

GEOLOGY, MINERALIZATION AND GEOCHEMISTRY

TROITSA PEAK PROPERTY

WHITESAIL LAKE MAP AREA

93E.

OMINECA MINING DIVISION

N. LAT. 53 35 W. LONG. 127 06

FOR

ALPINE EXPLORATION CORPORATION

BY

MR. C. HARIVEL, FGAC,

BOX 233

SMITHERS, B.C.

NOVEMBER 28, 1986

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SUMMARY

The Troitsa Peak Property is located in the Intermontane Belt of the British Columbia Cordillera, along the southern flank of the Skeena Arch. The property comprises 72 units.

It is underlain by marine and continental volcanics of the Jurassic Hazelton Group intruded by a hypabyssal intrusive complex (Troitsa Complex) of general dacitic composition and probable early Tertiary age. The intrusive complex includes aphanitic and porphyritic dacite, bladed feldspar porphyritic monzonite, ash-flow tuff and diatreme breccias. The property is transected by a major set of faults trending both northerly and east-northeasterly. These faults are probably related to ring and radial fracture systems associated with the Tahtsa Caldera, located to the immediate west.

Mineralization on the property is of epithermal character, associated with the major fracture systems and the diatreme breccias of the Troitsa Complex. Seven zones of mineralization have been located. The Moraine Showing comprises veins, stockworks and silicification associated with argillic alteration and diatreme breccias containing gold values up to 1.06 oz/t. (NOT IN O/C)

The Flare Showing comprises silicified zones up to 3 meters wide associated with a 1 1/2 km long northeast trending shear zone. Gold values up to 0.044 oz/t Au and 3.63 oz/t Ag from grab samples have been taken. On the Zinc Creek Showing thin (to 15 cm), veins of quartz-chalcopyrite-sphalerite containing up to 78 oz/t silver and 1.3 oz/t gold are located in marine Hazelton Group sediments near the southwest contact with the Troitsa complex. o/c ?

On the Wolverine showing, stringers and stockworks of quartz in Hazelton volcanics returned results of up to 0.022 oz/t gold over 10 meters. South of Blitz Creek, a two km, north-northeast trending quartz-carbonate altered shear zone is associated with stibnite-marcasite mineralization and anomalous gold in soils. In and adjacent to Cummins Creek, numerous quartz veins, up to 2 m width, are exposed, with grab values know up to 1.3 oz/t gold and 292 oz/t silver. The Chalco Creek showing comprises a series of quartz veins, up to 1 meter wide, which contains silver up to 10 oz/t and low gold values. Other anomalous zones are present, represented by isolated soil anomalies, and rock samples, both in situ and float.

A soil grid was completed on the property in 1983 along with limited trenching. No drill holes have been collared on the claims. A two phase program is recommended for the property. The first phase of \$50,000, completed in September, 1986 consisted of geological mapping, prospecting, drilling and blasting to locate potential drill sites on known showings and identify new showings. The second phase of \$200,500, is to continue the work of the first phase and do 2,000 feet of drilling.

INTRODUCTION

In August, 1986 the author was requested by Willis W. Osborne, President of Alpine Exploration Corporation, to set up Phase I of the work program recommended for the Troitsa Peak Property in the June 29, 1986 report. The \$50,000 program was planned for September, and it included upgrading known showings on the property through geological mapping, prospecting, hand trenching and blasting. The author visited the property on September 21st.

This report describes the work done on the property in September and details much of the previous work. Noteable among sources describing previous work are reports by T.A. Richards (1982), N.G. Cawthorn and H. Jameson (1982) and N.G. Cawthorn et al (1984).

LOCATION AND ACCESS

The Troitsa Peak Property is located in the Whitesail Range of Central British Columbia (NTS Map Sheet 93E/11E) on the eastern flank of the Coast Range. It is approximately 130 km south of the town of Smithers and 95 km west-southwest of the town of Houston.

Access to the property is by helicopter from Houston or Smithers. Alternative access is by approximately 55 km of paved highway from Smithers to Houston, 49 km of all-weather gravel road south from Houston to Owen Lake, then by 60 km of seasonal gravel road southwest to the eastern end of Tahtsa Lake and finally 15 to 25 km southeast by helicopter to the property. Figure 1 (located on the following page) shows the general location of the property at a scale of 1:600,000.

PHYSIOGRAPHY

The property is centered near the western part of the Whitesail Range, a gentle, uplifted mountain block, transitional between the Nechako Plateau and the Hazelton Mountains. Troitsa Peak, the highest point on the Range and claims, occurs near the northeast corner of the property and attains an elevation of 2,089 m. Elevations decrease moderately to the west and south. Low points on the property are on Troitsa Creek (elevation 1,250 m), a prominent drainage system from the P.S. and Whitesail Claims and Cummins Creek (elevation 1,210 m), which drains to the south and east through the Wind Tunnel and Jesse Claims. The lowest point is near the southern boundary of the Jesse Claim where the elevation is 1,150 meters.

AFTER: CAWTHORN &
JAMIESON, 1982

127°W
SMITHERS



TELKWA

HOUSTON

EQUITY SILVER MINE

BRADINA DEPOSIT

BERG DEPOSIT

WHITING CREEK DEPOSIT

HUCKLEBERRY DEPOSIT

OX LAKE DEPOSIT

TROITSA
PEAK
PROPERTY

TWEELESHUIR PARK

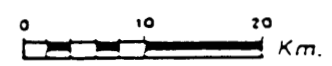
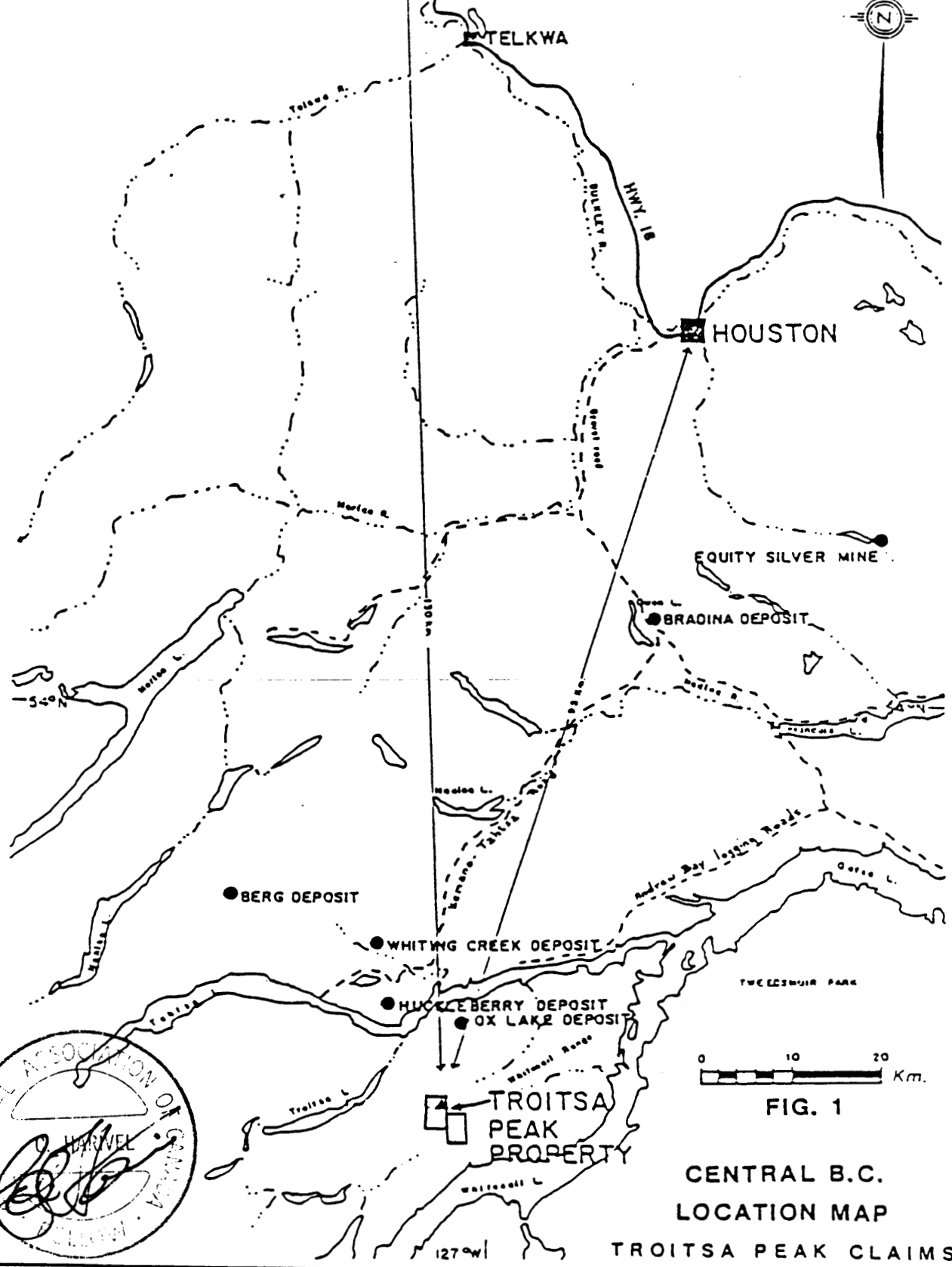
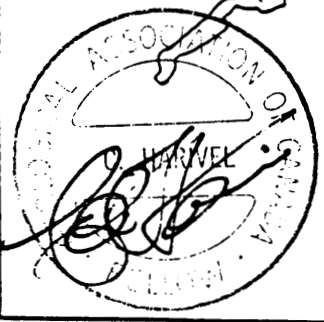


FIG. 1

CENTRAL B.C.
LOCATION MAP

TROITSA PEAK CLAIMS



Relief is generally moderate, except along the lower parts of Troitsa Creek, where prominent westerly facing cliffs are present. Tree-line is generally between 1,400 and 1,500 meters elevation.

PROPERTY HISTORY

Significant precious metal mineralization was first discovered in the Whitesail Range by Dr. T.A. Richards and crew, in 1981, during a reconnaissance exploration program supported by Union Carbide Exploration (UCEX). Prior to this, the only known occurrence of precious metal mineralization on the range was a 0.005 oz/ton gold analysis from an altered zone at the headwaters of the creek east of Cummins Creek (Duffel, 1959). Values of up to 1,200 ppb Au and 63 ppm Ag in association with epithermal-style mineralization from the 1981 program resulted in an extensive exploration program by UCEX in 1982. After UCEX terminated mineral exploration in Canada, they optioned the property to Canamax Resources Inc. Canamax explored the property in 1983, covering the area with a detailed soil grid, rock sampling and limited trenching. In 1984 they divested their interest in the property back to UCEX. In 1986, the claims were returned to Dr. T.A. Richards from UCEX.

Following the return of the claims to Richards, two agreements were completed between him and Takpani Resources Ltd. In the first agreement of July 2, 1986, Takpani purchased the P.S. and Whitesail claims from Richards, while in the second agreement of September 11, 1986 the company purchased the Wind Tunnel and Jesse Claims. Subsequently the name of the company was changed to Alpine Exploration Corporation.

In September, 1986 the company carried out a \$50,000 program on the property. This program entailed detailed prospecting, hand and blast-pit trenching and geologic mapping to more closely define known showings.

CLAIMS INFORMATION

The property consists of the P.S. and Whitesail claims each of which has 20 units, and the Wind Tunnel and Jesse claims of 16 units each. The claims occur in the Omineca Mining Division. Below is a table showing the record number, record date and expiry date of each claim.

<u>Name of Claims</u>	<u>Record Number</u>	<u>Record Date</u>	<u>Expiry Date</u>
Wind Tunnel	4362	11/13/81	11/13/92
P.S.	4364	11/13/81	11/13/92

Whitesail	4365	11/13/81	11/13/92
Jesse	4571	04/22/82	04/22/93

Figure 2 on the following page shows the locations of the claims.

REGIONAL GEOLOGIC SETTING AND MINERALIZATION

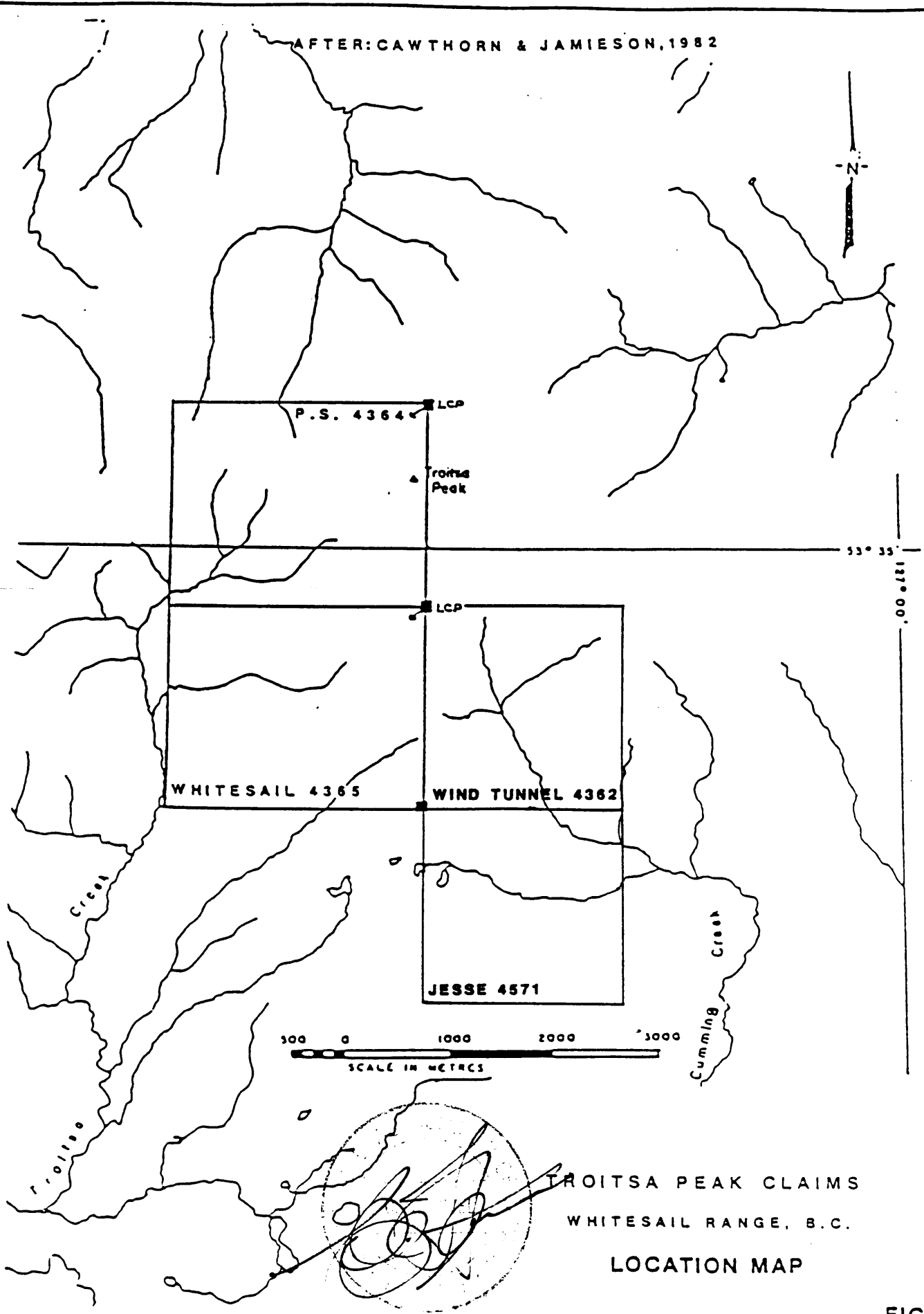
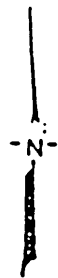
The Troitsa Peak Property is located in the west-central part of the Intermontane Belt of the British Columbia Cordillera along the southern margin of a major east-northeast trending, transverse tectonic belt known as the Skeena Arch. (Souther and Armstrong, 1966). This can be seen on Figure 3, Geological Setting, Mineral Deposits West - Central British Columbia, on page 3. Rock units across the Intermontane Belt include Upper Paleozoic to Miocene volcanics, sediments and intrusive rocks. Older units include the volcanic island-arc assemblages of the Upper Paleozoic Asitka Group, the Upper Triassic Takla Group and the Lower and Middle Jurassic Hazelton Group (Tipper and Richards, 1976). The Hazelton Group dominates these lithologies in this area. Unconformably and disconformably overlying these volcanic assemblages are the successor basin assemblages of the Upper Jurassic to Lower Cretaceous Bowser Lake and Skeena Groups. Strata of the Bowser Lake Group are confined to areas immediately north of the Skeena Arch, those of the Cretaceous Skeena Group were deposited as a blanket across the whole of the area.

Continental, calc-alkaline volcanism, of Upper Cretaceous to Eocene age, is related to an episode of block-faulting (basin and range type) and the evolution of caldera and down-drop volcanic basins across, and south of the arch. Volcanics of the Upper Cretaceous Kalsalka and lower Tertiary Ootsa Lake Group were deposited in a series of basins across much of the area, particularly immediately north of and south of Skeena Arch. This volcanic-tectonic episode is responsible for the development of most of the significant mineral deposits in west-central B.C. Overlying these volcanics are Eocene to Miocene basalts of the Endako Group. The period from Miocene to recent was one of uplift and erosion throughout most of the Canadian Cordillera.

The largest number of economically important showings are genetically related to an Upper Cretaceous to Eocene event dominated by explosive, continental volcanism, hypabyssal plutonism, caldera subsidence, basin and range block-faulting and hydrothermal activity.

These events cumulated to form a great array of mineralized showings throughout this region of west-central

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TROITSA PEAK CLAIMS

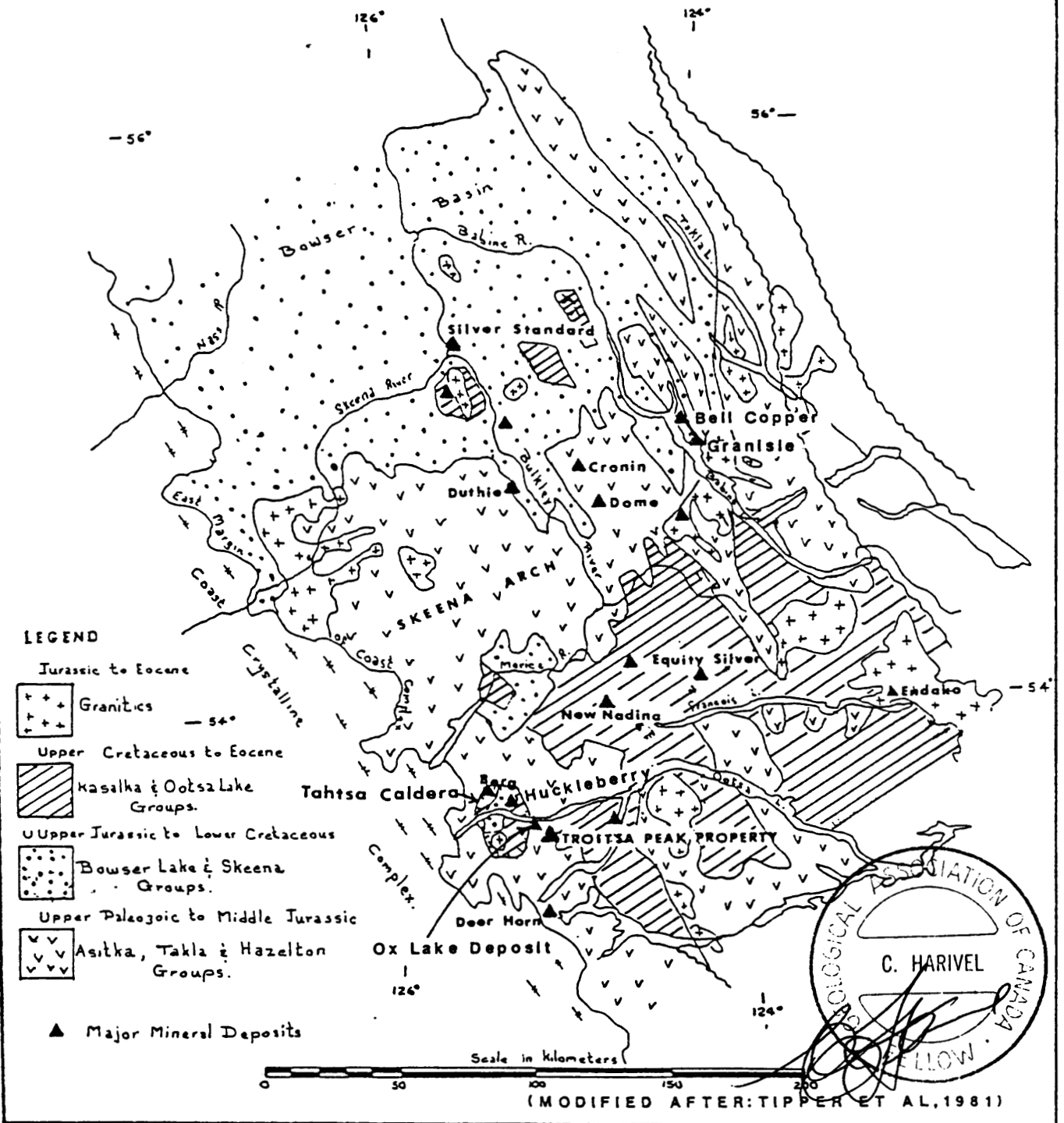
WHITESAIL RANGE, B.C.

LOCATION MAP

FIG. 2

Figure 3

GEOLOGIC SETTING, MINERAL DEPOSITS
West-central British Columbia



British Columbia. This sequence of events is similar to the sequence in the American Southwest that was responsible for the development of numerous precious metal and porphyry deposits.

Deposits of significance in this highly productive and mineralized region of west-central British Columbia include: Equity Silver, New Nadina (Bradina), Bell Copper, Granisle, Emerald Glacier, Deer Horn, Topley-Richfield, Silver Standard, the Duthie Mine, Berg, Huckleberry, Glacier Gulch, and numerous prospects of various degrees of merit. Equity Silver and Bell Copper are the only significant producers at present.

Significant production and or reserves of major deposits in the region are:

Equity Silver:	36,000,000 tons; 3 oz/t Ag, <u>0.026</u> oz/t Au; and 0.35% Cu.
New Nadina:	500,000 tons; 0.1 oz/t Au, 10.0 oz/t Ag, 0.76% Cu, 2.1% Pb. <u>6.9% Zn</u>
Deer Horn:	250,000 tons, 0.31 oz/t Au, 8 oz/t <u>Ag.</u>
Berg:	<u>272,000,000</u> tons, 0.51% Cu, 0.03% Mo.
Huckleberry	<u>77,000,000</u> tons, 0.40% Cu.

Numerous of these deposits are concentrated in the Whitesail Lake area, in and around the Tahtsa Caldera (McIntyre, 1985). This a resurgent caldera, 20 km in diameter, and 8 km due west of the Troitsa Peak Property. The collapsed caldera center is occupied by rocks of the Cretaceous Skeena Group, volcanics of the Kasalka Group and a variety of intrusive rocks. Several potentially economic mineral deposits are associated with small stocks around the periphery of the caldera, possibly localized at intersections between ring and radial faults related to caldera development (Hodder and MacIntyre, 1980). These are the Berg (Panteleyev, 1981), Huckleberry (James, 1976) and Ox Lake (Richards, 1981). Hodder and MacIntyre (1980) have pointed out similarities between this area and some important mining districts in the western U.S.A. (eg: San Juan Mountains caldera complex, Lipman, 1976).

The major north and northeast trending fault systems that transect the Troitsa Peak Property are likely part of the ring and radial faults zones related to the Tahtsa Caldera.

GEOLOGICAL SETTING

The Whitesail Range is underlain by four stratigraphic assemblages which range in age from Jurassic to Eocene. These are:

Jurassic	Hazelton Group; marine and non-marine calcalkaline volcanics; intrusives.
Lower Cretaceous	Skeena Group; marine sandstone, siltstone and shale.
Upper Cretaceous	Kasalka Group; continental volcanics; intrusives.
Eocene	Ootsa Lake Group; hornblende - feldspar porphyry volcanics; intrusives.

The Whitesail Range has been previously mapped by the Geological Survey of Canada (open-file map 708, G. Woodsworth), and the area immediately to the west, investigated by R. Hodder and D. McIntyre, (1980). Figure 4, Geological setting: Whitesail area, after G. Woodsworth with modifications by T.A. Richards, appears on the following page.

Deformation is simple, with faulting dictating the style; folding is of local significance noted in thin bedded sedimentary rocks. Upper Cretaceous Kasalka volcanics rest unconformably on Skeena and Hazelton Strata.

Stratigraphic and Intrusive Units

Hazelton Group

The Hazelton Group is the most extensive unit underlying the region. It is represented by two assemblages: a well, even-bedded assemblage of marine deposited, fine ash to lapilli tuff, cherty tuff, siltstone, volcanoclastic sandstone and shale; and a massive, to thick-bedded assemblage of coarse lapilli tuffs, fine breccia, lahar, ashflow tuff, tephra, sandstone, mudstone and minor flows. The former unit dominates the western and northern portions of the Whitesail Range; the later dominates the remaining areas and is of much more extensive regionally. Intrusive rocks, thought to be correlative to the Hazelton volcanics, are pink, medium-grained granite and quartz monzonite exposed south of the Whitesail Range.

Skeena Group

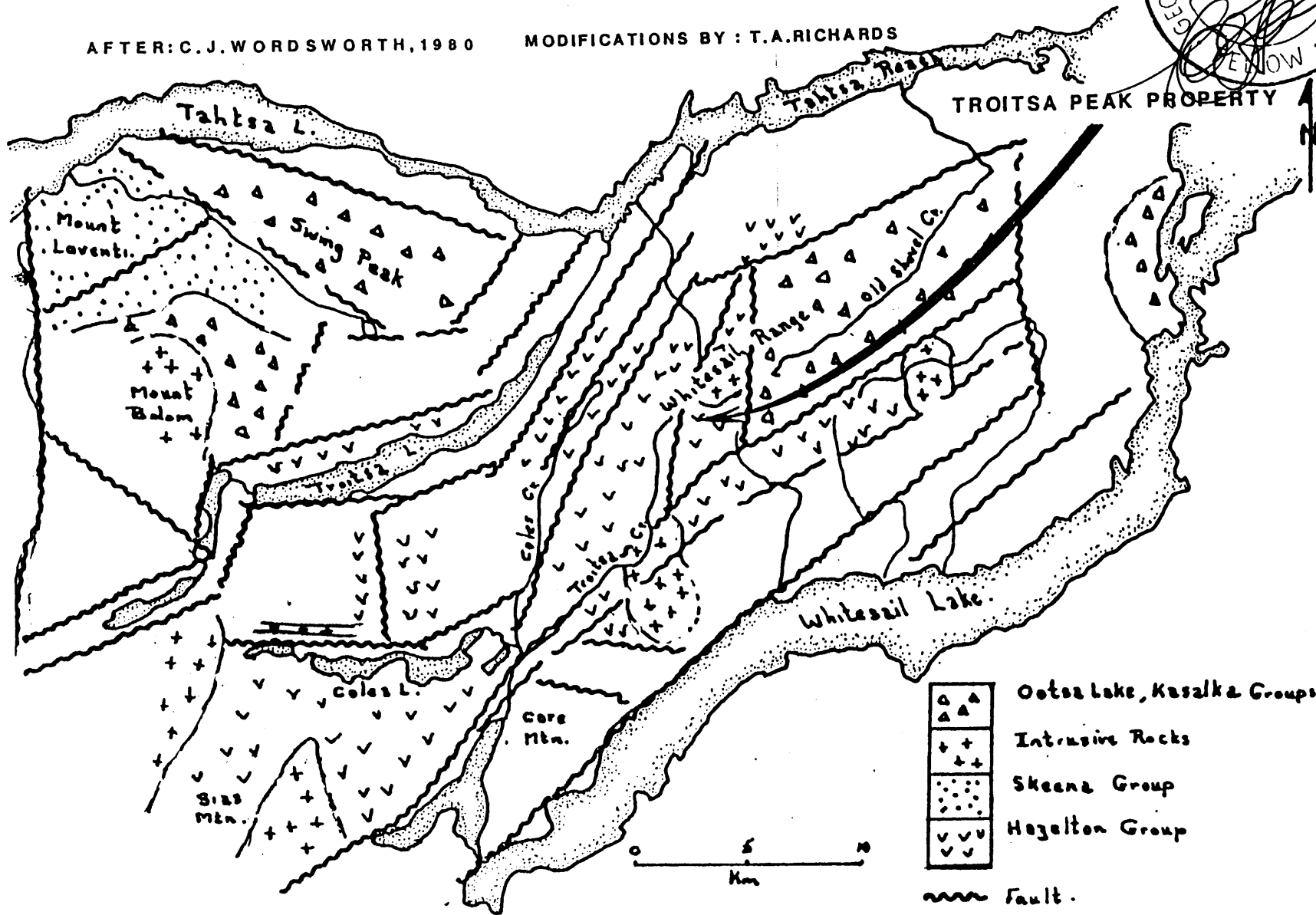
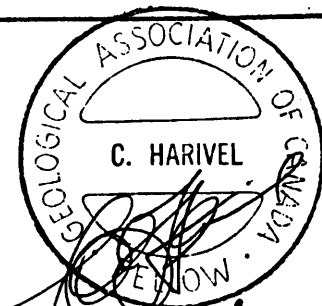
The Skeena Group strata are exposed northwest of the Whitesail Range. They are a monotonous assemblage of dark to light grey, even, medium, well-bedded, micaceous sandstone, siltstone and black shale. They are of shallow marine origin. Sedimentary structures visible are current ripples, cross-bedding, worm tubes and burrows. Overlying the dark,

GEOLOGICAL SETTING : WHITESAIL AREA

FIG. 4

AFTER: C. J. WORDSWORTH, 1980

MODIFICATIONS BY : T. A. RICHARDS



bedded strata is an assemblage of red-bed conglomerate and mudstone seen in three localities, exposed particularly to the west. This unit is not exposed on the Whitesail Range.

Kasalka Volcanics

The Kasalka volcanics unconformably overlie the Skeena Group and comprise a highly variable assemblage of intrusive, extrusive and hypabyssal rocks of acidic to intermediate composition that define the Tahtsa Caldera (Hodder and McInture, 1980), west of the Troitsa Peak property. Rock of the Troitsa complex, on the claims in the Whitesail Range, are possibly correlative with the Kasalka Group.

On the Whitesail Range, the Kasalka Volcanics are a thick sequence of fine to bladed feldspar prophyry rhyolite to dacite lahar, flows and intrusives. They are exposed along the northern and northeastern part of the range.

Ootsa Lake Group

Rocks suggested to be correlative with this assemblage lie at the extreme east margin of the area adjacent to Whitesail Reach. They have been little investigated. They comprise fresh hornblende-biotite-feldspar dacite porphyries.

Structure

Faulting dominates the structural style. At least two ages of structural activity are apparent with one affecting the older strata only. The older Hazelton and Skeena are much more intensely fractured, tilted and folded than the younger, mainly flat-lying Kasalka volcanics. The dominant structural trend is northeasterly (050 - 070 deg.), a trend mimiced by the topographic alignment of the major valley systems. A second set of shears trends northerly (350-030 deg.). The northeasterly structures tend to develop as wide, complex shear zones whereas the northerly ones develop as discrete fault zones.

The Whitesail Fault Zone is one of the main northeasterly structures. It is exposed in shattered zones along the southern flank of the Whitesail Range and extends southeasterly to Whitesail Lake with a width of up to 10 km. This zone was probably active in Upper Cretaceous and was reactivated in Tertiary. A similar northeasterly trending shear zone defines the northwestern boundary of the Whitesail Range.

The northerly structures are also evident. Two cut across the Whitesail Range.

Within the above zones Hazelton strata are: intensely sheared, shattered and altered to propylite and quartz-ankerite-siderite. The younger, Kasalka volcanics are

broken within the fault, and juxtaposed against the underlying Hazelton strata. Subsequent uplift and erosion resulted in a peneplaned surface across the juxtaposed surfaces. This later event caused the development of the present morphology and represents a third fault-deformation episode. Economic mineral occurrences found in the Whitesail area were exposed as a result of the last episode.

CLAIMS GEOLOGY

The claims are underlain by two units; the volcanic and sedimentary assemblages of the Lower Jurassic Hazelton Group which have been intruded by a high-level, hypabyssal complex called the Troitsa Complex of probable early Tertiary age. The geology of the claims has been mapped at 1:10,000 scale by Ms. H. Jamieson (Cawthorn et al, 1982) and partially mapped at 1:2,000 scale by Canamax geologists (Cawthorn et al, 1984). These maps (Figures 5,9 and 10) are found on pp. 25-30. In reading the descriptions in this section, please refer to the Jamieson Map (Figure 5).

The Hazelton Group strata comprise two lithologic assemblages separated by a major fault, the Troitsa Creek Fault. West of the Troitsa Creek Fault, the Hazelton strata comprise well bedded, volcanic sandstone, siltstone, argillite, tuff, tuffaceous sediments, breccia and ignimbrite of shallow marine origin. East of this fault, the Hazelton stratigraphy comprises a thick assemblage of well to massive bedded lithic lapilli tuffs. These units vary from well-sorted, waterlain varieties to unsorted, chaotic tuff and tuff-breccia. Minor red tuffaceous mudstone, feldspar porphyry flows and breccia and aphanitic andesite comprise a small part of the section.

Thin to massive bedded coarse to fine-grained lapilli tuffs of the Hazelton Group volcanics underlie the Wind Tunnel and Jesse claims. The units are highly variable in color with shades of red, maroon and purple most common in the unaltered rocks. A widespread, pervasive propylite renders much of the strata a greenish color. A diabase body, probably a dyke, is exposed on the ridge immediately west of Cummins Creek. In a prominent east-flowing tributary to Cummins Creek, highly fractured, propylitized quartz monzonite is exposed as a series of dyke-like bodies trending parallel to the creek.

The Troitsa complex underlies the northern and eastern part of the P.S. claim. A wide variety of blue-grey aphanitic dacite, with fine feldspar phenocrysts, green-grey dacite porphyry with bladed feldspar phenocrysts, pink feldspar biotite granite porphyry and coarse heterolithic breccia occurs here. The dominant rock type is a fine-grained, glassy to aphyric dacite with scattered fine-grained plagioclase phenocrysts. The unit is usually massive, with local columnar

jointing. A grey-green to grey, massive, medium to coarse bladed feldspar porphyry of monzonitic composition is widespread throughout the complex and barely subordinate to the finer-grained dacite.

Much of the southeastern portion of the Troitsa complex on the claims is represented by a heterolithic breccia comprised of a large variety of fragments of lithologies of the complex and wall rock. Fragments are floating in a comminuted matrix of similar material. Fragments are angular, reach up to 1 meter across, with a mode of 1 to 10 cm. These bodies are probably diatreme breccias. Four such bodies are present on the claims. These breccias have been subject to intense hydrothermal (mainly argillic) alteration and pyritization, and are locally cemented by silica (amethyst, bull, chalcedony).

Dykes of fine grained feldspar porphyry and quartz eye-porphyry intrude the Hazelton, ususally parallel to, or within, fault zones.

Rock within the Jesse, Wind Tunnel and the southeastern part of the Whitesail claims are cut by shears and shatter zones related to the Whitesail Fault Zone. Three northerly trending faults occur on the claims. They include the Troitsa Creek Fault in the western part of the P.S. and Whitesail claims, the Blitz Fault cutting through the center of the Whitesail claim and the Discovery Fault cutting the northeastern part of the Jesse Claims.

MINERALIZATION

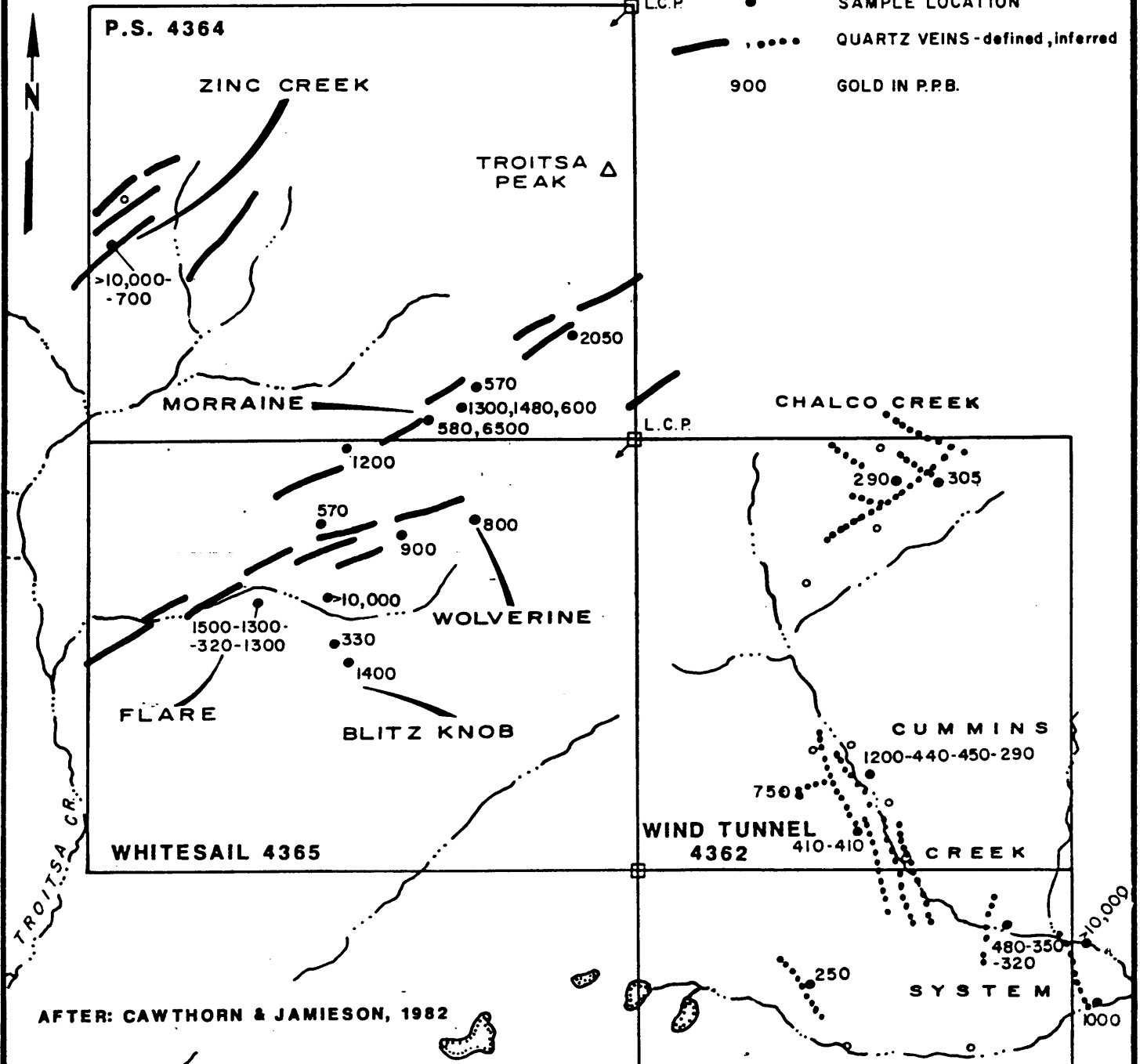
Seven showings and numerous isolated occurrences with anomalous precious metals values are known on the claims. All represent surface showings, discovered by prospecting and enhanced by soil geochemistry, hand and blast-pit trenching. Mineralized showings include veins, stockworks, silicified zones, stringers, lenses, fracture fillings and dissaminations of quartz and sulphides.

The showings of significance include the Moraine, Blitz, Flare, Wolverine, Zinc Creek, Chalco Creek and Cummins Creek occurrences. Some of the anomalous gold and silver values, from these showings are shown on Figures 6, 7, and 7a on the following pages. Values shown are mainly from grab samples. Those on Figures 6 and 7 are from work in 1982, and those on Figure 7a are from the 1986 program.

Mineralization is of epithermal character and is associated with major north-northeast and east-northeast fault structures and a hypabyssal intrusive volcanic complex (Troitsa Complex). Textures typify the epithermal regime. These include vuggy, cox-comb quartz, banded quartz veins, chaotic explosive breccias (diatremes). Quartz comes in a multitude of varieties including opaline, chalcedonic, cherty, milky, massive, fine-grained, jasper, amethystine and silicified country rock.

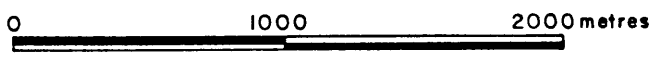
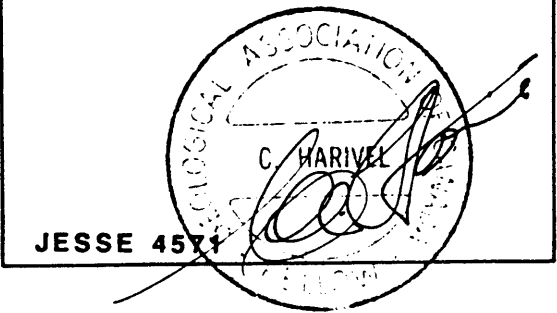
LEGEND

- SAMPLE LOCATION
- , ···· QUARTZ VEINS - defined, inferred
- 900 GOLD IN P.P.B.



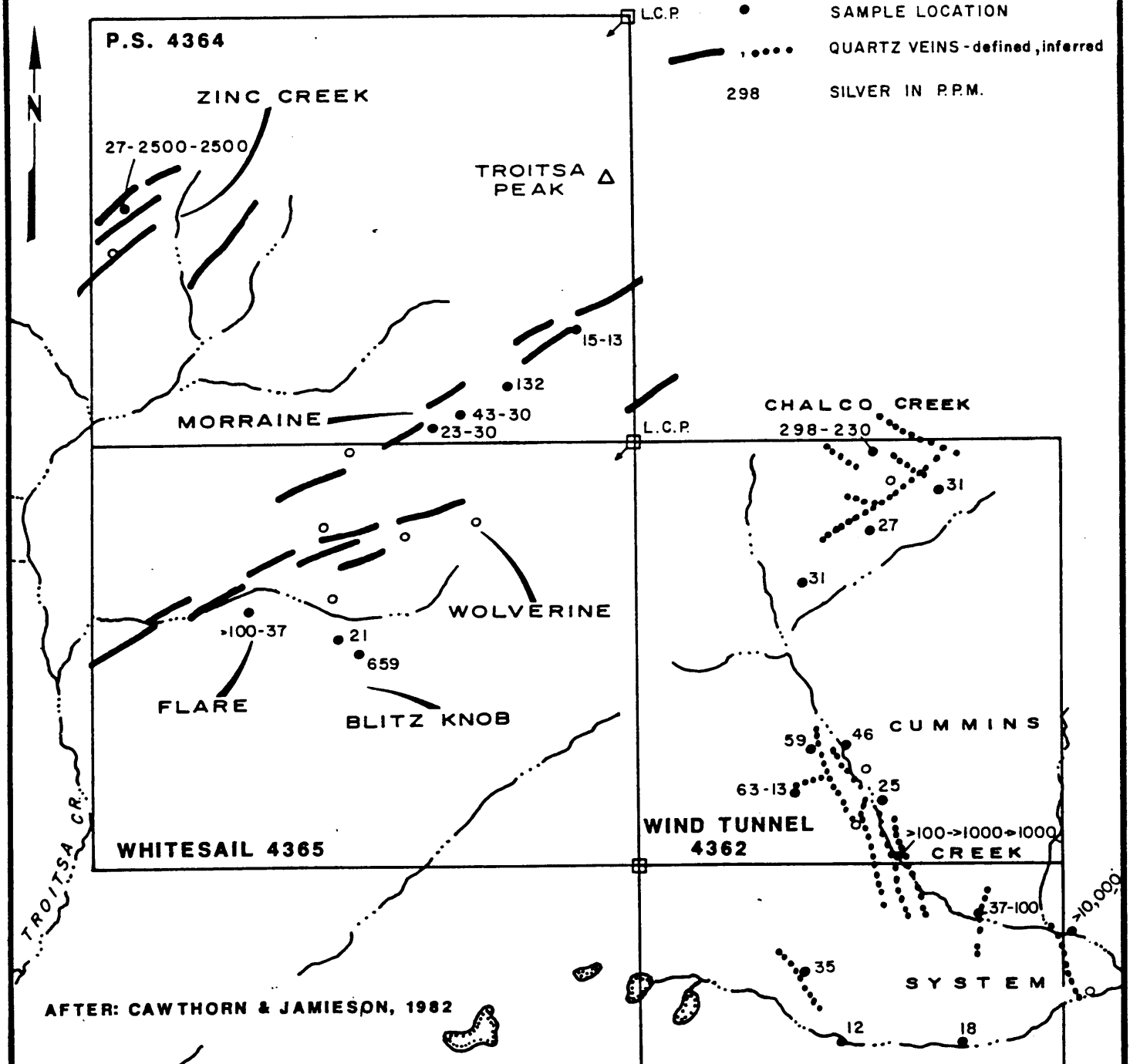
AFTER: CAWTHORN & JAMIESON, 1982

ALPINE EXPLORATION CORPORATION		
TROITSA PEAK PROPERTY		
WHITESAIL RANGE, B.C.		
ANOMALOUS GOLD		
COLIN P. HARIVEL B.S.C., F.G.A.C.		
FIG.	SCALE: AS SHOWN	N.T.S. 93E / 11
6	DRAWN: B.O. / dw	DATE: MAY 1987



LEGEND

- SAMPLE LOCATION
- , ···· QUARTZ VEINS - defined, inferred
- 298 SILVER IN P.P.M.



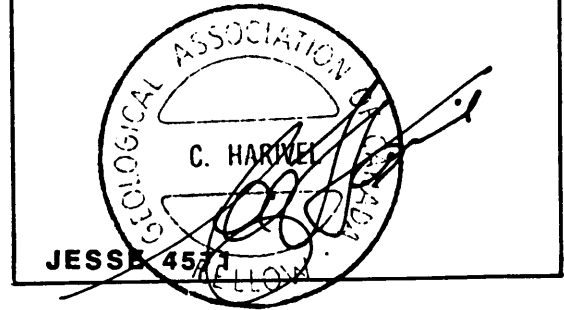
AFTER: CAWTHORN & JAMIESON, 1982

ALPINE EXPLORATION CORPORATION

TROITSA PEAK PROPERTY
 WHITESAIL RANGE, B.C.
ANOMALOUS SILVER

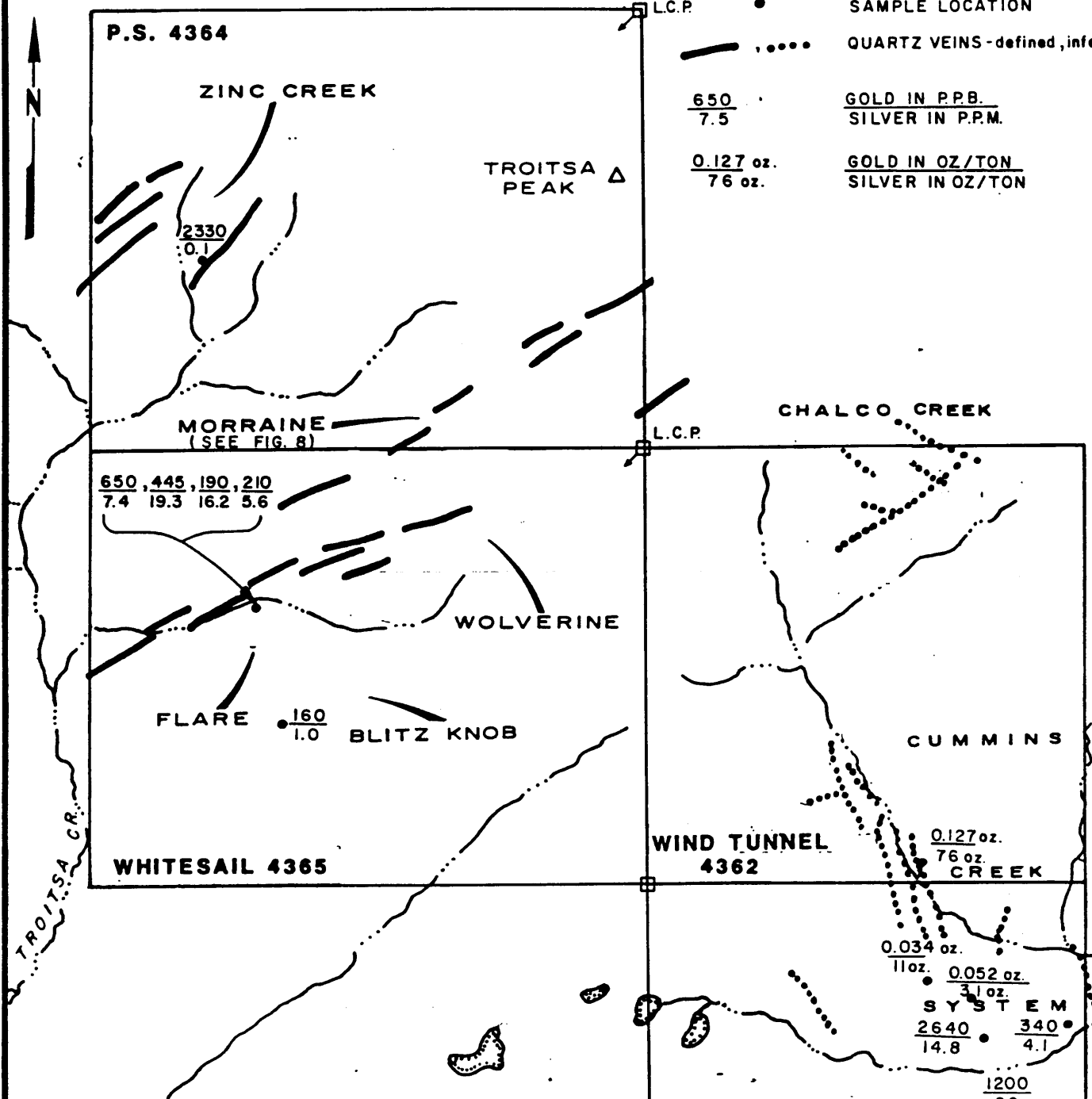
COLIN P. HARIVEL B.S.C., F.G.A.C.

FIG.	SCALE: AS SHOWN	N.T.S. 93E / 11
7	DRAWN: B.O. / dw	DATE: MAY 1987



LEGEND

- SAMPLE LOCATION
- , ···· QUARTZ VEINS - defined, inferred
- $\frac{650}{7.5}$ GOLD IN P.P.B.
SILVER IN P.P.M.
- $\frac{0.127 \text{ oz.}}{76 \text{ oz.}}$ GOLD IN OZ./TON
SILVER IN OZ./TON

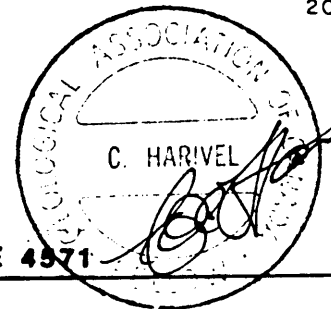


ALPINE EXPLORATION CORPORATION

TROITSA PEAK PROPERTY
 WHITESAIL RANGE, B.C.
1986 ANOMALOUS
GOLD-SILVER RESULTS

COLIN P. HARIVEL B.S.C., F.G.A.C.

FIG.	SCALE: AS SHOWN	N.T.S. 93E / 11
7a	DRAWN: B.O. / dw	DATE: MAY 1987



Precious metal mineralization is associated with sulphide poor assemblages, chalcopyrite - pyrite - galena - sphalerite - tetrahedrite assemblages, arsenopyrite, and argentite - pyrrhotite - galena - chalcopyrite. Other mineral assemblages include stibnite, marcasite. Alteration is variable, and includes silicification, argillic, phyllic and propylite. All the mineralized showings are likely the product of a single mineralizing event associated with Tertiary volcanism, high-level plutonism and the reactivation of major fault structures that acted as channelways for mineral deposition.

Morraine Showing

The Morraine Showing comprises a series of quartz veins, stockworks and silicification associated with argillic and propylitic alteration hosted in heterolithic breccia, bladed feldspar porphyry and flow-banded rhyolite of Tertiary age and volcanics of the Jurassic Hazelton Group. The showings are located at the headwaters of Troitsa Creek. Exposures are limited by an extensive, thin felsenmeer blanket over much of the showing area, except along north-facing cliffs above a small morainal lake at the southern part of the showing area.

Alteration and mineralization is known to extend for more than 1,000 meters in a general northeast direction (030 deg.) Two zones are present, the zone south of the morainal lake being separated from the zone to the north by a small terminal moraine and the lake itself. Best known mineralization is from the north zone, on a broad, flat basin at the immediate head of Troitsa Creek.

In the north Morraine zone, an irregular quartz vein and vein breccia gave a channel sample of 0.114 oz/t Au and 3.55 oz/t Ag across 1 m width. This sample was from a hand trench dug in 1982, across one of the few exposures in the basin. Quartz float is scattered along strike for 250 m from the above vein exposure, with grab samples giving values of 2,040 and 1,580 ppb Au, with others not anomalous (1983). Detailed prospecting of quartz float in 1986 outlined trains of quartz aligned in a north-easterly direction, shown on Figure 8 on page 18. There appears to be a discrete number of mineralized silica systems within the basin, distributed across a width of some 300 meters, traceable on strike for an excess of 600 meters, and open at both ends. Significant values of gold noted include 1.065, 0.286, 0.186 and 0.086 oz/t that enhance the earlier noted values. Silver is generally low, with the exception of 24.62 oz/t from the 1.065 oz/t Au sample. Sample distribution and values are noted in figure 8, and include samples BH 121 to 123, and TR 214 to 263 inclusive (see appendix, gold and ICP geochemistry).

Distributed from the southeast to the northwest, the following silica-associated mineralized systems appear to be

present. These are marked "A" through "J" on Figure 8 on the following page.

- A. Float samples of intensely propylitized volcanics with lenses, veins and stringers of coarse grained, coarsely vuggy quartz, frequently amethystine, with disseminated to crystalline galena, sphalerite and chalcopryrite. Precious metals are low, with insignificant gold and silver to one oz/t.
- B. Stockwork veins and veinlets of vuggy, fine-grained to chalcedonic quartz with minor disseminated pyrite. Anomalous gold to 340 ppb. This system is exposed on the ridge dividing Cummins Creek from Troitsa Creek.
- C. This zone is central to the basin and consisting of aligned series of boulders up to 3 X 2 X 2 ft. comprising stockworks of fine-grained quartz and quartz cemented breccia in argillic and propylitic heterolithic breccia. Values are to 2,040 ppb. The float train is traceable for 200 meters, but no outcrop was seen.
- D. This float train is an extension of the vein sampled in 1982 which gave 0.114 oz/t gold. Values here in fine-grained vuggy, banded quartz and quartz breccia include 7,230 ppb (0.186 oz/t) and 2,170 ppb (0.086 oz/t).
- E. A narrow quartz train traceable for 50 meters gave 1.065 oz/t Au from a finely collform banded, chalcedonic, vuggy quartz vein with finely disseminated grey sulphide, galena and sphalerite.
- F. Quartz stockwork boulders with low precious metal values.
- G. Quartz stockworks associated with propylite and argillic altered heterolithic breccia with gold to 1,580 ppb.
- H. An irregular train of quartz boulders typified by dense, cherty fine-grained textures with low values.
- I. A single sample site of fine-grained cherty, finely vuggy quartz which gave 0.286 oz/t Au. and 3.17 oz/t silver.
- J. A large block of very sugary fine-grained grey quartz up to 5 feet wide. A fine-grained grey, unidentified mineral occurs throughout the quartz, values of precious metals were low.

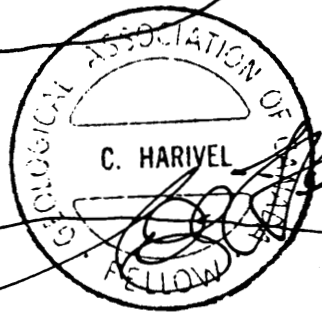
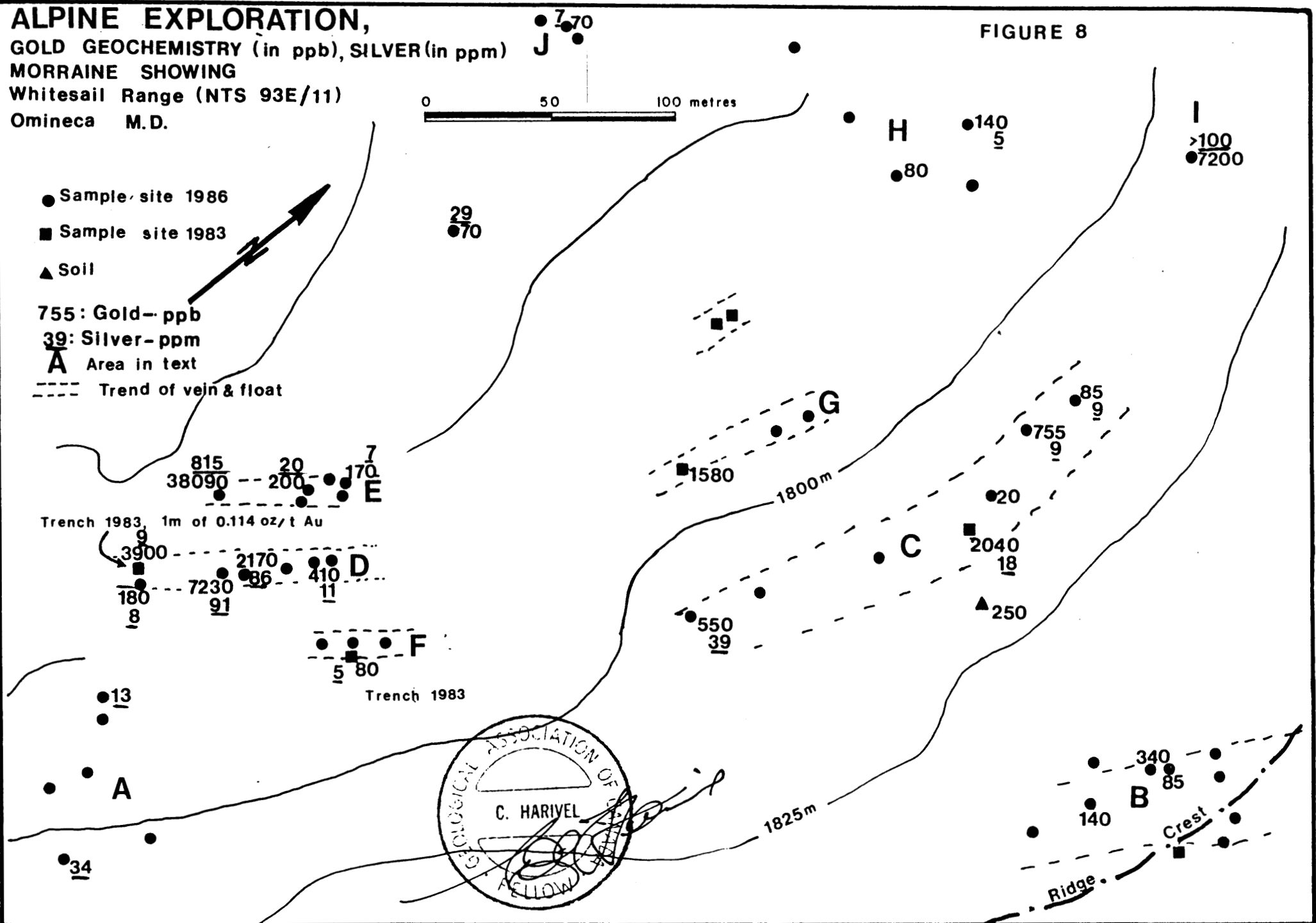
The southwest extension of the above mineralized zone, south of the morainal lake comprises intensely shattered and argillic to propylitic altered assemblages flooded with a stockwork of fine pyrite and quartz stringers, occasionally amethystine. Gold values of up to 0.136 oz/t and silver to 0.75

ALPINE EXPLORATION,
GOLD GEOCHEMISTRY (in ppb), SILVER (in ppm)
MORRAINE SHOWING
Whitesail Range (NTS 93E/11)
Omineca M.D.

FIGURE 8

0 50 100 metres

- Sample site 1986
- Sample site 1983
- ▲ Soil
- 755: Gold-- ppb
- 39: Silver-- ppm
- A Area in text
- Trend of vein & float



oz/t were obtained from this region in 1982. Values of up to 1,300 and 1,400 ppb Au were noted in 1986 (see samples Tr 201 to 231 and PH 107 to 125). Along the western margin of this zone, adjacent the propylite argillic alteration boundary, a silicified band of rock trending 030/70 E contained most of the significant values noted from this zone.

Blitz Showing

A prominent knob, south of Blitz Creek is bisected by a major northwest trending shear zone (Blitz Fault) defined by a prominent low relief gulley up to 15 meters width. Blast-pit trenching in 1986, across this gulley revealed a mineralized, silicified zone measuring 3 meters in width adjacent to the western margin of the shear zone. A second cut across the zone showed a 1 meter wide silicified zone. Mineralization comprised silicification of lapilli tuffs associated with abundant fine-grained stibnite and marcasite. Precious metals, associated with the stibnite-marcasite are negligible (Samples TR 307 to 315).

Immediately to the north of the stibnite-marcasite mineralized zone, along the north slope of Blitz Knob, two float boulders, located in 1982, gave anomalous precious metal values. Both samples are of fine-grained sugary quartz containing 1,400 and 330 ppb Au and 658 and 21 ppm Ag.

The northward extension of the Blitz Fault zone is traceable through two sets of parallel faults, separated by 50 meters, both containing mineralized showings and coincident with anomalous gold soil geochemistry. Along the eastern fault splay a 2 meter zone of quartz-arsenopyrite mineralization was uncovered by trenching. Samples from this zone are yet to be processed. The western splay is known to extend northward, and likely connects with the southward extension of the Moraine Showing. Along this fault trace is an anomalous soil sample of 250 ppb Au (1983), and gold to 0.494 oz/t from a stringer (1982). Other anomalous samples from 1983 include 1980 ppb Au (83WH 22) from a 0.3m zone adjacent to the fault and 3,200 ppb Au and 7.2 ppm Ag (83WG 417) from 2 m X 3 m of silicified quartz breccia. The locations of the 1983 samples can be found of Figures 9 and 10.

The connecting of the Blitz fault zone with the Moraine showing defines a structure with just under 2 miles (3,000 m) strike-length, mineralized intermittently along its entire known length.

Flare Showing

The Flare Showings consists of silicified zones and lenses within a major east-northeast trending shear zone located near the east margin of the Whitesail Claim. The shear zone is

exposed intermittently for 1,000 meters along the north-facing slopes of Blitz Creek. Exposures are limited to gulley washes across the mineralized zone. Grab samples in 1982 gave values of up to 0.044 oz/t gold and 3.63 oz/t silver. Several further grabs were collected in 1983 from a 5m wide zone of pyritized, silicified and argillic lapilli tuffs which gave results up to 200 ppb Au and 7.2 ppm Ag (83 WG 415) and 740 ppb Au and 4.2 ppm Ag (83 WG 417).

Trenching and channel sampling in 1986 produced anomalous but not significant values from this zone. Samples TR 282 to 306 were collected from the Flare showing.

Zinc Creek

The Zinc Creek Showing comprises a series of narrow vertical-dipping, northeast-striking, quartz-sulphide-barite veins up to 60 cm wide. They cut moderately westerly dipping siltstones and sandstones of the Hazelton Group. Grab samples gave 1.36 oz/t Au and 0.33 oz/t Ag from a barite-calcite vein (10cm thick), and 65.14 and 78.64 oz/t Ag with low gold from two chalcopjute-quartz veins 10 m apart and 10 cm thick. Although these veins are not of potential economic width, their high precious metal values indicates an area of potential interest. The showings are near the southwest contact of the Troitsa Complex.

A sample collected in 1986 gave 2,330 ppb gold (PS 149).

Wolverine Showing

The Wolverine Showing, near the northeast corner of the Whitesail Claim, consists of minor silicification and bleaching of lapilli tuffs adjacent to minor northeasterly trending faults. A series of five, two-meter-long channel-samples collected in 1982 gave average assays of 0.022 oz/t Au and 0.21 oz/t Ag over 10m across the showing. Sampling in 1982 of the same trenches gave an average of 232 ppb Au. No new data was collected in 1986.

Chalco Creek (Suratt) Showing

The Chalco Creek Showing lies immediately northwest of the junction of the Discovery Fault and the Whitesail Fault Zone, at the headwaters of Cummins Creek. It consists of about 12 discrete veins hosted in highly fractured and propylite altered lapilli tuffs, cut by felsite dykes. Veins trend in two directions: northerly (000-030 deg.) and easterly (050-070 deg.). All dip steeply. The veins range from 10 cm to two meters width, commonly between 50 and 150 cm. The pinch and swell and may display prominent rolls. The veins are dominantly dark to milky, dense, fine-grained to chalcedonic quartz. They are massive to finely banded. Siderite veins are present. The veins contain chalcopjrite, pyrite, galena, sphalerite and

possibly tetrahedrite. Sulphides are generally disseminated, but on occasion are massive pods. Geochemistry results (1982) showed mainly silver with values of 298, 238, 34, 31, and 27 ppm. Gold is anomalous with values of 305, 290, 230, 210, and 160 ppb. This system probably relates to tension gashes resultant from fault movement. It was not visited in 1986.

Cummins Creek Vein System

Numerous quartz veins, trending mainly north north easterly and east-northeasterly were discovered in the Cummins Creek drainage along the southern boundary of the Wind Tunnel claim and throughout the Jesse claim in 1982. A float boulder, located then, gave 1.34 oz/t gold and 293 oz/t silver, and was traced to two prominent veins (1 to 2 m width) exposed in Cummins Creek. Grabs from these veins gave results of 0.33 oz/t gold and 64.9 oz/t silver, with mineralization associated with pyrite, galena, argentite and pyargante. Detailed channel sampling and limited trenching along these veins exposed in the creek by Canamax (1983) did not produce results of immediate significance.

In September 1986, a short prospecting program on the Cummins Creek area was undertaken to attempt to establish the area distribution of the quartz veining system noted in the creek. This program outlined an extensive area underlain by quartz veining and proximal float boulders of quartz, some containing anomalous precious metal values. In addition, new veins were noted within Cummins Creek itself. Best value of 0.127 oz/t Au and 76.14 oz/t Ag (BH 209) was a grab from a vein trenched by Canamax (1983). Samples include BH 201-211 and PS 170-190. Argentite, galena and chalcopryrite in quartz float was noted west of Cummins Creek. New showings containing silver values of 11, 25 and 31 oz/t, and gold to 0.097 oz/t, in vein systems, 400 to 600 meters to the south of the known showings in Cummins Creek, were discovered in 1986. This area is underlain by a large amount of proximal quartz float and veins 2 m width.

SOIL GEOCHEMISTRY

In 1983 Canamax ran an extensive soil sampling program over a grid that covers roughly 35% of the P.S. and Whitesail Claims (see Figure 5 for the locations of this grid). The grid runs southwesternly from the southeastern corner of the P.S. Claim to the southwestern corner of the Whitesail Claim. 1360 soil samples were collected at 25m intervals on 31 parallel, southeasterly-trending lines, 100m apart. The samples were analyzed geochemically by Rosbacher Laboratory for Au, Ag, Pb, Zn, Cu and Mo. The data was analyzed statistically by Canamax with the following results (Cawthorn et al, 1984, p.14)

	<u>Anomalous Threshold</u>	<u>Highly Anomalous</u>	<u>Peak Value</u>
Au	20 ppb	100 +	570
Ag	0.8 ppm	2.0 +	8.6
Pb	100 ppm	500 +	6,500
Zn	200 ppm	500 +	3,600
Cu	100 ppm	200 +	580
Mo	5 ppm	10 +	450

N.G. Cawthorn et al (1984) identified 10 different gold and/or silver anomalies, a large and intense lead anomaly and some lesser lead, zinc and/or copper anomalies over the area covered by the grid. A summary of the more important anomalies follows. Outlines of these anomalies can be seen on Figures 9 and 10, pages 27 through 30

One gold-silver anomaly occurs around the Flare Showing. This anomaly with up to 570 ppb Au and 2.4 ppm Ag, extends 240 m in an east-northeast direction.

A large lead anomaly of greater than 100 ppm extends west-northwest for 1,200 m from 10+00S on line 24+00E on the Canamex grid. This anomaly is 150 m wide, but it narrows to the west. A zone of anomalous zinc of up to 2,500 ppm is roughly coincident. Within the area of anomalous lead are three zones of greater than 500 Pb, ranging from 160 to 250 m long, with values up to 6,500 ppm. The whole anomalous area mainly overlies porphyritic quartz monzonite with large, bladed-feldspar phenocrysts and heterolithic breccia of the Troitsa Complex. Quartz veins with anomalous precious metals have been found here.

Coincident with the east and west parts of the above, large, lead anomaly are large silver-gold anomalies. Silver is consistently anomalous across these areas whereas anomalous gold values are scattered. Values range up to 8.6 ppm Ag and 250 ppb Au. The Moraine Showing occurs on the north side of the above anomalous area. The northwestern part of this anomaly is located on a moraine.

Extending 1,500 m southwest from the east end of the above lead anomaly is a silver-gold anomaly up to 125 m wide with values ranging up to 120 ppb Au and 3.6 ppm Ag. This is reported to be underlain by bleached and altered shear zones in the Cummins Creek Group volcanics. The southeastern part of this anomaly along lines 1,500 and 1,600 E. as well as scattered anomalous values to the south-southeast appears to be related to the Blitz Fault.

Much of the area north, west and south of Blitz Knob is anomalous in copper. West of Blitz Knob is an area anomalous in lead. Values range up to 580 ppm Cu and 308 ppm Pb. Both the copper and lead anomalies show roughly coincident zinc

anomalies. Silver and gold is also anomalous in these areas. Mapping revealed that minor galena, arsenopyrite and chalcopyrite occurs in fractures cutting lapilli tuffs.

Several smaller anomalies in gold and silver occur within the area covered by the grid. These do not appear to have been investigated. Finally, some of the anomalies southwest of Blitz Knob are open to the southeast as well as the large lead-silver-gold anomaly to the north which appears to be open to the west.

Canamax also ran a soil sampling program over a grid over the northeast corner of the Jesse Claim and the southeast corner of the Wind Tunnel Claim. Four low grade silver anomalies were identified with some anomalous gold values. The largest anomaly crosses and is sub-parallel to Cummins Creek for 560 meters southeast of the point where the creek crosses the boundary between the Wind Tunnel and Jesse claims. This is the area where mineralized quartz veins are found.

CONCLUSIONS AND RECOMMENDATIONS

The general geologic setting is highly favourable for hosting epithermal precious metals deposits. Collapsed caldera structures and associated fault structures are common hosts to precious metal deposits (Sillitoe, 1980). The Whitesail Lake area has been interpreted by McIntyre (1978) as such a setting. In such a setting, the following styles of epithermal precious metal deposits may be expected: vein and shear hosted, breccia hosted and volcanic hosted.

The Moraine Showing presents a potential vein and breccia hosted target with both high-grade and low-grade bulk tonnage potential. Vein and shear hosted targets include anomalies along the Blitz fault zone and in the Cummins Creek vein system, where bonanza potential exists.

Phase One of the program, carried out in September 1986, consisted of detailed prospecting, sampling, trenching and geological interpretations of showings discovered and outlined in 1981, 1982 and 1983 by Dr. T.A. Richards, Union Carbide Canada Ltd. and Canamax. The purpose of Phase One was to evaluate the previous work, locate potential drillable targets and to determine the direction of Phase Two of the project. Results of phase one have outlined targets for drilling in the Moraine show area across which a series of short to medium depth (100 to 200 m) holes is recommended to be drilled. Areas where further follow-up by trenching, detailed prospecting and sampling may define further drill targets, include the Cummins Creek area and along the Blitz Fault. Prospecting, as a routine measure, should be continued on the property to evaluate anomalous areas not investigated in 1986, particularly along the northern extension of the Moraine Showing, in the headwaters of

Cummins Creek, and on the Chalco Creek Showing area. VLF-EM should be done across areas of high overburden to locate structures. Soil survey grids should be done across selected areas to confirm and further outline soil anomalies noted from the 1983 work.

BUDGET ESTIMATES: TROITSA PEAK PROPERTY

	<u>PHASE 1</u>	<u>PHASE 2</u>
Geologic Mapping, Supervision	6,000	12,000
Prospectors, Assistants, Labor	12,000	30,000
Camp Costs	3,500	12,000
Equipment Rentals	3,000	8,000
Supplies	3,000	7,000
Travel (including helicopter)	5,000	12,000
Geochemistry	6,000	15,000
Diamond Drilling (est. \$35/ft.)	-	70,000
Office, insurance, expediting	1,000	5,000
Report Preparation	3,500	6,000
Engineering, Consulting	2,000	3,000
Contingencies	<u>5,000</u>	<u>20,500</u>
	<u>50,000</u>	<u>200,500</u>