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GEOPHYSICAL REPORT
on an
INDUCED POLARIZATION SURVEY
on the
TATSHENSHINI RIVER PROPERTY
WHITEHORSE MINING DISTRICT, YUKON TERRITORY

July - August, 1973

Tatshenshini River Property : center of claims is 6 miles SW of Dalton Post

: 60° 137° SE

: NTS - 115A/3E

Written for : GOLD RIVER MINES & ENTERPRISES LTD.
802 - 1433 Burnaby Street
Vancouver, B.C.

by: David G. Mark
Geophysicist
Geotronics Surveys Ltd.
514-602 W. Hastings Street
Vancouver, B.C.

October 18, 1973

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INDUCED POLARIZATION SURVEY RESISTIVITY, DATA & CONTOURS, Sheets 2 and 2A	1" = 400'
INDUCED POLARIZATION SURVEY METAL FACTOR, DATA & CONTOURS, Sheets 3 and 3A	1" = 400'
INDUCED POLARIZATION SURVEY GRID A BASELINE - PROFILE, Sheet 4	1" = 400'

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SUMMARY

A frequency-domain induced polarization survey was carried out on the Tatshenshini River property, Whitehorse Mining District, during July and August, 1973. The property belongs to Jackpot Copper Mines Ltd. (NPL) of Vancouver, B.C., and is under option to Gold River Mines and Enterprises Ltd., Vancouver, B.C. The object was to locate potential areas of disseminated or fracture-filling sulphides.

The property consists of 262 mineral claims and is located in the southwestern part of the Yukon Territory on Tatshenshini River near the B.C. border. Access is by a truck road from Mile 106 of the Haines Road. The terrain varies from flat to very steep on the river and creek banks. Creeks, rivers, and lakes are found throughout the claim group.

The southwestern part of the property is underlain by sedimentary rocks of the Kasawalsh Group. To the north-east occur Mush Lake sediments and volcanics. Intruding into the Mush Lake rocks are granite and diorite of the Coast Intrusions. The copper mineralization, as chalcopyrite, occurs in quartzitic veins within andesites of the Mush Lake rocks.

The government aeromagnetic map shows the property to lie within several aeromagnetic highs surrounding an aero-magnetic low.

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The IP survey was carried out using a frequency-domain portable instrument and a dipole-dipole array with a dipole length of 400 feet. From the results, the resistivity and metal factor were calculated. The frequency effect, resistivity, and metal factor were plotted on maps at a scale of 1" = 400' and contoured.

Several IP anomalous zones occur within the survey areas.

CONCLUSIONS

1) A strong IP anomaly was found to reflect the known copper mineralization on the Alder Hill claims (grid A).

2) An IP anomalous value on L-8N, 10E may be on the edge of a larger anomalous zone and therefore may be reflecting previously unknown copper mineralization.

3) An anomalous area was located around Pirate Creek. It consists of an IP anomaly within a 4000-foot long resistivity low.

4) Three IP anomalous zones occur on grids B and C and are labelled Southern, Middle, and Northern Zones respectively.

5) All 3 correlate with anomalous copper soil geochemistry values and therefore could well be reflecting copper sulphides.

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6) The southern and middle zones occur within resistivity lows. The northern zone occurs on the boundary between a resistivity low and a resistivity high.

RECOMMENDATIONS

1) The main anomaly on grid A should be correlated with the diamond drill logs in the area. It is possible unknown mineralization may be indicated.

2) The IP survey should be extended and detailed around L-8N, 10E to determine if the anomaly is any larger.

3) The area around where the grid A baseline crosses Pirate Creek should be thoroughly examined. This could be done by prospecting, geological mapping, and/or a soil geochemistry survey.

4) The anomalous zones on grids B and C should be further detailed by the IP method. It is recommended to survey on 400-foot separated lines and take measurements every 200 feet. Also, in order to help determine the dips of the causitive sources, at least one survey line of first, second, and third separations should be taken across each anomaly.

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5) The anomalous zones on grids B and C should then be diamond drilled (apparently, this at present is being carried out). It is felt the holes should firstly be spotted on the frequency effect highs and secondly on the metal factor highs.

Respectfully submitted,

GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

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GEOPHYSICAL REPORT

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INDUCED POLARIZATION SURVEY

on the

TATSHENSHINI RIVER PROPERTY

WHITEHORSE MINING DISTRICT, YUKON TERRITORY

INTRODUCTION AND GENERAL REMARKS

This report discusses the procedure, compilation and interpretation of an induced polarization survey carried out over a group of claims on the Tatshenshini River and Pirate Creek in the southwestern part of the Yukon from the end of July to the middle of August, 1973.

The field work was carried out under the supervision of H.A. Larson, geophysicist. The number of line miles of survey completed was 18.5 and the area covered by the survey is as shown on fig. 2.

The object of the survey was to locate potential areas of disseminated or fracture-filling sulphides.

PORPERTY AND OWNERSHIP

The Tatshenshini River property consists of 262 claims, the registered owner being Jackpot Copper Mines Ltd. (NPL) of Mission, B.C. The property has been optioned to Gold River Mines and Enterprises Ltd. of Vancouver, B.C. which can earn up to 50% interest. The description of the property is as follows and as shown on fig. 2.

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Claims	Grant Number	Expiry Date
RT 1-6	Y18074-Y18079	May 1, 1976
TATS 1-8	Y5796-Y5803	May 1, 1976
TED 1-8	Y18080-Y18087	May 1, 1976
LEO 1-4	Y18094-Y18097	May 1, 1976
ALDER HILL 1-4	Y5653-Y5656	May 1, 1976
ALDER HILL 5	Y5722	May 1, 1976
ALDER HILL 6	Y5724	May 1, 1976
ALDER HILL 7	Y5723	May 1, 1976
ALDER HILL 8	Y5725	May 1, 1976
G.G. 1-8	Y8349-Y8356	May 1, 1976
JOE 1-6	Y18088-Y18093	May 1, 1976
STE 1-40	Y21185-Y21224	January 1, 1974
STE 41-56	Y21357-Y21372	January 1, 1974
STE 57-64	Y21225-Y21232	January 1, 1974
STE 65-72	Y21373-Y21380	January 1, 1974
STE 73-80	Y21707-Y21714	January 1, 1974
STE 81-88	Y21766-Y21773	January 1, 1974
STE 89-91	Y21715-Y21717	January 1, 1974
STE 92-94	Y21774-Y21776	January 1, 1974
STE 97-102	Y21793-Y21798	January 1, 1974
STE 103-112	Y21799-Y21808	January 1, 1975
STE 113-116	Y21777-Y21780	January 1, 1975
STE 117-120	Y21781-Y21784	January 1, 1974
STE 121-122	Y21895-Y21896	January 1, 1974
STE 123-128	Y21897-Y21902	January 1, 1975
STE 129-138	Y21809-Y21818	January 1, 1975
STE 139-148	Y21819-Y21828	January 1, 1974
STE 149-152	Y21829-Y21832	January 1, 1975
STE 153-160	Y21785-Y21792	January 1, 1975
LILL 1-36	Y29721-Y29728	November 1, 1974
RUM 1-8	Y29757-Y29764	January 1, 1974
RUM 9-16	Y30054-Y30061	January 1, 1974
RUM 17-20	Y29765-Y29768	January 1, 1974

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It is understood by the writer that about 40 additional claims have been staked but the location, names, record numbers and expiry dates are not known to the writer.

LOCATION AND ACCESS

The Tatshenshini property is located 2 to 3 airmiles to the west, southwest, and south of abandoned Dalton Post and 80 airmiles S60W of Whitehorse in the southwestern part of the Yukon just a few miles north of the B.C. border. The claims are located on and around Tatshenshini River, Pirate Creek, and Dollis Creek.

The geographical coordinates that cross the property are 60° 02' to 08' N latitude and 137° 01' to 09' W longitude.

Access to the property is from Mile 106 of the Haines road by a truck road west to Dalton Post. From Dalton Post, one crosses the Tatshenshini River by boat and henceforth southwest by road to the property. The distance by road from the Haines road to the property is about 12 miles. Also maps of the area show a trail and/or road following the north bank of Tatshenshini River through the STE claims.

PHYSIOGRAPHY

The property is located within the Alsek Ranges of the Coast Mountains. These ranges have peaks ranging from 6500 to 8500 feet in elevation and carry a small mantle of snow and ice.

Their serrate peaks have been sculptured by cirque action, and the major valleys especially have been modified strongly by the movement of ice along them. The creeks and rivers are heavily charged with sediments from melting glaciers, and most streams are aggrading; they flow in intricate and everchanging courses over their valley trains. The valley flats of the lower Alsek and Tatshenshini Rivers are more than a mile wide and present formidable barriers to travel by foot.

The elevation of the group ranges from below 2000 feet asl. on Tatshenshini River to 4000 feet asl. on the north-western part of the STE claims. Much of the eastern part of the claims sits on a plateau at about 2300 feet asl. The terrain varies from flat on the plateau to moderate on the side of the 2 mountains to steep on the Tatshenshini River banks.

The main water sources of the area are Tatshenshini River, Pirate Creek, and Dollis Creek with their tributaries of creeks and lakes.

HISTORY OF PREVIOUS WORK

During the summer of 1968, geological, soil geochemistry (copper), magnetometer, and vertical loop electromagnetic surveys were carried out under the supervision of Ace Parker, consulting geological engineer, over the Alder Hill, Tats, and STE claims. Apparently 'cat' trenching was also carried out during this time.

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On December 5, 1969, R.G. Hilker, consulting geological engineer, examined the property.

Diamond drilling was carried out on the property during the summer of 1970 under the supervision of F. Lee, geologist.

Steve Presunka, geophysicist, carried out a VLF-EM survey during September, 1970.

GEOLOGY

A. General

This is largely taken from the GSC memoir of the area by E.D. Kindle and is shown on fig. 4.

The property is found on the northeast limb of the northwest-striking Silver Creek anticline, its axis trending approximately along Dollis Creek and Silver Creek.

The oldest rocks of the area are those of the Kashawalsh Group which underlie the southwestern portion of the property. These are Carboniferous or Permian in age and form the center of the anticline. It is composed of limestone, marble, slate, quartzite, argillite, chert, andesite and schist.

To the northeast of the Kashawalsh Group occurs a band of Mush Lake Group rocks that is 4 miles wide and possibly up to 9 miles wide underneath the Quaternary overburden. This group is Triassic and Jurassic(?) in age and is comprised of

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andesite, basalt, rhyolite, volcanic breccia, tuff, argillite, slate and limestone. It appears to underlie most of the claim group.

Intruding into the Mush Lake rocks are granite and granodiorite of the Coast Intrusions. These rocks are Lower Cretaceous or later in age.

Copper mineralization has for years been known to occur in several locations along the northeast limb of the Silver Creek anticline within the Mush Lake rocks. The host rock is commonly andesite and the minerals are chalcopyrite, chalcocite and native copper.

B. Local

This section is quoted from the Summary Report by Hilker. "The Mush Lake Group andesites underly most of the claims area and are divisible into two general types. In the vicinity of the Alder Hill and Tats claims, the andesite is fine-to-medium grained, occasionally porphyritic, and dark olivine green/grey in color due to pronounced chloritization. Minor amounts of disseminated pyrite are common throughout along with calcite veinlets. In the southern part of the property, the andesite is much coarser than the above and also less noticeably green, due to a lesser degree of chloritization. Pyrite and calcite are not common in this area. Hornblende diorite dikes are common throughout the northern andesite area along with dikes of more basic composition.

"The granite is white to grey-white, medium grained, with a ferromagnesian content averaging about 2%. The fresh rock almost invariably has a glassy and often greenish appearance, indicating a mild degree of metamorphism, while the ferro-magnesian minerals have been almost totally converted to chlorite. Finely disseminated pyrite is common throughout the granite intersected by the drill holes and concentrations approach 2% in thin bands near shears. Examination of the drill core suggests that the granite intruded the andesite and the presence of diorite-related dikes in the granite and the freshness of the diorite suggests that the granite predates the diorite.

"Hornblende diorite underlies the northern portion of the claim group and is a part of the Coast Range Intrusions complex of the western cordillera. In the vicinity of the claim group, the diorite is fresh, medium-to-coarse grained, and carried no sulfides and only minor calcite veinlets. The diorite does not appear to be invaded by quartz veins."

"While some of the physiographical features of the area are possibly fault-controlled, the only fault observed on the property is that containing the quartz and copper mineralization on Alder Hill 1, 2, 3, and 4 claims. Shearing and jointing in the outcrop area make it difficult to obtain an attitude on the fault, but it is probable that the fault strikes between 330 and 340 degrees and dips in the vicinity of 70 degrees to the northeast. The fault appears to follow the leucocratic granite/andesite contact."

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"Copper mineralization, as chalcopyrite, is carried by medium-to large-sized quartz veins and/or by a narrow network of quartz stringers contained in the fault zone separating the andesite and granite. Pyrite and chalcopyrite are present and it is possible that arsenopyrite may also occur. The sulfides occur as partially segregated aggregates in the white quartz veins with a variable pyrite to chalcopyrite ratio. Drilling suggests the possibility of several mineralized zones."

AEROMAGNETIC SURVEY

The aeromagnetic survey in this area was flown for the GSC by Canadian Aero Service Ltd. from June, 1964 to February, 1966. The flight lines average about 3/4 of a mile apart and run in a north-south direction. The mean terrain clearance was about 1000 feet. The survey in the area of the property was traced onto fig.3 from GSC Map 3405 G.

The general aeromagnetic pattern, as seen on the larger GSC map, is that of alternating bands of highs and lows which strike in a north-westerly direction. This strike agrees with the general lithological strike as seen on the GSC geology map for the area.

However, there is very poor correlation between the particular rock-types as mapped by Kindle and the aeromagnetic anomalies. This can be seen by overlaying fig.3

onto fig. 4.

There are definite aeromagnetic highs, but these do not appear to correlate with either the Coast Intrusions or the Mush Lake volcanics. Three possible explanations for this are as follows:

1. The contours are mapped in the wrong place. At least part of this is caused by the data not being reduced to the magnetic pole.

2. The magnetic highs are actually reflecting the Coast Intrusions. Where a magnetic high is found over the Mush Lake volcanics, the high is actually reflecting the intrusion under a thin layer of Mush Lake rocks.

3. The highs are reflecting magnetite which is associated with sulphide mineralization. This possibility is mentioned since grids B and C are each found on a magnetic high striking northwest. Copper soil geochemistry anomalies were outlined on both grids but to the writer's knowledge, no copper sulphides so far are known.

Surrounded by aeromagnetic highs is an aeromagnetic low on the southern half of the property. This low strikes north northeast through Mush Lake rocks and then north northwest through Coast Intrusions. This low correlates with known sulphide mineralization on grid A and therefore may be reflecting a zone of alteration and mineralization. It is a well-known fact that many sulphide deposits are reflected by magnetic lows.

INSTRUMENTATION AND THEORY

The survey was carried out using a portable frequency-domain induced polarization instrument manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. A 12-volt lead-acid storage battery (rechargeable) was used as a power supply. This unit has a transmitter power output of 200 watts normal and up to 250 watts with a fully charged battery. Output voltage is 125, 250, 375 and 500 volts with selection by a switch.

The instrument operates on 10 Hz. or 5 Hz. for the high frequency and on 0.3 Hz. for the low frequency. The receiver is a sensitive AC-DC voltmeter capable of measuring the voltage range from 1 to 10,000 millivolts. The volt-meter is calibrated to read in percent frequency effect.

There are basically two methods of IP surveying, frequency-domain and time-domain. Both methods are dependent on a current flowing across an electrolyte-electrode interface or an electrolyte-clay particle interface, the former being called electrode polarization and the latter being called membrane polarization.

In electrode polarization, a current is put into the ground which then flows along electrolyte-filled capillaries within the rock. If the capillaries are blocked by certain mineral particles that transport current by electrons (most sulphides, some oxides, graphite), ionic charges build up at the particle-electrolyte interface, positive ones

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where the current enters the particle, and negative ones where it leaves. This accumulation of charge creates a voltage that tends to oppose the current flow across the interface.

In time-domain IP, direct current is put into the ground. When this current is stopped, the created voltage at the electrode particle - electrolyte interface slowly decreases as the accumulated ions diffuse back into the electrolyte. The more conductive the electrolyte and the electrode particle, and the greater number of electrode particles, the greater the induced polarization effect. Time-domain IP is measured in units of millivolt-seconds per volt or milliseconds and is referred to as chargeability.

Frequency-domain IP is based on the fact that the resistance produced at the electrode particle-electrolyte interface decreases with increasing frequency. Therefore, when taking a measurement, alternating current at a frequency between 1 to 10 Hz. is put into the ground and the current and voltage is measured. Then alternating current at a lower frequency, say between 0.1 and 0.9 Hz., is put into the ground. At this point the instrument measures the difference in resistance between the 2 frequencies at the electrode-electrolyte interface. Frequency-domain IP is measured in units of percent and is referred to as frequency effect.

Membrane polarization explains the IP effect where no sulphides occur. A charged clay particle attracts opposite-

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charged ions from the electrolyte in the capillary around the particle. If a current is forced through the capillary, the charged ions are displaced. On interruption of the current, the charges redistribute themselves in their former equilibrium pattern and therefore manifests itself as an IP effect.

SURVEY PROCEDURE

The survey was carried out over 3 different grids on the claim group labelled A, B, and C respectively. In addition, measurements were taken along the baseline for grid A and its extension to grid C. The survey lines on grid A strike almost due east-west and those on grids B and C about northeast-southwest.

On all 3 grids readings were taken every 400 feet on survey lines at 800-foot intervals. The dipole - dipole array was used and the dipole size was 400 feet. Measurements were taken on only 1 separation. The 2 frequencies used were 10 Hz and 0.3 Hz.

In the dipole - dipole array, one dipole consists of 2 current electrodes (stainless steel stakes) and the other dipole consists of 2 potential electrodes (unglazed porcelain pots filled with a saturated solution of copper sulphate). Both dipoles are of equal length and are separated from each other by a multiple of the dipole length. The multiple is described as 1 separation, 2 separations, 3 separations, and so on.

TREATMENT OF DATA

Frequency effect - The frequency effect is read directly on the IP receiver in units of percent.

Its values were plotted and contoured at a scale of 1" = 400' on sheet 1 for grids B and C and on sheet 1A for grid A. The contour interval chosen was 1% and only those values above 4% were contoured. The 4% contour was dashed in since it was felt to be subanomalous. The anomalous contours, 5% and above, were drawn in solid.

The values from the grid-A baseline were profiled on sheet 4.

Resistivity - The resistivity is obtained by dividing the secondary voltage by the current and multiplying by 400 feet, 2π, and by 3, a geometric constant peculiar to the 1st separation. In these calculations, on this survey, the factor 2π was not used and therefore the resistivity should actually be read as resistivity/2π.

The resistivity values were plotted and contoured on sheet 2 for grids B and C and on sheet 2A for grid A. The contour interval chosen was 100 ohm-feet. Those contours 400 ohm-feet and above were drawn in solid and those 300 ohm-feet and below were drawn in dashed.

The values from the grid-A baseline were profiled on sheet 4 with the frequency effect and metal factor profiles.

Metal factor - This value was obtained by dividing the frequency effect by the resistivity and multiplying by 1000.

The metal factor values were plotted and contoured on sheet 3 for grids B and C and on sheet 3A for grid A. The contour interval varied from 5 on almost all the anomalies to 50 on a high intensity anomaly on grid A. Only those values greater than 10 were contoured.

The values from the grid-A baseline were profiled on sheet 4 with the frequency effect and the resistivity profiles. The contour interval varied from 5 on almost all the anomalies to 50 on a high intensity anomaly on grid A. Only those values greater than 10 were contoured.

The values from the grid-A baseline were profiled on sheet 4 with the frequency effect and the resistivity profiles.

DISCUSSION OF RESULTS

The most important parameter considered by the writer is the frequency effect which is a measurement of the IP effect. Metal factor can be useful but can also be misleading. This parameter was designed to delineate those areas that are high in IP effect and low in resistivity. However, a resistivity low can be caused by a myriad of causes other than a sulphide deposit and therefore a metal factor anomaly can be formed where there is no mineralization. What metal factor is useful for is to show up the most interesting part of an IP (frequency effect) anomaly. This can also be done, however, by correlating the frequency effect results with the resistivity results.

A. Grid A and Grid A Baseline

There is one very strong IP anomaly produced on this grid and occurs at the southern end of the IP grid (see sheets 1A to 3A). The anomaly measures 800 feet long, 1000 feet wide, strikes N35°W (325°) and is open on both ends.

The anomaly correlates well with a resistivity low and therefore produces a very high metal factor anomaly. The metal factor anomaly also strikes N35W.

This anomalous zone correlates with the known copper mineralization that has been trenched and diamond drilled previously. It is not known to the writer if the drilling has shown the mineralization to be as extensive as the IP anomaly shows it.

There appears to be a second anomalous zone that may be separate from the main one. It consists of one value occurring at L-8N, 10E. The percent frequency value was erratic (hence in brackets) but nevertheless appeared to be high. The resistivity reading is low and is considered valid. This one anomalous value may be on the edge of a larger anomaly or it may be part of the main anomaly.

The values along the baseline correlate poorly with those along the survey lines in the area of the anomaly. This

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is a common occurrence in IP-resistivity surveys and is simply caused by the IP array measuring in 2 different directions. In other words, IP readings (frequency effect) will be much higher if the IP array is measuring along the mineralized zone than it will be if it is measuring across the zone.

On the grid A baseline extension to grid C, except for the anomalous zone on grid A and one on grid C (which will be discussed later), there is only one anomalous value and 2 sub-anomalous values.

The anomalous value (6.0%) occurs at station 140N in an area of high resistivity. Therefore, the metal factor value is non-anomalous.

A sub-anomalous value of 4.0% occurs at station 62 N and here the correlating resistivity value is also high.

An area that may be of economic interest is that around Pirate Creek. Three readings could not be obtained but one that could is a sub-anomalous value of 4.0%. It occurs within a broad zone of very low resistivity readings about 4000 feet long (or wide). Hence, the metal factor values are very high.

B. Grids B & C

There are several anomalous zones on grids B and C. The ones of most economical interest, the writer feels, are those in which there is good correlation between frequency effect anomalies, resistivity lows, and copper soil geochemistry anomalies, or, in other words, between metal factor and soil geochemistry anomalies. There are 3 IP anomalies that meet this requirement and are located on:

1) The southeastern part of grid B referred to as the southern zone;
2) the southeastern part of grid C close to grid B, referred to as the middle zone;
3) the northwestern part of grid C referred to as the northern zone.

1) Southern Zone

The southern zone is characterized by a broad resistivity low that correlates very well with a soil geochemistry anomalous area. Within this resistivity low also is found a frequency effect, or IP, anomaly, and 2 metal factor anomalies.

The one metal factor anomaly is southwest of the baseline and is caused by the frequency effect anomaly coupled with the low resistivity values. It correlates very well with high copper soil geochemistry values. The frequency effect anomaly is about 2000 feet by 500 feet and strikes northwesterly. The overlying metal factor anomaly is, as expected, larger, and measures 3600 feet by 1200 feet and is open on the southwestern end.

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The other metal factor anomaly in this area is northeast of the baseline and is caused by high non-anomalous frequency effect values coupled with low resistivity values. It also correlates very well with copper soil geochemistry values. The anomaly measures 1600 feet by 800 feet and is open on the northeast and southeast ends. The strike appears to be north of northwest.

Considering the good correlation with the copper soil values, there is a good probability that both metal factor anomalies are reflecting copper sulphides.

2) Middle Zone

The middle zone is characterized by a relatively high frequency effect anomaly within a low resistivity area and thus producing a high metal factor anomaly. The correlation with the soil geochemistry results is fair. The most anomalous part of the zone measures about 1000 feet by 500 feet and is open on the northeast end.

About 1000 feet east of this anomaly is a metal factor anomaly that appears to be due more to low resistivity than high frequency effect. However, there is good correlation with a copper soil geochemistry anomaly.

3) Northern Zone

This zone is found on the southeastern bank of the Tatsenshini River where occurs a large gossan. The anomalous zone is composed of three frequency effect

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anomalies that are joined together as a much larger metal factor anomaly. There is fairly good correlation with the soil geochemistry though the copper values are not as high as within the southern zone.

The resistivity values are low northeast of the baseline and high southwest of the baseline. The low resistivity area may be caused by deep overburden as was mapped by Ace Parker, consulting geologist. Another possibility is that the high and low values reflect 2 different rock types.

The anomalous zone measures according to the metal factor values, about 4000 feet by 3600 feet and is open on the northeast and northwest ends. There are large areas within this area that are non-anomalous whether the values are frequency effect, metal factor, or soil geochemistry. It is difficult to ascertain the strike of the causitive source. The frequency effect shows one anomaly within this zone to be striking northwest, and another, northeast.

The grid A baseline extension on grid C has a relatively high frequency effect anomaly on it that correlates poorly with the 2 adjacent grid C survey lines (36N & 44N). As within grid A, this is caused by the measurements being taken in 2 different directions. From this, it is quite conceivable that the causitive source strikes more north-south than northwest-southeast.

4) General Comments

Whether or not the frequency effect or metal factor anomalies correlate with the soil geochemistry results should not be a criterion as to whether further exploration should be carried out. It should be remembered that the soil geochemistry method explores only to the top of bedrock through no more than 100 feet of overburden, whereas the IP method in this case explores to a depth of 300 feet and possibly 400 feet. Therefore, if IP anomalies are found in an area of soil geochemistry anomalies, then this should be inducement enough for further exploration.

There is poor correlation on grids B and C between the IP results and the vertical loop electromagnetic results.

Some of the magnetic highs and some of the magnetic lows correlate with some of the frequency effect highs. The former may be interpreted as magnetite being some or all of the cause of the correlating frequency effect anomalies. The latter may be interpreted as the frequency effect anomalies reflecting a zone of alteration and sulphides. In general, however, there is poor correlation between the magnetic survey and the IP survey.

Respectfully submitted,

GEOTRONICS SURVEYS LTD.

David G. Mark
Geophysicist

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Resume of

Professional and Technical Experience

of

Howard Larson, Geophysicist

Education

1971 Graduate of the University of British Columbia with a Bachelor's degree in Science (B.Sc.) in geophysics.

Experience

August 1971 to Present	Geotronics Surveys Ltd. geophysicist in both mining and engineering geophysics
May 1970 to September 1970	Tri-Con Exploration Surveys Ltd. Field Supervisor in geophysics.
May 1969 to September 1969	Atlas Explorations Ltd. geochemical analyst and geophysical operator.
May 1968 to September 1968	Coast Eldridge Engineers and Chemists. chemist's assistant on geochemical rock assays and soil samples.

Location of experience is British Columbia, Yukon, and the Northwest Territories.

Types of geophysical surveys experience are single and multi- channel seismic, induced poloarization, resistivity, self-potential, magnetometer (air and ground), various types of electromagnetic, radiometric and soil sampling.

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GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of GEOTRONICS SURVEYS LTD., with offices at 514-602 West Hastings Street, Vancouver 2, B.C.

I further certify:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.

2. I have been practising in my profession for the past five years and have been active in the mining industry for the past eight years.

3. I am an associate member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.

4. This report is compiled from data obtained from an induced polarization survey carried out by H.A. Larson, geophysicist, on the Tatshenshini River Property belonging to Jackpot Copper Mines Ltd. (NPL) of Vancouver, B.C., during July and August, 1973, and from pertinent data from reports and maps as listed under Selected Bibliography.

5. I have no direct or indirect interest in the property described herein, or in the securities of Jackpot Copper Mines Ltd. (NPL) or in the securities of Gold River Mines and Enterprises Ltd., nor do I expect to receive any interest therein.

David G. Mark
Geophysicist

092562

Resume of

Professional and Technical Experience

of

Howard Larson, Geophysicist

Education

1971 Graduate of the University of British Columbia with a Bachelor's degree in Science (B.Sc.) in geophysics.

Experience

August 1971 to Present	Geotronics Surveys Ltd. Geophysicist in both mining and engineering geophysics.
May 1970 to September 1970	Tri-Con Exploration Surveys Ltd. Field Supervisor in geophysics.
May 1969 to September 1969	Atlas Explorations Ltd. Geochemical analyst and geophysical operator.
May 1968 to September 1968	Coast Eldridge Engineers and Chemists. Chemist's assistant on geochemical rock assays and soil samples.

Location of experience is British Columbia, Yukon, and the Northwest Territories.

Types of geophysical surveys experience are single and multi-channel seismic, induced polarization, resistivity, self-potential, magnetometer (air and ground), various types of electromagnetic, radiometric and soil sampling.

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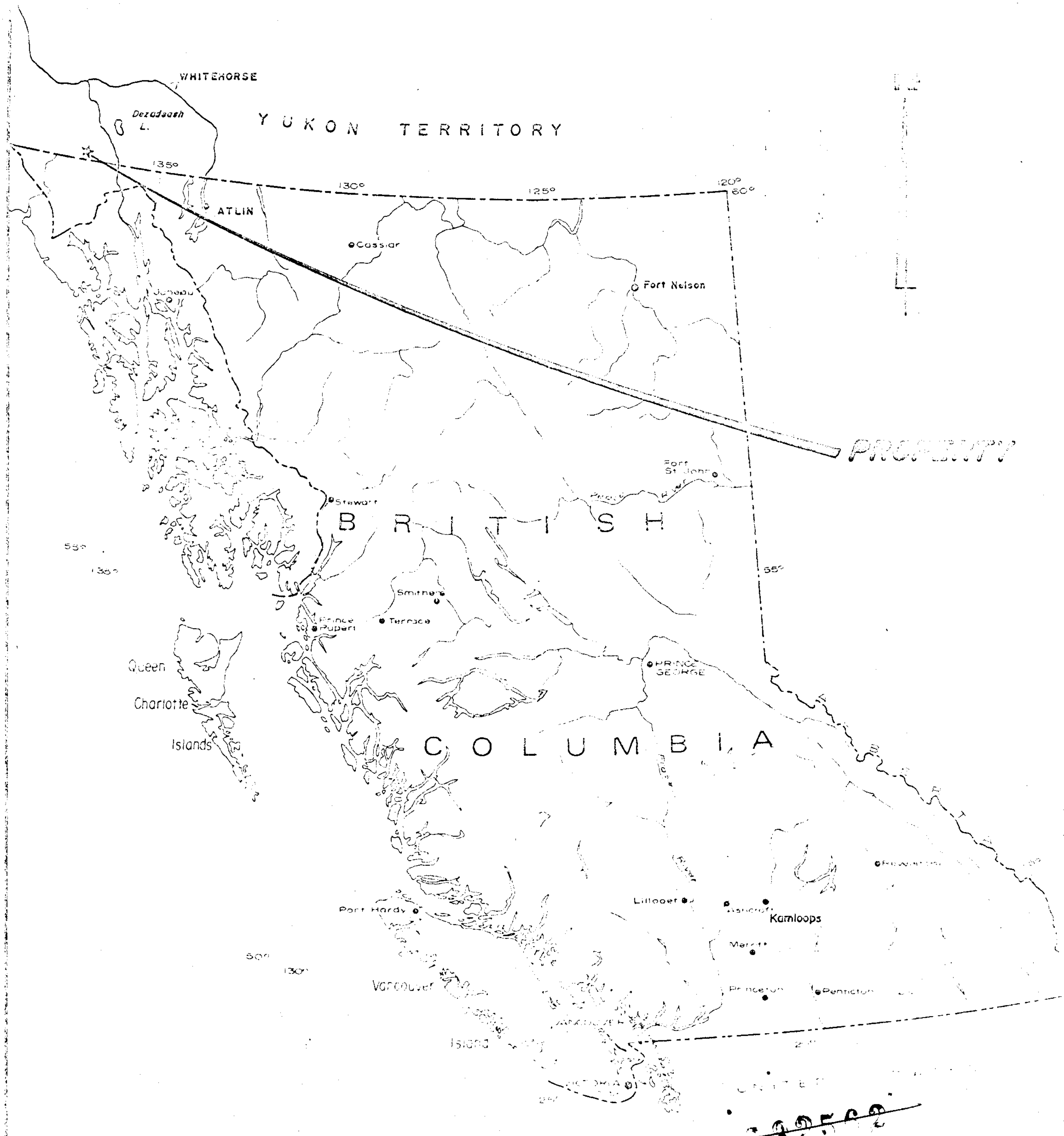


~~32502~~

FIG. I

GEOTRONICS SURVEYS LTD.

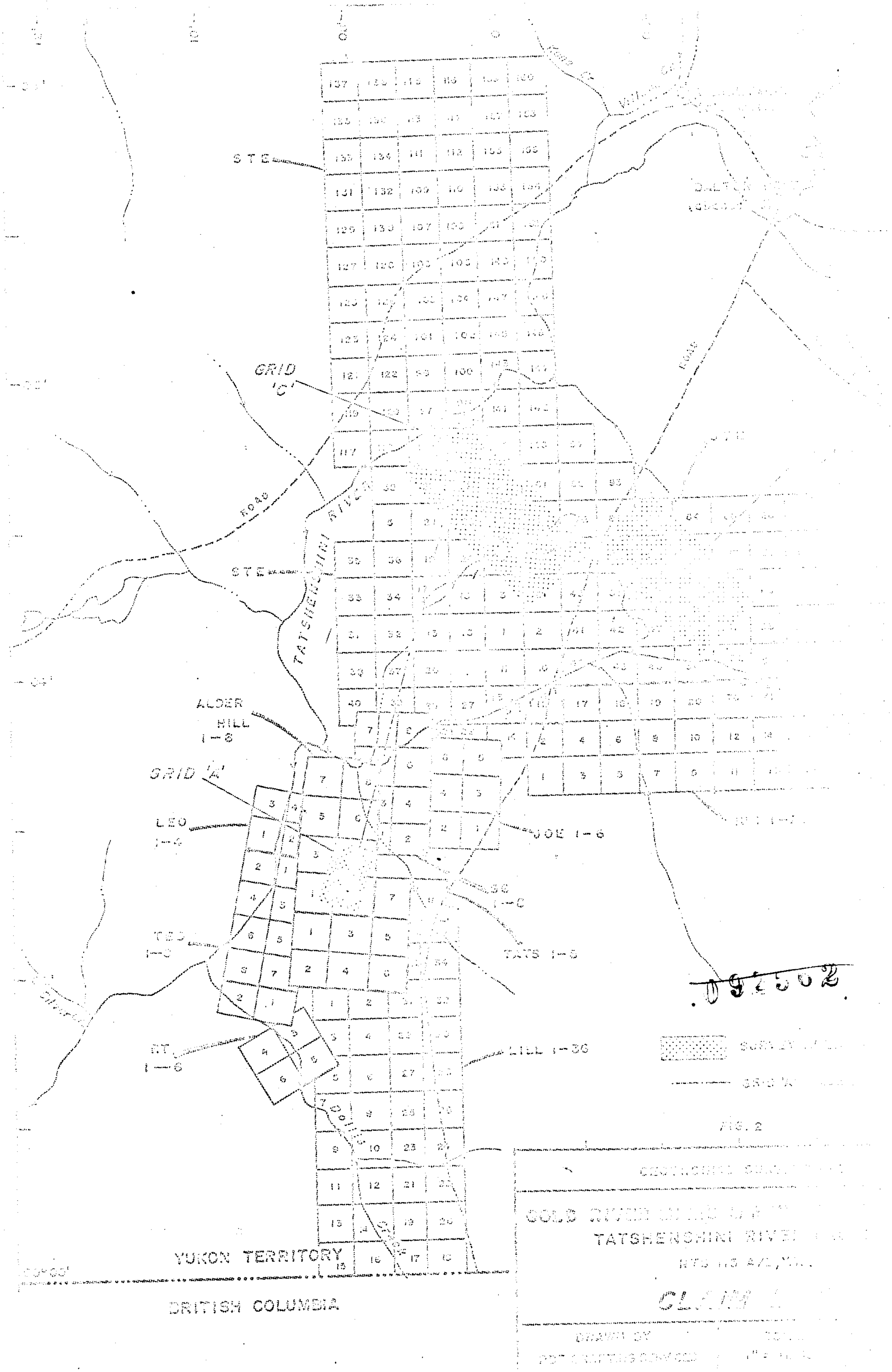
GOLD RIVER MINES & ENTERPRISES LTD.

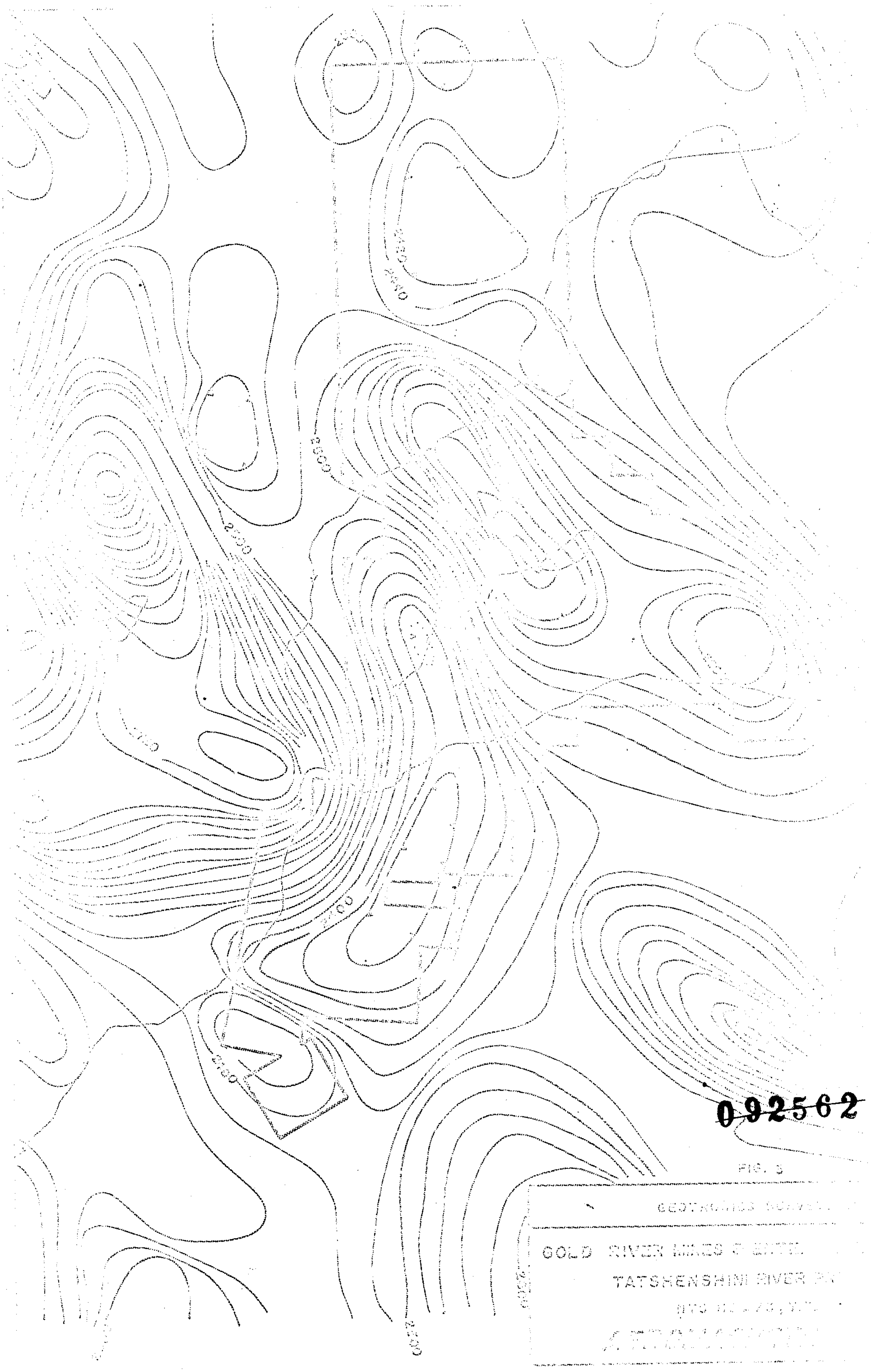
TATSHENSHINI RIVER PROPERTY

NTS 115 A/3, Y.T.

LOCATION MAP

SCALE 1" = 134 miles


STE
GRID 'C'
ROAD
TATSHENSHINI RIVER
STE
ALDER HILL 1—8
GRID 'A'
LEO 1—4
JOE 1—8
TATS 1—8
LILL 1—36
RT 1—6
YUKON TERRITORY
BRITISH COLUMBIA
092502
FIG. 2



092562
GOLD
TATSHENSHINI RIVER

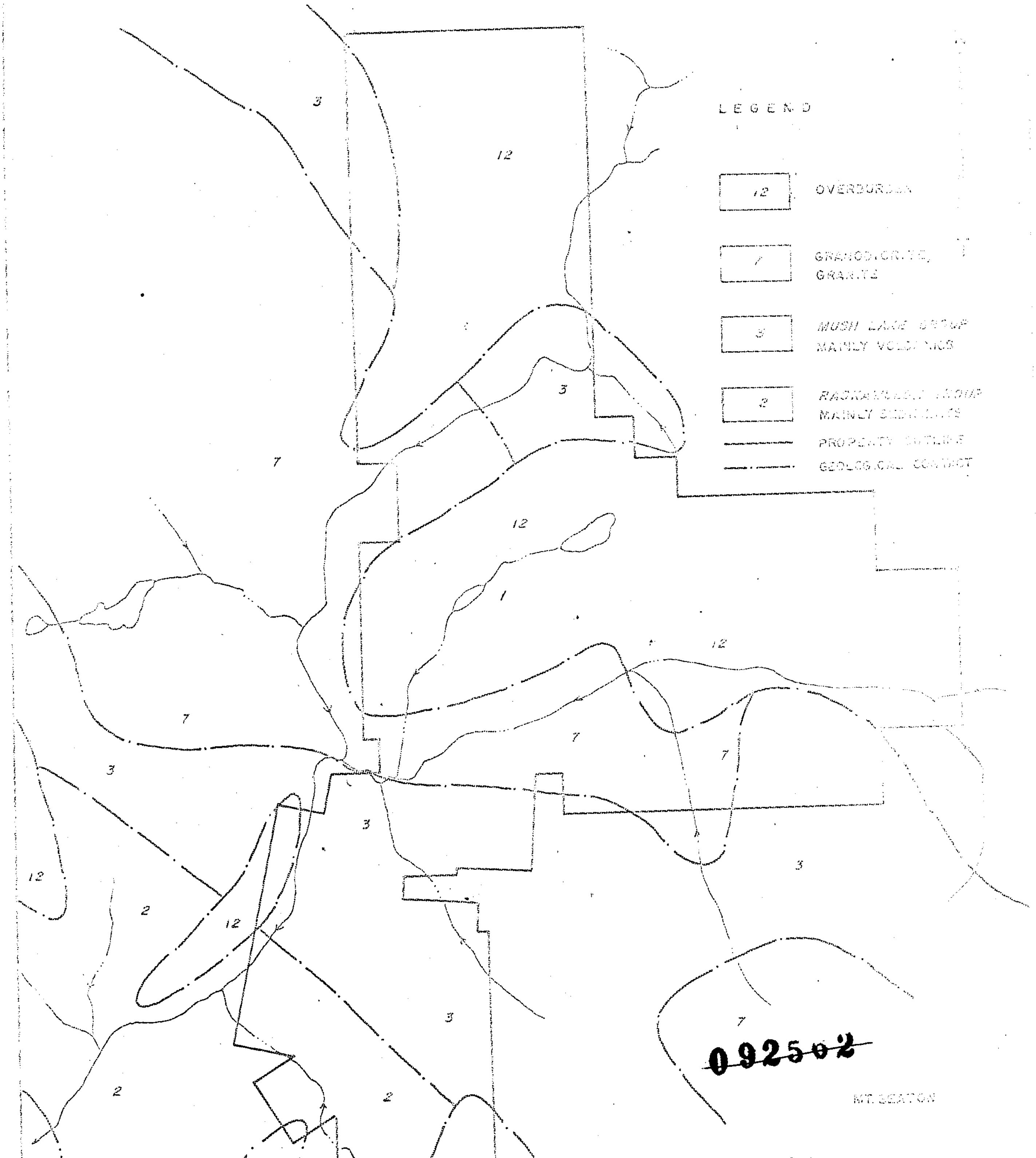


FIG. 4

GEOTRONICS SURVEYS LTD.

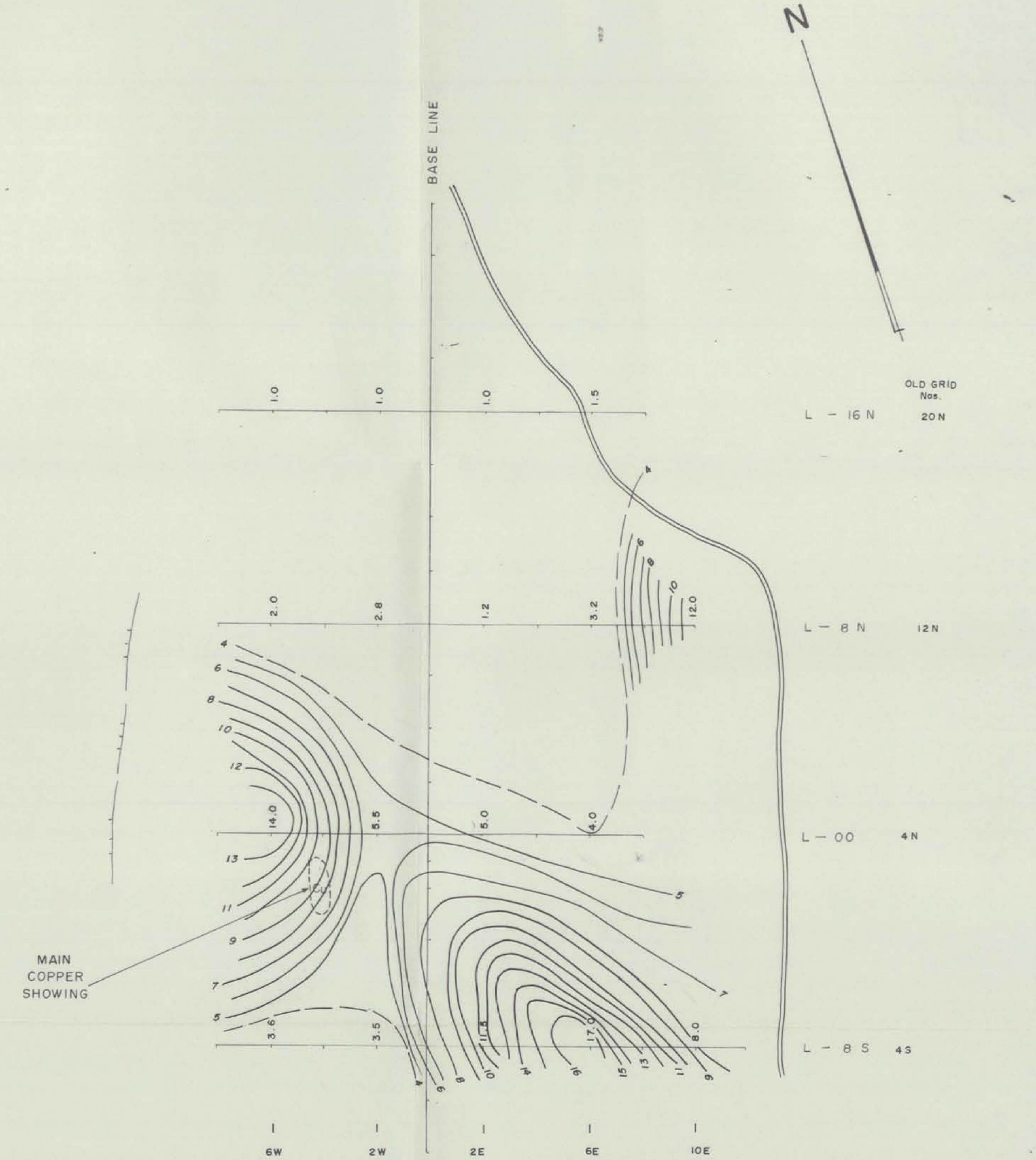
GOLD RIVER MINES & ENTERPRISES LTD. N.P.L.
TATSHENSHINI RIVER PROPERTY
NTS 115 A/3, Y.T.

GEOLOGY MAP

DRAWN BY	SCALE	DATE
PCT DRAFTING SERVICES	1" = 1 mile	OCT. [illegible]

SKETCHED FROM GSC MAP 1019A (KINDLE)


N
MAGNETIC
OLD GRID NO. 56N
NEW LINE NO. 60N
NORTHERN ZONE
MIDDLE ZONE
SOUTHERN ZONE
GRID B
GRID C
BASE LINE
Duncan Lake
Lake
LEGEND
SURVEY LINE
SWAMP
CONTOURS
PERCENT FREQUENCY — 4%
PERCENT FREQUENCY — 5% AND OVER
GEOCHEMISTRY ANOMALY— Cu
CONTOUR INTERVAL IS 1%
INSTRUMENT
TYPE : FREQUENCY DOMAIN
FREQUENCIES : 10.0 , 0.3 Hz
ARRAY : DIPOLE – DIPOLE
DIPOLE LENGTH : 400 feet
SEPARATION : FIRST
061158
TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK ,GEOPHYSICIST
GEOTRONICS SURVEYS LTD.
GOLD RIVER MINES & ENTERPRISES LTD.
TATSHENSHINI RIVER PROPERTY
NTS 115 A/3(E)
YUKON TERRITORY
INDUCED POLARIZATION SURVEY
PERCENT FREQUENCY EFFECT , DATA & CONTOURS
DRAWN PDT DRAFTING SERVICES
SCALE 1" = 400'
JOB NO. 73 – 69
DATE AUGUST '73
SHEET NO. 1



GRID A

LEGEND

SURVEY LINE

CLIFF

NOTE : READINGS ARE IN PERCENT

INSTRUMENT :

TYPE : FREQUENCY DOMAIN

FREQUENCIES : 10.0 , 0.3 Hz

ARRAY : DIPOLE – DIPOLE

DIPOLE LENGTH : 400 feet

SEPARATION : FIRST

001158

TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, GEOPHYSICIST

GEOTRONICS SURVEYS LTD.

GOLD RIVER MINES & ENTERPRISES LTD.

TATSHENSHINI RIVER PROPERTY

NTS 115 A/3(E)

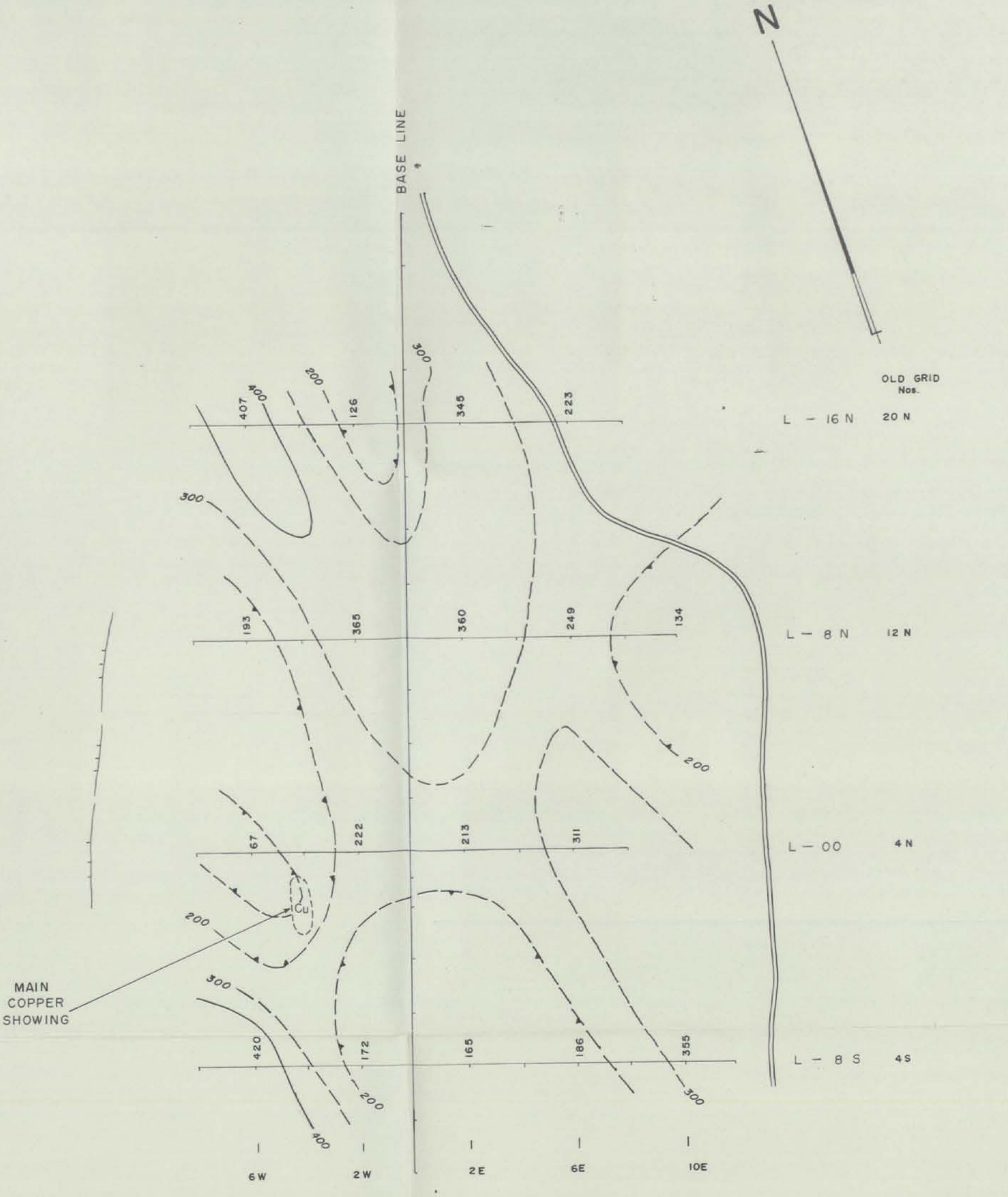
YUKON TERRITORY

INDUCED POLARIZATION SURVEY

PERCENT FREQUENCY EFFECT , DATA & CONTOURS

DRAWN	SCALE	JOB NO.	DATE	SHEET NO.
PDT DRAFTING SERVICES	1" = 400'	73 – 69	AUGUST '73	1A


SOUTHERN ZONE
MIDDLE ZONE
NORTHERN ZONE
GRID B
GRID C
BASE LINE
Duncan Lake
Lake
OLD GRID NO.
NEW LINE NO.
LEGEND
SURVEY LINE
SWAMP
NOTE: READINGS ARE IN 2π (ohm-feet)
CONTOURS: 300 AND LESS
400 AND OVER
CONTOUR INTERVAL IS 100
INSTRUMENT:
TYPE: FREQUENCY DOMAIN
FREQUENCIES: 10.0, 0.3 Hz
ARRAY: DIPOLE - DIPOLE
DIPOLE LENGTH: 400 feet
SEPARATION: FIRST
0023162 061158
TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, GEOPHYSICIST
GEOTRONICS SURVEYS LTD.
GOLD RIVER MINES & ENTERPRISES LTD.
TATSHENSHINI RIVER PROPERTY
NTS 115 A/3(E)
YUKON TERRITORY
INDUCED POLARIZATION SURVEY
RESISTIVITY, DATA & CONTOURS
DRAWN: PDT DRAFTING SERVICES
SCALE: 1" = 400'
JOB NO. 73 - 69
DATE: AUGUST '73
SHEET NO. 2



LEGEND

SURVEY LINE

CLIFF

GRID A

NOTE : READINGS ARE IN 2π (ohm-feet)

INSTRUMENT :		
TYPE	:	FREQUENCY DOMAIN
FREQUENCIES	:	10.0 , 0.3 Hz
ARRAY	:	DIPOLE – DIPOLE
DIPOLE LENGTH	:	400 feet
SEPARATION	:	FIRST

061158

TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, GEOPHYSICIST

GEOTRONICS SURVEYS LTD.

GOLD RIVER MINES & ENTERPRISES LTD.

TATSHENSHINI RIVER PROPERTY

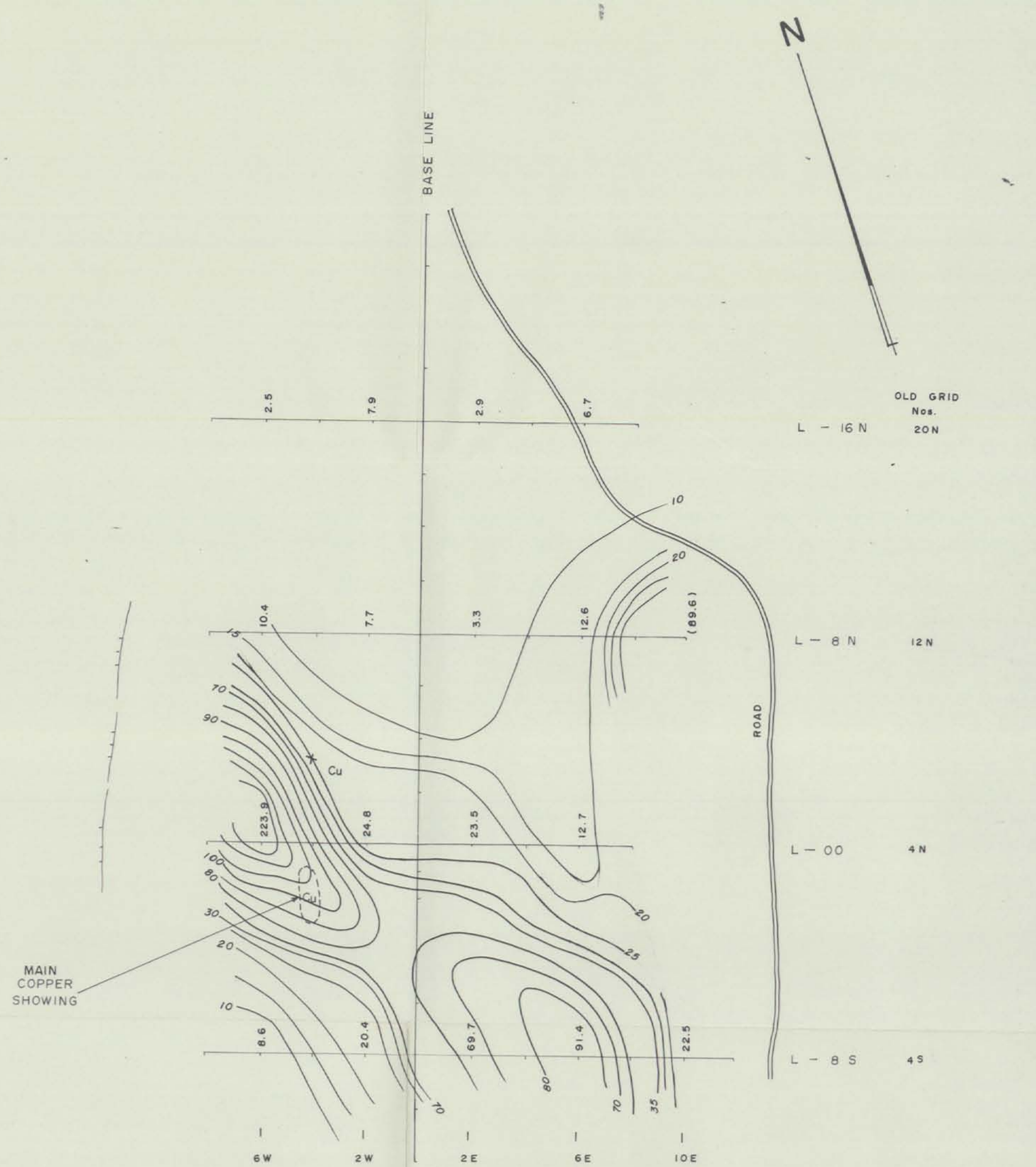
NTS 115 A/3(E)

YUKON TERRITORY

INDUCED POLARIZATION SURVEY RESISTIVITY, DATA & CONTOURS

DRAWN	SCALE	JOB NO.	DATE	SHEET NO.
PDT DRAFTING SERVICES	1" = 400'	73 – 69	AUGUST '73	2A


N
MAGNETIC
NORTHERN ZONE
MIDDLE ZONE
SOUTHERN ZONE
GRID B
GRID C
BASE LINE
Duncan Lake
OLD GRID NO. 56N 48N 40N 32N 24N 16N 8N 0+00 8S 16S
NEW LINE NO. 60N 52N 44N 36N 28N 20N 12N 4N 4S 12S
28S 36S 44S 52S 60S 68S 76S 84S 92S
LEGEND
SURVEY LINE
SWAMP
NOTE : UNITS ARE [%/2π(ohm-feet)]×1000 = MFu
CONTOUR INTERVAL IS 5 MFu
INSTRUMENT :
TYPE : FREQUENCY DOMAIN
FREQUENCIES : 10.0 , 0.3 Hz
ARRAY : DIPOLE - DIPOLE
DIPOLE LENGTH : 400 feet
SEPARATION : FIRST
061158
TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, GEOPHYSICIST
GEOTRONICS SURVEYS LTD.
GOLD RIVER MINES & ENTERPRISES LTD.
TATSHENSHINI RIVER PROPERTY
NTS 115 A/3(E)
YUKON TERRITORY
INDUCED POLARIZATION SURVEY
METAL FACTOR, DATA & CONTOURS
DRAWN: PDT DRAFTING SERVICES
SCALE: 1" = 400'
JOB NO.: 73-69
DATE: AUGUST '73
SHEET NO.: 3



GRID A

LEGEND

SURVEY LINE

CLIFF

NOTE : UNITS ARE [% / 2Π (ohm – feet)] 1000

INSTRUMENT :		
TYPE	:	FREQUENCY DOMAIN
FREQUENCIES	:	10.0 , 0.3 Hz
ARRAY	:	DIPOLE – DIPOLE
DIPOLE LENGTH	:	400 feet
SEPARATION	:	FIRST

061158

TO ACCOMPANY GEOPHYSICAL REPORT BY D. G. MARK , GEOPHYSICIST

GEOTRONICS SURVEYS LTD.

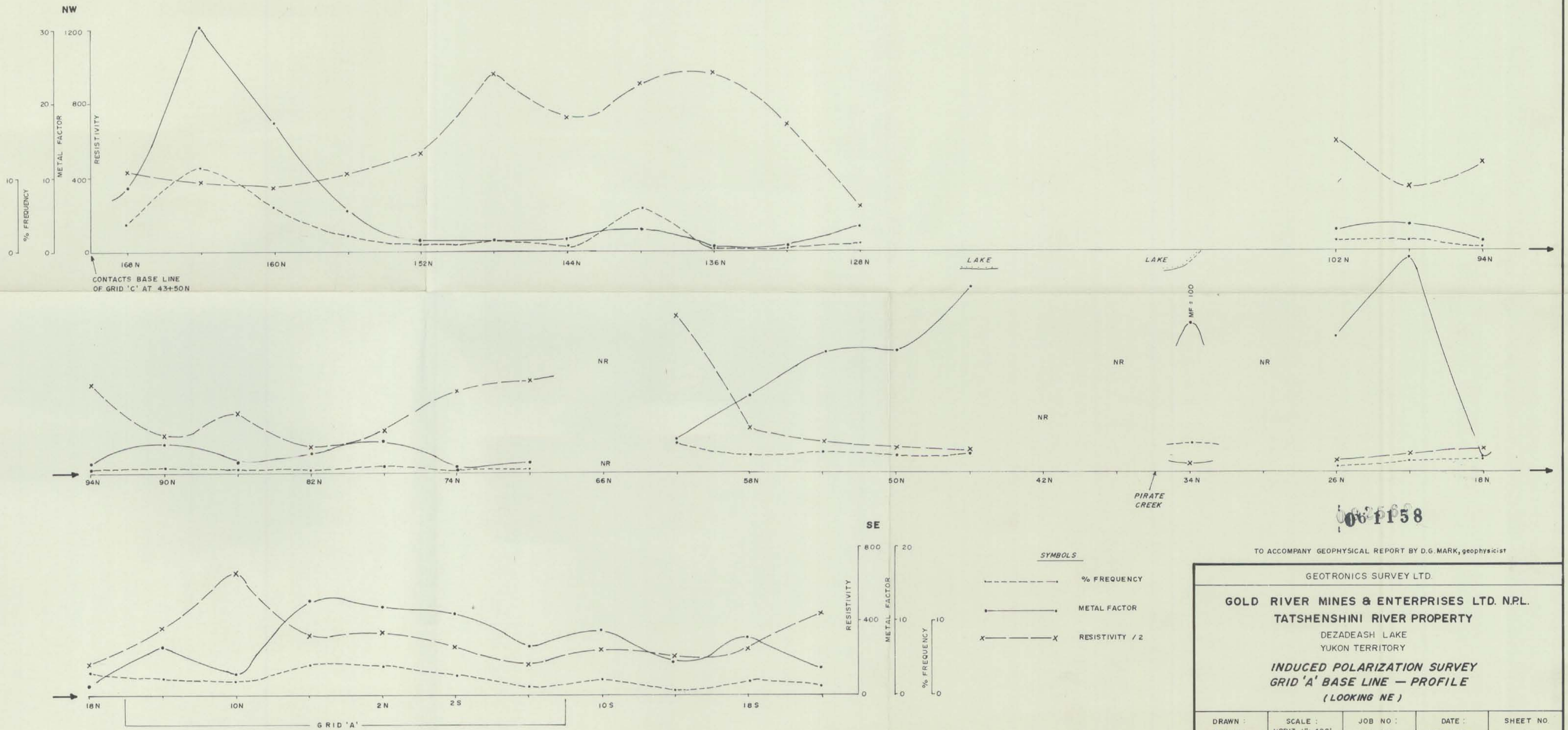
GOLD RIVER MINES & ENTERPRISES LTD.
TATSHENSHINI RIVER PROPERTY

NTS 115 A / 3 (E)

YUKON TERRITORY

INDUCED POLARIZATION SURVEY
METAL FACTOR, DATA & CONTOURS

DRAWN	SCALE	JOB NO.	DATE	SHEET NO.
PDT DRAFTING SERVICES	1" = 400'	73 – 69	AUGUST '73	3 A



061158

TO ACCOMPANY GEOPHYSICAL REPORT BY D.G. MARK, geophysicist

GEOTRONICS SURVEY LTD.

GOLD RIVER MINES & ENTERPRISES LTD. N.P.L.
TATSHENSHINI RIVER PROPERTY

DEZADEASH LAKE
YUKON TERRITORY

INDUCED POLARIZATION SURVEY
GRID 'A' BASE LINE — PROFILE
(LOOKING NE)

DRAWN :	SCALE :	JOB NO :	DATE :	SHEET NO.
P. PECEK	HORIZ. 1" = 400' VERTIC. AS SHOWN	73 — 69	OCT. 1973	4