

CARIBOO PROJECT British Columbia 1964

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CARIBOO PROJECT - 1964

INTRODUCTION:

A series of aeromagnetic maps covering part of Central British Columbia was published during 1963 and 1964. Five claim groups were staked on aeromagnetic anomalies early in 1964 and a programme of examination and prospecting was undertaken, partly on the claim groups, and partly in apparently favourable areas of the same general region. The greater part of this programme was centred in the Cariboo District between Noranda's Boss Mountain property and Prince George. The location of claim groups and general geology is shown on Figure I.

SUMMARY AND CONCLUSIONS:

Two properties were staked in the Cariboo District on showings of low grade copper mineralization located by prospecting. Of the five properties staked on aeromagnetic data alone, three were found to be of no apparent economic value. Two have had only cursory examination and are of sufficient interest to warrant further work.

Detailed descriptions of these properties are given below.

Programmes of detailed geophysics and possible drilling are recommended for the Gerimi-Sam groups and for the B. J. Group. Detailed soil sampling and mapping is recommended for the Wil Group and some further soil sampling and prospecting is warranted for the vicinity of the Ahb Group.

REPORT ON THE GERIMI & SAM CLAIM GROUPS QUESNEL RIVER AREA, B.C.

INTRODUCTION AND CONCLUSION:

The Gerimi 1 - 36 claims were located following the discovery of copper mineralization east of the Quesnel River. Finding of minor mineralization associated with limy beds to the north and south of the discovery warranted extension of the Gerimi Group to the north and staking of the Sam Group to the south. A portion of the mineralized limestone formation is within the boundaries of claims held by Coast Silver Mines who were staking a separate structure at the time of our discovery.

A programme of soil sampling, prospecting and geological mapping, followed by limited geophysical surveying, explored parts of the claim groups.

Outcrop is extremely limited and the geochemical results to date have been disappointing. However, sporadic mineralization at various places in an extensive area indicates that further work is advisable.

LOCATION AND ACCESS:

The Gerimi and Sam claim groups are located approximately 15 miles south-east of Quesnel, in the Cariboo District.

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The property may be reached by approximately 14 miles of relatively good gravel road south from Fifteen Mile Lake on the Barkerville Highway, or by approximately seven miles of forest access road east from Gravelle Ferry, crossing the Quesnel River approximately twenty miles by road south-east of Quesnel. The better route is the one south from the Barkerville Highway. However, the first eleven miles of this road are privately owned by Sigert Spruce Mills and permission should be obtained from Mr. Elgert.

PHYSIOGRAPHY:

The area is extensively drift covered. Rock outcrops are found along some ridge tops and occassionally in the creek beds. Local relief of approximately 200 feet or more is found, but most slopes roll relatively gently down to the Quesnel River on the west, and to Victoria Creek on the east.

Three small lakes, named from south to north, Smitty Lake, Four Mile Lake, and Devil's Lake, are included within the claim groups. Gerimi and Cantin Creeks head within the claim area and flow westerly to the Quesnel River. There are numerous swamps.

A portion of the claim area is being logged by Elgert Spruce Mills. Most of the north half of the property has been either logged or burned over, and now sustains a growth of poplar with considerable underbrush.

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GEOLOGY

TABLE OF FORMATIONS:

JURASSIC and/or CRETACEOUS

Granodiorite, monzonite, feldspar porphyry

UPPER TRIASSIC and/or JURASSIC

Green volcanics-agglomerate, volcanic breccia Limestone Purple volcanics-breccia, agglomerate, tuff

INTRUSIVES:

A number of granitic intrusives have been examined in the field. These are generally deficient in quartz and vary from granodiorite to monzonite.

An intrusive has been uncovered by road building along the Elgert Spruce Mill road, north of the Gerimi claim group. This is a coarse feldspar porphyry consisting of approximately 60% orthoclase feldspar, 30% hornblende, and less than 10% quartz. Some feldspar phenocrysts are over one inch in length. The intrusive body is moderately fractured and some of these fractures contain quartz veins up to 4 inches wide. One outcrop shows an 18 inch dark coloured feldspar porphyry dyke which is also cut by quartz-filled fractures.

On Claims Gerimi 6 - 21, purple tuffs and agglomerates are cut by dyke-like masses of grey intrusive diorite. A few small dykes have been noted cutting the green volcanics. South west of the Gerimi and Sam claim groups is a large mass of granodiorite. This has not been mapped in any detail. Prospecting notes indicate that this intrusive underlies the Sam Group west of Smitty Lake. Minor fracturing has been noted with a little pyrite, but no mineralization of interest has been found. The north-west contact zone of the intrusive grades into dioDite, relatively rich in magnetite, and this is apparently responsible for the large magnetic anomalies on Aeromagnetic Map 93 N/16 "QUESNEL RIVER."

A number of lamprophyre dykes are exposed along the road cut through the limestone bed on Gerimi 4.

PURPLE VOLCANICS:

A belt of purple volcanics occurs west of the limestone formation and is apparently continuous for the length of the claim group. This belt is made up of agglomerates, volcanic breccias, and bedded tuffs. The purple colour appears to be caused by hematite.

This belt is apparently relatively extensive and is described on Page 81-A1 of Summary Report 1932, Part A-1. Some lenslike areas of well bedded tuffs occur on the Gerimi Group. Bedding indicates steep westerly dips for the most part. A small exposure of rather poor pillows indicate that tops are probably to the east.

LIMESTONE:

White to dark-grey limestone is exposed here and there along a midge on the Gerimi Claims 1 - 6, and on Coast Silver claims BI 27 and 28. A length of about 4,600 feet is indicated for this formation.

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Some areas of the limestone are well brecciated, and portions appear to be partially silicified.

The limestone appears to lie above the purple volcanics for the most part, although this contact is not exposed. Near the north-west end of the limestone, a marrow tongue of purple volcanics occurs east of the limestone but, for the rest of its length the limestone is in contact with green volcanic breccia with limy material between the fragments.

South of Smitty Lake, along the projected strike of the formation, a single outcrop of limestone, approximately 200 feet in length and 80 feet in width, has been located. Purple volcanics occur west of this outcrop and green volcanics occur to the east indicating the same succession of rocks.

On Gerimi claims 45 and 46, a very narrow band of thin bedded limestone has been located in contact with green volcanics to the east. Purple volcanics occur in sparse outcrops to the west.

A number of angular limestone fragments occur just north of Elgert Spruce Mill on Gerimi No. 105. No outcrop has been located. Some fine pyrite and very minor chalcopyrite mineralization is present here. North of the claim group, the limestone horizon appears to be marked by highly contorted beds of argillite.

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GREEN VOLCANICS:

A series of volcanic agglomerates and breccias occur east of the limestone horizon. These rocks are very similar to the purple volcanics in composition and structure except for the colouration and an apparent lack of bedded tuffs in the green volcanics.

MINERALIZATION:

The main limestone formation is well fractured and sparingly mineralized with fine pyrite, chalcopyrite, tetrahedrite and bornite. Some surface areas are slightly rusty and show minor malachite and azurite.

Very small amounts of similar mineralization were found in the limestone outcrops south of Cantin Creek and south of Smitty Lake.

| Sample | | ASS. | AYS | |
|--------|-------------------------------------|--------|--------|---|
| Nos | Location | Gu | Au Ag | Remarks |
| 54054 | Main Pits | 1.79 0 | .01 Tr | Composite grab sample of best mineralization. |
| 54055 | a st st Antoin Colonada - | 0.77 T | r 0.2 | Grab sample grey brecciated limestone. |
| 54056 | 88 88 | 0.46 T | r Tr | " " Ditto " |
| 54057 | £\$ 53 | 0.84 T | r 0.06 | Chip sample north west face of main pit $0^{\circ} - 3^{\circ}$ |
| 54058 | £9 88 | 0.15 T | r Tr | Chip sample 3' - 8' |
| 54059 | 88 88 | 0.10 T | r Tr | " " 8º - 14º |
| 54060 | Trench 15N 2W | 0.26 | | и и 0 ⁸ – 10 ⁶ |
| 54062 | | 0.08 | | " " 10° - 20° |
| 54063 | | 0.12 | | n n 20° - 27° |
| 54064 | | 0.15 | Tr | II II 27° - 32° |
| 54065 | | 0.20 | | " " 32' - 41' |
| 54066 | | 0.12 | | " " 41° - 50° |
| 54071 | Outcrop 18N 0+20W | 0.38 | Tr | Character sample, fractured white limestone. |

The following assays have been obtained-(see Figure IV)

Locally malachite staining occurs in the purple volcanic breccias but no sulphide mineralization has been observed.

On claims Gerimi Nos. 94 and 96, a small area of outcrop shows purple volcanics apparently intruded by dark green volcanic intrusives. The green intrusives are fractured and shared to some extent with development of chlorite schist. Some malachite and minor chalcopyrite were found. A small granitic dyke showed tetrahedrite mineralization.

STRUCTURE:

Because of peor exposures, very little is known concerning the structure of the area. A persistent belt of purple volcanics is bordered on the east by an intermittent grey limestone formation which is partially interbedded in the purple volcanics. The limestone in turn is bordered on the east by massive green volcanics.

Average strike on the property is N45[°]W, but local variations occur. Dips have been observed in only a few locations and indicate steep attitudes, both east and west.

The aeromagnetic maps of the area indicate a possible fold structure in the vicinity of Devil's Lake, but, if this is the case, no direct evidence has yet been found in outcrops of the area.

A major shear zone trends through Smitty Lake to Four Mile Lake, and thence north-westerly through Gerimi Creek to the Quesnel River.

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GEOPHYSICS AND GEOCHEMISTRY:

Attention was directed to the area because of the interesting anomalies on the aeromagnetic maps of the region, together with known copper occurrences in the immediate vicinity.

Reconnaissance magnetometer observations, using MF-1 and PMF-3 fluxgate magnetometers were made during exploration of the claims. No direct relationship to mineralized zones was found and therefore, no survey as such, was carried out.

A systematic soil sampling programme was carried out along the apparent strike of the limestone horizon from Four Mile Lake to the north end of the claim group. For this purpose, the claim location lines were chained and samples were then taken on tape and compass lines between the location lines at 400 foot intervals. Samples were taken at 200 foot intervals along these lines with a $1\frac{1}{2}$ "diameter auger. Depth of sampling was reasonably constant at 12" to 15" but many variations in the soil were encountered and it is not possible to say that any particular horizon was consistently sampled. An effort was made to avoid collection of the upper, humus-rich layer.

All samples were tested in the field camp with a rubeanic acid kit and strong positive reactions were obtained where mineralization is known close to the surface. Numerous large indefinite areas of apparently high background or weakly anomalous results were also indicated.

Approximately 300 soil samples from various areas were then submitted to Coast Eldridge Ltd. for semi-quantitative spectrographic determination of copper. A number of samples from the main limestone area were also tested for silver. These determinations indicated:-

- Sporadic high copper content immediately over the mineralized limestone.
- Scattered high copper results from samples on the steep slope and low area just east of the limestone.
- Three high copper determinations from the zone of shearing and mineralization of Claims Gerimi Nos. 94 and 96.
- 4. Large zones of apparent high background content where no evidence of mineralization has been found.
- 5. Silver determinations seem to confirm the assays on rock samples in indicating little or no silver with the tetrahedrite.

In some areas the steep banks of Gerimi and Cantin Creeks indicate overburden depths of over 100 feet and it is evident that soil sampling cannot be deemed decisive.

Two set-ups were made on the main limestone showing with large vertical loop 1,000 cycle E. M. equipment. Readings indicated a very weak conductor approximately along the southwest contact which is completely covered with overburden. The anomaly is probably due to shearing; no massive sulphides are indicated. (See Figure IV)

On Claims Gerimi Nos. 49, 50, 51, 52, 68 and 70 initial testing of soil samples had indicated two areas of higher than normal copper content. Since this coincided, in part, with a strong positive aeromagnetic anomaly, the vertical loop E. M. equipment was used on a reconnaissance basis to check the area. The tape and compass lines marked by the soil samplers were used for control. However, due to irregularities in the lines, topography and wind, considerable difficulty was experienced in getting reasonable orientation. Results seem to indicate a number of broad conductive zones striking approximately

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N20°E. These may be in part due to magnetite. However, it is recommended that these zones be further investigated by E. M. methods and magnetometer. A proper local grid should be cut and chained for the purpose. (See Figure V)

On the main limestone showings an investigation was carried out by Electronic Geophysical Surveys Ltd., using the Geomag Theodolite Magnetic Component Vectoring System. A copy of the report for this survey is attached. A number of anomalies are indicated. The linear anomaly L-3 does, in part, parallel the weak E. M. anomaly in this area, and is also observed to extend through the main pits where the best mineralization has been found to date.

Areal anomalies A-1 and A-2 do not conform to any known structures, but tend to attract attention to the low area immediately east of the limestone where some soil samples show a high copper content.

CONCLUSIONS:

The claim group contains a number of areas which should be investigated further. Some of these are indicated by zones of relatively high copper content outlined by soil sampling, Others are indicated by examination of the aeromagnetic map in conjunction with known geology for significant geological structures.

The scarcity of rock outcrop indicates the necessity of employing geochemical and geophysical methods. Large areas of swamp and small lakes limit the areas amenable to direct geochemical methods. Geophysical investigation of these wet areas, as well as of geochemical anomalies, is warranted and should be done during winter months. Direct investigation of the low resistivity geomag anomalies associated with the main limestone zone seems desirable. This should, however, be postponed as considerable further information is becoming available through co-operation with officers of Coast Silver Mines. When their geophysical work is complete consideration of diamond drilling will be warranted.

RECOMMENDATIONS:

The following areas warrant additional geophysical work :-

- 1. Mineralized shear zones on Gerimi Nos. 92 and 94;
- Conductive zones on Gerimi Nos. 49 52; 68 and 70. If these zones are confirmed they should be checked by magnetometer.
- 5. The lakes and swamp areas south from the Four Mile Lake area, on what is presumably a strong shear zone parallel to the granodiroite contact and close to the projected strike of the limestone horizon.

Area No. 1 can be done at any time of the year. Area No. 2 can best be done during the winter when easy access can be had to the ground covered by creek and beaver ponds. Area No. 3 can only be done during the winter, because of swamp and lake areas.

The first two of these areas are relatively small and would require approximately ten miles of line cutting with lines at 400 foot intervals. If results were encouraging, further detail lines might then bewarranted. On Area No. 3, a series of tape and compass lines are proposed using the claim location lines as base lines. E. M. work would be done on a reconnaissance basis over an area three miles long and 3,000 feet wide.

REPORT ON THE B. J. CLAIM GROUP

INTRODUCTION AND CONCLUSIONS:

The B. J. claim group was staked to cover a symitic stock, with an associated aeromagnetic anomaly, wherein geochemical tests indicated copper mineralization. Initial prospecting revealed scattered chalcopyrite mineralization in fractured symite. Staking was followed by soil sampling and geological mapping. Further systematic investigation of the mineralized area is warranted.

LOCATION AND ACCESS:

The property is at Latitude 52°33'N; Longitude 121°38'W; within the Cariboo District of Central British Columbia.

The claim group is approximately 35 miles northeast of Williams Lake. It consists of 130 claims surrounding Bootjack Lake and extending east to Polley Lake (see Figure I). Bootjack Lake can be reached by seven miles of poor jeep road from Morehead on the McLeese Lake-Likely Road; Polley Lake can be reached by four miles of rough jeep road from a point approximately seven miles east of Morehead on the Likely Road.

Aircraft could land in either of Bootjack or Polley Lakes, but were not used by the field crew.

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PHYSICORAPHY:

Bootjack Lake lies at an elevation of 3,170 feet and Polley Lake at an elevation of 3,012 feet above sea level. Bootjack Mountain, between Trie Lake and Bootjack Lake, has an elevation of 4,175 feet and Mount Polley, between Bootjack and Polley Lake, reaches an elevation of 4,132 feet.

The area is fairly heavily timbered with spruce, balsam, cedar and fir. Much of the area occupied by Mount Polley can best be described as a cedar swamp and there is relatively little rock outcrop in spite of the fairly steep slopes.

In previous years placer operators have dredged the outlet at the north end of Bootjack Lake and drainage of the lake is now to the north into Morehead Lake. Water level of Bootjack Lake is augmented by the activities of an industrious beaver population.

GEOLOGY: (See Figures VI and VII)

The regional geology has been mapped by R. B. Campbell and is published by the G. S. C. in Map Sheet 3-1961 "QUESNEL LAKE -West Half". Mapping at a scale of 1" = 1 mile is published in Summary Report 1932, Part A "Geology and Placer Deposits of Quesnel Forks Area" by W. E. Cockfield and J. F. Walker.

The claim group covers nearly the whole area of the Bootjack Lake syenitic stock. Detailed mapping has indicated a number of different types of syenite intrusive, but it appears at present that only one of these contains appreciable copper mineralization. Areas shown in solid colour on the 1" = 600° scale geology map (Figure VII) are actually "outcrop areas" which may have relatively little fresh outcrop available for examination. It is emphasized that most of the area shown is covered and therefore a great deal is still unknown regarding the mineralization and structure.

TABLE OF FORMATIONS:

JURASSIC and/or CRETACEOUS

Monzonite

Diorite

Grey Syenite

Grey Syenite Porphyry

LOWER JURASSIC

Pyroxenite

Volcanics

The types of intrusive recognized and mapped are as

follows:-

2.

1. <u>SYENIT</u> contai

<u>SYENITE</u> - a coarsely crystalline pink syenite containing up to 70% orthoclase with minor plagioclase and mafics.

In the area between Polley and Bootjack Lakes, where the most detailed work has been done, the pink syenite appears to intrude the monzonite, cutting it with dykes and healing small fractures.

MONZONITE - a medium to fine-grained rock with up to 40% mafics and a nearly equal orthoclaseplagicclase ratio.

- <u>GREY SYENITE</u> a coarsely crystalline plagioclase rich rock with minor mafics. The area west of Bootjack Lake is partially underlain by a distinctive porphyritic variety of grey syenite. East of the south end of Bootjack Lake, the grey syenite commonly contains 5 - 10% pyrite.
- <u>DIORITE</u> between Bootjack and Polley Lakes small local areas were mapped as diorite. This is probably only a local, more basic phase of the monzonite.

The country rocks invaded by these intrusives have not been mapped in any detail on the property, and the geology shown on Figure VI is from reconnaissance work only, except in the area between the two main lakes.

East of the south end of Bootjack Lake, a few widely scattered, small outcrops were mapped as pyroxenite. A number of these occurrences were actually float and the contacts are only tentative. This is probably an alteration phase of some of the volcanics.

Volcanics have been noted on the west, north and southeast margin of the syenite stock. They also occur on the east side of Polley Lake. South of Bootjack Lake, the syenite extends beyond the claim boundaries and the volcanics were not observed. Volcanic exposures within the claim group are limited. The rocks themselves are dark-green to purplish, rather massive agglomerates and breccias indicated to be of Jurassic Age by R. B.Campbell of the G. S. C. (Map 3-1961) "QUESNEL LAKE"). No important mineralization has been found in these rocks.

3.

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MINERALIZATION:

The pink syenite has been moderately brecciated in certain areas and the fractures healed with epidote, magnetite, and chalcopyrite. Some disseminated chalcopyrite also occurs in apparently massive host rock. Most of the better showings are located close to the monzonite-pink syenite contact. Epidote is restricted to the brecciated zone.

There appears to be some general correlation between the concentration of magnetite and the occurrence of chalcopyrite. However, relatively fine disseminated magnetite occurs through much of the symmite and monzonite which appear devoid of copper mineralization.

Local areas of mineralization also contain minor pyrite and pyrrhotite.

The following is a list of assay determinations made on rock samples:-

| Sample | le | | | ASSAY VALUES | | | | | | | |
|--------|---------|----------------|------|--------------|----|---------|----|--|--|--|--|
| Nos | L | ocation | Cu | Mo | Ag | Áu | Ni | | | | |
| 54001 | 209E | 194N (approx.) | 0.30 | 0.01 | Tr | 0.03 | Tr | | | | |
| 54002 | 209B | 194N " | 0.71 | 0.005 | Tr | 0.02 | Tr | | | | |
| 54007 | 209+00B | 192+00N | 0.34 | | | | | | | | |
| 54008 | 209E | 192N | 0.27 | | | | | | | | |
| 54009 | 224B | 200N | 0.32 | | | | | | | | |
| 54010 | 234E | 244 N | 0.20 | | | ug Siè. | | | | | |
| 54011 | 2263 | 203N | 0.76 | | | | | | | | |
| 54012 | 219B | 179N | 0.54 | | | | | | | | |
| 54012 | 227B | 250M | 0.32 | | | | | | | | |
| 54014 | 234E | 184N | 1.63 | | | | | | | | |
| 54015 | 233N | 199N | 0.51 | | | | | | | | |
| 54016 | 231B | 198N | 0.35 | | | | | | | | |
| | | | | | | | | | | | |

These samples are grab samples reasonably representative of mineralization in individual outcrops and are spread erratically over an area extending about 2,500 feet east-west by 6,500 feet north-south.

SOIL SAMPLING: (See Figures VI & VIII)

A systematic programme of soil sampling was conducted between Polley and Bootjack Lakes, and reconnaissance soil sampling was done over the remainder of the group. Chained lines along the location lines and part of the claim group boundary served as base lines. From these, tape and compass lines were run at 400 feet intervals and soil samples were collected at 200 foot intervals on these lines. In an area east of the north end of Bootjack Lake early sampling was done by the same method, but on a 300 feet grid. All soil samples were collected in small plastic bags marked with the co-ordinates of the sample location.

Soil samples were tested at the field camp by the rubeanic acid method and visually graded as "positive", "indicator", or "negative" according to the density of the colour spot produced on the test paper. This provided a rapid check on the areas deserving attention, but, as it is evident from Figure IV, no specific correlation could be made with the geology mapped. Samples from a limited area were then submitted to Coast Eldridge Ltd. for semi-quantitative spectrographic determinations for copper and molybdenum. The copper determinations are plotted on the soil sampling map and contoured with the lowest contour at 50 ppm and each succeeding contour at twice the value of the preceding one. The geochemical anomalies show good correlation with mapped areas of mineralization. Because of this correlation, it is proposed that further samples be submitted for spectrographic determination.

Molybdenum values are also plotted, but only two relatively small areas appear to be anomalous, and, since no molybdenite has so far been identified in rock samples, no attempt is made to indicate these as positive anomalies,

MAGNETOMETER SURVEY:

During the early part of the soil sampling programme magnetometer readings were taken at each sample location with an Arvela Pocket Magnetometer. The results of these readings are plotted on a separate map and suggest some correlation with soil sample results. (See Figure IX)

CONCLUSIONS:

Exploration has indicated an area of perhaps 12 claims within which scattered chalcopyrite mineralization has been found. Due to the paucity of outcrop and the widespread occurrence of brecciation and mineralization, further work will be required before a decision can be reached regarding the future of this property. Very limited character sampling of some of the mineralized outcrops has returned relatively low assay values. The only metal of apparent economic importance is copper. However, there remains a possibility of outlining very substantial tonnages of copperbearing material and, if the average grade can be demonstrated to reach perhaps 0.8% copper, there is a good possibility of establishing a profitable operation.

RECOMMENDATIONS:

Soil samples for the remainder of the main anomalous zone should be submitted for spectrographic determination of both copper and molybdenum content.

During winter months, a magnetometer survey of the mineralized area should be carried out. For this purpose a tripod-mounted magnetometer, Sharpe A-2 is proposed. The purpose is to follow up indications of associated magnetite and chalcopyrite with a survey sufficiently accurate to assist in interpretation of later geophysical work.

During summer months, an I. P. survey should be conducted over those areas of greatest potential as indicated by work conducted to date, as well as by the proposed magnetometer survey.

P. G. CLAIM GROUP:

These claims were staked on a large positive aeromagnetic anomaly located 12 miles south-east of Prince George. Soil and silt sampling, ground magnetic readings and geological mapping failed to indicate any mineralization of interest. The magnetic anomaly is due to magnetite in a basic intrusive.

B. B. CLAIM GROUP:

An aeromagnetic anomaly 6.5 miles northeast of Alexandria lies over volcanics mapped as Takla. Examination of the ground after the snow had melted showed that the area had previously been investigated by geophysical means, and one diamond drill hole had been put down. Core at the drill site indicated the hole to be 150 feet deep. It had cut contorted argillite with minor pyrite and pyrrhotite. The argillite was intruded by a coarse altered gabbro, which probably contributed to the magnetic anomaly. From appearance of the formation it is likely that both a magnetic and an electro-magnetic anomaly are present. Prospecting, soil sampling and silt sampling in the area failed to indicate any mineralization of interest.

BARK CLAIM GROUP:

Outcrops of volcanics were observed while staking an aeromagnetic anomaly 12 miles northeast of McLeese Lake. The geological map of the area had indicated the bedrock to be a granitic intrusive. The volcanics are probably the source of the magnetic anomaly. Prospecting in the area, previously done by an independent prospector, showed little or no mineralization. The property was not further examined.

AHB CLAIM GROUP:

This group consists of 24 claims lying 22 miles southwest of Ahbau Lake, and 1 mile north of Ahbau Creek.

Most of the claim group is covered by overburden. Prospecting indicates that the aeromagnetic anomaly is caused by a serpentinite plug. No mineralization was seen associated with this plug.

Between the serpentinite and Ahbau Lake, a number of sparsely mineralized quartz veins occur. Some have been investigated by trenching by early prospectors. Large pieces of quartz float were found with galena mineralization. A picked piece of one of these ran 7.9 ozs. silver. Relatively low grade silver-gold showings exist in the general area. It is possible that more showings would be found through soil sampling for silver. For this reason it is proposed that prospecting be continued in the area. Old workings should be mapped and soil sempled. Some of the early work is described in Memoir 118, page 99.

Float bearing minor chalcopyrite and pyrrhotite was discovered on the claim group but its source has not been found.

WIL CLAIM GROUPS

Forty-eight claims were staked to cover a complex aeromagnetic anomaly in Triassic volcanics just east of a major fault. The claim group is located about 40 miles southeast of Prince George.

Early in the season it was not possible to reach the claims due to flooding conditions on the access road. Late in the season two men attempted to do some work but were forced out by snow. Very little information was gathered but positive reactions for copper and for heavy metals were obtained in some soil samples. Some outcrops near the claim group show rather massive pyrite. Further work is recommended for the group. A magnetometer survey during the current winter would probably provide valuable information to guide work during the summer.

PROSPECTING:

The writer did reconnaissance prospecting from roads and lakes in the Central British Columbia area. As a result of this, three areas are recommended for detailed prospecting during the coming season. These are outlined in a general way below:

- (a) <u>BOSS MOUNTAIN BATHOLITH</u> Prospecting was carried out around the south margin of the batholith and from Murphy and Lang Lakes. Some indications of mineralization were found in the Murphy Lake area. Prospecting and soil sampling is recommended (Figure X)
- (b) <u>CHUCHI SYENITE AREA</u> A syenite stock north of Chuchi Lake is recommended for prospecting due to its composition, its intrusive relationships with the surrounding volcanics and diorite, and to the presence of small mineral occurrences in the vicinity. (Figure XI)

<u>KLAWLI RIVER CONTACT ZONE</u> - The north contact of the granodiorite mass west of the Klawli River is recommended for reconnaissance E. M. surveying. Examination of the Kohse copper showing east of the river indicates mineralization in a strong shear zone striking approximately N60[°]W. Aeromagnetic data shows a probable continuation of the structure to the north-west in areas of extensive overburden. This project could be carried out during the winter. (Figure XI)

PROPERTIES EXAMINED:

(c)

The following properties were examined by the writer or by S. B. McBeath. None of these properties were recommended for further work or for participation:-

> <u>Coast Silver Mines</u> - Nyland Lake property, Quesnel area. <u>Malabar Mines Ltd</u>. - McLeese Lake, Cariboo district. <u>Sture Peterson Claims</u> - Granite Lake, Cariboo district. <u>Mouse Mountain</u> - Barkerville Highway, Cariboo district. <u>Duck Group</u> - Williams Lake area. <u>Hay Group</u> - Pavilion area.

Jericho Mines Ltd. - Highland Valley.

Respectfully submitted, Stephen J.C. Stephen

Vancouver, B. C. December 18th, 1964

- 26 -GEOMAG GEOPHYSICAL REPORT on the Gerimi Group, Quesnel, B. C. 52° North 122° West for Mastodon-Highland Bell Mines Ltd. November, 1964 D. L. Hing, P. Eng. ____ Electronic Geophysical Surveys Limited, 250 North Grosvenor Avenue, North Burnaby 2, B. C. Telephone: 298-9619

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ELECTRONIC GEOPHYSICAL SURVEYS LIMITED

GEOPHYSICAL RESEARCH AND EXPLORATION

November 26th, 1964

This is a Geomag Geophysical Report covering the Gerimi Group, for the Mastodon-Highland Bell Mines Ltd., Quesnel, B. C., November, 1964

SURVEY STATISTICS

E.G.S.

The type of instrumentation used in this survey was the Geomag Theodolite Magnetic Component Vectoring System.

- 28 -

The Geomag Survey was made in November, 1964, and consists of 5,585' of line surveyed. A total of 72 setup readings were made over 59 Stations.

The work distribution included: -

2 man days staking
2 man days surveying
¹/₂ man day field office
¹/₂
¹/₂ field man days
¹/₂ man days preparation of report, interpretation
and plans

TOTAL: 9 Man Days

RESULTS

The Geomag Geophysical Survey results are indicated on three plans; Plan 122-1 shows the resistive contours and areal anomalies; 122-2 shows the surface contours with the dashed lines indicating the strike of the linear anomalies. The vector plan 122-3 indicates the direction and strength of the vectors over the mean magnetic components. This is a Geomag Geophysical Report covering the Gerimi Group, for the Mastodon-Highland Bell Mines Ltd., Quesnel, B. C., November, 1964

INTERPRETATION

The vector plan 122-3 shows three linear anomalies, L-1 appears to be on the strike of possible mineralization, L-2 also shows some mineralization although the strike alters somewhat from L-2, and L-3 would appear to be a contact anomaly possibly from the limestone with the volcanics. Reference to drawing 122-1 of the resistive contours indicates A-1 and A-2 slightly north of the L-1 strike. The A-3 resistive anomaly is in the vicinity of L-2 but the strikes do not coincide.

- 29 -

2 ...

The L-3 contact on the Vector Plan covers the same approximate area as the high resistive anomaly around Stations 30 and 40. SUMMARY

The linear anomaly L-1 might possibly be the foot wall of a northerly dipping formation wherein the areal anomalies A-1 and A-2 show the low resistance areas that might be mineralized. This combination of L-1, A-1 and A-2 appear to be the main formation within the bounds of the survey. The area to the northwest, A-3 and L-2 have insufficient control to support interpretation.

From the information supplied on the geology of the Gerimi Group it would appear that the high resistive area surrounding Stations 30 and 40 is in the vicinity of the limestone, our information on the green volcanic and limestone contact is, it extends approximately along the east/west centre line. This does not coincide with the anomaly strike by some 30 degrees. An estimate of the depth from the cluster of Vectors in the vicinity of Station 41 would suggest that the

November 26th, 1964

This is a Geomag Geophysical Report covering the Gerimi Group, for the Mastodon-Highland Bell Mines Ltd., Quesnel, B. C., November, 1964

anomalous area is not deeper than 150 feet and possibly quite a lot less. The east end of the anomaly appears to be closest to the surface, therefore A-2 would appear to be the first area for any geological investigation.

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- 3 -

ELECTRONIC GEOPHYSICAL SURVEYS LIMITED

D. L. Hings, P. Eng.

DLH/j

REPORT ON THE CARIBOO PROJECT to October 20, 1964.

SUMMARY & CONCLUSIONS:

A prospecting program has been conducted in the Cariboo area during the past summer and is continuing at the present time.

Interesting mineralization has been found on the GERIMI and B. J. claim groups. These occurrences are being investigated by geological mapping, soil sampling and limited geophysical surveying.

Information available on published aeromagnetic maps, together with reasonably encouraging prospecting results indicate the region deserves further systematic exploration.

INTRODUCTION:

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Publication of a series of aeromagnetic maps in central B. C. led to consideration of the regional geology to predict those areas most favourable for mineralization. At the time of publication staking crews were placed in the field and five groups of claims were staked covering those anomalies considered most favourable.

Early in May, the writer scouted parts of the area and during the latter part of May, two geologists, S. G. Turner and S. B. McBeath, started examination of the ground staked.

Subsequent scouting indicated other areas of interest and as a result of careful prospecting the GERIMI and SAM groups were staked in the Quesnel River area and the B. J. Group was staked in the Bootjack Lake area.

REGIONAL GEOLOGY:

Attention has been focussed on an area east of the Fraser River extending from Boss Mountain in the south-east to Prince George on the north.

Much of the south and southwest portions of the area are underlaim by a series of tertiary and quaternary volcanics and sediments. A portion of this series is composed of highly magnetic basalt and andesite which obscures the structural information which would otherwise be available on the aeromagnetic maps.

Operations have been concentrated on a central, northwesterly trending belt, approximately 80 miles by 15 miles, which is underlain by Upper Triassic to Jurassic age volcanics and sediments.

This belt is separated from Palaeozic rocks to the northeast by a major fault which is marked by a series of ultra basic intrusives.

A second major fault zone bounds the belt on the southwest, separating it from a series of Permian and Triassic rocks. This is thought to be the extension of the Pinchi Lake fault.

The northern limit of the area prospected is underlain by Triassic volcanics.

A number of important granitic intrusives occur throughout the area. Those at Boss Mountain, Bootjack Lake and McLeese Lake show copper and molybdenite mineralization. Other indications of mineralization have been found in sediments and volcanics of Triassic and Jurassic age.

Most of the region is obscured by a mantle of glacial debris. In many places rock outcrops constitute less than 1% of the surface area.

METHODS AND EQUIPMENT:

Exploration has been guided by interpretation of the aeromagnetic maps based on known geology, followed by rapid scouting by the writer. Further detailed prospecting is aimed at those areas indicated as interesting by the preliminary scouting.

An intricate network of access and logging roads cover much of the area, and together with a number of lakes provide a relatively good means of communication.

In general, each party has been provided with a 4-wheel drive vehicle and complete camp equipment. A canoe and aluminum boat are in use on the lakes. Aeromagnetic anomalies have been checked out roughly with Sharpe fluxgate, and Arvela pocket magnetometers. Numerous silt and soil samples have been taken and depending on the area and are tested for copper and one or more of the metals zinc, lead, molybdenum and silver.

Where mineralization has been found, intensive soil sampling, together with geological mapping and some geophysical surveying has been used to outline target areas. This is a time-consuming procedure requiring considerable skill and care, and a lack of experienced personnel hampered the operation during part of the season.

CLAIM GROUPS:

Seven claim groups have been staked. Five of these were based on aeromagnetic data, and two on mineralization found by detailed prospecting in areas pointed up by interpretation of aeromagnetic data and preliminary scouting.

The first type of staking is based on decisions made within one hour of release of the aeromagnetic maps. The second type of staking follows a piecing together of many scraps of information along with examination of the aeromagnetic maps.

The amount of work performed on each claim group has varied widely. Each group is described separately below:

GERIMI and SAM GROUPS

A complex belt of magnetic anomalies, about 30 miles long and from 4 to 10 miles or more wide, extends along the east side of the Quesnel River. The anomalies arise from a variety of sources. Some magnetic highs are due to magnetite in volcanics, some to magnetite in granitic intrusives, and some to ultra basic bodies. Equally important are magnetic lows which apparently indicate major zones of shearing and faulting. Some may also be due to belts of sediments and volcanics very low in magnetite content. The percentage of rock outcrop is quite low, but in spite of this, a number of copper occurrences are known.

The GERIMI claim group was staked to cover copper mineralization found in a bed of brecciated limestone. Part of this mineralized zone was covered by claims staked by Coast Silver Mines Ltd. who were staking in the area at the time our crew located the limestone mineralization. The GERIMI group was extended and the SAM group staked to cover strike extensions of the zone as indicated by aeromagnetic data. Approximately 300 claims have been recorded.

A systematic soil sampling survey has been conducted over part of the area staked and this work is continuing. Approximately 2,350 soil samples, representing about 90 miles of line have been tested thus far. A number of zones showing high copper content have been outlined by this survey. In some areas initial examination indicates mineralization of no economic importance, but the source of the copper in other areas has not yet been determined.

The most important showing is still the original limestone find. Here, tetrahedrite, bornite, chalcopyrite and pyrite mineralization are found rather sparsely on fractures and bedding planes in brecciated limestone.

The limestone bed has been traced for a total of 4,300 ft. 2,200 of which 2,550 ft. are on Mastodon-Highland Bell ground, and 1,750 ft. are on Coast Silver ground. The bed is approximately 200 ft. wide, but this is only approximate, as it is not well exposed and the contacts are covered by overburden for the most part. A number of old pits and trenches exist. Most of these are on Coast Silver ground, although one 50 ft. trench and a number of small pits were found near the northwest end of the bed on the GERIMI claims.

Only a limited number of assays have been obtained, varying from 0.15% to 1.79% copper. None of these could be said to represent any large portion of the zone. Silver content appears negligible.

4.

Soil sampling on the zone has only served to confirm the size of the zone and provides a comparison for other soil sample anomalies.

A survey of the zone has been partially completed using vertical loop E.M. equipment. This has indicated a weak conductor parallel to the supposed position of the southwest contact. It is thought that this is due to a shear or fault zone, possibly within the volcanics. The mineralization seen thus far is not likely to be indicated by this type of instrument, but the results show that no large vein or body of massive sulphides can be expected. This conductor should not be ignored however even if proven to be in the volcanics as indications of copper have been found in these beds for considerable distances to the south-east and north-west of the area surveyed.

Furthertesting with this method appears warranted in areas

- 1) where geochemical anomalies cannot be directly investigated due to lack of outcrop;
- where lakes and swamps make soil sampling impossible.

This work can best be done after freeze-up.

An experimental survey of 6,000 ft. of line over the limestone zone is being conducted by the relatively new Geo-mag method. This provides a measurement of the relative conductance of a body at very low frequency and is capable of outlining low concentrations of sulphides where magnetic effects are relatively weak.

B. J. GROUP

A total of 130 claims have been staked to cover copper bearing intrusives, approximately 34 miles north-east of Williams Lake.

Presence of a magnetic anomaly over a portion of a syenite intrusive led to examination of this intrusive. Silt sampling and prospecting led to discovery of low grade chalcopyrite mineralization.

Subsequently systematic soil sampling has outlined an anomalous zone over the north-east portion of the property. Detailed geological mapping of this area is being done in conjunction with the soil sampling. Actual rock outcrop is relatively sparse, but thus far at least four different phases of intrusive have been identified. One of these appears somewhat younger than the others and and this phase is well fractured and caontains most of the mineralization found to date. There appears to be some relationship between the copper and magnetite mineralization within this particular phase of the intrusive.

The anomalous zone covers a large area and considerable further work will be necessary to define more localized targets. After geological mapping has provided further information it would appear that a careful magnetometer survey should be made. This can best be done during the winter with a two-man camp supplied by aircraft landing on Bootjack Lake.

A brief report by Mr. E. Holt concerning the geology is attached.

A.H.B. GROUP

This group of 24 claims covers a magnetic anomaly associated with a major fault in Cambrian sediments of the Cariboo group.

Work on the claim group indicates that the magnetic anomaly is probably due to serpinitized peridotite. The percentage of outcrop is small and a very careful examination is being made due to the discovery of a basic intrusive (?) rock carrying disseminated pyrrhotite and chalcopyrite. It is also known that a number of quartz veins occur and some lead and silver bearing mineralization is present.

At present two men are prospecting and soil sampling these claims.

WIL GROUP

Forty-eight claims cover a complex magnetic anomaly in Triassic volcanics just east of a major fault.

No work has been done on the claim group as yet. At the time a crew was available for this area the roads were considered impassable, and since that time personnel have been fully occupied in other areas.

The writer obtained positive copper reactions from silt samples in this area and it is understood that occurrences of copper, silver and lead mineralization are known in the area.

Geophysical and geochemical work is planned as soon as men are available.

B. B. GROUP

Thirty-two claims were staked on an aeromagnetic anomaly located 22 miles south of Quesnel.

At the time of staking it was known that this ground had been previously staked, but no information was available as to the work done.

On examination of the ground it was found that there was practically no rock outcrop. The anomaly had been previously detected, a series of lines had been cut for a geophysical survey and a drill hole had been drilled to 150 ft. on the anomaly. The drill hole showed an altered basic intrusive cutting highly contorted thin-bedded argillite with disseminated pyrite mineralization on fractures and bedding planes.

This structure would probably provide both a magnetic and an E.M. anomaly. A reconnaissance soil and silt sampling program did not locate anything of interest.

The claim group will be allowed to lapse.

P.G. GROUP

This group of 48 claims lies 11 miles south-east of Prince George. It was staked to cover a magnetic anomaly in an area of Triassic volcanics.

Careful prospecting together with soil sampling and a reconnaissance magnetometer survey showed that the anomaly was due to magnetite in a basic phase of the volcanics.

No sulphide mineralization was found. The claim group will be allowed to lapse.

BARK GROUP

These claims are located 12 miles north-east of McLeese Lake. They were staked to cover a relatively weak aeromagnetic anomaly. The area was indicated by the four-mile geology map to be underlain by the granitic intrusives within which copper, molybdenum mineralization has been found at Cuisson Lake.

During staking, outcrops of volcanics were observed and these are the probable source of the magnetic anomaly. No further work has yet been done.

OTHER PROSPECTING:

The writer has done some reconnaissance work through much of the area. Simple prospecting of outcrop has a very small chance of finding anything new as the area has been generally well prospected. Investigation will have to be based on information such as that provided by the aeromagnetic maps. Unfortunately these do not cover all of the potential ground.

In the Murphy Lake portion of the Boss Mountain batholith signs of copper and molybdenum mineralization were encountered. Access is relatively good in this area and further work is indicated.

A number of properties were briefly investigated by the writer and by Mr. S. McBeath. Brief reports have been filed covering these. Personnel also briefly investigated fhe ground in the Highland-Valley area, the Pavilion area and the Klawli-Chuchi Lake area. The writer also visited Noranda's Boss Mountain property in company with Dr. Bacon.

The writer also staked a small group of claims covering indications of copper and molybdenum on West Redonda Island in the general Campbell River area.

PROPOSED PROGRAM:

Relatively little systematic exploration has been conducted in the Cariboo area. With the information now available it would appear that exploration should be continued and favourable areas indicated by published geological and aeromagnetic maps, should be thoroughly investigated. Some further consideration should be given to the Topley intrusions which occur on the west half of the Prince George sheet. A program of geochemical sampling would seem to be the best mode of attack

Soil sampling on the GERIMI group is only 50% complete and this program should be continued. Anomalous zones should be investigated by geological mapping, check sampling and geophysical survey.

Major lake and swamp areas along strike of the mineralized zone should be checked by geophysical means.

Depending on the results of the Geo-mag survey, drilling may be indicated to provide adequate sampling of the limestone zone. Due to the shallow overburden and location of the showing on a ridge it is thought that a very low grade of ore could be worked by open pit methods.

On the B. J. Group a magnetometer survey should follow completion of the geological mapping and soil sampling. Location of sulphide concentrat**ions** by I.P. or Geo-mag methods is hampered by the presence of magnetite. It is probable that more than one type of geophysical survey should be run prior to stripping or diamond drilling.

Although initial work was not encouraging there are large areas of the intrusives occurring east of the Fraser River, between Quesnel and Prince George, which have not been investigated. These areas probably warrant some further attention.

Some remarks on a possible placer occurrence are attached.

Respectfully submitted,

J. C. Stephen

JCS:c Vancouver B.C. Oct. 21, 1964 Encls.

To: Dr. W. R. Bacon

Sept. 14/64

From: J. C. Stephen

| Re: | Probability | of I | Placer | Deposit | in |
|---|-------------|-------|---------|---------|----|
| and the second se | Quesnel | River | r area. | 1 | |

The aeromagnetic map - Quesnel River 93 B/16 shows a magnetic low extending from Smitty Lake on the SAM claim group for a distance of approximately 18 miles northwest, to the Quesnel River.

The magnetic highs to the southwest of this low apparently are caused by a magnetite-rich contact phase of a granitic intrusive.

The magnetic highs to the north-east of this low apparently are caused by magnetite-rich volcanics similar to those on the GERIMI claim group.

The magnetic low is probably the result of a number of factors, of which the following are considered to be the most important:-

(a) the normal magnetic low generally associated with the north or north-east edge of a magnetic high

(b) strong shear or fault zones which outcrop in this area on Gerimi and Cantin creeks and on the road south of our Gerimi Creek camp

(c) A buried river valley exposed where cut by the Quesnel River and the creeks entering Quesnel River from the east.

Important quantities of placer gold were obtained from the Quesnel River south to Deacon Creek, and from Deacon Creek. Contin Creek was staked for placer, and placer workings are evident on Gerimi Creek. No placer workings are known to us on creeks which do not intersect the buried channel along the line of the magnetic low. The channel is filled mainly by a thick series of varied clays. Near the top, a bed of boulders and gravel occurs and it is in this bed that the gold values were obtained. No records of production are immediately available here, but residents on the Quesnel River report that about \$1,000,000 in gold was taken from the mouth of Deacon Creek, and perhaps \$2,000,000 from the Quesnel River flats.

There appears to be a possibility of further placer gold being present in the upper beds filling this old valley. No investigation has been carried out by crews presently working in the area.

JCS:c

C./Stephen

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GEOLOGICAL REPORT ON "B.J." GROUP.

By: E. S. Holt.

The "B. J." group consists of 130 mining claims located 40 miles north-east of Williams Lake, in the Quesnel mining district.

The property surrounds Bootjack Lake and extends east to the west shore of Polley Lake.

Copper mineralization is associated with a syenite stock, which intrudes the Jurassic volcanics of this region. The syenite varies widely in mineralogic composition. For mapping convenience four main divisions are being used, but all gradations between these units do exist.

- Pink syenite a coarsely crystalline syenite containing up to 70% orthoclase with minor plagioclase and mofics.
- (2) <u>Monzonite</u> a medium to fine-grained rock with up to 40% mofiles and a nearly equal orthoclase-plagioclase ratio.
- (3) <u>Grey syenite</u> a coarsely crystalline plagioclase-rich rock with minor mofics.
- (4) <u>Syenite porphyry</u> a distinctive porphyritic variety of grey syenite.

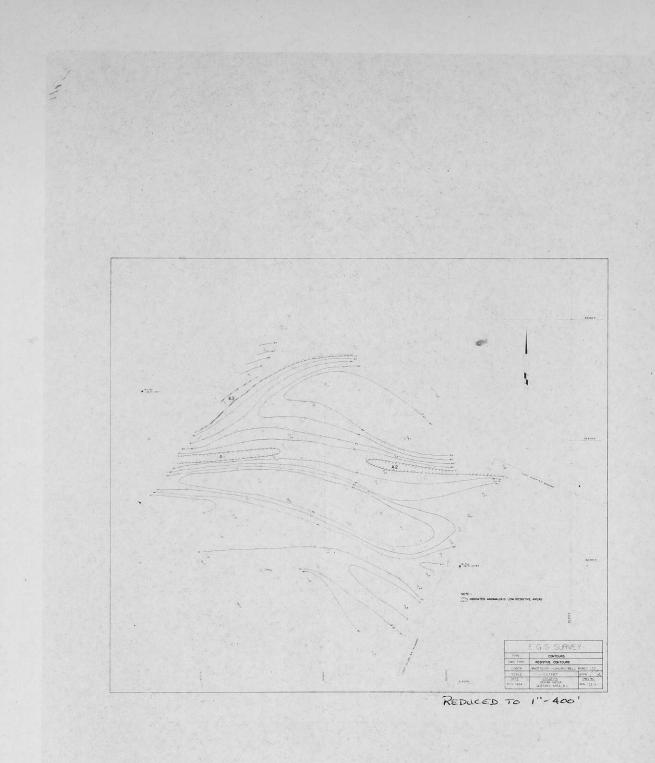
To date, all copper mineralization found has been within, or associated with the pink orthoclase-rich variety of syenite. Most of the mineralized areas are moderately brecciated, but some concentrations of chalcopyrite do exist in the compact host rock.

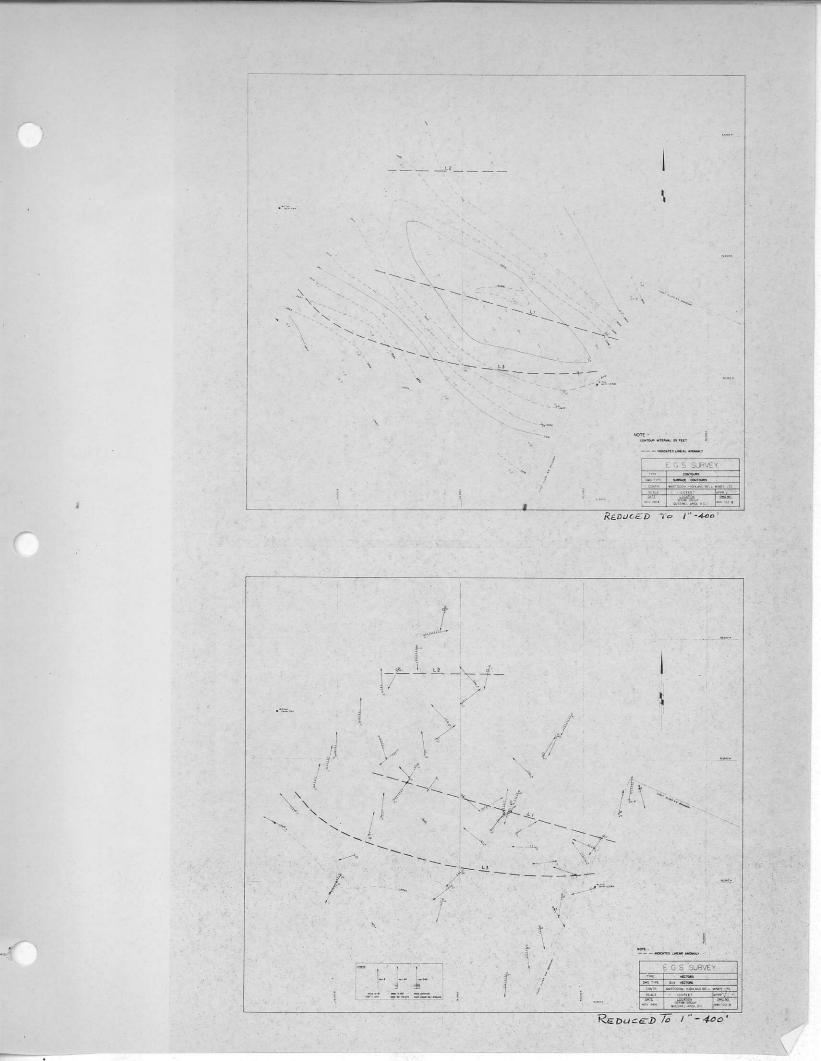
In the area between Polley and Bootjack Lakes, where most of our work has been concentrated, the pink syenite appears to intrude the monzonite variety cutting it with dykes and healing small fractures. Most of the best showings are located close to the monzonite-pink syenite contact.


The mineralization consists of chalcopyrite, magnetite and epidote, with local areas containing minor amounts of pyrite and pyrrhotite. The epidote appears to be restricted to the brecciated areas, while magnetite can be found throughout the property. It is, however, generally more abundant in the mineralized areas, and locally has been seen to replace up to 50% of the host rock.

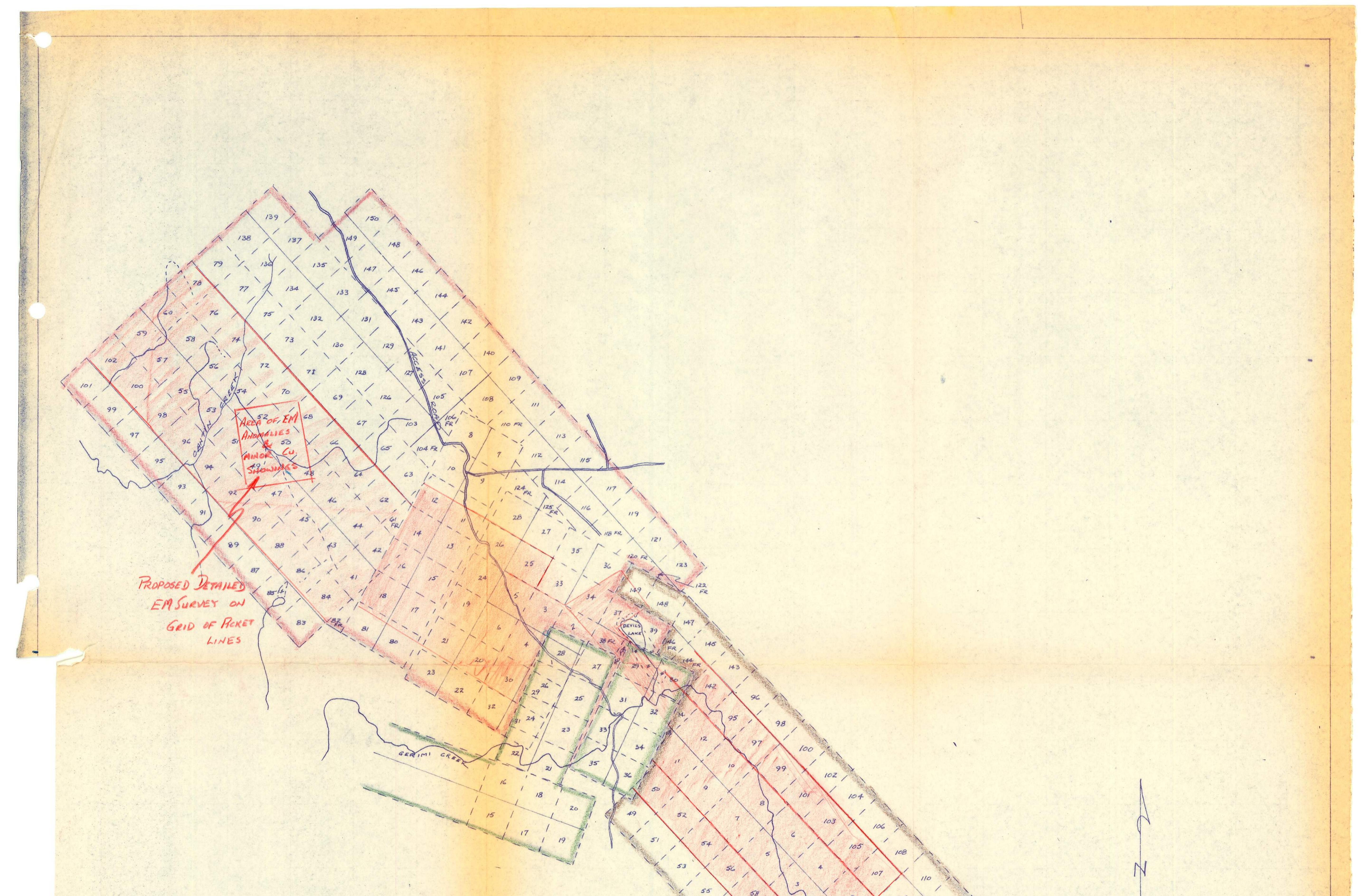
The mineralized areas are estimated to contain between .1 and .7% copper with a few exceptions of higher grade material. They generally cover an area 10 to 20 feet in diameter with no large continuous areas of mineralization having been seen to date. We are, however, working in a large area which is predominantly covered by overburden. It produced a magnetic anomaly, soil sampling continues to give favourable results and interesting amounts of copper do exist on the property.

Vancouver, B.C. October 26, 1964 E. S. Holt.



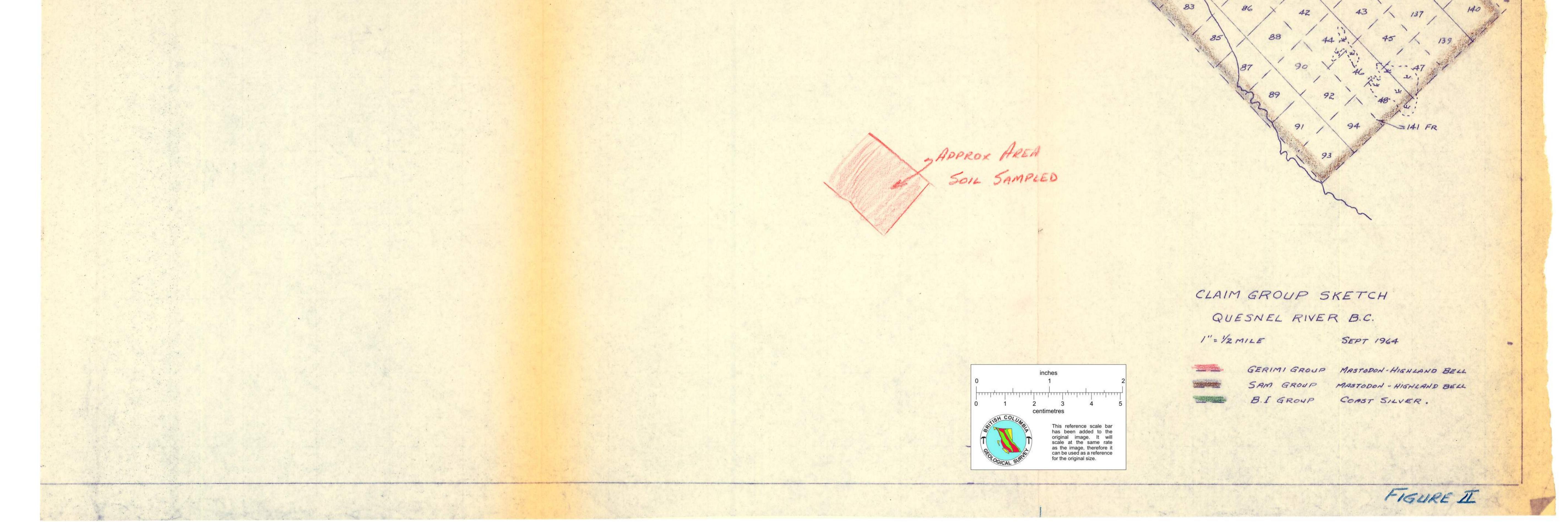


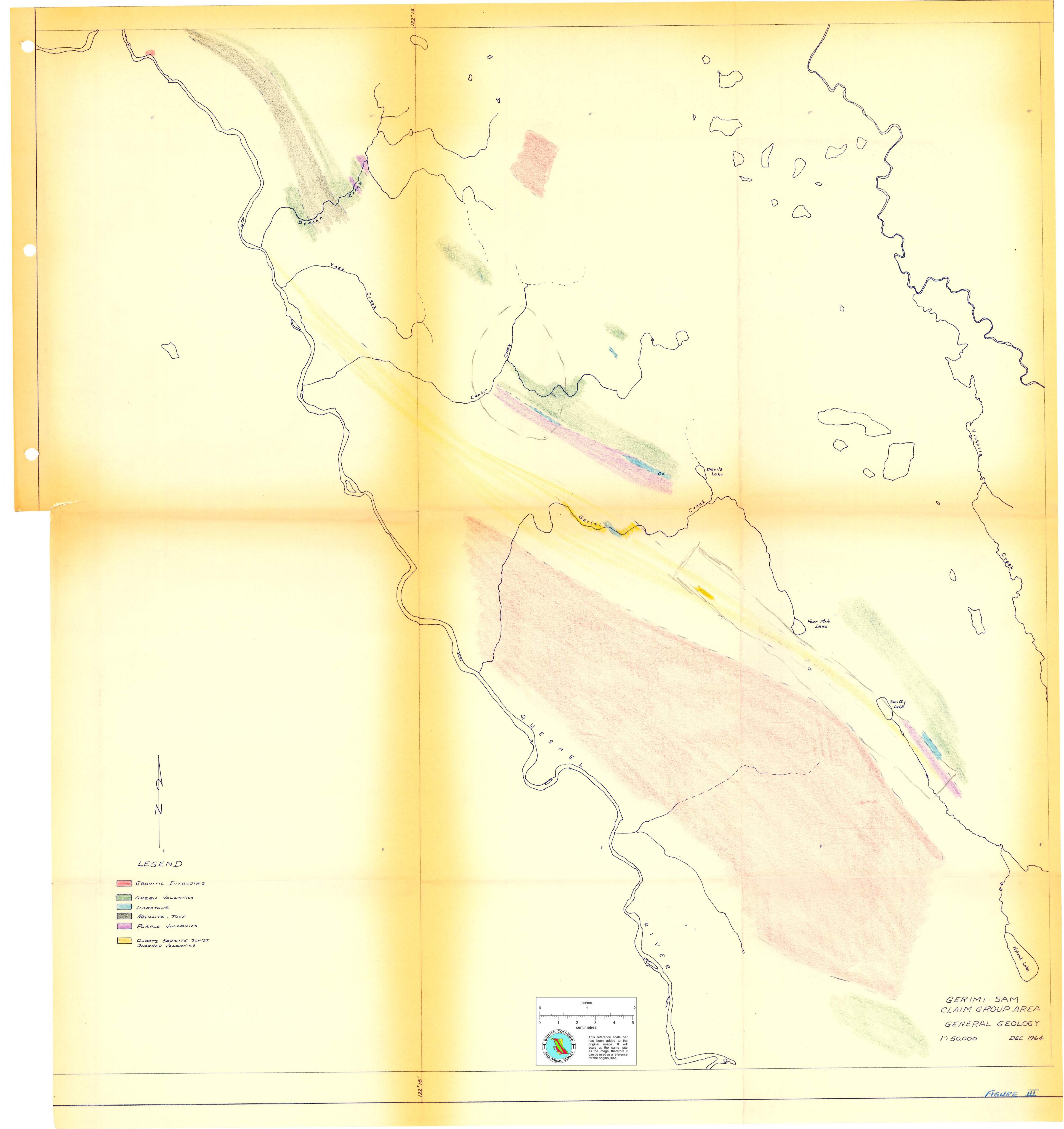






RECONNAISSANCE E.M. SURVER FROM COAST SILVER GEOMAG AHOMALIES ALONG SUPPOSED SHEAR TO SMITTY LAKE AREA USING LOCATION LINE & ROAD AS BASE WARS

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LEGEND

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
| | | Y She |
|-----|----------------------|-------|
| 735 | Syenite (pink) | |
| 737 | Monzonite | |
| 747 | Syenite (grey) | |
| 746 | Syenite porphyry | |
| 738 | Volcanics | |
| 742 | Brecciated volcanics | |
| 741 | Pyroxenite | |
| S | SOIL SAMPLING | |
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| | L'IIII | 0 |


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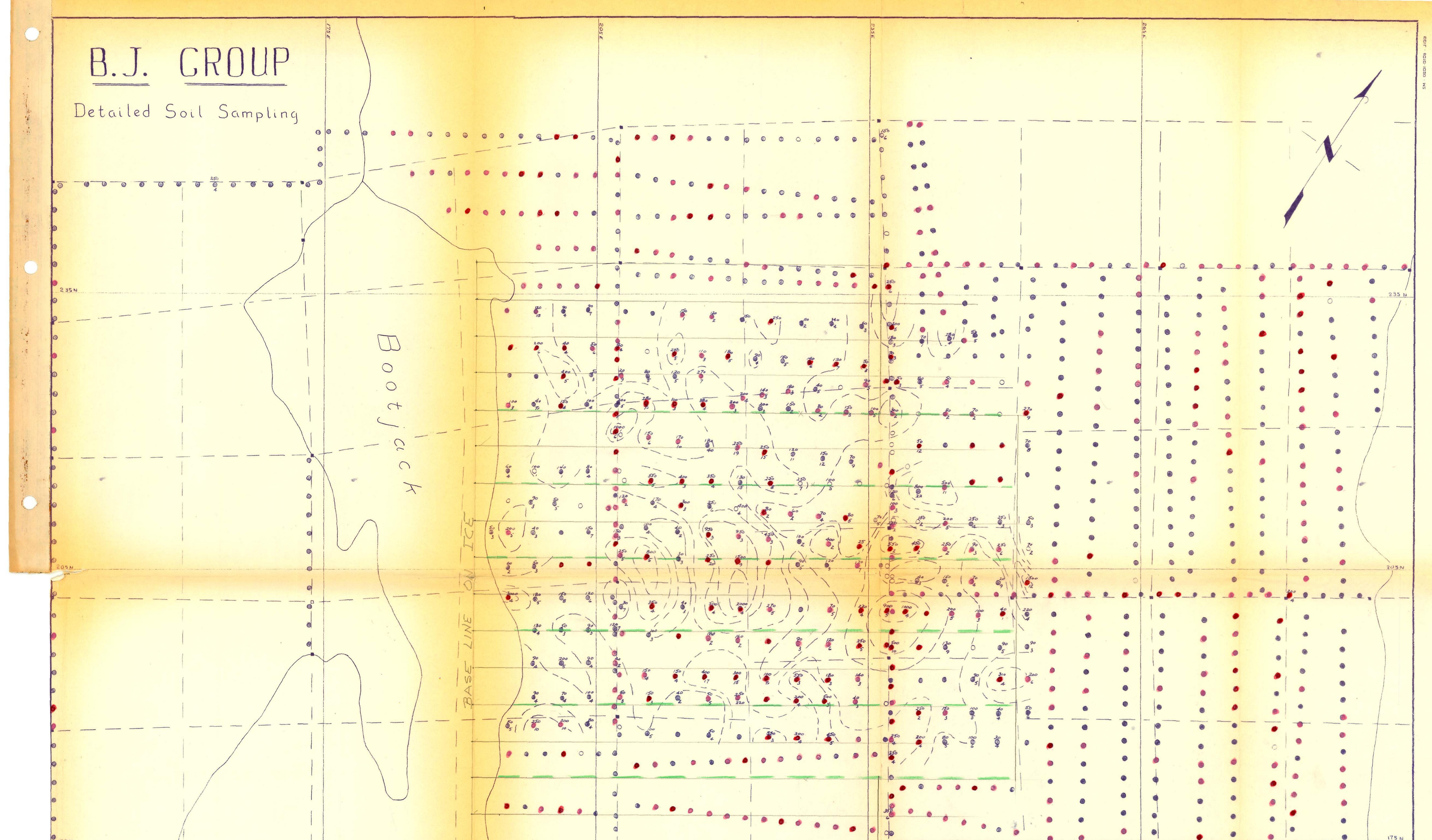
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E.S HOLT

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