2785

GEOPHYSICAL-GEOCHEMICAL REPORT
FOR 93A/2W
ELECTROMAGNETIC-SOIL SAMPLE SURVEY
EXETER MINES LTD. (N.P.L.)
SILVER BOSS, SB & GUS CLAIMS
HENDRIX LAKE AREA, CARIBOO M.D., B.C.
AUGUST 14 - OCTOBER 9, 1970

SILVER BOSS, SB & GUS CLAIMS: 51.5 miles E of Williams Lake, British Columbia

50° 120° SW

N.T.S. - 93 A/2W

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November-December, 1970

Submitted to: EXETER MINES LTD. (N.P.L.)
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Geotronics Surveys

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SUMMARY

A combined electromagnetic and soil sampling survey was undertaken on the SILVER BOSS, SB, and GUS claims from August to October, 1970. The claims are located on Big Timothy (Takomkane) Mountain next to the molybdenite-producing Brynnor Mines, in the Cariboo Mining Division, British Columbia, which is about 65 miles by road east of 100 Mile House.

The claims were staked for various copper showings, the main one being a 700-foot long vein of sulphides (containing copper, lead, silver and zinc) with a quartz gangue and found with a shear or fault zone. The claim group is underlain by different phases, from monzonite to diorite, of the Takomkane Batholith, in addition to a capping of Pleistocene volcanic basalt. The property is crossed and cut by many faults and shear zones.

The JEM 'shootback' survey was attempted at first, but after thorough testing over the existing mineralization, it was abandoned for a VLF-EM survey. Some soil sampling was done during this period on the east end of the SB claims and the east end of the GUS claims.

The VLF-EM and soil sample survey produced a number of anomalies, some extremely worthy of further exploration. Many of the VLF-EM anomalies are probably reflecting structure which could be associated with sulphides. EM anomalies B and C increase the possibility of a breccia zone occurring in that area.

Extensive further exploration is recommended, varying from a geochemical program to diamond drilling.

Geotronics Surveys

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GEOPHYSICAL AND GEOCHEMICAL REPORT

ON AN

EM AND SOIL SAMPLE SURVEY

ON THE

SILVER BOSS, SB AND GUS CLAIM GROUPS

HENDRIX LAKE AREA, B.C.

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Submitted to: EXETER MINES LTD. (N.P.L.)
1010 - 789 W. Pender St.
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INTRODUCTION

This report primarily discusses the procedure and results of an electromagnetic (EM) survey completed over the SILVER BOSS 1-24 m.c., the SB 29-31, 33, 34 and 37-38 m.c., and the GUS 1-6 and 8-14 m.c. The survey was under supervision of the writer and under technical supervision of Mr. R. Simpson and was completed from August 14 to October 9, 1970. Included also in this report is a discussion of a limited amount of soil sampling undertaken during this period on the SB 37, 39, 40, 43, 46-48 m.c. and the GUS 1, 2, 13 and 14 m.c. by Mr. Clifford Gunn.

The purpose of any form of exploration on this property was to locate any unknown mineralization or extension of the known mineralization, which was mainly massive chalcopyrite and pyrite in quartz veining. To this end, therefore, a Crone shootback JEM survey was chosen for the following reasons:

1) mineralization in the form of massive sulphides

2) not affected by topography

3) provides good definition of conductive zones for drill targets.

However, after 23.5 survey line miles and extensive testing over the known copper showing on SILVER BOSS 5 claim, it was decided between T. R. Tough and the writer to discontinue using the JEM because of lack of positive results. This was thought to be because of surrounding of the conductive sulphide globules by the insulative quartz. VLF-EM was therefore substituted, since because of its much higher frequency, it will pick up a zone with much lower conductivity. It was thought also that it could assist in mapping faults and shear zones. Unlike the JEM, it is not so clearly interpretive in the field, and must therefore await an intensive study for a correct interpretation. The number of survey line miles completed was 35.5.

The soil sampling was done in order to assist in the interpretation of the VLF-EM survey. Only four lines were completed since Mr. C. Gunn had a limited amount of time. The samples were tested for copper and silver since they are known to occur on the property.

LOCATION AND ACCESS

The Exeter Mines property is located 51.5 miles due ~~west~~ ca of Williams Lake within the Cariboo Mining Division. Bordering on the north end of Noranda's Brynnor Mines, it is situated on Takomkane Mountain, referred to on some maps as Big Timothy Mountain but not to be confused with 'Little' Timothy Mountain which is a short distance to the south. Coordinates are latitude 52° 06' and longitude 120° 56'.

The property is best reached by going first to Brynnor Mines, accomplished by leaving Highway 97 immediately north of 100 Mile House and travelling 65 miles east through Forest Grove, Trout Creek and Hendrix Lake. Access from here is best by helicopter at this time, if a camp or any amount of equipment is to be moved in. However, a road that in summer is passable by a 2-wheel drive vehicle connects the Brynnor Mines area to the Horsefly-Black Creek Road. This road passes through the east end of the GUS claims. The Exeter Mines access road, going westerly, leaves this road about 1½ miles from the mine and before the GUS claims. This road is about 1 mile long and goes within 500 feet of the location line of SB 47 and 48 m.c. A trail, much of the first part following the SB and SILVER BOSS claim line, departs from this road and proceeds up into the center of the property.

TOPOGRAPHY AND FLORA

The property is in an area known as the Quesnel Highlands. The elevation varies from about 5300 feet on the east end of the GUS claims to over 7000 feet on the cinder cones, most prominent feature of the claims. Local relief could be termed hilly with

LOCATION MAP

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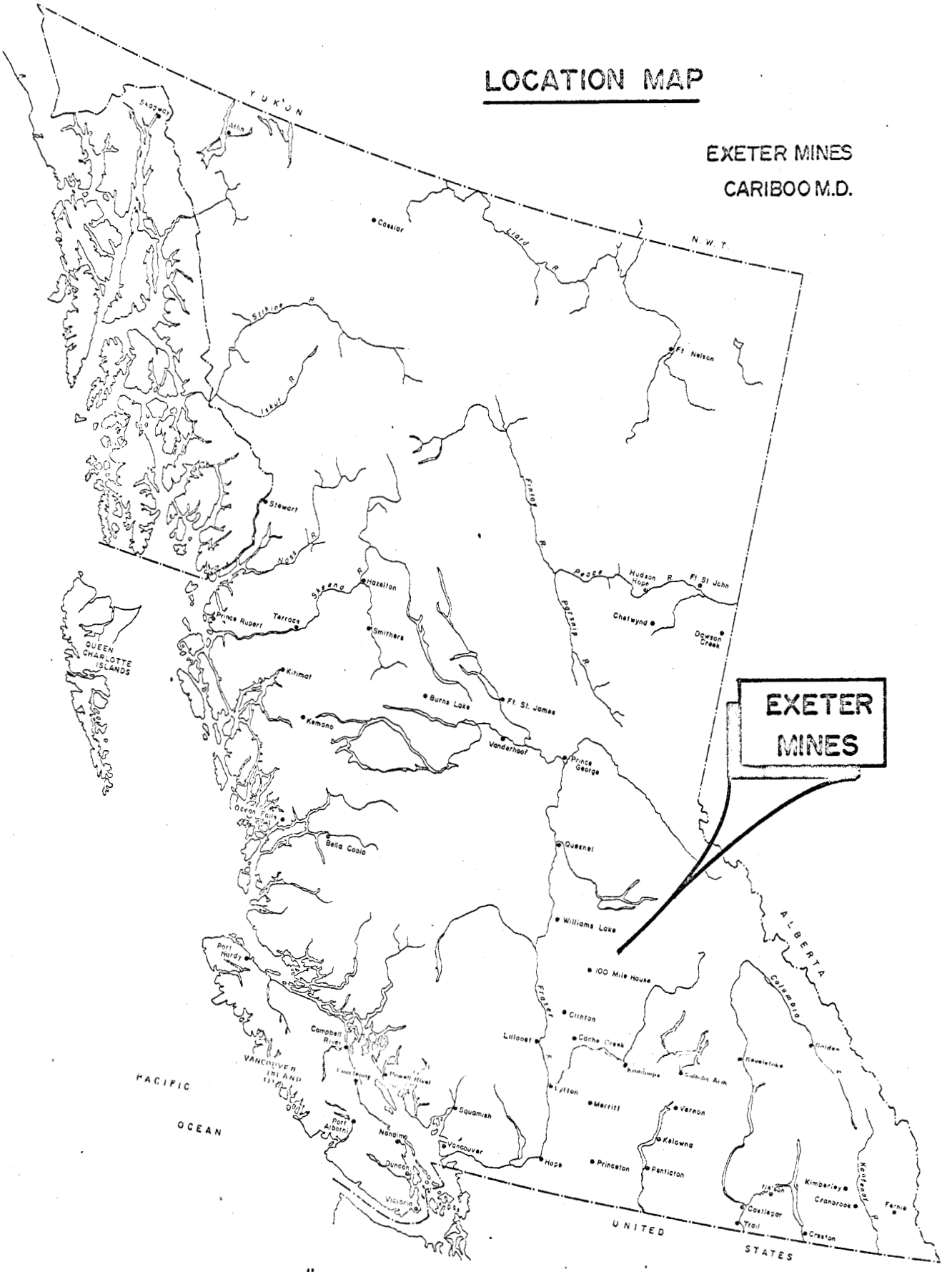
CARIBOO M.D.



SCALE 1" – 110miles

gentle slopes, but varies from plateau-like west of the cinder cones to very rugged on the SILVER BOSS 11-14 m.c. Three main creeks drain the claims area: one west of center of the claims and draining northerly, one on SILVER BOSS 13 and 14 m.c. and draining easterly, and one on the GUS claims draining north-easterly.

Much of the area is above timber line and is therefore composed largely of upland meadow with pine and spruce trees present rarely exceeding a height of 20 feet and being stocky at the base and narrow at the top. The lower elevations below 6500 feet are populated with taller growth of spruce, pine, and balsam which grow to a height of 40 feet or more.

WEATHER

During the early part of the survey, the weather was usually clear and warm with odd intervals of rain and fog. The latter half of the survey was much cloudier with rain and finally snow, which would come and go until near the end. About 5 days were lost due to weather.

SURVEY PROCEDURE

A base line was compassed in along the claim lines of SB 29, 30 and SILVER BOSS 1-8 m.c., in an average direction of N 55° E. This same direction was continued from SILVER BOSS 1, 2 initial post and SB 41, 42 final post to L-112E. The base line was, generally speaking, well blazed and marked with 'Handi-flags' every 100 feet. A 'Handi-flag' consists of a 3-foot length of wire with a 3½ x 4-inch piece of vinyl attached to the top.

The survey lines were chained and compassed in at 400-foot intervals perpendicular to the base line and in a direction of N35W - S35E. Red 'Handi-flags' were placed at 100-foot intervals. These lines were numbered 16E to 112E.

The grid on the GUS claims was surveyed in similarly except that the direction of the base line was N70E - S70W and the direction of the survey lines were N20W - S20E. The base line followed the claim line for claims GUS 1-6. The survey lines were numbered 0W to 32W.

As can be seen on the maps in the pocket, several of the lines are crooked. This is due to compass error that is thought to be caused by the large amount of magnetite in the rock. In addition, some lines were not surveyed in due to ruggedness or a low potential of positive results, as in the case of the VLF-EM.

GEOLOGY

This section is taken from Soregaroli (1968) and Allen (1970).

The property is found within the Takomkane Batholith, of Jurassic Age, near the northeastern edge. This batholith crops out sporadically over an area of 500 square miles and cuts Triassic volcanic and sedimentary rocks that probably can be correlated to the Nicola Group. This batholith is intruded, throughout and around the Exeter Mines property, by the following, going from oldest to youngest: andesite and andesite porphyry dykes, pegmatite dykes, rhyolite porphyry dykes, rhyolite dykes, quartz monzonite porphyry, and the alkali basalt of Takomkane Volcano and related dykes.

According to Allen, claims are underlain by intrusives that range from light grey, fine- to medium-grained hornblende-biotite monzonite and hornblende quartz monzonite on the SILVER BOSS 1-24 and SB 25-36 claims, to a medium-grained biotite diorite on the SB 37-48 claims, to a coarse-grained diorite on the GUS 1 (south portion), 3, 11 and 13 claims to a coarse-grained and porphyritic diorite on the GUS 1 (north portion), 2, 4 and 14 claims. He notes that disseminated chalcopyrite was sparsely evident in some of the porphyritic diorite outcrops. Parts or all of the SILVER BOSS 9 and 10 claims and the SB 25-32 claims are covered by a lava flow of vesicular basalt with olivine crystals and is of Pleistocene Age. It is of irregular shape and measures approximately 3600 feet by 2600 feet.

The property has several faults and shear zones, the most prominent being the Ten Mile Creek fault. It strikes approximately east-west, dipping steeply south, and runs 200 feet north of the SILVER BOSS 5, 6, 7, 8 claim post. It runs off the property in both directions, part of which runs with Ten Mile Creek. Several other smaller faults, concentrated north and west of the basaltic flow run in either a north-northeast or west-northwest direction. A number of faults seem to radiate from an area about 1000 feet north of the northwest corner of the basaltic flow (or where the Ten Mile Creek fault crosses the major creek in this area). Allen notes that this could indicate an unexposed breccia zone.

There are 2 main prospects on the Exeter Mines property. One is a 700-foot fault or shear zone that runs in a northeast direction off of the Ten Mile Creek fault and on the boundary between the SILVER BOSS 5 and 6 m.c. It is a 15- to 30-foot width of faulted, sheared brecciated and altered quartz monzonite containing sulphides in quartz. The minerals are, in order of

abundance, pyrite, chalcopyrite, arsenopyrite, pyrrhotite, galena, sphalerite, limonite, malachite and azurite. Exploratory work has been done previous to 1917 by an adit, shaft, trenches and pits.

On the boundary between the GUS 1 and 2 claims and 900 feet from the initial post is some disseminated chalcopyrite and pyrite. Being that no exploratory work has been done and that there is much overburden in the area, the grade extent of the mineralization is presently unknown. There are several other minor prospects of copper and molybdenum throughout the property.

Brynnor Mines (Noranda) is mining molybdenite on the southeast slopes of Takomkane Mountain. The following is quoted from the abstract of Soregaroli's thesis.

"The deposits occur in granodiorite and porphyritic biotite granodiorite phases of the composite Takomkane Batholith near an epizonal Cretaceous quartz monzonite porphyry body, the Boss Mountain Stock. Molybdenite occurs in economic concentrations in two classes of deposits: (1) Breccia Deposits, which include fracture zones, and (2) Vein Deposits, which include both single and multiple systems."

SOIL GEOCHEMICAL SURVEY

1) Field Procedure - The soil samples were taken on the lines on the east end of the SB claims and the east end of the GUS claims, as shown on Sheets 4 and 5 in the pocket, at 100-foot centers. The soil horizon sampled was the B which was generally a brown to reddish silt. In some spots on the SB claims, the B horizon was somewhat sandy. The samples were dug with a spade

at depths varying from 6" to 1½', depending on how deep the B was. All samples were placed in brown, wet-strength envelopes with line and station number marked thereon. The number collected was 231.

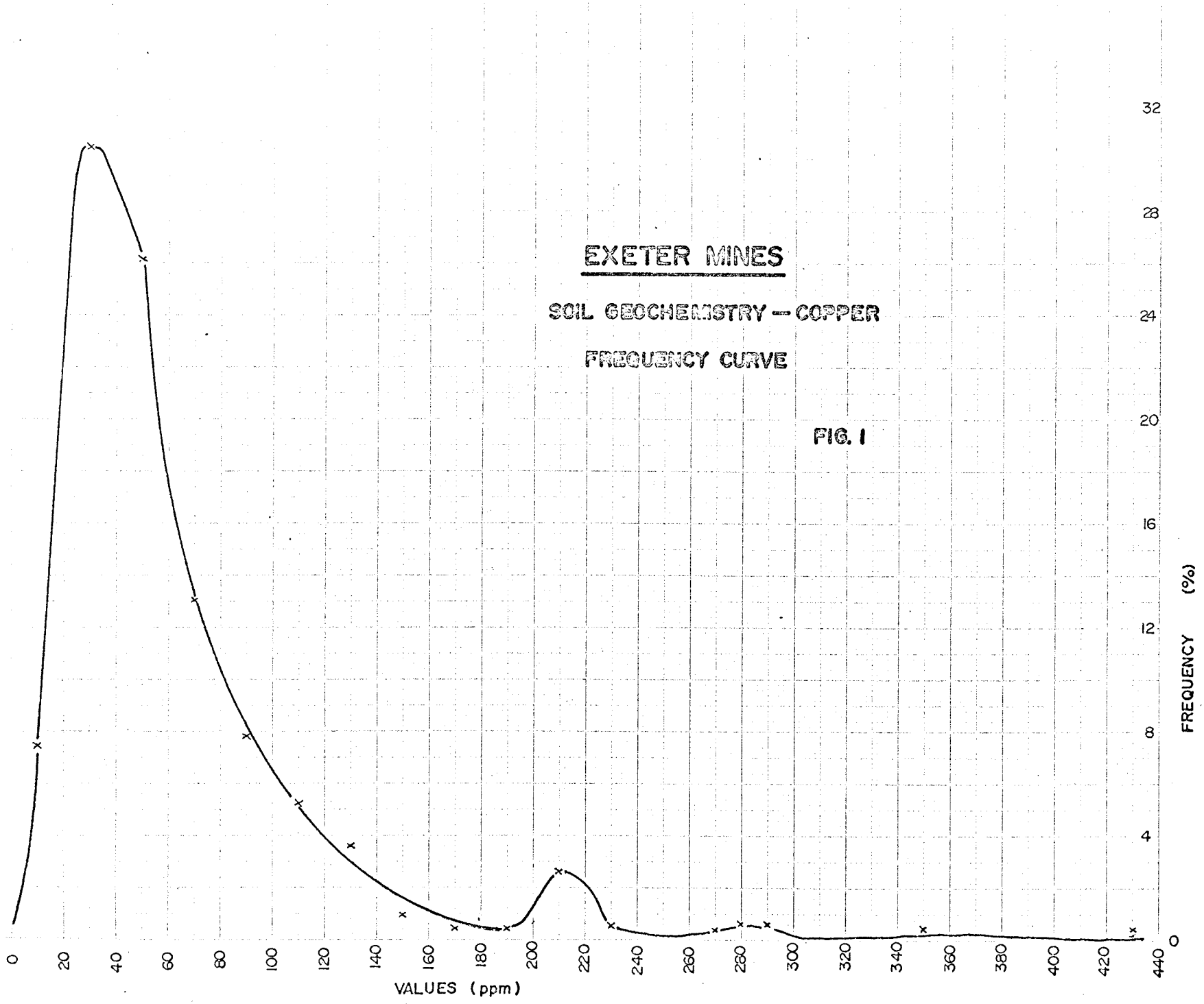
2) Testing Procedure - All samples were tested by Bondar-Clegg & Company Ltd. of North Vancouver. The sample was first thoroughly dried and then sifted through an 80-mesh screen. A measured amount of the sifted material is then put into a test tube with subsequent measured additions of aqua regia acid. The mixture is then heated for approximately 3 hours. The parts per million (ppm) copper (or silver) is then measured by atomic absorption. The results are enclosed at the end of the report.

3) Discussion of Results -

a) The copper and silver results, in ppm, were plotted as frequency curves and are shown on Figures 1 and 2, respectively. Anomalous or threshold value was 'eyeballed' at 120 to 200 ppm for copper and 1.6 ppm for silver. It was then thought that more precise statistical information could be gained by employing a more sophisticated method of data treatment (Lepeltier, 1969).

b) The results, separately for both copper and silver, were divided into classes with an equal logarithmic interval width and plotted against its cumulative frequency (Figure 3). If the results have a lognormal distribution, then the background, coefficient of deviation and threshold values can be easily estimated.

c) For silver, the background value, taken from the 50% level on Figure 3, is 0.9 ppm. The minimum sub-anomalous value


EXETER MINES
SOIL GEOCHEMISTRY — COPPER
FREQUENCY CURVE
FIG. 1
FREQUENCY (%)
0
4
8
12
16
20
24
28
32
VALUES (ppm)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440

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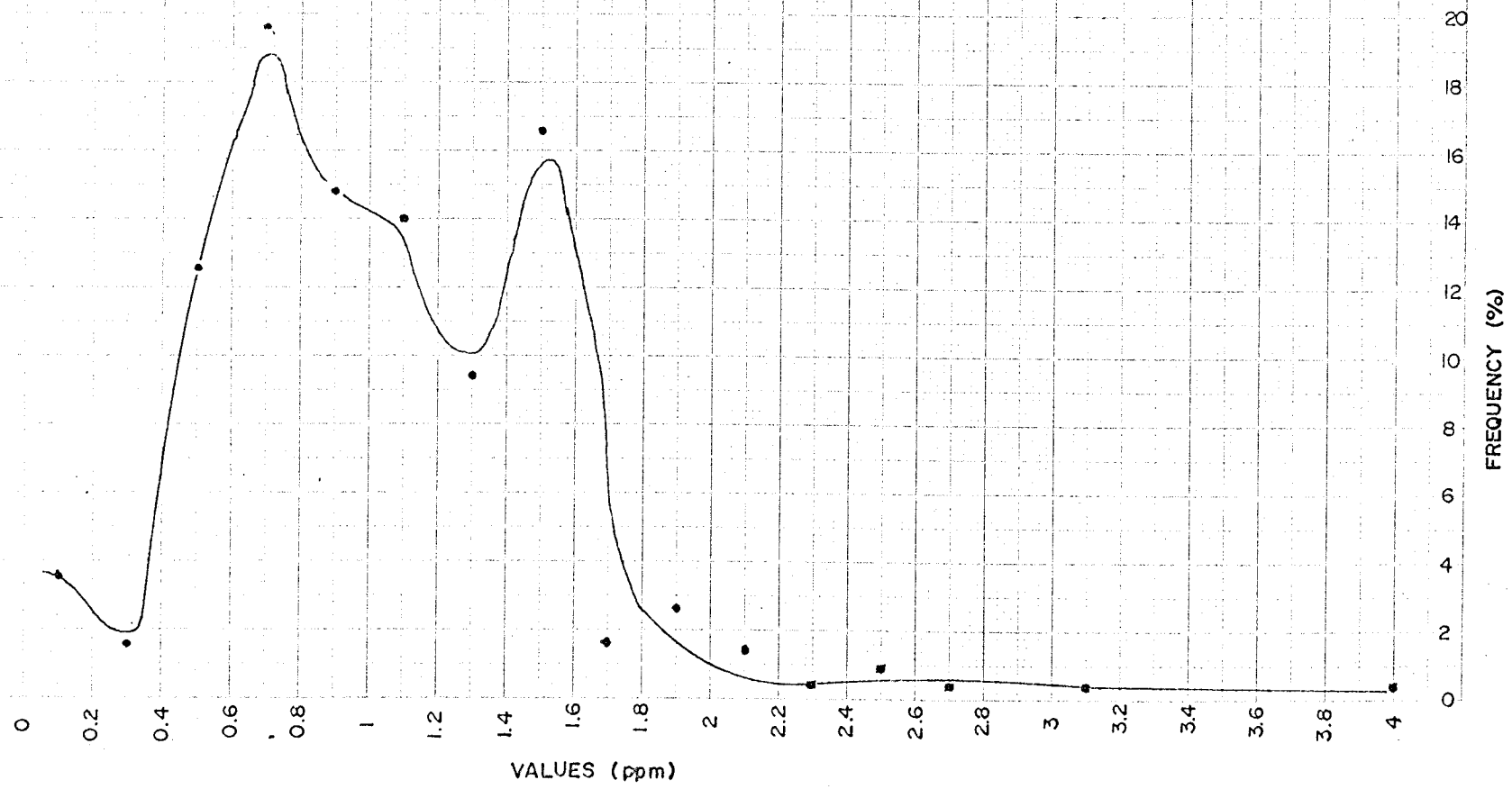
SOIL GEOCHEMISTRY – SILVER

FREQUENCY CURVE

FIG. 2



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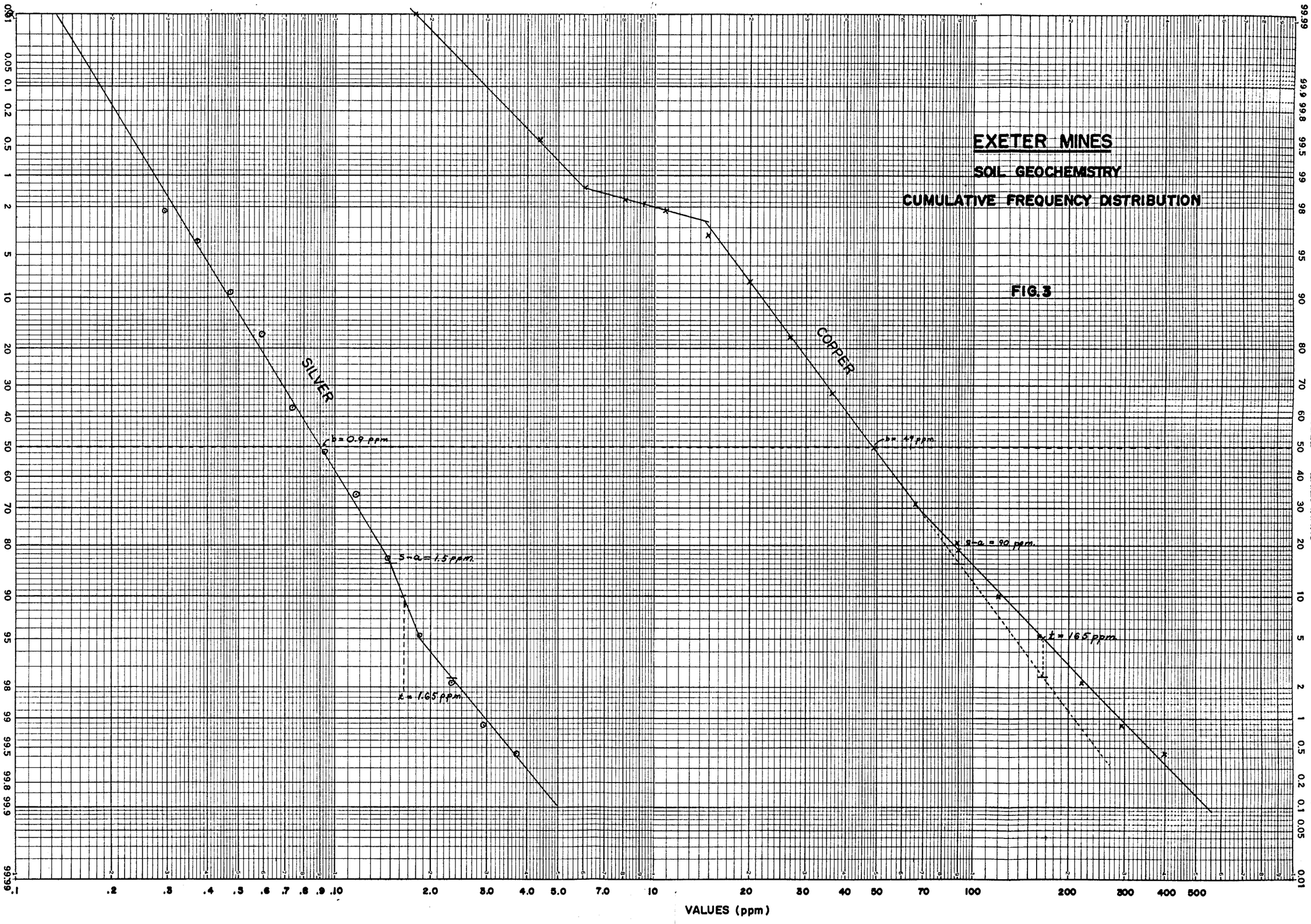
SOIL GEOCHEMISTRY

CUMULATIVE FREQUENCY DISTRIBUTION

FIG. 3



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SOIL GEOCHEMISTRY

CORRELATION DIAGRAM FOR Ag/Cu

FIG. 4

SILVER

COPPER (ppm)

1 1.5 2 2.5 3 4 5 6 7 8 9 10 | 1.5 2 2.5 3 4 5 6 7 8 9 1 | 1.5 2 2.5 3 4 5 6 7 8 9 10 | 1.5 2 2.5 3 4 5 6 7 8 9 10 | 1.5 2 2.5 3 4 5 6 7 8 9 10

1 10 15 20 25 30 40 50 60 70 80 90 100 150 200 250 300 400 500 600 700 800 - 1000

10 9 8 7 6 5 4 3 2.5 2 1.5 1 .9 .8 .7 .6 .5 .4 .3 .2 .1

(a term used by the writer to denote all those values that are not anomalous, but not background either and, therefore, could still possibly indicate mineralization) is taken from the 16% level and is 1.5 ppm. There are 2 breaks in the plotted line which indicates that there is more than one distribution. Among some of the possibilities, the 2 most likely are, 2 different rock types causing 2 different backgrounds or 2 different minerals of copper held by the soil. The threshold value, above which all values are considered anomalous, is, in this case, taken as the half-way point between the 2 breaks, giving a value of approximately 1.7 ppm. The coefficient of deviation is 0.22.

The copper plot shows 3 breaks. The double break around the 90% level indicates, quite definitely, that there are two different distributions. Again, the possibilities are the same as those mentioned above. The third break, at the 30% level, indicates that there is an above-average number of high values. Upon examining Sheet 5, this seems readily apparent by the number of high values on the GUS claims. The background level is taken as approximately 50 ppm. The sub-anomalous and threshold levels are taken from 16% and $2\frac{1}{2}$% levels on the dashed extension and are 90 ppm and 165 ppm, respectively. The coefficient of deviation is calculated as 0.26 and therefore the copper has a similar dispersion as the silver values.

A correlation diagram between the copper and silver values was also plotted (Fig. 4). The correlation cloud is roughly within an elliptical area. The coefficient of correlation was calculated from this to be +0.72 (The coefficient of correlation can vary between ± 1.0. If it is +1.0, then the values of the 2 minerals are directly proportional to each other and the plots would fall in a straight line with positive slope going through the first and third quadrants. If it is -1.0, the results are

inversely proportional to each other and the plots would fall in a straight line with negative slope going through the second and fourth quadrants. If it is zero [0], then there is no relationship and the plots would be evenly distributed through all 4 quadrants). Therefore, there is a fairly good positive relationship between the copper and silver values. That is, if a soil sample has a high copper value, it is quite likely to also have a high silver value, and vice versa.

On both the silver and copper maps, just the sub-anomalous and anomalous zones were contoured. The silver map was contoured at an interval of 0.2 ppm and starts at 1.3 ppm in order to make the minimum sub-anomalous value 1.5 ppm stand out. The copper map was contoured at an interval of 40 ppm and begins at the 80 ppm value. On both maps the threshold contour line of 1.7 and 160 ppm, respectively, was drawn with thick pen. All the anomalous areas worthy of discussion are labelled with letters.

The most interesting area is certainly zone A, on the GUS 1 and 2 claims. It is anomalous in both copper and silver with several copper values over 200 ppm and silver values up to 3 ppm. It strikes N60W, is 200-400 feet wide and has a length of at least 1200 feet being open at both ends. Somewhat interesting is that it is on the south flank of a VLF-EM anomaly striking in approximately the same direction. The EM anomaly could be reflecting a fault or shear zone that the copper-silver mineralization is associated with.

Zone B is located on the south part of the SB 46 and 48 claims. It contains the highest value in silver, 3.9 ppm and the highest copper value is sub-anomalous at 116 ppm. It also corresponds to a very high, but small VLF-EM anomaly and thus indicates a sulphide zone containing silver. The zone seems to strike

slightly south of west, is about 100 feet wide and at least 600 feet long, again being open at both ends.

Zone C is within a zone of negative EM readings and thus has no EM correlation. The copper values are good with a few going above 200 ppm but only one silver value is anomalous at 1.9 ppm. Because of the limited information, it is difficult to ascertain strike, length and width, but it appears to be made up of 2 smaller zones separated by 200 feet of background copper.

D is a narrow zone containing 2 very high copper values and one fairly good silver value. Strike is approximately S70W; width, probably about 50 feet or less and length, at least 400 feet and open at both ends. Zone D is on the north flank of an EM anomaly that closes out about 100 feet west of L-4W and is open at the east end. It is possible that this could also be a fault or shear zone.

Zone E is found on the SB 43 m.c. and is anomalous only in silver. The zone is narrow consisting of only 2 anomalous values, is 400 feet long (open at both ends), and strikes just south of west. It also is on the north flank of an EM anomaly striking in the same direction.

The rest of the anomalous values are scattered, except for 2 of silver that are fairly close together on the SB 39 m.c.

It should be noted here that in soils, copper travels short distances from its source and silver travels virtually not at all. Therefore, where anomalous silver values are found within anomalous copper zones, the silver values could be used to pin-point more exactly the location of their mutual source.

ELECTROMAGNETIC SURVEY

1) Survey Procedure - With the "shootback" dual frequency unit, the higher frequency, 3600 Hz, was used at all 100-foot interval stations and a 200-foot coil separation was employed. Where anomalies were suspected, readings were taken at 50-foot intervals on both frequencies, 3600 Hz and 1800 Hz. Dual frequency readings give additional information on the conductivity, and thus the nature of the source of the anomaly.

On the VLF-EM survey, station separation was kept at 100-foot intervals. The transmitter station used was the one located at Seattle which operates on 18.6 KHz. The direction facing on all readings was towards the station. An east dip angle reading means the conductor is to the east and a west reading, to the west.

2) Instrumentation - The dual-frequency unit used was a Crone JEM manufactured by Crone Geophysics Ltd. In general, an EM instrument is designed to pick up conductive zones through electromagnetic induction. The EM transmitter sets up an alternating magnetic field, called the primary, by passing an alternating current through the transmitter coil. If a conductive mass is nearby, the primary magnetic field induces electric currents in the mass which produces a secondary magnetic field. This secondary field distorts the primary field, and it is a measure of this distortion that constitutes the results of the electromagnetic survey. In the Crone JEM, the angle of the distorted field, called the dip angle, is measured by the receiver. Both coils transmit and receive, and thus the two dip angles are added together (one is almost always negative and the other almost always positive). If the result is zero (0), no conductor is present, whereas in VLF-EM instruments, 0^{o} usually

indicates a conductor. Therefore, in this instrument, the higher the resultant reading, the better the conductor, with $\pm 4^{\circ}$ usually being considered anomalous.

The VLF-EM instrument used was a G-28 manufactured by Geotronics Instruments Ltd. of Vancouver, B.C. It is a visual null type instrument designed to measure the very low frequency electromagnetic field produced by U.S. Naval transmitter stations spotted throughout the North American continent (in this case, Seattle). Like the JEM, it does this by measuring the angle of the distorted field.

INTERPRETATION

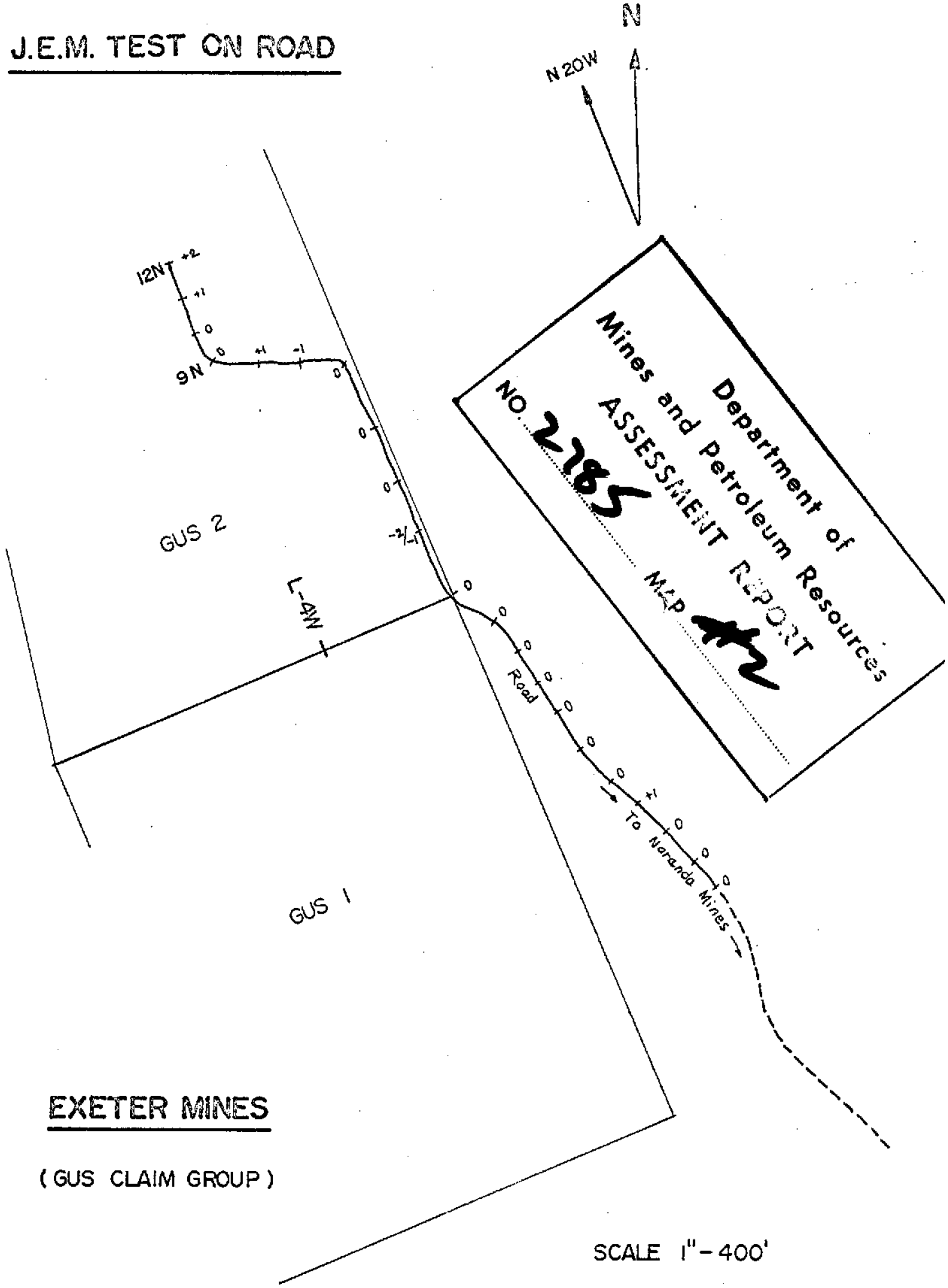
The JEM survey, as noted before, produced virtually no anomalies worthy of attention. The anomalous zones(?) that did result contained only 1 or 2 low-order anomalous readings and thus were almost non-interpretable. Also, it failed to pick up the main copper showing found along a fault zone on the SILVER BOSS 5 and 6 m.c. This is no doubt due to the sulphide globules being surrounded by the non-conductive quartz. Results are shown on Sheet 1 in pocket.

The JEM was also tried out along the road on the GUS 1 and 2 claims with no positive results (on accompanying map).

The VLF-EM results are shown on Sheet 2 in pocket. Conductive zones, inferred from cross-overs, are drawn with a heavy dark line.

The Fraser filter was applied, and results are shown on Sheet 3. On the SILVER BOSS and SB claims, contour interval is 10°, but

J.E.M. TEST ON ROAD



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2785 MAP #2

EXETER MINES

(GUS CLAIM GROUP)

SCALE 1" - 400'

on the GUS claims, it is 5°. The reason for this disparity is that the survey lines are only 30° off from the direction to the station (ideal is 90°) on the GUS group as opposed to 50° on the SB-SILVER BOSS claims. This, therefore, produces low-order anomalies and a smaller contour interval is thus used in order to make them stand out better.

The Fraser filter is applied since it cuts out much of the noise due to the high VLF-EM frequency. It turns non-contourable data into a contourable form. Also, a conductive zone that does not show up as a cross-over on the unfiltered data quite often will show up after the filter has been applied. An example is the main showing on the SILVER BOSS 5 and 6 m.c. On the other hand, low-order cross-overs are phased out. One advantage of the unfiltered data is that conductors that are almost wholly between lines will show up, but will not on the filtered data.

The depth penetration of the VLF-EM is excellent, supposedly going as deep as 1000 feet, but is severely limited by conductive overburden. However, the clear, sharp readings of the JEM showed that the conductivity of the overburden is nil, thus ensuring good depth penetration for the VLF-EM.

The main showing, marked A on Sheet 3, showed up quite well. The strike of the EM anomaly follows the ore zone at N40E. The known length of the fault is about 900 feet but the EM anomaly extends its length about 400 feet S30W past the Ten Mile Fault and about 500 feet N40E of the adit. Both these extensions quite likely contain sulphide mineralization considering the existing mineralization there already.

Anomalous zone B is centered around an area from which a number of faults radiate. A. Allen mentioned this and discussed the

possibility of an unexposed breccia zone occurring in this area. The size, type, and shape of the anomaly increase this possibility. It appears to be striking SW, is 1000 feet wide by 2600 feet long and is open at the SW end. It is a positive anomaly within which is a negative low. These facts are indicative of a large body of greater conductivity than the surrounding rock. The possibility is thus increased that there is a breccia zone.

Zone C is very similar to zone B and could be its extension. It is located immediately to the northeast, strikes in the same direction and is 2600 feet by 800 feet. It also is a positive anomaly containing a negative area and thus the same possibilities exist for it as for zone B. It should also be considered that these 2 anomalies are only reflecting 2 parallel faults striking southwesterly and containing a conductive medium.

The anomalies marked D-G are worthy of attention because of corresponding geochemistry anomalies. The geochemistry anomalies are usually found on the north or south flank of the EM anomalies which therefore could be reflecting either sulphide mineralization itself or faults or shear zones that have resulted in the mineralization. Anomaly E holds the most interest because of the size of the geochem anomaly correlating with it.

Anomalous zones H, I and J very likely reflect fault or shear zones because of their being long and narrow. Anomaly H strikes southwesterly, is at least 4400 feet long and is open at the northeast end. Anomaly I strikes northerly, is at least 2000 feet long and open at the north end. Anomaly J has a length of 4400 feet and strikes southwesterly. These probable faults could contain mineralization. Also of special interest is that an aeromagnetic anomalous low is centered approximately around zone J on L-84E (the aeromagnetic map is relatively of coarse scale

and therefore exact position of its anomalous low could vary from south part of zone G to south part of zone I). Since an aeromagnetic low is centered over the breccia zone of Brynnor Mines, this area must be seriously considered. If a covered breccia zone does exist, anomalies G and J or I and J likely reflect the contact between the breccia and the surrounding rock.

Anomaly K could also be a fault, but has 2 flanks. One has a length of 2000 feet and strikes S50W and the other has a length of 1500 feet and strikes S40W. Both these flanks contain very high readings, one as high as 72°, and the other 80°. This indicates relatively good conductivity that could be the result of sulphide mineralization.

Anomalous zones L to R are of similar magnitude as the anomaly over the known zone of mineralizatinn and therefore must not be overlooked.

Anomaly S, just below A, follows the ridge top from the N cinder cone and therefore could be due to topography. However, Soregaroli noted that there is copper mineralization, as shown on the map, on the N flank.

On the GUS 1 and 3 claims, there are 4 elliptical shaped anomalies striking east-west. It is difficult to say what is their source. The northern one contains a negative zone and therefore indicates a large conductive body (300 feet x 800 feet).

There are a number of other areas that contain anomalous readings but are rather sporadic and do not merit further discussion. Some anomalous zones such as the one on GUS 6 m.c. and the one on SB 10 m.c. lack sufficient information to interpret properly.

As shown above, there are many anomalous zones that could be of exploration interest. The writer has attempted to break them down into classes of varied sources. Nevertheless, the possibility that must be considered is that most or all of the EM anomalies are caused solely by structure (faults, shear zones or contacts) and not mineralization. But the mineralization could be associated with the structure. For instance, the EM anomaly over the main copper showing on SILVER BOSS 5 and 6 could be reflecting the fault, and not the sulphides.

It should also be noted that a VLF-EM instrument will not pick up conductors that are perpendicular to the direction of the station. This was no doubt the reason why the Ten Mile Fault was not picked up.

One immediately notices upon examining the contour map that all the anomalies are elongated in a direction perpendicular to the survey lines. This is due to the unequal station interval of 100 feet by 400 feet (or more) which therefore biases the contours in the direction of greatest station interval.

CONCLUSIONS AND RECOMMENDATIONS

It is in the writer's opinion that the results of both the geochemistry and the EM surveys warrant much further exploration. The geochemistry survey, though limited, has certainly shown the existence of sulphides, especially on the GUS group, by the relatively high results. The VLF-EM survey produced many anomalies many of which are likely due to fault, shear, or contact zones. Because of a fault being associated with the existing mineralization, many of these could quite possibly be associated with mineralization also. Further exploration is therefore recommended as follows:

1) If possible, the ground around the GUS claims should be staked, especially on the north and east sides. This is to cover the possibility of any potential mineralization continuing off of the presently staked ground.

2) More access roads should be constructed in order to cut down transportation costs such as helicopters.

3) A thorough geochemistry program should be undertaken as follows:

a) The GUS claims should be soil sampled on a 100- by 400-foot grid. Anomalous zones should be filled in with 50- by 200-foot spacing.

b) The SILVER BOSS and SB claims should be soil sampled on the same grid zine wherever there is a B layer. This will no doubt limit the sampling to the north and east ends.

The soil samples should be tested for copper and molybdenum. Silver appears to be associated with the copper values (see correlation diagram, Fig. 4) and, therefore, need not be tested. However, it is important to test for molybdenum being that a molybdenum mine is very close to the property.

4) Areas containing the more promising anomalies, such as the geochemistry ones, EM anomalies B to G, and any new areas the geochemistry program turns up should be thoroughly prospected.

5) It may prove worthwhile to do some 'cat' trenching in promising areas where overburden is suspected to be not too deep. Some of the present anomalies could be 'cat' trenched while road building is under way.

6) Diamond drilling most certainly must be undertaken. It would be preferable to drill after much of the above program is completed. However, present targets for diamond drilling do exist and are as follows:

a) The mineralized zone on SILVER BOSS 5 and 6 claims. It should be drilled along the entire length of the EM anomaly.

b) EM anomalies B and C. It is felt this is the only method of further exploration, mainly because of limited overburden, except for, perhaps, induced polarization (IP). However, IP is rather chancey and questionable.

c) A few of the more interesting geochem anomalies, especially A. It is preferable, however, to do further soil sampling previous to any diamond drilling.

Respectfully submitted,

GEOTRONICS SURVEYS LTD.

DAVID G. MARK, B.Sc.
Geophysicist

DGM:ly
December 14, 1970

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. TOUGH

REFERENCES

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Geotronics Surveys

517 - 602 West Hastings Street, Vancouver, British Columbia, Canada ✱ Telephone 688-4342

RESUME OF TECHNICAL AND FIELD EXPERIENCE OF R. S. SIMPSON

1. Presently Field Manager for Trans-Arctic Explorations Ltd.

2. Two and one-half years of applied field experience in various aspects of geophysical surveying, staking, prospecting, blasting, sampling and geochemistry.

3. Instrument operator on ground magnetic surveys, Ronka EM-16, Sabre Magnetometer, Geotronics G-100 Magnetometer, Sharpe MF-1 Magnetometer, Sharpe Ground Scintillometer, Crone J.E.M. Shootback E.M., Sharpe Horizontal Loop E.M.

4. Above mentioned experience applied in the western United States and Canada but most extensively in the eastern and western Arctic regions of North America.

517 - 682 West Hastings Street, Vancouver, British Columbia, Canada ✆ Telephone 688-4342

RESUME OF TECHNICAL AND FIELD EXPERIENCE
of
DAVID MARK, B.Sc.

EDUCATION

Graduate of University of British Columbia in Science (B.Sc.) in Geophysics.

EXPERIENCE IN INDUSTRY

1. Prospecting and geological evaluation for New Taku Mines Ltd. during exploration season of 1965.
2. Field supervisor for geophysical and geochemical work and prospecting for Mastadon - Highland Bell Mines Ltd. during exploration season of 1966.
3. Field supervisor in geochemical work and geological mapping for Anaconda (Canada) Company during exploration season of 1967.
4. Field geophysicist for Geo-X Surveys Ltd. during exploration season of 1968.
5. Presently geophysicist for Geotronics Surveys Ltd., Vancouver, B. C.
6. Experience in various geophysical instrument surveys: magnetometer, electromagnetic, self potential, gravity, induced polarization, restivity and seismic methods.
7. Member of British Columbia Geophysical Society and Vancouver Branch of The Canadian Institute of Mining and Metallurgy.
8. P. Eng. applied for with Association of Professional Engineers of B. C.

COST BREAKDOWN

Job No. 70-47
EM & Geochem Survey
Exeter Mines Ltd. (NPL)

Wages:

R. Simpson,	62 days @ $50.00/day	$3,100.00
R. Gunn,	50 days @ $30.00/day	1,500.00
C. Gunn,	5 days @ $60.00/day	300.00
D. Mark,	10 days @ $80.00/day	800.00
EM instrument rental, 2 months @ $220.00/month		440.00
Soil analysis, 231 samples @ $1.75/sample		404.25
Survey supplies & materials		320.00
Camp maintenance, 30 days @ $25.00/day		750.00
Mapping		300.00
Geophysical report		800.00
		$8,714.25
Engineering fees (T. R. Tough)		500.00
TOTAL COST		$9,214.25

As a representative of GEOTRONICS SURVEYS LTD., Suite 514, 602 W. Hastings St., Vancouver 2, B.C., I hereby declare that I have done, or caused to be done, work on GUS 1-14, SILVER BOSS 1-24, SB 25-36, SB 37-48 mineral claims, to the value of Nine Thousand Two Hundred Fourteen & 25/100 Dollars ($9,214.25).

GEOTRONICS SURVEYS LTD.

Per:

DAVID G. MARK, B.Sc.
Geophysicist

Declared before me at the City
of Vancouver, in the
Province of British Columbia, this 17
day of Dec. 1970, A.D.

Dan [illegible]

Juli Turner

A Commissioner for taking Affidavits within British Columbia
A Notary Public in and for the Province of British Columbia

Sub-mining Recorder

251 samples

geologists • geochemists • analysts

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVENUE, NORTH VANCOUVER, B.C.
PHONE 988-5315

DATE REC'D November 4, 1970

GEOCHEMICAL LAB REPORT

No. 20-816

Extraction Hot Aqua Regia — From Exeter Mines

Method Atomic Absorption — Date Completed November 12, 1970

Fraction Used -80 Mesh — Analyst K.B.

SAMPLE NO.	Cu ppm	Ag ppm		SAMPLE NO.	Cu ppm	Ag ppm	REMARKS
0W-0S	46	.6		4W-1S	215	1.9	
0W-1S	90	1.0		4W-2S	102	1.4	
0W-2S	205	2.0		4W-3S	120	1.3	
0W-3S	205	1.4		4W-4S	86	.7	
0W-4S	210	1.3		4W-5S	98	1.0	
0W-5S	20	1.0		4W-6S	24	.4	
0W-6S	24	.6		4W-7S	46	.8	
0W-7S	32	1.0		4W-8S	39	.7	
0W-8S	42	.7		4W-9S	42	.4	
0W-9S	88	.6		4W-10S	59	.8	
0W-10S	24	.7		4W-11S	104	1.3	
0W-11S	51	.9		4W-12S	106	1.3	
0W-12S	24	.8		4W-13S	32	.5	
0W-13S	8	ND		4W-14S	34	.3	
0W-14S	355	2.7		4W-15S	420	1.2	Cu_H
0W-15S	31	.7		4W-16S	138	1.1	
0W-16S	72	.7		4W-17S	32	.9	
0W-17S	20	.1		4W-18S	14	.1	
0W-18S	118	1.4		4W-19S	52	.8	
0W-19S	56	.8		4W-20S	30	.1	
0W-20S	85	1.0		4W-21S	130	1.2	
0W-21S	66	.8		4W-22S	74	1.0	
0W-22S	275	1.9		4W-23S	45	.9	
0W-23S	230	1.5		4W-1N	123	1.0	
0W-24S	59	.7		4W-2N	112	1.1	
0W-25S	49	.8		4W-3N	210	2.0	
0W-26S	210	1.1		4W-4N	162	1.7	
0W-27S	108	1.2		4W-5N	90	1.4	
0W-28S	N.S.	N.S.		4W-6N	126	1.3	
0W-29S	9	.4		4W-7N	100	1.5	
0W-30S	20	.4		4W-8N	90	1.4	

5887 60.2

GEOCHEMICAL LAB REPORT

SAMPLE NO.	Cu ppm	Ag ppm		SAMPLE NO.	Cu ppm	Ag ppm	REMARKS
4W-9N	64	1.0		100E-15S	57	1.3	
4W-10N	51	.8	✓	100E-16S	30	.5	✓
4W-11N	74	1.2		100E-17S	35	.5	
4W-12N	102	1.5	✓	100E-18S	24	.7	✓
4W-13N	75	1.0		100E-19S	41	.8	
4W-14N	91	.9	✓	100E-20S	44	1.5	✓
4W-15N	78	1.2		100E-21S	32	.7	
8W-1N	14	.6	✓	100E-22S	24	.6	✓
8W-2N	18	.6		100E-23S	30	.6	
8W-3N	124	1.1	✓	100E-24S	29	.5	✓
8W-4N	290	3.0		100E-25S	42	1.0	
8W-5N	116	1.5	✓	100E-26S	64	1.4	✓
8W-6N	102	1.5		100E-27S	116	3.9	
8W-7N	140	1.7	✓	100E-28S	27	.8	✓
8W-8N	80	1.1		100E-29S	56	1.6	
8W-9N	118	1.5	✓	100E-30S	70	1.0	✓
8W-10N	66	1.2		100-1N	20	.5	
8W-11N	24	.6	✓	100-2N	36	.6	✓
8W-12N	99	1.3		100-3N	31	.5	
8W-13N	96	1.0	✓	100-4N	55	.5	✓
8W-14N	98	1.5		100-5N	93	1.4	
8W-15N	180	1.2	✓	100-6N	63	1.4	✓
100E-1S	36	.9		100-7N	75	2.0	
100E-2S	18	.5	✓	100-8N	56	1.7	✓
100E-3S	30	.7		100-9N	30	.8	
100E-4S	18	.4	✓	100-10N	35	.7	✓
100E-5S	18	.4		100-11N	34	1.5	
100E-6S	34	.5	✓	100-12N	54	1.0	✓
100E-7S	41	.8		100-13N	44	.7	
100E-8S	28	.5	✓	100-14N	39	.6	✓
100E-9S	74	1.5		100-15N	39	1.4	
100E-10S	46	.7	✓	100-16N	78	1.4	✓
100E-11S	66	1.4		100-17N	47	.7	
100E-12S	49	1.2	✓	100-18N	24	.7	✓
100E-13S	66	.9		100-19N	52	.8	
100E-14S	46	1.4	✓	100-20N	58	1.2	✓

10 241 1356.5

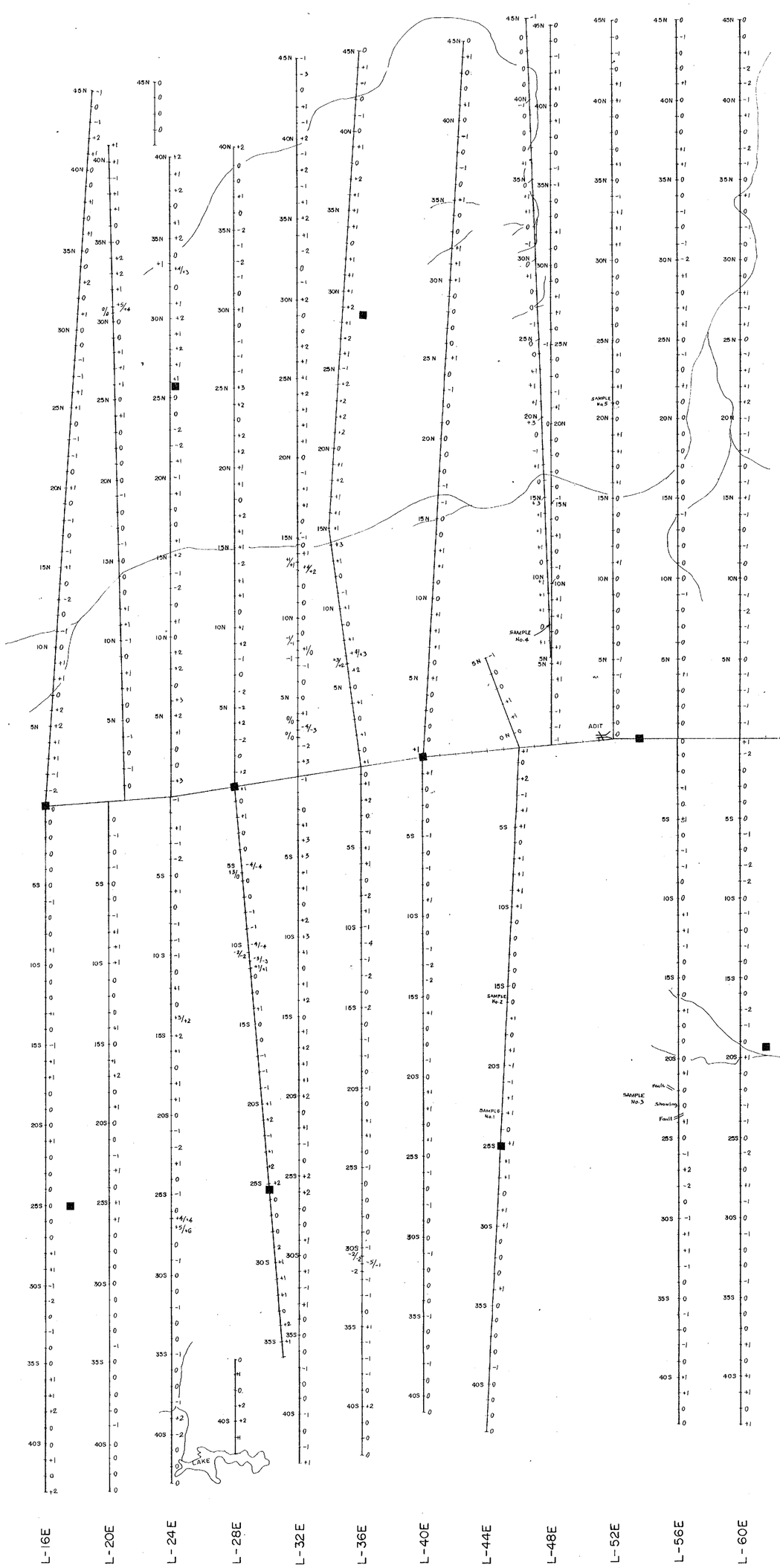
GEOCHEMICAL LAB REPORT

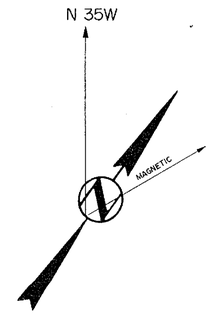
SAMPLE NO.	Cu ppm	Ag ppm		SAMPLE NO.	Cu ppm	Ag ppm	REMARKS
100-21N	39	1.0		104E-16S	26	.7	
100-22N	45	.7	✓	104E-17S	29	1.2	✓
100-23N	12	.3		104E-18S	40	.5	
100-24N	23	.1	✓	104E-19S	59	.8	✓
100-25N	49	1.0		104E-20S	40	.6	
100-26N	89	1.5	✓	104E-21S	20	.6	✓
100-27N	47	.8		104E-22S	29	.4	
100-28N	68	.6	✓	104E-23S	24	.3	✓
100-29N	24	.4		104E-24S	27	.6	
100-30N	16	ND		104E-25S	55	.7	✓
100-31N	30	.5		104E-26S	34	.8	
100-32N	22	.4	✓	104E-27S	38	1.0	✓
100-33N	26	.6		104E-28S	36	1.4	
100-34N	18	.6	✓	104E-29S	74	2.5	✓
100-35N	90	1.4		104E-30S	74	1.5	
100-36N	69	1.8	✓	104E-1N	61	.6	✓
100-37N	72	1.3		104E-2N	18	.1	
100-38N	30	.5	✓	104E-3N	63	1.5	✓
100-39N	52	2.5		104E-4N	32	.6	
100-40N	19	.8	✓	104E-5N	28	1.5	✓
104E-0S	59	.8		104E-6N	39	1.4	
104E-1S	56	.4	✓	104E-7N	56	1.8	✓
104E-2S	23	.6		104E-8N	48	1.5	
104E-3S	6	.3	✓	104E-9N	35	1.1	✓
104E-4S	61	1.5		104E-10N	47	1.5	
104E-5S	50	.9	✓	104E-11N	78	1.5	✓
104E-6S	49	1.0		104E-12N	45	1.0	
104E-7S	130	1.4	✓	104E-13N	54	1.5	✓
104E-8S	46	.8		104E-14N	92	2.3	
104E-9S	63	.7	✓	104E-15N	39	1.1	✓
104E-10S	45	.7		104E-16N	126	1.0	
104E-11S	68	1.4	✓	104E-17N	24	1.1	✓
104E-12S	56	1.5		104E-18N	38	.7	
104E-13S	49	1.1	✓	104E-19N	20	.5	✓
104E-14S	44	1.9		104E-20N	45	1.2	
104E-15S	19	.5	✓	104E-21N	37	1.0	✓

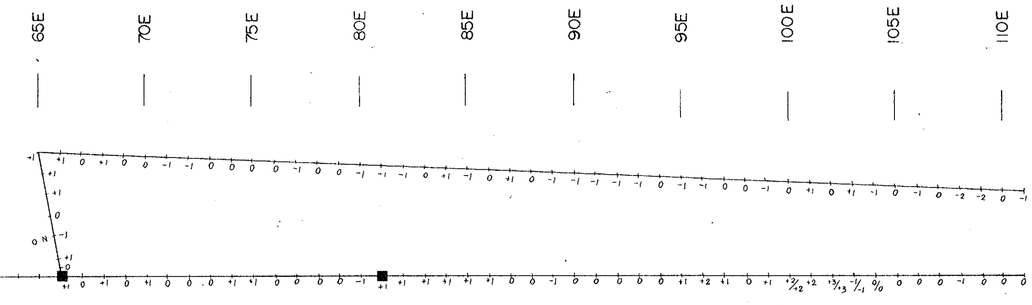
Report No. 20-816 BONDAR-CLEGG & COMPANY LTD. Page No. 4

GEOCHEMICAL LAB REPORT

SAMPLE NO.	Cu ppm	Ag ppm		SAMPLE NO.	Cu ppm	Ag ppm	REMARKS
104E-22N	36	.9					
104E-23N	32	.8	✓				
104E-24N	40	.5					
104E-25N	78	1.0	✓				
104E-26N	47	1.0					
104E-27N	53	.9	✓				
104E-28N	39	.6					
104E-29N	40	1.8	✓				
104E-30N	38	.6					
104E-31N	56	.8	✓				
104E-32N	45	.9					
104E-33N	30	.6	✓				
104E-34N	51	1.0					
104E-35N	36	1.3	✓				
104E-36N	52	.7					
104E-37N	19	.4	✓				
104E-38N	36	.9					
104E-39N	80	1.2	✓				
104E-40N	94	.9					
4W-24S	56	.5	✓				
4W-25S	66	.7					
4W-26S	150	1.4	✓				
4W-27S	67	1.2					
4W-28S	2	ND	×	Cu L			
4W-29S	5	.4					
4W-30S	39	.8	✓				
			28-8				
	14822			Av Ag =		1.0	
				Av Cu =		64	







LEGEND

- LOCATED CLAIM POST
- SURVEY LINE
- CREEK

NOTE

UNITS OF READINGS ARE DEGREES

$^{+4}/_{+4}$; $^{-5}/_{-1}$ — Hi/Lo (3600Hz / 1800Hz)

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2785 MAP #3

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA Thomas G. Mark

TO ACCOMPANY GEOPHYSICAL REPORT BY D.G.MARK, B.Sc.

EXETER MINES

SB & SILVER BOSS CLAIMS

HENDRIX LAKE AREA, CARIBOO M.D.

J.E.M. SURVEY

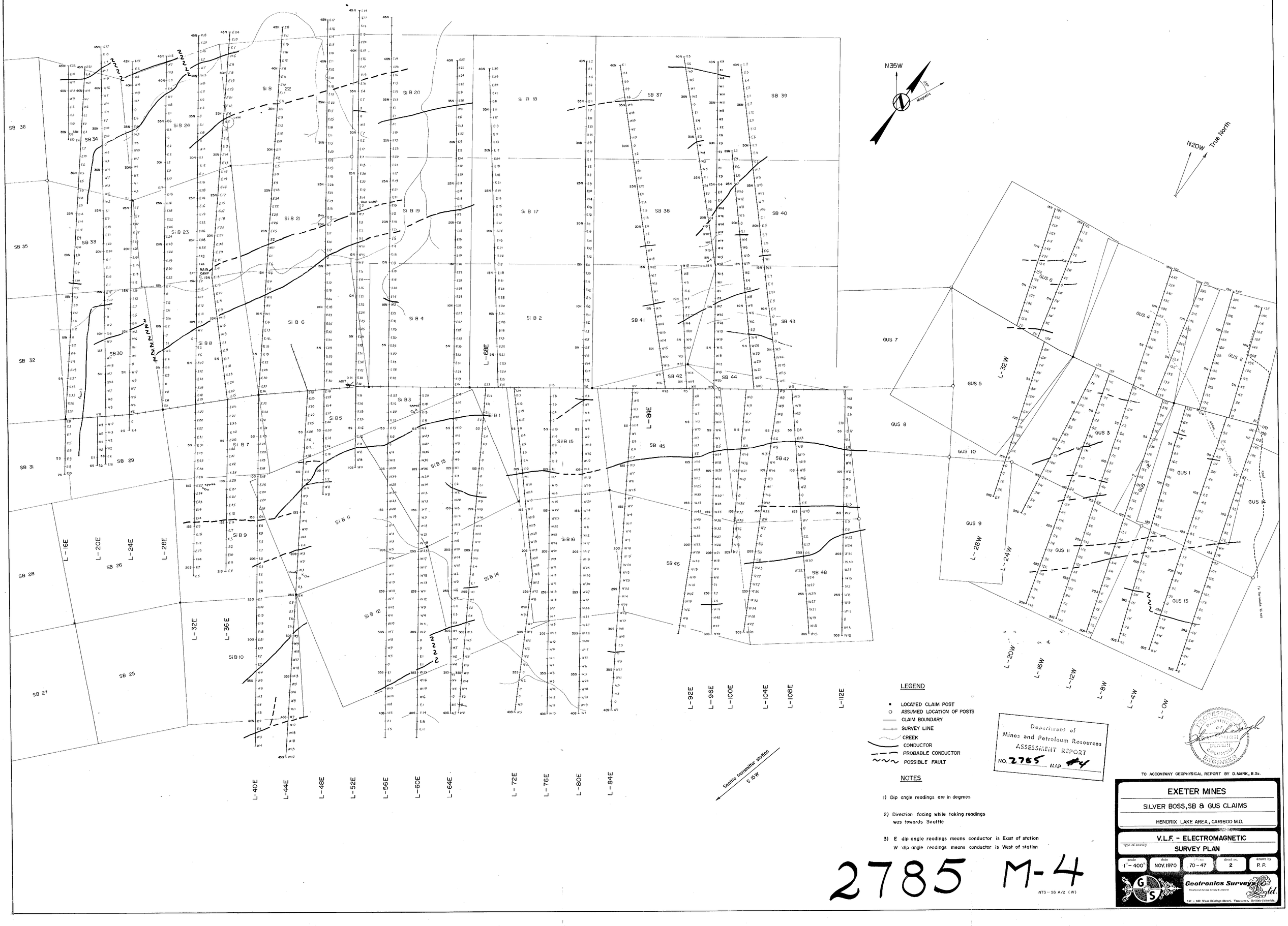
Type of survey: SURVEY PLAN

scale	date	job no.	sheet no.	drawn by
1"=400'	NOV. 1970	70-47	1	P.P.

Geotronics Surveys Ltd.
Geophysical Surveys, Ground & Airborne
517 - 602 West Hastings Street, Vancouver, British Columbia.

2785 M-3

NTS — 93 A/2 (W)



LEGEND

- LOCATED CLAIM POST
- ASSUMED LOCATION OF POSTS
- CLAIM BOUNDARY
- SURVEY LINE
- CREEK
- CONDUCTOR
- PROBABLE CONDUCTOR
- POSSIBLE FAULT

NOTES

1) Dip angle readings are in degrees

2) Direction facing while taking readings was towards Seattle

3) E dip angle readings means conductor is East of station
W dip angle readings means conductor is West of station

TO ACCOMPANY GEOPHYSICAL REPORT BY D.MARK, B.Sc.

EXETER MINES

SILVER BOSS, SB & GUS CLAIMS

HENDRIX LAKE AREA, CARIBOO M.D.

V.L.F. - ELECTROMAGNETIC

type of survey

SURVEY PLAN

scale	date	job no.	sheet no.	drawn by
1" = 400'	NOV. 1970	70 - 47	2	P. P.

Geotronics Surveys Ltd.
Geophysical Surveys, Ground & Airborne
517 - 602 West Hastings Street, Vancouver, British Columbia.

2785 M-4

NTS - 93 A/2 (W)

SILVER BOSS 1 - 24

SB GROUP (37 - 48)

SB GROUP

GUS CLAIM GROUP 1-14

N 35W

N 20W N

Q R O N M L I J G K H A B C P S D E F

L-16E L-20E L-24E L-28E L-32E L-36E L-40E L-44E L-48E L-52E L-56E L-60E L-64E L-72E L-76E L-80E L-84E L-92E L-96E L-100E L-104E L-108E L-112

L-28W L-24W L-20W L-16W L-12W L-8W L-4W L-0W

SEATTLE TRANSMITTER STATION S 10W

LEGEND

- LOCATED CLAIM POST
- CLAIM GROUP BOUNDARY
- SURVEY LINE
- NEGATIVE AREA

NOTE

CONTOUR INTERVAL 10° ON SB, SILVER BOSS CLAIMS
5° ON GUS CLAIMS

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. TOURIGNY Jr.

TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, B. Sc.

EXETER MINES

SILVER BOSS, SB & GUS CLAIMS

HENDRIX LAKE AREA, CARIBOO M.D.

V.L.F. ELECTROMAGNETIC

type of survey: FRASER FILTER - CONTOUR MAP

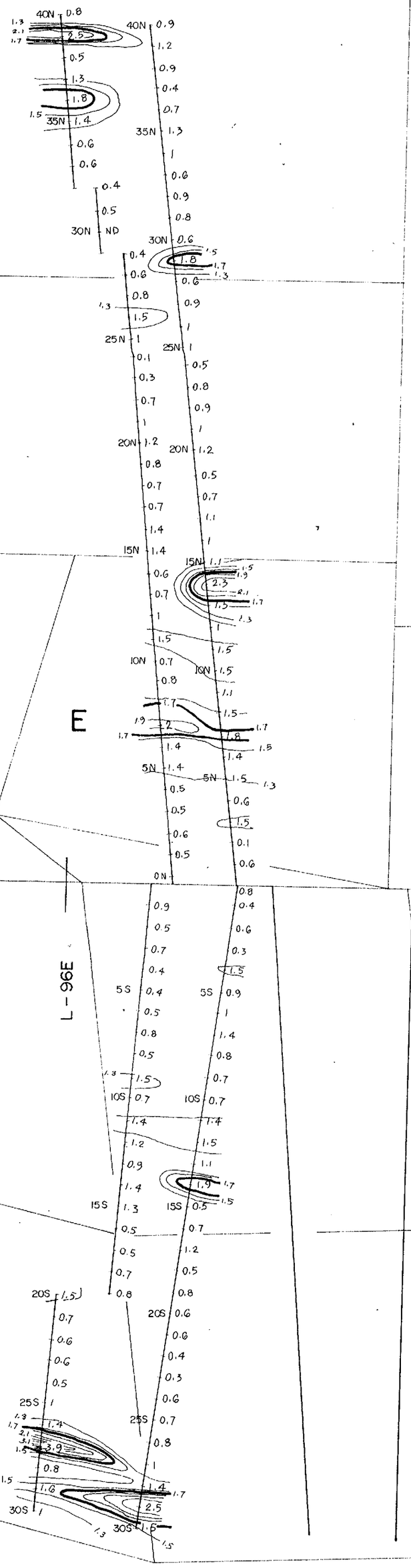
scale	date	job no.	sheet no.	drawn by
1" = 400'	DEC. 1970	70 - 47	3	P.P.

Geotronics Surveys Ltd.
Geophysical Surveys, Ground & Airborne
317 - 602 West Hastings Street, Vancouver, British Columbia

2785 M-5

NTS - 93 A/2 (W)

SB GROUP (37-48)



N 35W

magnetic

N20W

GUS CLAIM GROUP 1-14

L-32W

L-28W

L-24W

L-20W

L-16W

L-12W

L-8W

L-4W

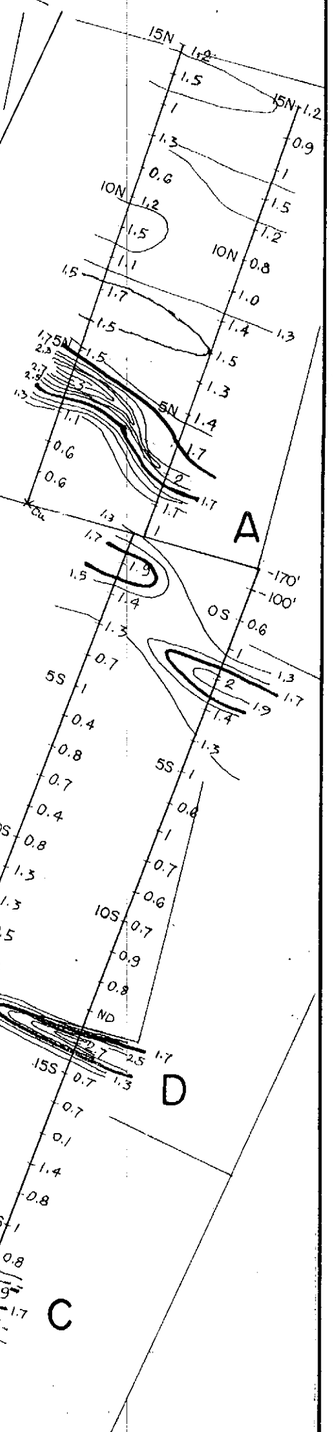
L-0W

L-100E

L-104E

L-108E

L-112E



LEGEND

- LOCATED CLAIM POST
- CLAIMS LINE
- SURVEY LINE
- TRESHOLD CONTOUR LINE (1.7 ppm)

NOTE

CONTOUR INTERVAL - 0.2 ppm

2785

M-6

TO ACCOMPANY GEOCHEMICAL REPORT BY D.G. MARK, B.Sc.

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2785 MAP #C

EXETER MINES

SB & GUS CLAIMS

HENDRIX LAKE AREA, CARIBOO M.D.

GEOCHEMISTRY - SOIL SAMPLING

type of survey: SILVER - HOT ACID EXTRACTION

scale	date	job no.	sheet no.	drawn by
1"=400'	NOV. 1970	70 - 47	4	P.

Geotronics Surveys Ltd.

317 - 602 West Hastings Street, Vancouver, British Columbia.

NTS — 93 A/2 (W)

SB GROUP (37-48)

N 35W magnetic

N20W

GUS CLAIM GROUP 1-14

L-32W

L-28W

L-24W

L-20W

L-16W

L-12W

L-8W

L-4W

L-0W

92E

L-96E

L-100E

L-104E

L-108E

L-112E

A

B

C

D

LEGEND

- LOCATED CLAIM POST
- CLAIMS LINE
- SURVEY LINE
- TRESHOLD CONTOUR LINE (160ppm)

NOTE

CONTOUR INTERVAL — 40ppm

2785 M-7

NTS — 93 A/2 (W)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA Thomas K. Daugh

TO ACCOMPANY GEOCHEMICAL REPORT BY D.G. MARK, B.Sc.

EXETER MINES

SB & GUS CLAIMS

HENDRIXON LAKE, CARIBOO M.D.

GEOCHEMISTRY - SOIL SAMPLING

type of survey: COPPER - Hot acid extraction

scale	date	job no.	sheet no.	drawn by
1"=400'	NOV. 1970	70 - 47	5	P.

Geotronics Surveys Ltd.
Geophysical Surveys, Ground & Airborne
517 - 602 West Hastings Street, Vancouver, British Columbia.