# GEOPHYSICAL REPORT

# ON

# IP AND RESISTIVITY SURVEYS

# OVER A PORTION OF THE

# BOGG CLAIM GROUP

# TA HOOLA LAKE AREA

# KAMLOOPS AND CLINTON M.D., BRITISH COLUMBIA

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| | |
|---|---|
| PROPERTY | : Near Jim Creek, 30 km northwest of the settlement of Little Fort |
| | : 51° 37' North Latitude<br>120° 32' West Longitude |
| | : N.T.S. 92P/9, 10 |
| WRITTEN FOR | : GEOTECH CAPITAL CORP.<br>319-470 Granville Street<br>Vancouver, B.C., V6C 1V5 |
| WRITTEN BY | : David G. Mark, Geophysicist<br>Patrick Cruickshank, Geophysicist<br>GEOTRONICS SURVEYS LTD.<br>530 - 800 West Pender S<br>Vancouver, B.C., V6C 2V |
| DATED | : August 29, 1988 |

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GEOTRONICS SURVEYS LTD.
Engineering & Mining Geophysicists
VANCOUVER, CANADA

## TABLE OF CONTENTS

# LIST OF ILLUSTRATIONS

## SUMMARY

IP and resistivity surveys were carried out from July 3 to 20, 1988 over eight lines within the Bogg claim group. It is located approximately 4 km northeast of Jim Creek and 30 km northwest of Little Fort, in both the Kamloops and Clinton Mining Divisions of British Columbia.

The main purpose of the IP survey was to locate sulphide mineralization which on this property may occur with gold and silver values. The main purpose of the resistivity survey was to locate geologic structure and/or alteration zones which could host gold.

The property is underlain by the Upper Triassic Nicola volcanic rocks, with a second unit of intrusives of the Upper Triassic or Lower Jurassic age. Mineralization in the area occurs as sulphides along shear zones in intensely altered volcanic rocks. Gold geochemical values reaching 940 ppb were taken from within a shallow physiographic linear depression which trends northwesterly from Ta Hoola Lake.

The property is accessible by four-wheel drive vehicle. The terrain varies from gentle to moderate. Vegetation consists of light underbrush within well-populated coniferous trees.

The IP and resistivity surveys were conducted using a Huntec receiver operating in the time-domain mode. The array used was the double-dipole with 30-metre dipoles read to three and five levels. A total of eight lines were covered with the results being plotted on eight pseudosections and two plan maps for level n=1, and contoured.

## CONCLUSIONS

1. The IP (chargeability) survey has revealed two very strong northerly-striking anomalies that correlate with strong resistivity lows. The two IP/resistivity anomalies, that have been labelled A and B, correlate with a topographic low. This, with the sometime lineal character of the resistivity low, suggests the causative source is geological structure mineralized with sulphides.

2. Anomaly A discontinuously correlates with soil geochemistry results anomalous in gold indicating gold values occur with the sulphides.

3. Only a few soil geochemistry results correlate with B. However, a strong gold soil geochemistry anomalous zone occurs adjacent to B on its western side within the western corner of the survey area.

4. Anomaly C consists of moderately high resistivity values that correlate with an IP anomalous high of low amplitude. This zone contains numerous anomalous soil geochemistry values in gold. The suggested causative source is gold mineralization occurring within quartz and ankerite and with some sulphides.

5. Anomaly D is a one-line strong IP high correlating with a resistivity high. (There is no IP/resistivity survey coverage on either side of the anomaly).

6. Anomaly E consists of a very strong resistivity high correlating with a relative IP low, that is, low compared to anomalies A and B on either side of E. Geological mapping in the field indicate the cause of the resistivity high is a very hard, competent argillite.

## RECOMMENDATIONS

The property is widely covered with overburden leaving few outcrops. Also glaciation may have direct correlation between the soil geochemistry results and the geophysical results. Therefore the first priority must be to determine how the geophysics results relate to gold mineralization on this property. This should preferably be done with trenching. If this is not possible then drilling is a second choice.

Target areas are those parts of C and A that are more strongly anomalous in IP results and that correlate with more consistent soil geochemistry results. A' is certainly of exploration interest as well. Another area of interest is the soil geochemistry anomaly to the immediate west of anomaly B in the area of the baseline within the western corner of the survey area.

Dependant on these results, further IP/resistivity surveying as well as diamond drilling would then be recommended.

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## INTRODUCTION AND GENERAL REMARKS

This report discusses the instrumentation, theory, field procedure and results of IP and resistivity surveys carried out over a portion of the Bogg claim group. The property is located about 30 km northwest of the village of Little Fort and 19 km northeast of the settlement of Bridge Lake.

The field work was completed from July 3rd to 20th, 1988 under the supervision of David Mark, geophysicist and under the field supervision of Tracy Campbell, geophysicist, who also formed part of the field crew. A geophysical technician as well as 2 helpers completed the crew of four.

The main purpose of the IP survey was to locate sulphide mineralization which on this property may occur with gold and silver values. The main purpose of the resistivity survey was to locate geologic structure and/or alteration zones which could host gold.

## PROPERTY AND OWNERSHIP

The property consists of eighteen contiguous metric grid claims totalling 242 units lying in both the Kamloops and Clinton Mining Divisions as shown on Map 2 and as described below:

Those lying completely, or partially, within the Kamloops Mining Division:

| Name of Claim | No of Units | Record Number | Expiry Date |
|---|---|---|---|
| Bogg 1 | 10 | 6271 | June 1989 |
| Bogg 2 | 12 | 6272 | June 1989 |
| Bogg 3 | 12 | 6273 | June 1989 |
| Bogg 4 | 16 | 6274 | June 1989 |
| Bogg 7 | 10 | 7059 | May 1990 |
| Bogg 8 | 10 | 7060 | May 1990 |
| Bogg 9 | 12 | 7061 | May 1990 |
| Bogg 10 | 12 | 7220 | Aug. 1988 |
| Bogg 11 | 9 | 7221 | Aug. 1988 |
| Bogg 12 | 12 | 7222 | Aug. 1988 |
| Bogg 13 | 6 | 7223 | Aug. 1988 |
| Bogg 14 | 16 | 7308 | Sept. 1988 |
| Bogg 17 | 16 | 7309 | Sept. 1988 |
| Bogg 19 | 15 | 7338 | Nov. 1988 |
| Bogg 20 | 14 | 7339 | Nov. 1988 |
| Total Units | 182 | | |

Those lying completely within the Clinton Mining District:

| Name of Claim | No of Units | Record Number | Expiry Date |
|---|---|---|---|
| Bogg 15 | 20 | 2425 | Sept. 1988 |
| Bogg 16 | 20 | 2426 | Sept. 1988 |
| Bogg 18 | 20 | 2427 | Sept. 1988 |
| Total Units | 60 | | |

NOTE There is an overstaking of a total of 4 metric units of Bogg 7 by Bogg 20.

The expiry dates shown takes into account the work described within this report as being accepted for assessment credits.

Claims 1-4, 7, 8 and 9 were acquired under option by Geotech Capital Corp., from G.H. Rayner & Associates Ltd. of Vancouver, B.C. Claims 10-13 and 15-20 are owned by Geotech Capital Corp.

## LOCATION AND ACCESS

The Bogg claim group is located about 30 km northwest of Little Fort, Ta Hoola Lake area, Kamloops and Clinton Mining Divisions.

The geographical coordinates for the center of the property are 51° 37' north latitude and 120° 32' west longitude.

Access to the property is gained by travelling east of Highway 24 from 100 Mile House to a point appoximately 19 km east of the Bridge Lake post office. From this point a 4-wheel drive logging and mining road continues 24 km in a northerly direction to the property.

## PHYSIOGRAPHY

The property occurs within the southern part of the Fraser Plateau, a physiographic division of the Interior Plateau System. The terrain is gentle to moderate over most of the property, as it crosses a hilltop and valley 4 kilometres northeast of Jim Creek. The elevations vary from 1,375 m to 1,650 m to give an elevation difference of 275 m.

The vegetation consists mainly of lightly- to moderately-dense stands of aspen and pine with light underbrush.

## HISTORY

The history of this property is summarized from a geological report by Croome.

Prior to 1966 Anaconda American Brass, Western Exploration Division, staked the property as the Ro and So claims. After extensive geological, geochemical, geophysical and diamond drilling programmes aimed at copper produced little results, the claims were allowed to lapse in 1971.

The claims were restaked as the Bogg claims in 1971 by G.H. Rayner and leased to Prism Resources Ltd. until 1973.

Cities Service Minerals Corp. then optioned the property and carried out extensive copper exploration which included geological, geophysical and drilling programmes.

Commonwealth Minerals Ltd. of Vancouver conducted line cutting and soil sampling in 1980, analyzing for copper, lead and silver.

Geotech Capital Corp. optioned the Bogg claims in May 1987 and commenced a programme of exploration aimed at gold and silver. Three km of base line with 950-metre long traverse lines at 50 metre intervals were established. 2,257 soil samples were taken at 25 metre intervals and analyzed for gold, silver and arsenic. Several anomalous gold zones were indicated within the grid boundaries.

In October 1987 the grid was extended to the northwest and southwest, with soil samples taken on the extensions. The assays for gold, silver and arsenic indicated the extension of the anomalous gold zones, especially No. 1 to the north.

## GEOLOGY

The following is quoted from Croome's report:

1. Regional

"The Bogg Claims are located in that area referred to as the Quesnel Trough. The Quesnel Trough (Roddick et al 1967) applies to a long narrow strip of predominately Lower Mesozoic and mainly volcanic rocks that lies between Proterozoic and Paleozoic strata of the Omineca Geanticline to the east and the Upper Paleozoic rocks of the Pinchi Anticline to the west (SK GC-3). The trough extends from below the 49th Parallel into Northern British Columbia."

"The oldest rocks of the Quesnel Trough are the Upper Triassic black phyllite unit and the Nicola Group. The former consists of dominantly dark grey to black phyllite with local thin limestone beds, with different grades of metamorphism. The peltic rocks vary from shale to kyenite schist. The unit lies generally along the eastern margin of the Trough, where it appears to be the basal unit resting unconformably on the strata of the Omineca Geanticline."

"The Nicola Group consists dominantly of volcanic-clastic rocks of basic to intermediate composition. Minor intercalations of limestone and argillite are present and locally prominent. The rocks are unmetamorphosed or mildly altered. The group may overlie or be all or partly equivalent to the black phyllite, so that these two units together effectively form the basal member of the Quesnel Trough."

"The rocks vary in composition from hornblende-biotite granodiorite to quartz diorite; prominent porphyritic textures are exceptional. These plutons lie in a broad zone that trends northwesterly."

"Jurassic volcanic and sedimentary rocks are mapped as two units, a volcanic clastic unit similar to the Nicola Group and a sedimentary unit. The Jurassic volcanic-clastic assemblage is characterized by coarse augite porphyry breccia and fine grained, well bedded rocks. Locally, the base of the unit is marked by coarse conglomerate containing clasts of Nicola and Cache Creek rocks. Although the intervals between marine Triassic deposition and marine Jurassic deposition was marked by intrusion, uplift and erosion, volcanism was probably more or less continuous."

"Along the western side of the Quesnel Trough, Lower and Middle Jurassic shale, greywacke and conglomerate rest unconformably on the Cache Creek Group of the Pinchi Geanticline and possibly on the Nicola Group. The base is common boulder to pebble conglomerate."

"The distribution of the tertiary rocks is super-imposed on the pre-Tertiary geology in SK GC-4. The Tertiary geology falls into two distinct units - lower Tertiary sedimentary and fragmental basic rocks varying from basalt to rhyolite with abundant andesite and upper Tertiary dominantly basaltic plateau lava. The lower Teriary are gently tilted, whereas the upper Tertiary lavas are flat-lying and undeformed."

## 2. Property

The following is summarized from Croome's report:

The property has been mapped on two separate occasions. A reconnaissance survey done by Campbell and Tipper (1971), indicated Nicola volcanic rocks of Upper Triassic age to be encompassed by the Bogg claim group. A more detailed study by Preto (1970) showed the presence of a second major unit, composed of intrusive rocks ranging in composition from leucogranite to leucosyenite, and of probable Upper Triassic or Lower Jurassic age. The Bogg claim group is very much drift-covered, with outcrops occurring infrequently.

Volcanic breccia and/or agglomerate occurs often on the property. The rock is highly fragmented, consisting mostly of massive, green andesite with fine-grained tuffaceous material. The most abundant type of Nicola rocks on the property is an aphanitic, thinly-bedded, light-green rock that is interpreted as being a marine tuff, and occurs predominantly on the western part of the property. Sulphides occurring on the property include pyrite, chalcopyrite, and galena, most of which appear to have been superimposed on Nicola rocks during an episode of hydrothermal mineralization. A small proportion of disseminated pyrite suggests an earlier low-grade metamorphic event.

The term leucosyenite is used for a group of plutonic rocks predominantly throughout the southern part of the claim group. This group is not entirely syenitic in composition, but includes granitic and monzonitic varieties occurring as part of a single unit.

A small mass of monzonite was found along the main road across the northern part of the property. A steep grade was also found where a monzonite dyke or dykes about three metres wide contain much chalcopyrite as both disseminated and fracture-filling.

The pyroxenite occurring on the property is almost purely composed of pyroxene, and occurs as dykes or seams varying from only a few millimetres to three metres or more in width dipping vertically.

3. <u>Mineralization</u>

Values in copper, with minor gold, lead, and silver, were found in stream silt sediment samples in the vicinity of stocks. Lead and silver, with minor amounts of copper, were found along shear zones in intensely altered volcanic rocks. Copper in quartz stockwork occurs in granitic rocks of the Thuya batholith.

Locally southeast of the Bogg claims, sulphide mineralization reporting values of gold and copper is found in the area of Deer Lake in volcanic rocks and limestones that have been locally altered to skarn. East of the Bogg claims, about 900 metres north of Friendly Lake, exploration has shown a zone of argentiferous galena mineralization within a shear zone striking N60°W and dipping 65° to the southwest.

The following is quoted from Croome's report:

"Adjacent to leucogranite and leucosyenite porphyry stocks in the Bogg Claims area, and also immediately east of the stockwork (designated as Map unit 5, see GC-6) several occurrences of chalcopyrite, pyrite, galena and tetrahedrite have been found in altered volcanics and intrusive rocks. Sulphides are found either along fractures or disseminated throughout the altered rocks."

"Stream sediment samples were taken on the Bogg claims giving interesting gold results."

"A geochemical assessment report on the Bogg Mineral claims was conducted in July, 1986. Stream sediment samples were taken in limited areas within the area sampled for the strongest gold values ranging up to 1,750 ppb gold in the heavy mineral fraction, and to 940 ppb gold in the minus 80 mesh fraction, are located within and adjacent to the shallow physiographic linear depression which trends north-westerly from Ta Hoola Lake. Of equal importance are the lesser, but persistent, gold samples in the 50 ppb range in several adjacent creeks."

## INSTRUMENTATION

The transmitter used for the induced polarization-resistivity surveys was a Model IPT-1, manufactured by Phoenix Geophysics Ltd. of Markham, Ontario. It was powered by a 2.5 kw motor-generator, Model MG-2, also manufactured by Phoenix.

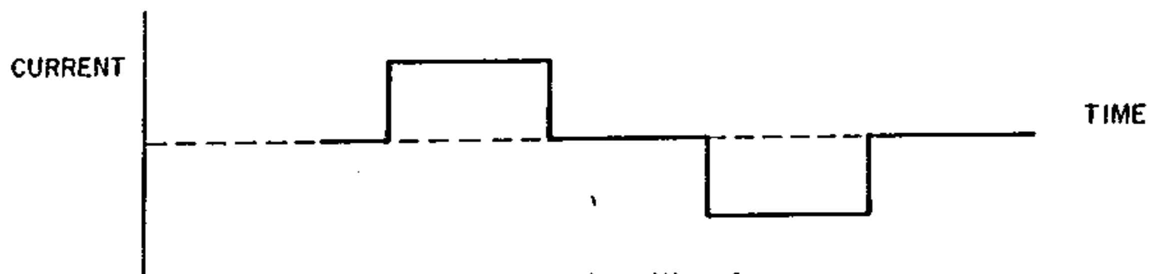
The receiver used was a model Mark IV manufactured by Huntec ('70) Limited of Scarborough, Ontario. This is state-of-the-art equipment, with software-controlled functions, programmable through the front panel.

The Mark IV system is capable of time domain, frequency domain, and complex resistivity measurements.

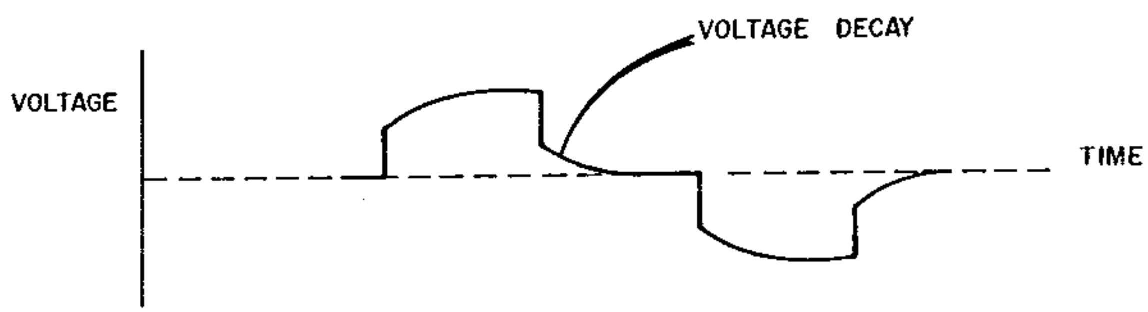
THEORY

When a voltage is applied to the ground, electrical current flows, mainly in the electrolyte-filled capillaries within the rock. If the capillaries also contain certain mineral particles that transport current by electrons (most sulphides, some oxides and graphite), then the ionic charges build up at the particle-electrolyte interface, positive ones 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. When the current is switched off, the created voltage slowly decreases as the accumulated ions diffuse back into the electrolyte. This type of induced polarization phenomenon is known as electrode polarization.

A similar effect occurs if clay particles are present in the conducting medium. Charged clay particles attract oppositely-charged ions from the surrounding electrolyte; when the current stops, the ions slowly diffuse back to their equilibrium state.




Transmitted Waveform




Recorded Voltage

This process is known as membrane polarization and gives rise to induced polarization effects even in the absence of metallic-type conductors.

Most IP surveys are carried out by taking measurements in the "time-domain" or the "frequency-domain".

Time-domain measurements involve sampling the waveform at intervals after the current is switched off, to derive a dimensionless parameter, the chargeability, "M" which is a measure of the strength of the induced polarization effect. Measurements in the frequency-domain are based on the fact that the resistance produced at the electrolyte-charged particle interface decreases with increasing frequency. The difference between apparent resistivity readings at a high and low frequency is expressed as the percentage frequency effect, "PFE".

The quantity apparent resistivity, $\rho_a$ , computed from electrical survey results is only the true earth resistivity in a homogeneous sub-surface. When vertical (and lateral) variations in electrical properties occur, as they always will in the real world, the apparent resistivity will be influenced by the various layers, depending on their depth relative to the electrode spacing. A single reading cannot therefore be attributed to a particular depth.

The ability of the ground to transmit electricity, in the absence of metallic-type conductors, almost completely depends on the volume, nature and content of the pore space. Empirical relationships can be derived linking the formation resistivity to the pore water resistivity, as a function of porosity. Such a formula is Archie's Law, which states (assuming complete saturation) in clean formations:

$$\frac{Ro}{Rw} = 0^{-2}$$

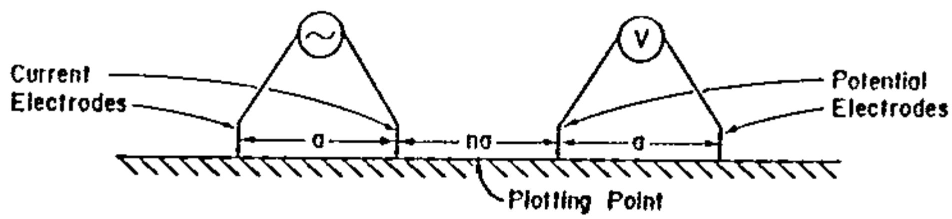
Where: Ro is formation resistivity
Rw is pore water resistivity
0 is porosity

**SURVEY PROCEDURE**

The IP and resistivity measurements were taken in the time-domain mode using an 8-second square wave charge cycle (2-seconds positive charge, 2-seconds off, 2-seconds negative charge, 2-seconds off). The delay time used after the charge shuts off was 200 milliseconds and the integration time used was 1,500 milliseconds divided into 10 windows.

The array chosen was the dipole-dipole array shown as follows:

DIPOLE-DIPOLE ARRAY




The dipole length ('a') was chosen to be 30 m for all of the lines. All lines were read from one to three levels ('n'), with the exception of line 30+00, which was read to five levels at its northern end.

The dipole-dipole array was chosen because of its symmetry resulting in a greater reliability in interpretation. Furthermore, narrow, vein-like targets which occur within the area, can be missed by non-symmetrical arrays such as the pole-dipole.

Stainless steel stakes were used for current electrodes, and porous pots filled with a copper salt solution were used for the potential electrodes.

Readings were taken over eight different lines as shown on the survey plan (map 3) to give a total survey length of 5,760 m.

## COMPILATION OF DATA

The IP (chargeability) values are read directly from the instrument and no data processing is therefore required prior to plotting. The resistivity values are derived from current and voltage readings taken in the field. These values are combined with the geometrical factor appropriate for the dipole-dipole array to compute the apparent resistivities.

The IP and resistivity surveys were conducted with eight parallel grid lines striking at 45°, which were drafted in plan form on maps 3 and 4, at a scale of 1:2,500. These two maps also show the results of the IP and resistivity surveys, respectively, plotted and contoured for level n=1. The plan view of the contoured data was chosen to show at a glance the general trends of the anomalies discussed below.

To produce each pseudosection, each value is plotted at a point formed from the intersection of a line drawn at 45° from the mid-point of each of the two dipoles. The IP and resistivity pseudosections for each of the lines 29+00 to 36+00 have been plotted in a stacked manner on maps 5 to 12, respectively.

The resistivity results were contoured at a logarithmic interval and the IP (chargeability) results were contoured at a 10-msec interval.

## DISCUSSION OF RESULTS

The most obvious feature of the IP and resistivity surveys that is best seen on the survey plans (maps 3 and 4), is the northerly trend to very strong anomalies. This is of strong exploration interest since the gold soil anomalies appear to trend in the same direction. A characteristic of these anomalies is that the IP highs correlate with resistivity lows and, conversely, resistivity highs correlate with IP lows. This is not, however, strictly the case, since some moderate IP highs correlate with moderate resistivity highs.

For ease of discussion, the anomalies have been labelled by the capital letters A to E, respectively.

Anomaly A is the most prominent feature of the IP survey. It consists of an IP high correlating with a resistivity low. This anomaly dips westerly, with a minimum depth of 60 metres, and is open to depth. The minimum strike length of 800 metres is open to the north and south, and though the IP and resistivity values appear to diminish at the extreme ends, they are still strong at depth. The IP values are commonly above 100 msec with 154 msec being the highest value. The resistivity values are typically below 100 ohm-m with 20 ohm-m being the lowest value.

Anomaly A occurs along, and thus correlates with, a topographic depression (or bench on line 36+00). This is not surprising because of the low resistivity values. This suggests the causative source of this anomaly is a fault, shear, or fracture zone that is heavily mineralized with sulphides. Since gold is known to occur with sulphides on adjacent properties, and since anomalous gold soil geochemistry results occur discontinuously along anomaly A, it follows that gold values likely occur within anomaly A.

An alternative possible cause of anomaly A is a recessive mineralized rock-type such as a graphitic shale or a pyritic argillite. However, it must be remembered that it would probably still be important as a marker horizon for locating the gold mineralization. For example, within some gold properties, a graphitic zone occurs adjacent to the gold mineralized zone.

A very interesting feature of anomaly A is the northwesterly-trending arm, labelled A', occurring within the middle of the survey area (see map 3). This feature is indicative of cross structure, and because of its excellent correlation with a gold soil anomaly, is a very good exploration target.

Anomaly B has very similar characteristics to A and subparallels it to the west. That is, it trends in a northerly direction, dips to the west, consists of high IP values correlating directly with resistivity low values, has a minimum strike length of 800 m, and is open to the north as well as to the south. Anomaly B is not as strong as A, however, with IP values being commonly above 80 msec with 117 msec being the highest, and resistivity values being commonly below 300 ohm-m with 110 ohm-m being the lowest.

Anomaly B also correlates with a topographic depression. On some lines the depression is rather sharp. Also on two or three of the pseudosections, the resistivity low is somewhat lineal in shape. This therefore suggests more strongly than for anomaly A, that the causative source is a fault or shear zone that is mineralized with sulphides.

There is little correlation of anomalous gold soil geochemistry values with B, indicating that gold values do not occur with the sulphides. However, it is interesting to note that to the immediate west of B within the western corner of the survey area, in the area of the baseline, that a strong gold soil geochemistry anomaly occurs. This indicates gold mineralization that is associated with the causative source of anomaly B.

Anomaly C is a very weak IP high correlating with a moderate resistivity high and occurs to the immediate east of anomaly A. It consists of typical values of 10 to 15 msec, though as high as 30 msec, and typical resistivity values of 300 to 700 ohm-m. It trends northerly, has a minimum strike length of 550 m, and is open to the south.

What is interesting about this anomaly is the consistent correlation with anomalous gold soil geochemistry values. The writer has noted a similar geophysical/geochemical feature on a property he has worked on near Vernon. On this property the resistivity high was due to quartz and ankerite containing some sulphides and gold values. The writer therefore considers anomaly C to be a fairly good exploration target.

Anomaly D is only seen on line 31+00 and consists of an IP high reaching 68 msec correlating with moderately high resistivity values in the 1000 to 1800 ohm-m range. There is no soil geochemistry correlation.

Anomaly E is the strongest resistivity feature. It consists of a resistivity high with values typically above 10,000 ohm-m and an IP low with values typically in the 15 to 35 msec range. The low IP values, of course, are relative, since E occurs in between and adjacent to IP highs A and B.

Anomaly E strikes northerly and appears to dip vertically to westerly. It has a minimum strike length of 800 m being open to the north and to the south.

From discussions with Black and Archer, the cause of the resistivity high is a very hard, competent argillite. As seen on the pseudosections, it forms a topographic ridge. There are some anomalous gold soil geochemistry values correlating with E.

The very strong gold soil geochemistry values on the property are strongly indicative of gold on the property. It may be difficult to ascertain where the lode sources of this gold occur because of the soil transport by glaciation in the area. Due to the somewhat discontinuous nature of the gold anomalies, one should not expect to always see good correlation between the geophysics anomalies and the soil geochemistry anomalies.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

Patrick Cruickshank,
Geophysicist

August 29, 1988

47/G430

## REFERENCES

Archer, Gordon, verbal discussions, 1988.

Black, Philip, Ph.D., verbal discussions, 1988.

Croome, N.C., P.Eng., (Revised) Report on Geotech Capital Corp., Bogg Mineral Claims, Ta Hoola Lake Area, Kamloops M.D., N.C. Croome & Associates Ltd., August 5, 1987.

# 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 located at #530-800 West Pender Street, Vancouver, British Columbia.

I further certify:

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

2. I have been practising my profession for the past 20 years and have been active in the mining industry for the past 23 years.

3. This report is compiled from data obtained from induced polarization and resistivity surveys carried out by a crew of Geotronics Surveys Ltd., under the supervision of myself and under the field supervision of Tracy Campbell, geophysicist, from July 3 to 20, 1988.

4. I hold no direct nor indirect interest in Geotech Capital Corp. nor in the properties discussed in this report, nor do I expect to receive any interest as a result of writing this report.

David G. Mark
Geophysicist

August 29, 1988
47/G430

## GEOPHYSICIST'S CERTIFICATE

I, M.A. PATRICK CRUICKSHANK, 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 located at 530-800 West Pender Street, Vancouver, British Columbia.

I further certify:

1. I am a graduate of the University of British Columbia (1986) and hold a B.A.Sc. degree in Geophysics Engineering.
2. I have been practising my profession for over two years.
3. I am registered with the British Columbia Association of Professional Engineers as an Engineer-in-Training, in geophysics.
4. This report is compiled from data obtained from induced polarization and resistivity surveys carried out by a crew of Geotronics Surveys Ltd. under the supervision of David G. Mark, geophysicist, and under the field supervision of Tracy Campbell, geophysicist, from July 3 to 20, 1988.
5. I hold no direct nor indirect interest in Geotech Capital Corp. nor in the properties discussed in this report, nor do I expect to receive any interest as a result of writing this report.

Patrick Cruickshank
Geophysicist

August 29, 1988
47/G430

## AFFIDAVIT OF EXPENSES

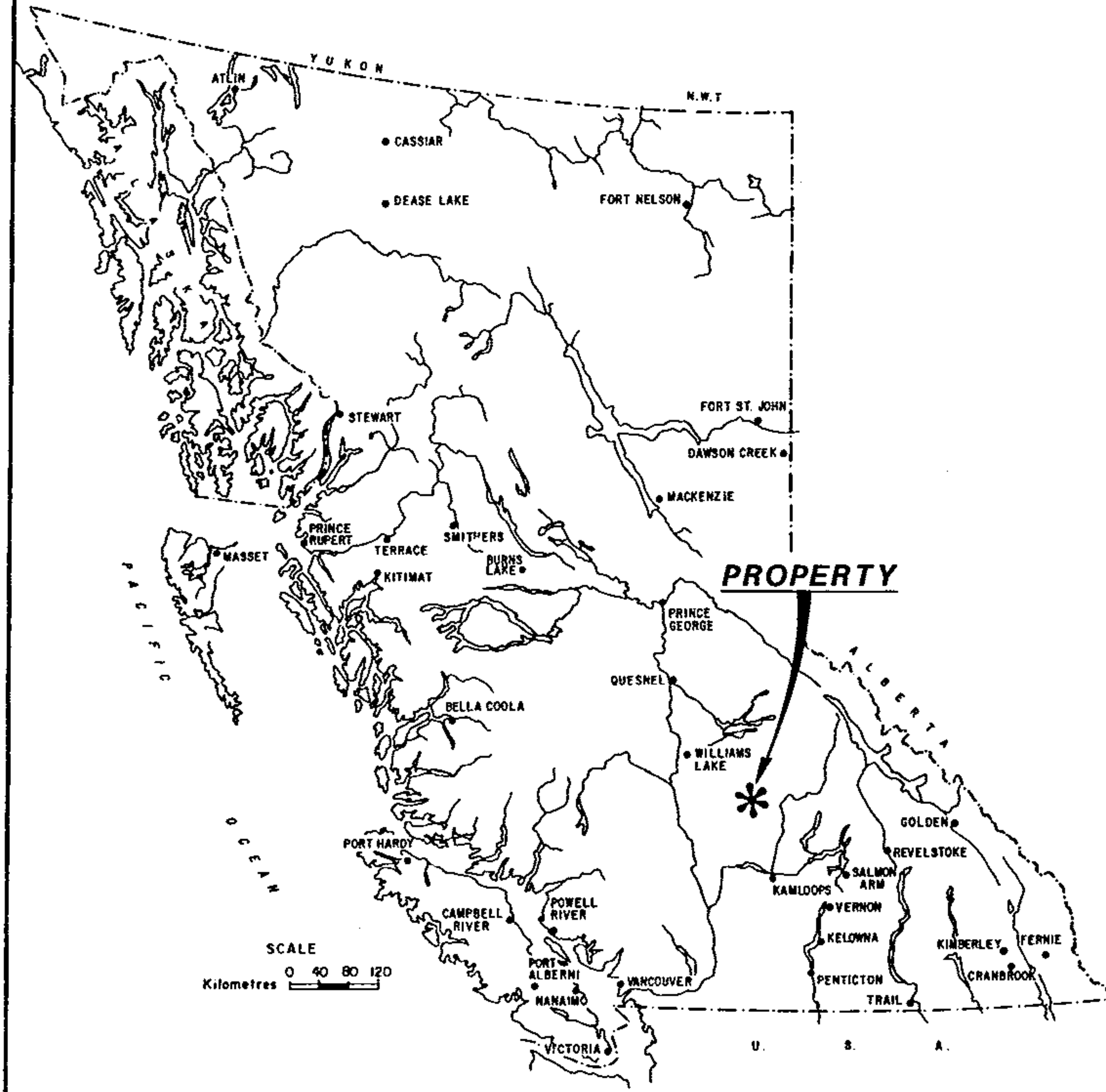
This is to certify that I caused IP and resistivity surveys to be carried out on the Bogg Claim Group in the Ta Hoola Lake area of the Kamloops and Clinton mining divisions from July 3rd to 20th, 1988, to the value of the following:

| | |
|---|---|
| **FIELD:** | |
| Mob-demob, at cost | $ 3,924 |
| 4-man crew, all inclusive field costs, 10 days @ $1500/day | 15,000 |
| | $18,924 |
| **OFFICE:** | |
| Senior geophysicist, 10 hours @ $45/hour | $ 450 |
| Junior geophysicist, 30 hours @ $35/hour | 1,050 |
| Geophysical technician, 12 hours @ $25/hour | 300 |
| Drafting and printing | 1,350 |
| Typing, photocopying and compilation | 250 |
| | $ 3,400 |
| GRAND TOTAL | $22,324 |

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark, Geophysicist
Manager

47/G430




GEOTRONICS SURVEYS LTD.

**GEOTECH CAPITAL CORP.**

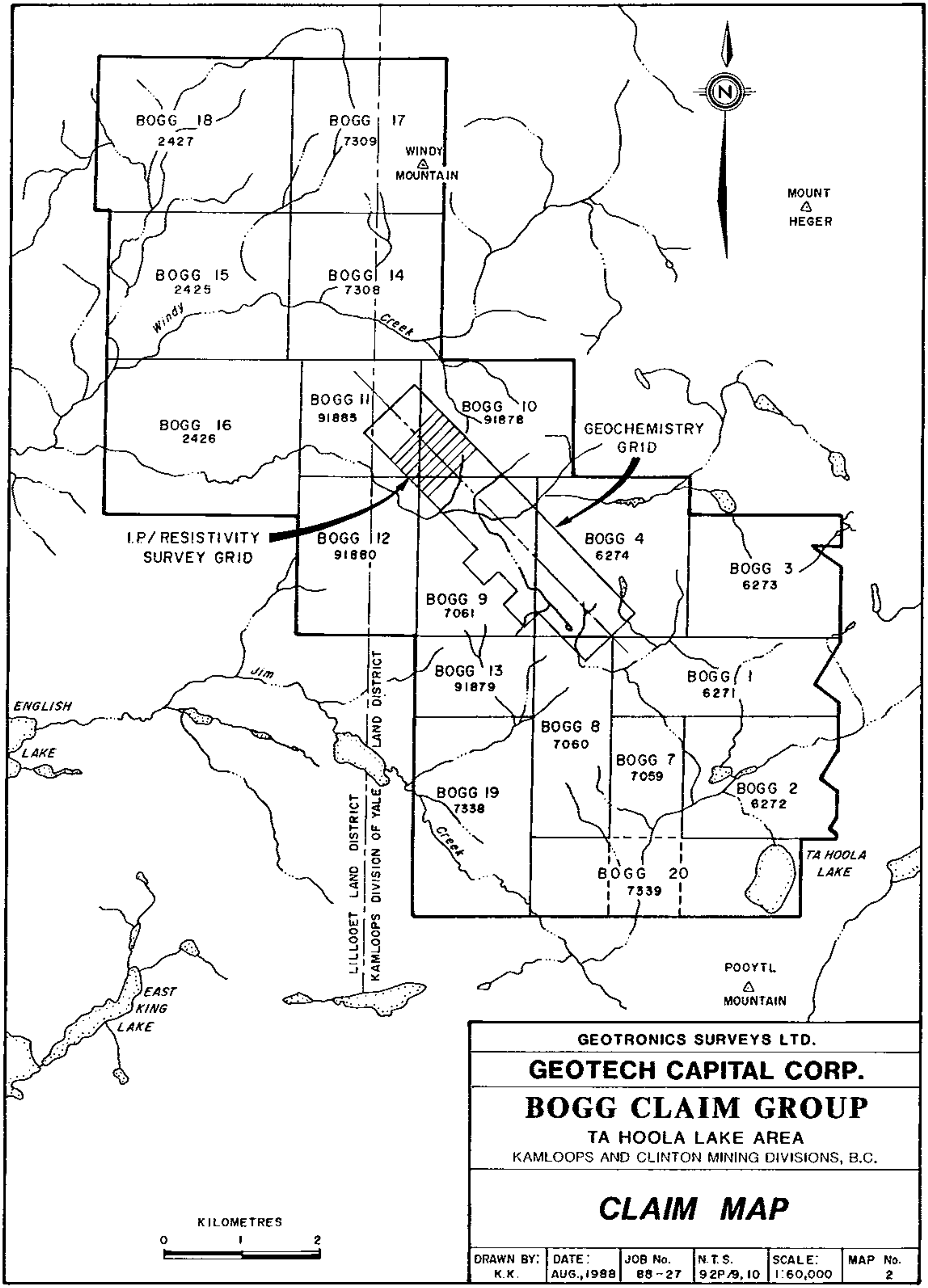
# BOGG CLAIM GROUP

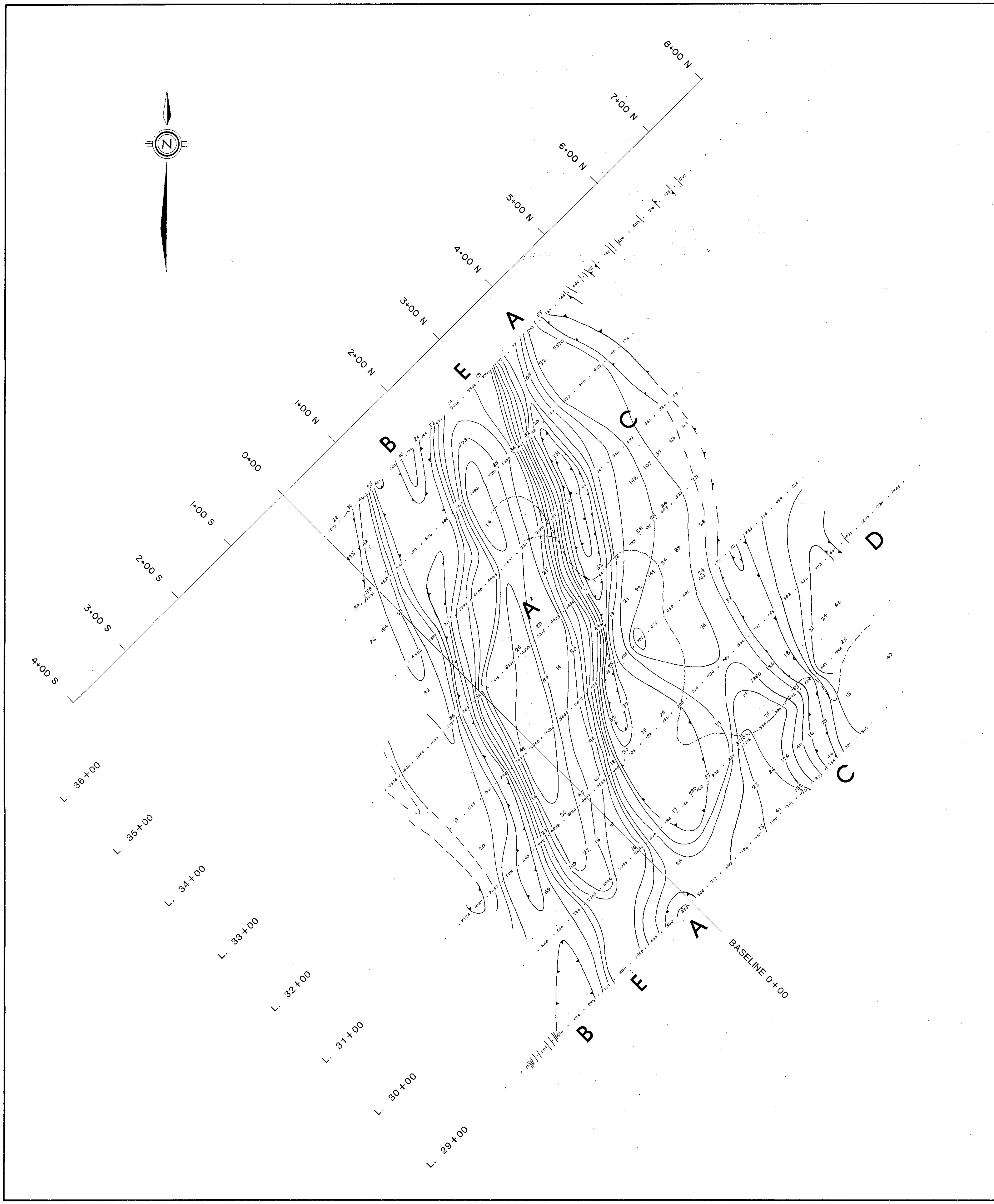
TA HOOLA LAKE AREA

KAMLOOPS AND CLINTON MINING DIVISIONS, B.C.

## *LOCATION MAP*

| DRAWN BY: | DATE: | JOB No. | N.T.S. | SCALE: | MAP No. |
|---|---|---|---|---|---|
| K.K. | AUG., 1988 | 88 - 27 | 92P/9, 10 | 1:8,000,000 | 1 |


BOGG 18
2427
BOGG 17
7309
WINDY MOUNTAIN
MOUNT HEGER
BOGG 15
2425
BOGG 14
7308
Windy Creek
BOGG 16
2426
BOGG 11
91885
BOGG 10
91878
GEOCHEMISTRY GRID
I.P./RESISTIVITY SURVEY GRID
BOGG 12
91880
BOGG 4
6274
BOGG 3
6273
BOGG 9
7061
BOGG 13
91879
BOGG 1
6271
Jim Creek
ENGLISH LAKE
LILLOOET LAND DISTRICT
KAMLOOPS DIVISION OF YALE LAND DISTRICT
BOGG 8
7060
BOGG 7
7059
BOGG 19
7338
BOGG 2
6272
BOGG 20
7339
TA HOOLA LAKE
POOYTL MOUNTAIN
EAST KING LAKE
KILOMETRES
0
1
2
GEOTRONICS SURVEYS LTD.
GEOTECH CAPITAL CORP.
BOGG CLAIM GROUP
TA HOOLA LAKE AREA
KAMLOOPS AND CLINTON MINING DIVISIONS, B.C.
CLAIM MAP
DRAWN BY: K.K.
DATE: AUG., 1988
JOB No. 88-27
N.T.S. 92P/9,10
SCALE: 1:60,000
MAP No. 2




LEGEND

INSTRUMENTATION

Receiver: Huntec Model MK. IV

Transmitter/Generator: Phoenix MG2, 2.5 kwatt

SURVEY PARAMETERS

Survey Mode: Time Domain

Array: Dipole-Dipole

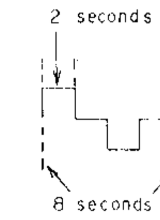
Dipole Length: 30 metres (100 feet)

Dipole Separation: n-1 to n-3

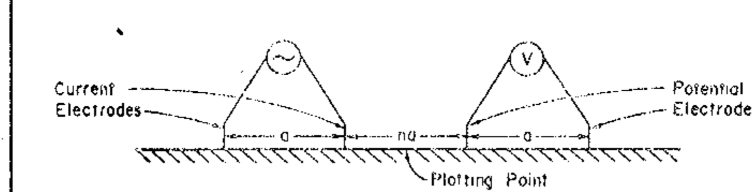
Delay Time: 200 milliseconds

Integration Time: 1500 milliseconds

Charge Cycle: 8 seconds square wave




DIPOLE-DIPOLE ARRAY




RESISTIVITY LOW

ROAD

CONTOURS: 70, 100, 200, 300, 500, 700, 1000, 2000, 3000, 5000, 7000, 10000

74 Gold Geochemistry Values (ppb)

NOTE: Gold geochemistry values added for correlation.

GEOLOGICAL BRANCH ASSESSMENT REPORT

17,968

METRES 0 50 100

To accompany geophysical report by DAVID G. MARK, geophysicist, August, 1988.

GEOTRONICS SURVEYS LTD.

GEOTECH CAPITAL CORP.

BOGG CLAIM

TA HOOLA LAKE AREA

KAMLOOPS AND CLINTON MINING DIVISIONS, B. C.

*RESISTIVITY SURVEY*

*APPARENT RESISTIVITY n = 1*

*DATA AND CONTOURS*

| DRAWN BY: | DATE | JOB No. | N.T.S. | SCALE | MAP No. |
|---|---|---|---|---|---|
| T.C. | AUG., 1988 | 88-27 | 92P/9,10 | 1:2500 | 3 |


LEGEND

INSTRUMENTATION

Receiver: Huntec Model MK. IV

Transmitter/Generator: Phoenix MG2, 2.5 kwatt

SURVEY PARAMETERS

Survey Mode: Time Domain

Array: Dipole-Dipole

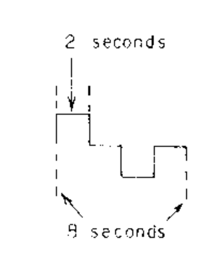
Dipole Length: 30 metres (100 feet)

Dipole Separation: n-1 to n-3

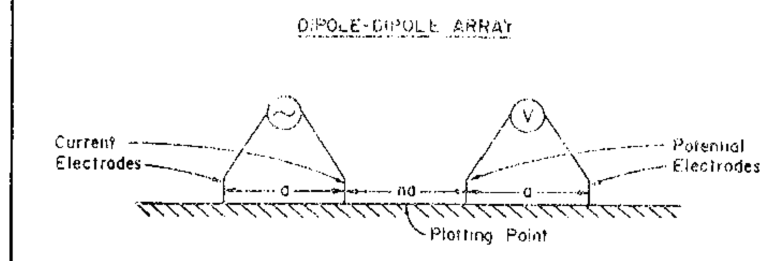
Delay Time: 200 milliseconds

Integration Time: 1500 milliseconds

Charge Cycle: 8 seconds square wave




DIPOLE-DIPOLE ARRAY




ROAD

CHARGEABILITY LOW

CONTOUR INTERVAL: 10 milliseconds

74 Gold Geochemistry Values (ppb)

NOTE: Gold geochemistry values added for correlation.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,968

METRES
0 50 100

To accompany geophysical report by DAVID G. MARK, geophysicist, August, 1988.

GEOTRONICS SURVEYS LTD.

GEOTECH CAPITAL CORP.

BOGG CLAIM

TA HOOLA LAKE AREA

KAMLOOPS AND CLINTON MINING DIVISIONS, B. C.

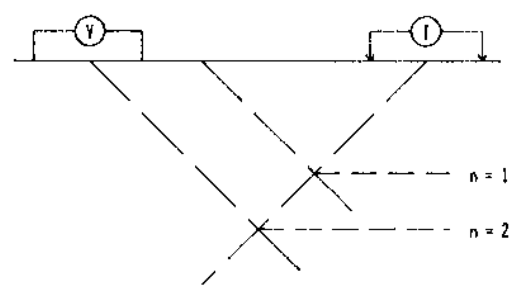
*INDUCED POLARIZATION SURVEY*

*APPARENT CHARGEABILITY n = 1*

*DATA AND CONTOURS*

| DRAWN BY: | DATE: | JOB No. | N.T.S. | SCALE | MAP No. |
|---|---|---|---|---|---|
| T.C. | AUG, 1988 | 88-27 | 92P/9,10 | 1: 2500 | 4 |


Pseudosection Plotting Method




## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

### INSTRUMENTATION

| | |
|---|---|
| Receiver: | Huntec Model MK. IV |
| Transmitter/Generator: | Phoenix MG2, 2.5 kWatt |

### SURVEY PARAMETERS

| | |
|---|---|
| Survey Mode: | Time Domain |
| Array: | Double-Dipole |
| Dipole Length: | 100 feet(30 metres) |
| Dipole separation: | n=1 to 3 |
| Delay Time: | 200 milliseconds |
| Integration Time: | 1500 milliseconds |
| Charge Cycle: | 8 second square wave |

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,968

GEOTECH CAPITAL CORPORATION

Geotronics Surveys Ltd.

# BOGG CLAIM PROJECT

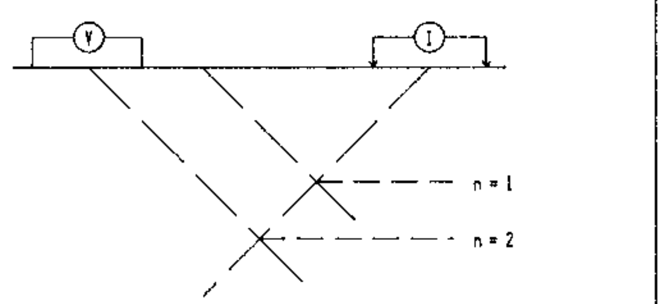
Kamloops Mining Division B.C.

## APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS I.P. LINE 29

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 5 |




Pseudosection Plotting Method




## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

### INSTRUMENTATION

Receiver: Huntec Model MK. IV
Transmitter/Generator: Phoenix MG2, 2.5 kWatt

### SURVEY PARAMETERS

Survey Mode: Time Domain
Array: Double-Dipole
Dipole Length: 100 feet(30 metres)
Dipole separation: n=1 to 3
Delay Time: 200 milliseconds
Integration Time: 1500 milliseconds
Charge Cycle: 8 second square wave

GEOTECH CAPITAL CORPORATION

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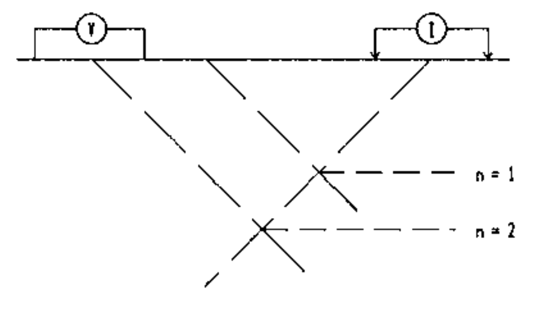
# BOGG CLAIM PROJECT

Kamloops Mining Division B.C.

APPARENT RESISTIVITY and CHARGEABILITY
PSEUDOSECTIONS
I.P. LINE 30

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 6 |


Pseudosection Plotting Method




## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

### INSTRUMENTATION

| | |
|---|---|
| Receiver: | Huntec Model MK. IV |
| Transmitter/Generator: | Phoenix MG2, 2.5 kWatt |

### SURVEY PARAMETERS

| | |
|---|---|
| Survey Mode: | Time Domain |
| Array: | Double-Dipole |
| Dipole Length: | 100 feet(30 metres) |
| Dipole separation: | n=1 to 3 |
| Delay Time: | 200 milliseconds |
| Integration Time: | 1500 milliseconds |
| Charge Cycle: | 8 second square wave |

GEOLOGICAL BRANCH ASSESSMENT REPORT

17,968

GEOTECH CAPITAL CORPORATION

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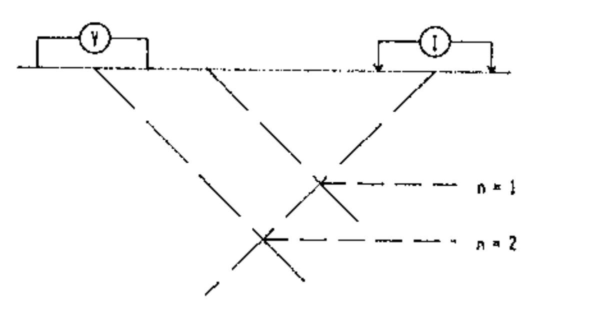
# BOGG CLAIM PROJECT

Kamloops Mining Division B.C.

APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS I.P. LINE 31

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 7 |


## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

### INSTRUMENTATION

Receiver: Huntec Model MK. IV
Transmitter/Generator: Phoenix MG2, 2.5 kWatt

### SURVEY PARAMETERS

Survey Mode: Time Domain
Array: Double-Dipole
Dipole Length: 100 feet(30 metres)
Dipole separation: n=1 to 3
Delay Time: 200 milliseconds
Integration Time: 1500 milliseconds
Charge Cycle: 8 second square wave



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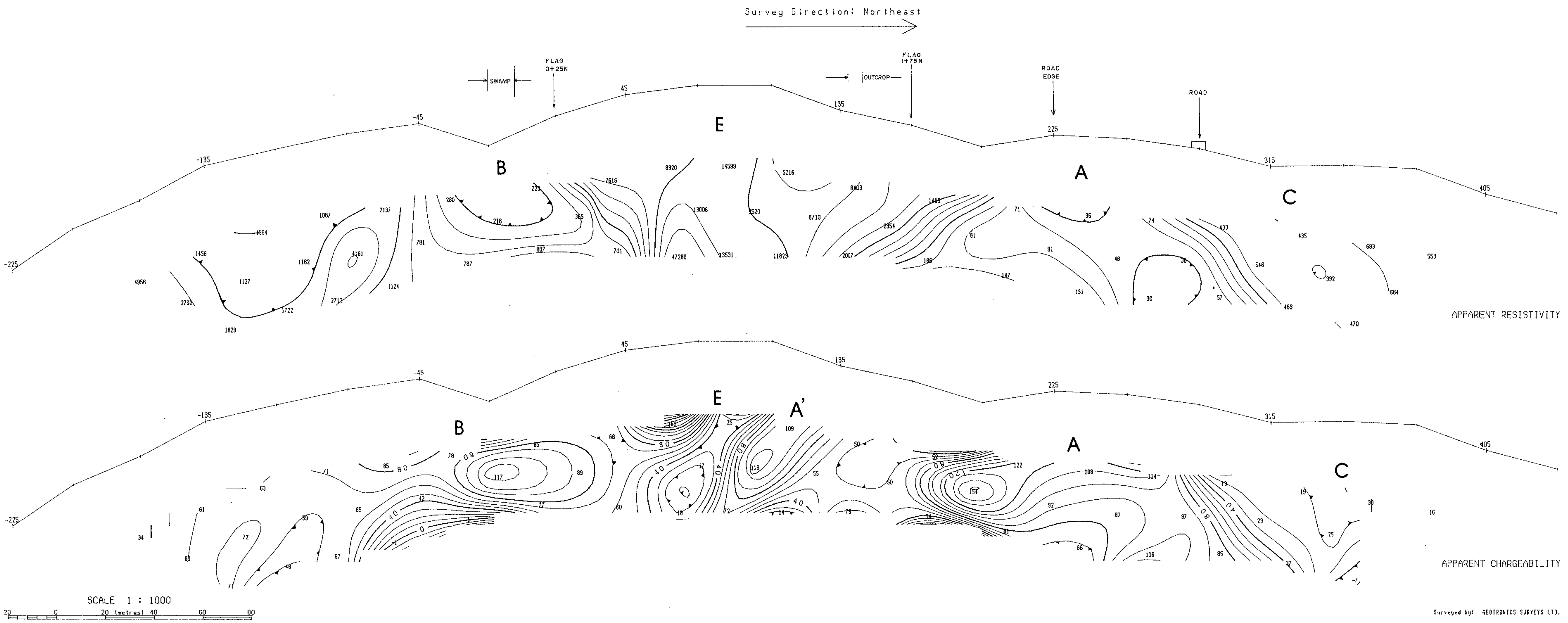
# BOGG CLAIM PROJECT

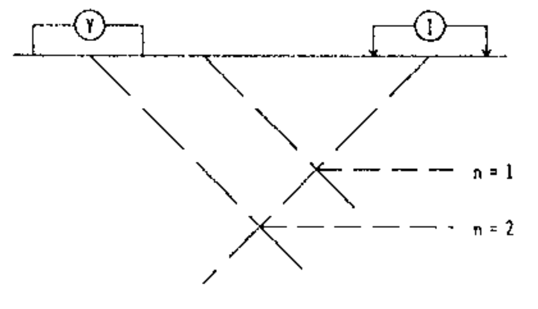
Kamloops Mining Division B.C.

## APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS I.P. LINE 32

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 8 |




Pseudosection Plotting Method




## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

### INSTRUMENTATION

| | |
|---|---|
| Receiver: | Huntec Model MK. IV |
| Transmitter/Generator: | Phoenix MG2, 2.5 kWatt |

### SURVEY PARAMETERS

| | |
|---|---|
| Survey Mode: | Time Domain |
| Array: | Double-Dipole |
| Dipole Length: | 100 feet(30 metres) |
| Dipole separation: | n=1 to 3 |
| Delay Time: | 200 milliseconds |
| Integration Time: | 1500 milliseconds |
| Charge Cycle: | 8 second square wave |



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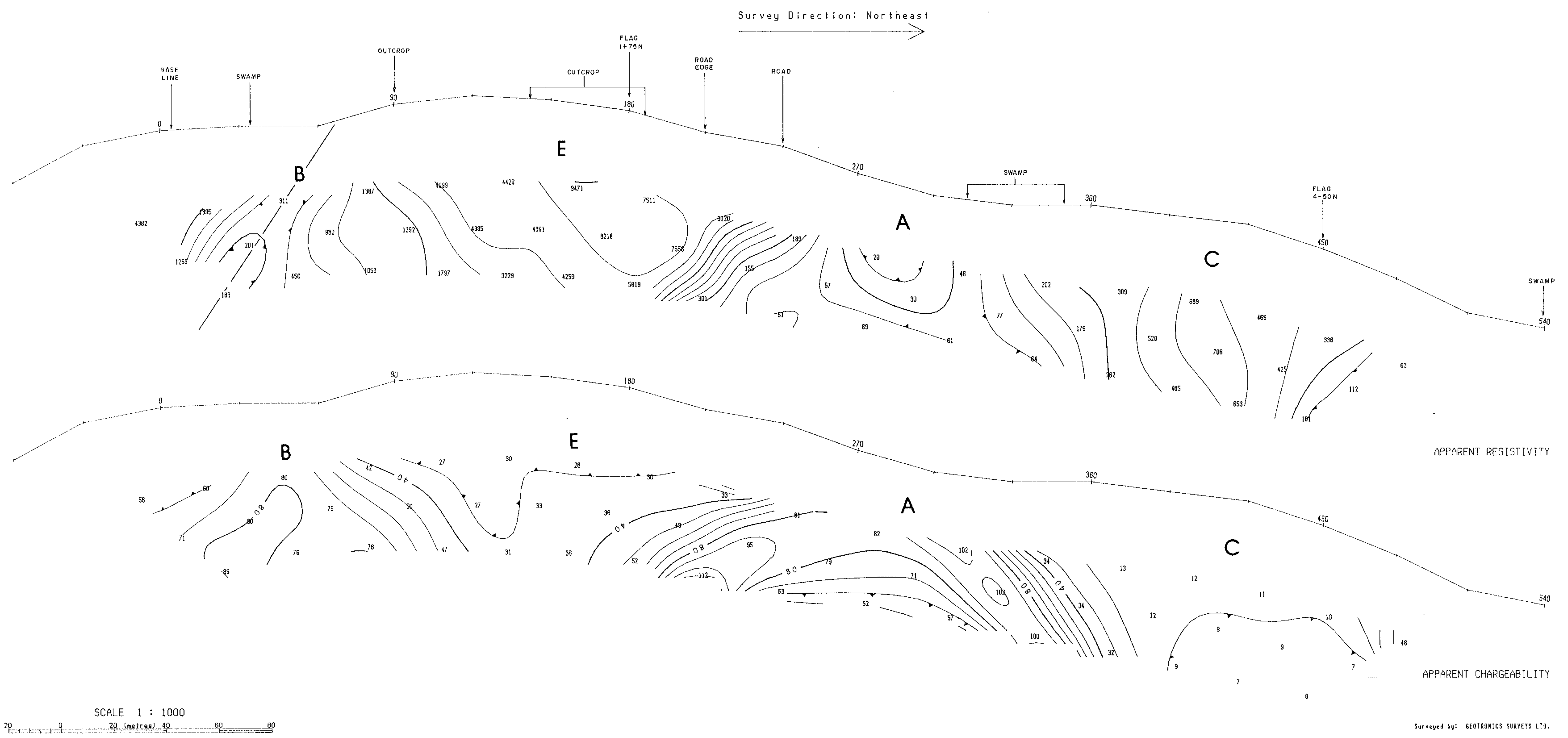
# BOGG CLAIM PROJECT

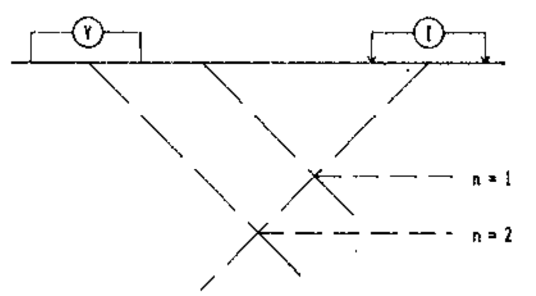
Kamloops Mining Division B.C.

## APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS I.P. LINE 33

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 9 |




Pseudosection Plotting Method




## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

## INSTRUMENTATION

Receiver: Huntec Model MK. IV
Transmitter/Generator: Phoenix MG2, 7.5 kWatt

## SURVEY PARAMETERS

Survey Mode: Time Domain
Array: Double-Dipole
Dipole Length: 100 feet(30 metres)
Dipole separation: n=1 to 3
Delay Time: 200 milliseconds
Integration Time: 1500 milliseconds
Charge Cycle: 8 second square wave

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,968

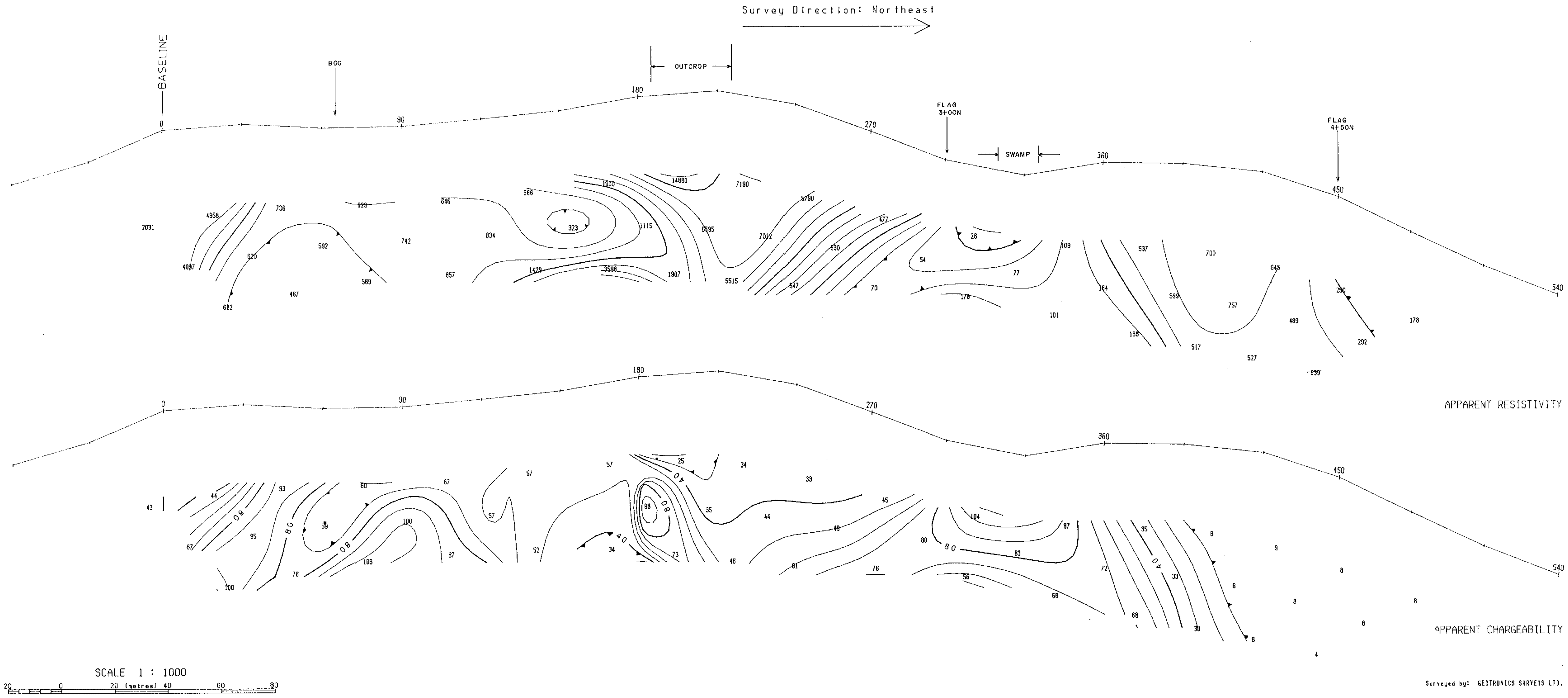
GEOTECH CAPITAL CORPORATION

Geotronics Surveys Ltd.

# BOGG CLAIM PROJECT
Kamloops Mining Division B.C.

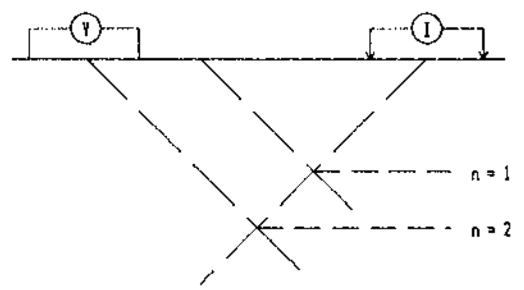
APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS
I.P. LINE 34

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 10 |




Surveyed by: GEOTRONICS SURVEYS LTD.

Pseudosection Plotting Method




## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

### INSTRUMENTATION

| | |
|---|---|
| Receiver: | Huntec Model MK. IV |
| Transmitter/Generator: | Phoenix MG2, 2.5 kWatt |

### SURVEY PARAMETERS

| | |
|---|---|
| Survey Mode: | Time Domain |
| Array: | Double-Dipole |
| Dipole Length: | 100 feet(30 metres) |
| Dipole separation: | n=1 to 3 |
| Delay Time: | 200 milliseconds |
| Integration Time: | 1500 milliseconds |
| Charge Cycle: | 8 second square wave |

GEOLOGICAL BRANCH
ASSESSMENT REPORT

# 17,968

GEOTECH CAPITAL CORPORATION

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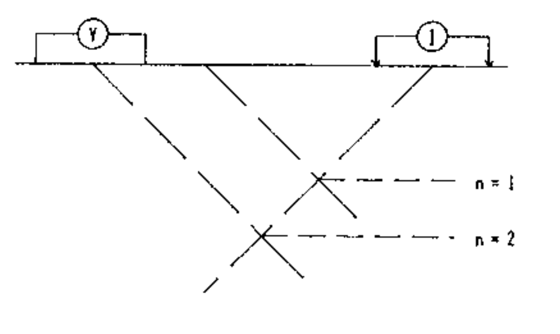
## BOGG CLAIM PROJECT
Kamloops Mining Division B.C.

APPARENT RESISTIVITY and CHARGEABILITY
PSEUDOSECTIONS
I.P. LINE 35

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 11 |


Pseudosection Plotting Method




## LEGEND

Resistivity Contour Interval: log base 10 Ohm-metres
Chargeability Contour Interval: 10 milliseconds

### INSTRUMENTATION

| | |
|---|---|
| Receiver: | Huntec Model MK. IV |
| Transmitter/Generator: | Phoenix MG2, 2.5 kWatt |

### SURVEY PARAMETERS

| | |
|---|---|
| Survey Mode: | Time Domain |
| Array: | Double-Dipole |
| Dipole Length: | 100 feet(30 metres) |
| Dipole separation: | n=1 to 3 |
| Delay Time: | 200 milliseconds |
| Integration Time: | 1500 milliseconds |
| Charge Cycle: | 8 second square wave |

GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,968

GEOTECH CAPITAL CORPORATION

Geotronics Surveys Ltd.

# BOGG CLAIM PROJECT

Kamloops Mining Division B.C.

## APPARENT RESISTIVITY and CHARGEABILITY PSEUDOSECTIONS I.P. LINE 36

| Drawn by: | Job No. | Scale | Date | Map No. |
|---|---|---|---|---|
| Geotronics | 88-27 | 1:1000 | Aug/88 | 12 |