CCH MINERALS LTD.

ASSESSMENT REPORT

GEOLOGICAL AND GEOCHEMICAL SURVEYS
September, 1980/June 11-27, 1981

BANDER CLAIMS 1 to 80

115-P-15

63°47'N 136°49'W

MAYO AREA
YUKON TERRITORY

Brian Paul/Daniel Rota
January 12, 1981

This report has been examined by the Geological Evaluation Unit under Section 53 of the Yukon Quartz Mining Act and is allowed as representation work in the amount of $ 12,500.

P Watson

for Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

Department of Indian Affairs and Northern Development

YUKON QUARTZ MINING ACT

FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK

(This form required in duplicate with sketch showing location of work.)

MINING RECORDER
MAYO, Y.T.
I.A. & N.D.

OFFICE DATE STAMP

I (Name) BRIAN JAMES PAUL Occupation GEOLOGIST

(Postal Address) CAMPBELL RESOURCES INC., P.O. BOX 37, MAYO, YUKON, Y0B 1M0

MAKE OATH AND SAY, THAT:-

1. I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.

2. I have done, or caused to be done, work on the following mineral claim(s):
(Here list claims on which work was actually done by number and name)

BANDER 1 TO 80 INCLUSIVE (YA 40328 - YA 40407)

situated at FORTY MILE CREEK Claim Sheet No. 115P-15

In the MAYO Mining District, to the value of at least $12594.00

dollars, since the ELEVENTH day of JUNE 19 81,

to represent the following mineral claims under the authority of Grouping Certificate No. ——,
(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested.)

BANDER 1-20 (YA40328-YA40347), BANDER 61-68 (YA40388-YA40395),
BANDER 70 (YA40397), 72 (YA40399), 74 (YA40401), 76 (YA40403) AND
BANDER 78-80 (YA40405-YA40407) ALL FOR ONE YEAR
BANDER 21-60 (YA40348-YA40387), BANDER 69 (YA40396), 71 (YA40398),
73 (YA40400), 75 (YA40402) AND 77 (YA40404)
ALL FOR TWO YEARS

3. The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53)

6 PANNED CONCENTRATES ANALYZED FOR SN AND W AT $7.35/SAMPLE	$44.10
26 STREAM SEDIMENT SAMPLES ANALYZED FOR SN, W, CU, PB, ZN, AG AND AS AT $13.75/SAMPLE	$357.50
496 SOIL SAMPLES ANALYZED FOR SN, ZN, AG AND AS AT $8.90/SAMPLE	$4414.40
15 GEOLOGIST DAYS AT $100/DAY, 34 ASSISTANT DAYS AT $45/DAY	$3030.00
FOOD AND SUPPLIES: 49 MAN DAYS AT $12.00/DAY	$588.00
4 HELICOPTER HOURS AT $500/HOUR (CASUAL RATE)	$2000.00
DRAFTING AND INTERPRETATION	$500.00
HEAVY MINERAL STUDY (SEPTEMBER, 1980) 1.5 HELICOPTER HOURS AT $440/HOUR (CASUAL RATE) PLUS 10 GEOLOGIST DAYS AT $100/DAY	$1660.00
	$12594.00

Sworn before me at MAYO, YUKON TERRITORY

this 3RD day of JULY 19 81

Notary Public

Brian Paul Brian Paul

Applicant.

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Plates

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Illustrations

West-central portion of the BANDER group with Fortymile Creek in the valley to the left, and JABBERWOCK in the left background.

Introduction

The BANDER claim group covers an area of approximately 1670 hectares along and to the immediate east of Fortymile Creek. The claims are owned in their entirety by CCH Minerals Ltd. of Toronto, Ontario.

The work outlined in this report was conducted from June 11 to June 27, 1981 and includes in addition, a heavy mineral study completed during September of 1980. Geological surveys at 1:10000 scale were completed along the main ridge on the BANDER group and almost five hundred soil samples collected for tin, zinc, silver and arsenic analyses. Twenty-six stream sediment and six panned concentrate samples were collected from tributaries draining into Fortymile Creek in an attempt to locate the source of cassiterite in this particular stream.

An amount totalling twelve thousand, five hundred dollars has been claimed for assessment purposes.

Exploration History

No exploration activity is reported in the area of the BANDER claims prior to 1978. During 1978, several highly anomalous tin stream sediment values were located along the middle sections of Fortymile Creek by CCH Resources Ltd., and the company staked a block of eighty claims to cover the probable source area of this tin during July of 1979. Soil sampling along the claim lines and along both sides of Fortymile Creek was carried out during the same year. Work during 1980 was confined to a heavy mineral study done late in the field season. This study outlined several areas worthy of additional follow-up which were the targets for geological mapping, soil and stream geochemical sampling and additional heavy mineral sampling during 1981.

Geology

Summary

The BANDER and SNATCH claim groups are underlain by gently dipping metasedimentary rocks of the Precambrian and/or Cambrian "Grit" Division. These rocks have been intruded in several localities by narrow intermediate to acid dykes of probable Cretaceous age. Small scale nappe folding, apparently related to regional overthrusting, is common within the map area. The axial trend of the folds is ENE/WSW indicating that thrusting has occurred in a NNW direction. An (S_2) axial plane cleavage developed parallel to the fold axes is commonly observed, unlike other areas which are underlain by "Grit" Division rocks where only the compositional layering(S_0) and original schistosity(S_1) can be seen. The metasediments are of low to moderate metamorphic rank, and many of the original sedimentary structures have been preserved. Accessory amounts of galena and arsenopyrite are present in a few of the local quartz veins, but the map area, as a whole, seems to lack significant mineral occurrences.

Bedded Rocks

Schistose metasediments of Precambrian and/or Cambrian age underlie the entire map area. The term "Grit" Division is generally applied to the sequence to which these rocks belong. Six different lithologies have been recognized in the area and these are indicated on the accompanying geological map(711-8/712-3) as units 1A through 1F. These units tend to grade into one another and appear to pinch out rapidly along strike.

As many as three or four different lithologies can be found within the limits of a single outcrop, and intense folding has further obscured the relationships between various units. For these reasons, no attempt has been made to separate the various lithologies on the geological map.

The dominant planer feature within the metasediments is the (S_1) schistosity. Bedding or compositional variation (S_0) is commonly observed and appears in all instances to be parallel to the schistosity. The schistosities are quite variable in this area, but on the whole the sequence seems to be relatively flat-lying, with dips seldom in excess of 20 degrees. Three dykes have been intruded near parallel to foliation and their trace on the geological map appears to support the concept of an almost flat-lying sedimentary sequence.

The metasedimentary rocks are well exposed as shown in Plate 1, outcropping along the main ridge crest, as well as a number of small "spur" ridges dropping off toward Forty-mile Creek. Quartz-carbonate veins are fairly abundant throughout the sequence, tending to occupy late cross-cutting fractures and other dilatant zones.

The various lithologies of Unit 1 are discussed briefly under the headings below.

Quartz-Mica Schist (Unit 1A)

This is by far the most common lithology within the map area. The rocks of this unit are typically light brownish-grey, weather much the same color, and are characterized by alternating quartz and sericite-rich laminae, seldom more than 1 mm in thickness.

Plate 1: Main ridge, BANDER group, showing "Grit" Division sediments in outcrop along and to the west(left) of the ridge crest → JABBERWOCK in the left background.

The brown coloration in these rocks is caused by the oxidation of Fe-rich carbonate, producing limonite. "Grit" Division sequences are generally dominated by quartz-mica schist, and Unit 1A has become more or less a type lithology for the entire division.

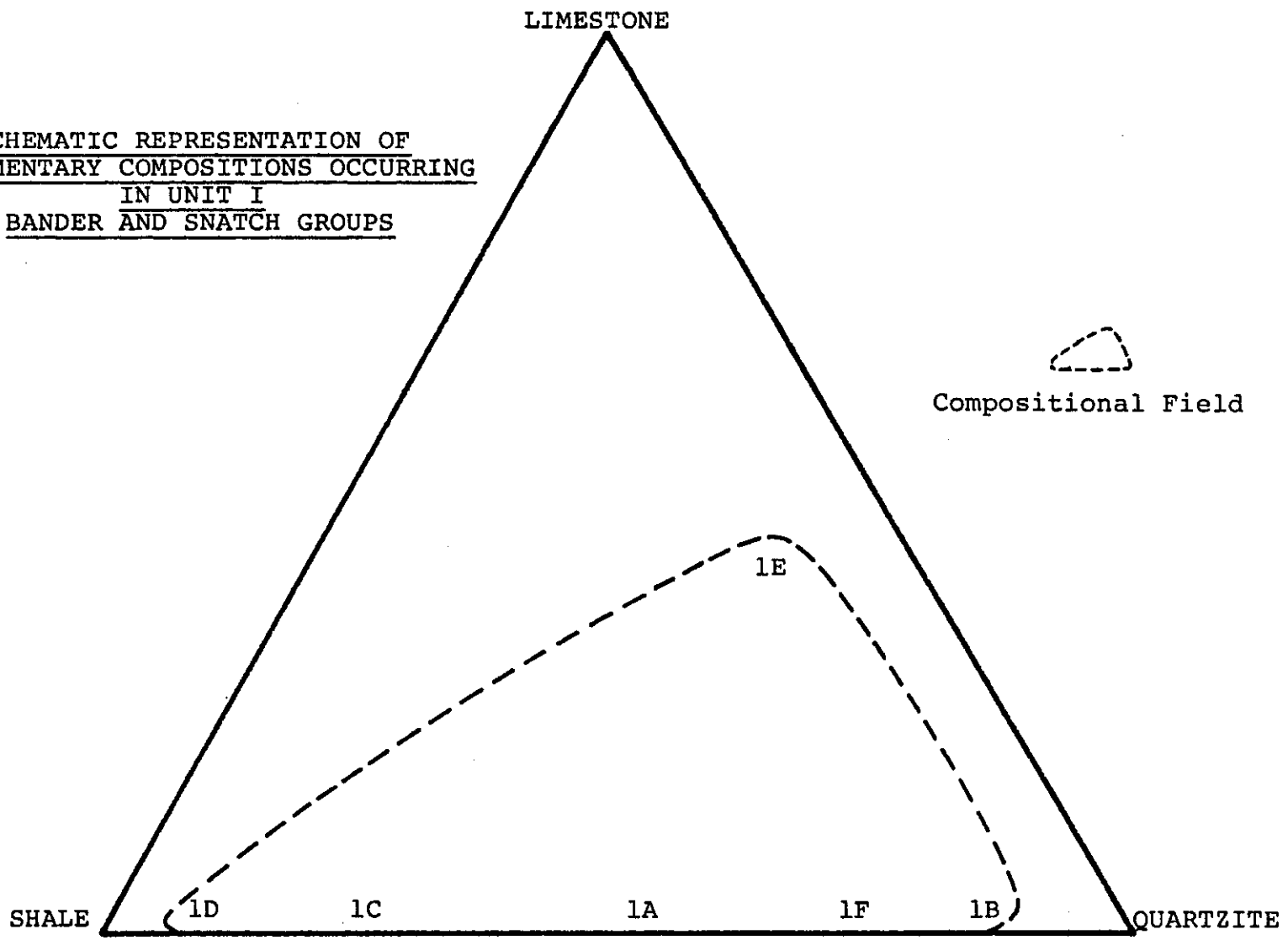
Quartz Schist (Unit 1B)

These rocks occur closer to the siliceous end of the spectrum (see diagram, following page) and are harder and more massive than the normal schists. They tend to be fine-grained and because of their hardness, are commonly well-jointed. Foliations can still be observed and are defined by the presence of extremely thin sericite-rich laminae. The rocks are typically pale grey, but weather a light rusty brown similar to the schists of Unit 1A. The silica content of most of the rocks within this unit is high enough that almost all could be described as good quartzites.

Mica Schist, Graphitic Schist (Unit 1C)

Rocks of this unit are more pelitic than the normal schists, grading on occasion into the argillaceous sediments of Unit 1D. The quartz-rich laminae are reduced in number and thickness, resulting in sediments which are extremely fissile. Fresh specimens of these rocks are generally dark grey, but they tend to weather a light, rusty brown in the typical fashion. Much of the mica in these rocks is probably retrograde chlorite after biotite.

SCHEMATIC REPRESENTATION OF
SEDIMENTARY COMPOSITIONS OCCURRING
IN UNIT I
BANDER AND SNATCH GROUPS



Shale, Slate, Argillite (Unit 1D)

True shales and slates are not common within the area, most rocks of this affinity containing appreciable amounts of quartz. The argillaceous horizons are generally quite thin and run the gamut from soft shales through fissile argillite to more indurated slate. These rocks are usually dark grey or black in color. In Plate 2, rocks of Unit 1D are shown interbedded with quartz schist and quartz-feldspar crystal tuff.

Limestone, Calcarenite (Unit 1E)

The rocks of this unit consist almost entirely of calcarenite, and horizons of clean limestone are absent nearly altogether. The calcarenites are fine to medium-grained, with abundant granular quartz, yet they react readily to the application of HCL. The rocks are grey when fresh, but weather rather easily to produce a characteristic buff-colored granular surface. These rocks are also quite soft and schistose, with abundant sericite-rich layers throughout. The calcareous rocks of Unit 1E are somewhat more common on the BANDER group than is normally the case in areas of "Grit" Division rocks.

Quartz-Feldspar Crystal Tuff "Grit" (Unit 1F)

This is the most problematical of all the units, occurring in only a few areas on the BANDER and SNATCH claim groups. Rocks of this unit are essentially quartz-sericite schists, but grade from grit through to quartz pebble conglomerate containing rounded quartz fragments to 10mm in diameter.

Plate 2: Interbedded argillite(1D), quartz schist(1B) and quartz-feldspar crystal tuff(1F), cut by quartz-carbonate veining, in the southeastern corner of the claim group.

More typically, the rocks consist of rounded bluish quartz eyes(3-4 mm), and altered feldspathic fragments(4-8 mm), within a fine-grained matrix of quartz, feldspar, chert and sericite. Rocks typical of Unit 1F are shown in Plates 2, 5 and 6, but the textures are not at all evident from these photographs. The most spectacular outcrops occur in the northern portion of the SNATCH group, where the rocks truly appear to be conglomeratic.

Fragmental rocks of Unit 1F occur sporadically throughout the Mayo-McQuesten area and have been mapped as everything from conglomerate through crystal tuff to even quartz-feldspar porphyry. Earlier reports produced by the Cortin Joint Venture have stressed the tuffaceous nature of these rocks. It appears in the area of the BANDER and SNATCH claims that these rocks more closely resemble conglomeratic sediments and the term "crystal tuff" on the geological map may be somewhat misleading.

Intrusive Rocks

No intrusive rocks of any sort were mapped in the area of the BANDER and SNATCH claims prior to 1981. At least four narrow intermediate to acid dykes(three distinctive lithologies) were located during the present geological survey. Two additional intrusive rock types were identified west of the BANDER group during reconnaissance stream sediment sampling. The dykes are flat-lying and have been intruded near parallel to the foliation in the enclosing metasediments. Volumetrically unimportant, they serve as marker horizons in an otherwise complicated sedimentary sequence.

All five intrusive types are assumed Cretaceous in age and have been assigned to Unit 14 in concordance with mapping by the Geological Survey of Canada.

The various intrusive types are discussed under the headings below.

Feldspathic Dyke Rock (Unit 14A)

Rocks of this unit have been traced as a single flat-lying dyke over one kilometre in the south-central portion of the BANDER group. They also occur in a large rubble patch, and as scattered pieces of float, in the southern area of the claim group. The main dyke is approximately four metres in width and appears conformable with the foliation in the enclosing sediments. Sedimentary rocks in the vicinity of the dyke are not noticably contact metamorphosed. An olive green color when fresh, possibly due to sericitic alteration, the dyke on its weathered surface is a distinctive reddish-brown. The weathered exterior of the dyke is typically exfoliated and white, carbonate-coated fractures are common. This weathering rind is also extremely thick, so much so that samples of fresh material are often difficult to obtain. Small euhedral phenocrysts of white mica several millimetres in length, and the occasional small feldspar phenocryst are the only visible minerals in an otherwise nondescript rock. Traces of iron sulphide are present in some samples and leucite has been tentatively identified in thin section. Despite the fact that the groundmass contains a high proportion of feldspar (as opposed to quartz) the rocks are generally quite competent and extremely hard. All samples of this particular unit appear to be heavily sericitized.

No classification is possible at the present time, although the rocks of Unit 14A are almost certainly intermediate to acid in composition. More than one dyke may be present, as evidenced by the additional occurrences of rubble in the southern portion of the claim group. An outcrop of the main dyke is illustrated in Plates 3 and 4.

Biotite Lamprophyre (Unit 14B)

Dyke rocks of this composition are found in two localities on the BANDER group. Their ground trend suggests that they are more or less conformable with the bedded rocks, although they are seen on occasion, cross-cutting foliation in the enclosing sediments. Intermediate to near mafic varieties are known. The rocks are generally fine-grained and grey in color, containing greater than 5% chloritized biotite in the form of small phenocrysts. The dykes, which are occasionally foliated, vary in width from one-half to three metres and small clots of iron sulphide are present in most specimens.

Lamprophyric dyke rocks are found throughout the Mayo-McQuesten area and are among the youngest intrusive phases within this area.

Inclusion-Rich Biotite Lamprophyre (Unit 14C)

These rocks, which have again been intruded parallel to the foliation in the enclosing sediments, are essentially biotite-feldspar porphyries. They consist of a fine-grained, dark grey groundmass, with generally greater than 10% biotite as small euhedral phenocrysts to one millimetre in size.

Plate 3: Feldspathic dyke rock, Unit 14A, intruded almost parallel to the foliation in the enclosing sediments → hammer and fieldbook for scale in mid-photo.

Plate 4: A closeup of the dyke in the preceding plate, showing the characteristic reddish weathering→divisions every 10 cm on the hammer handle.

Quartz is occasionally present as a phenocryst phase as well. The rocks weather reddish-brown, and both arsenopyrite and pyrrhotite(to 1%) have been noted as constituent phases. The most noticable feature of these rocks is the presence of abundant angular to sub-rounded inclusions of quartz, quartz-mica schist and mildly skarned calcarenite. The fragments occur in all sizes, the largest being somewhat less than a centimetre and a half in diameter.

Quartz Microdiorite(Unit 14D)

This unit occurs as rubble in an area west of Fortymile Creek. The rocks are fine-grained and nondescript, containing a few small phenocrysts of biotite. Pyrite-bearing fractures are common and, as a result, the rocks weather a light, rusty orange.

Granite Porphyry(Unit 14E)

Rocks of this unit are found as rubble in the same locality as those of 14D. A quartz-eye porphyry of granitic composition, the rock is composed of euhedral quartz phenocrysts, as well as phenocrysts of an unidentified greenish-black mafic mineral, both within a fine-grained, grey groundmass of quartz, plagioclase and potassium feldspar. Weathered specimens of this unit are white in color.

Structure

A summary of the deformation affecting rocks in the vicinity of the BANDER and SNATCH claims is provided on the following page.

DEFORMATION AFFECTING ROCKS IN THE AREA OF THE BANDER AND SNATCH CLAIMS

S_0	compositional layering
S_1	1st foliation (schistosity), generally parallel to compositional layering: parallel to axial surfaces of isoclinal folds???
S_2	fracture cleavage (parting) parallel to axial surfaces of nappe folds
	jointing/fracturing: related to F_3
F_1	tight isoclinal folding???
F_2	nappe folding related to regional overthrusting
F_3	broad open folding related to the intrusion of Cretaceous igneous rocks

The dominant planar feature in the metasedimentary rocks of the area is the (S_1) foliation or schistosity. Bedding and compositional layering (S_0) are commonly observed and in all cases appear parallel to the primary schistosity.

Small scale nappe folding related to regional overthrusting occurs throughout the area of the two properties. The axial trend of these folds is ENE/WSW, indicating that thrusting occurred in a NNW direction. An (S_2) axial plane cleavage developed parallel to the fold axes is commonly observed, unlike other areas of "Grit" Division rocks where only the compositional layering (S_0) and the primary schistosity (S_1) can be seen(Plates 5 and 6).

The schistosities are quite variable within the map area, but on the whole the sequence seems to be relatively flat-lying, with dips seldom in excess of 20°. Three dykes have been intruded near parallel to foliation and their trace on the geological map seems to support the concept of an almost flat-lying sedimentary sequence.

An (F_3) fold, the McQuesten Antiform, supposedly passes through the southern portion of the BANDER group, but no evidence for this folding was uncovered during the present survey.

Jointing and fracturing is well developed in rocks of the metasedimentary sequence, occurring in a wide variety of orientations. These fractures are often filled with quartz-carbonate veins as shown in Plate 2.

Plate 5: Parting, or fracture cleavage(S_2) in rocks of Unit 1F. Crenulations affect the original (S_1) foliation.

Plate 6: Axial plane cleavage(S_2), again in rocks of Unit 1F → typical of the small scale, isoclinal "nappe" folding in this area. Both the bedding(S_0) and the original foliation(S_1) have been affected by the fold in the photograph.

Alteration

The "Grit" Division metasediments are of low to moderate metamorphic rank. No alteration or metamorphism is associated with the Cretaceous dyke rocks, with the exception of Unit 14A. The feldspathic rocks of this unit appear well sericitized in all outcrop localities.

Mineralization

The area of the BANDER and SNATCH claim groups appears devoid of significant mineral occurrences. Arsenopyrite and galena were noted as constituents of quartz-carbonate veins in two localities on the BANDER group. Thin iron and manganese-stained, quartz-filled fractures, occur in rocks of Unit 1F in the northern portion of the SNATCH group, but the relationship of these fractures to soil anomalies in the area is uncertain.

Geochemistry

Methods

Soil samples were collected from the B horizon wherever possible. Areas of well developed A horizon (in excess of 1/3 metre) are found only in the valley bottoms and were largely avoided during the present survey. The base line for the detailed soil grid was laid out along the main ridge of the BANDER group by chaining and line-of-sight. Pickets were established at 50-metre intervals and grid lines run to the southwest using simple chain and compass methods every 100 metres. These lines were all backtied for accurate plotting at 1:5000 scale. Individual samples were collected using geological picks and kraft paper envelopes and stream sediments were collected where the grid lines crossed a stream course.

Minus 80 mesh fractions were analyzed for tin, zinc, silver and arsenic by Bondar-Clegg and Co. Ltd. in Whitehorse and North Vancouver. Tin analyses were done using ammonium iodide fusion and atomic absorption spectrometry after the method of Stanton and MacDonald(1961), and Smith (1967). Zinc and silver were analyzed by atomic absorption spectrometry following standard digestion by nitric and hydrochloric acids. Arsenic was analyzed by a colorimetric method, after digestion by nitric and perchloric acids, in Bondar-Clegg's North Vancouver laboratory.

Reconnaissance stream sediment samples were collected in a similar manner, but the use of plastic bags permitted much larger than normal samples to be taken.

In addition to tin, zinc, silver and arsenic, these samples were also analyzed for tungsten, copper and lead. Tungsten analyses were done using a standard colorimetric technique, which involves fusion with sodium carbonate and complexing with zinc dithiol. Copper and lead were analyzed in a similar manner to zinc and silver.

Large samples consisting of several full pans of material were collected for each panned concentrate analysis. The original samples were passed through a "grizzly" (if necessary) to remove the coarse gravel and then carefully panned down to a generous concentrate of two to three tablespoons. As the final concentrate was approached, the samples were generally passed through a minus 20 mesh screen to remove the fine gravel. The concentrates were then pulverized and analyzed for tin and tungsten in the manner described above.

Results

Tin, zinc, silver and arsenic were analyzed in soils on a 100 metre x 50 metre grid covering approximately 195 hectares in the west-central portion of the claim group. All of this work was completed in June of 1981. Included with the report are Maps 711-2(sample locations), 711-3(tin), 711-4(silver), 711-5(arsenic) and 711-6(zinc), all at 1:5000 scale, showing arbitrarily contoured results for the various elements.

Tin values in soil are subdued throughout the grid area, peaking at only fifteen ppm.

Scattered, moderately anomalous values in silver(13.5 ppm maximum), arsenic(750 ppm maximum) and zinc(2150 ppm maximum) are found in the northern half of the grid area. These elements appear to be somewhat sympathetic in their distribution. The central portion of the grid contains all of the peak values, but on the whole, there appear to be no targets within the sample area worthy of additional work.

The reconnaissance stream sediment and panned concentrate results are shown on Map 711-7/712-2(compilation geochemistry), here at 1:10000 scale. This map incorporates the results of various surveys run from 1978 through 1981, and emphasizes the thorough geochemical coverage in the area of the BANDER and SNATCH claim groups. With the exception of three samples, the 1981 results were uniformly low. Samples BR-81-36 and 36A contain 30 and 800 ppm tin respectively, but these samples were collected from within the floodplain of Fortymile Creek, and are probably contaminated by outwash material from this particular creek. Sample BR-81-40 contains 6.6 ppm silver and occurs next to an area of highly anomalous lead and silver in soils within the SNATCH claim group.

Heavy Mineral Study

Claim line sampling on the BANDER and SNATCH groups during 1979 failed to produce any particularly interesting soil values, and a heavy mineral study was conducted on panned concentrate samples from Fortymile Creek in an effort to validate the original stream sediment anomalies. This study was completed during September of 1980. Reasons for the initial high stream sediment values were thought to include reworked bedload cassiterite of non-local origin, laboratory error yielding spurious anomalies and local in situ cassiterite mineralization.

Panned concentrate samples were taken at intervals along Fortymile Creek from the JABBERWOCK group to a point well downstream from the SNATCH claim group. The cassiterite particles were removed from the sample concentrate, counted, measured and an estimate made of their relative angularity. The results are shown on Figure 711-1(characteristics of cassiterite grains from Fortymile Creek).

Downstream from the JABBERWOCK group the number of grains, the grain angularity and the grain size all diminish until a tributary from the SNARK group is reached. Immediately below this tributary the number of grains increases, while angularity and size continue to decrease. This would appear to be an indication of additional cassiterite particles from the SNARK group rather than from a more local source. The next panned concentrate sample exhibits a sharp increase in the number of grains, grain angularity and grain size. After a subsequent drop in all three parameters, there is another sharp peak. These two peaks correlate with the original stream sediment anomalies and were thought at the time of the study to indicate two local tin sources on the BANDER group.

Downstream the values fall away and there is no positive correlation with the stream sediment value of 77 ppm that led to the staking of the SNATCH group.

The probable source areas on the BANDER group which were outlined during the above study were given further attention during 1981, as described elsewhere in this report. More emphasis was placed on evaluation of the southern area, as it appeared the most promising of the two. There was no indication in the heavy mineral study of any substantial contribution of cassiterite to the Fortymile Creek drainage from the area of the SNATCH claims, and much of this group was allowed to lapse during 1981.

Recommendations for Future Work

Heavy mineral studies done along Fortymile Creek during 1980 hinted that there were two possible areas of in situ cassiterite mineralization within the boundaries of the BANDER claim group. The geological and geochemical surveys completed during 1981 suggest that this is not the case. Geological mapping over a good portion of the claim group revealed nothing of interest, nor did a soil geochemical survey over the southernmost target area. All of the tributary creeks emptying into the Fortymile drainage within the area of interest have now been sampled, with negative results.

The high tin stream sediment values present along certain portions of Fortymile Creek appear to be caused by the reworking of bedload cassiterite, which is not of local origin. In situ cassiterite mineralization would not appear to be present on the BANDER group, and it is recommended that these claims be allowed to lapse in 1983.

STATEMENT OF QUALIFICATIONS

Work on the BANDER group during 1981 was carried out under the direction of D. Rota of Toronto, Ontario.

Mr. Rota is Project Geologist for BILLITON CANADA LTD. Currently seconded to the Cortin Joint Venture, he holds a B.Sc. degree in geology from Laurentian University, Sudbury, Ontario and has practiced his profession continuously for a period of twelve years in a variety of geological environments within Canada.

The geological and geochemical surveys described in the present report were carried out by the author, Brian Paul, with the capable assistance of Evan L. Jones of Vancouver, B.C. and B. Scott Martell of Kingston, Ontario. Mr. Paul, also an employee of BILLITON CANADA LTD. has been involved as a member of the Cortin Joint Venture since May, 1979. He holds a B.Sc.(Hons.) degree in geology from the University of Western Ontario and is currently completing the requirements for an M.Sc. degree in geology from the University of Manitoba. He is a member of the Canadian Institute of Mining and Metallurgy, the Geological Association of Canada and the Mineralogical Association of Canada.

A. Woodsend of Vancouver, B.C. conducted the heavy mineral study along Fortymile Creek during September, 1980. At the time of the study, Mr. Woodsend was Field Manager-North for CCH Resources Ltd. He holds a B.Sc.(Hons.) degree in geology from Southhampton University, England and has practiced his profession for more than eleven years in a variety of countries and geological settings.

STATEMENT OF EXPENDITURES

6 Panned Concentrates analyzed for Sn and W @ $7.35/sample	$ 44.10
26 Stream Sediment samples analyzed for Sn,W,Cu,Pb,Zn,Ag and As @$13.75/sample	357.50
496 Soil samples analyzed for Sn,Zn, Ag and As @ $8.90/sample	4414.40
15 Geologist days @ $100.00/day	1500.00
34 Assistant days @ $45.00/day	1530.00
Food and Supplies: 49 man-days @$12.00/day	588.00
4 Hours Helicopter @ $500.00/hour (casual rate)	2000.00
Drafting and Interpretation	500.00
	$10934.00

The above work was carried out from
June 11 to June 27, 1981

Heavy Mineral Study - September, 1980

10 Geologist days @ $100.00/day	1000.00
1.5 Hours Helicopter @ $440.00/hour (casual rate)	660.00
	$ 1660.00
	$12,594.00

Vancouver, B. C.
January 12, 1981.

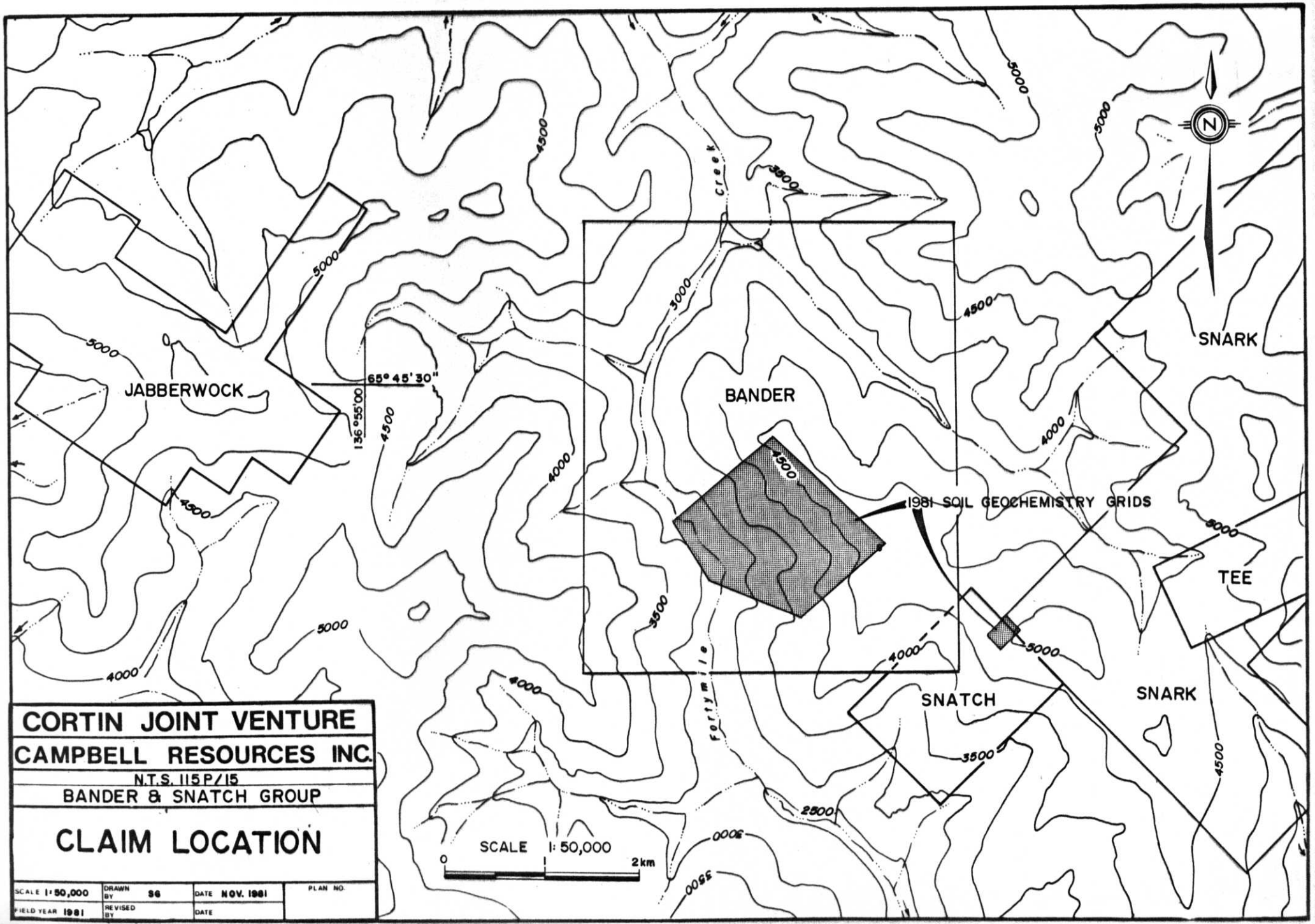
Brian Paul
Geologist - Cortin J.V.

LIST OF CLAIMS

GRANT NUMBERS	CLAIM NAMES	LOCATION	CLAIM SHEET NO.
YA40328-YA40407	BANDER 1-80	FORTYMILE CREEK	115-P-15

Assessment credits have been applied as follows, for which this report is representation:

YA40328-YA40347	BANDER 1-20	
YA40388-YA40395	BANDER 61-68	
YA40397	BANDER 70	
YA40399	BANDER 72	(RENEWAL FOR ONE YEAR
YA40401	BANDER 74	UNTIL JULY 23, 1982.)
YA40403	BANDER 76	
YA40405-YA40407	BANDER 78-80	
YA40348-YA40387	BANDER 21-60	
YA40396	BANDER 69	
YA40398	BANDER 71	(RENEWAL FOR TWO YEARS
YA40400	BANDER 73	UNTIL JULY 23, 1983.)
YA40402	BANDER 75	
YA40404	BANDER 77	



CORTIN JOINT VENTURE

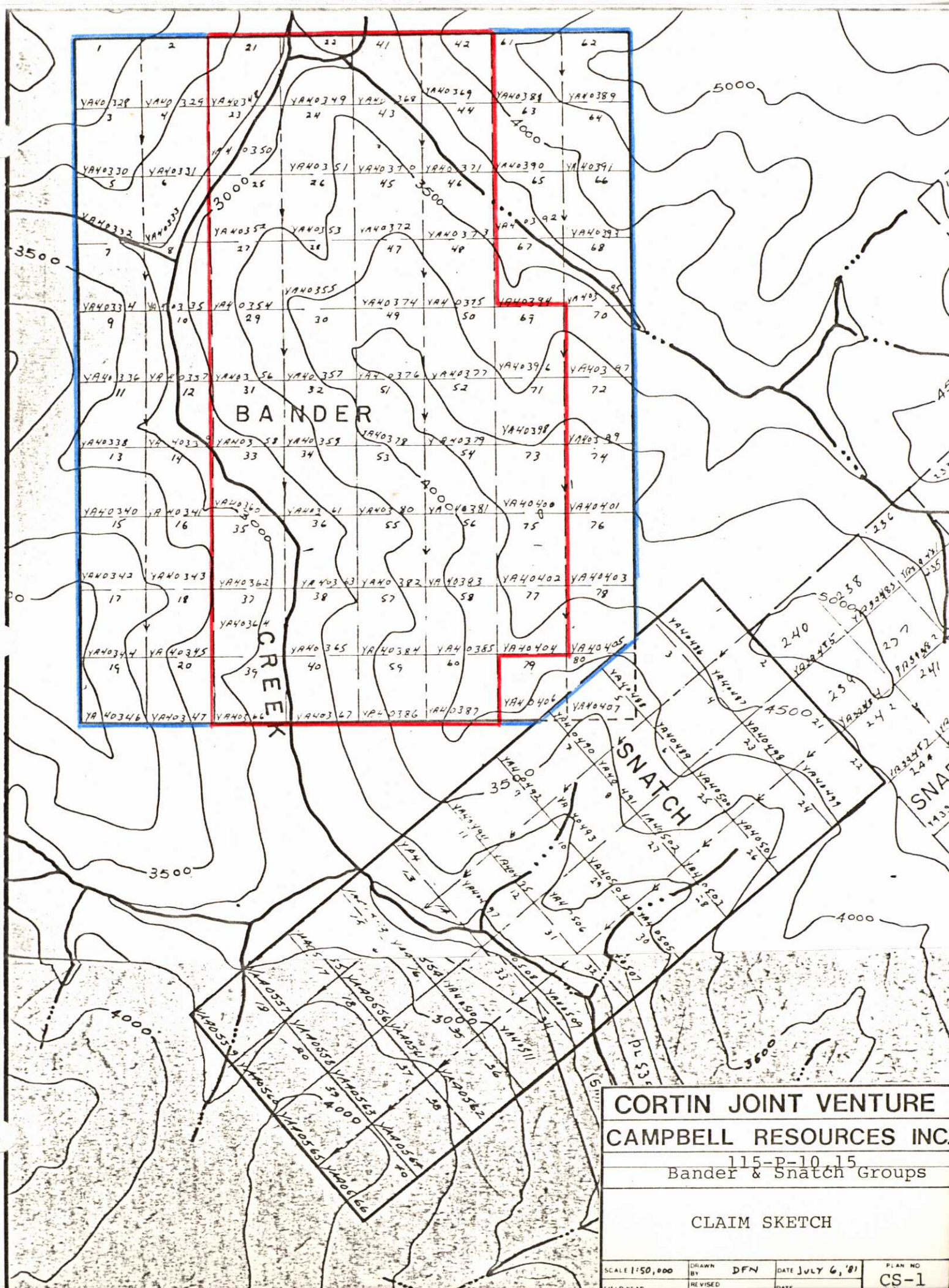
CAMPBELL RESOURCES INC.

N.T.S. 115 P/15

BANDER & SNATCH GROUP

CLAIM LOCATION

SCALE 1:50,000	DRAWN BY SG	DATE NOV. 1981	PLAN NO.
FIELD YEAR 1981	REVISED BY	DATE	



CORTIN JOINT VENTURE

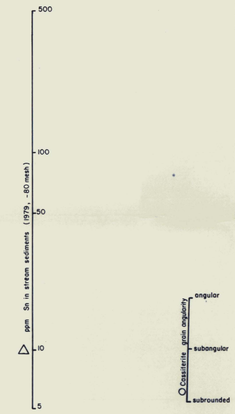
CAMPBELL RESOURCES INC.

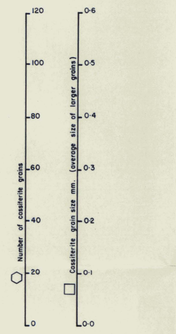
115-P-10,15

Bander & Snatch Groups

CLAIM SKETCH

SCALE 1:50,000	DRAWN BY DFN	DATE July 6, '81	PLAN NO CS-1
	REVISED		





LEGEND

Stream sediment samples taken in 1978. -80 mesh fraction analysed for Sn by XRF. Sample sites differ from 1980 samples.

Cassiterite grains separated from single pan concentrates taken in 1980.

Fortymile Creek profile : Horizontal scale 1:50,000
Vertical scale 1:10,000

090964

CORTIN JOINT VENTURE
CAMPBELL RESOURCES INC.

115-P-10, 15

BANDER, SNATCH, JABBERWOCK

CHARACTERISTICS OF CASSITERITE GRAINS FROM FORTYMILE CREEK.

SCALE 1:50,000	DRAWN BY AW	DATE Feb 1981	PLAN NO.
FIELD YEAR 1980	REVISED BY	DATE	711-1

NCI-455

SCALE 1:5000

100 50 0 100 200 300 400 metres

LEGEND

- Base line with actual picket locations
- 235 · · · Soil sample location and number
- 1505 · · · Stream sample location and number
- 16505 · · · 1979 soil sample location and number
- 1979 soil sample line
- Claim line
- Claim post (Campbell Resources Inc.)
- Claim post (Other)
- Ridge
- Creek
- Swamp

All sample numbers prefixed by 711-81

090964

CORTIN JOINT VENTURE

CAMPBELL RESOURCES INC.

N.T.S. 115 P/15

BANDER GROUP

DETAILED SOIL GRID SOIL SAMPLE LOCATIONS

SCALE 1:5000	DRAWN BY BJP/SG	DATE NOV. 1981	PLAN NO. 711-2
FIELD YEAR 1981	REVISED BY	DATE	

SCALE 1:5000

100 50 0 100 200 300 400 metres

LEGEND

- ≥10 ≤15 Sn ppm
- Base line with actual picket locations
- Soil sample location
- 15 Sn ppm
- Stream sample location
- 1979 soil sample location
- 1979 soil sample line
- Claim line
- Claim post (Campbell Resources Inc.)
- Claim post (Other)
- Ridge
- Creek
- Swamp

All samples not contoured have <10 Sn ppm

090964

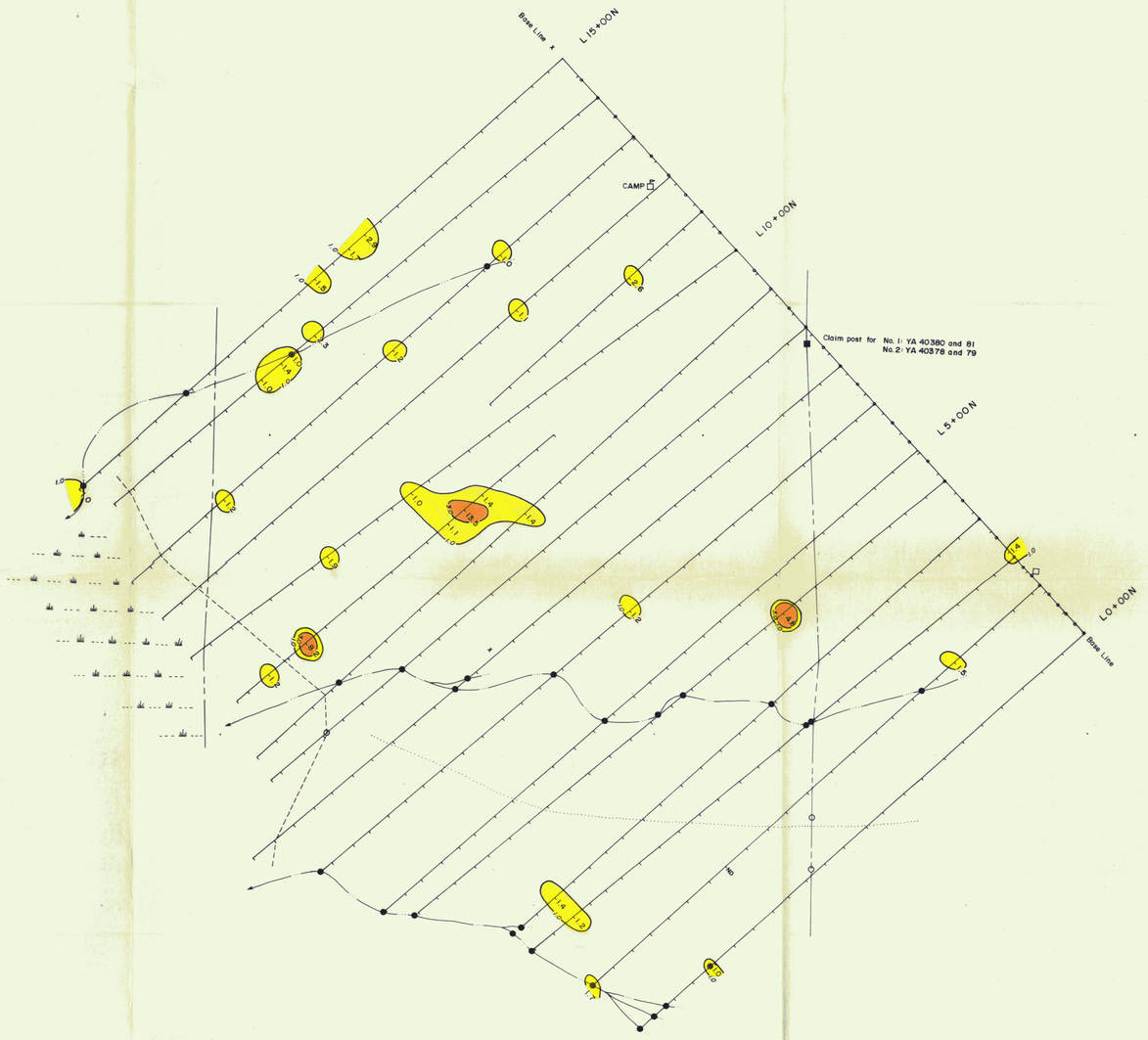
CORTIN JOINT VENTURE
CAMPBELL RESOURCES INC.

N.T.S. 115P/15

BANDER GROUP

DETAILED SOIL GRID
Sn ppm

SCALE 1:5000	DRAWN BY BJP/SG	DATE NOV. 1981	PLAN NO. 711-3
FIELD YEAR 1981	REVISED BY	DATE	



LEGEND

- ≥3.0 Ag ppm
- ≥1.0 <3.0 Ag ppm
- Base line with actual picket locations
- Soil sample location
- 4.8 Ag ppm
- Stream sample location
- 1979 soil sample location
- 1979 soil sample line
- Claim line
- Claim post (Campbell Resources Inc.)
- Claim post (Other)
- Ridge
- Creek
- Swamp

All samples not contoured have <1.0 Ag ppm

ND ... Not Determined

SCALE 1: 5000

100 50 0 100 200 300 400 metres

090964

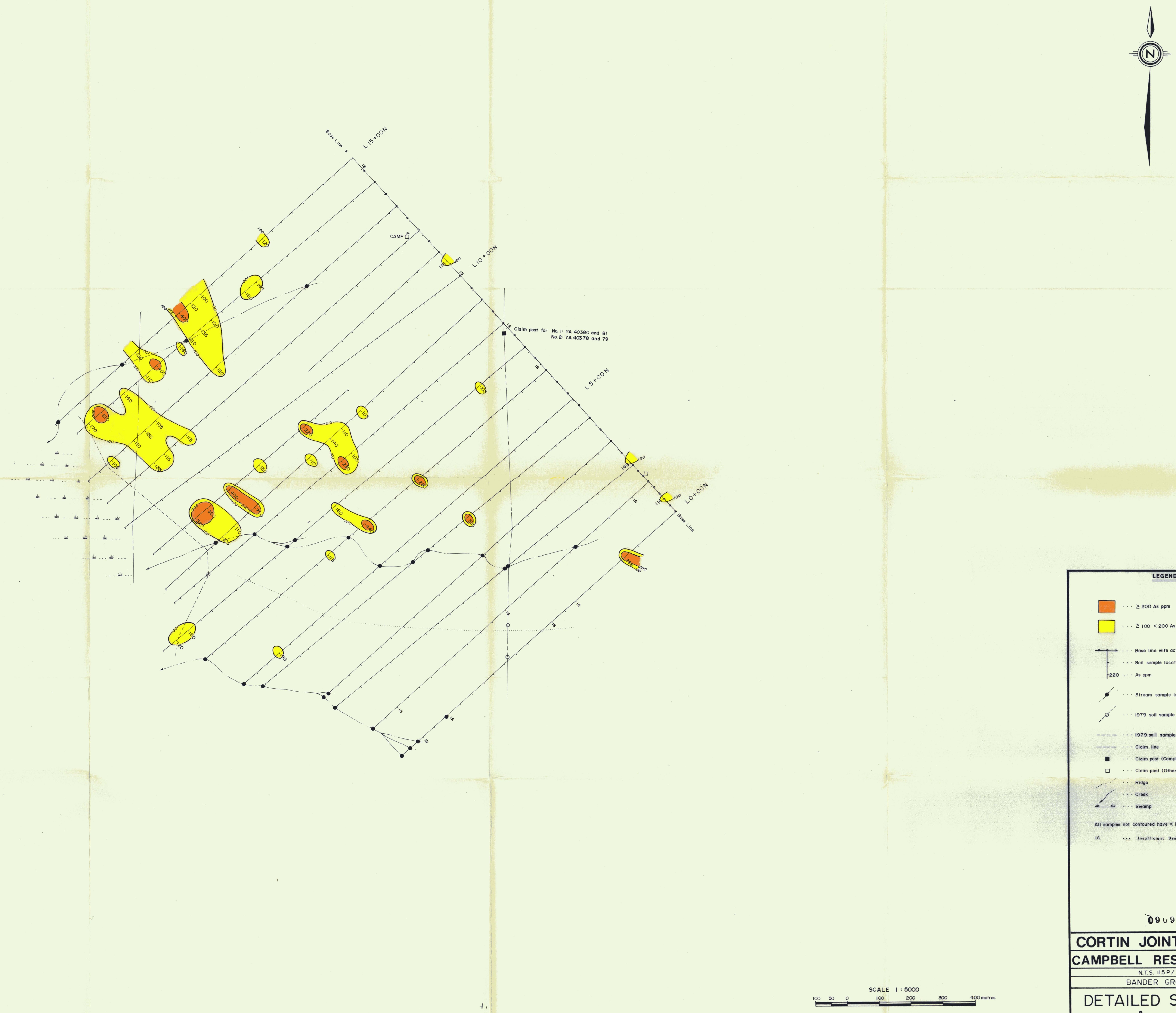
CORTIN JOINT VENTURE
CAMPBELL RESOURCES INC.

N.T.S. 115P/15

BANDER GROUP

DETAILED SOIL GRID
Ag ppm

SCALE 1: 5000	DRAWN BY: BJP/SG	DATE: NOV. 1981	PLAN NO.	711-4
FIELD YEAR: 1981	REVISED:	DATE:		



LEGEND

- ≥ 200 As ppm
- ≥ 100 < 200 As ppm
- Base line with actual picket locations
- Soil sample location
- 220 · · · As ppm
- Stream sample location
- 1979 soil sample location
- 1979 soil sample line
- Claim line
- Claim post (Campbell Resources Inc.)
- Claim post (Other)
- Ridge
- Creek
- Swamp

All samples not contoured have < 100 As ppm

IS · · · Insufficient Sample

090904

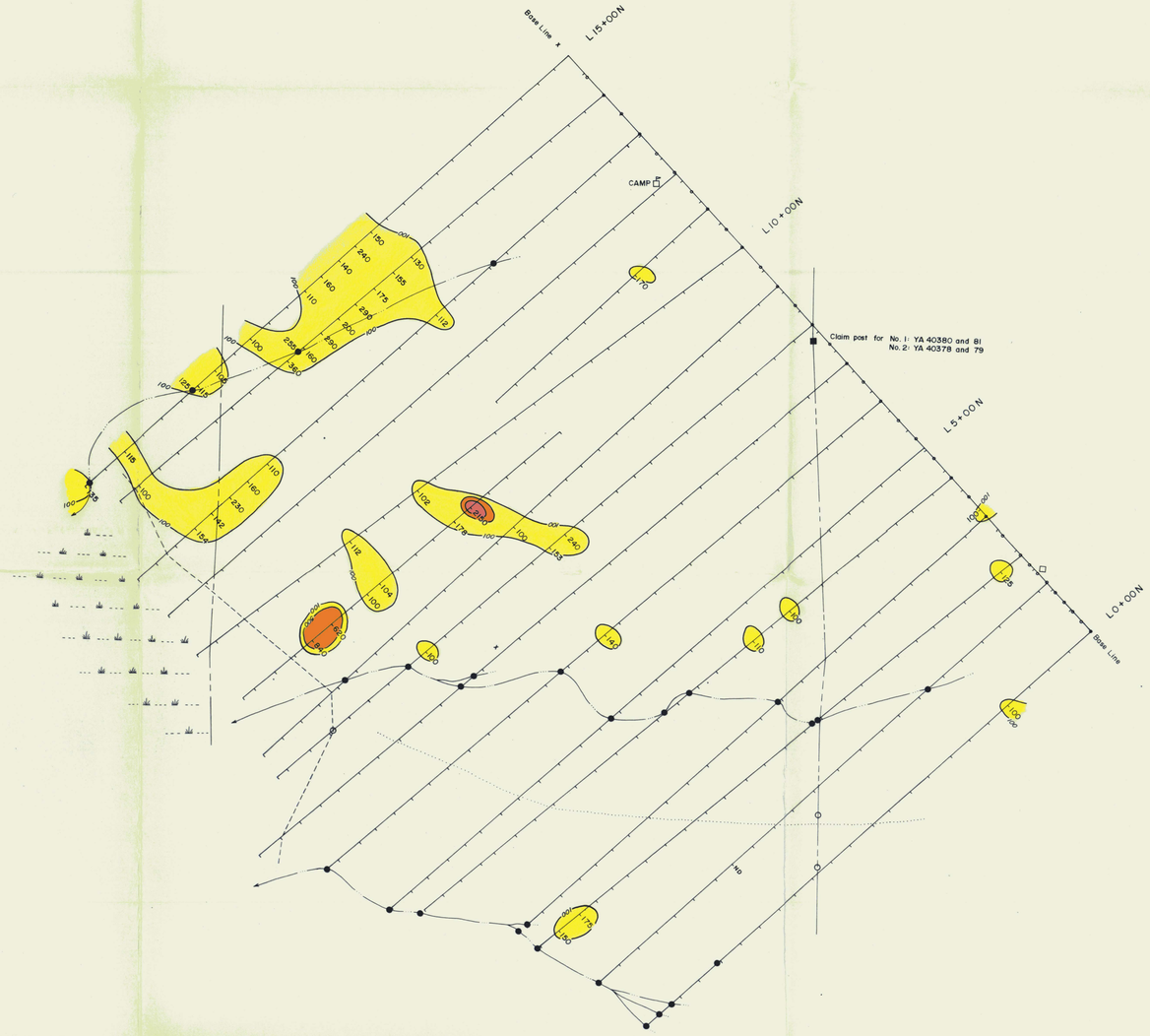
CORTIN JOINT VENTURE
CAMPBELL RESOURCES INC.

N.T.S. 115P/15

BANDER GROUP

DETAILED SOIL GRID
As ppm

SCALE 1: 5000	DRAWN BY BJP/SG	DATE NOV. 1981	PLAN NO. 711-5
FIELD YEAR 1981	REVISED BY	DATE	



N

LEGEND

- ≥ 1000 Zn ppm
- ≥ 500 < 1000 Zn ppm
- ≥ 100 < 500 Zn ppm
- Base line with actual picket locations
- Soil sample location
- 153 Zn ppm
- Stream sample location
- 1979 soil sample location
- 1979 soil sample line
- Claim line
- Claim post (Campbell Resources Inc.)
- Claim post (Other)
- Ridge
- Creek
- Swamp

All samples not contoured have < 100 Zn ppm

ND --- Not Determined

SCALE 1:5000

100 50 0 100 200 300 400 metres

090964

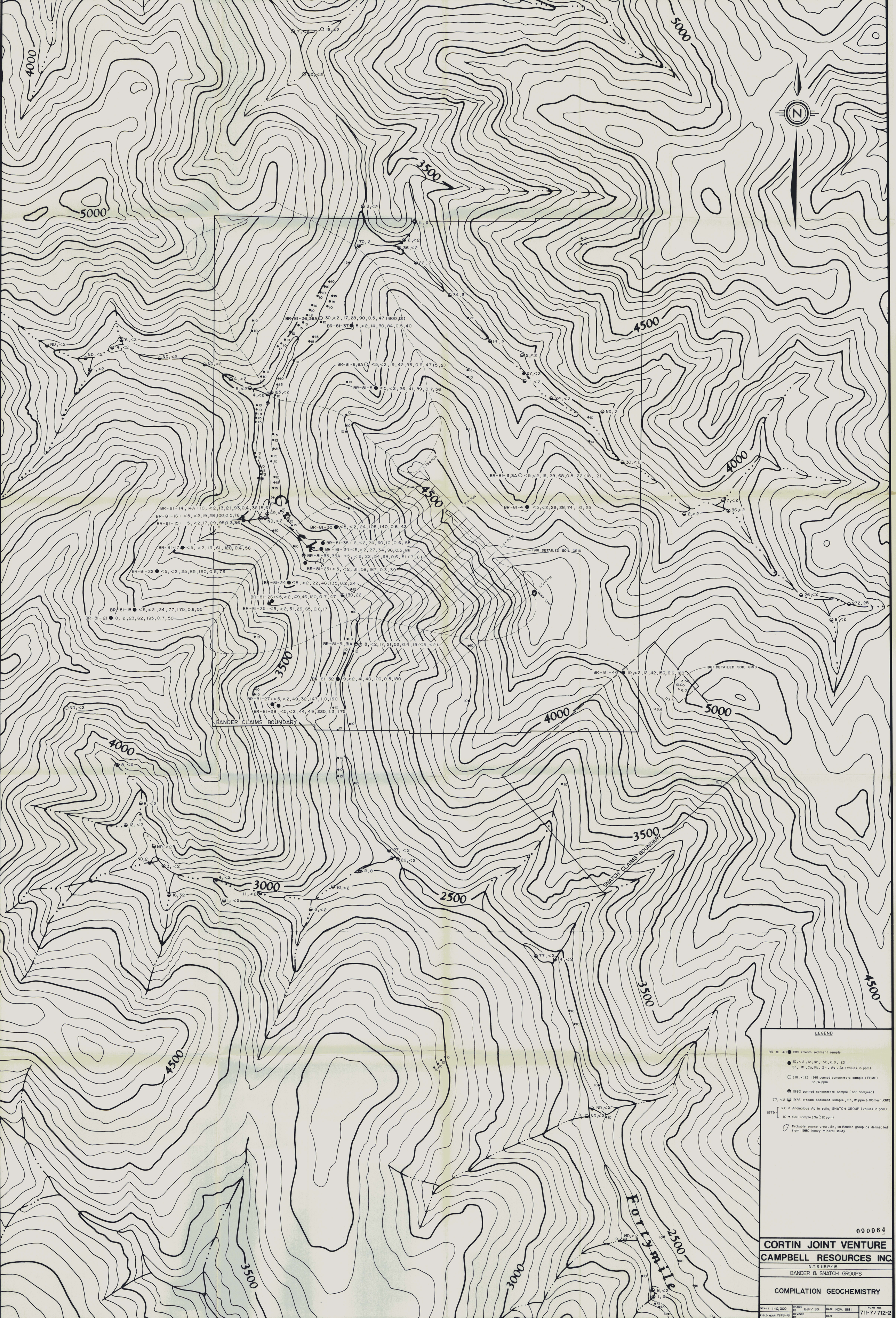
CORTIN JOINT VENTURE
CAMPBELL RESOURCES INC.

N.T.S. 115 P/15

BANDER GROUP

DETAILED SOIL GRID
Zn ppm

SCALE 1:5000	DRAWN BY BJP/SG	DATE NOV. 1981	PLAN NO. 711-6
FIELD YEAR 1981	REVISED BY	DATE	



LEGEND

BR-81-40 ● 1981 stream sediment sample

● 10,<2,12,42,150,6.6,120
Sn, W, Cu, Pb, Zn, Ag, As (values in ppm)

○ (18,<2) 1981 panned concentrate sample (PHMC)
Sn, W ppm

◓ 1980 panned concentrate sample (not analysed)

77,<2 ◒ 1978 stream sediment sample, Sn, W ppm (-80mesh, XRF)

1979 { 6.0 ○ Anomalous Ag in soils, SNATCH GROUP (values in ppm)
10 • Soil sample (Sn ≥ 10 ppm)

Probable source area, Sn, on Bander group as delineated from 1980 heavy mineral study

090964

CORTIN JOINT VENTURE
CAMPBELL RESOURCES INC.

N.T.S. 115 P/15

BANDER & SNATCH GROUPS

COMPILATION GEOCHEMISTRY

SCALE 1:10,000	DRAWN BY BJP/SG	DATE NOV. 1981	PLAN NO. 711-7/712-2
FIELD YEAR 1978-81	REVISED BY	DATE	

BANDER CLAIMS BOUNDARY

SNATCH CLAIMS BOUNDARY

Fortymile

No.1 YA 40352, 353
No.2 YA 40350, 351

No.1 YA 40340, 341
No.2 YA 40336, 339

No.1 YA 40380, 381
No.2 YA 40378, 379

No.1 YA 40402, 403
No.2 YA 40400, 401

No.1 YA 40404, 405
No.2 YA 40402, 403

No.1 YA 40486, 487

SOIL ANOMALIES Ag ≥ 2.5 ppm, Pb ≥ 300 ppm

Rubble, outcrop
14D, E
BR-81-19,20
Rubble, outcrop

Outcrop on hillside not mapped

Scattered rubble

Intrusive rubble

Intense folding

Intense minor folding

Fractures stubbed at 5 mm to 10 mm
Minor Fe and Mn staining

minor IF

LEGEND

CRETACEOUS

- 14A Feldspathic dyke rock, altered: may contain leucite
- 14B Biotite lamprophyre, intermediate to mafic varities
- 14C Inclusion-rich biotite lamprophyre
- 14D Quartz microdiorite
- 14E Granite porphyry

PRECAMBRIAN and/or CAMBRIAN
"GRIT DIVISION"

- I undivided
- IA quartz-mica schist
- IB quartz schist
- IC mica schist, some graphitic schist
- ID shale, slate, argillite
- IE limestone, calcarenite
- IF quartz-feldspar crystal tuff-"grit"

- ASPY arsenopyrite
- PBS galena
- QV quartz veining
- CC calcite veining
- S_0 compositional layering, inclined
- S_1 foliation, inclined
- S_2 fracture cleavage, parting, inclined
- joints, fractures: inclined, vertical
- minor fold axes: plunging, horizontal
- contact: inclined
- contact: definite, assumed
- x rubble
- outcrop
- talus
- ■, □ claim post: BANDER & SNATCH, other
- camp location
- • BR-81-10 hand specimen location

09 : 96

CORTIN JOINT VENTURE

CAMPBELL RESOURCES IN

N.T.S. 115 P/15

BANDER & SNATCH GROUPS

GEOLOGY

SCALE 1:10,000	DRAWN BY BJP/SG	DATE NOV. 1981	PLAN NO 711-8/7
FIELD YEAR 1981	REVISED BY	DATE	