FIELD

CASAU SURVEY REPORT

1983 PROGRAM

CASSIA AREA 104P,1040

672031

CASAU SURVEY REPORT

FOR 1983 PROGRAM

CASSIAR AREA 104P, 104O

by

J.C. STEPHEN A.E. HEAGY

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J.C.STEPHEN EXPLORATIONS LTD.
1458 RUPERT STREET
NORTH VANCOUVER, B.C.

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ORGANIZATION AND SCOPE OF PROJECT

The Casau Survey was arranged under an agreement prepared by Newmont Exploration to operate in the Cassiar Region defined as NTS map sheets 1040/1, 8, 9, 16; 104P/1 to 16; 104I/9, 13 to 16. The budget for the program was set at $75,000 and priority was understood to be on the search for precious metals.

J.C. Stephen had previously recommended prospecting the Sylvester formation within the Cassiar geosyncline for volcanic centres which might have associated precious metal mineralization. This assumption was based on such considerations as the indication in GSC Memoir 319 that the Sylvester contained an unusually high percentage of volcanic rocks in the McDame gold area and the age relationships indicated by Panteleyev and Diakow indicating the age of gold mineralization in the district to be 131 m.y. while nearby granitic intrusives were dated at 73 m.y.

Exploration in other formations for silver lead zinc mineralization had also been recommended based on discoveries at Midway and examination of the ROMAN claim group on the Liard River at the Yukon - B.C. boundary northwest of widespread zinc geochemistry indicated by published regional geochemical data.

In view of limitations imposed by a $75,000 budget the program conducted during 1983 concentrated almost exclusively on prospecting the Sylvester formation. Reconnaissance ranged from the Tootsee Lake area, to the northwest, along the synclinal structure to the south margin of map sheet 104P near Eagle and Sheep mountains. Minor work was done within maps 1040/9 and 16. No work was done within map sheet 104I. No investigation of zinc geochemistry in the east portion of map 104P was done.

Capital Helicopters had earlier been engaged to provide helicopter support for a larger program in the same area but accepted the stringencies of the reduced budget and substantially subsidized the program by basing a Hughes 500C helicopter at the base camp during June 27 to August 8 and by supplying a Bell 206 from Atlin, when required, with no ferry charge from August 8 to August 28 at the end of the field work.

Work was done with a crew averaging six people with Audrey Heagy as senior geologist. Crew members were among the best available for this type of work and all put forth consistant enthusiastic effort.

REGIONAL GEOLOGY

Government reconnaissance geological mapping in the CASAU survey area was conducted by H. Gabrielse in the 1960's. The McDame sheet (104P) is published as GSC Map 1110A in Memoir 319, while the Jennings River Sheet (104O) is GSC Map 18-1968 and accompanies Paper 68-55.

More recent detailed mapping by Panteleyev and Diakow (B.C. Geology Branch Papers 1979-1, 1981-1, 1982-1) was restricted to the immediate area of the Erickson - Cusac (McDame) camp and the area of the varied mineral deposits near the Cassiar townsite.

The geology of the region can be subdivided into three terranes: a platformal sequence, an oceanic terrane and a group of large intrusions.

Platformal Terrane

The platformal rocks include carbonate and clastic sedimentary strata ranging from Late PreCambrian to Devonian in age. This sequence includes the Good Hope, Atan, Kechika, Sandpile, and McDame Groups.

As mapped during this reconnaissance survey the Good Hope Group is largely limestone while the Atan Group includes limestone, dolomite, siltstone and quartzite. Quartz-muscovite and quartz-feldspar schists have been included in the Atan Group although they may be older.

The Kechika Group black shales, and sandy dolomite and quartzite of the Sandpile Group are relatively thin units in the survey area. The McDame Group lies at the top of the platformal sequence and includes black fetid dolomite and limestone and dolomite breccia and calc-arenite.

Oceanic Terrane

The oceanic assemblage is an allocthonous terrane which has been thrust onto the platformal rocks. The entire greenstone-argillite-chert package forms the Sylvester Group of Mississippian to Upper Devonian age.

The lower Sylvester is dominantly sedimentary and includes argillite, chert, chert conglomerate, graywacke, shale and only minor volcanic intervals. The Upper Sylvester rocks are typically thick massive andesitic volcanics. Minor dacite and basalt are present as well as discontinuous beds of tuffaceous chert, limestone and argillite. The volcanics often appear to be tuffs or agglomerates but much of the volcanic rocks are structureless and may include flows, sills and pyroclastics.

Chlorite - epidote - calcite - albite alteration is abundant. Iron carbonate alteration zones are locally associated with faults and fractures within the Sylvester rocks.

Intrusive bodies restricted to the Sylvester terrane include a heterogeneous group of small diorite stocks and numerous small pods of serpentinite and larger sills and stocks of peridotite, pyroxenite and serpentinite. The ages of these intrusive rocks are not known but the diorites may be feeders to the Sylvester volcanics while the ultramafic bodies are alpine-type intrusives related to the emplacement of the allochthonous oceanic terrane.

Intrusive Terrane

The large intrusive bodies in the survey area include the multi-phase Cassiar Batholith along the western boundary of the area, the Plate Creek Stock in the northeast corner of the Jennings River sheet, and the Four Mile River Stock at the southeast limit of the reconnaissance coverage. These intrusions are of Jurassic to Late Cretaceous ages and include quartz diorite, granodiorite, quartz monzonite and minor granitic porphyry phases.

Structure

The dominant structural feature of the area is a northwesterly trending anticline - syncline pair. The Sylvester Group occupies the core of the southeast - plunging McDame Synclinorium. The anticlinorium to the west has been intruded by the Cassiar batholith.

Abundant small-scale folding and faulting is evident in the platformal strata. These structures are difficult to recognize in the massive Sylvester Group rocks but the discontinuity of sedimentary beds, local shearing, intercalated ultramafic pods and air photo linears indicate extensive internal deformation within the oceanic terrane.

REGIONAL GEOCHEMISTRY

Government reconnaissance silt geochemistry has been published for both the McDame and Jennings River sheets (GSC Open Files 561, 562. 1978) Neither arsenic nor gold were analysed during the government survey.

Silver, lead and zinc anomalies, especially in the lower Sylvester Group or underlying McDame Group rocks, had been staked following the Midway discovery. Location of claim groups is shown on Map I with this report.

Regionally the Sylvester terrane silt geochemistry has significantly higher levels of copper, cobalt, nickel, iron and manganese than the platformal or intrusive terranes. Multi-element anomalies including silver, lead, zinc, tungsten and molybdenum are also associated with the younger small granite porphyry intrusions such as at Mt. Haskins and Needlepoint Mtn.

During the 1983 CASAU survey, geochemical analyses were made on a total of 913 samples including 268 silt samples. About 50% of the samples were collected from the five properties acquired during the program. The distribution of sample types and determinations are given in Table I.

CASAU SURVEY TABLE I

RECONNAISSANCE GEOCHEMISTRY

GEOCHEMICAL SAMPLE TYPES

SILT	268	29.3%
SOIL & TALUS	301	33.0%
ROCK	344	37.7%
TOTAL	913	100.0%

DETERMINATIONS

GOLD	871	32.6%
ARSENIC	830	31.0%
ZINC	506	18.9%
SILVER	138	5.2%
COPPER	272	10.2%
LEAD	30	1.1%
OTHER	27	1.0%
TOTAL	2674	100.0%

Silt samples were analysed for gold, arsenic (gold pathfinder), and zinc (most mobile element in silver-lead-zinc deposits). Rock and talus samples were analysed for gold and usually one or more of arsenic, silver, zinc, copper or lead. The reconnaissance geochemistry is plotted on Maps II to IX provided with this report.

The gold geochemistry of the silt samples was uniformly low with 84% of the samples conaining no detectable (<10 ppb) gold. Erratic values of 10 to 20 ppb gold are not considered significant but a cluster of values of 20 to 170 ppb gold in silts from small drainages just east of the main Erickson - Cusac camp is of interest. These particular analytical results were obtained after the end of the program and ground follow up in the area was not possible.

Arsenic values in the silts were generally in the 5 to 20 ppm range. Values of 20 to 80 ppm arsenic in silts appear to be related to areas of the Sylvester volcanics with iron-carbonate alteration which often carry 100 to 1000 ppm arsenic, or with small showings of arsenic bearing mineralization

Zinc silt geochemistry ranged within the regional background of up to 250 ppm zinc.

The rock, soil and talus sampling was largely on the acquired properties and is discussed separately. The highest gold value was 1200 ppb. This anomaly and a few weaker gold and arsenic anomalies are discussed in the prospecting results section of the report.

Values above 20 ppb gold or 50 ppm arsenic were considered anomalous for reconnaissance rock geochemistry in the survey area. Areas of iron carbonate alteration within the Sylvester volcanics often ran up to 1000 ppm arsenic and occassionally had values of 20 to 100 ppb gold. Several occurrences of copper mineralization in the Sylvester rocks did not carry any gold or silver values. Sampling in an area of white barite vein float near the favourable McDame-Sylvester contact did not reveal any zinc or lead values. Sampling of mineral showings in the Atan Group, including heavy galena and chalcopyrite-bornite mineralization failed to indicate any significant precious metals content.

PROPERTY DESCRIPTIONS

EAGL CLAIM GROUP

SUMMARY AND CONCLUSIONS

The 40 unit EAGL claim group is located about thirty-five kilometres southeast of Cassiar B.C. The EAGL 1 and EAGL 2 claims were staked in July and August 1983 and a total of 28 man days were spent on the claims. Preliminary geological mapping, intensive prospecting and geochemical sampling of rock and talus material from numerous alteration zones were carried out at a total cost of $6,391.00.

The geology of the claim group consists largely of structureless, epidote-chlorite-calcite altered, andesitic tuffs and breccias. Considerable argillite occurs interbedded with tuffs on the EAGL 1 claim and minor siltstone, chert, chert arenite limestone and serpentinite are also locally present. All lithologies belong to the allocthonous Upper Devonian to Mississippian Sylvester Group.

The structural geology of the area is complex and poorly understood. The air photo of the area shows a striking pattern of intersecting lineaments. The ground expression of these lineaments are walled linear gullies typically floored by glacial drift and often containing small ponds. Numerous areas of iron carbonate alteration, with traces of pyrite, arsenopyrite and mariposite; and quartz veins with traces of pyrite, chalcopyrite, galena or sphalerite; occur along the base of the outcrops on either side of these linears and along steep, northeast striking joints adjacent to the gullies.

Eight poorly exposed areas of manganese stained float are associated with the significant mineralized showings so far located.

The showings consist of fine drusy quartz-pyrite veins and vein breccias and colloform textured iron carbonate vein breccias with minor to massive amounts of stibnite, arsenopyrite, sphalerite, galena and chalcopyrite mineralization. Geochemical sampling of these zones returned values of 150 to 1080 ppm gold as well as strongly anomalous arsenic and zinc values. A rock sample from a sphalerite-galena breccia showing contained 220 ppb gold and greater than 100 ppm Ag.

A total of some three hundred rock, talus, soil and silt samples were collected and analysed for gold, arsenic and usually zinc geochemistry. Only a few silver analyses were run. Values of 50 ppb gold or higher were found in 16 rock, 24 talus and 3 soil samples. In addition to the twelve samples taken from the anomalous manganese-stained zones, twenty seven anomalous rock and talus samples were collected elsewhere on iron carbonate zones. One sample of silicified andesite with traces of pyrite and pyrrhotite ran 500 ppb gold.

The anomalous gold values and visible mineralization and alteration zones are clearly controlled by the recessive-weathering linear fracture sets. Very little frost-heaved material has been observed in the glacial drift which floors these linear gullies. The mineralization and anomalous gold values found to date strongly suggests that these gullies might cover an extensive quartz vein system with significant gold and/or silver mineralization.

A two phase program of exploration work is recommended on the EAGL group in 1984. Phase One would consist of intensive prospecting along the gullies, detailed mapping of lithology and alteration types, thorough analysis of the structural geology of the claim area and further selective geochemical sampling. Phase Two would involve trenching to expose the bedrock in selected parts of the linear gullies associated with mineralized showings. Selection of specific trenching targets is dependent on the results of the first phase of the program. The relative merits of mechanical trenching versus hand trenching and blasting will depend on the number of targets selected and their suitability to either method of trenching.

A complete report on EAGL claim group is submitted as a separate report.


ELDURADO M&PET.
BRINCO
SAU
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STOLLERY
IDE
CAN.OCCID.
ASSIAR MINE
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BRINCO
DEKALB
UNITED
HEARNE
PLAZA
STORIE
ERICKSON
GOLD
FOX
PENDLETON
PLAZA
PLAZA/
CUSAC
SILVER
STANDARD
UMEX
AN. OCCIDENTAL
RIVER
EAGL
DALTO
CASAU SURVEY
LOCATION MAP
104P/3,4
1:250,000
Figure 1

FOX 1 MINERAL CLAIM

SUMMARY AND CONCLUSIONS

The FOX 1 claim is located 15 kilometres east of Cassiar B.C. on the fringe of the Cassiar (McDame) lode and placer gold mining district. The claim was staked in August 1983 to cover a tetrahedrite bearing quartz vein located in pyritic shale of the Sylvester Group.

The geology of the property consists of pyritic shale and andesitic flows and volcaniclastics of the Sylvester Group. Miner serpentinite, greywacke, chert and diorite are found in the area.

A well mineralized sample of the quartz tetrahedrite vein material assayed 0.003 oz per ton gold, 7.28 oz per ton silver, 0.57% arsenic, 1.86% copper. A chip sample across the two metre width of the vein ran <10 ppb Au, 340 ppm As, 11.5 ppm Ag and 1250 ppm Cu. No other anomalous samples were collected on the claims but several anomalous stream silt samples, carrying up to 170 ppb Au, were collected from open ground to the south of the FOX claims.

In itself the known mineralization is of limited interest but the area has good potential for additional mineralized veins. If such a vein system could be traced into the volcanic rocks it might contain significant gold and silver values.

Further work is recommended on the FOX 1 claim and in the open ground to the south. A program of intensive prospecting and geochemical silt and soil sampling accompanied by geological mapping and structural analyses is proposed.

A complete report on FOX 1 mineral claim is being submitted separately to accompany this report.

DALTO MINERAL CLAIM

SUMMARY AND CONCLUSIONS

Reconnaissance traverses located minor sulphide mineralization and easterly trending iron carbonate zones within volcanics of the Sylvester Group. The 20 unit DALTO claim was staked and reconnaissance mapping and talus, silt and rock geochem sampling was carried out on the property.

The initial program returned one anomalous value of 200 ppb gold and 1000 ppm arsenic from an iron carbonate alteration zone. No other significant results were obtained. Two rock samples collected at a later date along the above iron carbonate alteration zone contained <10 ppb gold.

The low gold geochemistry of the weak sulphide mineralization and iron carbonate alteration zones on the DALTO claim does not warrant further follow up work.

LOCATION AND ACCESS (Figure 1.)

The DALTO claim is located about 40 km southeast of Cassiar, B.C. in NTS sheet 104P/3W. The claim is located in a rolling plateau area and includes several small lakes and ponds. Drainage from these lakes is northerly into Dalton Creek and then into the Dease River. The northern end of five mile long Meek Lake lies just south of the DALTO claim.

Although Meek Lake is suitable for floatplanes, access to the property was by helicopter. The closest road access point is on the Stewar--Cassair highway approximately 22 km west of the property.

GEOLOGY

Map X with this report, is an enlargement of part of the published 1:50,000 topographic map. The plateau area is at or above treeline and outcrop is very good although of limited vertical exposure.

The following rock units were observed. Age relations are uncertain. Except for rock units 3a- quartz sericite foliated rock; and 3c- iron carbonate alteration, the rocks are moderately fresh in appearance. The volcanics belong to the Sylvester Group except for unit 4, Recent Basalt, which is probably of Tertiary age.

ROCK TYPES:

1. ANDESITE TUFF Medium to fine grained, grey green, sometimes chloritic, strongly jointed, resistant, light brown to grey weathering. Contains minor disseminated pyrite. This rock is slightly foliated but contains few quartz stringers. Locally contains thin lenses of limestone.

2. DACITE 2a) flow banded, fine aphanitic texture, light green, silicious, strongly jointed, resistant, light gray to white weathering, disseminated pyrite, pyrrhotite, magnetite, chalcopyrite.

   2b) dacite tuff, medium grained, light green, rough weathering surface, strongly jointed, gray to light brown weathering, quartz veining and chloritic alteration, minor disseminated pyrite.

   2c) dacite tuff, coarse grained, light fine grained green matrix, small rounded clast, white to dark green in color. weathering uneven at surface, minor disseminated pyrite.

3. ALTERATION ZONES 3a) Quartz-sericite white-yellow to orange colour, large disseminated pyrite cubes, strongly foliated. Rather porous and granular. This rock may be an altered shear zone or tuff horizon or possibly an altered intrusive dyke complex. This zone contains large white quartz veins up to 50 cm in width which are irregular and discontinuous.

3b) Quartzite - limestone lenses - Very small lenses of clean, white to buff, thin bedded quartzite contain limonite on weathered fracture surfaces.

Thin, (few centimetres) lenses of limestone one or two metres in length occur within the dacites. No mineralization occurs with these lenses.

3c) Iron-carbonate Alteration Light orange weathering, limonitic,minor disseminated pyrite, some silicification narrow quartz veins.

4. BASALT Black, relatively coarse grained,spheroidal weathering, breaks with a rough surface, weathers black to dark brown. Contains irregular pods to 1 cm long of a tan coloured granular mineral - possibly olivine. The rock may be a Tertiary basalt flow or dike.

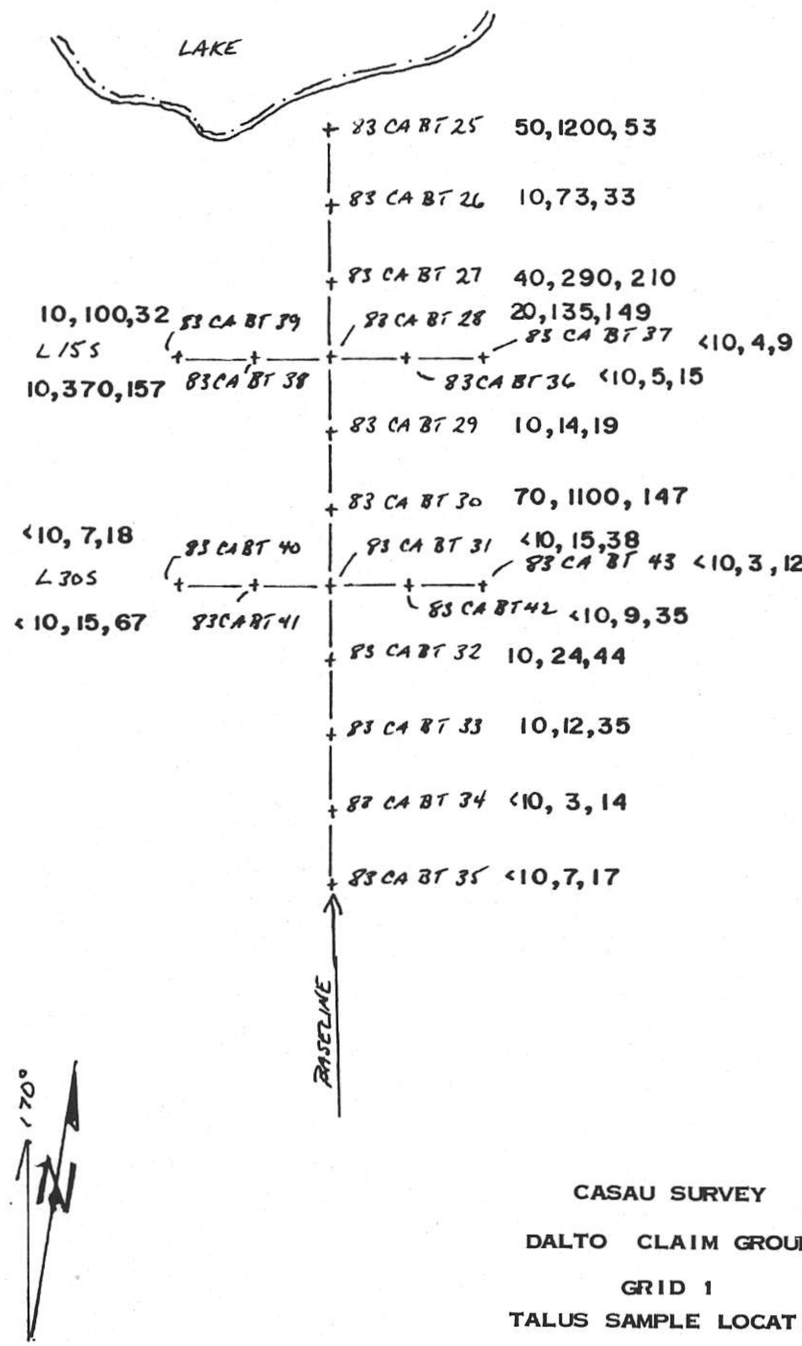
Alteration and Mineralization

The easterly-trending iron carbonate alteration zones in the northern portion of the DALTO claim can be traced for over a kilometre. The quartz - sericite - pyrite alteration zone in the same area is much less extensive but also trends easterly. The latter is spatially associated with several large quartz veins while the iron carbonate alteration is not generally associated with either quartz veining or silicification. Several less continuous carbonatized zones are present within the volcanics elsewhere on the claim.

Quartz veining is fairly common in the area especially in the finer-grained dacitic units. These veins vary from +1 m wide, NNE - trending milky white quartz veins to fine hairline vein stockworks within the flow-banded dacite. The veins often carry traces of pyrite, chalcopyrite and magnetite.

The small sulphide showing (Figures 2, 3) consists of disseminated pyrite,chalcopyrite, pyrrhotite and magnetite within the coarse-grained dacitic tuff. The outcrop is noticeably rusty-weathering relative to the unmineralized volcanics.

GRID 1



CASAU SURVEY

DALTO CLAIM GROUP

GRID 1

TALUS SAMPLE LOCATIONS

JULY 19 1983 M.P. WEBSTER

SCALE: 0 5 10 15 meters

AU, AS, CU

FIGURE 2

GRID 1

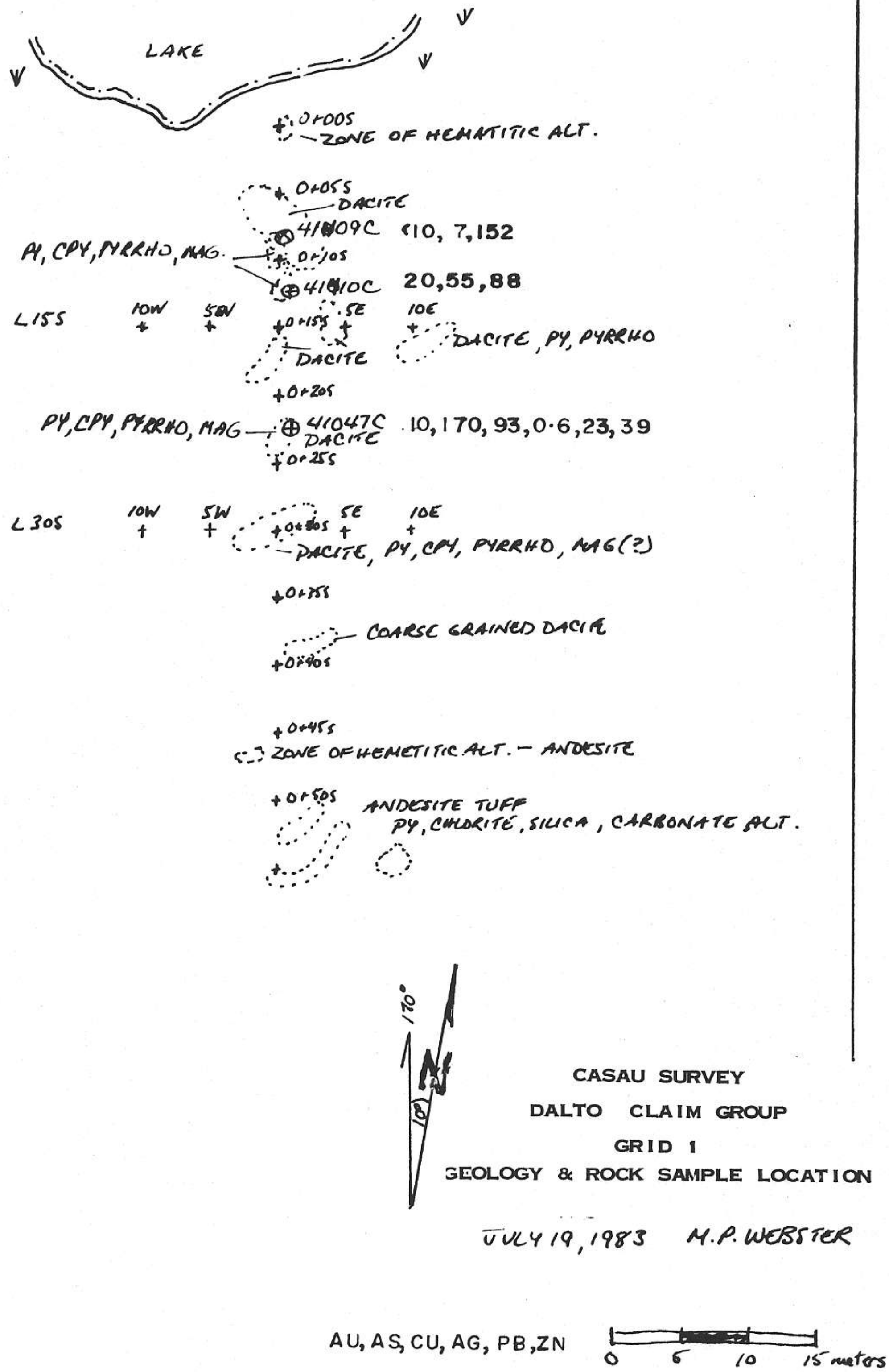


FIGURE 3

GEOCHEMISTRY

A total of 29 rock samples, 40 talus samples and 10 silt samples were collected for analysis. Sampling concentrated on the small sulphide zone and on some of the better quartz veins. Samples were all analysed for gold, arsenic and copper with a few additional analyses being done on selected samples.

Rock Geochemistry

Of the 29 rock geochem samples six returned values of 20 ppb gold and six returned values of 10 ppb gold. The remainder ran less than 10 ppb. Of those samples giving 20 ppb gold three were dacites. Presence of chalcopyrite, as in 41411C, or pyrite, limonite mineralization did not appreciably affect results.

Five of the rock samples contained 106 to 285 ppm copper. Arsenic values range from 2 to 17 ppm in all but two samples which ran 55 and 150 ppm. No arsenopyrite was recognized.

Sample 41416C of moderately iron carbonate altered dacite with about 2% disseminated pyrite gave 20 ppb Au and 150 ppm As. The iron carbonate alteration zones were not otherwise sampled during the initial program.

Talus Geochemistry

Of the 40 talus samples collected 20 returned <10 ppb Au, 10 returned 10 ppb; 9 returned 20 to 70 ppb and one returned 200 ppb Au. Of all these samples 19 are from the small grid on the sulphide showing, four of the values between 20 and 70 ppb were obtained here. The 200 ppb Au sample is from the vicinity of one of the vein carbonate alteration zones.

Arsenic values of 3 to 24 ppm generally coincide with gold values of <10 ppb although there is considerable overlap with the As range of 11 to 73 ppm corresponding to 10 ppb Au. Two samples running 10 ppb Au are anomalous for As having returned 100 and 370 ppm. The gold values ranging from 20 to 70 ppb correspond to arsenic values of 135 to 1200 ppm except for two 20 ppb values which each returned 16 ppm As. The 200 ppb Au sample gave 1000 ppm As. This general correlation of values is more consistant on this property than has been found in the region in general.

Copper values for talus samples range from 9 to 275 ppm. Four of the 13 values over 100 ppm copper come from the small grid on the sulphide showing. There is little correlation between gold and copper values.

Silt Geochemistry

The ten silt samples returned values of 10 or <10 ppb gold and 4 to 46 ppm arsenic. Copper values range from 30 to 170 ppm but there is little or no correlation with arsenic values.

Recommendations

Due to the low gold values obtained in geochemical sampling of the DALTO claim, no further work is recommended.

SAU MINERAL CLAIM

SUMMARY AND CONCLUSIONS

Reconnaissance prospecting for precious metals within the Sylvester group rocks of the McDame map sheet returned a value of 240 ppb on a rock geochem sample at the head of a north flowing creek. The gold geochem value was associated with a very small occurrence of malachite bearing sheared chert separated by faults on either side from outcrops of ultra basic intrusive.

Prospecting was conducted in the general area and the SAU four unit claim was staked on a westerly striking iron-carbonate altered fault zone. Quartz and carbonate veining, mariposite and pyritic mineralization are present and were well sampled. The structure cuts both sediments and volcanics but sampling results are uniformly negative. No further work is recommended.

LOCATION AND ACCESS

SEE FIGURE 1.

The SAU claim is located 8 km west of Gallic Lake and 18 km northeast of Cassiar townsite in Map sheet 104P/5E. The claim is situated on a small west flowing creek between elevations 1370 and 1675 metres. Drainage in the main valley to the west flows north and north-easterly into the Blue River.

A network of exploration access roads runs north through the Cassiar mine area to service the TANYA asbestos prospect 3 km west of the SAU claim.

Small, treeline zone, timber is scattered thinly over the lower half of the property.

Access to the property, for this program, has been entirely by helicopter.

CASAU SURVEY

SAU CLAIM GROUP

1:31,680 FIGURE 4

GEOLOGY

Prospecting in the area extended from McDame Group limestones northwest of Gallic Lake westward through the sequence of west dipping Sylvester rocks to the SAU claim. The general sequence of rocks observed, illustrated diagramatically in Figure 5, from east to west, -

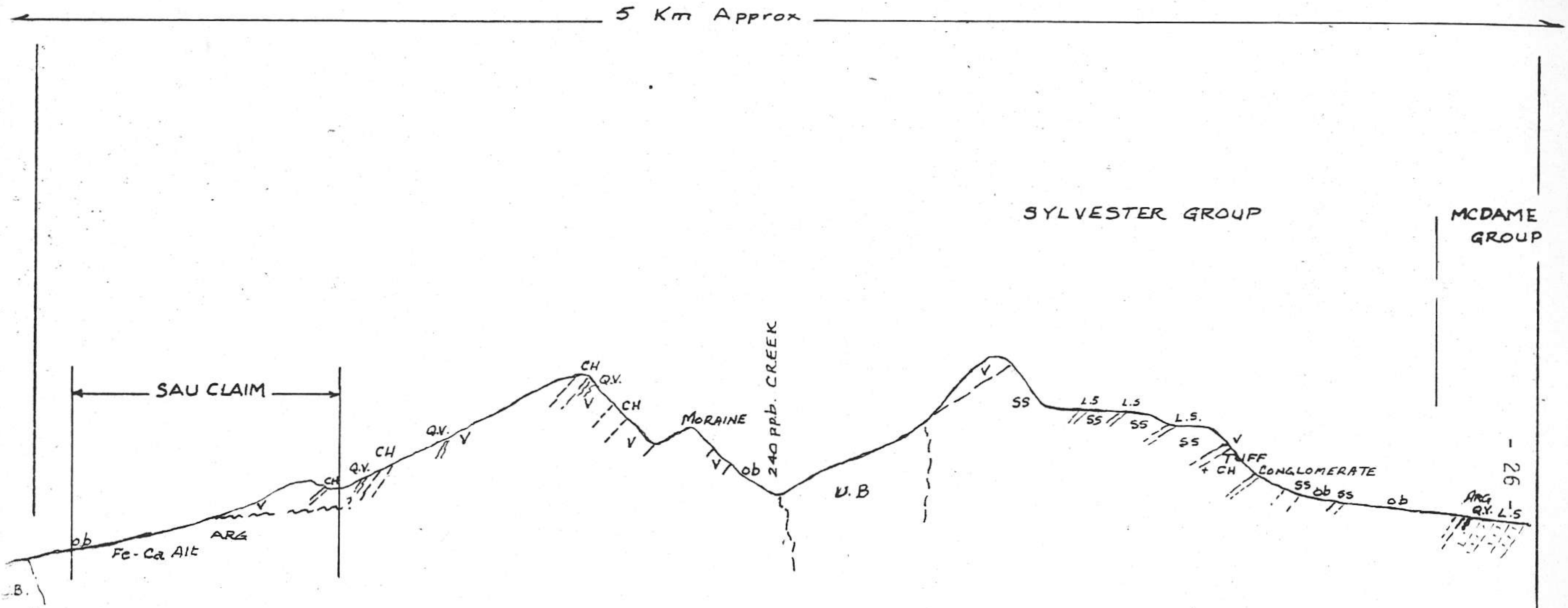
McDame Group - thin to thick bedded steeply dipping white limestone and dolomite conformably overlain by black shaley siltstone with fine pyrite seams. The limestones are cut by large white quartz veins with minor pyrite just below the siltstone contact.

Sylvester Group - A relatively broad area of overburden separates the McDame Group rocks from those assumed to be part of the Sylvester in the area traversed. The lowest outcrops of Sylvester are dark colored well bedded cherty siltstone with rare pyrite, overlain by relatively thin bedded sequences of chert pebble conglomerate,cherty tuff?, light weathering chert, green sheared tuff with hematitic zones and minor quartz veining, cherty siltstones, thin horizon green volcanic agglomerate, wide area black cherty siltstone rubble, thin limestone horizon dipping about 25° west, then about 1 kilometre of black thin bedded and sheared siltstone and argillite, some of it graphitic, which contains two recessive weathering limey horizons with networks of small quartz veins. The black siltstone horizon is overlain by massive dark grey green, somewhat rusty brown weathering volcanic breccias, agglomerates and tuffs. The contact between the siltstones and volcanics occurs on the east side of the north flowing creek north of the 240 ppb Au rock sample. The rock sequence is intruded here by a relatively large body of ultra basics trending southeast across the creek valley approximately 0.3 km west of the location plotted on the GSC map.

West of the ultrabasic intrusive similar volcanic rocks outcrop on the west side of the creek. This thick sequence of volcanics includes approximately 25% to 30% cherty sediments as lenses and thin beds often making up fairly thick horizons. The sequence appears to dip westerly. Zones of white quartz veins occur, without obvious alteration, generally within the volcanics but apparently structurally controlled by certain chert horizon contacts.

STRUCTURE AND ALTERATION

On the westerly slopes of the west ridge, in the area of the SAU claim the structure becomes considerably more complex. A fault zone trends 285°/90° from the top of the ridge into SAU creek. This fault is iron-carbonate altered and has quartz and quartz-carbonate veins extending into the walls. On the SAU claim sheared black argillite occurs south of this fault and is cut by a northwest trending fault dipping 45° NE. West of the junction of these fwo faults the exposed alteration zone appears to affect this rock type as well as irregular lenses of volcanics and light gray to black cherty argillite. Dips of these formations are uncertain but steep southerly dips are recorded in the west portion of the claim.



UB. - ULTRABASIC INTRUSIVE
CH - CHERT. CHERT BRX
V - VOLCANIC BRX. AGGLOM.
SS - SILTSTONE. ARGILLITE
L.S - LIMESTONE. DOLOMITE
ARG - ARGILLITE
Q.V. - QUARTZ VEINS
Fe.Ca - IRON CARBONATE ALTERATION
ob - OVERBURDEN

CASAU SURVEY
SAU CLAIM GROUP
DIAGRAMMATIC VERTICAL CROSS-SECTION FACING NORTH
NOT TO SCALE

FIGURE 5

PROPERTY GEOLOGY

MAPS XII, XIII

The following description of property geology is taken, in part, from field reports submitted by Henry Awmack and Audrey Heagy. Organization of the descriptions and conclusions drawn are from personal observations and interpretation.

ROCK UNITS

$\boxed{1}$ ARGILLITE - black fine grained generally sheared or phyllitic. Contains rounded pyrite "knots" below the 45° north dipping fault. Often graphitic. Pyrite along some sheared zones.

$\boxed{2}$ ANDESITE TUFF - Olive gray, fine grained, slightly chloritic, with minor pyrite and calcite stringers. Generally massive in appearance with smoothed contacts against sheared argillite in places.

$\boxed{2a}$ VOLCANIC BRECCIA, AGGLOMERATE - Dark green, generally fairly massive, rough and resistant weathering, dark rusty brown colored on weathered surface. Chaotic coarse to fine volcanic fragments.

$\boxed{3}$ CHERT Light grey to black, variably argillaceous and phyllitic with prominent warped bedding, interbedded with volcanic breccias.

$\boxed{4}$ ULTRABASICS - Serpentine, dunite etc.

$\boxed{5}$ IRON CARBONATE ALTERATION - Iron carbonates, silicification, minor quartz veining, some disseminated pyrite, some mariposite. Rusty orange weathering.

The rock units termed argillite and andesite tuff are components of the alteration zone in SAU creek west of the junction of the two main faults. They are confined to the south side of the iron carbonate altered fault zone in the eastern portion of the claim. Awmack indicates these formations generally dip southerly but their relationship to rock units 2a and 3 is uncertain.

Rock units 2a and 3, volcanics and interbedded chert in the east portion of SAU claim are part of formations described with Figure 5 above.

The iron carbonate alteration becomes weaker along the fault zone to the east of SAU claim but can be followed to the top of the ridge. Its width and intensity varies in the main creek zone.

Much of the orange-weathering rock is only weakly carbonate-altered; original rock textures and colors are retained. The remainder is strongly altered to Fe-carbonate with fine-grained disseminated mariposite and coarser mariposite along fractures and with minor pyrite. Original textures and colors are destroyed. Seams of Fe-carbonate, with brecciated fragments of wall-rock, cut unaltered or weakly altered chert and tuff. North-trending quartz and quartz-calcite ± chlorite veins are present locally and rarely carry minor pyrite. One irregular quartz vein with local pods of massive pyrite to 10 cm across was observed below Slippery Waterfall and appears to be filling a shallow dipping shear.

Quartz and quartz carbonate veins often develop at near right angles to the main fault zone and usually cut the more massive volcanics. Veins are poorly developed on sheared argillite although more pyrite mineralization is present on those rocks.

Recommendations

No further work is recommended on this claim.

CAS 1 MINERAL CLAIM

Summary and Conclusions

The 20 unit CAS 1 claim was staked on weakly chalcopyrite - molybdenite mineralized quartz veins found during reconnaissance prospecting in the Sylvester Group volcanic rocks. Reconnaissance mapping and silt, and rock geochemical sampling was conducted.

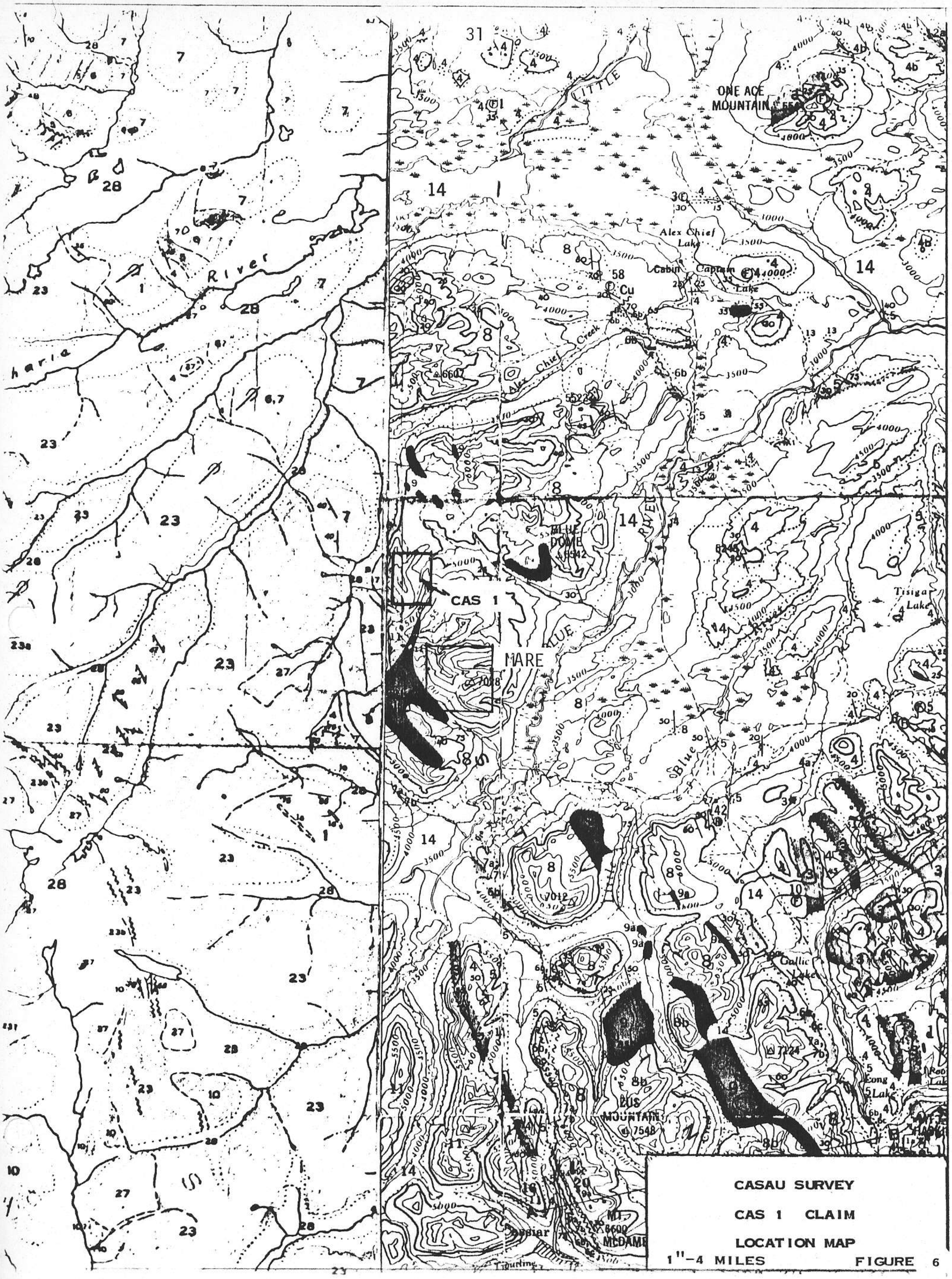
Sulphide mineralization on the CAS 1 claim is very limited and of no economic significance. No anomalous gold or silver values were obtained and no further work is recommended.

Location and Access

The CAS 1 claim is located approximately 40 kilometres north of Cassiar, B.C. on the western edge of NTS sheet 104P12. The property is about mid-way between the northeasterly flowing Blue and Little Rancheria Rivers. Falconbridge's MARE Group is about 3 km south of CAS 1. See Figure 6.

The area is accessible only by helicopter.

The property is entirely above treeline with a fairly rugged topography and elevations ranging from 5200 to 7000 feet.



CASAU SURVEY

CAS 1 CLAIM

LOCATION MAP

1"–4 MILES FIGURE 6

Geology

The CAS 1 claim lies immediately north of a short easterly protrusion of the generally northwesterly-trending edge of the Cassiar Batholith. To the south a large ultramafic body is in contact with the intrusion but in the claim area the rocks are dominantly volcanic rocks of the Sylvester Group.

The geology of the CAS 1 property is plotted on Map XIV, a 1:5000 enlargement of the published 1:50,000 topographic map.

The volcanic rocks are quite variable in appearance due to differing degrees of hornfelsing and chlorite-calcite alteration. Four volcanic units were distinguished during mapping; a reddish-weathering dark green basalt, fine-grained gray-green andesite more silicious dacite and dacite breccia, and augite porphyry. Several discontinuous beds of black argillite and pods of black to dark green serpentinite are present within the volcanic rocks. A few small outcrops of gray fossiliferous limestone were noted north of the claim.

In the southwest corner of the property coarse-grained biotite granodiorite is present as outcrop and in blocky talus. The biotite-feldspar porphyry dikes seen cutting the volcanic rocks are likely related to that phase of the Cassiar Batholith.

The structure of the area is not apparent at either the outcrop or map scale. The volcanic rocks are generally massive and may contain sills and dikes as well as extrusive flows and pyroclastic units. The discontinuity of the argillite beds and the distribution of the ultramafic pods suggest considerable internal deformation and shearing within the volcanic package.

Mineralization

Mineralization on the property is limited to a few milky white to purplish quartz veins containing traces of chalcopyrite, molybdenite, pyrite, pyrrhotite, malachite and limonite. These veins are up to a metre wide and often are localized along the margins of the biotite-feldspar porphyry dikes which are themselves silicified and rarely weakly mineralized.

A 20 by 1 metre zone of cherty rhodonite float was noted in the northwest corner of the property.

Geochemistry Map XV

A total of 24 silt samples and 12 rock samples were collected in the CAS 1 claim area.

Values of up to 20 ppb gold, 33 ppm arsenic and 168 ppm zinc in the silts were well within the regional background for these elements.

Gold and arsenic levels in the rock samples were very low. The only even slightly anomalous values being samples of two quartz veins which ran 20 ppb Au, 1.5 ppm Ag, 375 ppm Cu and 10 ppb Au, 2.8 ppm Ag, 4300 ppm Cu. A sample of the cherty rhodonite material contained 1300 ppm Cu but <10 ppb Au and 0.1 ppm Ag.

Recommendations

No further work is recommended.

PROSPECTING RESULTS

In addition to the five acquired properties a number of areas of slightly anomalous gold and arsenic geochemistry and/or favourable alteration or mineralization were located during the CASAU survey, but not staked.

The geology and geochemistry of each of the areas discussed is shown on the respective base map (in the back pockets) and is described below.

HEAGY 240 ppb GOLD SHOWING

The immediate area from which a rock-chip sample carrying 240 ppb gold was previously taken, was re-examined and sampled by rock-chip and talus sampling. Additional prospecting was carried out in the area.

The initial anomalous sample was of malachite-bearing sheared chert with Fe and Mn oxides on fractures and as veining. As indicated by the original traverse, the copper-bearing material does not outcrop but has a potential source area of only about 2 square metres. The iron-stained sheared grey to white chert outcrops immediately above the top of the talus in the southeast corner of the cirque and is separated by steep dipping faults from outcrops of ultramafic rock on either side. The chert becomes less sheared and limonitic upwards. Two sets of vertical shears at ≃ 150° and 070° are present and the Cu, Fe and Mn mineralization appears to be closely related to the intensity of shearing.

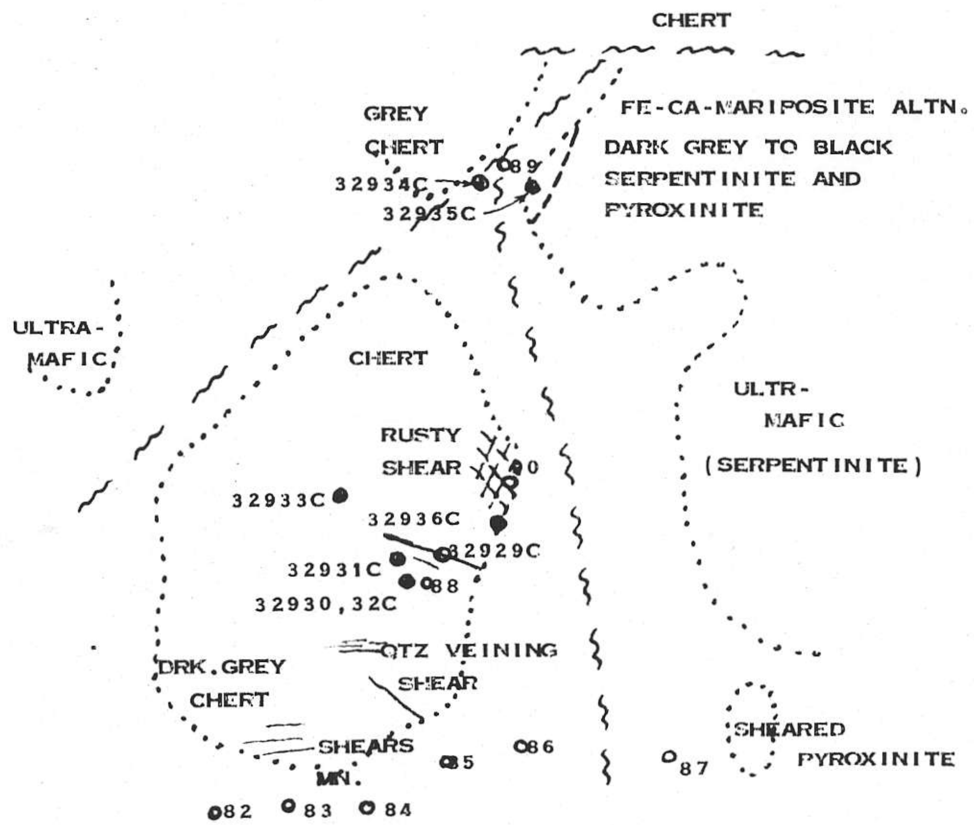
The outcrop exposed along the cirque walls consists of interbedded intermediate to basic volcanic tuffs and gray cherts and minor argillite units. These beds dip gently to the southwest. Numerous fractures and faults of varying strike directions but generally steep dip angles were observed but appear to have caused only minor offsets (up to about 10 metres) of bedding. Rusty to orange limonitic areas on the south wall of the cirque and along fractures elsewhere appear to be areas of sheared chert some of which are cut by a network of 1 - cm wide quartz veins.

Except for an area of quartz veins with traces of chalcopyrite observed on the initial propsecting traverse no other areas of copper mineralization were found. The only rock type of interest within the cirque appears to be the sheared ±Fe-Mn stained

±quartz veined chert. The ultramafic and volcanic rocks along the ridge and in the creek to the north appear unaltered except for the small area of iron-carbonate ±py ±mariposite alteration sampled on the initial traverse. A similar iron carbonate-mariposite-pyrite alteration zone trend 150° on the ridge to the southeast of the cirque back was noted and sampled.

An area of iron-carbonate ±mariposite ±pyrite alteration in volcanic tuffs was discovered to the west of the 240 gold cirque along an east west trending lineament noted on the air photo. The alteration zone appears to be related to the intersection of this vertical east-west fault with a second east-west trending fault which dips moderately to the north. The 4 unit SAU claims were staked to cover the area of iron-carbonate alteration.

The area of mineralization associated with the anomalous sample appears to be of very limited extent and no further work in the area is warranted pending results of the latest sampling.



SAMPLE NO.	AU	AS	AG	ZN	CU
32929C	10	6			
32930C	20	335	1.7	1800	
32931C	20	39	1.2	700	>10000
32932C	10	17			
32933C	220	510			
32934C	20	5			
32935C	<10	11			
32936C	<10	3			

SKETCH OF

HEAGY 240 GOLD OCCURRENCE

LOOKING EAST AT LOWER

CIRQUE WALL

SCALE APPROX 1:1000

FIGURE 7

°89 - TALUS SAMPLE 83CABT89

Geochemistry - Heagy 240 ppb Au Area

A total of 34 rock, 35 talus and 11 silt samples were collected in this area and analysed for gold and arsenic. Zinc was determined on talus and silt samples and silver or copper were determined occasionally.

A value of 220 ppb Au was obtained from fault gouge in the vicinity of the original 240 ppb Au value. Two values of ·20 ppb Au were obtained in the area of the original sample. One of these and the 220 ppb value returned arsenic values of 335 and 510 ppm respectively. These were the only significantly anomalous arsenic values obtained.

The prospecting program failed to obtain any other anomalous gold or arsenic values.

Zinc values obtained from talus sampling have a standard deviation of 121 ppm and a mean of 220 ppm. These values are probably above those that would be obtained from Sylvester rocks on a regional basis. However using a threshold of the mean plus one standard deviation or 340 ppm zinc then anomalous values of 440 and 475 ppm were obtained in the vicinity of the original copper gold sample and one anomalous value of 450 ppm Zn was obtained over a recessive dolomite, quartz vein horizon to the northeast.

No anomalous values were obtained from silt sampling

PROSPECT AREA BETWEEN
CAP AND CHIEF CLAIM GROUPS _ (104O/9, P/12)

A few weakly anomalous talus samples were collected during prospecting in the five-kilometre-wide strip of open ground between Regional Resources' CAP and CHIEF claim groups (discussed in following section). Two talus samples collected from a large area of sericitic, pyritic, phyllitic tuffaceous chert, returned values of 200 ppb gold, 440 ppm arsenic and 40 ppb gold, 220 ppm arsenic. Two other talus samples from this same lithology were slightly anomalous in arsenic geochemistry. Limonitic, pyrite-bearing quartz veins in the sericitic chert did not carry gold or arsenic values.

Small lenses of iron carbonate alteration in andesitic tuffs located just last of the CAP claim group carried 97 to 410 ppm arsenic but only 20 ppb gold.

Intensive silt sampling was carried out in this area and results were uniformly negative, less than 10 ppb gold, 7 to 27 ppb arsenic and 62 to 260 ppm zinc.

Outcrops of the sericitic tuffaceous chert are present over at least 3000 metres and thus presents a large target. The iron carbonate alteration in the volcanic tuffs are too limited to be considered significant. The geologic setting of the gold-arsenic mineralization on the adjacent CAP claim has not been published.

GALLIC LAKE BARITE OCCURRENCE (104P/5)

An occurrence of white barite float was found near the stratigraphic contact of the McDame and Sylvester Groups, some three kilometres west of Gallic Lake. The barite occurs in flaggy limestone rubble and a small outcrop of the limestone cut by an irregular coarse white barite vein (≈ 20 cm wide) appears to be typical of the source of the barite float. A 10 cm wide, barite - dolomite vein was also seen cutting an outcrop of red and green cherty slate at the base of the Sylvester Group to the west.

The McDame Group rocks, including gray limestone, black, fetid dolomite, sedimentary dolomite breccia and cross-bedded calc-arenite are fairly well-exposed as a barren felsenmeer - covered dome. The stratigraphically overlying rocks are poorly exposed but an almost continuous stratigraphic succession is exposed along a narrow ridge which runs perpendicular to the NNW strike of the thin-bedded argillite, chert, limestone and graywacke and siltstones of the lower Sylvester Group. No sulfide mineralization was located in the area and silt samples were anomalous in barium (2450 to >10,000 ppm barium) but not in zinc (77 to 210 ppm zinc). No exhalative horizons were recognized within the lower Sylvester succession.

Hip chain thread along the creeks in the area indicated other companies had been actibe in the area but no staking had been done.

Although this stratigraphic horizon is regionally favourable for lead-zinc-silver deposits, possibly associated with massive barite mineralization, no further work is recommended in the area of the Gallic Lake barite occurrence.

LONG LAKE AREA (104P/5)

Prospecting was carried out in the vicinity of a known copper showing on Long Lake. The showing consists of a 20m x 30m area of partially silicified and quartz-brecciated graywacke (Sandpile Group?) with a few small patches with bornite-chalcocite mineralization. A sample of the highest grade material present contained 2800 ppm copper, 0.7 ppm silver, <10 ppb gold and 103 ppm arsenic.

Several areas of interesting alteration were however located near the base of the Upper Sylvester Group andesites. Zones of strong clay-alteration and silicification, containing 2 to 10% pyrite and minor malachite and arsenopyrite, were sampled. One rock sample ran >10,000 ppm arsenic while a sample from a different zone showing local brecciation contained 100 ppb gold and 100 ppm arsenic. A few other rock samples from the argillic alteration zones and samples from small iron carbonate - pyrite - mariposite alteration zones were also slighlty anomalous in arsenic (63 to 130 ppm).

Individual alteration zones are quite limited, being generally 2 to 20 metres wide and traceable for at most 100 metres. The zones appear to be generally aligned along a trend of 160°.

Silt sampling in the area returned uniformly low results.

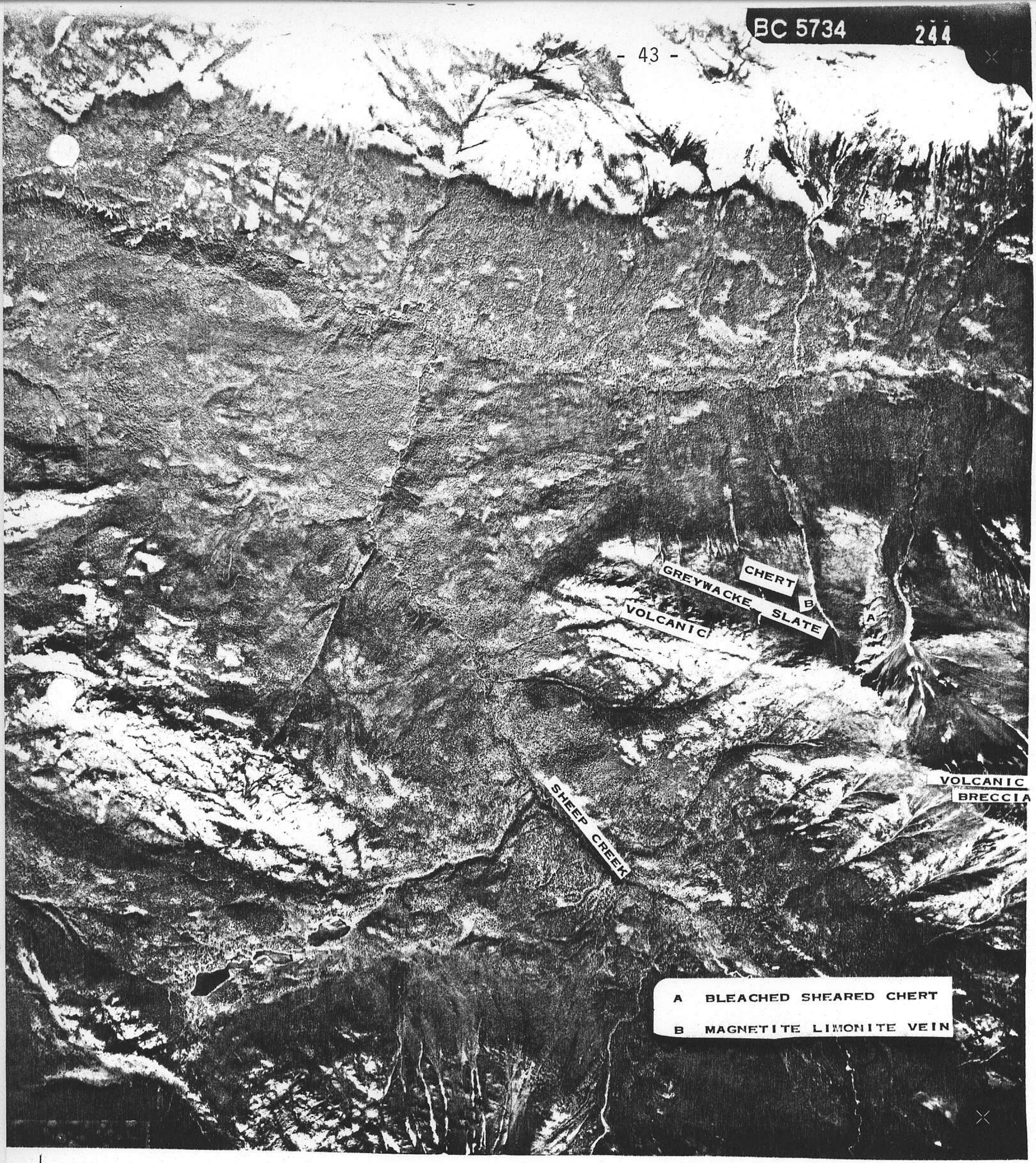
The small alteration zones do not present a favourable target and no further work is recommended.

SHEEP MOUNTAIN 104P/3

A number of rock-chip samples collected during a reconnaissance traverse on Sheep Mountain returned anomalous gold, arsenic, zinc and copper values. As these anomalies were at the southeast limit of the survey area and not readily accessible by a fly camp, follow-up was limited to a brief re-examination and re-sampling of the initial showings.

The peak of Sheep Mountain is a dioritic breccia which appears to be a volcanic neck. The back of the ridge trending northwest from the peak consists of gray-green andesitic tuffs. Volcanic graywacke and slate are exposed below the andesites on the north slope and are in turn underlain by dark gray cherts. Each of the rock units contains interbeds of the other rock types. The entire sequence strikes northwest and dips moderately to the southwest.

The anomalous samples come from two separate locations part way down the north slope. (See Figure 8) The highest values, 1200 ppb gold, 225 ppm arsenic, 975 ppm zinc, came from a limonitic zone in a volcanic unit within the dominantly sedimentary beds. Re-examination of the area indicated the limonite, hematite alteration was largely confined to joint places within the volcanics. These joints locally contain seams, to 10 cm wide, of massive brown magnetite. A sample of the magnetite vein contained <10 ppb gold and 0.3 ppm silver and a grab sample of the limonite-hematite rich material ran 450 ppb gold and 5.6 ppm silver. The entire limonitic zone appears to be about 20 m x 50 m and concordant to the general bedding trends.



CASAU SURVEY

SHEEP MOUNTAIN ZONE

1:31,680 FIGURE 8

The second group of anomalous rock-chip samples are from about 400 metres from the first group. They are exposed at the top of the west wall of a cirque-like valley in the north slope of Sheep Mountain. The anomalous samples are of a sheared, bleached chert which appears to be strongly leached and is locally argillic. The altered chert runs 160 to 340 ppb gold and is slightly anomalous in arsenic (41 ppm) and silver (3.3 ppm).

The bleached chert is confined to a 10m x 50m zone and grades laterally into dark rusty weathering, black pyritic chert which contains no gold or silver values.

Quartz-chlorite veins in calcareous diorite about fifty metres downslope of the bleached chert contain minor chalcopyrite and malachite and are anomalous in copper and zinc but do not carry gold or arsenic values.

A few small occurrences of shearing, limonite-staining and/or weak silicification in between the two showings were sampled but did not carry any gold values.

Although further prospecting in the area has good potential for locating additional geochemically anomalous areas, the limited extent of the known showings and the general absence of alteration and quartz veining suggests the area does not present a very attractive target and further prospecting is not a high priority.

PROPERTIES EXAMINED

Brief visits were made to several properties in the district, primarily in the McDame area. Three of the crew visited the Erickson Mine at the beginning of the season but were unable to arrange an underground tour since the Erickson staff felt we were in direct opposition in our exploration program. Our crew did see some examples of ore and alteration material.

CUSAC INDUSTRIES LTD. 104P/4E

The Cusac property was visited August 18 where we met Guilford Brett, President and accompanied other non technical people on a surface tour. The property consists of about 3600 acres. Location is shown on Figure 1.

Line 4 zone

The trenched area and some rock contacts and veins trend northerly. Flat north dipping shears and apparently irregular easterly striking quartz veins occur in altered volcanics? and listwanite. A zone of black graphitic argillite occurs on the east side of the exposure. No attempt was made to map the zone - it appears quite complex. Manganese stain is more common than usual, veins contain pyrite, some chalcopyrite, minor sphalerite, arsenopyrite? tetrahedrite and galena. Listwanite contains some pyrite, minor chalcopyrite. Other mineralization in manganese stained altered rock includes pyrite, sphalerite,galena. High grade assays over widths of 25 feet are reported with some areas giving relatively high silver low gold but more regularly gold to about 1 ounce with low silver.

Freddie Vein

At the millsite a fairly large series of small dumps of underground quartz material is stockpiled and is used to feed the 30 ton mill by front end loader. Most of this material is said to be from the Freddie vein and consists of massive white glassy quartz, somewhat rusty white quartz, quartz with vuggy apparently micaceous areas, quartz with zones of pink coloration. This pink mineral may be kermesite Sb_2S_2O which occurs at Erickson. Other mineralization consists of pyrite, minor chalcopyrite, tetrahedrite, galena, sphalèrite? and VG.

VG occurs usually within somewhat cubic cavities from which pyrite has been weathered. It occurs also in rather fresh looking small cavities with no limonite.

Hot Vein

Beyond the mill at Line 9 the Hot Vein trends 070°/55°N. It is said to be 450' long and open at both ends. It looks to be about 4' in width. A surface cut was mined of 300 to 400 tons said to average 0.40 oz. The dump near a small older working contains pieces of spectacular free gold, partly in limonitic gossanous material but also in narrow fractures close to the gossanous surface.

The vein looks massive glassy to bull quartz but contains small vuggy cavities and pyrite with minor arsenopyrite? and a flaky gray mineral.

A subdrift is being driven about 30' below surface from the raise on the Hot vein.

The mill is said to be capable of 70 tons per day but was milling about 25 tons per day since a piece of tramp steel shattered the small roller mill. Sequence is - hopper - jaw crusher -

roller mill (now smaller jaw crusher) - ball mill - oversize back to small crusher(wheelbarrow)- jig - which recovers 60% of gold - jig con to tables - fines to flotation circuit. Two concentrates are produced, jig and flotation.

There are said to be approximately 1200 feet of drifting underground - no maps or assay records were seen.

Veins exposed from Hot vein line 9 to Line 4 zone are said to be distributed over a length of 2600 feet.

Conclusions

The strength and number of veins, and the several instances of visible gold, made this one of the more impressive properties seen recently. The erratic nature of the mineralization, however, would make accurate sampling difficult. We gained the impression the property may have competent consultative advice but that day to day survey, mapping and assay control might be lacking. It would be interesting to examine the mine records as it was our understanding Bret was looking for senior financing.

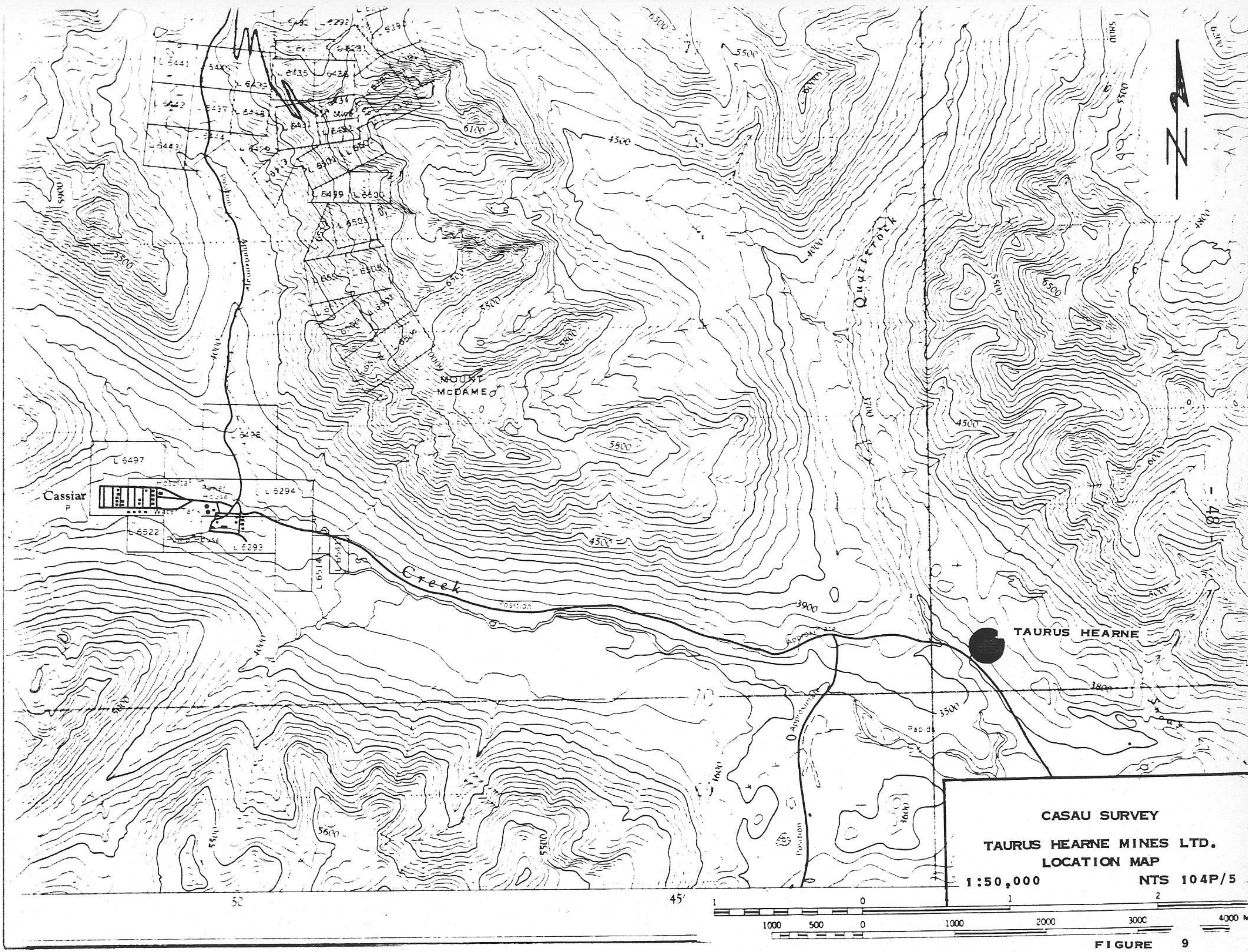

Cassiar
MOUNT
McDAME
Creek
Quartzrock
TAURUS HEARNE
CASAU SURVEY
TAURUS HEARNE MINES LTD.
LOCATION MAP
1:50,000
NTS 104P/5

FIGURE 9

TAURUS-HEARNE MINES LTD. 104P/5

This property is located approximately 9 kilometres east of the Cassiar townsite on the north side of the Cassiar access highway as shown on Figure

The property was visited August 22 during which visit we were given a tour of the underground workings and of the mill. No detailed mine plans or assay results were shown.

Mine Development

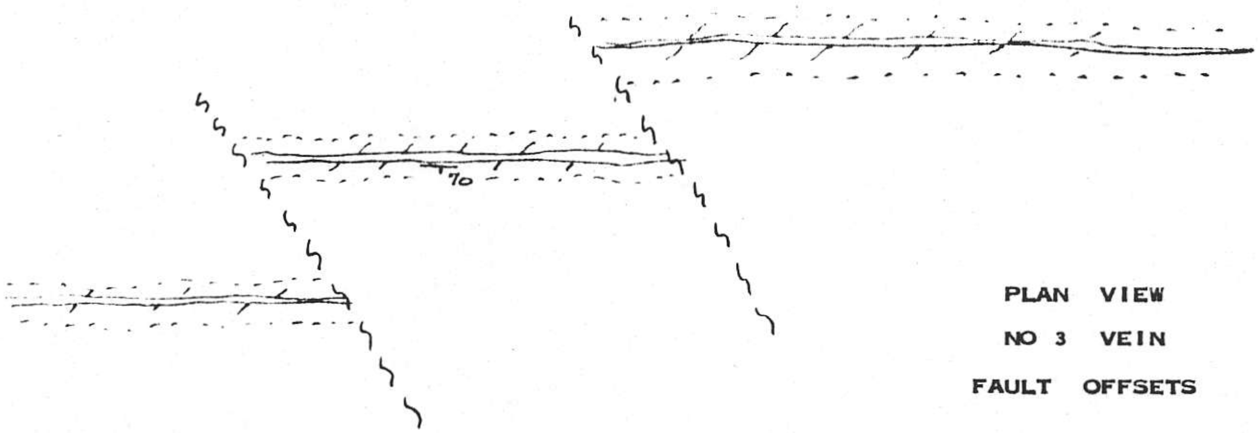
The mine was explored about 1964 to 68 with a series of crosscuts at 100' to 200' intervals running north and south from the 3600?' level. Veins were not drifted on. Production development is by way of a decline from the 3575' elevation running easterly for approximately 500 feet at a -15% grade. In this area, near 3500 level, the decline encountered a thrust fault striking (350°?) northerly and dipping about 25° east. There is considerable shattered quartz on the lower portion of this fault zone - probably crushed vein quartz rather than new introduction of quartz or mineralization. The decline was turned north to continue in the hanging wall of the fault and goes about 250 feet where a short west drift cuts the thrust fault and follows fairly strong vein quartz which is near vertical and continues west beyond the drift below the fault. The decline turns east and south where the thrust shows in the west wall. The decline seems to bend slightly east of south to stay in the hanging wall and reaches the 3375 level. The decline continues and turns east to provide a loading pocket for trackless haulage to surface. Stoping levels are tracked and use 1½ ton side dump cars and Mancha trammers and Eimco 12? mucking machines.

Mine Grade

Average production grade is 0.16 ounces per ton, 0.20 ounces per ton or better in mine sampling is considered good. High assays are cut to 0.80 ounces. Veins are channel sampled at 5' intervals. Calculated grades approximate production but individual assays are hard to duplicate. Grade is only approximately proportional to sulphide content with pyrite possibly least important.

Geology

Mineralization is contained in quartz veins cutting volcanics which are variably altered and pyritized. Vein structures trend 85° to 90° and dip 70° south. They are cut by 135°?/80°W? dipping faults with left hand movement of 40 to 100'? See Figure Minor faults trending 160°? are common but have only small offsets.



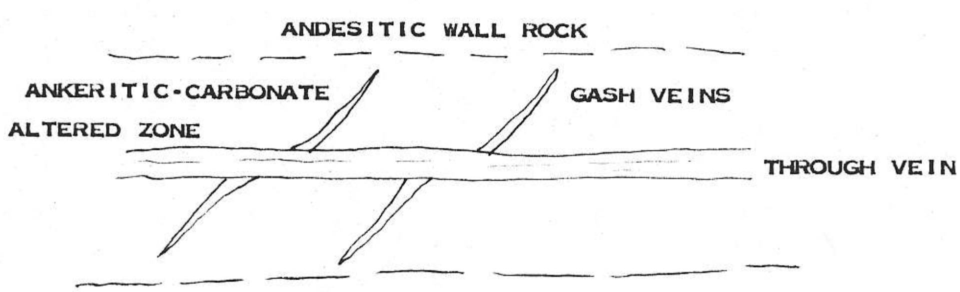
PLAN VIEW
NO 3 VEIN
FAULT OFFSETS

FIGURE 10

The decline encountered a thrust fault trending approximately north (340°?) dipping 25° east. A near vertical fault, trending 100° is referred to as a fault breccia zone. It pinches and swells and contains up to 2' quartz in places. This zone shows horizontal slickensides with much polished pyrite smear and contains angular fragments of pyritic alteration material.

All faults appear to be post mineral. Much crushed quartz occurs in places on the footwall of the thrust fault.

Veins vary in width from 1 inch to about 3 feet. They do not appear strong and commonly split or branch and contain horses and fragments of pyritic alteration zone rocks. What appears, in places, to be pyrite banded quartz consists of parallel altered wall rock fragments well mineralized with fine pyrite, tetrahedrite, little sphalerite, little chalcopyrite and cubic well crystallized pyrite. The main east trending No. 3 vein is broken into three large segments by northwest trending faults. See Figure . This vein structure has numerous gash veins running into the hanging and footwalls which sometimes contain good grade pyrite, tetrahedrite, sphalerite, rare visible gold mineralization. These gash veins trend about 45^{o}-65^{o}. The apparent vein relationships shown in Figure indicate two stages of veining. The No 2 vein structure is said to consist of gash vein structures but no through going vein.

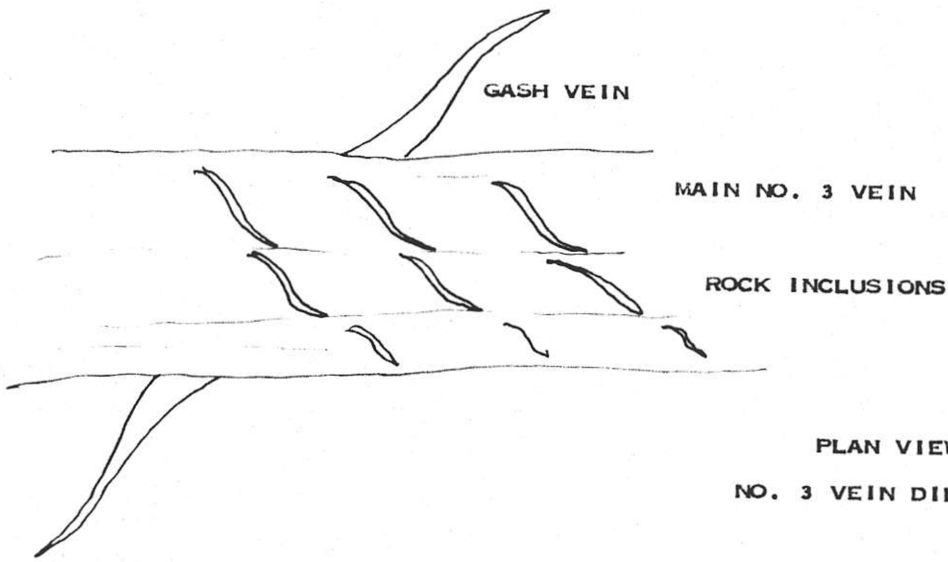


THROUGH VEIN SELVEDGES APPEAR TO BYPASS GASH VEINS INDICATING EAST TRENDING THROUGH VEINSARE LATER STAGE, CUTTING, OR FILLING, TENSION ZONE WITHIN PREVIOUS ALTERED ZONE CONTAINING GASH VEINS FILLING TENSION FRACTURES

PLAN VIEW

FIGURE 11

In one of the wider, stronger sections of No. 3 vein on 3500 level the vein contains sigmoidal rock inclusions which are shaped similarly to the gash veins but in the opposite directional sense. See Figure 12.



PLAN VIEW
NO. 3 VEIN DILATION

FIGURE 12

Most veins, rather than being a fairly simple structure as in the best portions of No. 3 vein, are made up of several branches a few inches to a few feet apart and 1 to 10 inches in width. In many places mining has slashed out to full width with considerable dilution.

Conclusions

The overall impression is that the vein structures are too weak, and the average grade too low, to be economic. Considerable development work has been done on veins too narrow, or too narrow and too widely spaced, to provide ore grade tonnage after dilution. We do not have sufficient detailed data to suggest any possibilities for ore grade localization.

The mill building is more than adequate for the current 100 ton per day plant and would allow for more than double that capacity. There are some good items of mill equipment but the crushing plant is made up of a gravel pit plant and is not efficient.

PLAZA MILL SITE Figure 13.

The Plaza mill and the Plaza claims have been acquired by Erickson Gold. The millsite was visited to examine vein material contained in two small stockpiles of oversize material. This vein material is understood to have been mined from the Vollaug vein south of the Erickson Mine. At the mill it is evident only a small tonnage was processed. The stockpiles consist of large fragments of massive white, rather glassy, quartz. The largest pieces suggest they come from a vein over 1 metre in width. Some of these contain a zone on one side, about 25 cm in width, which contains disseminated small patches of tetrahedrite. Careful examination shows fine free gold associated with these tetrahedrite patches and with tiny cavities in the quartz. The overall grade of these stockpiles might be respectable but accurate sampling would be nearly impossible.

It is possible this type of localized high grade mineralization will occur in other veins in the district making ordinary sampling results erratic and requiring very careful examination of any quartz outcrops.

CASAU SURVEY

PLAZA MILL SITE

LOCATION MAP

1:31,680

FIGURE 13

CAP CLAIM GROUP - SPIRIT PETROLEUM CORP. 104 O/9E

The following information regarding this claim group was published in the George Cross newsletter July 7, 1983.

GOOD RESULTS FROM REGIONAL RESOURCES MIDWAY AREA PROPERTY - Spirit Petroleum Corporation has reported that the first stage of the 1983 exploration program for the "Cap" property in northern B.C. has been completed with encouraging results. (See property location map GCNL No.87, page 2, May 5, 1983).

Three additional claims have been staked to cover airborne electromagnetic anomalies. Line cutting, soil and stream sediment samples were collected and located anomalies within areas of phyllitic cherts of the Lower Sylvester Group. A.W. Achilles, president of Spirit states "Of more immediate interest is a 300m by 100m area of quartz-carbonate-talc alteration within volcanics of the Upper Sylvester Group. Intial geochemical results from this area returned strongly anomalous gold (to a high of 3300 parts per billion gold) and arsenic values. Rock samples returned analysis of up to 225 parts per billion gold and 235 parts per million arsenic. Results from soil samples from the overburden covered extension of this area returned up to 1650 parts per billion gold and 2314 parts per million arsenic. Sample lines were extended to cross this area and results of detailed sampling are pending. It should be emphasized that results received are preliminary and may not be indicative of significant mineralization. The alteration area is centered in the magnetic "high" anomaly on the south central boundary of Cap 4 mineral claim. The geological structure evident on the property is a new and previously unmapped formation in this area. It is however, the same geological formation evident at the site of the Erickson Gold Mine, immediately south at Cassiar, B.C."

Under the terms of an agreement with Black Giant Mines Ltd., the 1983 exploration program is being funded 100% by Black Giant Mines Ltd. which can earn a 40% working interest in the property by: paying for the 1983 program to $150,000; making a $50,000 cash payment to Spirit; issuing 100,000 treasury shares to Spirit and by paying 50% of all future property costs.

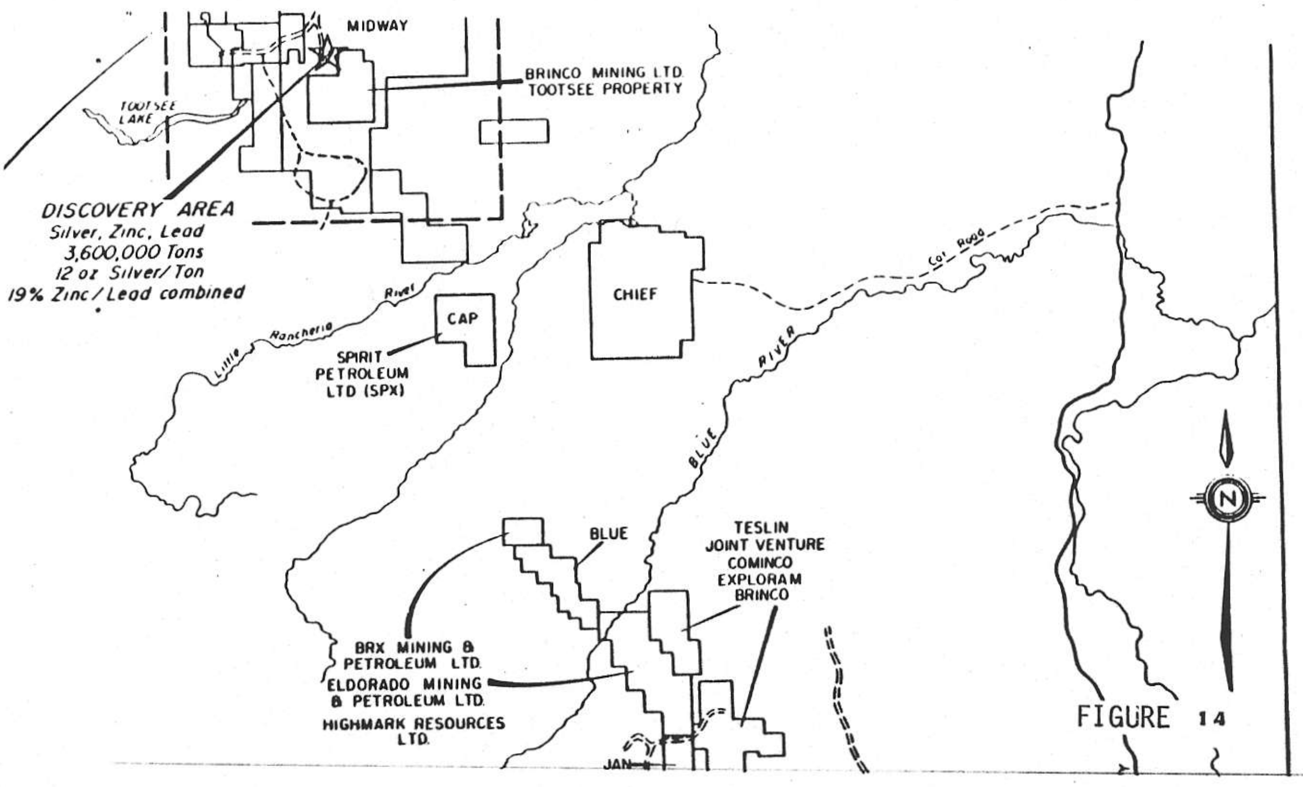
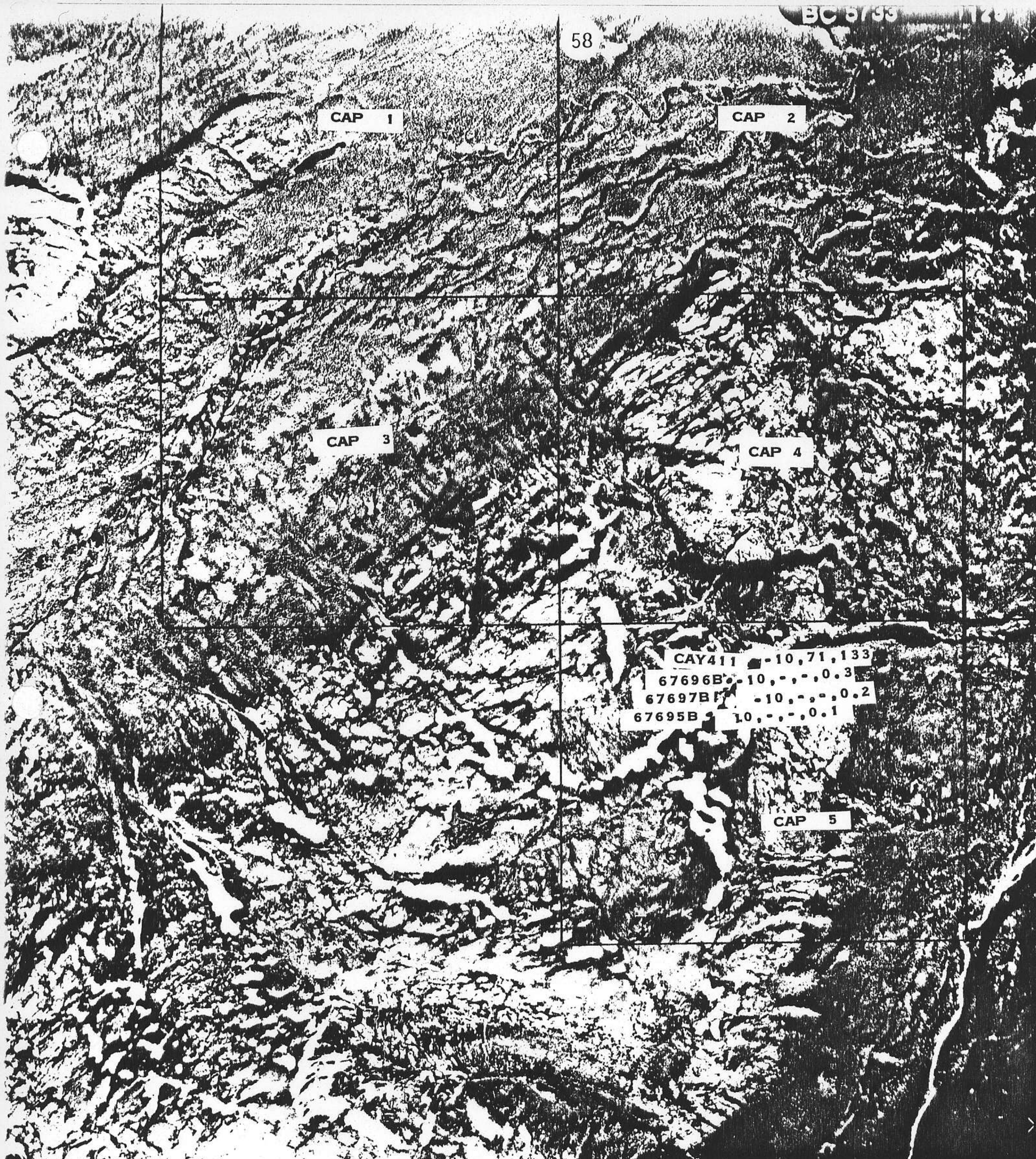


FIGURE 14

A prospecting traverse resulted in locating the east contact of the Cassiar batholith considerably further east than shown on the GSC 4 mile map. The contact is located just within the northwest corner of CAP 4. Rock geochem samples from several outcrops of argillitic sediments and quartz veins east of the contact were barren. Figure 15 shows results of one silt and three rock geochem samples from a rusty area in the north central part of CAP 5. The narrow creek valley here is marked by extensive bright rust zones. The main rock types consist of thin bedded argillites and chert striking $335^{o}/65^{o}W$. These rocks are cut by biotite feldspar porphyry and lamprophyre dykes. Quartz veins and float are present. The creek bed is unusual for such a steep narrow gorge in that it contains a ferricrete like deposit with cemented boulders including granite. The three rock samples are from the best looking quartz, the ferricrete and the most siliceous cherty sediments. No gold values are indicated. The silt sample CAY411 is relatively high, 71 ppm, in arsenic but no other anomalousvalues are reported. Prospecting was carried out east of CAP group with marginally interesting results as described under the heading "Prospecting Results".



CASAU SURVEY

CAP CLAIM GROUP
SPIRIT PETROLEUM CORP.
BLACK GIANT MINES LTD.
SCALE 1 31.680 AU.AS.ZN.AG

FIGURE 15

CHIEF CLAIM GROUP 104P/12W

Location of this claim group relative to CAP program is shown on Figure 14. Prospecting was conducted in the area between CAP and CHIEF groups with generally weakly anomalous results for zinc in the CHIEF group area as shown on Figure 16 from base map 104P/12W. Within the group examination was made of several outcrops and rubble areas near the 43+50N station on the 2000E base line. Black cherty argillite, chert and reddish brown sericitic quartzite and phyllite were observed. No mineralization was observed but talus sample BT407 ran 760 ppm zinc.

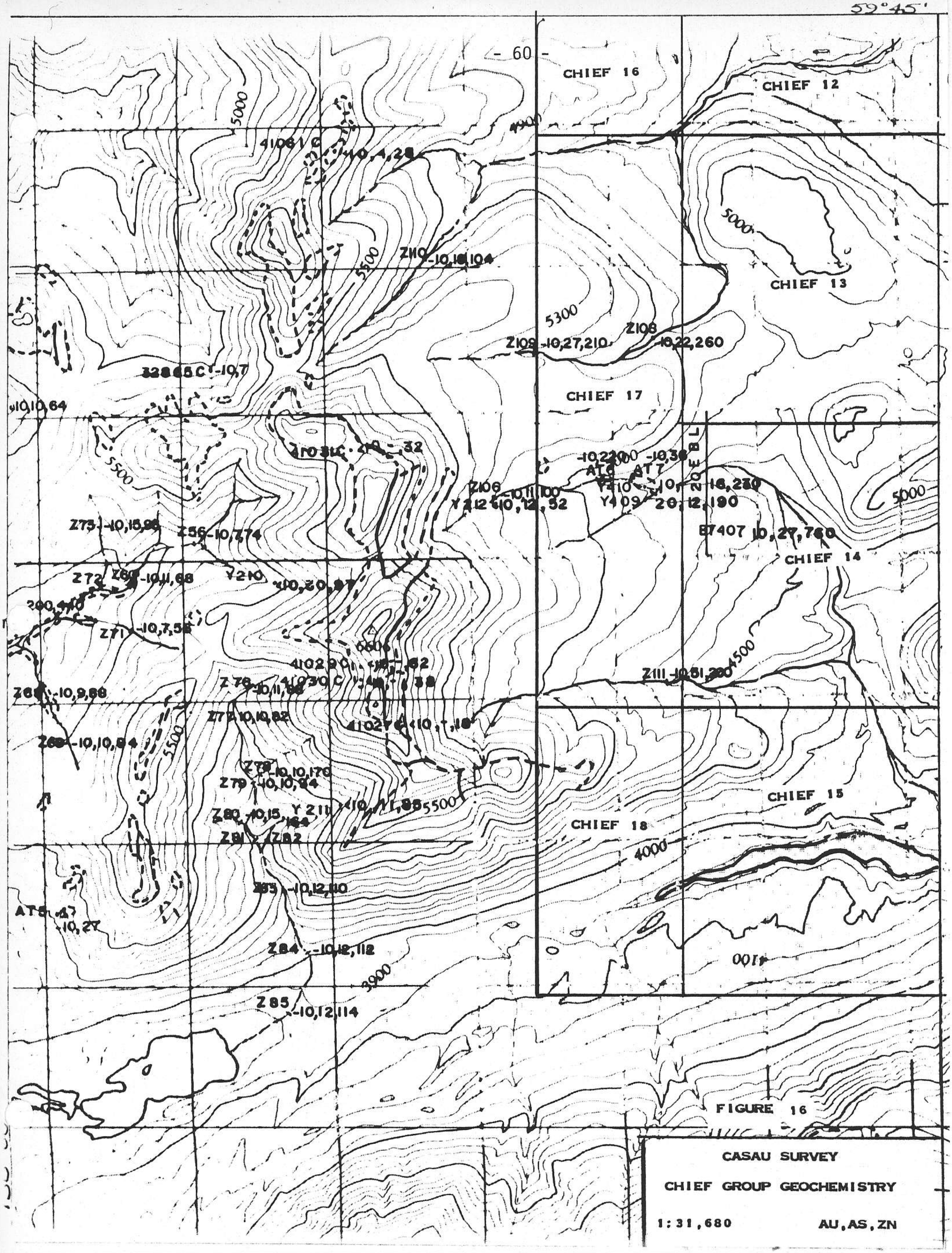


FIGURE 16

CASAU SURVEY

CHIEF GROUP GEOCHEMISTRY

1:31,680 AU, AS, ZN

CAPTAIN LAKE COPPER 104P/12E

Location of this showing is indicated on Figure 17 copied from part of the 1" - 4 mile geological maps of the area. As shown on Figure 18, from airphoto, B.C.5735 - 206 a fairly extensive grid has been established and several tractor trenches have been excavated. Local pits have been blasted in these trenches for sampling purposed. There is little apparent natural outcrop other than that revealed by trenching. Work was apparently done by Craigmont in 1976. The following description is from the 1976 Minister of Mines Report.

PIP (Fig. E-1, NTS 104, No. 39) 1976

LOCATION:	Lat. 59° 44' Long. 129° 42' (104P/12E) LIARD M.D. Northwest of Blue River, 2 kilometres southwest of the large peninsula in Captain Lake.
CLAIMS:	PIP 1 (18 units), PIP 2 (18 units), PIP 3 (18 units).
OWNER:	CRAIGMONT MINES LIMITED, 270, 180 Seymour Street, Kamloops V2C 2E2.
METAL:	Copper.
DESCRIPTION:	Chalcopyrite occurs in a heavily silicified zone which appears to be conformable with the enclosing limestone and shale.
WORK DONE:	Linecutting, 15 kilometres; surface geological mapping, 1:5000; magnetic survey, 15 kilometres; electromagnetic survey, 15 kilometres; geochemical survey, 385 samples, covering Pip 1 and 2.
REFERENCES:	Mineral Inventory 104P-60; Assessment Report 6087.

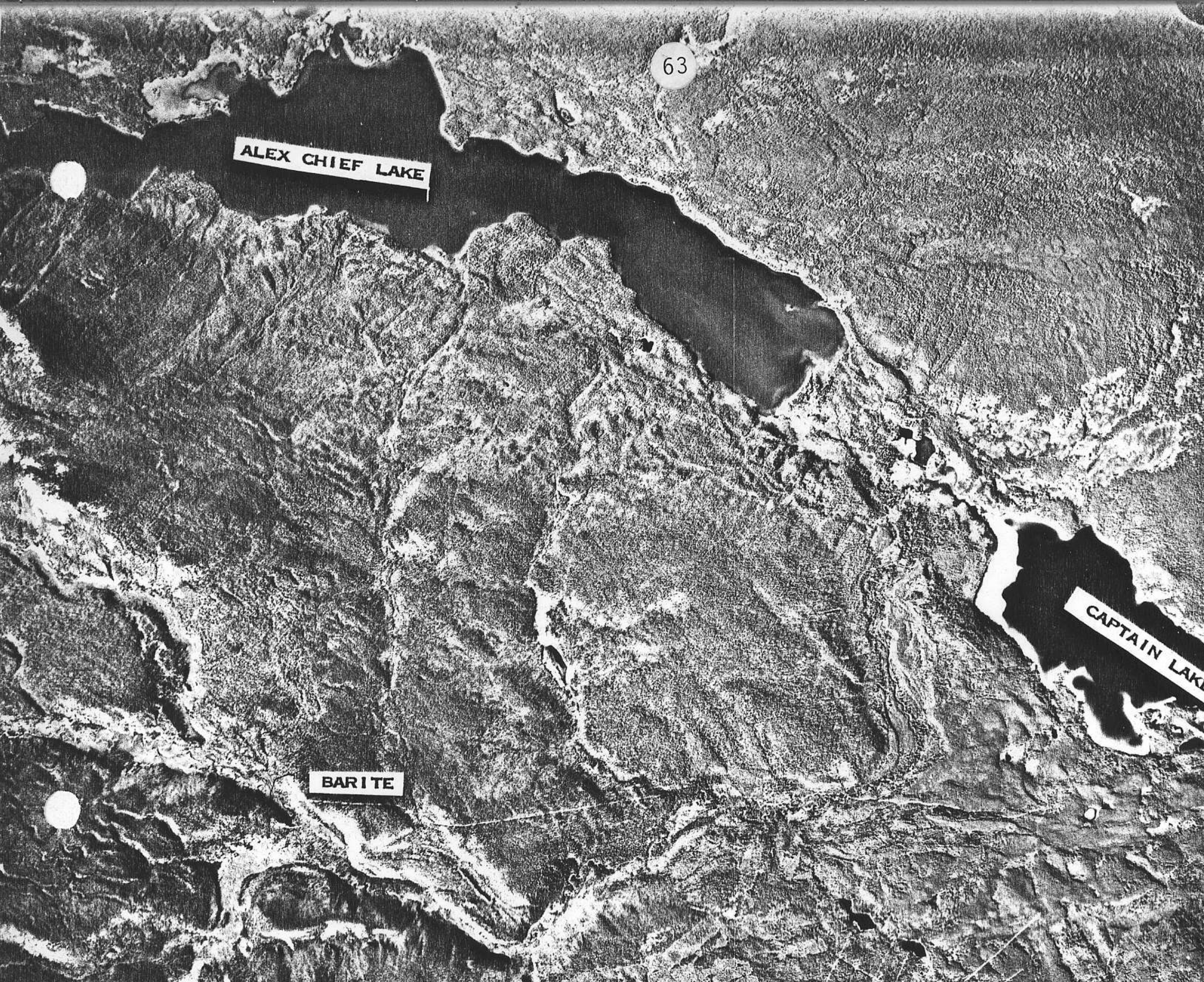
Two samples were taken:

67693B Selected sample of best cpy bn mineralization 4.03% Cu 0.01 oz Ag <0.003 oz Au/ton

67694B Selected sample of silicified material and quartz stringers 0.01 oz Ag <0.003 oz Au/ton

The showing does not appear to merit further work

CASAU SURVEY
CAPTAIN LAKE AREA
1" = 4 MILES
FIGURE 17



CASAU SURVEY

CAPTAIN LAKE COPPER
DEKALB BARITE

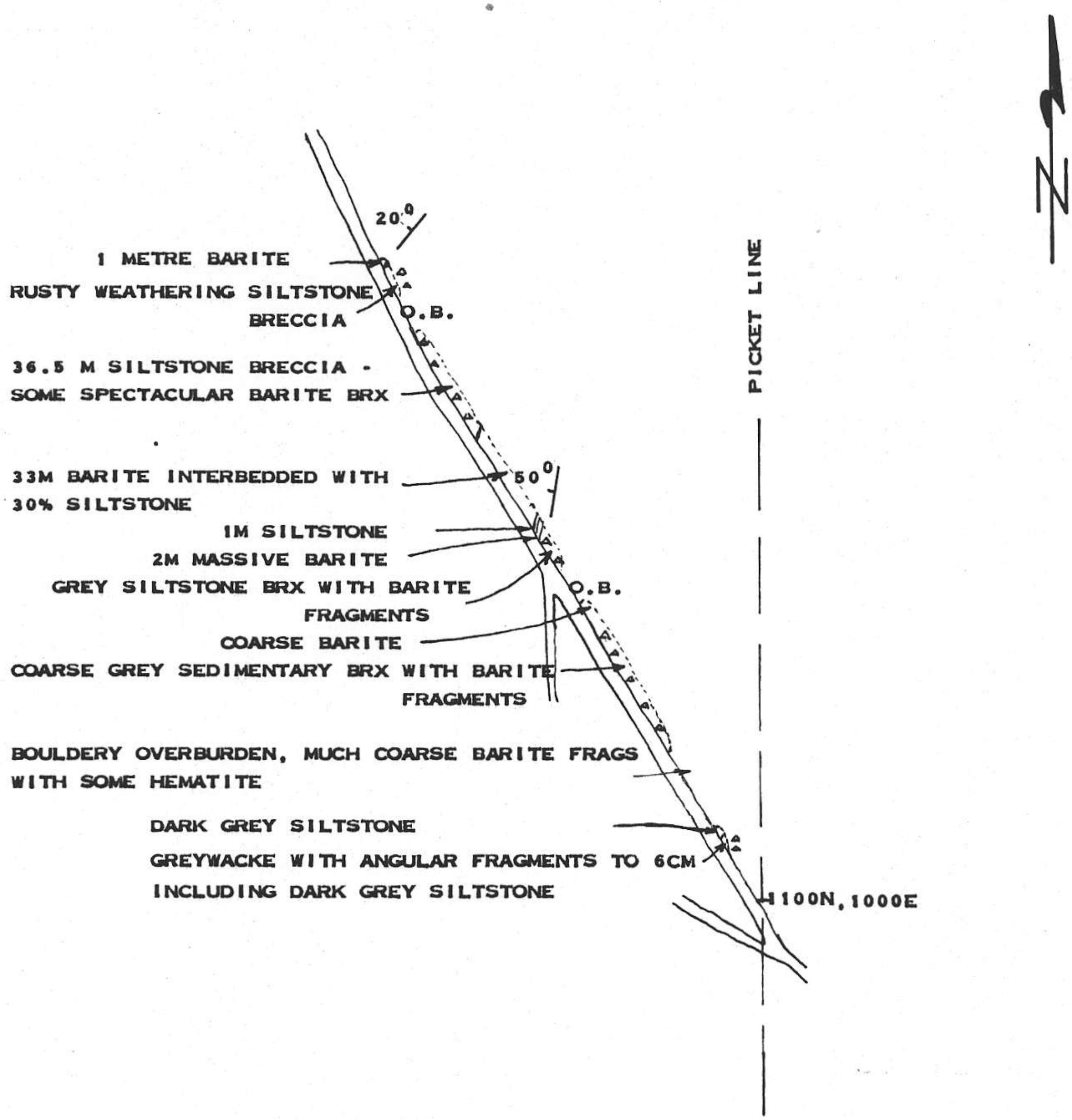
1:31,680

FIGURE 18

DEKALB BARITE 104P/12E

Figure 18shows the location of this showing approximately 4 kilometres northwest of the Captain Lake copper showing.

The showing has been extensively trenched revealing considerable barite but no sulphide mineralization except minor copper stain. Figure 19is a sketch of the lowest trench. Narrow beds of massive barite occur but the greater part is interbedded with more or less siltstone. Sedimentary breccias with angular fragments are prominent.



SKETCH OF LOWEST TRENCH

CASAU SURVEY

DEKALB BARITE

SCALE 1:2000

FIGURE 19

ROSELLA CREEK PLACER

Location of this rather minor placer area is shown on Figure20 copied from the GSC geological map. Figure21 taken from air photo BC5682 - 194 shows the local area in more detail.

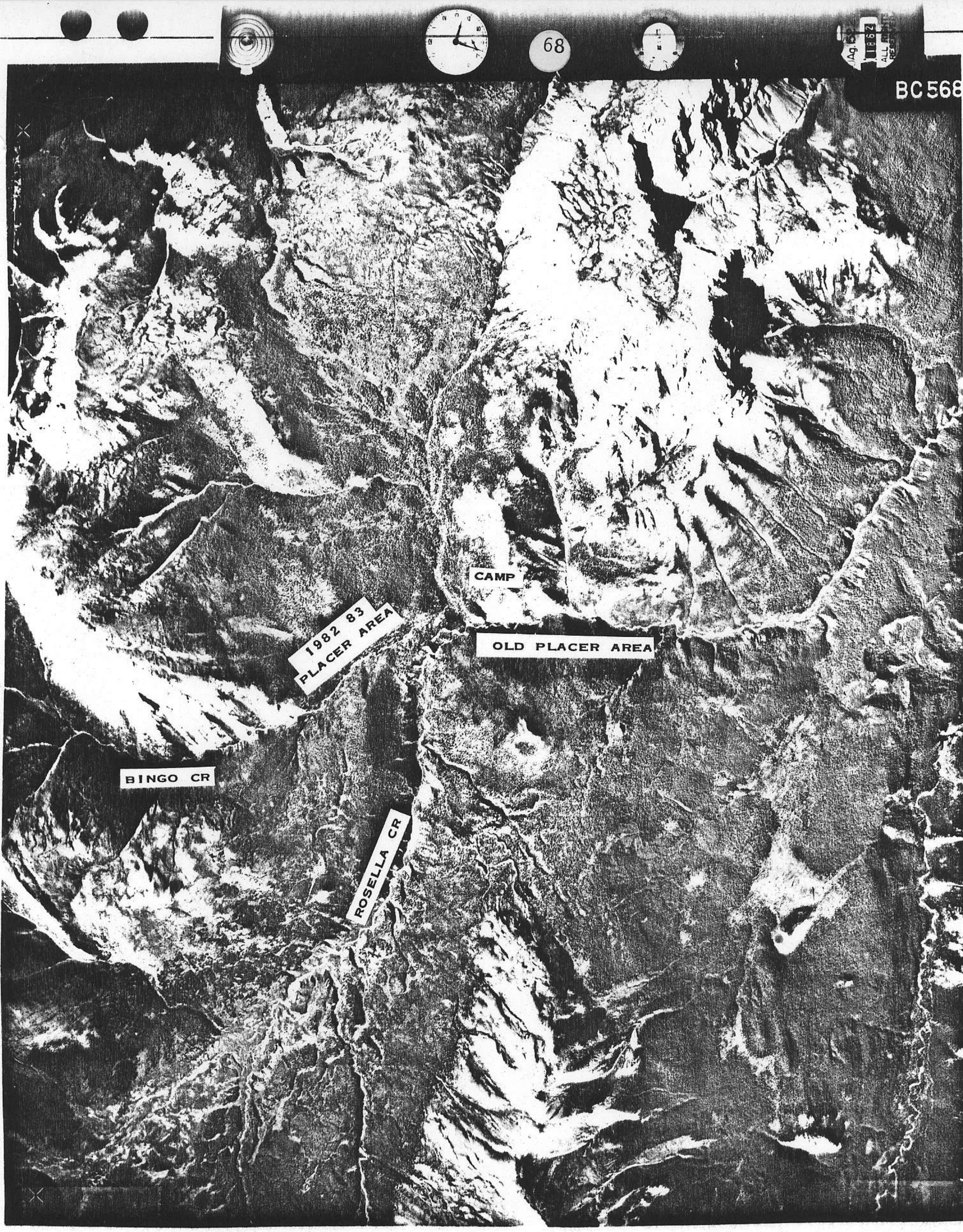
The placer area is located within rock units 3 and 4 of the Lower Cambrian Atan Group. Unit 3 consists of quartzite, shale, slate, argillite, pebble conglomerate and siltstone while unit 4 is primarily limestone dolomite and minor shale. The area contains prominent beds of hematite rich siltstone or shale.

Panned concentrates shown us, with gold, contained small pebbles of barite to 1 cm, and garnet together with fairly coarse (up to 3 mm) fragments of galena, minor pyrite and minor magnetite. Hematitic fragments are common in all panned material.

Little is known of the material encountered in the original Rosella Creek workings although the GSC Memoir 319 suggests the gold may have been derived from Sylvester rocks to the west. The presence of galena and barite with only very minor magnetite suggested to us the gold might have a more local source. A report by Vancouver Petrographics follows.


CASAU SURVEY
ROSELLA CREEK PLACER
AND OLD GRID AREA
1" = 4 MILES
OLD GRID AREA
ROSELLA CREEK
CASSIAR ROAD
MT. McDAME
Cassiar
Centerville (abandoned)
MOCCASIN MINES
Quartz Mining Camp
McDame Lake
McDame
MT. REED
HASKIN
BLACKFOX MTN.
MT. PENDLETON
JUNIPER MTN.
NEEDLEPOINT MTN
LUS MOUNTAIN
BLUE DOME
Tisiga Lake
Edward Johnny Lake
Rosella
Chief
Simmons Lake
Cook Lake
Vines Lake
Callison Lake
Allan Lake
Long Lake
Rapids
Pooley Creek
RIVER
Blue River
Stone Island
67

FIGURE 20



CASAU SURVEY

ROSELLA CREEK PLACER

1:31,680

FIGURE 21

New File CASAU ROSELLA CREEK PLACER 104P/5

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph.D. Geologist

P.O. BOX 39
8887 NASH STREET
FORT LANGLEY, B.C.
V0X 1J0

PHONE (604) 888-1323

Report for: J.C.Stephen,
J.C.Stephen Explorations Ltd.,
1458 Rupert Street,
North Vancouver, B.C., V7J 1G1

Invoice 4010

Sample: Bingo Mining: Placer Heavy Mineral Concentrate (Magnetic Fraction Removed)

Discussion:

In order to make a positive identification of minerals and to aid in interpretation, two polished blocks were prepared. Polished thin sections would have been better to examine the transparent minerals, but since the main interest appears to be in the metallic minerals, the polished blocks were considered sufficient.

The minerals in approximate order of abundance are as follows:

hematite
quartz
barite
pyrite
galena (± tetrahedrite; secondary Pb minerals, covellite)
garnet
native copper
native bismuth?
Ti-oxide
magnetite

Hematite shows a wide variety of textures suggesting several origins. Pyrite commonly is altered in part to hematite. Galena is moderately altered in most fragments to secondary Pb-minerals (anglesite and/or serrusite) with minor covellite. Minor primary tetrahedrite occurs with one galena fragment. Native copper forms flakes with a crude layered texture. Native bismuth forms one large fragment.

Quartz forms a few coarse grains, aggregates, and fine sand-sized grains. Barite forms coarse grained fragments. Garnet grains generally are free of inclusions.

John G. Payne

John G. Payne,
July 1983

Placer Mineral Concentrate (Magnetic Fraction Removed)

The sample contains the following fragment types, roughly in decreasing order of abundance.

1. Hematite

Several types of hematite and hematite-rich fragments are present. Some are extremely fine grained aggregates, in part after colloidal pyrite. Others are equant submosaic aggregates of grains 0.02-0.05 mm across. Some show colloform textures. Some are intergrown with minor to moderately abundant very fine grained to fine grained quartz. Some are dusty hematite, possibly of sedimentary origin. One fragment is of specular hematite.

2. Quartz

Quartz occurs as a few large fragments showing several textures, and as very abundant fine sand grains averaging 0.05-0.2 mm in size. Some large fragments are of single grains, others are of fine to medium grained quartz veins, and a few are of metamorphic quartz aggregates. Quartz occurs in a few fragments with hematite. Minor pyrite inclusions are present in a few fragments. Some quartz-rich rock fragments are present. Other rock fragments of undetermined composition are present; they probably are dominated by quartz and possibly fledspar.

3. Barite

Barite forms numerous large fragments averaging 1-2 mm in size; it is distinguished by its hardness and cleavage.

4. Pyrite

Pyrite occurs in a variety of textures. Commonly it forms single subhedral to euhedral grains. It also forms colloidal aggregates, and very fine to fine grained aggregates. A few coarse grains and aggregates are present. Many grains are partly to completely altered to pseudomorhic or massive hematite. Hematite commonly forms concentric alteration shells around cores of pyrite. Hematite also occurs along fractures in large fragments of pyrite.

5. Galena

Galena forms several large fragments up to 1.5 mm in size. It commonly is slightly to strongly replaced along borders and fractures to secondary Pb-minerals, locally containing intergrowths of extremely fine grained covellite. Some galena fragments are intergrown with fine grained pyrite. Pyrite generally is fresh, but in one fragment it is strongly fractured and altered on fractures to an unknown secondary mineral, possibly siderite. One fragment contains a few grains of a light brownish grey mineral, possibly tetrahedrite. These are up to 0.1 mm in size. Some are equant and others form a band along the edge of the galena fragment.

6. Garnet

Garnet forms equant to elongate grains and fragments averaging 0.5-1 mm in size, with a few up to 2.5 mm across. Most grains are free of inclusions, but one contains a rounded inclusion of pyrite 0.03 mm across.

Native copper

Native copper occurs in elongated, slightly curved fragments up to a few mm long. Most have a finely banded texture, which is only weakly developed. The color is yellower than normal for native copper, suggesting that it may contain precious metals.

Native bismuth

Native bismuth forms one grain 1.5 mm across. It has high reflectivity (slightly higher than that of galena), a light cream color, and is very soft (less than galena). The color is paler than that of pyrite, but is moderately strong in comparison with galena. Anisotropism is moderate to strong with shades of grey and creamy grey. The only other possibility for this mineral are several tellurides, but their anisotropism is more intense and anisotropic colors are bright.

Ti-oxide

Ti-oxide forms a few equant to slightly elongated grains averaging 0.1-0.15 mm in size. Some are secondary after ilmenite.

Magnetite

A very few grains consist of magnetite with exsolution? or alteration lenses of hematite.

The creek being worked by Normint Mines is locally called Bingo Creek and is a western tributary to Rosella Creek. Only very little gold was recovered during 1983 and we were told 20 ounces were recovered in 1982. Most of the material consisted of fluvial gravels, with fore set beds or cross bedding being very prominent in places, or unsorted dirty glacial till. Some very tenacious yellow clay near bed rock was also handled. We panned several pans of the various types of material without finding gold. No significant pre glacial gravels were indicated in this area.

The concentrates seen suggest there are deposits in the area containing barite lead and copper mineralization. Such mineralization is known in the "Old Grid" area and several other zones are suggested by reports of work in the vicinity. No significant gold has been found or reported in these deposits. Limited rock geochemical work in the area failed to indicate anomalous zones.

OLD GRID AREA 104P/11N, 12E

Location of this prospect area is shown on Figure 20 Unit 4 limestones and dolomite of the Atan Group are widespread in the area. We have no record of the previous operator here but extensive tractor trenching has been done.

Figure 22 (air photo BC5731 - 130) shows the extent of the tractor grid within which trenching was done.

Mineralization

Several mineralized outcrops were located in the old grid area and along the limestone ridge to the north. No areas of mineralization were located outside of the area inferred to have been covered by the Ax 1 - 24 claims.

The best mineralization seen outcrops in the 'North Creek' between lines 4S + 5S on the west side of the grid. It consists of two showings within clean gray limestone with 1 - 2m thick beds striking 160° and dipping 35° to the east.

The 'Lower Showing" consists of a 15m wide exposure along the south wall of a limestone gully. The zone is a white quartz vein enclosing blocks of highly silicified limestone and with silicified wallrock so that the margins of the silicified area are not sharp. Locally within the vein are pods of course - crystalline white to gray barite. Mineralization consists of minor amounts of malachite, azurite, chalcopyrite, chalcocite, specular hematite and limonite distributed irregularly throughout the silicified zone. The strike and true width of the zone are not clear but several blocks up to 2m across, of quartz vein ±silicified limestone ±minor mineralization are located in the creek immediately below the showing, suggesting

CASAU SURVEY

OLD GRID AREA

1:31,680 FIGURE 22

a maximum width of a few metres. A chip sample (32950C) was taken along the 15m long rock face exposure. Assays were 1.17% Zn, 0.43% Cu; 0.22% Pb; 0.36 oz Ag; <.003 oz Au. The 'Upper Showing' is located approximately 100 metres above the 'Lower Showing' and is located in the creek bed. It consists of a 10 metre wide quartz vein striking 160° across the creek. A 1 metre wide band of massive coarse - crystalline galena (±malachite) is exposed along the base of the outcrop. Sample 73794B assayed 1.48% Cu; 43.7% Pb; 4.66 oz Ag; <.003 Au. The upper section of the vein contains minor to trace amounts of galena, malachite, azurite, chalcocite, chalcopyrite, sphalerite, hematite and limonite.

Three trenches had been bulldozed across the southern extensions of the above showings. Although the trenches are all 6' to 8' deep they generally do not reach bedrock. The trench just south of line 6S is entirely within float material. The creek immediately north of line 6S has been trenched and some 7 metres length of subcrop and/or outcrop of resilicified brecciated quartz and silicified limestone ±limonite and minor malachite (over 2m) is present. Sample 73798B geochem results were 1100 ppm Cu; 240 ppm Zn; >10,000 ppm Pb 5.8 ppm Ag; 46 ppm As; <10 ppb Au.

Bedrock is fairly well exposed in the trench on line 5S. Much of the trench is cutting at a shallow angle across the east dipping limestone but it also cuts a 20 metre wide zone of silicified brecciated limestone and quartz ± minor barite veining on strike (N60°) with the Lower Showing. A 5 metre wide zone of dark red-brown hematite -limonite staining is present within the silicified zone. Minor malachite; azurite are present erratically throughout the silicified zone. A rock-chip sample was collected along the 20 metres of exposed silicification (73799B) which gave 2300 ppm Cu, 2350 ppm Zn; 9000 ppm Pb: 5.8 ppm Ag; 120 ppm As; <10ppb Au.

The other showings are all along the limestone ridge to the north of the grid. They are small irregular areas of silicification ± quartz ± barite veins (to 2m width). They contain rare traces of malachite, pyrite, azurite, chalcopyrite. Sample 73796B returned 90 ppm As, 7.0 ppm Ag; <10 ppb Au and Sample 73797B gave 69 ppm As; 0.1 ppm Ag, <10 ppb Au.

All of the above showings appear to be approximately conformable with the bedding of the limestone but no other structural control is apparent. Several of the silicified areas have a weak yellow to yellow-green staining which may be a secondary iron, lead or possibly arsenic mineral.

Mineralized float was found over a somewhat more extensive area than the above showings but is generally similar to the exposed mineralization and is likely locally derived. The only unusual float material was a few pieces seen in the saddle between the limestone ridge and the west ridge. It consisted of a white quartz arenite with very fine laminae with malachite and traces of chalcopyrite (Sample A52-1). No source for this material was located but it is likely also locally derived from a sandstone bed within the limestone unit.

Conclusions and Recommendations

The exposed mineralization consists of a very narrow 1 - kilometre long zone of epigenitic quartz ± barite ± malachite azurite ± chalcopyrite, chalcocite,± galena ± hematite ±sphalerite veining and silicification within a clean gray micritic limestone unit. Although a few small high grade zones of copper and lead are exposed, overall grades of Cu, Pb, Zn within the silicified areas are extremely low.

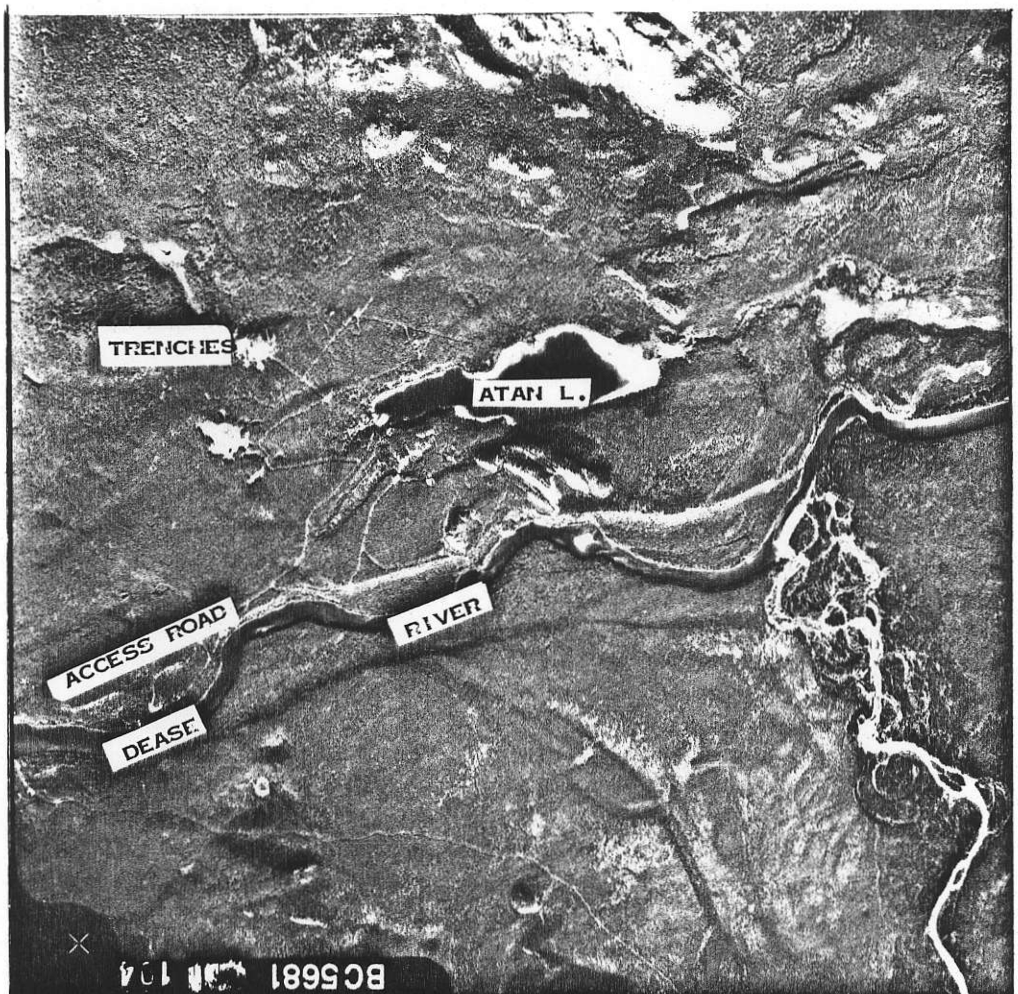
The known mineralization and stratigraphy do not appear particularly favourable for Pb, Zn or precious metal targets.

No further work in the immediate area is recommended.

ATAN LAKE - CARLICK GROUP

A brief visit was made to this mineral showing located a short distance northeast of McDame. Relative location of trenches and access roads is shown by Figure 23 .

Several short tractor trenches expose coarse barite,siderite, fairly prominent copper stain and minor copper sulphide mineralization together with relatively little galena and little sphalerite.. The mineralization did not appear to warrant sampling or further investigation. The assay results given in Memoir 319 indicate very low precious metal content.



CASAU SURVEY

ATAN LAKE - CARLICK GROUP

1 31,680 FIGURE 23

Atan Group Mineral Showings - Remarks

The Atan Lake - Carlick group, the Rosella placer area and Old Grid showing and the Captain Lake copper showing indicate the probability that significant barite, galena, copper and sphalerite mineralization may be widespread in these formations. The mineralization contains relatively low precious metal values in the showings sampled.

The Dekalb barite showing near Captain Lake has been assumed, by us at least, to be within McDame group rocks but further investigation would be needed to be sure of this.

So long as precious metals are necessary to provide an economic value to mineral deposits in the general Cassiar area there is little incentive to further prospect the Atan group rocks.

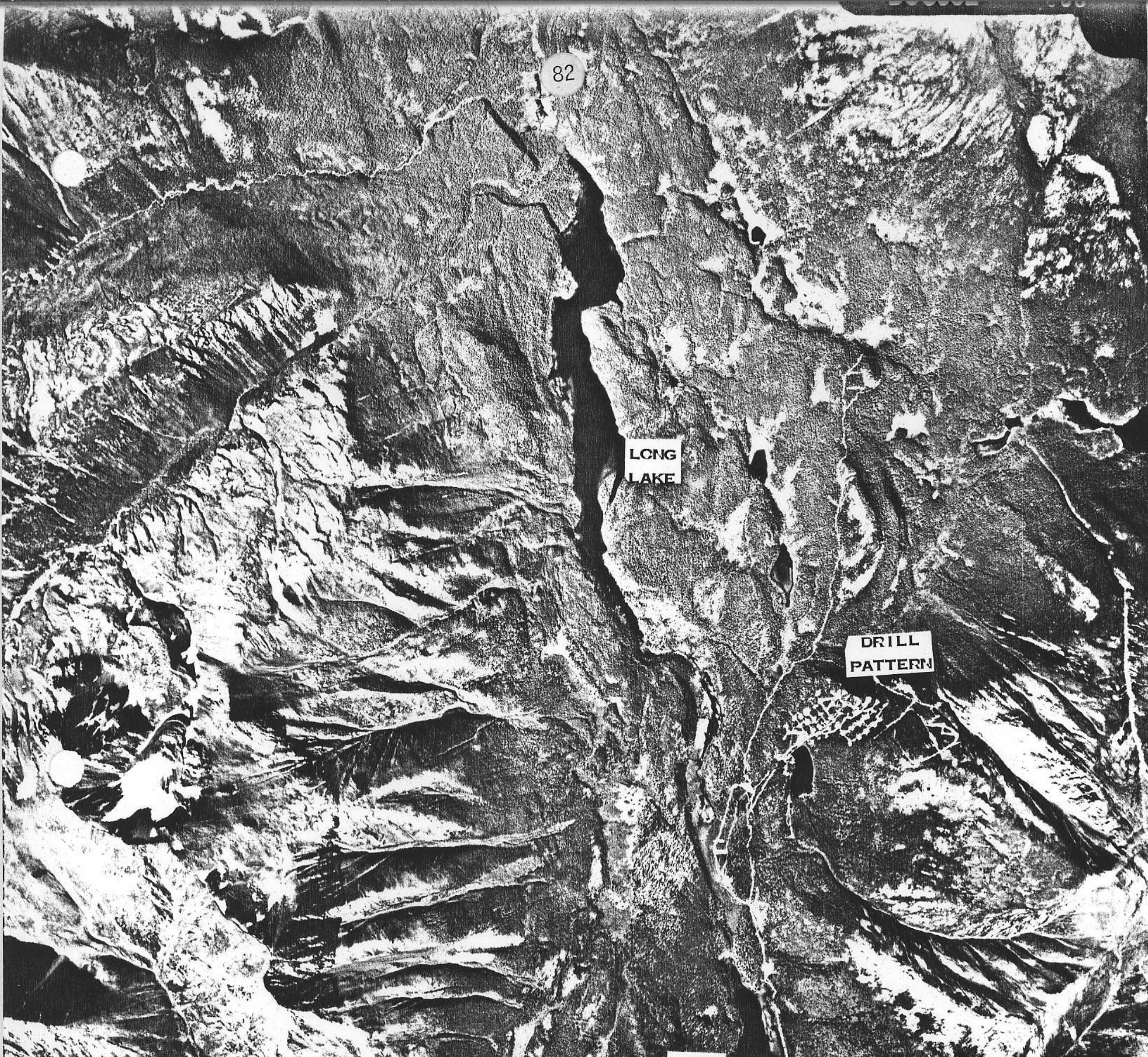
MT. HASKINS - DELLA MINES 104P/5E, 6N

Extensive exploration was conducted by Della Mines on Mt. Haskins during the period 1969 - 1976. Figure 24 shows location of Mt Haskins in relation to regional geology. An effort was made to examine those showings southeast of the peak of Mt Haskins during a period of bad weather. This proved to be impractical due to bad road conditions and poor visibility. The drill area northeast of Hot Lake,(Figure 25)was the only mineralized area seen.

The drill hole pattern on the air photo suggests approximately 40 drill holes. A large amount of core has been left in racks and in a plywood building. Some of this is still legible but some is scattered or illegible.

The prospect appears to have been a molybdenum porphyry type. Major rock types are (1) - pale green to cream,hard, very fine grained, siliceous calc-silicate with fine, sometimes contorted banding (2) - massive fine grained pink-brick garnet skarn (3) - fine grained dark and light banded argillite (4) - unit 3 hornfelsed to a fine brown hornfels containing occasional quartz veinlets with minor MoS_2. (5) - medium grained fresh, light gray porphyritic biotite granite - pale pink feldspar phenocrysts to ½" long, porphyroblasts of granular quartz - small black biotite booklets disseminated through rock; (6) - as (5) but feldspars altered greenish. Unit 5 is also brecciated with fine silicified healing zones.

CASAU SURVEY
INDEX MAP
MT. HASKINS, DELLA MINES
1" = 4 MILES
FIGURE 24



CASAU SURVEY

DELLA MINES

RAIN GROUP DRILL PATTERN

1:31,680 FIGURE 25

Mineralization

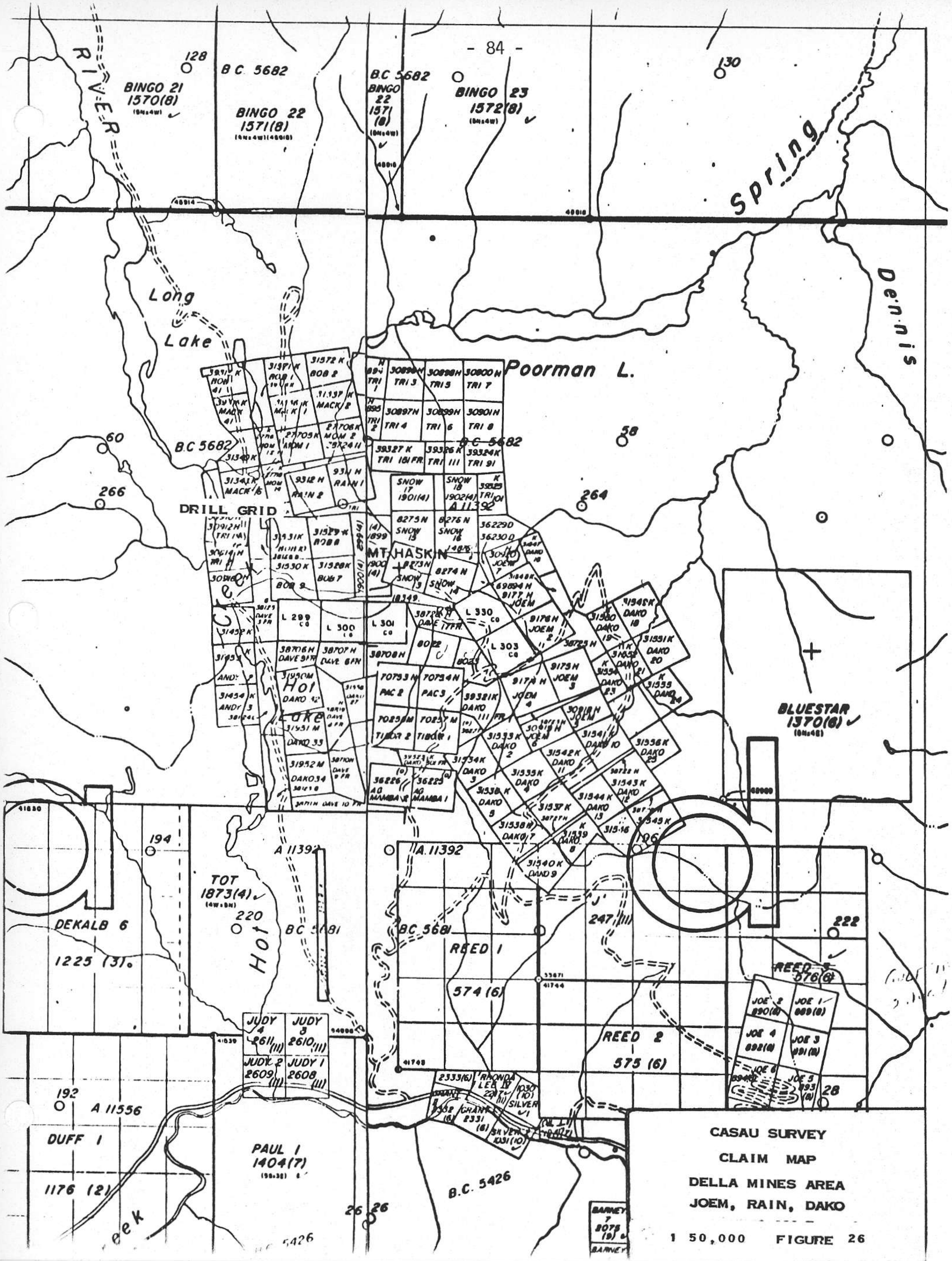
Just north of Hot Lake fine grained quartzite and chert outcrop on the road. This contains abundant fine disseminated pyrrhotite and rare chalcopyrite with some pyrite or pyrrhotite on fractures. One example of galena and sphalerite on a fracture was found.

In core at the camp white to bluish quartz veins cut brown hornfels and porphyritic granite and contain fine MoS_2.

Light colored calc-silicate contains seams and blebs of pinkish garnet in places and a few zones of massive pyrrhotite, chalcopyrite with rare galena and sphalerite.

Pink garnet zones have rare pyrite on fractures. One zone of several feet of fairly massive pyrrhotite was seen in core.

None of the mineralization seen appears to be ore grade in view of the apparent short lengths of the intersections. Some core specimens later checked by UV lamp showed scattered scheelite mineralization. No research has been done on assessment reports to find out whether tungsten had been assayed for. This may have been done later when Canadian Superior were drilling on the Mt. Reed skarns.



CASAU SURVEY
CLAIM MAP
DELLA MINES AREA
JOEM, RAIN, DAKO
1 50,000 FIGURE 26

DISTRICT POTENTIAL

Significant gold mineralization known to date is confined to the McDame area shown in Figure 27 taken from "Geological Fieldwork 1981". Similar structural and alteration patterns occur on EAGL group to the south with associated gold and silver geochemistry. A short distance southeast of EAGL on the DALTO group however very little indication of gold mineralization was found although altered east west trending zones of large size are present.

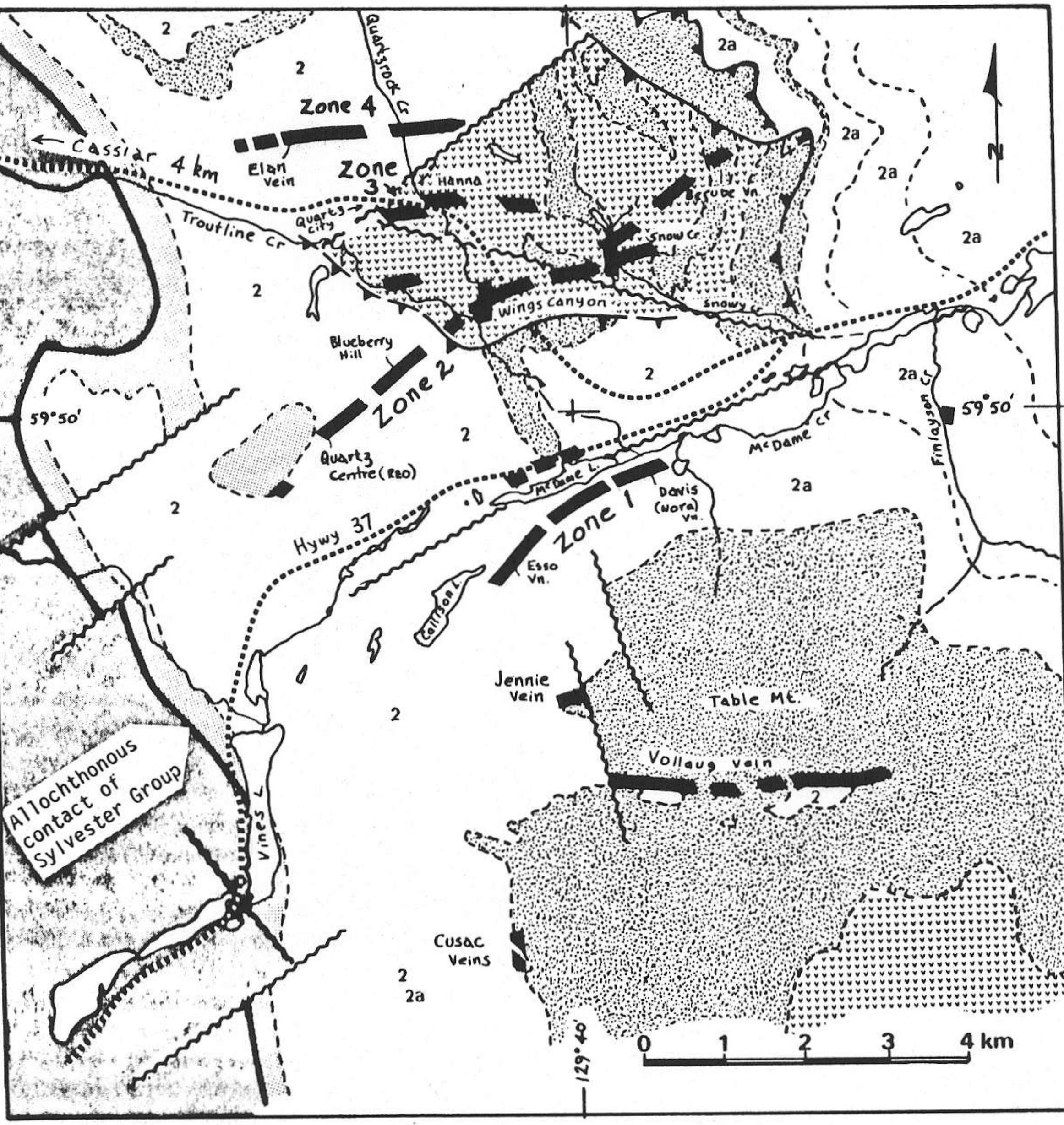


Figure 27 Geology of the McDame map-area.

To the north of the McDame area gold geochemistry in surface soil and rock samples has been reported by Spirit Petroleum on the CAP group. Butler Mountain Minerals reported isolated gold assays in drilling just north of the B.C. - Yukon border. Very few indications of gold mineralization were obtained elsewhere during our exploration although several zones of iron carbonate alteration with some quartz veining were located. Check sampling of mineralization at Long Lake, Captain Lake and in other areas failed to indicate significant precious metals.

Development over the years at Erickson Gold Mines and at Cusac suggest that further discoveries will be made in the district in the future. Erickson Gold have greatly increased their land holdings through acquisition of the Plaza assets and carried out much careful staking and restaking this year.

Only very limited prospecting was conducted within McDame group rocks and considerable evidence was seen of recent silt sampling and detailed prospecting by other companies. Barite mineralization was seen near Gallic Lake but no distinctly anomalous zones were located.

Work in the Atan group rocks suggests there are probably widespread copper, lead, zinc, barite, silver bearing deposits. None of the showings known suggest large tonnage possibilities and precious metals contents were generally low. These factors prevent us from recommending further prospecting in this environment but in general the existence of the Rosella creek placers, the massive galena at "Old Grid", high grade copper at Captain Lake and the widespread red bed hematite rich horizons suggest that these rock units may have some real potential for base metals with some silver content.

No prospecting was done in the eastern portion of the 104P map sheet where extensive low level zinc geochemical anomalies are indicated by regional geochemical maps. These anomalies are associated with high ph values and are presumably subdued because of this basic environment. The barite, pyrite, galena, sphalerite, tetrahedrite mineralization on the ROMAN group at the Yukon boundary suggests possibilities for significant mineralization in the region.

CONCLUSIONS AND RECOMMENDATIONS

Reconnaissance prospecting of the Sylvester group rocks of McDame map sheet failed to locate new indications of gold mineralization except in the general vicinity of the known Erickson Gold Mines district. Gold deposits in this district are associated with quartz veining which occurs in several fairly distinct systems. The only deposits which have produced significant profits are those of Erickson Gold Mines and it is likely that with the current successful management this mine will continue to generate profits.

The vein systems at Cusac Industries property appear to be strong and judging from the amount of free gold seen this property warrants careful evaluation.

The veins being mined at Taurus - Hearne appear narrow and weak. A significant portion of the gold values available are concentrated in small gash veins in both the hanging and footwalls of the main veins. Recovery of these values tends to be offset by excessive dilution and the 0.16 oz/ton mill head values being obtained suggest this deposit will not make a profit.

New properties staked on behalf of Newmont Exploration, the FOX and EAGL groups, may be considered to be on the fringe of the known gold bearing district. No ore grade material has been located to date but the quartz veining, silver values and tetrahedrite mineralization on FOX indicates this property has many of the characteristics of the Erickson area. We are told Erickson does encounter veins or zones with only silver values (up to 20 oz/ton) which have very limited tonnage potential and are not mined. The extensive fracture systems on EAGL with rock and talus geochemical values up to 3450 ppb Au warrant careful and thorough investigation. An extreme case at Erickson in 1983 involved trenching on a soil sample anomaly, uncovering quartz float which led to discovery of a new vein. Overburden was up to 12 metres in depth. The soil sample grid lines were spaced at 40 metres with samples every 10 metres. The geochem values being investigated consisted of two values of 80 ppb Au.

Further detailed prospecting is recommended in the vicinity of FOX group and some further detailed prospecting is recommended between Cusac and EAGL group. Detailed recommendations, with cost estimates, for work on FOX and EAGL groups are supplied with separate reports on these properties. A summary of cost estimates follows.

Respectfully submitted,
J.C. Stephen Explorations Ltd.

J.C. Stephen

J.C. Stephen

1984

SUMMARY COST ESTIMATES

(A) Detailed mapping and prospecting south of FOX Group

Wages and Benefits

Geologist @ $2200/m for 12 days + 15%	$1015.
Helper @ $1600/m for 12 days + 15%	735.
	$1750.

Wages represent 30% of total cost

Total estimated cost of 12 day prospecting program $6,000.00

(B) Detailed mapping and prospecting between CUSAC and EAGL

Wages and Benefits

Geologist @ $2200/m for 18 days + 15%	$1520.
Helper @ $1600/m for 18 days + 15%	1100.
	$2620.

Wages represent 30% of total cost

Total estimated cost of 18 day prospecting program $9,000.00

(C) Detailed exploration FOX Group
as per Prospecting Report $10,000.00

(D) Detailed exploration EAGL Group
as per Prospecting Report Phase I $15,000.00
Hand Trenching Phase II $16,000.00

TOTAL BUDGET $56,000.00

REGISTER OF CLAIMS

Group	Claims	Record Number	No. of Units	Record Date
CAS	CAS 1	2863(7)	20	July 4 1983
SAU	SAU	2916(8)	4	Aug 11 1983
FOX	FOX 1	2918(9)	12	Sept 2 1983
EAGL	EAGL 1	2912(7)	20	July 25 1983
	EAGL 2	2917(9)	20	Sept 2 1983
DALTO	DALTO	2913(7)	20	July 25 1983

These claim groups have been staked as agent for Newmont Exploration of Canada Limited and claim records are held by Newmont.

APPENDIX I

GEOLOGICAL LEGEND

TO ACCOMPANY MAPS II TO IX

REGIONAL GEOLOGY

LEGEND

TERTIARY

10 Recent basalt

JURASSIC - CRETACEOUS

9 Cassiar Batholith - quartz monzonite, granodiorite
- 9a Pyritic felsic stock unknown age
- 9b Four Mile River Batholith
- 9c Plate Creek Stock

MISSISSIPPIAN

8 Ultra mafic intrusives - serpentinite, peridotite, pyroxenite

UPPER DEVONIAN - LOWER MISSISSIPPIAN

7 Upper Sylvester Group - andesitic tuffs and agglomerates minor dacite, basalt, includes flows, sills, dykes.
- 7a Diorite, diorite breccia
- 7b Volcanics with limestone interbeds
- 7c Volcanics with tuffaceous chert interbeds

6 Lower Sylvester Group - argillite, slate, siltstone greywacke
- 6a Chert, tuffaceous chert
- 6b Chert pebble conglomerate

MIDDLE - UPPER DEVONIAN

5 McDame Group - black fetid dolomite, dolomite breccia, limestone, calc-arenite

SILURIAN - DEVONIAN

4 Sandpile Group - dolomite, sandy dolomite, sandstone

CAMBRIAN - ORDOVICIAN

3 Kechika Group - black shales, limestone

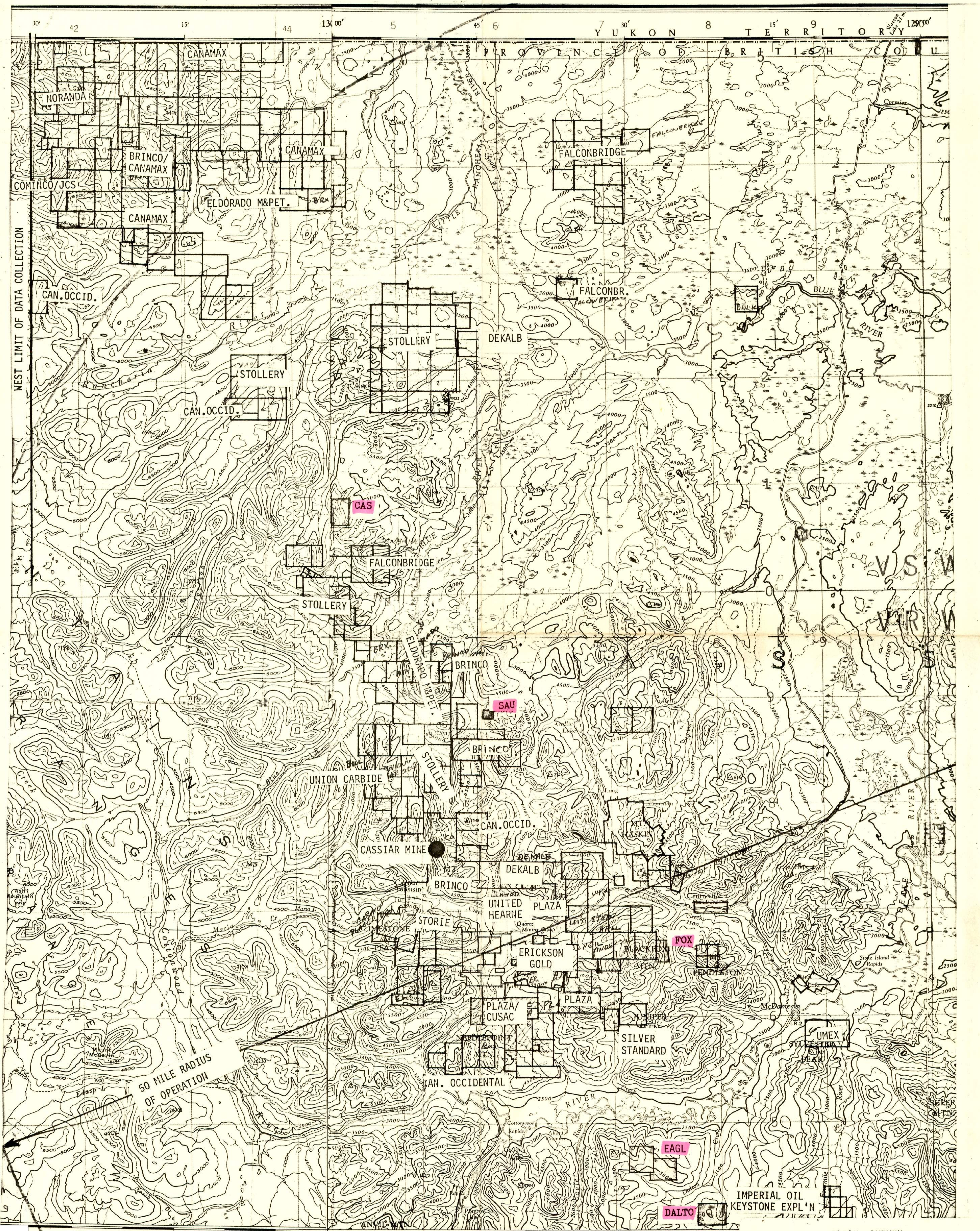
CAMBRIAN

2 Atan Group -

2a - siltstone, quartzite, calcareous siltstone, includes quartz mica schist - possibly older?

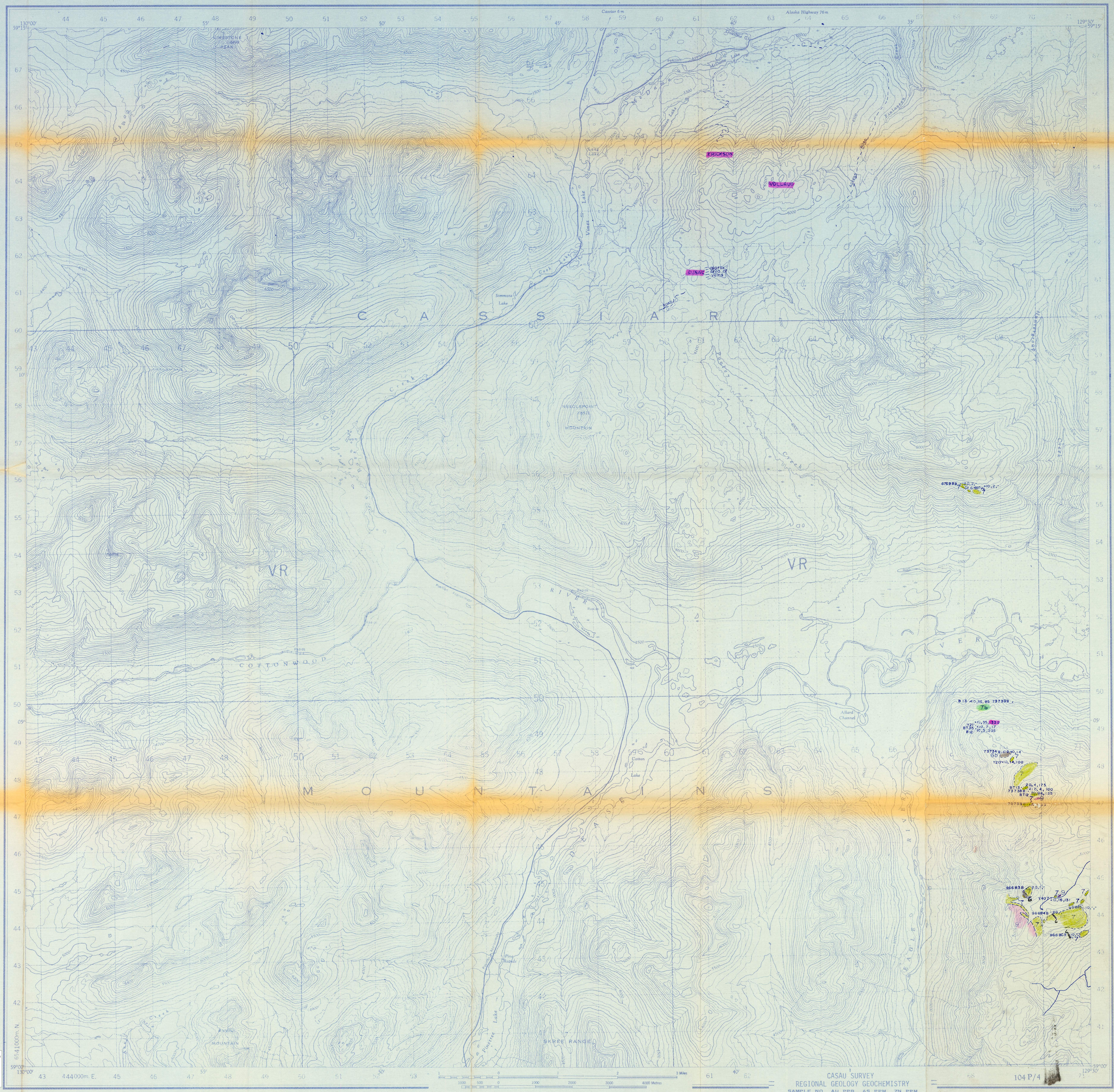
2b - limestone, dolomite

1 Good Hope Group - limestone



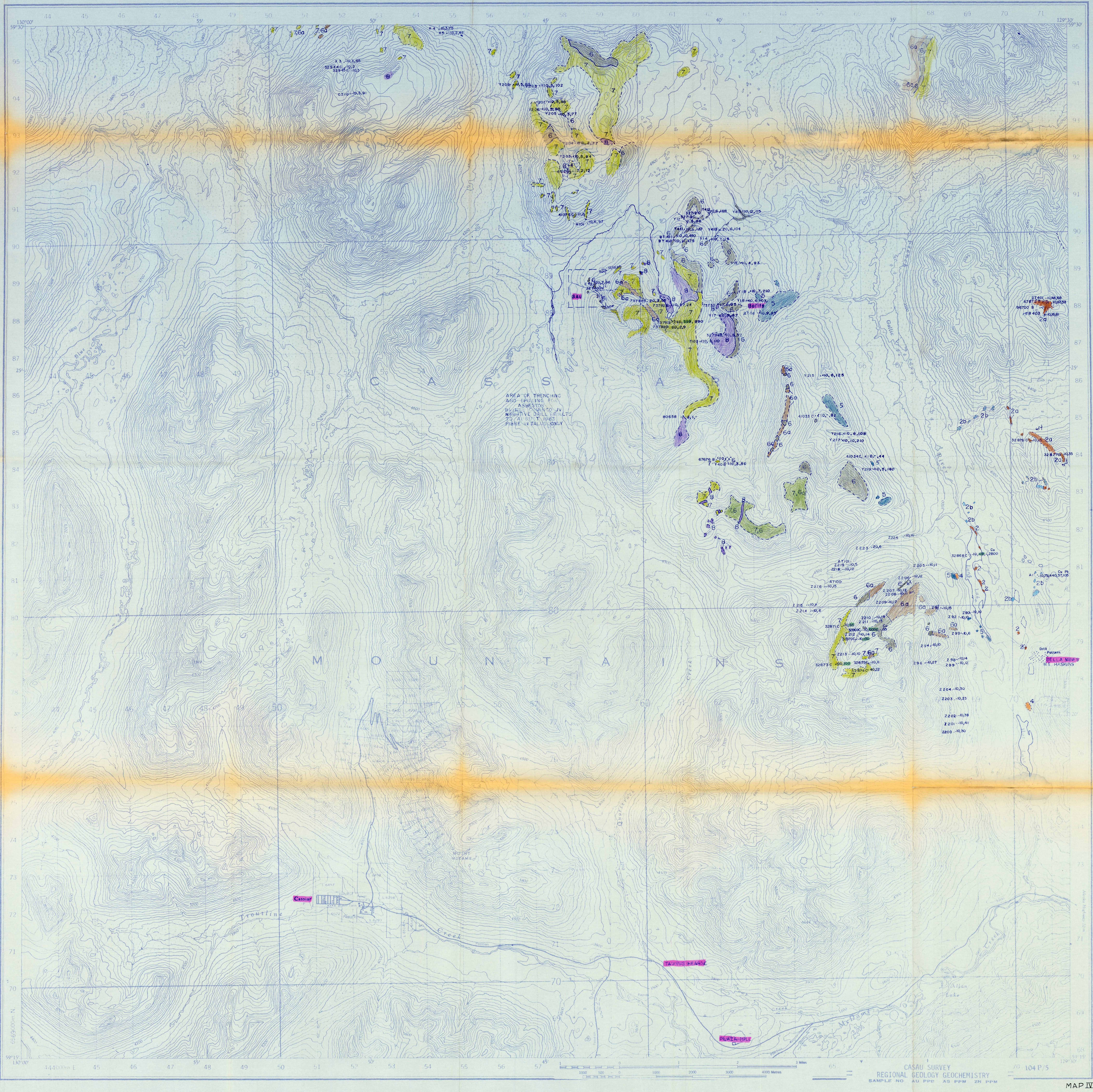
CASAU SURVEY
MINERAL CLAIMS IN SURVEY AREA
as of MAY 1983
Scale: 1; 250000

MAP I

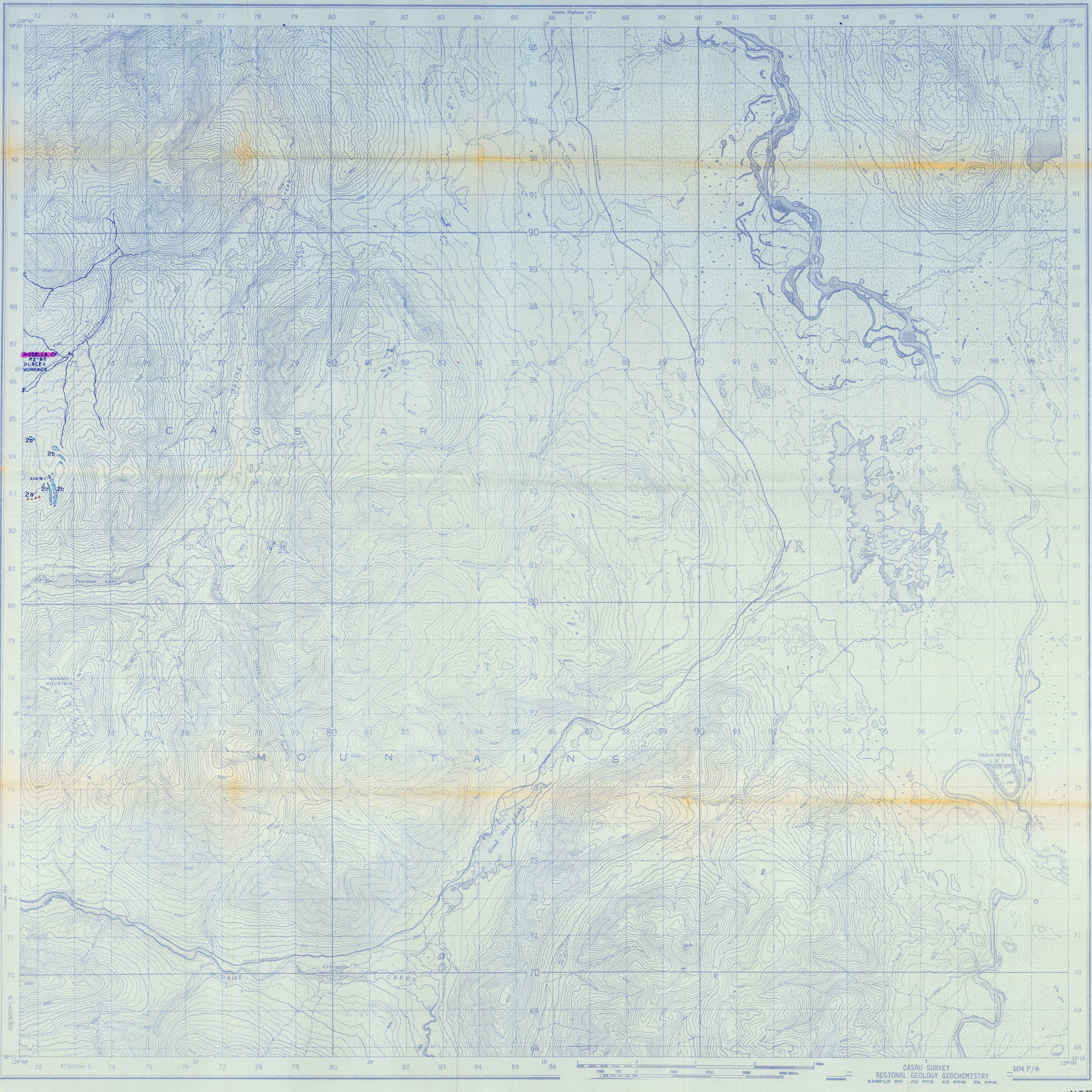


CASSIAR
MOUNTAINS
VR
VR
ERICKSON
VOLLAUG
CUSAC
approx area of veins
ROAD
Cassiar 8 m.
Alaska Highway 78 m.
NEEDLEPOINT PEAK
MOUNTAIN
RIVER
COTTONWOOD
SKREE RANGE
Allend Channel
CASAU SURVEY
REGIONAL GEOLOGY GEOCHEMISTRY
SAMPLE NO AU PPB AS PPM ZN PPM
104 P/4

MAP III

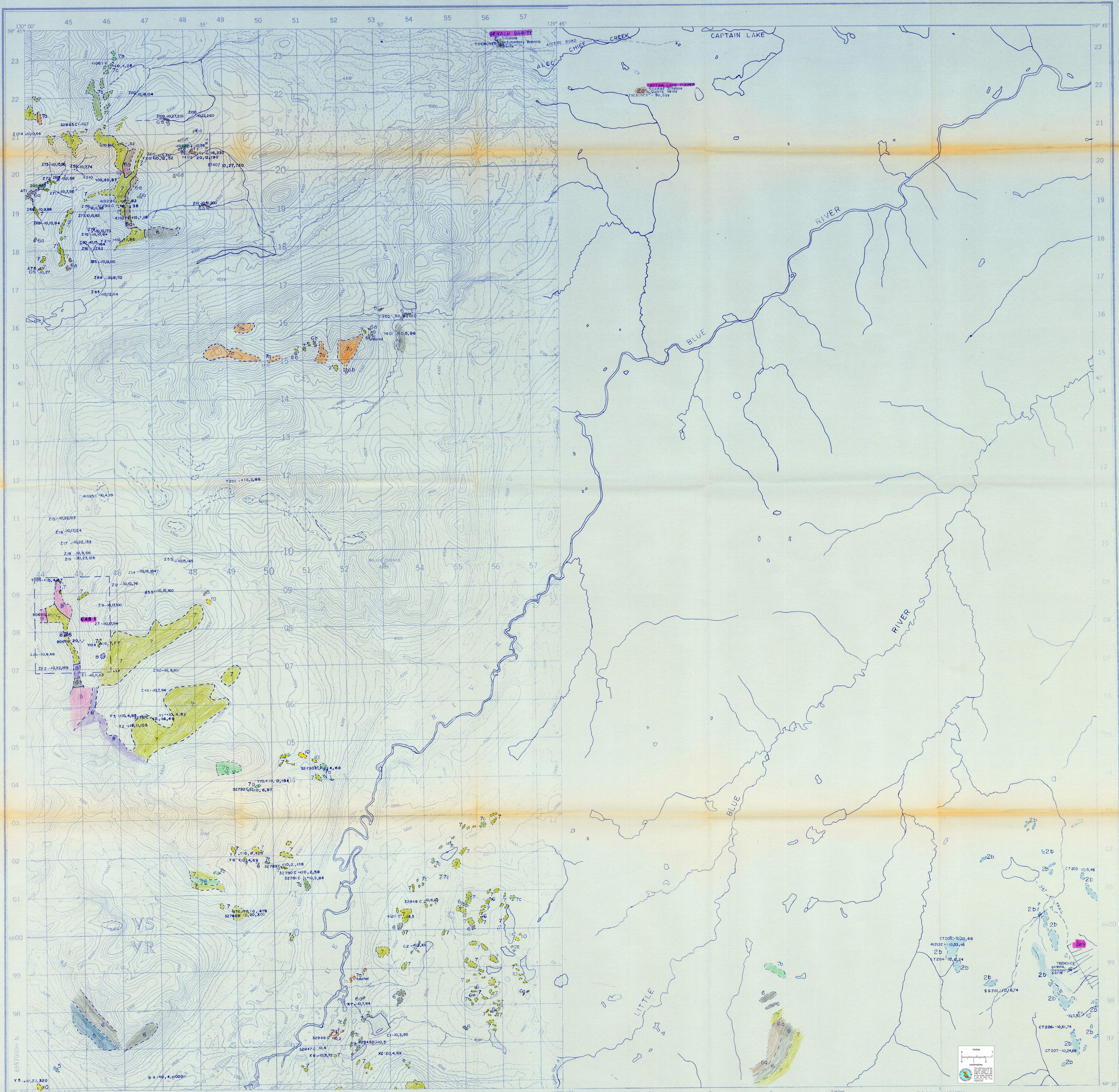


C A S S I A R
M O U N T A I N S
AREA OF TRENCHING
AND DRILLING FOR
ASBESTOS
NEGATIVE DRILL RESULTS
TO AUGUST 1983
FIBRE IN TALUS ONLY
CASAU SURVEY
REGIONAL GEOLOGY GEOCHEMISTRY
SAMPLE NO AU PPB AS PPM ZN PPM
104 P/5
MAP IV



Alaska Highway 45 m
CASSIAR
MOUNTAINS
Poorman Lake
Good Hope Lake
Centreville
ROSELLA CK.
82-83
PLACER
WORKINGS
2b
2b
32878 C
2b
2b
2a
CASAU SURVEY
REGIONAL GEOLOGY GEOCHEMISTRY
SAMPLE NO AU PPB AS PPM ZN PPM
104 P/6

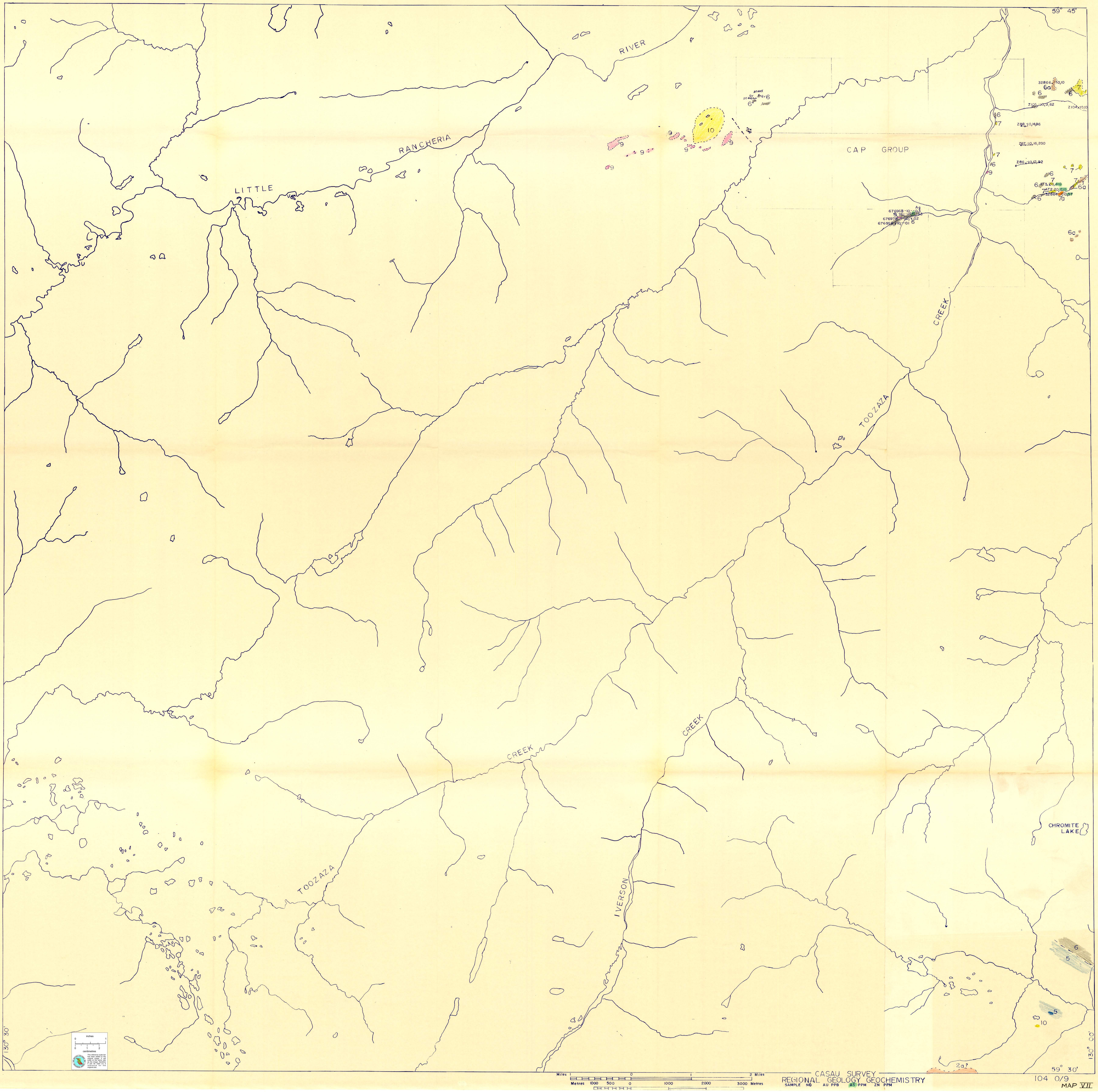
MAP V



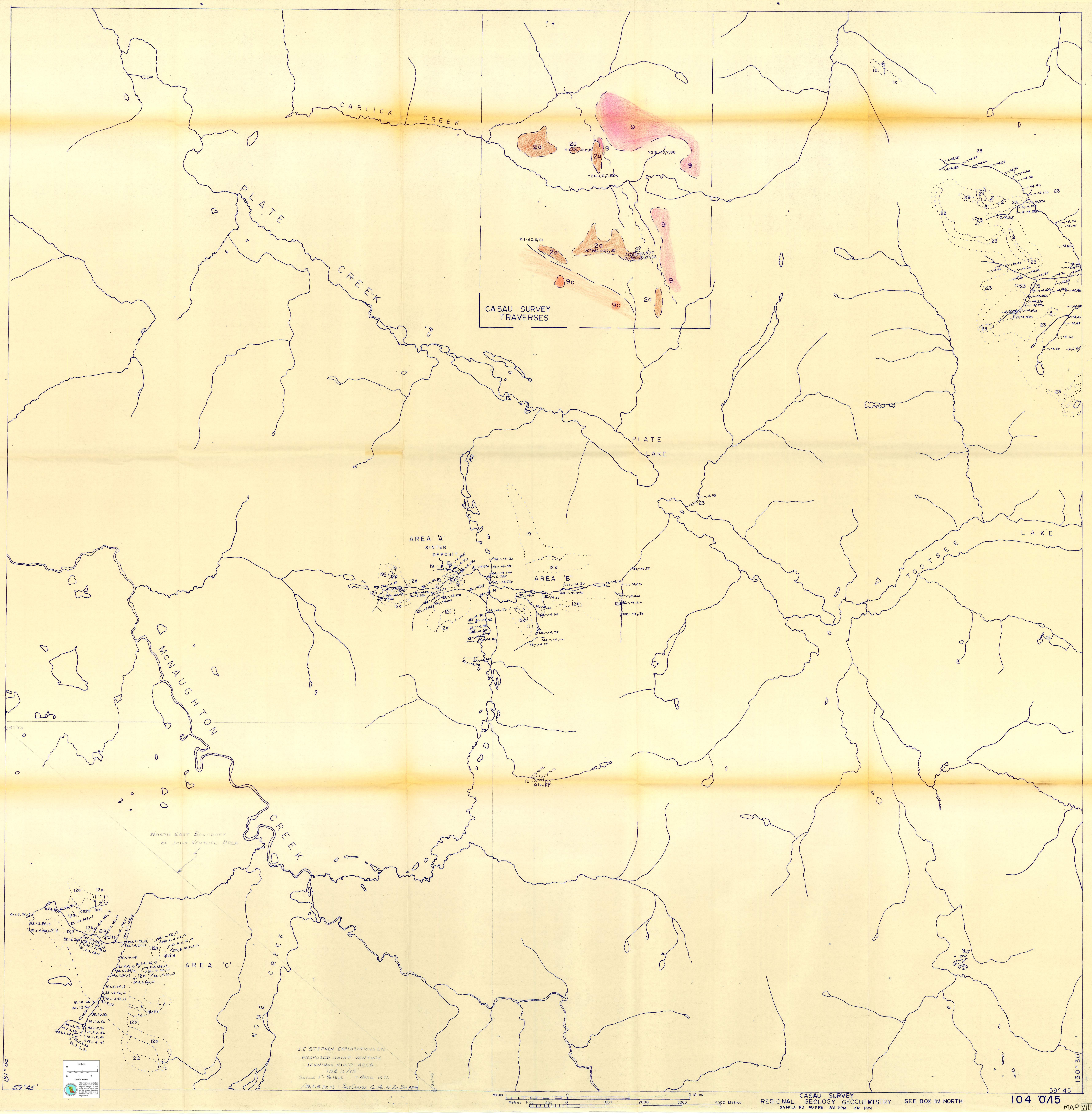
CASAU SURVEY
REGIONAL GEOLOGY GEOCHEMISTRY
SAMPLE NO AU PPB AS PPM ZN PPM

104 P/12

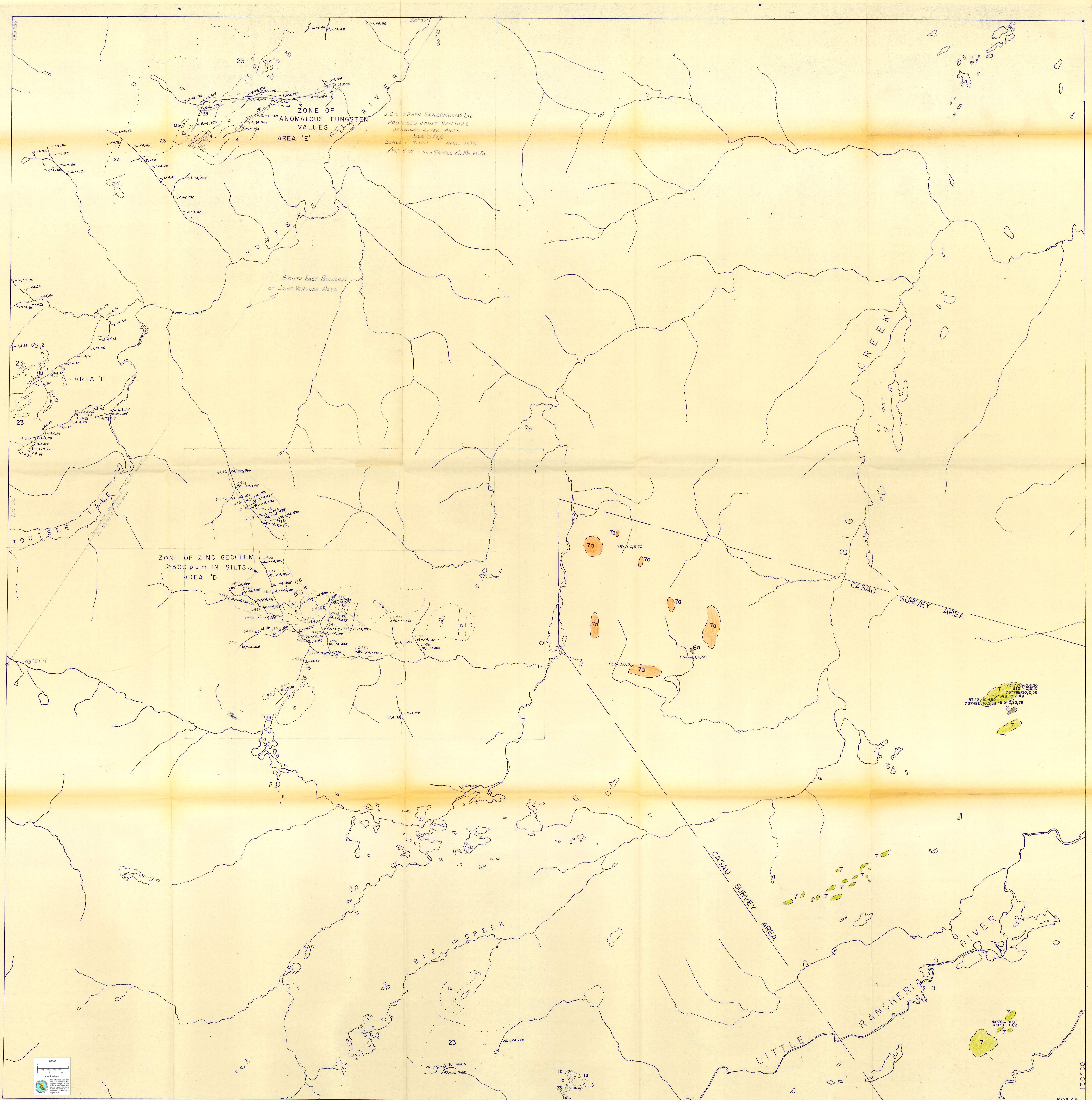
MAP VI



59° 45'
RIVER
RANCHERIA
LITTLE
CAP GROUP
CREEK
TOOZAZA
CREEK
CREEK
TOOZAZA
IVERSON
CHROMITE LAKE
130° 30'
130° 00'
59° 30'
Miles 1 0 1 2 Miles
Metres 1000 500 0 1000 2000 3000 Metres
CASAU SURVEY
REGIONAL GEOLOGY GEOCHEMISTRY
SAMPLE NO AU PPB AS PPM ZN PPM
104 O/9
MAP VII



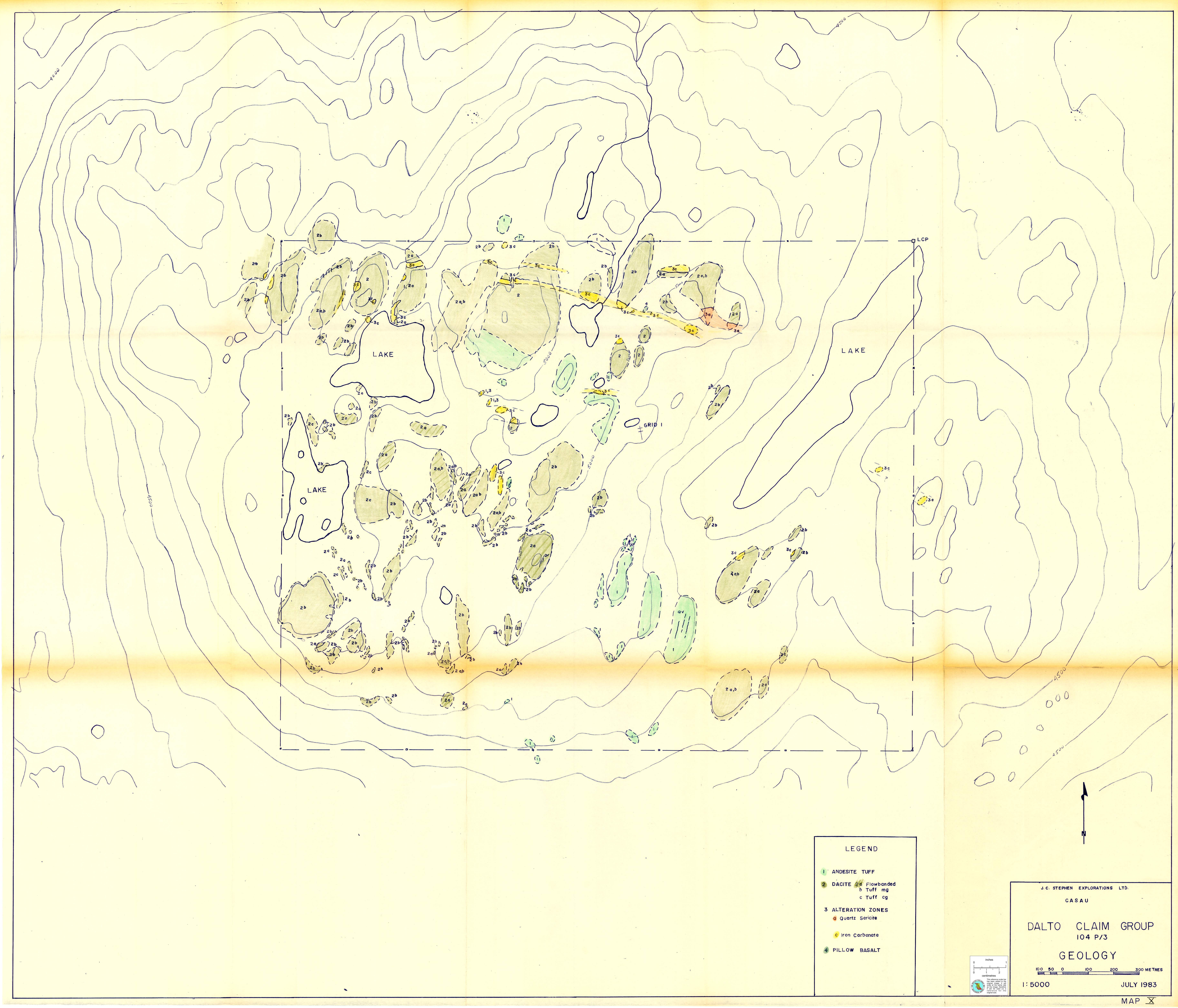
CARLICK CREEK
PLATE CREEK
CASAU SURVEY TRAVERSES
PLATE LAKE
TOOTSEE LAKE
AREA 'A'
SINTER DEPOSIT
AREA 'B'
McNAUGHTON CREEK
NOME CREEK
AREA 'C'
NORTH EAST BOUNDARY OF JOINT VENTURE AREA
J.C. STEPHEN EXPLORATIONS LTD.
PROPOSED JOINT VENTURE
JENNINGS RIVER AREA
104 O/15
SCALE 1" - 1/2 MILE - APRIL 1975
38, 2.5, 92, 3 = SILT SAMPLE Cu. Mo. W. Zn. Sn PPM
Miles 1 0 2 Miles
Metres 1000 500 0 1000 2000 3000 4000 Metres
CASAU SURVEY
REGIONAL GEOLOGY GEOCHEMISTRY
SAMPLE NO AU PPB AS PPM ZN PPM
SEE BOX IN NORTH
104 O/15
MAP VIII
59° 45'
130° 30'
131° 00'

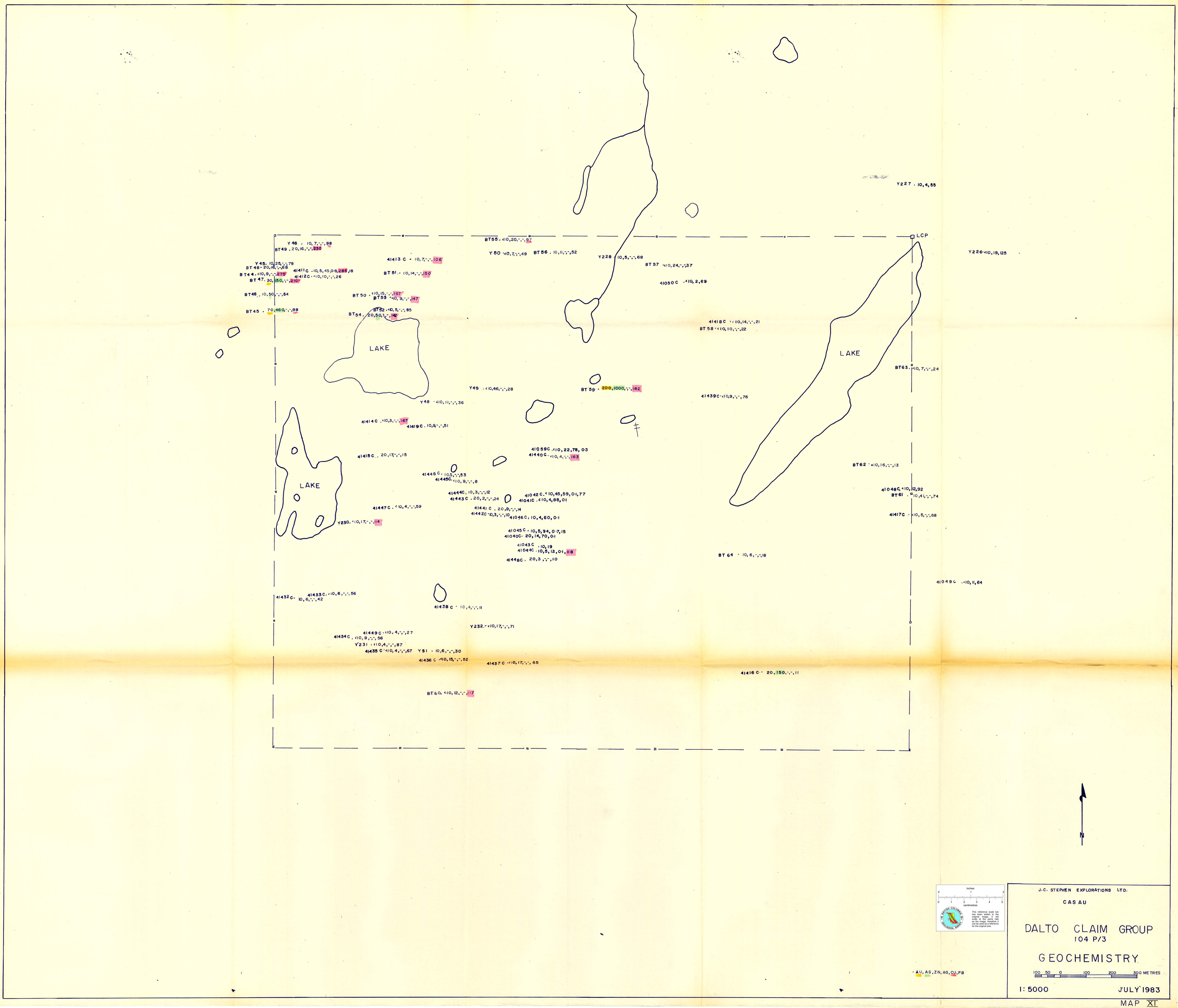


CASAU SURVEY
REGIONAL GEOLOGY GEOCHEMISTRY SEE SOUTHEAST CORNER
SAMPLE NO AU PPB AS PPM ZN PPM

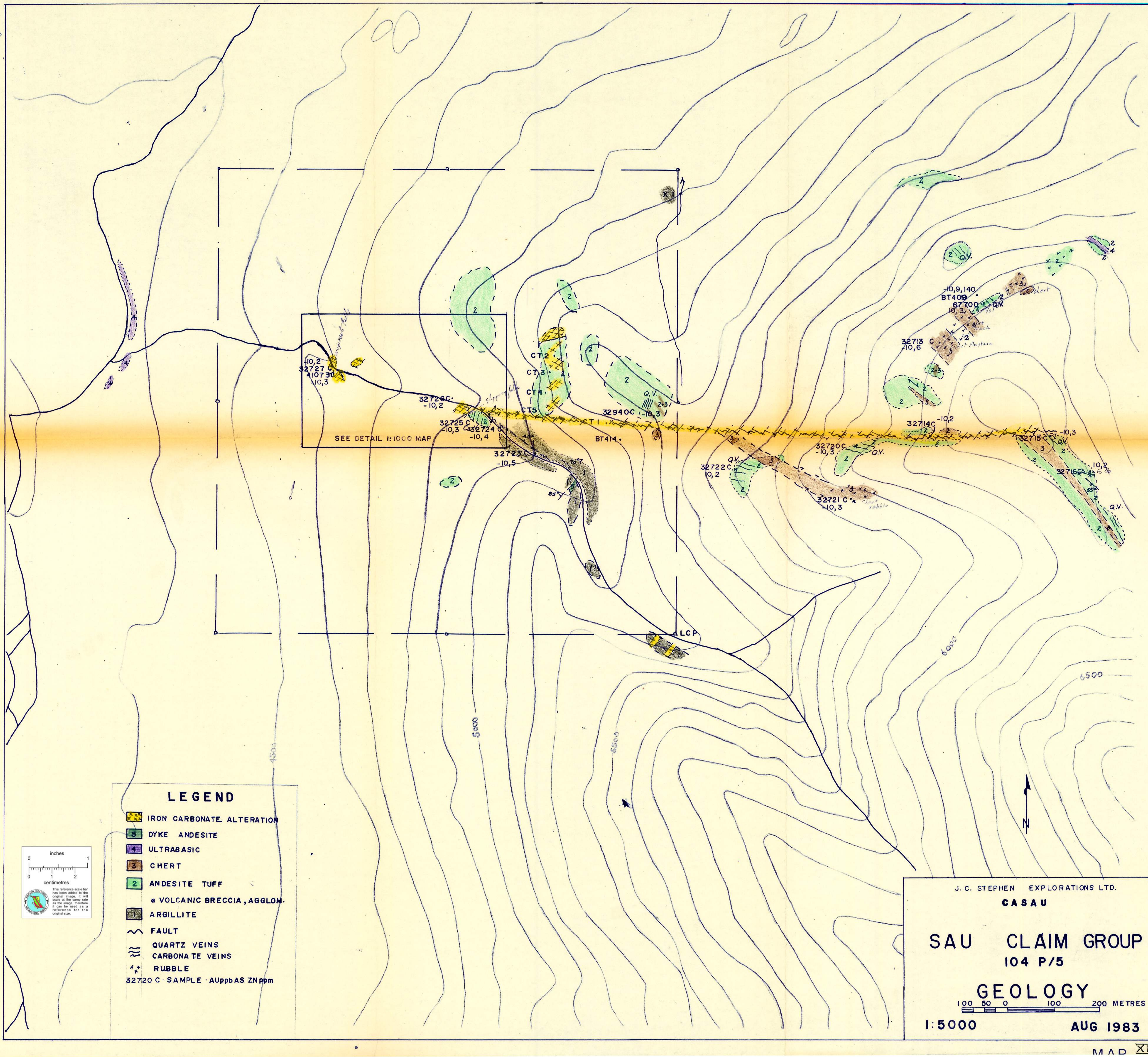
104 'O'/16

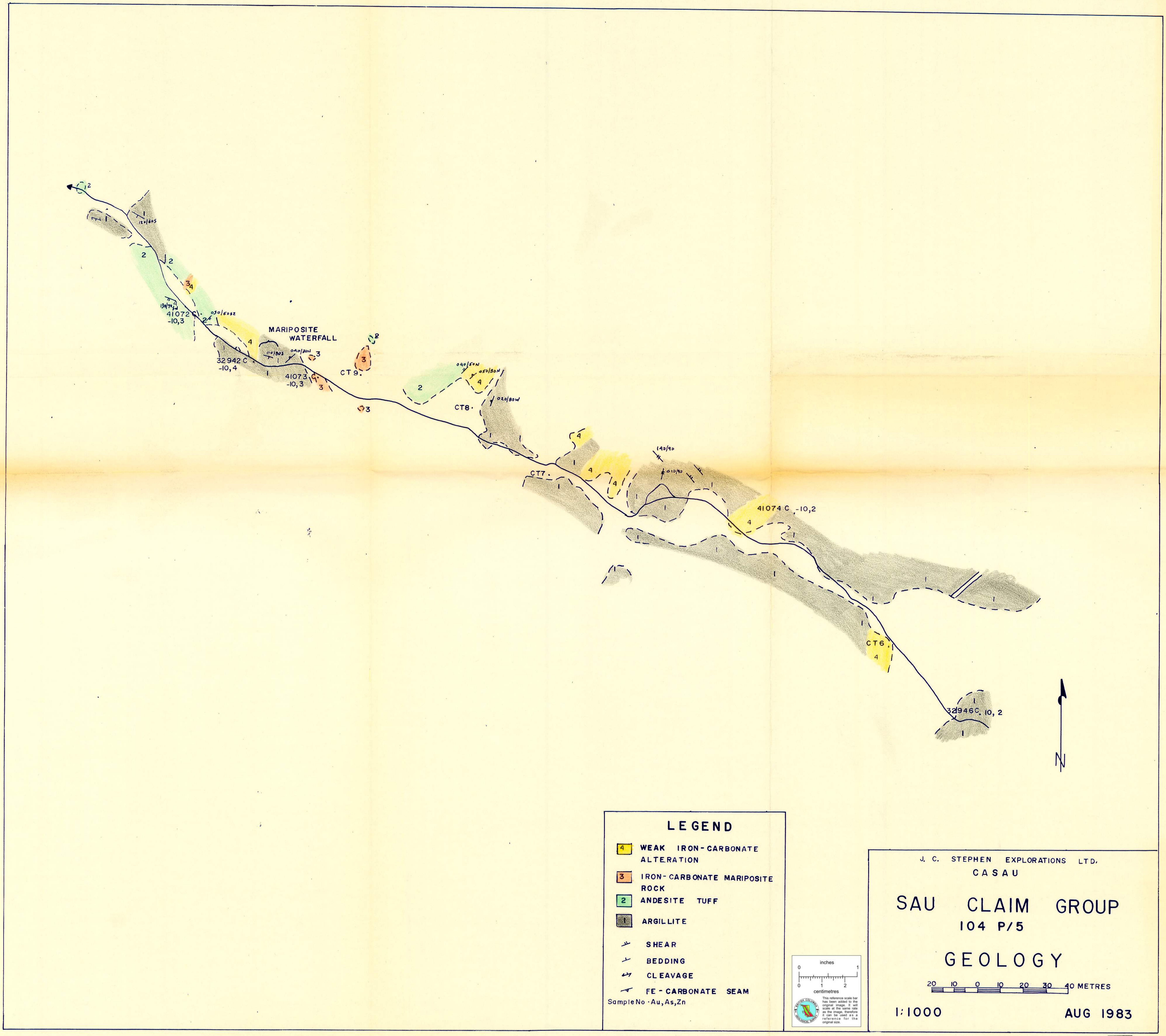
MAP IX


LAKE
LAKE
LAKE
GRID I
LCP
LEGEND
1 ANDESITE TUFF
2 DACITE 2a Flowbanded
b Tuff mg
c Tuff cg
3 ALTERATION ZONES
a Quartz Sericite
c Iron Carbonate
4 PILLOW BASALT
J.C. STEPHEN EXPLORATIONS LTD.
CASAU
DALTO CLAIM GROUP
104 P/3
GEOLOGY
100 50 0 100 200 300 METRES
1:5000
JULY 1983
inches
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
MAP X



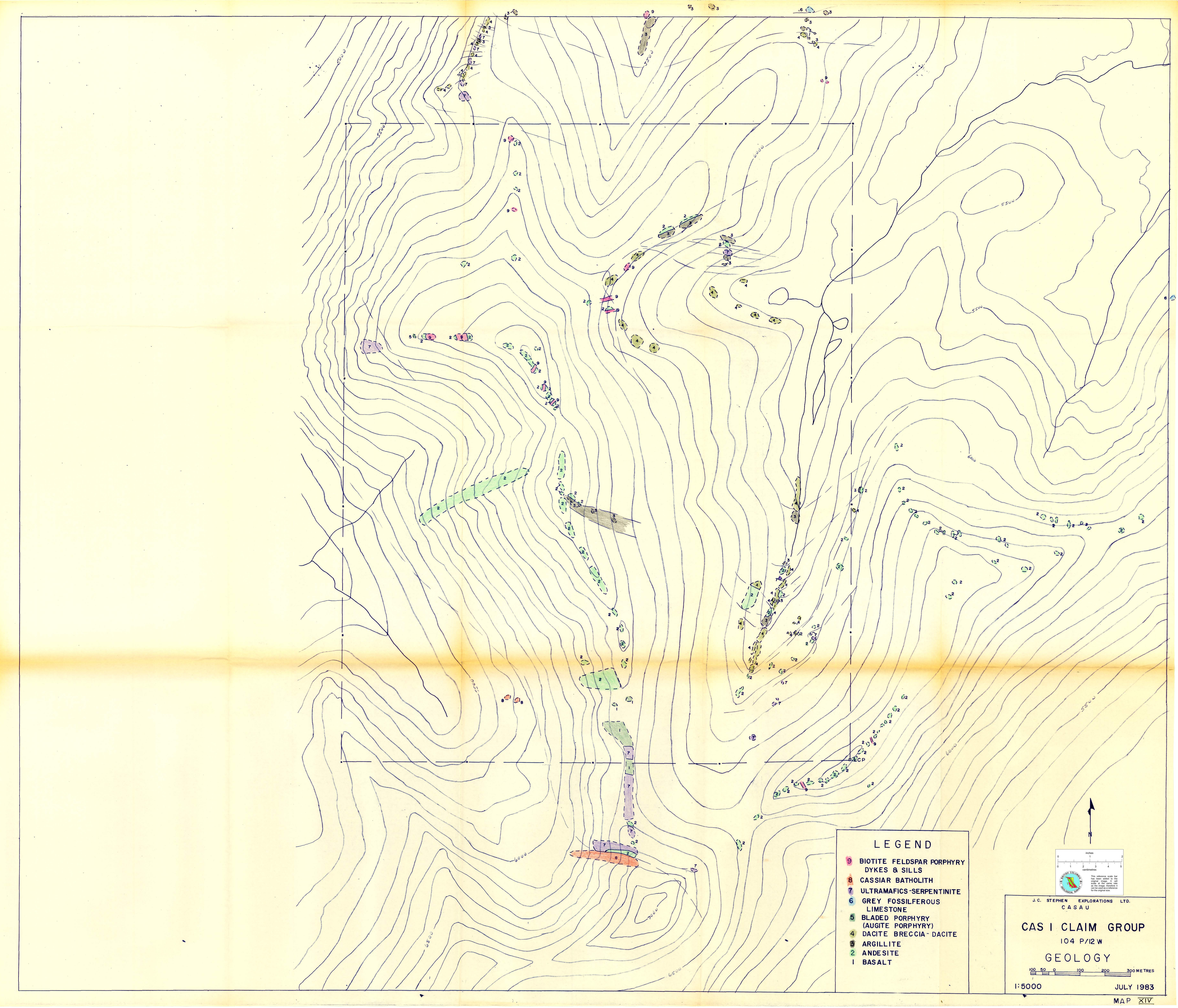
Y227 . 10,4,55
LCP
Y226·<10,19,125
Y46 . 10,7,-,-,98
BT49 . 20,16,-,-,230
BT55 . <10,20,-,-,97
Y50 ·<10,7,-,-,49
BT56 . 10,11,-,-,52
Y228 · 10,5,-,-,68
BT57 ·<10,24,-,-,37
41050C .<10,2,69
41413 C · 10,7,-,-,106
Y45. 10,25,-,-,78
BT48 · 20,16,-,-,68
41411C .10,5,45,0·8,285,18
BT44 .<10,9,-,-,275
41412C ·<10,10,-,-,26
BT51 .· 10,14,-,-,150
BT47. 30,150,-,-,210
BT46 . 10,50,-,-,54
BT50 · <10,15,-,-,167
BT53 ·<10,9,-,-,147
BT45 . 70,460,-,-,98
BT52 .<10,5,-,-,85
BT54 . 20,50,-,-,142
41418C ·<10,14,-,-,21
BT58 ·<10,10,-,-,22
LAKE
LAKE
BT63 .<10,7,-,-,24
Y49 .<10,46,-,-,28
BT59 · 200,1000,-,-,182
Y48 ·<10,11,-,-,36
41439C·<10,9,-,-,76
41414C .<10,3,-,-,167
41419C . 10,9,-,-,51
41059C .<10,22,78,0·3
41440C ·<10,4,-,-,163
41415C . 20,17,-,-,15
BT62 ·<10,16,-,-,13
41446C · 10,5,-,-,53
41445C·<10,9,-,-,8
LAKE
41444C . 10,3,-,-,12
41443C . 20,2,-,-,24
41042C .<10,45,59,0·1,77
41041C .<10,4,88,0·1
41048C <10,12,92
BT61 . 10,41,-,-,74
41447C .<10,4,-,-,59
41441C . 20,9,-,-,14
41442C ·10,3,-,-,10
41046C : 10,4,60,0·1
41417C · <10,5,-,-,68
Y230. <10,17,-,-,114
41045C · 10,5,94,0·7,15
41040C · 20,14,70,0·1
41043C ·10,19
41044C . 10,5,13,0·1,118
41448C . 20,3,-,-,10
BT64 · 10,6,-,-,18
41049C .<10,11,64
41432C · 10,6,-,-,42
41433C .<10,6,-,-,56
41438C · 10,4,-,-,11
Y232 ·<10,17,-,-,71
41449C ·<10,4,-,-,27
41434C . <10,9,-,-,56
Y231 ·<10,4,-,-,87
41435C ·<10,4,-,-,67
Y51 · 10,6,-,-,30
41436C ·<10,15,-,-,52
41437C ·<10,17,-,-,65
41416C · 20,150,-,-,11
BT60. <10,12,-,-,117
N
inches
0 1 2
0 1 2 3 4 5
centimetres
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
· AU, AS, ZN, AG, CU, PB
J.C. STEPHEN EXPLORATIONS LTD.
CASAU
DALTO CLAIM GROUP
104 P/3
GEOCHEMISTRY
100 50 0 100 200 300 METRES
1:5000
JULY 1983
MAP XI

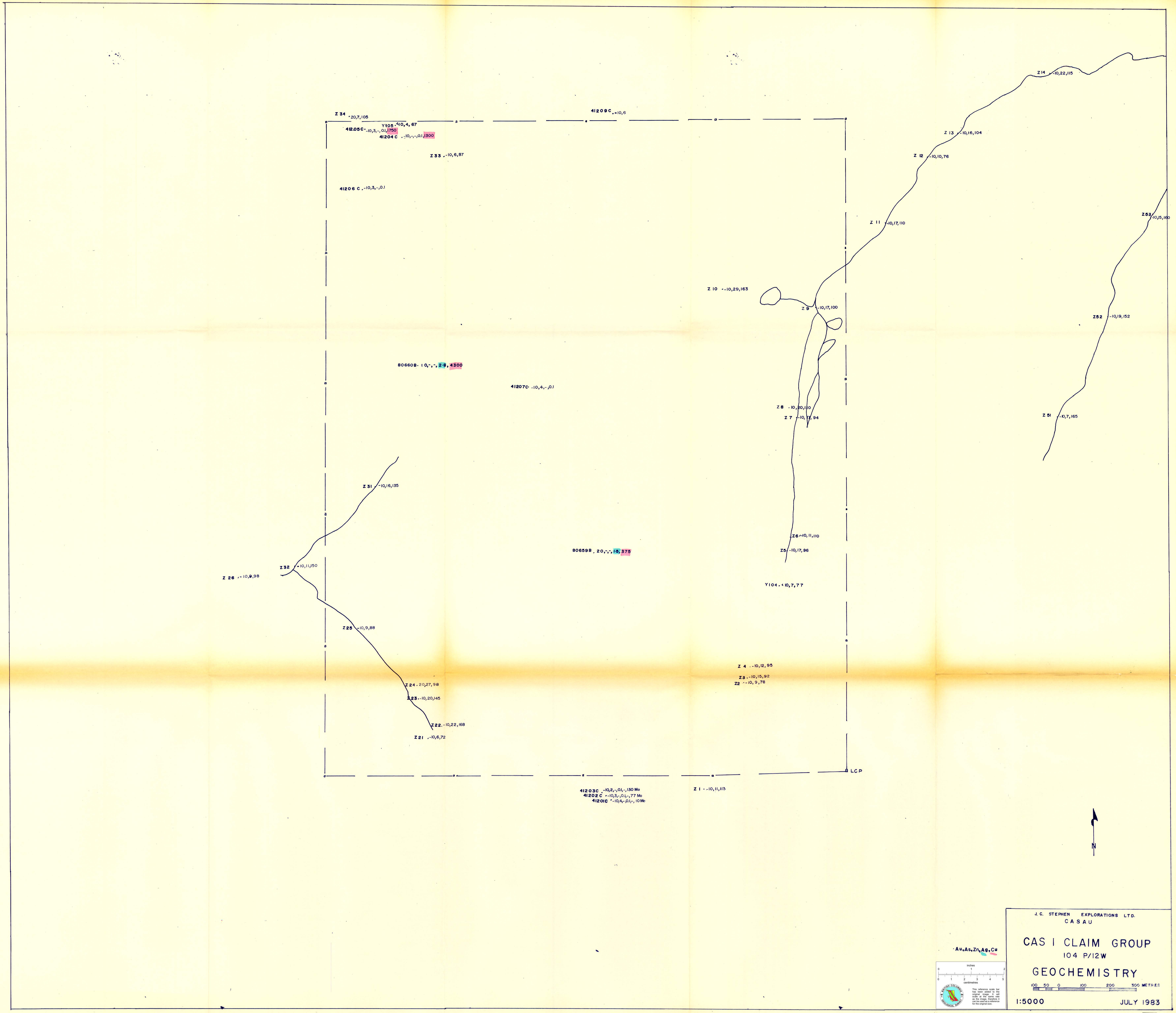

LEGEND
IRON CARBONATE ALTERATION
5 DYKE ANDESITE
4 ULTRABASIC
3 CHERT
2 ANDESITE TUFF
& VOLCANIC BRECCIA, AGGLOM.
1 ARGILLITE
FAULT
QUARTZ VEINS
CARBONATE VEINS
RUBBLE
32720 C · SAMPLE · AUppb AS ZN ppm
inches
centimetres
J. C. STEPHEN EXPLORATIONS LTD.
CASAU
SAU CLAIM GROUP
104 P/5
GEOLOGY
100 50 0 100 200 METRES
1:5000
AUG 1983
MAP XII
SEE DETAIL 1:1000 MAP
LCP
N
4500
5000
5500
6000
6500
CT 1
CT 2
CT 3
CT 4
CT 5
BT414
BT409
32727 C
32726C
32725 C
32724 C
32723 C
32722 C
32721 C
32720 C
32715 C
32716 C
32714 C
32713 C
32940 C
Q.V.



MARIPOSITE
WATERFALL
41072 C
-10,3
32942 C
-10, 4
41073
-10, 3
CT 9.
CT 8.
CT 7.
41074 C -10,2
CT 6
32946 C. 10, 2
N
LEGEND
4 WEAK IRON-CARBONATE ALTERATION
3 IRON-CARBONATE MARIPOSITE ROCK
2 ANDESITE TUFF
1 ARGILLITE
SHEAR
BEDDING
CLEAVAGE
FE-CARBONATE SEAM
Sample No · Au, As, Zn
inches
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
J. C. STEPHEN EXPLORATIONS LTD.
CASAU
SAU CLAIM GROUP
104 P/5
GEOLOGY
20 10 0 10 20 30 40 METRES
1:1000
AUG 1983

MAP XIII


LEGEND
9 BIOTITE FELDSPAR PORPHYRY DYKES & SILLS
8 CASSIAR BATHOLITH
7 ULTRAMAFICS-SERPENTINITE
6 GREY FOSSILFEROUS LIMESTONE
5 BLADED PORPHYRY (AUGITE PORPHYRY)
4 DACITE BRECCIA-DACITE
3 ARGILLITE
2 ANDESITE
1 BASALT
N
inches
centimetres
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
J.C. STEPHEN EXPLORATIONS LTD.
CASAU
CAS I CLAIM GROUP
104 P/12 W
GEOLOGY
100 50 0 100 200 300 METRES
1:5000
JULY 1983
MAP XIV


Z 34 20,7,105
41209C -10,6
Y105 <10,4, 67
412.05C -10,3,-, 0.1,1750
41204 C -10,-,-,0.1,1300
Z 33 -10,6,87
41206 C -10,3,-,0.1
Z14 -10,22,115
Z 13 -10,16,104
Z 12 -10,10,76
Z 11 -10,17,110
Z53 -10,15,160
Z 10 -10,29,163
Z 9 -10,17,100
Z52 -10,19,152
80660B 10,-,-,2.8,4300
41207C -10,4,-,0.1
Z 8 10,20,110
Z 7 -10,17,94
Z51 -10,7,165
Z 31 -10,16,135
Z6 -10,11,110
Z5 -10,17,96
80659B 20,-,-,1.5,375
Z32 -10,11,150
Z 26 -10,9,98
Y104 <10,7,77
Z25 -10,9,88
Z 4 -10,12,95
Z3 -10,15,92
Z2 -10,9,78
Z24 20,27,98
Z23 -10,20,145
Z22 -10,22,168
Z21 -10,6,72
LCP
41203C -10,2,-,0.1,-,130 Mo
41202 C -10,3,-,0.1,-,77 Mo
41201C -10,4,-,0.1,-, 10 Mo
Z 1 -10,11,113
N
Au,As,Zn,Ag,Cu
inches
0 1 2
0 1 2 3 4 5
centimetres
BRITISH COLUMBIA GEOLOGICAL SURVEY
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
J. C. STEPHEN EXPLORATIONS LTD.
CASAU
CAS I CLAIM GROUP
104 P/12W
GEOCHEMISTRY
100 50 0 100 200 300 METRES
1:5000
JULY 1983

MAP XV