF FLOAT): SPHERICITY: ANGULAR SUB-ANGULAR SUB-ROUNDED ROUNDED

COLOUR (WEATHERED): WHITE/LIGHT GREY　　COLOUR (FRESH): WHITE/YELLOW-BROWN SPOTS

DOMINANT GRAIN SIZE: GLASSY APHANITIC [✓ FINE(S)] MEDIUM COARSE(P) V. COARSE

ROCK TEXTURE: FOLIATED [✓ NON-FOLIATED]

IF FOLIATED: APHANITIC VERY FINE-GRAINED FINE TO MEDIUM AND COARSE

IF FOLIATED: ORIENTED PLATY MINERALS　ORIENTED NEEDLE-LIKE/OR BLADED CRYSTALS　MINERALS SEGREGATED INTO LAYERS

IF NON-FOLIATED: APHANITIC [✓ GRANULAR] GRANOBLASTIC

ROCK STRENGTH: LOOSE FRIABLE WEAK [✓ STRONG] VERY STRONG

ROCK CLEAVAGE: [✓ NONE] FAIR GOOD

ROCK HARDNESS: [✓ HARD (≥5)] SOFT (~3)

HCl REACTION: STRONG WEAK POWDER ONLY [✓ NONE]

IF HCl YES, GIVE PATTERN:

OVERALL MINERALOGY: MULTI-MINERALIC [✓ ?]? MONO-MINERALIC [✓ ?]

MINERALS:			MUSCOVITE?	QUARTZ	FELDSPARS?
PERCENTAGE:	%	%	%	40? %	%
GRAIN SIZE:	mm	mm	<0.05 mm	0.05-0.5 mm	<0.05 mm

ROCK ALTERATION:

IS THERE ~~AN ALTERED~~ ANOTHER ROCK SUMMARY SHEET? [✓ YES] NO

IF YES, GIVE PAGE: ~~AR~~ I-2

OTHER FEATURES: SEEMS TO BE PRESENT AS A THIN LAYER/OR DYKE. QUARTZ PRESENT A CLEAR ROUNDED GRAINS WITH A FRESH CONCHOIDAL FRACTURE, IN A FINER GRAINED MATRIX SHOWING SOME CLEAVAGE FACES

PROBABLE FORMATION CACHE CREEK GROUP?　　AGE: ?

APPROXIMATE FIELD NAME: QUARTZITE?

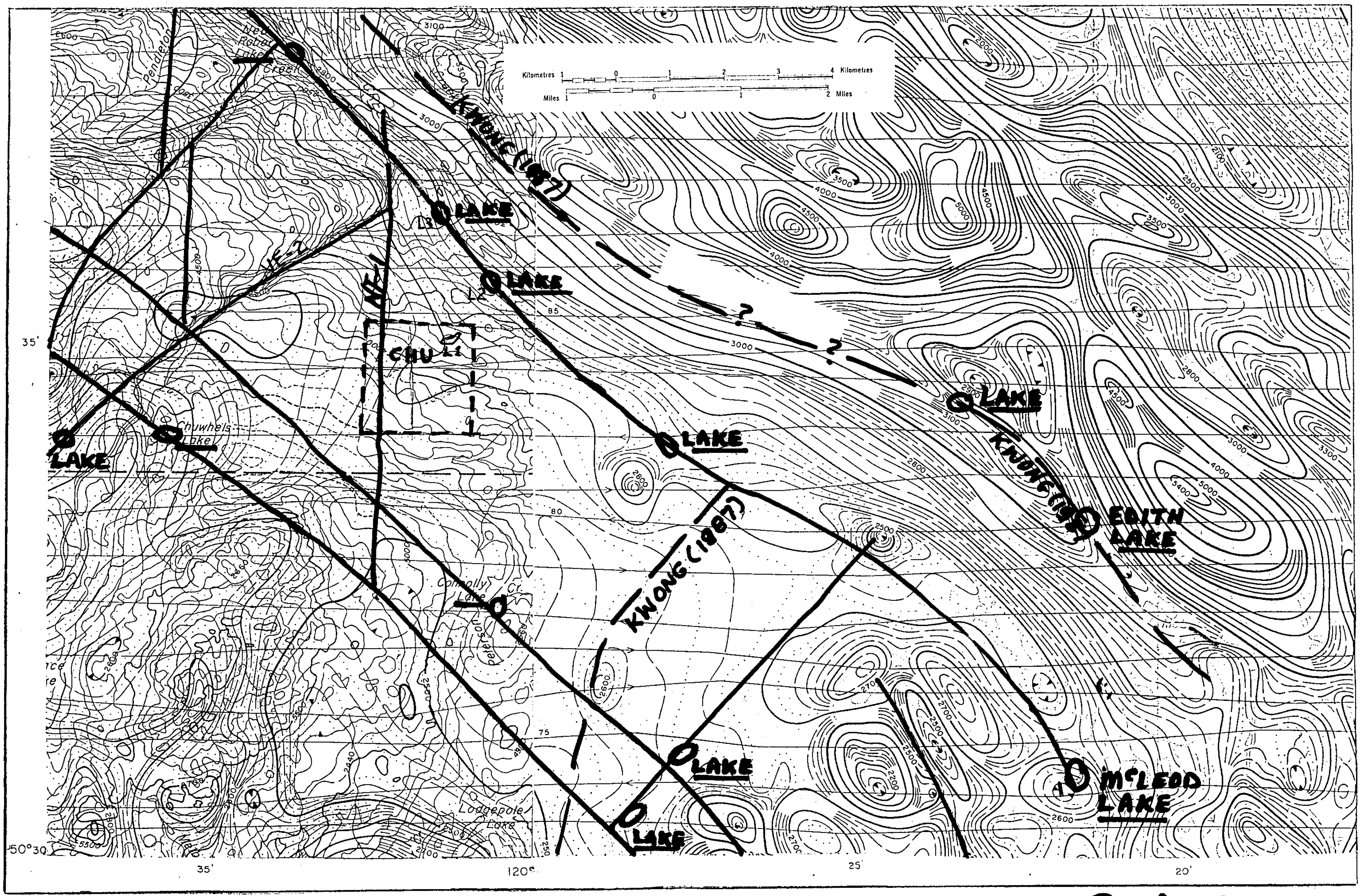


Figure 12:Air Magnetic Map Analysis

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