GEOLOGICAL, GEOCHEMICAL & PROSPECTING ASSESSMENT REPORT on the TAKLA PROPERTY (CLAIMS 1-3)

Chuchi Lake Area
Omineca Mining Division
Central British Columbia

Latitude: 55°16′ North Longitude: 124°44′ West

NTS: 93° - N/7E & W

for

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(OWNER)

by

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1.0 SUMMARY

The region surrounding the Takla property has been explored intermittently since the 1930's with principal activity taking place during the last two decades. Several alkalic copper-gold porphyry systems have been recognized in the area, most notable of which are Mt. Milligan, Lorraine and Southern Star. Companies actively exploring in the immediate area of the Takla property in 1991 were Kookaburra Gold Corp. with ASARCO on the Col property to the south; Rio Algom Exploration Inc. on the Klawli property to the east; Dasserat Developments Corp. on the MM property to the east; BP with Digger Resources Inc. on the Chuchi property to the south-east.

The Takla property is located within the Quesnel Trough along the eastern margin of the Intermontane Tectonic Belt of the Canadian Cordillera and is underlain by the volcanic rocks (with their epiclastic derivatives) of the Chuchi Lake Formation of the early Mesozoic Takla Group.

Areas of propylitic alteration have been mapped on the Takla property which are thought to be associated with faulting and/or the proximity of intrusives. Chalcopyrite and/or malachite were observed at four locations. The geochemical programme comprised 23 soils, 5 rocks and 1 silt. Five of the rock samples and seven of the soils showed anomalous values in one or more of Au, Ag, Cu, Pb, or Zn. Most notable of these is the rock sample from Takla 3 (west) with 0.55gm Au and 0.55% Cu, which is considered to be related to the Col porphyry system to the south of the claims. Also considered of significance are the copper anomalous soil and rock from Takla 1 (east) which may be related to copper anomalous areas identified on the MM claims of Dasserat Developments Corp. adjoining the Takla property to the east.

Copper and gold anomalous clasts in Unit 1 (Heterolithic Agglomerate) are indicative of a metal-rich volcanic centre in the immediate vicinity. There significance should be more clearly defined.

Three areas of alteration and/or anomalous copper-gold within the Takla claims are recommended for detailed work in 1992. A two-phased work programme estimated at $ 300,000 is presented.

2.0 INTRODUCTION

2.1 Objectives

At the request of the owner of the Takla claims, D.S. Gujral, the writer was engaged to prospect, map and sample the Takla claims 1 to 3 for assessment of their potential for a copper-gold porphyry system similar to the Mt. Milligan deposit of Placer Dome Inc. 45km to the east-south-east. In the event of encouraging results, a 1992 exploration programme and budget was to be formulated.

2.2 Location and Access

Province:	British Columbia
Area:	Chuchi Lake
Mining Division:	Omineca
Claim Names:	Takla 1, 2 & 3
NTS:	93 N/7E & W
Longitude:	124° 44'00" West
Latitude:	55° 16'00" North
Size of Claim Area:	1400 hectares

The Takla Property is located approximately 110 road kilometres (68.7 miles) north of Fort St. James, Central British Columbia, and 11 kilometres (6.8 miles) north of Chuchi Lake (Figures 1 and 4). The claims' northern boundary is situated about 6.5 kilometres (4 miles) south of Klawli Lake and the western boundary 2.5 kilometres (1.5 miles) east of Klawli river. The eastern boundary of the Takla claims adjoin the MM claims of Dasserat Developments Corp.. The claims are accessed by helicopter from a base located 2.5 kilometres to the south-east at the eastern end of Chuchi Lake. Flying time from the helicopter base to the property is about 20 minutes. The helicopter base can be reached by an all weather gravel road from Fort St. James, locally referred to as "The North Road".

2.3 Claim Status and Ownership

The Takla Claims, located in the Omineca Mining Division, Central British Columbia comprise 3 Modified Grid System claims totalling 56 units (Figure 2).

These claims are shown on Mineral Claim Map 93° N/7E & W and are recorded with the B.C. Mining Recorder as follows:

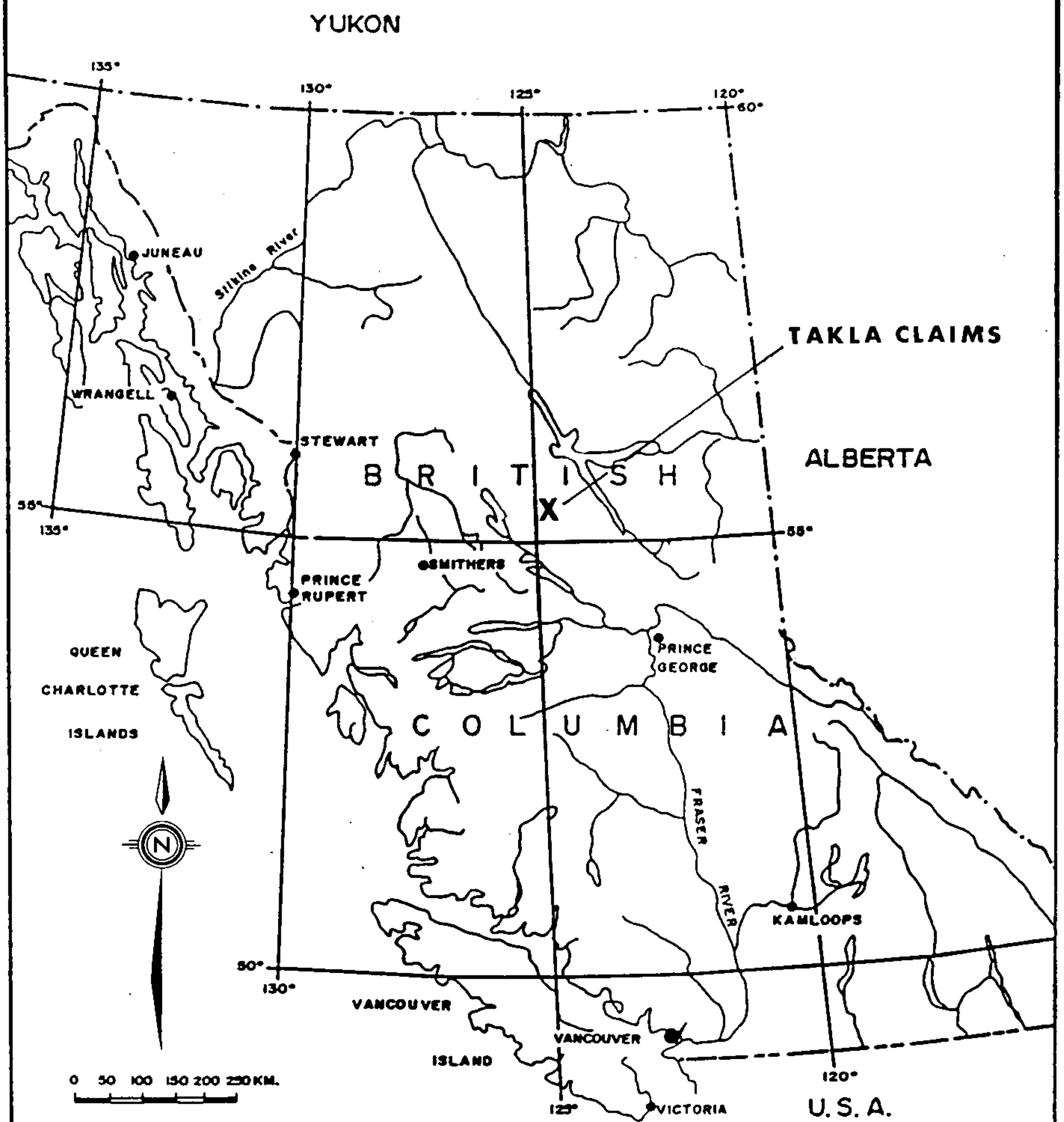
Table 1: Mineral Claims Summary

Claims	Record No.	No. of Units	Expiry Date	Owner
Takla 1	12894	18	February 7/92	Dil Gujral
Takla 2	12895	18	February 7/92	Dil Gujral
Takla 3	12896	20	February 7/92	Dil Gujral

LCP for Takla 1 & 2, as well as many sections of claim line, were identified by the writer during prospecting and mapping.

2.4 Physiography and Climate

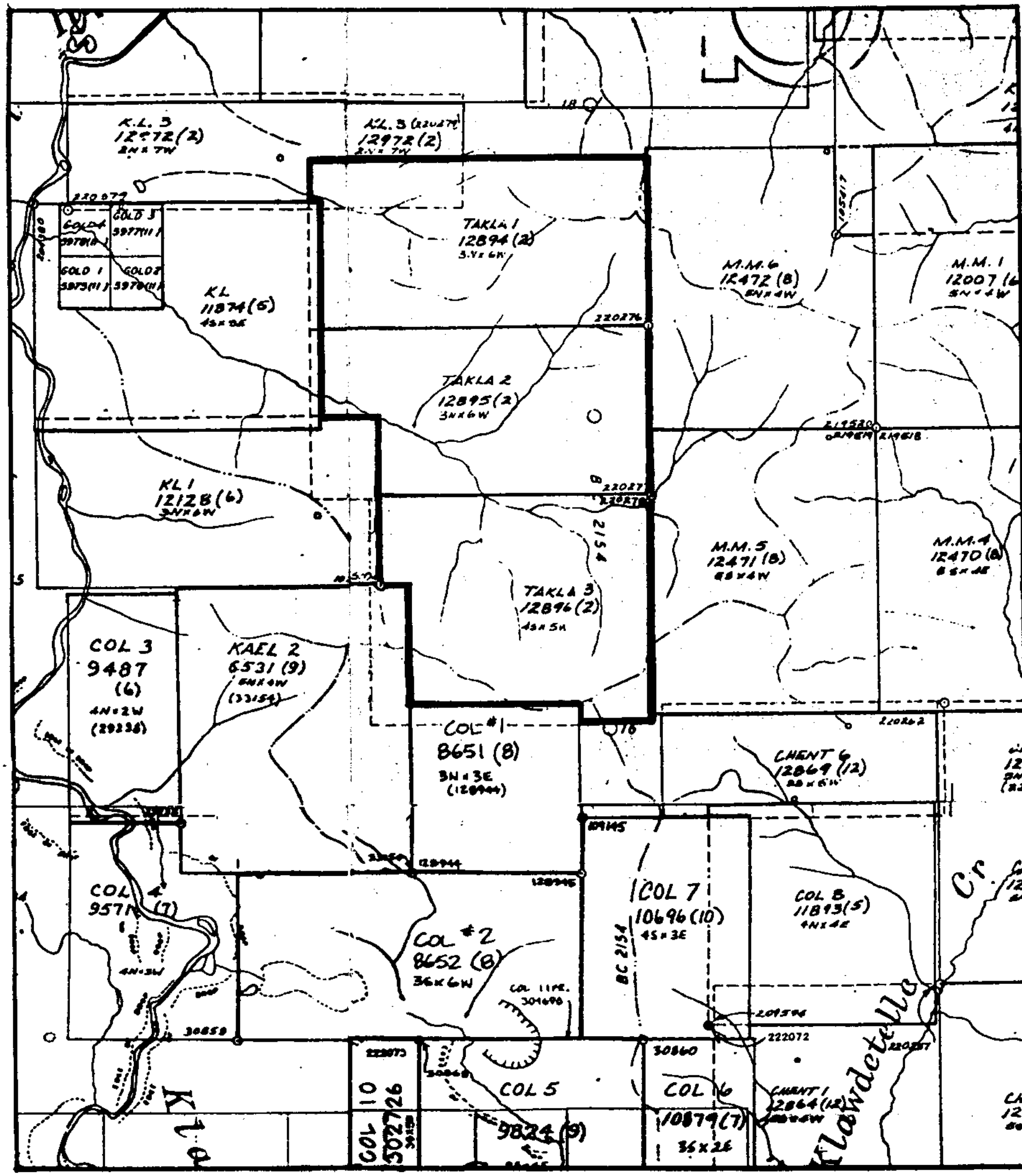
The Takla claims are situated in the Swannel Ranges of the Omineca Mountains. The area exhibits the characteristics of typical glaciated physiography. These include wide U-shaped, drift-filled valleys flanked by steep, rugged mountains and deeply incised V-shaped upland valleys.



PROPERTY LOCATION MAP

TAKLA CLAIMS

FIGURE 1



MINERAL CLAIMS MAP

Takla 1,2 & 3

NTS: 93N7E&W

Scale 1:50,000

Figure 2

Local topographic relief varies from moderate to steep with elevations ranging from 1150 meters (3770 feet) A.S.L. along a west flowing creek on Takla 2 to 1905 meters (6250 feet) A.S.L., a peak named 'Adade Yus on Takla 1. (Figure 3).

Vegetation is characteristic of mountainous terrain in the northern part of the Interior Plateau and consists mainly of widely spaced spruce, fir, and pine at lower elevations with alpine grassland and scrub brush at higher elevations.

Climate comprises generally long, cold and snowy winters and relatively short moderate to cool summers.

2.5 Logistics and Costs

The geological mapping, prospecting and geochemical programmes were conducted during the periods June 29, August 10, and August 14, 1991.

The field crews, consisting of R.R. Arnold and D.L. Cook, mobilized in Vancouver and drove to Chuchi Lake where a BH206 helicopter of Highland Helicopters Ltd. transported them to the property area. Base camp was set up at Latitude 55° 17'N and Longitude 124° 41'W. Transportation to Chuchi Lake was provided by a van rented from Cana Rentals Ltd. for Phase 1 and a van rented from Budget Rentals for Phase 2. Radio communications were maintained with the Vancouver office and with the helicopter base on a regular basis.

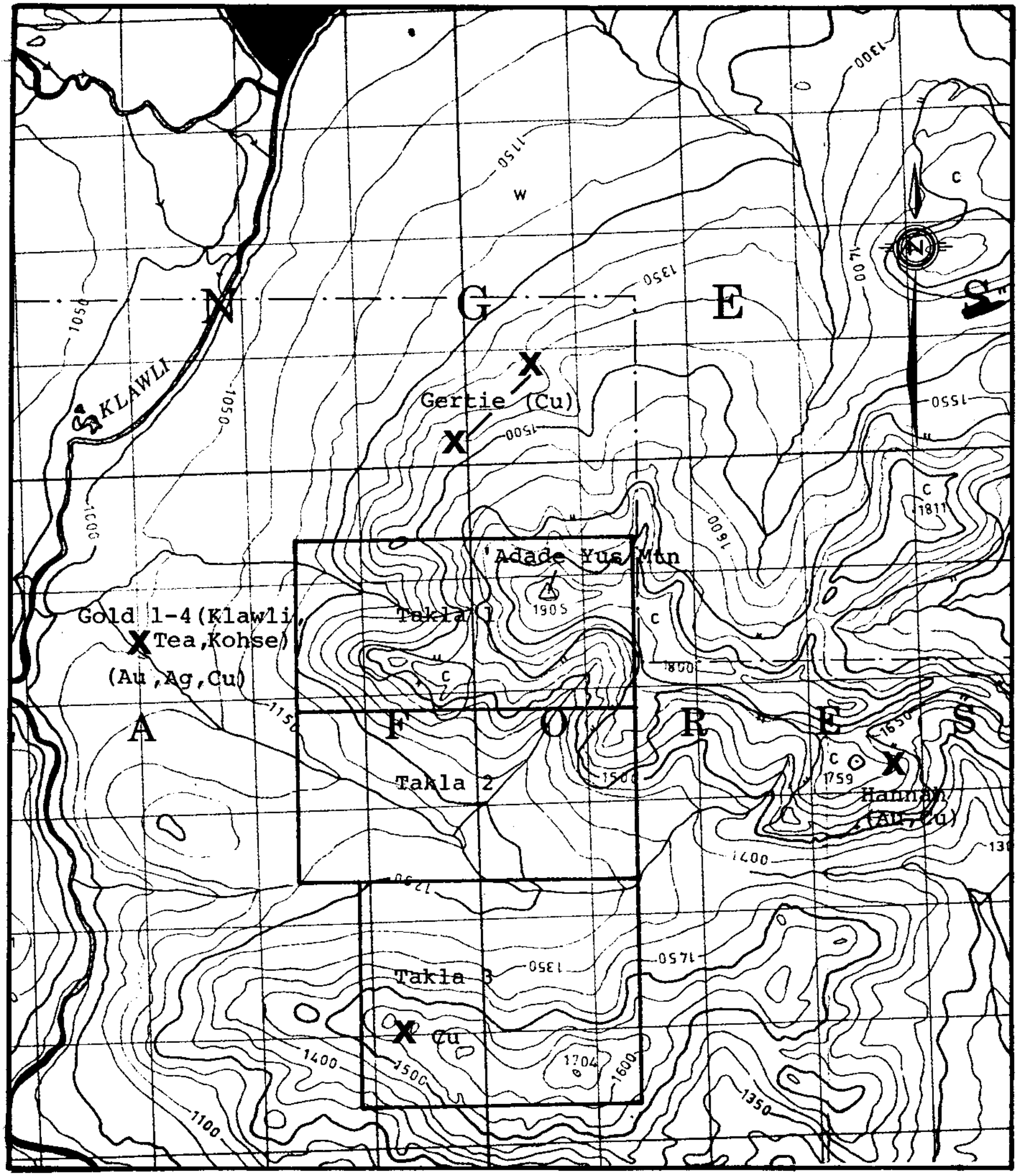
Geological mapping and prospecting was carried out by the writer using altimeter, pace and compass with a 1:5000 contoured base map. Helicopter assistance was used for drop-off for some of the longer traverses. The soil sampling grid programme was carried out by R.R. Arnold.

A Statement of Costs for the 1991 programme is supplied under Appendix VII.

3.0 HISTORY OF PROPERTY & ADJACENT AREAS

Mining activity in the area surrounding the Takla claims started in the second half of the 19th century when placer gold was discovered on Silver Creek, located approximately 80 kilometres (50 miles) northwest of the subject claims.

The remoteness of the area hindered exploration and the area saw three main phases of porphyry copper exploration. The initial phase, from 1947 to 1963 led to the discovery of the Lorraine deposit. Exploration work carried out during the 1970's concentrated mainly on deposits located in and adjacent to the Hogem Batholith. Among others, the Lorraine deposit, Takla Rainbow prospect, Mt. Milligan and Col properties were explored during the 1970 to 1975 period. The third phase took place in the 1980's when strong gold and copper prices renewed interest in alkaline porphyry deposits.



TOPOGRAPHIC MAP

Takla 1,2&3

NTS:93N7

X = Mineral Occurrence

Scale 1:50,000 Échelle

Figure 3

The Mt. Milligan copper-gold porphyry deposit was discovered in 1987. By the end of 1989, over 400 million tonnes of copper-gold mineralization, grading from 0.15% to 0.70% copper and from 0.17 to 2.75 g/t gold, were outlined by 406 holes totalling 96,390 meters of diamond drilling.

On the Kookaburra Gold Corp. Col property, which is contiguous with the southern boundary of the Takla claims, 2 million tons grading 0.6% copper was drilled off by Falconbridge in the 1970's. Significant gold values were found in this core by Kookaburra (and joint venture partner ASARCO). A drilling programme was completed in 1991.

Drilling programmes were completed recently on ground held by BP/Digger Resources Inc. (Chuchi property) and Rio Algom Exploration Inc. (Klawli property) east of Takla property. Significant copper and gold has been intersected e.g. 328' of 0.28% Cu with 0.009 oz/ton Au on the Chuchi property. The provincial government conducted detailed geological mapping in the Mt. Milligan area during the past two years which included the Takla claims and adjacent areas.

The Gold claims 1 to 4 (Shaede 1984) formerly known as Klawli (Clarke 1967), Kohse (Armstrong & Thurber 1945) or Tea (B.C. Department of Mines 1971), are centered 1.9 km west of Takla 1 (Figure 3). Trenching and two shallow shafts have exposed mineralized quartz/carbonate veins in a 55' (16.76 metres) wide shear zone in altered andesite. Average width of veins is 4". Values of 0.41 oz/ton Au, 33.34 oz/ton Ag and 6.71% Cu occur in one 2" vein with up to 0.8 oz/ton Au, 1.95 oz/ton Ag and 2.14% Cu in altered andesite between the veins.

The Gertie Copper showing (Minfile No. 093N210) lies approximately 1 km north of Takla 1 on Jan claims 5 and 6 (Figure 3). Nelson et al (1992) describe this showing as follows:

> "It is hosted by volcanic flows of the Early Jurassic Chuchi Lake Formation. The showing consists of two large outcrops spaced roughly 1 km apart. The westernmost outcrop is exposed along a glacial gully. An amygdaloidal, maroon and grey, plagioclase-phyric latite flow hosts disseminated and fracture controlled malachite and minor azurite. Pink calcite (rhodochrosite?) and jasperiod quartz occur as vesicle infillings. An assay on a single grab sample from this locality returned 0.2 per cent copper. A brecciated zone in a more greenish and aphanitic area of the outcrop contains minor chalcopyrite and has areas of bleaching and hairline fractures with chlorite envelopes. Multidirectional vuggy quartz veinlets are also present and some contain malachite. An altered and bleached intrusive body outcrops 150 metres south of the gully. It contains a crackle breccia that grades into a matrix-supported breccia with milled fragments of intrusive floating in a hematite rich matrix; no sulphides were visible at this locality.

Native copper blebs 1 by 2 centimetres in size are associated with carbonate and jasper in open-space fillings and occur within a highly amygdaloidal part of the same flow package 75 metres north of the gully. Two, 1-metre wide zones of strong propylitic alteration (epidote, chlorite) cut the outcrop and contain disseminated malachite.

The eastern outcrop is 1.2 km northeast of the native copper showing. Brecciated green, grey and maroon crystal-lapilli tuff contains disseminated malachite, chalcocite and possibly tetrahedrite. A representative grab sample from this outcrop yielded 1.08 per cent copper and 17.5 grams per tonne silver."

The Hannah occurrence (Minfile No. 093N211) discovered by the writer lies 2.3 km east of Takla 2 on MM claim No.1 (Figure 3). Nelson et al (1992) describes this occurrence as follows: (Also refer to Arnold, 1991)

"The Hannah minfile occurrence incorporates several areas that have concentrations of mineralized and altered fragments within green, heterolithic agglomerate of the Early Jurrassic Chuchi Lake Formation. Fine grained fragments are rusty weathering and contain disseminated pyrite and pyrrhotite. The main Hannah showing outcrops approximately 3.25 km southeast of 'Adade Yus Mountain. At this locality crowded porphyry monzonite are bleached and potassically? altered. Assay results from an area rich in rusty monzonite fragments yielded 840 ppb gold and 224 ppm copper (David Cook, personal communication, 1991). The heterolithic agglomerates around 'Adade Yus Mountain and the Hannah showing appear to be tapping a mineralizing porphyry system."

No mineral showings were known on the Takla claims prior to the present work and there is no public record of prospecting or exploration on the property.

Staking of the Takla claims 1 to 3 was carried out using compass, Topofil and contoured topographic map.

4.0 GEOLOGY

4.1 *Regional Geology and Tectonics*

The Takla claims lie within the Intermontane Tectonic Belt of the Canadian Cordillera (Figure 4). The regional geologic setting to the Nation Lakes area, which encompasses the Chuchi Lake area, has been described in detail by J. Nelson et al., (1991) as follows:

"The Takla Arc

The Nation Lakes area is predominantly underlain by Early Mesozoic Takla Group rocks of island-arc affinity. The Takla Group and its southern equivalent, the Nicola Group, define the Quesnel Terrane or Quesnellia (Monger et al., 1990).

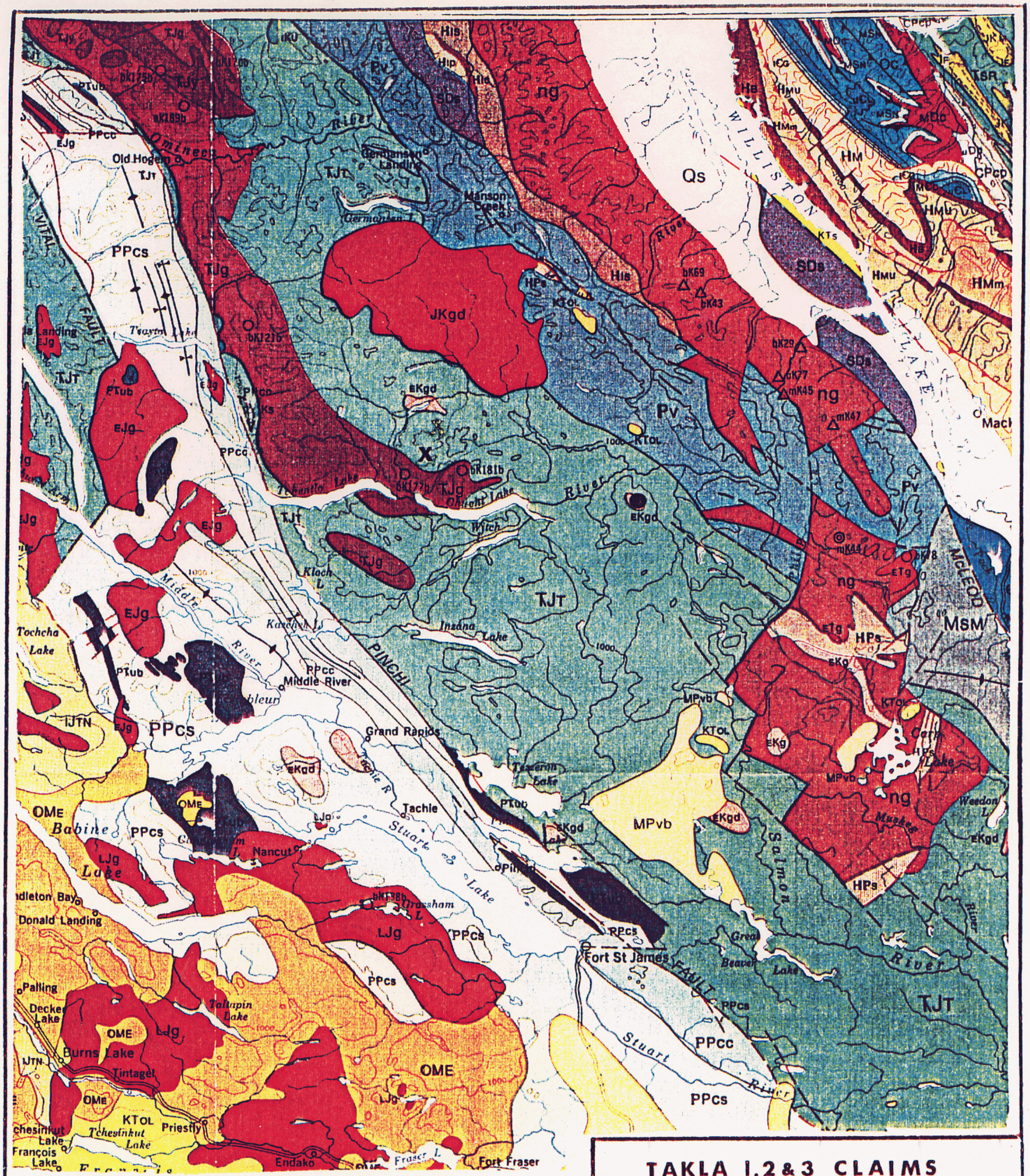


FIGURE 4

X TAKLA PROPERTY

● MT. MILLIGAN PROPERTY

TJT:	Takla Group
TJg:	Hogem Batholith
EKgd:	Early Cretateous granodiorite
JKgd:	Jurassic Cretateous granodiorite

TAKLA 1,2&3 CLAIMS

PARSNIP RIVER

Geological Map

Map No. 1424A, Sheet 93

Scale 1:1,000,000

Miles 25 0 25

Km 20 0 20

REGIONAL GEOLOGICAL MAP

The northwest-elongated Hogem Batholith is intruded into this terrane. The southern tip of this intrusion lies .... on the north shore of Chuchi Lake. The main phase of the Hogem Batholith is dated by K-Ar methods as 176-212 Ma, and is considered to be an intrusive equivalent of at least part of the Takla Group (Garnett, 1978).

At the latitude of the (claim) area, the western border of Quesnellia is the Pinchi fault. Here the Takla Group lies in tectonic contact with oceanic rocks of the Cache Creek Terrane. The presence of Triassic blue-schists along the Pinchi fault (Paterson, 1977) suggests that a subduction zone lay west of the Takla Arc. The eastern border of Quesnellia is a complex zone of faults that place lower Takla rocks against the Late Palaeozoic Slide Mountain Terrane (Ferri and Melville, in preparation) and metamorphic rocks of autochthonous North America, notably the southern Wolverine Complex near Carp Lake (Struik, 1990).

Regionally, the Takla Group comprises a lower Late Triassic sedimentary unit which interfingers with and is overlain by voluminous volcanic, pyroclastic and epiclastic rocks. These rocks are intruded by coeval plutons which range up to Early Jurassic in age. Augite-phyric rocks predominate, although plagioclase and hornblende are present and can be abundant. Takla volcanics tend to be unusually potassium rich and are transitional to alkalic in their major element chemistry (Rebagliati, 1990; Ferri and Melville, in preparation). They share this characteristic with contemporaneous arc-volcanic rocks of the Nicola Group in the Quesnel Terrane (Mortimer, 1987) and the Stuhini Group in the Stikine Terrane near Galore Creek (Logan and Koyanagi, 1989). The Stikine Terrane is separated from Quesnellia either by major faults or by the strongly allochthonous Cache Creek Terrane (Monger et al., 1990). [..]

Regional Structural Setting

The Nation Lakes area lies between two regional scale northwest trending fault systems that probably had significant dextral offsets in Late Mesozoic to Eocene time; the Pinchi fault to the west and the Manson, McLeod and Northern Rocky Mountain Trench faults to the east. Struik (1990) has shown how transcurrent motion in this area was transferred from one fault system to the other through sets of subsidiary faults in the block between. The southern Wolverine Complex, centered on Carp Lake (100 kilometres southeast of the Takla claim area), is an uplifted horst of basement gneisses. It is bounded by a series of steep, northwest-trending dextral faults and northeast-trending low-angle normal faults (Struik, 1989, 1990). Several of the northwest-trending bounding faults project into the Nation Lakes map area. [...]

Stratigraphy of the Takla Group

Mapping in the Nation Lakes area in 1990 resulted in a provisional subdivision of the Takla Group into four informal Formations, the Rainbow Creek, Inzana Lake, Witch Lake and Chuchi Lake Formations. A nearly complete stratigraphic succession can be seen in the broad anticline that outcrops from south of Chuchi Lake to the southern limit of mapping near Dem Lake. Epiclastic sediments of the Inzana Lake Formation are overlain by augite and other porphyritic volcanics and pyroclastics of the Witch Lake Formation. These in turn pass upward into polymictic lahars and subaerial flows of the Chuchi Lake Formation. Elsewhere, Takla units occur in incomplete, fault-bounded panels.

Rainbow Creek Formation

The Rainbow Creek Formation is a basinal package of dark grey slate with lesser siltstone and, in some exposures, epiclastic interbeds. It occurs in three fault-bounded structural blocks in the Nation Lakes map area; one north of Rainbow Creek, one near Dem Lake in the far southwest corner of the map area, and one intersected in a drillhole southeast of the Mount Milligan deposit.

The exposures north of Rainbow Creek are divided into two sub-blocks based on different trending schistosities and distinctive lithologic suites. The northern block consists mostly of monotonous grey slate with sparse, thin siltstone interbeds and minor quartz sandstone. The southern block, next to Rainbow Creek, is also dominated by slate, but contains some volcanic and volcaniclastic components. Near Dem Lake, the grey slate contains very common siltstone interbeds and also sedimentary breccias composed of slate interclasts. The black slate intersected in drill hole DDH-274, southeast of the Mount Milligan deposit, is limy, graphitic and soot-black.

All of these exposures are completely fault-bounded. Their original relationships to the rest of the Takla Group are not known. Regionally, the lowest unit of the Takla Group is a package of dark-grey to black slates or phyllites with interbedded quartz-rich siltstones and sandstones and minor limy beds and limestones. Near Quesnel this unit is termed the "Triassic black phyllite" (Struik, 1989, Bloodgood, 1987, 1988). More locally, Ferri and Melville (in preparation) recognize dark grey slates, limy slates, siliciclastics and limestones of Late Triassic age in the Manson Creek area, which they propose to include in the lower part of the Slate Creek Formation. The Rainbow Creek Formation is correlated to these on lithologic grounds.

Inzana Lake Formation

Extensive sedimentary, epiclastic and lesser pyroclastic rocks outcrop in the map area from north of Inzana Lake to the southern ... border (of Nation Lakes Map Area). Due to the lithologic monotony shown by this package over large areas, and to the tight folding within it, no subdivisions were made. It consists of abundant grey, green and black siliceous argillite with lesser green to grey volcanic sandstones and siltstones, green augite-bearing crystal and lapilli tuffs, sedimentary breccia, siliceous waterlain dust tuffs, heterolithic volcanic agglomerates and rare, small limestone pods.

The argillite is siliceous and poorly cleaved; it contrasts strongly with the alumina-rich grey slates of the Rainbow Creek Formation. Although the sandstones tend to be thick-bedded and relatively featureless, graded bedding and load casts are common within the thin-bedded siltstones. They provide extensive control on sedimentary tops. Two separate sets of flame structures, and imbricated volcanic agglomerates, indicate arc-parallel northwesterly transport into the basin, suggesting a volcanic centre to the south.

Crystal and lapilli tuff occurs mostly along the western margin of the (the Nation Lakes) Map Area. Fragments in the lapilii tuff are characteristically sparse, less than 10 per cent in a sandy matrix. These units may represent an upward transition to the overlying augite porphyry flows and coarse pyroclastic deposits. They contain fragments of augite and lesser hornblende (plagioclase) porphyry. Fresh olivine crystals are rare but notable.

The sedimentary breccias contain mostly intrabasinal clasts of argillite, sandstone and fine-grained, green siliceous tuff. Volcanic and high-level plutonic clasts are also present, including plagioclase and pyroxene porphyry. At one exposure 300 meters east of the Fort St. James-Germansen road and 200 meters north of the Germansen-Cripple Lake subsidiary road, a broad channel in the sedimentary breccia is filled with a slump of rounded augite porphyry clasts. These breccias attest to high-energy conditions within the basin, possibly induced by synsedimentary faulting.

The Inzana Lake Formation is transitionally overlain by augite porphyry agglomerates of the Witch Lake Formation on the low ridge north of Mudzenchoot Lake. Its low stratigraphic position in the Takla Group and its character as facies equivalent of the distant volcanic centres suggests that the Inzana Formation correlates with Unit 7 of the Takla Group near Quesnel (Bloodgood, 1998) and with the upper part of the Slate Creek Formation of the Takla Group near Germansen Lake (Ferri and Melville, in preparation).

Witch Lake Formation

The best known lithologies of the Takla Group are augite porphyry flows and pyroclastics. In the Nation Lakes area they are included in the Witch Lake Formation, named for the thick, well-exposed sequences around Witch Lake. The Witch Lake Formation has two main areas of exposure, one between Mudzenchoot and Chuchi lakes, where it is in stratigraphic continuity with the underlying Inzana Lake and overlying Chuchi Lake Formations; and a fault-bounded structural panel on the eastern side of the Wittsichica Creek map sheet, which hosts the Mount Milligan deposit.

In addition to augite porphyry, a thick section dominated by plagioclase porphyritic latites occurs in the Witch Lake Formation south of Witch Lake. Acicular hornblende-plagioclase porphyries are locally abundant, particularly south of Rainbow Creek and extending southward into the northeastern corner of the Tezzeron Creek map sheet. Here hornblende porphyries are the dominant lithology in agglomerates and in heterolithic aggregates that also contain the more common augite porphyries. At one locality south of Rainbow Creek, hornblendite and amphibolite clasts occur within the hornblende porphyries. One clast consists of clinopyroxenite in contact with amphibolite, reminiscent of Polaris-type ultramafic bodies (Nixon et al., 1990).

Trachyte breccia occurs near the top of the western Witch Lake Formation in the head waters of the south fork of Wittsichica Creek. In the Mount Milligan panel, two thin trachyte units can be traced over several kilometres. They are composite units that include pale-coloured flows with large, ovoid amygdules, flow breccias, and lapilli tuffs that contain deformed glass shards.

The augite porphyry suite that dominates the Witch Lake Formation is typical of explosive intermediate volcanism. It includes all gradations from flows and probable hypabbysal intrusions to coarse volcanic breccias and agglomerates, lapilli and crystal-rich tuffs and thinly bedded, subaqueous epiclastic sandstones and siltstones. Both small-augite porphyry and large-augite porphyry variations are present. Plagioclase and hornblende phenocrysts are subordinate and olivines rare. In terms of composition, the augite porphyries contain between 20 and 80 per cent matrix and phenocrystic plagioclase and in rare examples, primary potassium feldspar as a matrix phase. They are classified as andesites and basaltic andesites. The abundance of potassium feldspar in the volcanic rocks at and near the Mount Milligan deposit, has led past authors (Rebagliati, 1990) to classify them as augite-porphyritic latites and banded trachytes.

However, microscopic examination of adesites and derived sediments up to 4 kilometres from the MBX and Southern Star stocks shows the invasion of secondary potassium feldspar occurring as veinlets, as clumps with pyrite and epidote, as seams in plagioclase phenocrysts, and as fine-grained aggregates along bedding planes in the sediments. Such replacement distal to the deposit suggests that the highly potassic nature of the rocks within the deposit is due to wholesale replacement, converting andesites to "latites" and bedded andesitic sediments to "trachytes".

Chuchi Lake Formation

The intermediate to felsic Chuchi Lake Formation transitionally overlies the Witch Lake Formation along a northwest-trending contact that can be traced for 25 kilometres south of Chuchi Lake. The best exposures are seen north of Chuchi Lake; however, in this area the basal contact with the Witch Lake Formation lies north of the Wittsichica Creek map sheet. In contrast with the marine Witch Lake Formation, the Chuchi Lake Formation shows evidence of deposition in a partly subaerial environment. It is dominated by polymictic plagioclase porphyry agglomerates and breccias. They are typically matrix-supported and grey-green to pale maroon in colour. One of these lahars is in contact with a thin volcanic sandstone bed containing abundant wood fragments on bedding planes. Wood fragments caught up in the hot lahar are evidenced by black cores of remnant carbonaceous material with reaction rims.

The plagioclase (+/-augite+/-hornblende) porphyries contain from 70 to 80 per cent plagioclase and from zero to 15 per cent matrix potassium feldspar. They are andesites and latitic-andesites.

Another characteristic lithology of the Chuchi Lake Formation is dark maroon, felsic latite to trachyte flows with large, irregular, partly filled amygdules. Microscopically, the flows consist of potassium feldspar and plagioclase in varying proportions. Some are plagioclase phyric. The amygdules are filled with calcite and albite. A single large plagioclase intrusion and flow unit, with individual phenocrysts averaging several centimetres long, is exposed north of Chuchi Lake. Although megacrystic intrusions are fairly common, this is the only documented volcanic occurrence of megacrystic feldspar porphyry in the map area. Farther north and down-section, a partly welded trachyte tuff-breccia is cut by the Hogem Batholith.

Hornblende porphyry with acicular phenocrysts occurs as clasts in polymictic breccias at the base of Chuchi Lake Formation between Witch and Chuchi lakes, and also upsection north or Chuchi Lake. This textural variant is also seen in dikes.

In some exposures, the acicular hornblende porphyries contain small inclusions of hornblendite and amphibolite.

The basal contact of the Chuchi Lake Formation is gradational; it lies within a zone where mainly augite porphyry agglomerates of the Witch Lake Formation pass upwards into polymictic agglomerates with small, abundant plagioclase phenocrysts in the clasts. As well, the dark green colours of the Witch Lake Formation change to maroon, reddish and green shades. The top contact of the Chuchi Lake Formation is not observed in the map area.

Metamorphism

Three distinct metamorphic facies are seen in volcanic and plutonic rocks of the Takla Group. The lowest grade is subgreenschist, developed in the western and southern part of the map area. Metamorphic minerals include chlorite, carbonate, albite and rare pumpellyite. In general clinopyroxenes are fresh, and plagioclases are fresh to albitized and sericitized.

In the eastern part of the map area, including the vicinity of the Mount Milligan deposit and south to Cripple Lake, abundant clear to pale green actinolite indicates lower greenshist facies conditions. Actinolite occurs as mats of tiny acicular crystals and also as overgrowths on, and replacements of, clinopyroxene phenocrysts. This facies is developed in the megacrystic diorite south of Kalder Lake, and thus is not a contact metamorphic effect of Takla intrusions.

Near the peak of Mount Milligan, the lower greenschist passes into texturally destructive upper greenschist facies. Actinolites are well oriented trains that wrap around phenocrysts and lithic fragments, and appear to develop at the expense of randomly oriented clusters. Hornfelses without visible fabric are also present. Within the Mount Milligan complex itself, there are screens of well-foliated granulites. The transition outwards from the Mount Milligan plutonic complex seems to be in part a thermal, and in part, a strain gradient. [...]"

The intrusive rocks of the Nation Lakes area have been defined by the B.C. government geologists using the classification of Streckeisen (1967), and the following compositions were noted:

1) granite
2) syenite
3) monzonite/monzodiorite
4) diorite
5) gabbro/monzogabbro

The B.C. government geologist (J. Nelson et al., 1990) recorded the following textures for these various intrusions:

1) coarse-grained equigranular to somewhat porphyritic
2) crowded-porphyritic
3) porphyritic with megacrysts
4) porphyritic with sparse phenocrysts in a very fine-grained matrix.

Because of the abundance of fine-grained matrix material in the sparsely porphyritic intrusions, they are named using volcanic terminology:

1) rhyodacite/dacite
2) trachyte
3) latite/latitic andesite
4) andesite

4.2 Economic Geology

Several major past producers, deposits and significant prospects are hosted within the Quesnel Trough, a major structural feature which extends for about 100 km to the NNW and 700 km to the SSE from the Takla claims. Among the most important deposits and occurrences are: Copper Mountain, Ingerbell, Afton, Ajax and Gibralter Mines, as well as the Lorraine, Cat and Takla Rainbow deposits. During the past few years, porphyry copper-gold deposits have been identified in several other properties located in the Takla claims' general area. These include the Mount Milligan, Tas, Max, Windy, Indata, Swan and Tam deposits.

Most of these deposits occur within the Takla Group volcanic rocks of Upper Triassic to Lower Jurassic age and exhibit a relationship with potassic intrusions of early Jurassic age. The wide alteration haloes that exist around these deposits, can be used as an exploration tool. Due to extensive glacial overburden, the potential for undiscovered alteration haloes in the area still exists. These haloes vary from place to place and are described in detail by J. Nelson et al., (1991). They bear the following common features:

i) abundance of disseminated pyrite and/or pyrrhotite.
ii) Propylitic alteration which is usually represented by epidote flooding.
iii) presence of widespread secondary potassium feldspar which is usually detected only by chemical staining or in thin section as hairline veinlets and spread patches.
iv) in the heart of the haloes a pervasive, texture-destructive alteration has been observed succeeding biotite hornfels.

The exploration parameters for alkalic porphyry copper-gold deposits are summarized by J. Nelson et al., (1991) as follows:

> "One of the most important characteristics of alkaline porphyry deposits is that they tend to be spatially related to long-lived faults. Faults that control early intrusive activity are later reactivated and also control much younger features such as Eocene extensional basins. Both Copper Mountain and Afton/Ajax lie near important Eocene basin-bounding faults, which are interpreted as reactivated Triassic-Jurassic structures (V.A. Preto, pers. comm., 1990).
>
> The alkalic intrusive bodies associated with porphyry copper-gold deposits are typically small and high level to subvolcanic. Their textures strongly resemble those of volcanic flows. These intrusions consist of densely crowded, blocky plagioclase phenocrysts about 2 millimetres in diameter, and perhaps less abundant biotite, augite, hornblende, or orthoclase, in a dense very fine-grained feldspar matrix. They are distinguished from surrounding flows by their limited areal extent, lack of volcanic features such as amygdules and pyroclastic facies, extremely crowded phenocrysts and a relatively more felsic composition. Intrusive breccias and diatremes are also an important aspect of alkaline porphyry systems (Barr et al., 1976; Sillitoe, 1990).
>
> Alkalic porphyries often have associated propylitic and potassic alteration. Abundant magnetite, part of the potassic suite, make airborne and ground magnetic surveys an important exploration tool. Extensive pyrite haloes outline the porphyry systems and can aid the prospector who does not have access to a petrographic microscope or feldspar staining apparatus. Small, high-grade veins such as the Esker veins at Mount Milligan (Rebagliati, 1990) and the gold-magnetite veins and magnetite-matrix breccias at the Cat property, may signal the presence of nearby large-tonnage, lower grade zones."

4.3 Property Geology (Figure 6: Back Pocket)

Geological mapping of the Takla property by the writer corresponds well with 1991 regional mapping by the Geological Survey Branch, B.C. Ministry of Energy, Mines and Petroleum Resources. (pers. comm. J. L. Nelson & K. A. Bellefontaine and Nelson et al 1992).

The property is underlain by volcanic and sedimentary rocks of the Chuchi Lake Formation of the upper Triassic to lower Jurassic Takla Group which may be intruded coevally by alkaline intrusions. The Takla Group has been provisionally subdivided into four Formations (J. Nelson et al., 1990). See Regional Geology and Tectonics (4.1) of this report.

The following rock units within the Chuchi Lake Formation have been identified on the Takla property:

a) Heterolithic Agglomerate with green or maroon matrix: (Unit 1)

Pyrite-rich clasts of a highly altered rock thought to be monzonite are common in this rock. The green and maroon matrix of these rocks is indicative of both marine and aerial environments of deposition i.e. deposition has been close to the air/water interface.

b) Crystal, lapilli and ash tuffs: (Unit 2)

A thin section from outcrop 1625 meters east of Takla 3 on Claim MM5 shows tuff with clasts that are themselves brecciated, indicating multiple explosive events in the source region.

c) Volcanic porphyry: (Units 3i, 3ii, 3iii)

For the purpose of field mapping, these rocks have been subdivided into Augite Porphyry, Feldspar Porphyry, and Megacrystic Feldspar Porphyry. In thin section one sample was identified as latitic in composition (Thin Section Report No. 131b, Appendix VI). Dacite and latitic/andesite are reported elsewhere in the Chuchi Lake Formation by the Geological Survey Branch. One Feldspar Porphyry is distinctive for its megacrysts of plagioclase in a fine-grained feldspathic matrix. It is identified on the geological map (Figure 6) as Megacrystic Feldspar Porphyry but is considered to be a latite flow in thin section (see thin section report 131b, Appendix VI). However a second thin section report for 131b by C. de Long, Mineral Deposit Research Unit, U.B.C. describes this rock as a high level intrusion or flow with dacite to quartz andesite composition.

d) Fine-grained Mafic Volcanic: (Unit 4)

On the west part of Takla 3 a fine-grained actinolite hornfels has been identified in thin section (See thin section report 131a, Appendix VI). It is thought to be a metabasalt and is identified on the geological map (Figure 6) as Aphanitic Mafic Volcanic.

e) Sediments: (Unit 5 to 10)

Epiclastic rocks derived from the volcanic rocks occur on Takla 1. They have been identified during mapping as wacke, fine-grained rocks resembling cherts, sandstone, siltstone, mudstone and black argillite.

They are part of an intervolcanic sedimentary package that can be traced east from the Takla claims for at least 5 kilometres. A fossil locality immediately east of the Takla 3 eastern boundary has established a Pleinsbachian age (H. W. Tipper pers. comm. 1991).

4.4 Property Mineralization (Figure 6: Back Pocket)

During reconnaissance mapping and prospecting of the Takla property, four copper mineralized showings (one anomalous in gold) were located. The details of these are as follows:

a) Two showings of chalcopyrite with malachite staining were located about 50 meters apart in Augite Porphyry at the western end of the west-east ridge on Takla 3. One of these was sampled (sample No. 518130; Cu. 0.55%; Au. 0.55gm/ton). The other occurrence could not be sampled.

b) Minor malachite staining was noted in tuff on the south-west slope of the 1704 meter peak on Takla 3.

c) Minor chalcopyrite was noted in a quartz stringer in brecciated tuff on the west-east ridge, west end of Takla 3.

For details of geochemically anomalous soils and rock see Section 5.0 (Geochemistry).

4.5 Property Alteration

Common alteration minerals are chlorite, sericite, epidote, pyrite and actinolite. Hematite and manganese coat fractures in most of the propylitically altered areas.

Alteration manifests itself as follows:

a) Propylitic alteration of agglomerate in the eastern part of Takla 1 and of tuff in the north-eastern part of Takla 2. This area is the western extension of an altered and copper anomalous zone on the MM claims immediately to the east. Hematite and manganese are common as coatings on fractures within these rocks and a rusty soil anomalous in copper was noted (sample No. 518133). Alteration in this area and on the adjacent MM claims is thought to be related to the "Camp Fault" recognized on the MM claims and/or to the proximity at depth of a hypothetical intrusion.

b) Propylitic alteration with epidote the most obvious alteration mineral, occurs in the rocks of the western parts of Takla 1 & 3, most notably in the Megacrystic Feldspar-Porphyry (thin section report 131b) where epidote flooding was observed.

On Takla 1, (west) this alteration may related to a north-west to south-east fault indicated by a regional negative magnetic linear (Figure 5) and strong foliation parallel to the linear. The alteration may also be related to coincident IP, magnetic and geochemical anomalies identified on Noranda's KL claims contiguous with Takla 1 to the north-west.

It is not yet clear as to the cause of the propylitic alteration on Takla 3 unless it is related to the Hogem Batholith and/or the Col alteration halo (Nelson et al 1992).

c) Thin sections 130 and 131a from the west part of Takla 3 show strong hornfelsing with abundant actinolite. This may be due to the effect of the Hogem Batholith which has been mapped by Government geologists to the south.

d) Well developed propylitic alteration of agglomerate is common in talus on the south slope of 'Adade Yus Mountain on Takla 1. Time did not allow location of the source upslope. It is considered to be the western extension of similar alteration identified at rock sample location number 518107 which is 600 meters to the east.

e) Pyrite (2% to 5%) occurs in rusty, rounded clasts of altered "monzonite" in the agglomerates.

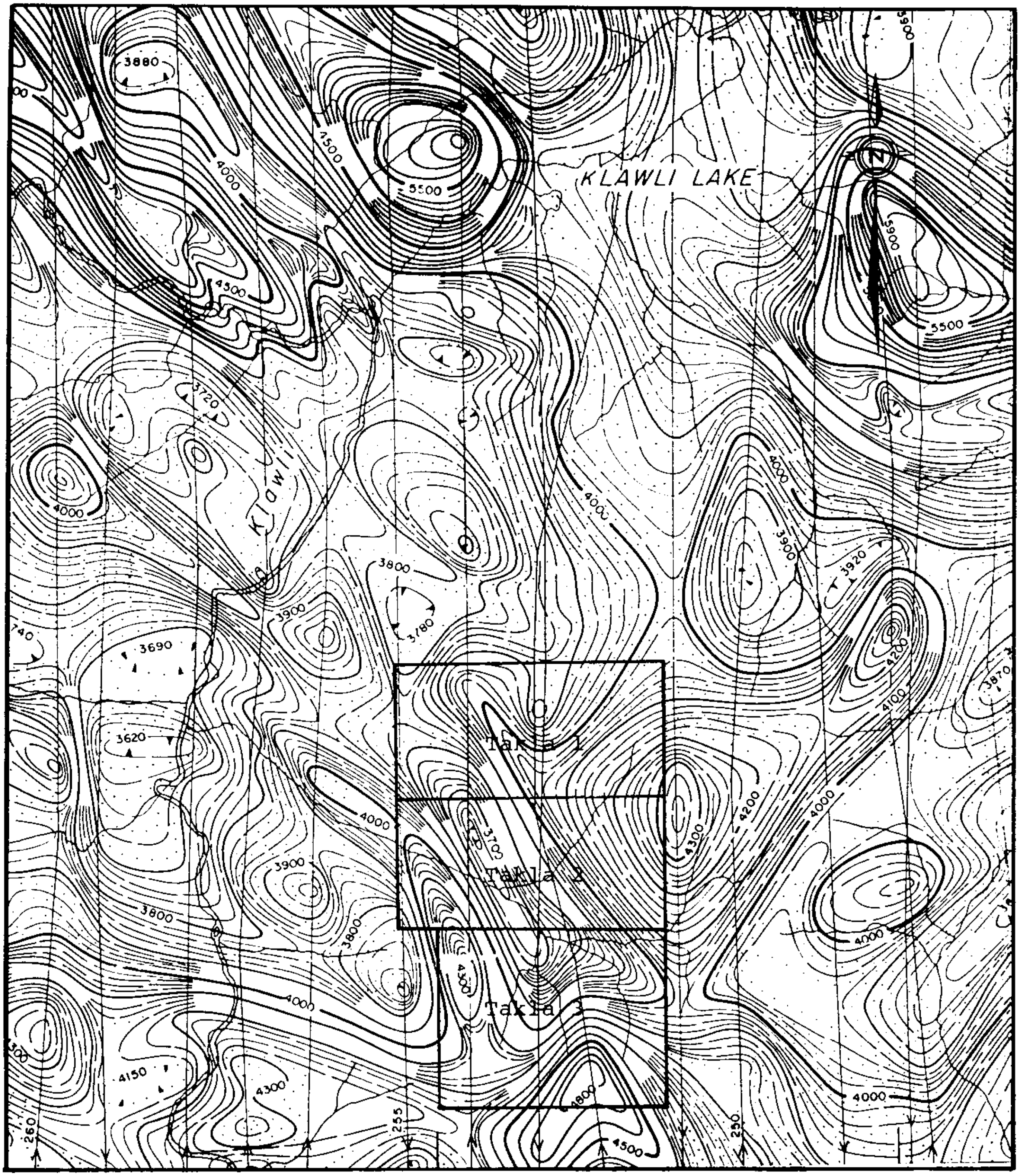
4.6 Structure

The Takla property lies within the Quesnel Trough (Roddick et al., 1967), a major structural feature which extends for about 100 km to the NNW and 700 km to the SSE from the property. It is bound to the west by the Pinchi Fault and approximately 50 km to the east by the Manson Fault Zone. The Quesnel Trough is a graben which has formed a basin of deposition for Lower Mesozoic volcanics and their epiclastic derivatives. Transcurrent motion of the Pinchi and Manson Faults has set up subsidiary faults in the block between. These subsidiary faults within the property area are approximately WNW to ESE and NNW to SSE. One of the WNW to ESE faults (Camp Fault) has been mapped on the MM claims adjoining the eastern boundary of Takla 1. It has not been identified on the Takla property but its western projection would correspond to propylitic alteration and shattering of agglomerate on Takla 1. Brecciation thought to be tectonic in nature, has been noted on Takla 1 (east) in Unit 1 near rock sample 518133 and on Takla 3 (west) in Unit 4 where chalcopyrite was seen in fractures.

A NNW to SSE fault may occur through the western end of Takla 2 and 3. This is suggested by:

1) Foliation (dipping 80° E) in maroon coloured rocks which may have been Megacrystic Feldspar Porphyry.

2) A regional negative aeromagnetic linear about 3 kilometres long through Takla 2 and 3 (Figure 5).



REGIONAL MAGNETIC MAP

Takla 1,2 &3

NTS:93N 7

Figure 5

Scale: One Inch to One Mile = $\frac{1}{63,360}$

Miles

1 ½ 0 1 2 3

No correction has been made for Topographical relief.

The volcanic and sedimentary rocks on the property strike approximately east to west with shallow dips to the south (58° & 50° S on the ridge of Takla 1; 60°S on the ridge of Takla 3). These rocks are considered to be right side up by the B.C. Ministry of Mines (pers. comm. J. L. Nelson and K. A. Bellefontaine, 1991).

5.0 *GEOCHEMISTRY*

Soil, silt and rock samples were taken for geochemical analysis during prospecting and mapping of the Takla property. Soil samples were taken along a two-line grid at the east end of Takla 1. All samples were submitted to Chemex Labs, North Vancouver, B.C. for 32 element analyses by Induced Coupled Plasma (ICP) method. Gold was detected by Fire Assay (FA) and Atomic Absorption (AA) methods. The results of these analyses are included in Appendix II to IV. For laboratory preparation and analytical procedures see Appendix V. Locations of samples and analyses of significant elements are shown on Figure 6.

5.1 Rock Geochemistry

A total of five rock grab samples were taken within the claim area. Descriptions and 32 element analyses are supplied in Appendix II. Anomalous values for Cu (151ppm), Pb (36ppm), and Zn (82ppm) are seen for sample 518036 on Takla 1 which is thought to be sub-outcrop of agglomerate with altered monzonite clasts. The copper is probably in the clasts. Anomalous values for Au (0.55gm/ton), Ag (2.2ppm) and Cu (0.55%) are seen for sample 518130, an outcrop of hornfelsed Augite Porphyry with visible chalcopyrite and malachite on Takla 3.

5.2 Soil Geochemistry

The single soil sample (No. 518133) taken during prospecting from Takla 1 (south-east) was anomalous in Cu (348ppm). Other soils (22 samples) were collected at 50 meter intervals along two parallel lines, 50 meters apart, on an azimuth of N260. The first soil (TS-001) was located on claim post "Takla 1, 2N" which is also "MM6, 4W-4N".

Two of these soils were anomalous in gold (10 & 30 ppb) and three were anomalous in copper (114, 133, and 174 ppm). The soil grid is too limited in extent for recognition of a pattern to the distribution of anomalous values. See Appendix III for description of soil samples and certificates of analysis.

5.3 Silt Geochemistry

The single stream silt sample (No. 518132) was taken from Takla 3 at 1550 meters elevation from a south-flowing stream draining tuffaceous volcanics exhibiting epidote on fractures. It was not anomalous in Au., Ag., Cu., Pb., or Zn. (See Appendix IV for certificate of analysis.

6.0 CONCLUSIONS & RECOMMENDATIONS

The 1991 reconnaissance exploration programme on the Takla property has demonstrated areas of propylitic alteration and anomalous metal values (Au, Ag, Cu, Pb and Zn) on Takla 3 (west) and Takla 1 (east). These areas of interest are thought to be related to known metal-rich areas on the Col and the MM claims adjoining the Takla property to the south and east respectively. Propylitic alteration with epidote flooding on Takla 1 (west) may be related to coincident geochemical, magnetic and I.P. anomalies known to occur on KL claim No.3 (Figure 3) adjoining the western boundary of Takla 1 (G.R. Cluff, pers. comm. 1992) and/or to a possible NNW to SSE fault on Takla 1 & 2 (west) (Figure 6). The Gertie and Gold mineral showings (Figure 3) give further weight to Takla 1 (west) as an area of interest. Metal-rich & altered monzonite clasts in Unit 1 of Takla and adjacent MM claims are indicative of a mineralizing volcanic centre. The direction from which these clasts have come may be identified by study of imbrication and submarine slump fabrics noted elsewhere in the Takla Group.

A 1992 work programme is therefore recommended to take the following form:

PHASE I

1) A soil sampling grid should be completed over the east part of Takla 1 (south of the ridge) and Takla 2 (north-east) to expand upon anomalous soil and rock samples collected in 1991 and to cover areas of alteration recognized in 1991. A proton ground magnetic survey should be run concurrently with the soil survey.

2) Geological mapping and soil sampling should be completed over Takla 1, west and north of the propylitic alteration (with epidote flooding) identified at the west end of the ridge to determine any relationship with the Gertie and Gold mineral showings, the KL3 anomalies and the possible fault.

3) Complete prospecting and geological mapping of the south slope of 'Adade Yus Mountain on Takla 1 where alteration was observed in talus at 1700 meters elevation.

4) Map and sample in more detail the ridge on Takla 3, west of the 1704 meter peak to clarify alteration and copper mineralization identified in 1991.

5) A broad-brush reconnaissance soil sampling survey should be done of the outcrop-poor and heavily forested valley between the ridges of Takla 1 and Takla 3.

6) The distribution of anomalous copper and gold in pyritic "monzonite" clasts of Unit 1 (Heterolithic Agglomerate) should be more clearly defined as they appear to be derived from a mineralizing porphyry system.

7) A ground magnetic and I.P. survey should be carried out concurrently with the soil survey described under 1) and 2) above.

The estimated cost for this Phase I of the 1992 programme would be approximately $ 150,000.

PHASE II

Contingent upon encouraging results from Phase I of the 1992 programme, a drilling programme should be designed to define the geometry and grade of mineralization. The estimated cost for this Phase II of the 1992 programme is approximately $ 200,000.

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APPENDIX I

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, David L. Cook, with business address at 8155 Cartier St., Vancouver, British Columbia do certify that:

1.) I am a Consulting Geological Engineer registered with the Association of Professional Engineers of British Columbia since 1972.

2.) I hold a Bachelor of Science (1962) from the University of Western Australia with Major in Geology.

3.) I have been practising my profession as a Geologist since 1962.

4.) I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly in the Takla property.

5.) I have based this report on the prospecting, mapping and sampling carried out by myself and Robert R. Arnold during the summer of 1991. Other information has been derived from a review of private published reports and maps as well as personal communication with Federal and Provincial Geologists currently working on the area.

6.) I consent to the use of this report by the owner for any Filing Statement, Statement of Material Facts or support document.

David L. Cook, B.Sc., P.Eng.

APPENDIX II

DESCRIPTION OF ROCK SAMPLES

&

CERTIFICATES OF ANALYSIS

Rock Description:

518036: Float of gossanous breccia with hematite and manganese staining. Fine-grained matrix with relatively coarse-grained, porphyritic/"andesite" clasts.

Collected and described by R. R. Arnold from East end of Takla 1 five meters north-east of station TS015 on the soil grid.

The writer considers this specimen to be sub-outcrop of propylitically altered agglomerate with clasts of altered pyritic monzonite. Copper in the sample is thought to be from the clasts.

518107: Propylitically altered pyritic agglomerate outcrop containing clasts of pyritic altered "monzonite".

Collected and described by the writer from east end of Takla 1 at 1700 meters elevation.

518130: Chalcopyrite with malachite *staining in* outcrop *of* augite porphyry (see thin section report 130).

Collected by the writer. Described by J. Nelson of B.C. *Ministry of Mines*. From west end of Takla 3 at 1600 meters elevation.

518134: Pyritic medium-grained lithic tuff with light green bloom thought to be copper indicative. A value of 57ppm copper from the analysis does not support the presence of copper.

Collected and described by the writer from the east side of the 1704 meter peak east end of Takla 3 at 1625 meters elevation.

518135: Float or sub-outcrop of propylitically altered equigranular medium-grained tuff.

Collected and described by the writer from west end of Takla 1 at 1515 meters elevation.

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: DASSERAT DEVELOPMENTS LTD.

920 - 609 GRANVILLE ST.
VANCOUVER, BC
V7Y 1G5

Project :
Comments: CC: WILSON GEWARGIS

Page Number : 1-A
Total Pages : 1
Certificate Date: 03-SEP-91
Invoice No. : I9120459
P.O. Number :

CERTIFICATE OF ANALYSIS A9120459

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
518101	205	294	< 5	< 0.2	1.43	10	370	< 0.5	< 2	2.14	< 0.5	17	45	234	4.57	20	< 1	0.39	10	0.55	940
518102	205	294	< 5	< 0.2	0.48	< 5	1530	< 0.5	< 2	5.37	< 0.5	14	26	173	4.74	20	< 1	0.25	10	0.92	1300
518103	205	294	< 5	< 0.2	1.48	10	780	< 0.5	< 2	1.59	< 0.5	19	26	117	5.00	20	2	0.13	10	1.02	980
518104	205	294	15	< 0.2	2.60	< 5	100	< 0.5	< 2	1.03	< 0.5	20	20	182	5.84	10	< 1	0.12	10	1.92	1130
518105	205	294	< 5	< 0.2	2.96	10	130	< 0.5	< 2	0.80	< 0.5	22	20	201	6.50	20	< 1	0.15	10	2.49	1330
518106	205	294	< 5	< 0.2	1.76	< 5	110	< 0.5	< 2	1.11	< 0.5	15	26	169	3.96	10	< 1	0.13	10	1.25	600
518107 rock	205	294	< 5	< 0.2	1.89	10	50	< 0.5	< 2	1.30	< 0.5	17	21	165	3.33	10	< 1	0.07	10	1.30	730
518108	205	294	< 5	< 0.2	2.12	< 5	510	< 0.5	< 2	1.89	< 0.5	15	16	731	4.76	20	< 1	0.16	20	1.47	1140
518109	205	294	< 5	< 0.2	2.07	15	190	< 0.5	< 2	3.62	< 0.5	14	12	142	4.66	30	< 1	0.18	20	1.58	885
518110	205	294	< 5	< 0.2	1.60	< 5	240	< 0.5	< 2	1.69	< 0.5	17	14	206	5.05	20	< 1	0.23	10	0.90	1140
518111	205	294	< 5	< 0.2	2.61	< 5	30	< 0.5	< 2	1.85	< 0.5	14	18	59	4.84	20	< 1	0.09	10	0.89	890
518112	205	294	< 5	< 0.2	2.97	20	30	< 0.5	< 2	5.95	< 0.5	18	8	148	5.07	30	< 1	0.05	10	1.55	1020
518113	205	294	< 5	< 0.2	2.09	20	20	< 0.5	< 2	1.59	< 0.5	15	19	111	4.09	10	< 1	0.09	10	1.29	635
518114	205	294	< 5	< 0.2	2.51	< 5	40	< 0.5	< 2	1.68	< 0.5	18	26	139	4.97	10	< 1	0.07	10	1.06	655
518115	205	294	< 5	< 0.2	4.36	35	10	< 0.5	< 2	3.58	< 0.5	14	21	103	5.07	20	< 1	0.05	10	1.37	540
518116	205	294	15	< 0.2	2.21	< 5	50	< 0.5	< 2	1.47	< 0.5	16	17	133	4.44	10	< 1	0.24	10	1.77	625
518117	205	294	< 5	< 0.2	1.67	20	2630	< 0.5	< 2	5.03	< 0.5	20	29	155	5.32	30	< 1	0.25	20	0.98	1130
518118	205	294	< 5	< 0.2	1.31	< 5	80	< 0.5	< 2	0.94	< 0.5	36	49	109	6.66	< 10	< 1	0.28	10	0.49	180
518119	205	294	< 5	< 0.2	1.25	< 5	690	< 0.5	< 2	0.74	< 0.5	10	37	93	3.81	10	< 1	0.42	10	0.36	595
518120	205	294	< 5	< 0.2	1.29	< 5	470	< 0.5	< 2	1.38	< 0.5	9	41	42	3.28	10	< 1	0.49	10	0.29	480
518121	205	294	< 5	< 0.2	1.01	< 5	2500	< 0.5	< 2	0.73	< 0.5	11	19	51	3.44	10	< 1	0.32	10	0.30	755
518122	205	294	< 5	< 0.2	2.72	< 5	220	< 0.5	< 2	1.40	< 0.5	18	26	136	5.03	10	< 1	0.21	10	1.37	1035
518123	205	294	< 5	< 0.2	1.52	< 5	400	< 0.5	< 2	1.48	< 0.5	19	19	138	5.46	20	< 1	0.25	10	0.87	795
518124	205	294	< 5	< 0.2	1.63	35	80	< 0.5	< 2	0.31	< 0.5	24	26	145	7.32	10	< 1	0.32	< 10	0.39	850
518125	205	294	< 5	1.2	1.71	5	140	< 0.5	< 2	1.17	< 0.5	14	23	359	4.40	10	< 1	0.32	10	0.82	530
518126	205	294	< 5	< 0.2	4.98	< 5	60	< 0.5	< 2	4.64	< 0.5	20	19	163	4.69	30	< 1	0.09	10	1.32	725
518127	205	294	< 5	< 0.2	2.43	< 5	20	< 0.5	< 2	1.81	< 0.5	23	81	121	5.30	10	< 1	0.06	10	2.18	595
518128	205	294	< 5	< 0.2	2.40	15	70	< 0.5	< 2	2.02	< 0.5	20	48	86	5.42	10	< 1	0.09	10	1.33	720
518129	205	294	< 5	< 0.2	2.26	< 5	350	< 0.5	< 2	7.36	< 0.5	24	29	144	6.63	30	< 1	0.30	10	1.04	1180
518451	205	294	< 5	< 0.2	2.90	< 5	60	< 0.5	< 2	1.27	< 0.5	20	9	135	5.08	10	< 1	0.17	10	1.57	720
518452	205	294	45	2.0	0.63	50	470	< 0.5	< 2	0.10	< 0.5	1	12	58	4.66	10	< 1	0.46	10	0.11	35
518454	205	294	< 5	< 0.2	1.81	10	80	< 0.5	< 2	0.86	< 0.5	11	17	95	4.63	10	< 1	0.09	10	1.35	555

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SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
518036 rock	205	294	< 5	< 0.2	3.24	10	70	< 0.5	< 2	2.40	< 0.5	12	25	151	4.61	10	< 1	0.10	10	1.48	1275

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SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
518036 rock	205	294	< 1	0.04	7	1740	36	5	6	112	0.29	< 10	< 10	200	< 10	82

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SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
518130 rock	205	294	55	2.2	3.20	20	80	< 0.5	18	2.21	< 0.5	14	79	5520	3.25	< 10	< 1	0.27	10	0.93	465
518134 "	205	294	< 5	< 0.2	1.47	45	70	< 0.5	< 2	1.07	< 0.5	12	12	57	2.88	< 10	< 1	0.07	10	0.93	405
518135 "	205	294	< 5	< 0.2	2.18	30	140	< 0.5	< 2	2.10	< 0.5	17	39	15	3.83	< 10	< 1	0.06	< 10	1.67	670

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SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
518130 rock	205	294	< 1	0.32	19	1570	6	< 5	4	148	0.26	< 10	< 10	140	< 10	44
518134 "	205	294	1	0.06	6	1350	18	5	2	106	0.26	< 10	< 10	63	10	54
518135 "	205	294	< 1	0.03	16	840	22	< 5	4	98	0.28	< 10	< 10	84	20	112

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APPENDIX III

DESCRIPTION OF SOIL SAMPLES

&

CERTIFICATES OF ANALYSIS

Description of Soil Samples

Sample Number	Location	Depth	Colour	Coarse Frag.	Frag. Shape	Text.	Horizon	Slope	Slope Dir	Soil Dev.
TS 001	L0 0	20 cm	MRB	5%	A	SSC	BF	GS	SW	GS
TS 002	L0 50 W	25 cm	MBR	10%	A	SSC	BF	GS	SW	GS
TS 003	L0 100 W	25 cm	MBR	10%	A	SSC	BF	GS	SW	GS
TS 004	L0 150 W	35 cm	MBR	10%	A	SSC	BF	GS	SW	GS
TS 005	L0 200 W	30 cm	MRB	25%	M	SSC	BF	SS	SW	GS
TS 006	L0 250 W	30 cm	MGB	20%	A	SSC	BF	SS	SW	GS
TS 007	L0 300 W	20 cm	MRB	35%	A	SSC	BF	SS	SW	GS
TS 008	L0 350 W	25 cm	MRB	35%	A	SSC	BF	SS	SW	GS
TS 009	L0 400 W	20 cm	MRB	10%	S	SSC	BF	SS	SW	GS
TS 010	L0 450 W	25 cm	MBR	5%	A	SSC	BF	SS	SW	GS
TS 011	L0 500 W	25 cm	MBR	5%	A	SSC	BF	SS	SW	MS
TS 012	L50N 500 W	30 cm	MRB	20%	M	SSC	BF	SS	SW	MS
TS 013	L50N 450 W	30 cm	MRB	20%	A	SSC	BF	SS	SW	GS
TS 014	L50N 400 W	20 cm	MRB	5%	A	SSC	BH	SS	SW	GS
TS 015	L50N 350 W	15 cm	MBR	10%	M	SSC	BH	SS	SW	MS
TS 016	L50N 300 W	15 cm	DBR	5%	A	SSC	BF	SS	SW	PSD
TS 017	L50N 250 W	25 cm	MRB	20%	A	SSC	BF	SS	SW	GS
TS 018	L50N 200 W	35 cm	MBR	10%	A	SSC	BH	GS	SW	GS
TS 019	L50N 150 W	25 cm	MBR	10%	A	SSC	BH	GS	SW	GS
TS 020	L50N 100 W	20 cm	MRB	20%	A	SSC	BF	GS	SW	GS
TS 021	L50N 50 W	30 cm	MRB	20%	M	SSC	BF	GS	SW	GS
TS 022	L50N 0	30 cm	MRB	20%	M	SSC	BF	GS	SW	GS

CODE FORMAT FOR RECORDING SOIL SAMPLES DATA

1. Depth

Depth in centimeters to the bottom of the hole

2. Colour

Colour Abbreviations' Prefix:

D = Dark
M = Medium
L = Light

Colour Abbreviations:

RE :	Red
YE :	Yellow
BR :	Brown
GY :	Grey
RB :	Red–brown
YB :	Yellow–brown
GB :	Grey–brown

3. % Coarse Fragments

Percentile (i.e. 10%) of rock fragments

4. Shape of Coarse Fragments

A :	Angular
R :	Rounded
S :	Subangular – Subrounded
M :	Mixture of Above Types

5. Sample Texture

SSC:	Sand – Silt – Clay

6. Soil Horizon

BF :	Iron–rich B Horizon
BH :	Organic B Horizon
AH :	Organic A Horizon

7. **Site Topography**

GS :	Gentle Slope
SS :	Steep Slope
HT :	Hill Top
L :	Level

8. **Approximate Slope Direction**

N :	North
S :	South
W :	West
E :	East
SW :	Southwest
SE :	Southeast
NW :	Northwest
NE :	Northeast

9. **Soil Development**

PSD:	Poor Soil Development
MSD:	Medium Soil Development
GSD:	Good Soil Development

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VANCOUVER, BC
V7Y 1G5

Project :
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CERTIFICATE OF ANALYSIS A9117289

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TS-01 soil	201	238	< 5	< 0.2	2.57	15	100	< 0.5	< 2	0.40	< 0.5	8	27	51	3.89	< 10	< 1	0.07	10	0.83	600
TS-02	201	238	< 5	< 0.2	2.89	5	130	< 0.5	< 2	0.34	< 0.5	9	21	56	3.61	< 10	< 1	0.06	10	0.99	560
TS-03	217	238	< 5	< 0.2	3.51	25	190	< 0.5	< 2	0.80	< 0.5	16	33	174	4.86	< 10	< 1	0.09	< 10	1.41	950
TS-04	201	238	030	< 0.2	2.52	5	140	< 0.5	< 2	0.25	< 0.5	9	22	56	3.73	< 10	< 1	0.06	10	0.68	785
TS-05	201	238	< 5	< 0.2	2.15	< 5	190	< 0.5	< 2	0.41	< 0.5	8	24	88	3.47	< 10	< 1	0.06	< 10	0.66	570
TS-06	201	238	< 5	< 0.2	2.02	< 5	170	< 0.5	< 2	0.30	< 0.5	9	22	64	3.54	< 10	< 1	0.07	10	0.64	790
TS-07	201	238	5	< 0.2	2.03	5	160	< 0.5	< 2	0.39	< 0.5	10	20	64	3.50	< 10	< 1	0.07	10	0.82	700
TS-08	201	238	10	< 0.2	2.20	< 5	120	< 0.5	< 2	0.51	< 0.5	11	18	78	4.03	< 10	< 1	0.07	10	1.01	775
TS-09	201	238	< 5	< 0.2	1.63	< 5	220	< 0.5	< 2	0.34	< 0.5	8	16	51	3.37	< 10	< 1	0.07	< 10	0.55	560
TS-10	201	238	< 5	< 0.2	1.66	5	230	< 0.5	< 2	0.38	< 0.5	9	16	80	3.17	< 10	< 1	0.08	10	0.44	1305
TS-11	201	238	< 5	< 0.2	1.48	< 5	240	< 0.5	< 2	0.28	< 0.5	4	16	46	2.63	< 10	< 1	0.10	10	0.30	500
TS-12	201	238	< 5	< 0.2	2.13	10	210	< 0.5	< 2	0.51	< 0.5	12	22	114	3.95	< 10	< 1	0.11	10	0.87	895
TS-13	201	238	< 5	< 0.2	2.35	< 5	100	< 0.5	< 2	0.91	< 0.5	15	20	133	4.32	< 10	< 1	0.08	10	1.06	785
TS-14	201	238	< 5	< 0.2	2.11	< 5	170	< 0.5	< 2	0.37	< 0.5	8	20	77	3.48	< 10	< 1	0.09	10	0.60	960
TS-15	217	238	< 5	< 0.2	1.89	5	250	< 0.5	< 2	0.58	< 0.5	19	34	63	3.86	< 10	< 1	0.19	< 10	0.65	2690
TS-16	217	238	< 5	< 0.2	1.49	5	350	< 0.5	< 2	0.75	< 0.5	17	30	54	3.15	< 10	< 1	0.15	< 10	0.65	4640
TS-17	201	238	< 5	< 0.2	2.24	5	200	< 0.5	< 2	0.23	< 0.5	10	22	52	3.69	< 10	< 1	0.11	10	0.64	610
TS-18	203	205	< 5	< 0.2	2.05	< 5	220	< 0.5	< 2	0.44	< 0.5	12	54	63	3.64	< 10	< 1	0.13	< 10	0.62	1215
TS-19	217	238	< 5	< 0.2	1.91	15	250	< 0.5	< 2	0.58	< 0.5	15	28	42	3.62	< 10	< 1	0.15	< 10	0.92	2020
TS-20	201	238	< 5	< 0.2	1.99	< 5	180	< 0.5	< 2	0.23	< 0.5	14	23	49	3.53	< 10	< 1	0.06	< 10	0.42	1510
TS-21	203	205	< 5	< 0.2	1.88	5	360	< 0.5	< 2	0.41	< 0.5	15	38	65	2.66	< 10	< 1	0.11	< 10	0.27	2780
TS-22	201	238	< 5	< 0.2	2.47	5	140	< 0.5	< 2	0.42	< 0.5	9	25	75	3.80	< 10	< 1	0.05	10	0.85	615

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SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
TS-01 soil	201	238	< 1	0.01	9	1260	12	< 5	2	77	0.09	< 10	< 10	107	< 10	76
TS-02	201	238	< 1	0.01	9	1520	12	< 5	1	53	0.06	< 10	< 10	93	< 10	76
TS-03	217	238	< 1	0.02	10	1570	16	< 5	8	104	0.19	< 10	< 10	157	< 10	70
TS-04	201	238	< 1	0.01	8	1440	16	< 5	< 1	53	0.04	< 10	< 10	97	< 10	70
TS-05	201	238	< 1	0.01	8	1660	14	< 5	1	87	0.05	< 10	< 10	100	< 10	60
TS-06	201	238	< 1	0.01	9	1320	16	< 5	< 1	58	0.03	< 10	< 10	90	< 10	58
TS-07	201	238	< 1	0.01	9	1410	4	< 5	1	63	0.05	< 10	< 10	91	< 10	70
TS-08	201	238	< 1	0.01	7	1690	16	< 5	1	87	0.08	< 10	< 10	127	< 10	80
TS-09	201	238	< 1	0.01	7	1450	8	< 5	< 1	75	0.03	< 10	< 10	100	< 10	78
TS-10	201	238	< 1	0.01	7	1670	14	5	< 1	73	0.03	< 10	< 10	98	< 10	68
TS-11	201	238	< 1	0.01	3	1420	12	< 5	< 1	61	0.03	< 10	< 10	74	< 10	62
TS-12	201	238	< 1	0.01	11	1750	18	< 5	2	77	0.07	< 10	< 10	101	< 10	88
TS-13	201	238	< 1	0.01	9	2230	14	< 5	4	120	0.18	< 10	< 10	144	< 10	72
TS-14	201	238	1	0.01	7	2010	10	< 5	< 1	72	0.03	< 10	< 10	104	< 10	70
TS-15	217	238	< 1	0.02	7	2080	22	< 5	1	100	0.07	< 10	< 10	135	< 10	82
TS-16	217	238	< 1	0.02	3	1920	10	< 5	1	113	0.06	< 10	< 10	105	< 10	94
TS-17	201	238	< 1	0.01	7	1260	8	< 5	< 1	42	0.03	< 10	< 10	92	< 10	60
TS-18	203	205	< 1	0.02	9	1450	6	< 5	< 1	95	0.04	< 10	< 10	116	< 10	72
TS-19	217	238	< 1	0.02	8	1560	8	< 5	1	94	0.05	< 10	< 10	96	< 10	84
TS-20	201	238	< 1	0.01	8	1920	6	< 5	< 1	60	0.02	< 10	< 10	108	< 10	46
TS-21	203	205	1	0.02	5	3790	8	< 5	< 1	78	< 0.01	< 10	< 10	89	< 10	74
TS-22	201	238	< 1	0.01	9	1410	6	< 5	2	74	0.08	< 10	< 10	107	< 10	56

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518132 silt	201	298	< 5	< 0.2	1.38	5	180	< 0.5	< 2	0.87	< 0.5	11	99	49	3.78	< 10	< 1	0.12	10	0.73	755
518133 SOIL	201	298	< 5	< 0.2	4.67	< 5	540	< 0.5	< 2	0.88	< 0.5	32	31	348	5.69	10	< 1	0.12	10	1.27	2940

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SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
~~518132 silt~~	~~201~~	~~298~~	~~< 1~~	~~0.01~~	~~21~~	~~1680~~	~~< 2~~	~~< 5~~	~~3~~	~~62~~	~~0.16~~	~~< 10~~	~~< 10~~	~~175~~	~~10~~	~~46~~
518133 SOIL	201	298	< 1	0.01	16	1740	20	< 5	18	445	0.16	< 10	< 10	169	30	80

CERTIFICATION: B. Cagli

APPENDIX IV

DESCRIPTION OF SILT SAMPLE

&

CERTIFICATE OF ANALYSIS

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: DASSERAT DEVELOPMENTS LTD.

920 - 609 GRANVILLE ST.
VANCOUVER, BC
V7Y 1G5

Project :
Comments: ATTN:DIL GUJRAL CC: DAVID COOK ✓

Certificate Date: 09-SEP-91
Invoice No. : I9120942
P.O. Number :

CERTIFICATE OF ANALYSIS A9120942

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
518132 silt	201	298	< 5	< 0.2	1.38	5	180	< 0.5	< 2	0.87	< 0.5	11	99	49	3.78	< 10	< 1	0.12	10	0.73	755
~~518133 SOIL~~	~~201~~	~~298~~	~~< 5~~	~~< 0.2~~	~~4.67~~	~~< 5~~	~~540~~	~~< 0.5~~	~~< 2~~	~~0.98~~	~~< 0.5~~	~~32~~	~~31~~	~~340~~	~~5.60~~	~~10~~	~~< 1~~	~~0.17~~	~~10~~	~~1.27~~	~~3940~~

CERTIFICATION: B. Cargh

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: DASSERAT DEVELOPMENTS LTD.

920 - 609 GRANVILLE ST.
VANCOUVER, BC
V7Y 1G5

Project :
Comments: ATTN:DIL GUJRAL CC: DAVID COOK

Page Number : 1-B
Total Pages : 1
Certificate Date: 09-SEP-91
Invoice No. : I9120942
P.O. Number :

CERTIFICATE OF ANALYSIS A9120942

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
518132 silt	201	298	< 1	0.01	21	1680	< 2	< 5	3	62	0.16	< 10	< 10	175	10	46
~~518133 SOIL~~	~~201~~	~~298~~	~~< 1~~	~~0.41~~	~~16~~	~~1740~~	~~30~~	~~< 5~~	~~10~~	~~445~~	~~0.16~~	~~< 10~~	~~< 10~~	~~169~~	~~50~~	~~80~~

CERTIFICATION: B. Cargill

APPENDIX V

LABORATORY PREPARATION AND ANALYTICAL PROCEDURES

Chemex Labs Ltd.

Analytical C mists Geochemists Registered Assayers

212 Brooksbank Ave
North Vancouver, B.C.
Canada V7J 2C1
Phone: (604) 984-0221
Telex: 04-352597
Fax: (604) 984-0218

Screening Procedure

Chemex Code: 201

Geochemical samples (soils,silts) are dried at 50 deg C and then sieved through an 80 mesh stainless steel screen. If insufficient material is obtained, the sample is sieved through a 35 mesh screen (code 203) and the -35 mesh material is ring pulverized (code 205).

If there is still insufficient material for analysis after sieving to -35 mesh, then the whole sample is recombined and ground (code 217).

Chemex Labs Ltd.

Analytical Chemists *Geochemists* *Registered Assayers*

212 Brooksbank Ave.
North Vancouver, B.C.
Canada V7J 2C1
Phone: (604) 984-0221
Telex: 04-352597
Fax: (604) 984-0218

Screening Procedure

Chemex Code: 203

Geochemical samples (soils,,silts) are dried at 50 deg C. and then screened through a 35 mesh stainless steel screen. The -35 mesh material is then ring pulverized using a ring mill with either a chrome steel ring set (code 205) or a zirconia ring set (code 248). If there is insufficient -35 mesh material for analysis, then the entire sample is ground (code 217)

Chemex Labs Ltd.

Analytical Chemists Geochemists Registered Assayers

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Canada V7J 2C1
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Telex: 04-352597
Fax: (604) 984-0218

Ring Grinding

Chemex Codes: 205 geochemical samples
208 assay samples

A crushed sample split is ground using a ring mill pulverizer with a chrome steel ring set. The Chemex specification for this procedure is that greater than 90% of the ground material passes a 150 mesh screen. Grinding with chrome steel will impart trace amounts of iron and chromium to a sample.

Chemex Labs Ltd.

Analytical Chemists *Geochemists* *Registered Assayers*

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Canada V7J 2C1
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Telex: 04-352597
Fax: (604) 984-0218

Ring-Grinding

Chemex Codes: 217 geochemical samples
268 assay samples

A sample which does not require crushing or splitting is ground using a ring mill pulverizer with a chrome steel ring set. The Chemex specification for this process is that greater than 90% of the sample will pass through a 150 mesh screen. Grinding with chrome steel will impart trace amounts of chromium and iron to a sample.

Chemex Labs Ltd.

Analytical Chemists *Geochemists* *Registered Assayers*

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North Vancouver, B.C.
Canada V7J 2C1
Phone: (604) 984-0221
Telex: 04-352597
Fax: (604) 984-0218

Gold

Fire Assay Collection/ Atomic Absorption Spectroscopy (FA-AA)

Chemex Code: 100

A 10g sample is fused with a neutral lead oxide flux inquarted with 6mg of gold-free silver and then cupelled to yield a precious metal bead.

These beads are digested for 30 mins in 0.5ml concentrated nitric acid, then 1.5ml of concentrated hydrochloric acid are added and the mixture is digested for 1 hr. The samples are cooled, diluted to a final volume of 5ml, homogenized and analyzed by atomic absorption spectroscopy.

Detection limit: 5 ppb Upper Limit: 10,000 ppb

Chemex Labs Ltd.

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North Vancouver, B.C.
Canada V7J 2C1
Phone: (604) 984-0221
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Fax: (604) 984-0218

32-Element Geochemistry Package (32-ICP)

Inductively-Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES)

A prepared sample (0.5g) is digested with concentrated nitric and aqua regia acids at medium heat for two hours. The acid solution is diluted to 25ml with demineralized water, mixed and analyzed using a Jarrell Ash 1100 plasma spectrometer after calibration with proper standards. The analytical results are corrected for spectral inter-element interferences.

Chemex Codes	Element	Detection Limit	Upper Limit
921	* Aluminum	0.01 %	15 %
922	Silver	0.2 ppm	0.02 %
923	Arsenic	5 ppm	1 %
924	* Barium	10 ppm	1 %
925	* Beryllium	0.5 ppm	0.01 %
926	Bismuth	2 ppm	1 %
927	* Calcium	0.01 %	15 %
928	Cadmium	0.5 ppm	0.01 %
929	Cobalt	1 ppm	1 %
930	* Chromium	1 ppm	1 %
931	Copper	1 ppm	1 %
932	Iron	0.01 %	15 %
933	* Gallium	10 ppm	1 %
934	* Potassium	0.01 %	10 %
935	* Lanthanum	10 ppm	1 %
936	* Magnesium	0.01 %	15 %
937	Manganese	5 ppm	1 %
938	Molybdenum	1 ppm	1 %
939	* Sodium	0.01 %	5 %
940	Nickel	1 ppm	1 %
941	Phosphorus	10 ppm	1 %
942	Lead	2 ppm	1 %
943	Antimony	5 ppm	1 %
944	* Strontium	1 ppm	1 %
945	* Titanium	0.01 %	5 %
946	* Thallium	10 ppm	1 %
947	Uranium	10 ppm	1 %
948	Vanadium	1 ppm	1 %
949	* Tungsten	10 ppm	1 %
950	Zinc	2 ppm	1 %
951	Mercury	1 ppm	1 %
958	Scandium	1 ppm	1 %

* Elements for which the digestion is possibly incomplete.

APPENDIX VI

THIN SECTION REPORTS

THIN SECTION DESCRIPTION

SAMPLE NUMBER: 130
FIELD NAME:
MAP UNIT:
PHOTOGRAPHED:
LATITUDE:
LONGITUDE:
ELEVATION:
LOCATION:

TEXTURE: vesicular, sparsely porphyritic, fine-grained to aphanitic.

MINERALS	DESCRIPTION	PERCENTAGE
Phenocrysts		
Augite	small subhedral to euhedral, altered to microcrystalline actinolite and opaques, some chlorite	10%

Geochem analysis : 5520ppm Cu; 55ppb Au

Matrix

- plagioclase laths, sometimes roughly allygned up to .5mm long — 60%
- deformed, non-spheroid vesicules, and open spaces filled with microcrystalline quartz, euhedral small actinolite crystals — 20%

Alteration

5-10% crystalline epidote patches, probably nucleating in open-spaces.

GENESIS: a vesicular andesitic extrusive rock

ROCK NAME: mildly altered andesite

REPORT ON THIN SECTIONS OF TAKLA VOLCANIC ROCKS FOR DAVE COOK

JoAnne Nelson
Geological Survey Branch
BCMEMPR
553 Superior St.
Victoria, B.C. V8V 1X4

Summary: These suite of 6 samples, 1316, 130, 1, 2, KL and 131a, belong to a mildly alkalic volcanic suite north of Chuchi Lake which we have included in published maps in the Chuchi Lake formation. They include flows and fragmentals; phenocrysts include plagioclase, augite, Kspar, biotite, hornblende and, in sample 2, minor quartz. There is abundant primary Kspar in the matrix of some. Its coexistence with augite is the grounds for referring to this as an alkalic suite. There is no compelling textural evidence for the presence of secondary Kspar. Common alteration minerals include chlorite, sericite, and epidote. No secondary biotite is present. Two of the samples, 130 and 131a, are strongly hornfelsed with abundant metamorphic actinolite.

131 b Plagioclase-megacrystic latite

This is a porphyritic volcanic or hypabyssal rock. Large, well-formed plagioclase and other phenocrysts are embedded in a very fine grained feldspathic matrix. In the matrix, Kspar grains are anhedral and interstitial to tiny plagioclase laths. Kspar constitutes 25% of the rock. The "other" phenocrysts are now aggregates of fine- to medium-grained quartz plus epidote, actinolite and opaques. Some of these secondary aggregates have the external prismatic outlines of augite crystals; I believe them to be after primary augite. The dominance of quartz in this secondary assemblage is unusual; normally augite is either pseudomorphed by actinolite, or replaced by chlorite, epidote, or secondary biotite. Elsewhere in the rock epidote occurs as scattered aggregates with chlorite and some quartz, and in veinlets. The plagioclase phenocrysts are heavily sericitized.

131a. Actinolite hornfels (metabasalt?)

The texture of this rock is dominated by a matte of well-formed pale green actinolite crystals with hairlike overgrowths on their basal terminations. They average 3 mm in length. Some of them have cores of relict augite. There is abundant interstitial Ti-oxide and sericitized plagioclase. Staining shows no Kspar present: this is a very mafic rock. Open spaces are filled with hairlike actinolite.

Dec 5 1994

THIN SECTION DESCRIPTION

SAMPLE NUMBER: 1316. LATITUDE:
FIELD NAME: LONGITUDE:
MAP UNIT: ELEVATION:
PHOTOGRAPHED: LOCATION:

TEXTURE: fine grained to aphanitic; porphyritic

MINERALS Phenocrysts	DESCRIPTION	PERCENTAGE
Plagioclase	Subhedral to Euhedral equant to tabular Zoned; up to 7 mm across	20%
Quartz eyes	Rounded to usually recrystallised to microcrystalline quartz up to 2 mm across	5%
Augite	Microphenocrysts subhedral less than .5 mm across	2%

Matrix

microcrystalline intergrowth of k-spar (30%), plagioclase (25%), quartz (5%) and augite (3%)

accessory opaques, slightly magnetic

Alteration

clays ± sericite dusting plagioclase
chlorite in groundmass and along cleavage fractures of pyroxenes.

GENESIS: high level intrusion; possible flow
Cams preference is an intrusion because of the Xtline groundmass.

ROCK NAME: Dacite to quartz andesite

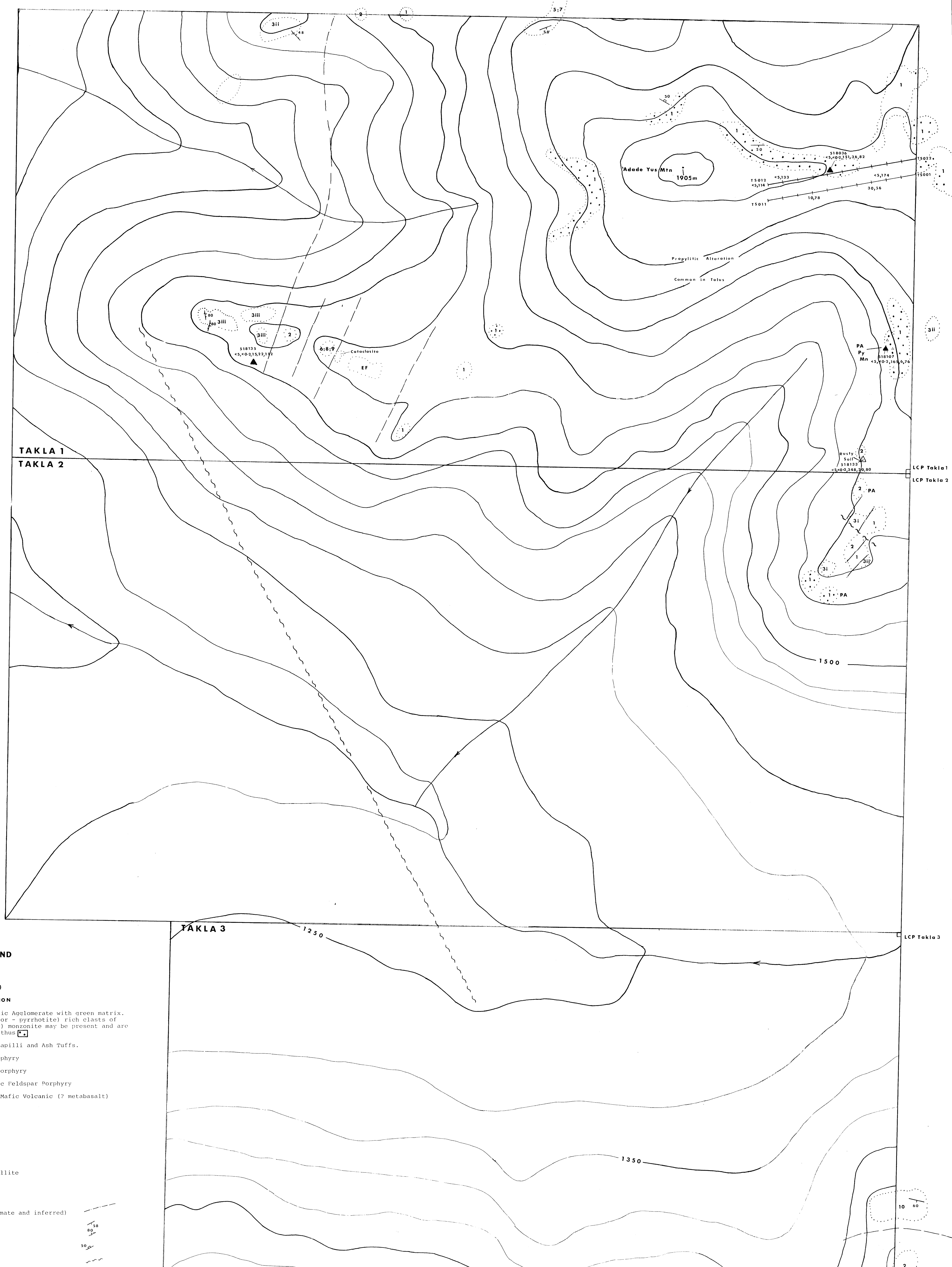
Report by: Cam DeLong, B.Sc.(Hon) Mineral Deposit Research Unit, University of British Columbia.

APPENDIX VII

STATEMENT OF COSTS

STATEMENT OF COSTS

Personnel:		
D.L, Cook, P.Eng. Project Geologist		
Field: 2 days @ $400/day	$	800.00
Office: Planning & co - ordination 1 day		400.00
R.R. Arnold, Assistant Geologist		
Field: 1 day @ $300/day		300.00
Room & Board Plus Consumables:		
3 man - days @ $75/day		225.00
Telephone & Xerox:		70.00
Disbursements:		
Truck Rental		300.00
Drafting Supplies		50.00
Chemex Lab Charges		396.44
Drafting & Map preparation:		
15 hours @ $30/hour		450.00
Office Supplies		23.76
Thin Section preparation & Reports		53.70
Camp Rental		225.00
Helicopter & Fuel		576.00
Field Suplies		180.00
Report Preparation:		
Writing, Word Processing, Copying & Binding		2,837.50
	$	6,887.40



LEGEND

LAYERED ROCKS

UPPER TRIASSIC (– JURASSIC?)
TAKLA GROUP
CHUCHI LAKE FORMATION

1	Heterolithic Agglomerate with green matrix. Pyrite (+ or - pyrrhotite) rich clasts of altered (?) monzonite may be present and are indicated thus
2	Crystal, Lapilli and Ash Tuffs.
3i	Augite Porphyry
3ii	Feldspar Porphyry
3iii	Megacrystic Feldspar Porphyry
4	Aphanitic Mafic Volcanic (? metabasalt)
5	Wacke
6	Chert
7	Sandstone
8	Siltstone
9	Mudstone
10	Black Argillite

SYMBOLS

Geological Contact (approximate and inferred)	
Strike and Dip of Bedding	58
Strike and Dip of foliation	80
Strike and Dip of Joint	50
Fault (inferred)	
Outcrop Boundary	
Brecciation	△ △
Propylitic Alteration	PA
Epidote Flooding	EF
Hornfels	HF
Malachite &/or Chalcopyrite Showing	Cu Cpy
Pyritisation	Py
Manganese Staining	Mn
Soil Grid with Sample Number & Au, Cu values of Note (PPB & PPM respectively)	TS001 30,174
Soil Sample with Sample Number & Au,Ag,Cu,Pb,Zn Values in PPM (Au in PPB)	△ 518113
Rock Sample with Sample Number & Au,Ag,Cu,Pb,Zn Values in PPM (Au in PPB)	▲ 518130
Stream Silt with Sample Number & Au,Ag,Cu,Pb,Zn Values in PPM (Au in PPB)	• 518132
Thin Section Number	• T131
Elevation in Metres Above Sea Level (Contour Interval 50 metres)	—1700—
Elevation of Peak in Metres Above Sea Level	• 1905m

Scale
0 100 200 400 metres

GEOLOGY & SAMPLE MAP

TAKLA 1,2&3

OMINECA MINING DIVISION, BC

Drawn By: DLC	NTS: 93N7E&W	Date: Jan 1992
Scale 1:5000		Figure 6

GEOLOGICAL BRANCH
ASSESSMENT REPORT

22,142