

BC Geological Survey  
Assessment Report  
32039

**GEOPHYSICAL REPORT  
ON AN  
IP/RESISTIVITY SURVEY  
WITHIN THE  
SURPRISE LAKE PROPERTY  
PINE CREEK, ATLIN AREA  
ATLIN MINING DIVISION, BRITISH COLUMBIA**

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**PROPERTY LOCATION:** On Pine Creek 15.7 km 070°E of Atlin,  
British Columbia  
59° 38' N Latitude, 133° 28' W Longitude  
Mineral Titles Maps: M104N053, '54, '63, '64  
N.T.S. - 104N/11

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## **SUMMARY**

Induced polarization (IP), resistivity, and self potential (SP) surveys were carried out on the Surprise Showing Grid. Both grids occur within the Surprise Lake Property owned by Double Crown Ventures. This property is located on Pine Creek at the west end of the Surprise Lake within the Atlin Mining Division of B.C.

The main purpose of the geophysical surveys was to locate gold/silver mineralization, perhaps similar to the nearby Yellowjacket Prospect, which is being explored for by Prize Mining. Here, bonanza-type gold occurs within listwanite and with associated sulphides.

The IP and resistivity surveys were carried out using a BRGM Elrec-6 multi-channel receiver operating in the time-domain mode. The transmitter used was a BRGM VIP 4000 powered by a 6.5-kilowatt motor generator. The dipole length and reading interval chosen was 25 meters read up to 12 levels and carried out over three lines for a total survey length of 4,350 meters. The IP and resistivity results were plotted in pseudosection form and contoured and the SP and magnetic results were profiled above the IP and resistivity pseudosections.

## **CONCLUSIONS**

1. The magnetic survey on the Surprise Grid revealed a strong magnetic anomaly sub-parallel to the base line and to the immediate east of the northerly-trending band of listwanite. It correlates with a resistivity high. The resistivity/magnetic high is probably reflecting an ultrabasic, or possibly basic, rock-type.
2. A second magnetic high, but weaker than the main one and to its east, also correlates with a resistivity high. Thus it also probably reflects an ultrabasic rock-type.
3. The IP survey revealed five chargeability highs that have been labeled by the upper case letters A to E. Anomaly A is the main high and occurs along the western boundary of the main magnetic high with a magnetic low to its west, the low being a reflection of the main band of listwanite. It also correlates with the boundary of a resistivity high and a resistivity low. Therefore, anomaly A is probably reflecting sulphides occurring within a contact zone between an ultrabasic rock type and the listwanite.
4. Anomaly B, also probably reflecting sulphides, occurs to the immediate west of the eastern magnetic high and correlates with a resistivity low. Anomaly C correlates directly with the weaker magnetic anomaly as well as a resistivity high. This suggests that the causative source is sulphides within a basic or ultrabasic intrusive.
5. Anomaly D occurs to the west of anomaly A as well as correlates directly with the listwanite suggesting the listwanite at this location contains sulphides. Anomaly E correlates with the northern end of the main magnetic high as well as a resistivity high suggesting the causative source may be the same as that of anomaly C, that is, sulphides within a basic or ultrabasic intrusive.
6. The VLF-EM survey was very limited in scope, with only three lines done, but it responded with weak conductors, one of them correlating with IP anomaly A. It probably was reflecting the lithological contact that the magnetic and resistivity surveys were reflecting.
7. The MMI soil sampling revealed three two-station anomalies, the first being highly anomalous in silver and gold, the second being anomalous in silver, gold and copper, and the third in zinc and cobalt.

## **RECOMMENDATIONS**

### Surprise Showing Grid

1. The magnetic survey should be continued to the north, east, and west with the same survey parameters, that is, taking a reading every 12.5 meters on lines 50 meters apart. The magnetic survey to date has been particularly adept at mapping the ultrabasic rock types that are related to any possible mineralization.
2. MMI soil sampling should be carried out wherever possible over the grid area. The sampling should be done every 25 meters preferably on the 50-meters lines. If the budget is limited, then the line spacing should be no more than 100 meters.
3. The IP survey should also be continued to the north, east, and west, but on lines 100 meters apart. At this point the IP survey has produced drill targets, but the IP survey should be filled in and extended in order to optimize the drill targets.
4. The grid and surrounding area should also be geologically mapped.
5. Targets resulting from the above work, especially the IP and MMI sampling, should then be diamond drilled.

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**INTRODUCTION AND GENERAL REMARKS**

This report discusses survey procedure, compilation of data, interpretation methods, and the results of induced polarization (IP) and resistivity surveying carried out within the Surprise Lake Property on the Surprise Showing Grid within the month of September, 2010. The property is located to the east of Atlin, BC, at the west end of Surprise Lake and is owned by Double Crown Ventures.

The Surprise Lake Property is a large property that contains two MinFile showings, the Cabin Silver Showing that occurs within the northwestern part of the property, and the Surprise Showing which occurs within the southeast part of the property. The work within this report was done on the Surprise Showing

The property occurs to the immediate east of the Yellowjacket Property which is being put into production by Eagle Plains Resources. The Yellowjacket mineralization occurs along the Pine Creek fault structure and consists of coarse gold hosted in quartz stockworks and silicified zones in brittle volcanic and altered ultramafic rocks.

The 2010 surveying consists of two north-south lines and is a follow-up to IP and resistivity surveying carried out in 2006 when three east-west lines were done. The purpose of the 2010 work was to optimize the drill targets based on work done on the property to date. Within this report the data from the 2006 IP and resistivity surveying has been re-reduced in order to align the 2006 data with the 2010 data because of up-dated software. Therefore, all five IP lines are presented within this report.

The general purpose of IP is to respond to sulphide mineralization especially that which occurs as fracture-filling and/or disseminated. The size of the IP anomaly is directly related to the surface area of the sulphides and thus fracture-filling and disseminated sulphides give a much higher anomalous reading than massive sulphides do. It was thus expected that the IP method would give the best results to the known mineralization on this property since it

appears that much of the gold mineralization occurs as, or is associated with, disseminated or fracture-filling sulphides.

The general purpose of the resistivity surveying is to reflect the mineral zones by responding as lows to any geological structure and/or alteration, or as highs to silicification and/or calcification any of which may be associated with mineralization. For geological mapping, the resistivity method is particularly adept at mapping lithology since all rock types have their own resistivities, i.e., intrusives usually respond as resistivity highs and argillites usually respond as resistivity lows. Also, as indicated above, the resistivity method is particularly proficient at mapping geologic structure.

Self potential, or SP, is essentially a by-product of carrying out IP/resistivity surveying. (It needs to be nulled out in order to measure the IP value.) Therefore it is not a prime exploration tool for this property. However, it is possible that it may respond to the mineralization and therefore prove to be quite useful. SP surveying usually has the best response to more massive sulphide mineralization such as vein-type.

**PROPERTY AND OWNERSHIP**

The property is comprised of 3 contiguous tenures that comprise an area of 2,358 ha and occurs within the Atlin Mining Division as shown on figure #2: These tenures occur on BC Mineral Title map sheets M104N053, M104N054, M104N063, and M104N064. The property is 100% owned by Double Crown Ventures Ltd. of Vancouver, British Columbia.

<u>Tenure Number</u>	<u>Type</u>	<u>Claim Name</u>	<u>Good Until</u>	<u>Area (ha)</u>
534085	Mineral	THREE CELLS	Sept 27, 2011	49.107
555060	Mineral	SURPRISE LAKE PROPERTY	Sept 27, 2011	2243.2
670183	Mineral	FOUR FEATHERS	Sept 27, 2011	65.5081
				Total Area: 2,357.815 ha

The expiry date shown assumes that the work discussed within this report is accepted as submitted for assessment credits.

**LOCATION AND ACCESS**

The Surprise Lake Property is located within the northwestern corner of British Columbia, as shown on figure #2, to the east of Atlin Village which is on the east shore of Atlin Lake and which is 145 km 150° E (S30°E) of the city of Whitehorse, Yukon and 1,290 km 333°E of the city of Vancouver, BC. It occurs on and around Pine Creek and its tributaries at the west end of Surprise Lake. Pine Creek drains Surprise Lake and flows westerly into Atlin Lake.

This property occurs within NTS map sheet number 104N/11. For the center of the property, the latitude is 59° 38' North and the longitude is 133° 28' West. The property boundaries occur within UTM co-ordinates 243000 and 251600 west; and 6614000 and 6620500 north.



Access to the Surprise Lake Property can be gained by traveling for 10 km almost due east from the town of Atlin along the Surprise Lake Road. To gain access to the eastern part of the property, one then turns south to travel along the Otter Creek road and thence along the Snake Creek road which becomes a drill access road. The road comes within 200 meters of the Surprise Showing. The western part of the property, which is largely north of Pine Creek and within which is the Cabin Silver Showing, is most easily gained via the Birch Creek road. Four-wheel drive is recommended.

## **PHYSIOGRAPHY AND VEGETATION**

The Property is found within the Teslin Plateau, which is part of the Yukon Plateau, which itself is a physiographic unit of the Interior Plateau System. The Teslin Plateau consists of an upland surface which rises to heights of 1800 and 2100 meters, such as Mount Barham (2,093 meters) west of Surprise Lake. These upland surfaces are dissected by broad valleys such as those of Atlin Lake, Surprise Lake, and their tributaries. Surprise Lake, which occurs within the northeast corner part of the property, is at an elevation of 942 meters.

Elevations on the property vary from 910 meters on Pine Creek to 1640 meters on Spruce Mountain, which is almost at its peak within the southeast edge of the property. Slopes are gentle to moderate with the occasional steep section such as on the northern slope of Spruce Mountain to the west of the Surprise Showing. Glaciers occupied the Teslin Plateau and thus much of the claim area is covered by glacial drift. For the most part it is not thick, but can be closer to the bigger lakes.

The main water sources on the property are the west-flowing Pine Creek as well as its tributaries, some of them being the south-flowing Birch Creek and the north-flowing Otter Creek and Snake Creek.

Tree line is at about 1400 meters (4600 feet) on north-facing slopes and 1500 meters (4900 feet) on south-facing slopes. Above the tree line, the property is mostly covered in alpine vegetation, which is predominantly heather and sedges, as well as stunted buck brush. Below the tree line it is covered with light to medium forest consisting of lodge-pole pine, black spruce, aspen, and scrub birch. The underbrush is generally light but can be thick in areas around streams.

The temperatures can reach 30°C in the summer months, with an average of 20° C whereas in winter they can drop down to -35°C with an average of -15°C. Snowfall in winter months is moderate. Depending on the elevation, mining exploration can be carried out from May until the end of October, which was when the IP survey was carried out. On a good year this can extend well into November, though this cannot be relied on.

## **HISTORY OF PREVIOUS WORK**

This section is quoted from David Dupre's report on the property.

“The Surprise showing occurs within a band of listwanites that occurs on the northeast flank of Spruce Mountain (Fig. 5). The primary showing is a quartz vein emplaced in andesite that measures up to six meters in width, strikes 170° and dips 70° to the west. Exploration of this quartz vein with an adit prior to 1925 revealed minor amounts of argentiferous galena, pyrite, chalcopyrite, and siderite. Sampling in 1982 of this showing by Standard Gold Mines Ltd. (Assessment Report # 11,138) returned values of 0.042 ounces per ton (1.27 g/t) of gold and 1.20 ounces per ton (36.58 g/t) of silver. A series of bulldozer trenches exposes a carbonatized serpentinite (listwanite) containing pyrite and pervasive mariposite.”

“In 1985 Daiwan Engineering (Assessment Report # 13,643) carried out a large program of soil sampling (538 samples), grid establishment, prospecting and geological mapping over an area to the north of Pine Creek and west of Birch Creek. The Cabin Silver showing was discovered at this time and was sampled.

“The showing comprises three quartz-calcite veins, which are around 50 centimeters wide and have varying attitudes. One of the veins contains visible galena, chalcopyrite, pyrite, arsenopyrite, and sphalerite. One grab sample (#8400502) contained 583 grams per tonne silver, 0.96 per cent lead, 0.14 per cent zinc, and 0.002 ounces per ton gold. A 20-centimeter vein sample contained 0.04 ounces per ton gold (Assessment Report #13643). The veins are exposed in the bank of Birch Creek.

“In 1985, the Surprise Lake Exploration Syndicate carried out a 7 line-kilometer ground magnetometer and VLF survey to investigate anomalies detected by a Dighem Survey in 1984. Strong magnetic responses typical of unaltered ultramafic or volcanic rock were delineated. Several discontinuous VLF anomalies were also outlined. This showing is located just to the north of the Cabin Silver occurrence – outside the Surprise Lake property.”

In 2006 Double Crown Ventures contracted Geotronics Consulting Inc. to carry out magnetic, VLF-EM, induced polarization (IP), resistivity, and self potential (SP) surveys on the Surprise Showing Grid and MMI soil sampling on the Plumb Prospect Grid, within the Surprise Lake Property. The main purpose of the geophysical surveys was to locate gold/silver mineralization, perhaps similar to the nearby Yellowjacket Prospect.

The magnetic survey was carried out with two proton precession magnetometers, with one being a base station, by taking readings every 12.5 m over ten lines for a total survey length of 9,975 meters. The VLF-EM survey was carried out with a Sabre model 27 receiver by taking dip angle readings of the electromagnetic field along the same survey lines as the magnetic survey, but for less survey length, being a total of 4,550 meters. The IP and resistivity surveys were carried out using a BRGM Elrec-6 multi-channel receiver operating in the time-domain mode. The transmitter used was a BRGM VIP 4000 powered by a 6.5-kilowatt motor generator. The dipole length and reading interval chosen was 25 meters read up to 12 levels and carried out over three lines for a total survey length of 1,800 meters. The MMI sampling consisted of 56 samples taken along two lines for a total survey length of 1800 meters. The samples were picked up every 25 meters where a picket was placed with

the grid coordinates marked on an aluminum tag. The samples were sent to SGS labs in Toronto and tested for 45 elements.

In 2007 Double Crown Ventures again contracted Geotonics Consulting Inc. to carry out MMI soil sampling on four different grids within the Surprise Lake Property. The main purpose of the MMI surveys was to continue the previous work done in attempting to locate gold/silver mineralization. An additional purpose, especially of the Birch Grid, was to locate molybdenum mineralization similar to the Adanac molybdenum deposit located

The MMI sampling consisted of 1,060 samples taken along two lines for a total survey length of 1800 meters. The samples were picked up every 25 meters where a picket was placed with the grid coordinates marked on an aluminum tag. The samples were sent to SGS labs in Toronto and tested for 46 elements.

## **GEOLOGY**

This section is quoted from David Dupre's Summary within his report on the property.

The Surprise Lake Property is predominantly underlain by the Atlin Ophiolitic Assemblage, a sequence of mid-Jurassic, relatively flat-lying, coherent thrust slices of oceanic crustal and upper mantle rocks. The most dominant lithological unit is metabasalt. Ultramafic peridotite occurs in an arcuate thrust slice in the northwestern part of the property and as small lenses in the southeast.

Placer deposits in the Atlin camp are situated in stream valleys occurring within erosional windows through the carbonatized, relatively flat lying thrust faults within the ophiolitic assemblage. The placers are considered to be derived from auriferous quartz lodes previously hosted by the ophiolitic crustal rocks. Large parts of the Surprise Lake property are situated within the drainage basins of several prolific gold placer streams such as Pine Creek and Spruce Creek. It can be concluded that some of the placer gold was likely derived from the bedrock on the property.

Gold quartz veins in the Atlin area are poorly and erratically developed within the ultramafic rocks and more commonly occur as random fracture fillings. Wider, more continuous tabular fissure veins have only been identified in the mafic igneous crustal components (andesite, gabbro, and diabase) of the Atlin ophiolite assemblage. Gold-quartz vein deposits and their derived placers are commonly associated with carbonate $\pm$ sericite $\pm$ pyrite altered ophiolitic and ultramafic rocks known as "listwanites". Provincial examples of gold camps with spatially associated ultramafic rocks include the Bridge River, Cassiar and Rossland lode gold and the Atlin and Dease Lake placer camps.

The prospective ophiolite assemblage and the adjacent carbonatized ultramafic rocks underlie large parts of the Surprise Lake property. Listwanites have also been identified at the Surprise showing. These favourable geological settings indicate that the property has the potential to host gold deposits of the listwanite association. The best target is considered to be within a belt enveloping the contact zone between the ultramafic and ophiolitic assemblages.

## **YELLOWJACKET SHOWING**

The Yellowjacket showing is currently being put into production by Prize Mining on the adjacent property to the west. Mineralization on the Surprise Lake property could be similar and hence the description of the Yellowjacket showing, taken from Prize Mining literature, is given below.

Gold mineralization at Yellowjacket consists of coarse gold hosted in light grey to white quartz veinlets generally less than two centimeters in thickness. Veining is mainly found in areas of more brittle volcanic rocks, but can also occur in altered serpentinites. Bleached, carbonated, silicified, and pyritic envelopes are common around quartz veins and often accompany most of the higher grade vein systems.

Gold is the only mineral occurrence of economic importance. Individual veins and vein stockworks frequently host sub-economic to economic grade widths of gold mineralization which exceed 3.0 grams per tonne or better. Visible gold is common but generally is at least 150 microns in size. While sulphide occurrence is often observed in association with better grade gold occurrences, it is also present in barren intersections.

Several additional sulphide occurrences have been observed in minor quantities; these include gersdorffite, arsenopyrite, millerite, chalcopyrite, and pyrrhotite.

## **INDUCED POLARIZATION AND RESISTIVITY SURVEYS**

### **(a) Instrumentation**

The transmitter used was a BRGM model VIP 4000. It was powered by a Honda 6.5 kW motor generator. The receiver used was a six-channel BRGM model Elrec-6. This is state-of-the-art equipment, with software-controlled functions, programmable through a keyboard located on the front of the instrument. It can measure up to 6 chargeability windows and store up to 2,500 measurements within the internal memory.

### **(b) 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 (mostly 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 phenomena is known as electrode polarization.

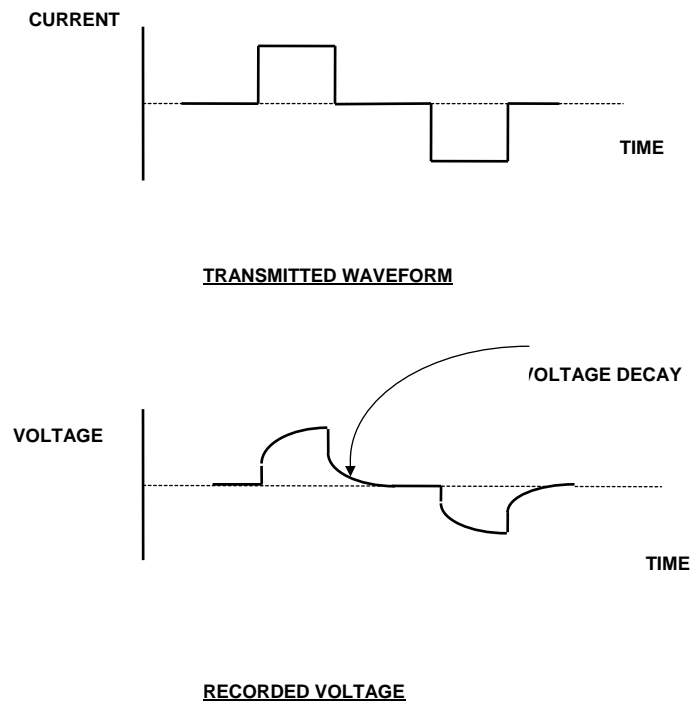
A similar effect occurs if clay particles are present in the conducting medium. Charged clay particles attract oppositely-charged ions from the surrounding electrolyte; when the current stops, the ions slowly diffuse back to their equilibrium state. This process is

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”, and some in 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, or “PFE”.

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



The ability of the ground to transmit electricity is, in the absence of metallic-type conductors, almost completely dependent 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:

$$R_o = O^{-2} R_w$$

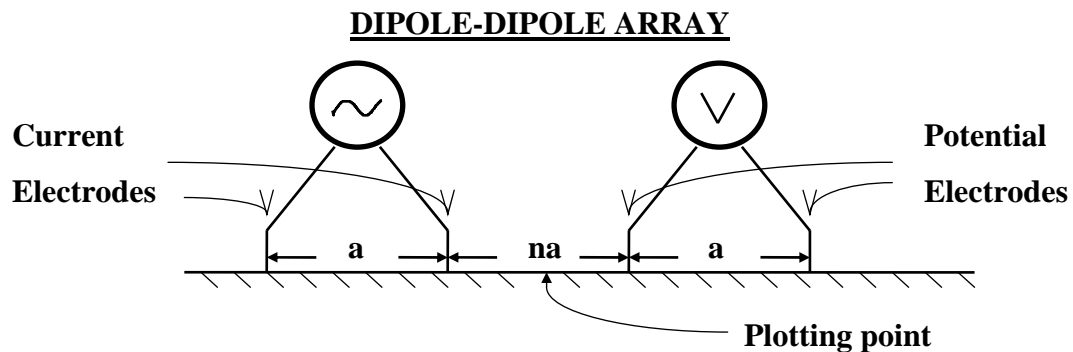
Where:  $R_o$  is formation resistivity  
 $R_w$  is pore water resistivity  
 $O$  is porosity

**(c) Survey Procedure**

In 2010 two survey lines, line 0E and 100W, were carried out in a north-south direction based on the grid area laid out in 2006. The three 2006 IP/resistivity survey lines, 100N, 250N, and 400N, were carried out along east-west lines within the grid area. The survey line direction was due east.

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 80 milliseconds and the integration time used was 1,760 milliseconds divided into 10 windows.

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



The electrode separation, or 'a' spacing, and reading interval were chosen to be 25 meters read to 12 separations (which is the 'na' in the above diagram). The theoretical depth penetration is about 115 meters, or 380 feet.

Stainless steel stakes were used for current electrodes as well as for the potential electrodes.

In places, there was some difficulty in reducing the stake resistance down to acceptable levels, which is a typical problem in alpine areas. (However, at most of the locations, there was no problem at all.) The result was that in places only a minimal current of 50 milli-amperes could be put into the ground. The surveying was done on the following lines and to the following lengths.

Line Number	Survey	PseudoSection	Inversion
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	<b>Length</b>	<b>Figure #</b>	<b>Figure #</b>
100W	1225	GP – 1	GP – 6
0E	1325	GP – 2	GP – 7
100N	725	GP – 3	GP – 8
250N	550	GP – 4	GP – 9
400N	525	GP – 5	GP – 10

The total amount of IP and resistivity surveying carried out was 4,350 meters.

**(d) Compilation of Data**

All data were reduced by a computer software program developed by Geosoft Inc. of Toronto, Ontario. Parts of this program have been modified by Geotronics Consulting Inc. for its own applications. The computerized data reduction included the resistivity calculations, pseudosection plotting, and contouring.

The chargeability (IP) values are read directly from the instrument and no data processing is therefore required prior to plotting. However, the data is edited for errors and for reliability. The reliability is usually dependant on the strength of the signal, which weakens at greater dipole separations and which also weakens in areas of lower resistivity.

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 resistivity.

All the data have been plotted in pseudosection form at a scale of 1:2,500. One map has been plotted for each of the five pseudosections, as shown on the above table and in the Table of Contents. The pseudosection is formed by each value being plotted at a point formed from the intersection of a line drawn from the mid-point of each of the two dipoles. The result of this method of plotting is that the farther the dipoles are separated, the deeper the reading is plotted. The resistivity pseudosection is plotted on the upper part of the map for each of the lines, and the chargeability pseudosection is plotted on the lower part.

All pseudosections were contoured at an interval of 5 milliseconds for the chargeability results, and at a logarithmic interval to the base 10 for the resistivity results.

The self-potential (SP) data from the IP and resistivity surveys were plotted and profiled above the resistivity pseudosection for each line at a scale of 1 cm = 100 millivolts with a base of zero millivolts.

A 2-D inversion interpretation was carried out on the IP and resistivity data using computer software produced by Geotomo Software. This purpose of inversion interpretation is to eliminate the electrode effect that is endemic with IP and resistivity data and thus locate the causative sources more accurately. The Geotomo inversion is a

rapid method that uses the least squares interpretation. The results are shown in section format for each line as shown in the above table and within the Table of Contents.

## **Discussion of Results**

The magnetic surveying has resulted in locating a strong magnetic high trending in a north to north-northeast direction on and to the immediate east of the base line. It is open to the north and to the south for a minimum strike direction of 450 meters. A second high, but weaker, is located at 225E to 300E and is sub-parallel to the first one. From known geology of the area these highs may be reflecting basic or ultrabasic rock-types. There are two other highs that could be reflecting sub-parallel bands of basic/ultrabasic rocks as well, and these are located at 150W to 250W, as well as at 375W to 475W, respectively.

The main magnetic high is located to the immediate east of a band of listwanite that strikes through the grid area in a north-south direction. Listwanite in the area, such as on the adjacent Prize Mining property, is associated with base metal sulphides containing gold and silver mineralization.

The resulting pseudosections showed IP highs of strong exploration interest and thus an inversion interpretation was carried out on each of the three IP lines. The purpose of doing inversion is to take away the electrode effects and thus attempt to show the locations of the cause of the IP highs more accurately.

The IP survey located five anomalies that have been labeled by the writer by the upper case letters A to E according to their location on the grid as well as their association with the resistivity survey and magnetic survey results.

*Anomaly A* is the main anomaly and is also the strongest one, correlating with the boundary of a resistivity low to the west and resistivity high to the east. It also occurs along the boundary of the main magnetic high with the listwanite and thus indicates that the listwanite not only is reflected as a magnetic low but also as a resistivity low. The adjacent resistivity high, since it correlates with a magnetic high, is probably reflecting the same rock type as the magnetic high is, which as mentioned above, is probably a basic or ultrabasic intrusive. Anomaly A has a north to north-northeast strike and a minimum strike length of 300 meter being open both to the north and to the south. The associated magnetic high suggests the IP anomaly is at least 450 meters long.

The magnetic high/listwanite boundary suggests that IP anomaly A is reflecting sulphide mineralization associated with a contact zone. Considering that known base metal sulphides as well as gold mineralization occurs on the property, there is a reasonable likelihood that at least some of the sulphides are base metals with associated gold and silver mineralization. The resistivity low may be caused by alteration associated with the mineralization and/or the lithological contact.



*Anomaly B*, also probably reflecting sulphides, occurs to the immediate west of the eastern magnetic high and correlates with a resistivity low. *Anomaly C* correlates directly with the weaker magnetic anomaly as well as a resistivity high. This suggests that the causative source is sulphides within a basic or ultrabasic intrusive. These two additional IP highs appear to have the same strike length and are likely reflecting sulphides as well.

*Anomaly D* occurs to the west of anomaly A as well as correlates directly with the listwanite suggesting the listwanite at this location contains sulphides. *Anomaly E* correlates with the northern end of the main magnetic high as well as a resistivity high suggesting the causative source may be the same as that of anomaly C, that is, sulphides within a basic or ultrabasic intrusive.

## **GEOPHYSICIST'S CERTIFICATE**

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

I am registered as a Professional Geoscientist with the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

I am a Consulting Geophysicist of Geotronics Consulting Inc, with offices at 6204 – 125<sup>th</sup> Street, Surrey, British Columbia.

I further certify that:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.
2. I have been practicing my profession for the past 43 years, and have been active in the mining industry for the past 45 years.
3. This report is compiled from data obtained from IP, resistivity, and SP carried out by a crew of Geotronics Consulting headed by myself over the Surprise Showing Grid occurring on Spruce Mountain. The grid occurs within the Surprise Lake Property located on and to the west of Surprise Lake within the Atlin Mining Division of British Columbia. The work was done during the period of September 12<sup>th</sup> to September 15<sup>th</sup>, 2010.
4. I do not hold any interest in Double Crown Ventures Ltd, nor in the property discussed in this report, nor in any other property held by this company, nor do I expect to receive any interest as a result of writing this report.

David G. Mark, P.Ge.  
Geophysicist

February 3, 2011

## **AFFIDAVIT OF EXPENSES**

Grid emplacement as well as magnetic, VLF-EM, IP, resistivity, and SP surveying was carried out over the Surprise Showing Grid, and MMI soil sampling was carried out over the Plumb Prospect Grid, both grids occurring within the Surprise Lake Property, which occurs on Pine Creek at the west end of Surprise Lake, located 11 km 70°E of the village of Atlin, B.C. This work was done during the period of August 9<sup>th</sup> to November 14<sup>th</sup> 2006, and to the value of the following:

### **Field:**

Mob/demob, share	\$1,800.00	
Grid preparation, including line cutting, 2-man crew, 2 days @ \$1,100/day	\$2,200.00	
IP/resistivity survey, 6-man crew, 2.5 days @ \$3,300/day	<u>\$8,250.00</u>	
<b>TOTAL</b>	<b>\$12,250.0</b>	<b>\$12,250.00</b>

### **Data Reduction and Report:**

Geophysical technician with computer 18 hours @ \$50/hour	\$900.00	
Geophysicist, 19 hours @\$60/hour	<u>\$1,140.00</u>	
<b>TOTAL</b>	<b>\$2,040.00</b>	<b>\$2,040.00</b>

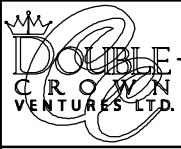
**GRAND TOTAL** **\$14,290.00**

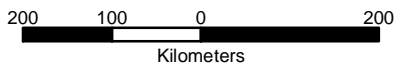
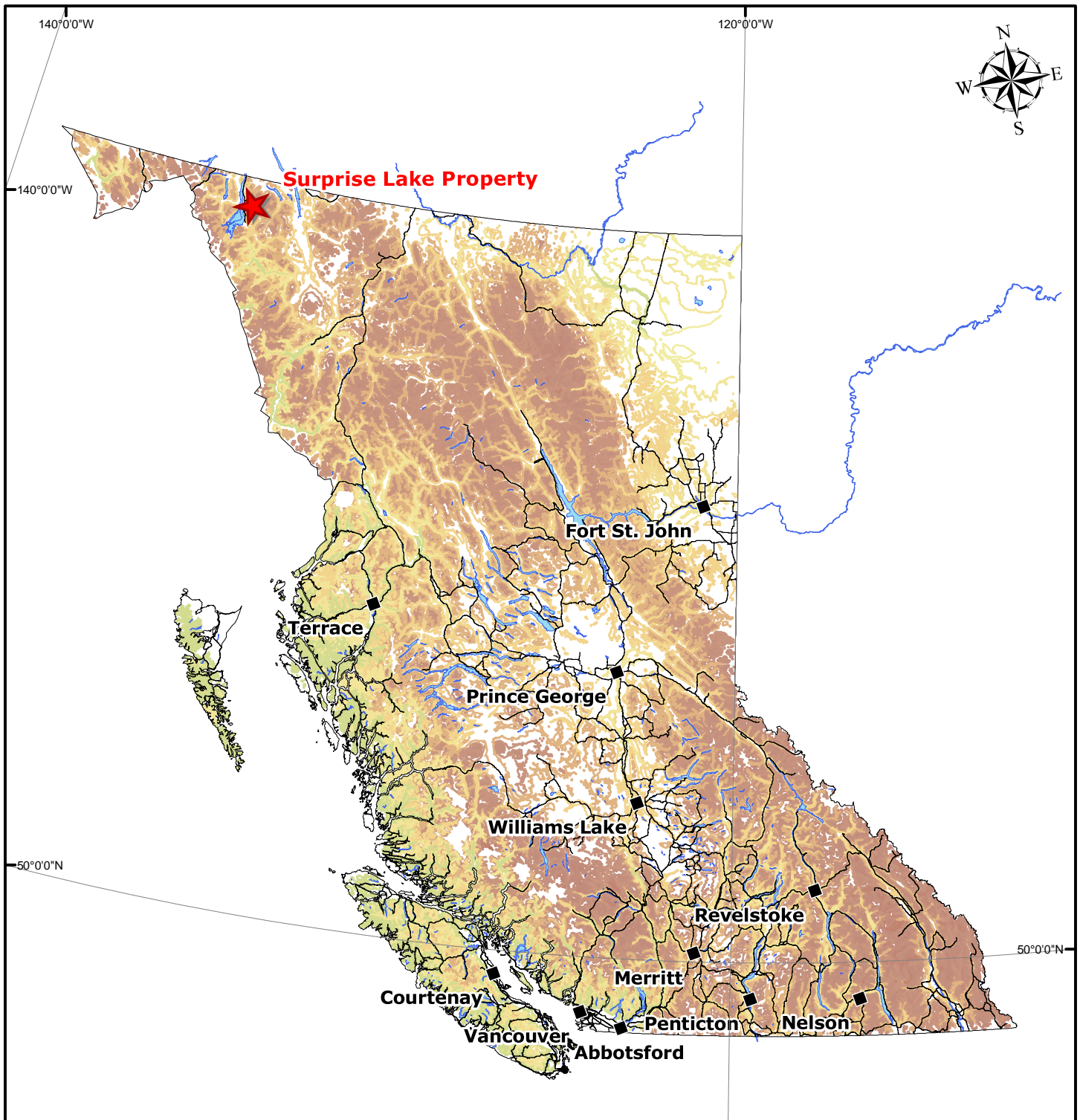
Respectfully submitted,  
Geotronics Surveys Ltd.

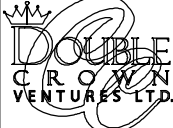
David G. Mark, P.Geo,  
Geophysicist

February 3, 2011



		<b>Double Crown Ventures Ltd.</b>	
		<b>Project Locations in Canada</b>	
<b>Surprise Lake Project</b>			
Scale:	As Shown	Design:	Figure: 1
Date:	Sept, 2006	Drawing:	TERRACAD LTD. Rev: 1.0



		<b>Double Crown Ventures Ltd.</b>	
		<b>Project Locations in British Columbia</b>	
<b>Title:</b>			
<b>Surprise Lake Project</b>			
<b>Scale:</b> As Shown	<b>Design:</b> 	<b>Figure:</b> 2	
<b>Date:</b> Sept, 2006	<b>Drawing:</b> TERRACAD LTD.	<b>Rev:</b> 1.0	

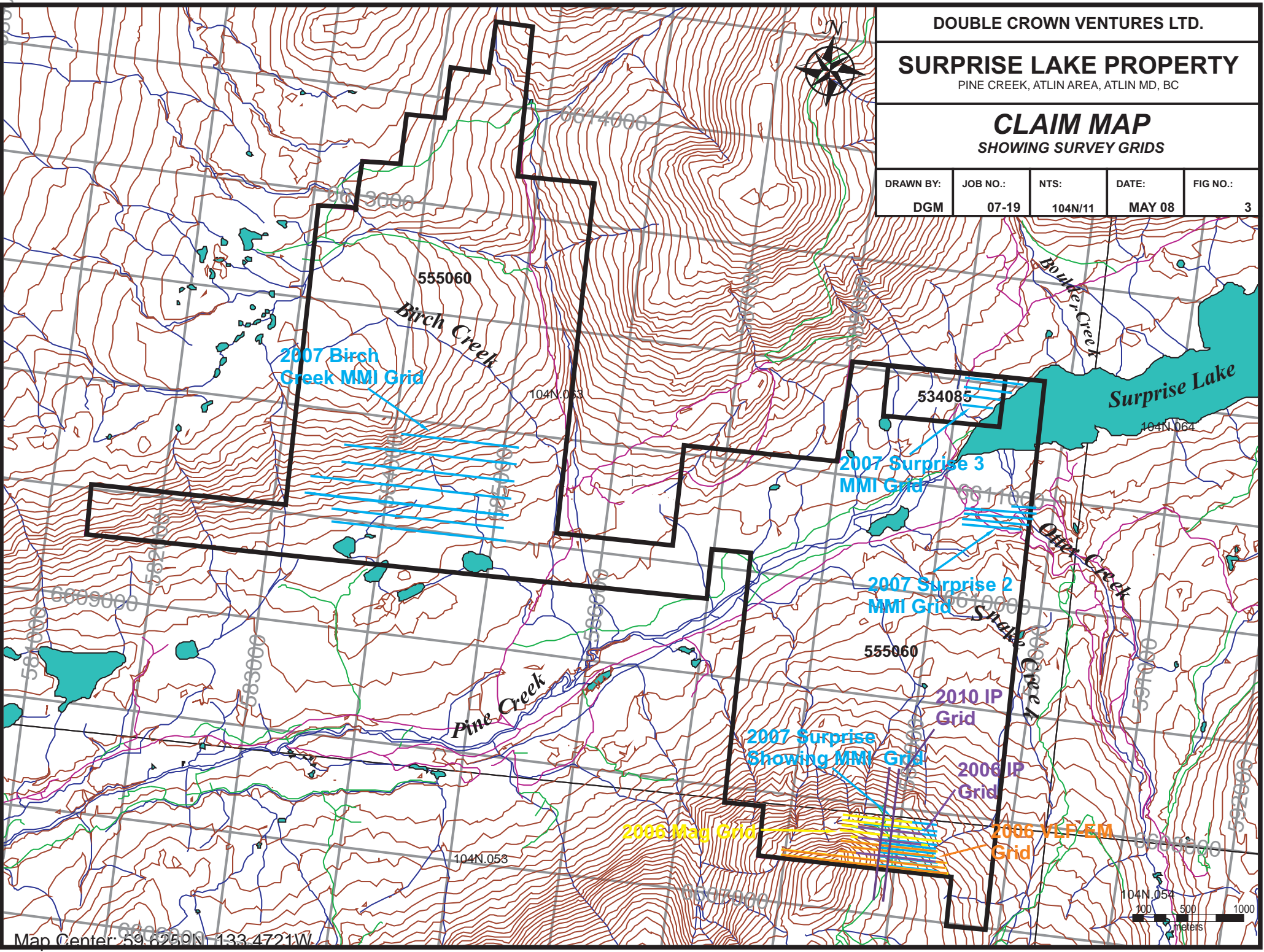
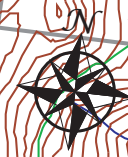
DOUBLE CROWN VENTURES LTD.

# SURPRISE LAKE PROPERTY

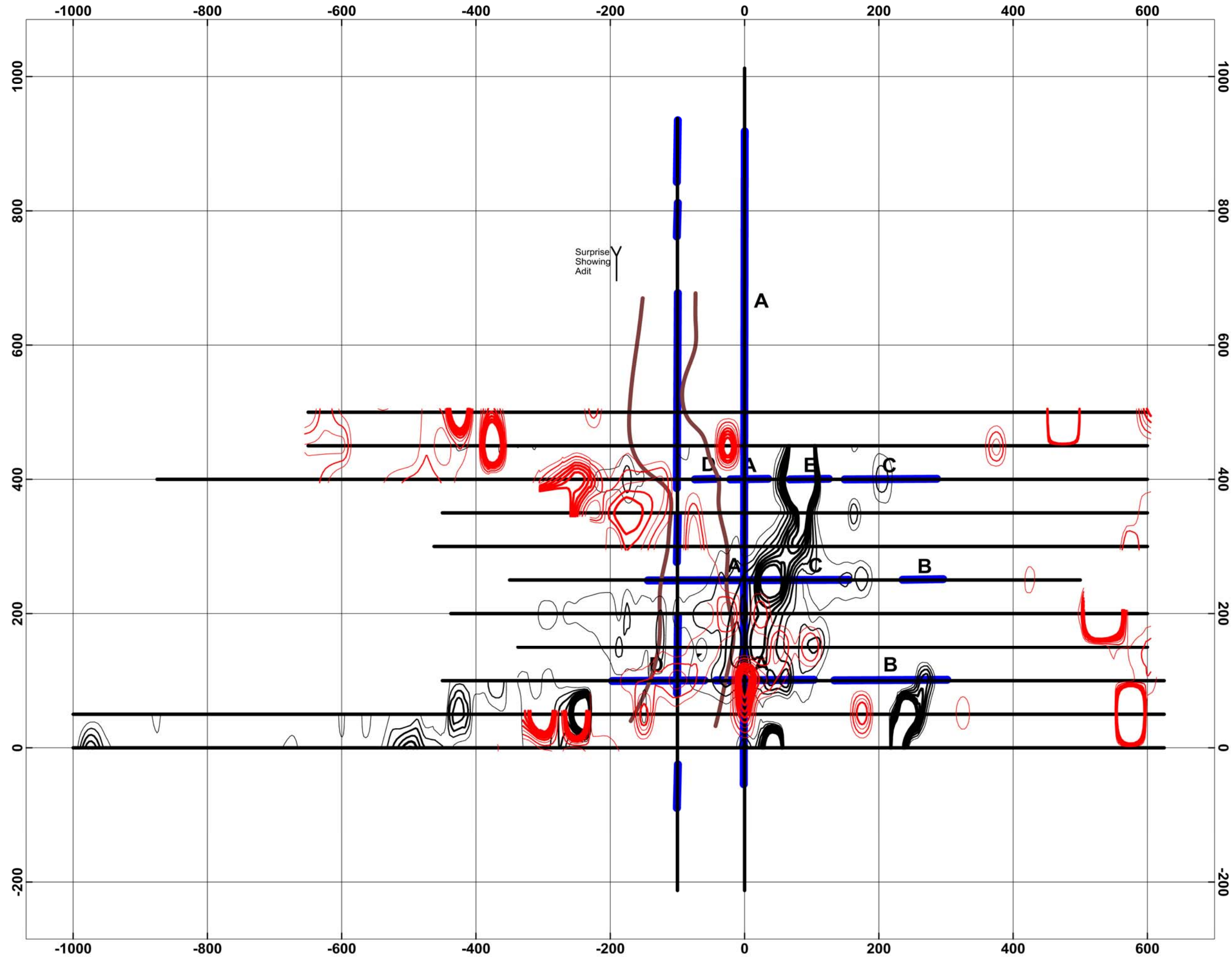
PINE CREEK, ATLIN AREA, ATLIN MD, BC




## CLAIM MAP SHOWING SURVEY GRIDS

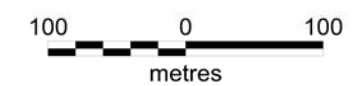
DRAWN BY:	JOB NO.:	NTS:	DATE:	FIG NO.:
DGM	07-19	104N/11	MAY 08	3



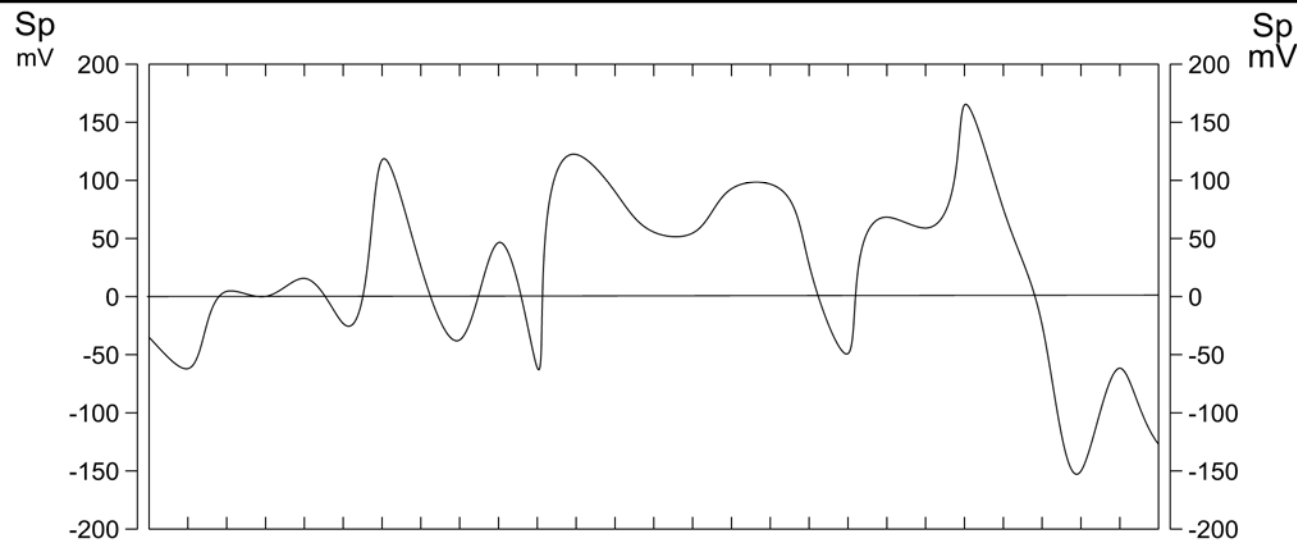
Map Center: 59.6250N 133.4721W



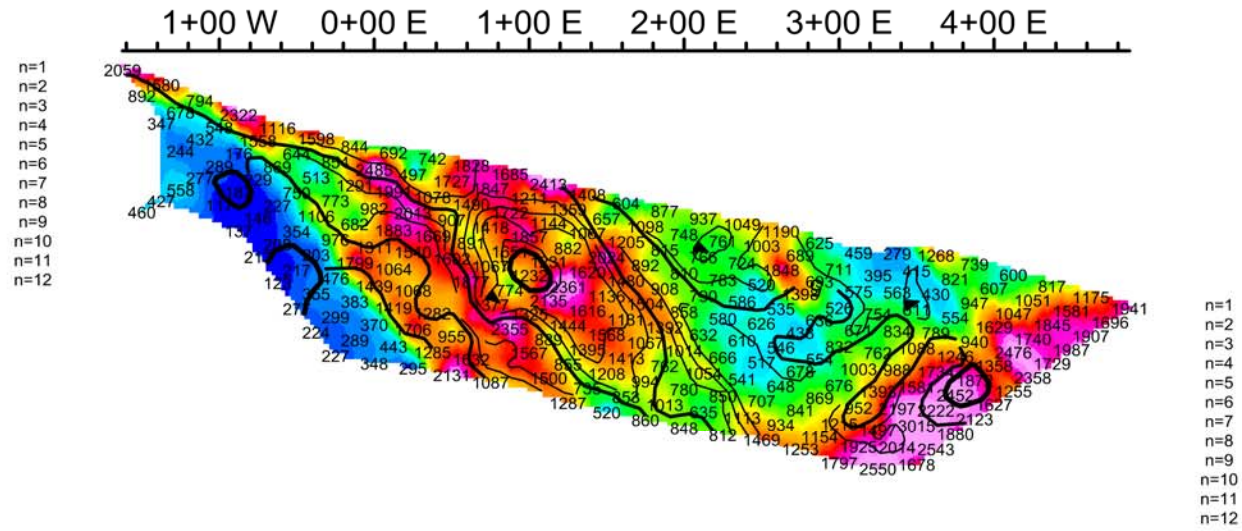
-  MMI Gold Anomaly (red contours)
-  Magnetic High Anomaly (black contours)
-  IP Anomaly



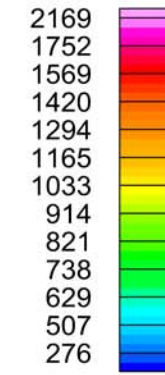
<b>DOUBLE CROWN VENTURES LTD.</b>				
<b>SURPRISE LAKE PROPERTY</b>				
Pine Creek, Atlin Area, Atlin MD, BC				
<b>SURPRISE SHOWING GRID</b>				
<b>COMPILATION MAP</b>				
DRAWN BY:	JOB NO.:	NTS:	DATE:	FIG NO.:
CAM	10-17	104N/11	JAN '11	4



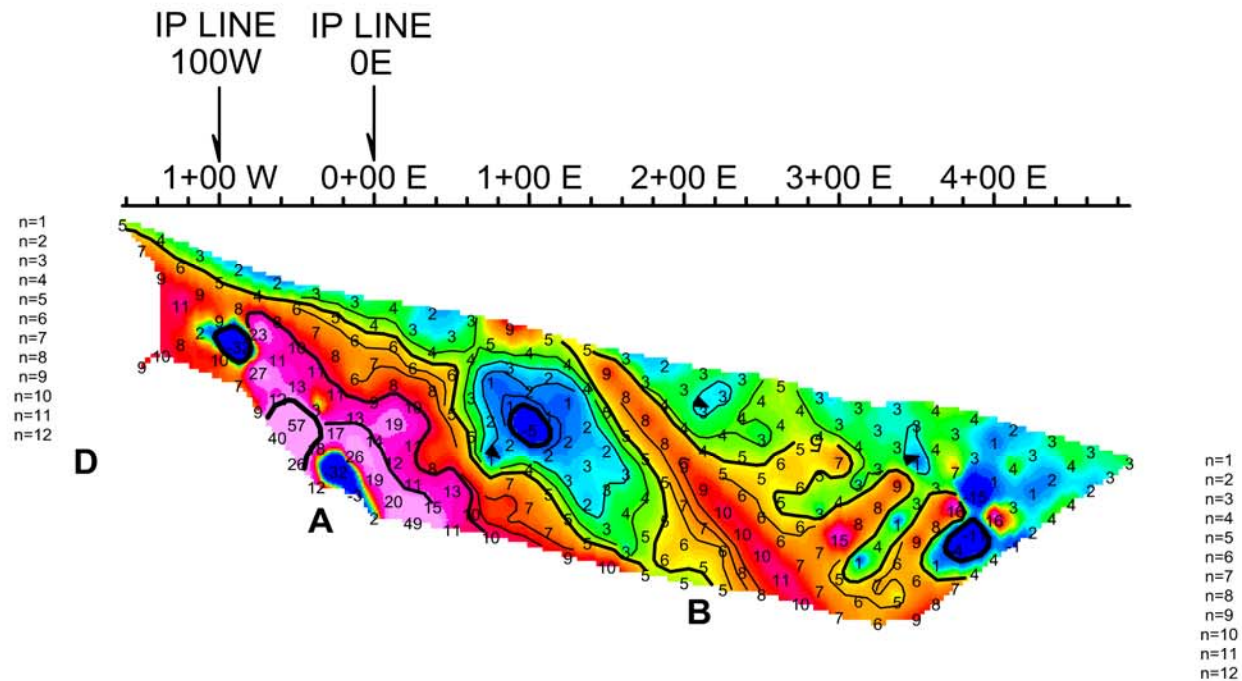
Resistivity  
Ohm\*m



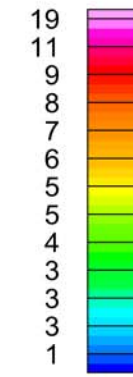
Resistivity  
Ohm\*m



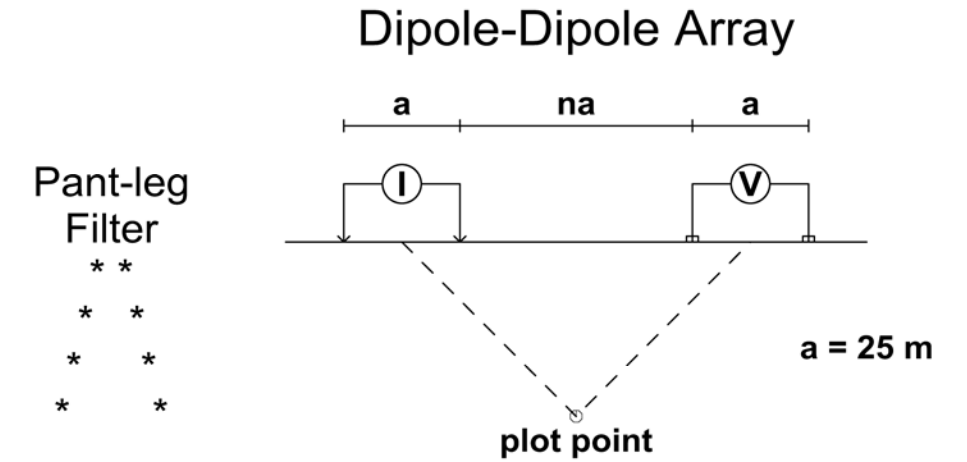
IP  
mV/V



IP  
mV/V



# Pseudo Section Plot



## LEGEND:

### CONTOUR INTERVALS:

Resistivity: log base 10 ohm-meters  
Chargeability (IP): log base 10 ohm-meters

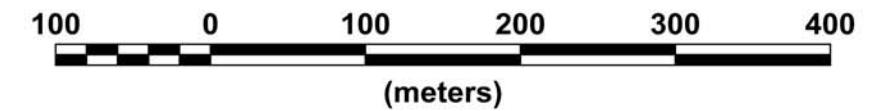
### INSTRUMENTATION:

IP Receiver: BRGM Iris Elrec 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

### IP SURVEY PARAMETERS:

Survey Mode: Time Domain  
Array: Dipole-dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration Time: 1600 milliseconds  
Charge Cycle: 8 second square wave

Scale 1:7500



**DOUBLE CROWN VENTURES LTD.**

**SURPRISE LAKE PROPERTY**

Pine Creek, Atlin Area, Atlin MD, BC

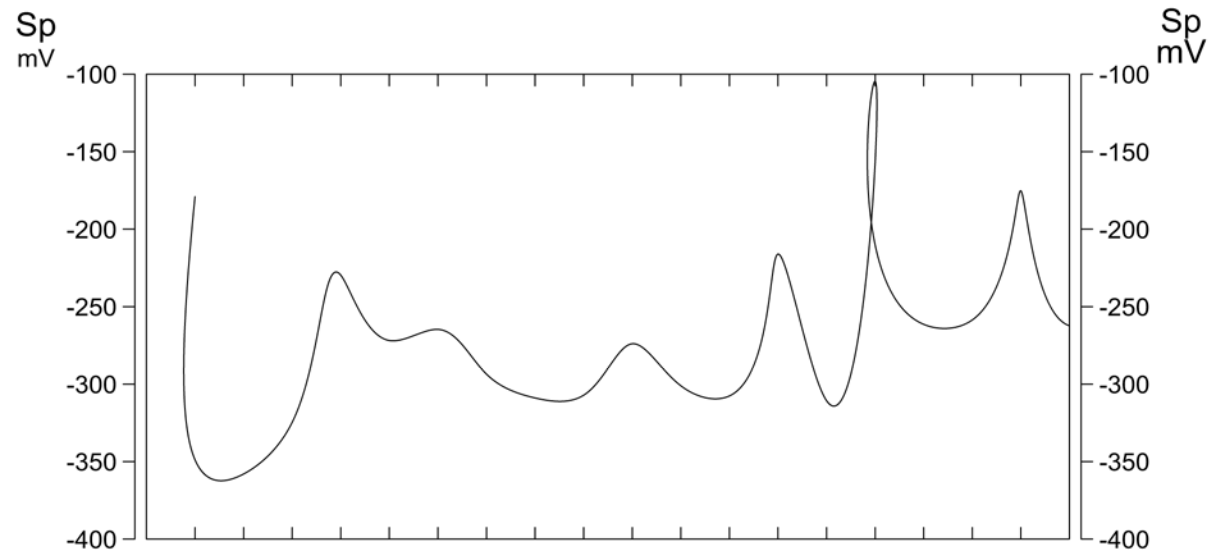
**INDUCED POLARIZATION and RESISTIVITY SURVEYS**

**PSEUDO SECTION PLOT**

**Line 100N**

DRAWN BY: CAM	JOB NO.: 10-17	NTS: 104N/11	DATE: JAN '11	FIG NO.: GP-3
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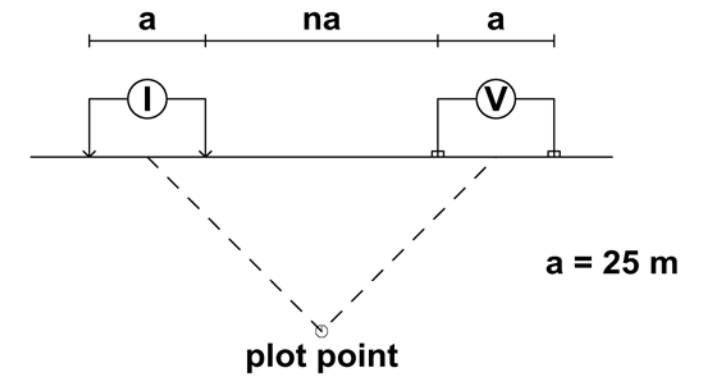




# Pseudo Section Plot

## Dipole-Dipole Array

Pant-leg  
Filter  
\* \*  
\* \*  
\* \*  
\* \*



### LEGEND:

#### CONTOUR INTERVALS:

Resistivity: log base 10 ohm-meters  
Chargeability (IP): log base 10 ohm-meters

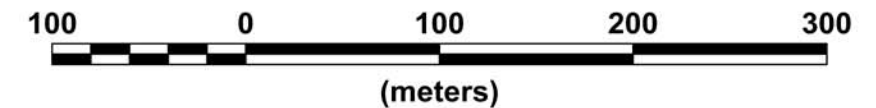
#### INSTRUMENTATION:

IP Receiver: BRGM Iris Elrec 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

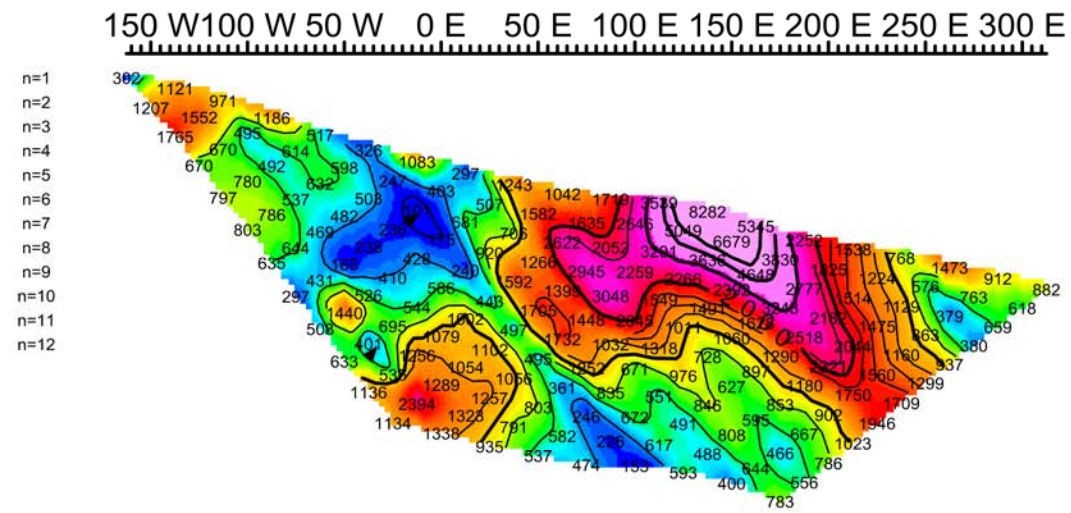
#### IP SURVEY PARAMETERS:

Survey Mode: Time Domain  
Array: Dipole-dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration Time: 1600 milliseconds  
Charge Cycle: 8 second square wave

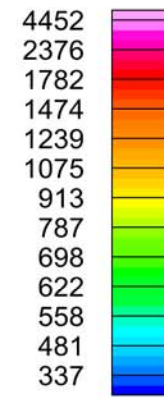
Scale 1:6000



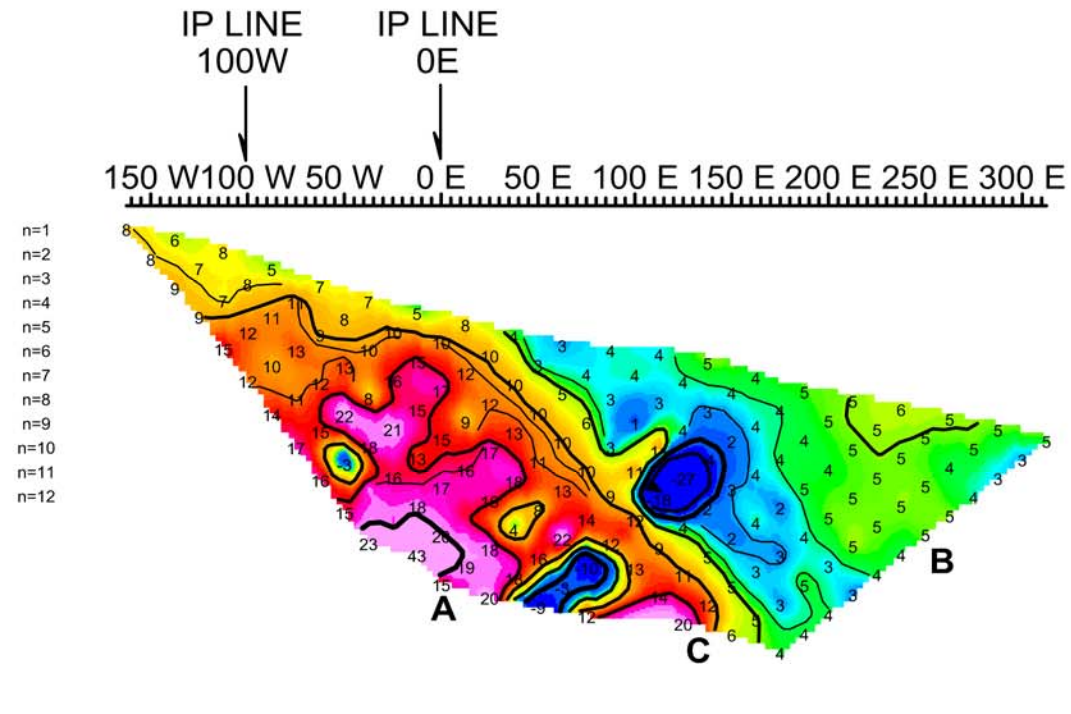
Resistivity  
Ohm\*m



Resistivity  
Ohm\*m



IP  
mV/V



IP  
mV/V



**DOUBLE CROWN VENTURES LTD.**

**SURPRISE LAKE PROPERTY**

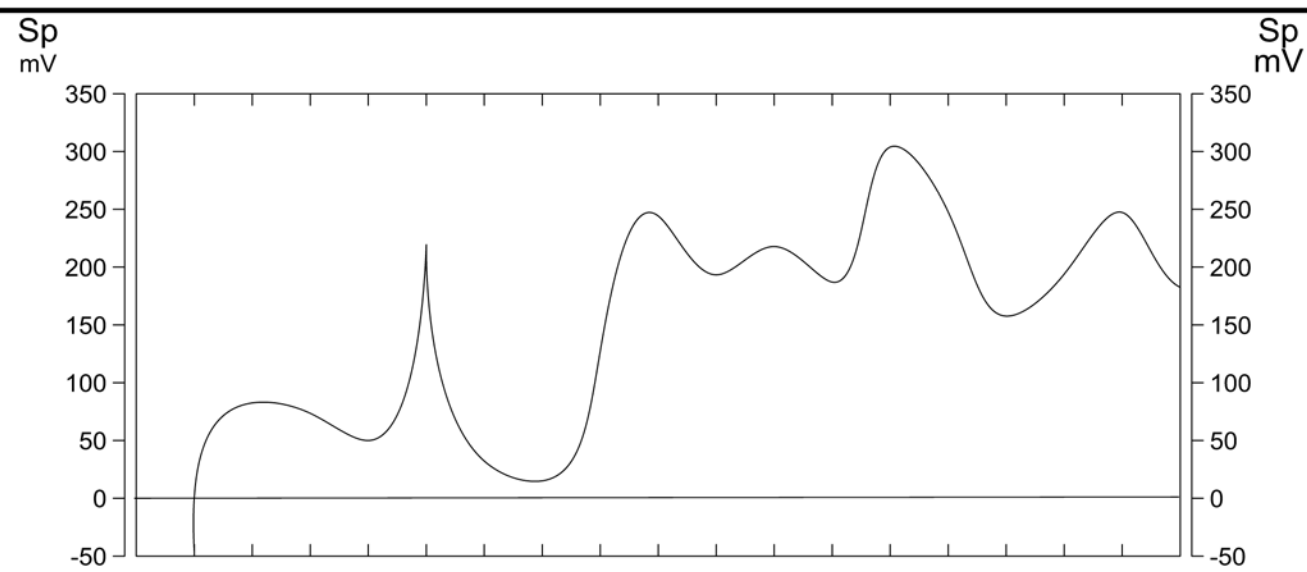
Pine Creek, Atlin Area, Atlin MD, BC

**INDUCED POLARIZATION and RESISTIVITY SURVEYS**

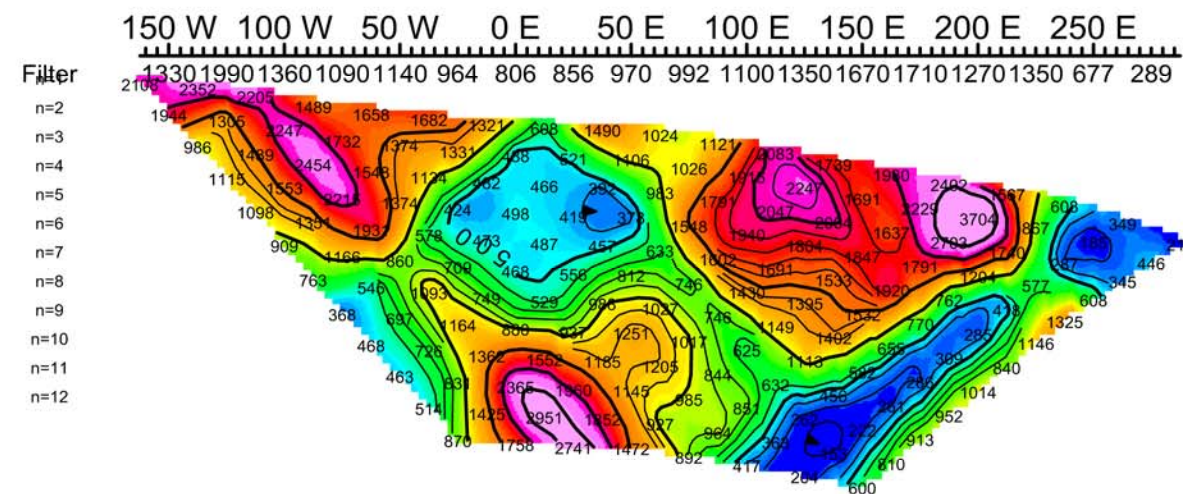
**PSEUDO SECTION PLOT**

**Line 250N**

DRAWN BY: CAM	JOB NO.: 10-17	NTS: 104N/11	DATE: JAN '11	FIG NO.: GP-4
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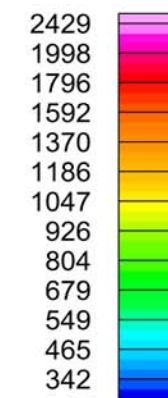


Resistivity  
Ohm\*m

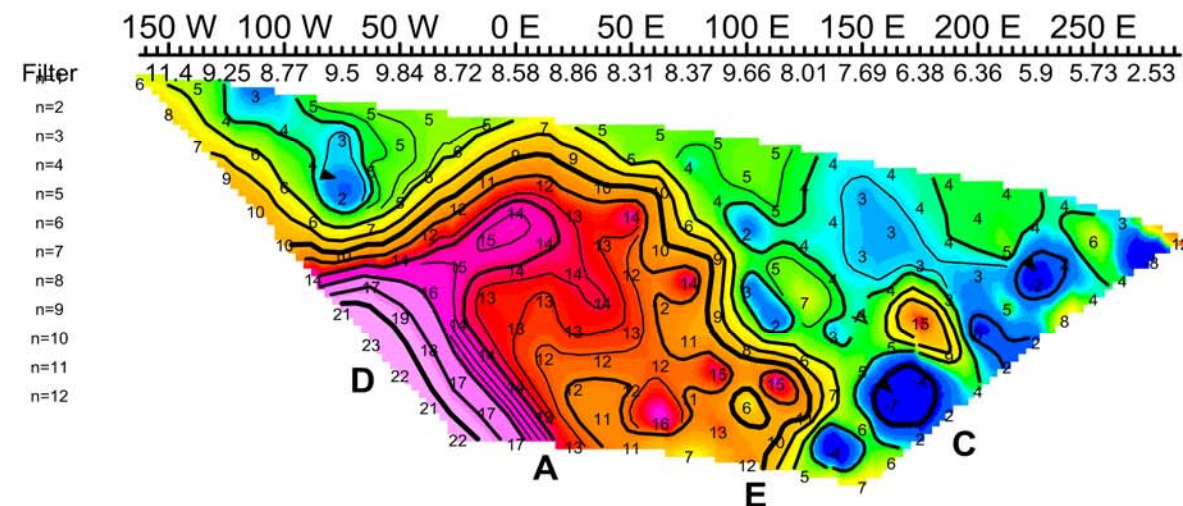


Resistivity  
Ohm\*m

Filter  
n=1  
n=2  
n=3  
n=4  
n=5  
n=6  
n=7  
n=8  
n=9  
n=10  
n=11  
n=12



IP  
mV/V



IP  
mV/V

Filter  
n=1  
n=2  
n=3  
n=4  
n=5  
n=6  
n=7  
n=8  
n=9  
n=10  
n=11  
n=12

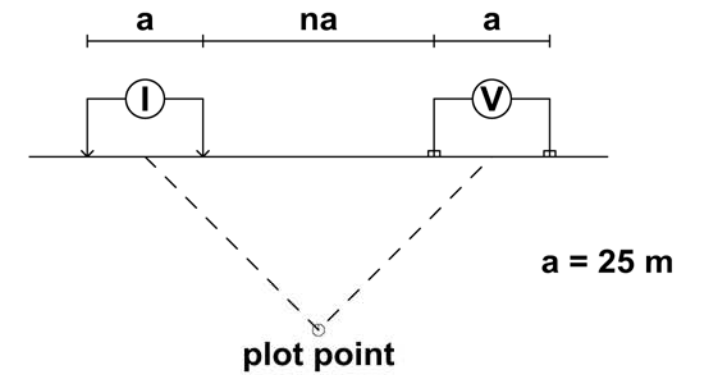


# Pseudo Section Plot

## Dipole-Dipole Array

Pant-leg  
Filter

\*\*  
\* \*  
\* \*  
\* \*



### LEGEND:

#### CONTOUR INTERVALS:

Resistivity: log base 10 ohm-meters  
Chargeability (IP): log base 10 ohm-meters

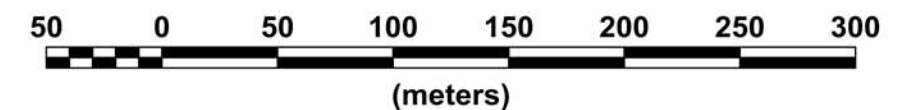
#### INSTRUMENTATION:

IP Receiver: BRGM Iris Elrec 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

#### IP SURVEY PARAMETERS:

Survey Mode: Time Domain  
Array: Dipole-dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration Time: 1600 milliseconds  
Charge Cycle: 8 second square wave

Scale 1:5000



**DOUBLE CROWN VENTURES LTD.**

**SURPRISE LAKE PROPERTY**

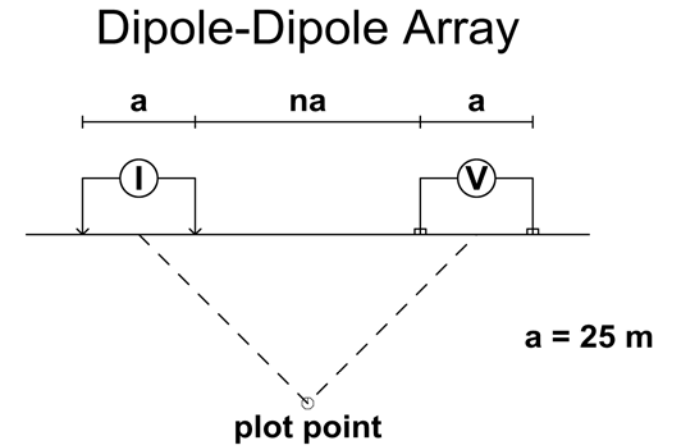
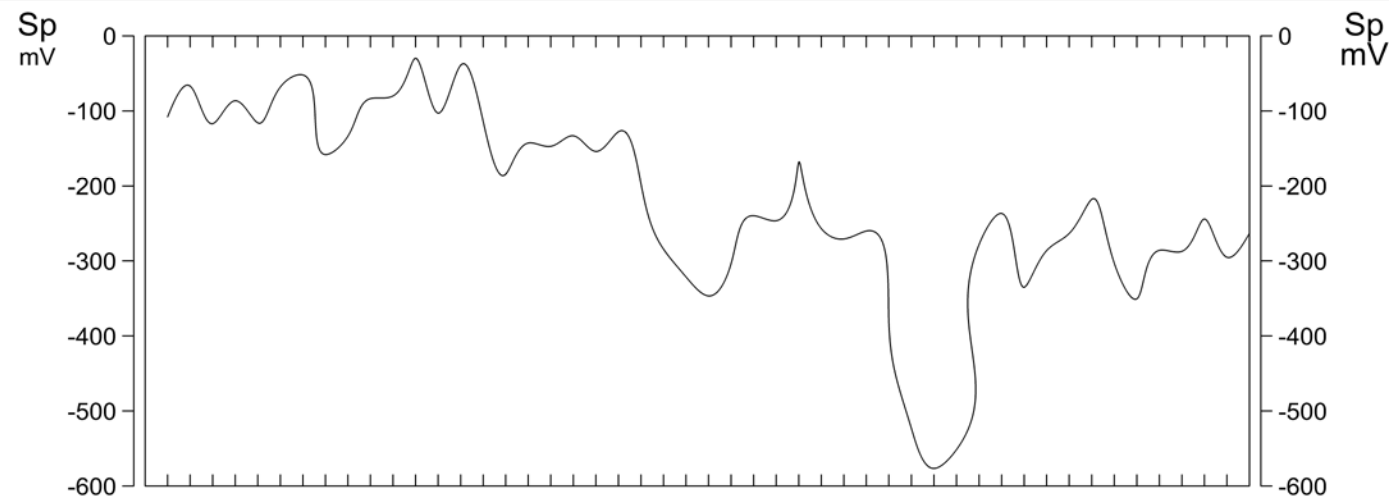
Pine Creek, Atlin Area, Atlin MD, BC

**INDUCED POLARIZATION and RESISTIVITY SURVEYS**

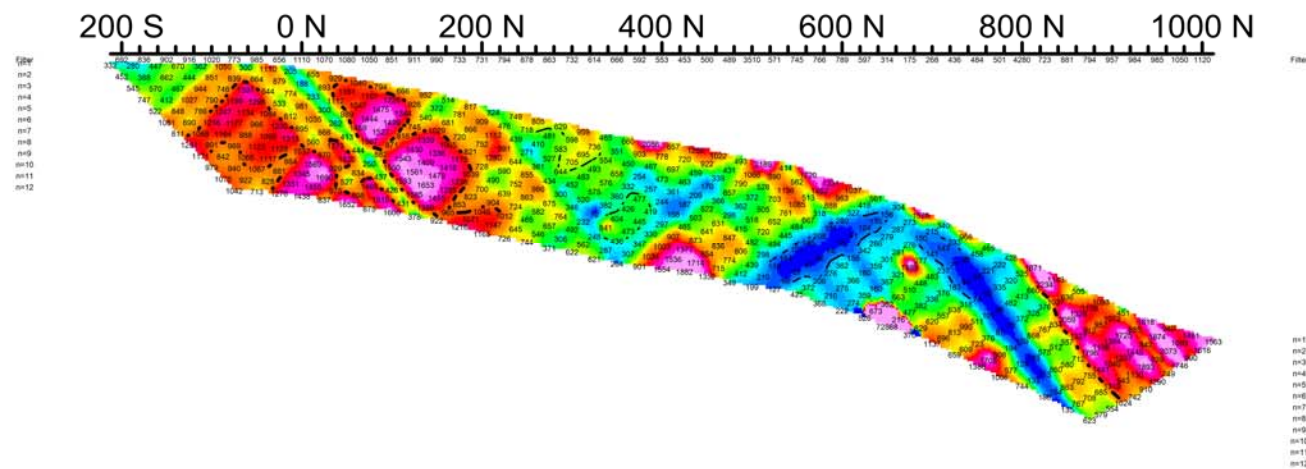
PSEUDO SECTION PLOT

**Line 400N**

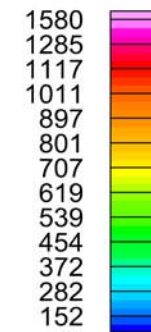
DRAWN BY: CAM	JOB NO.: 10-17	NTS: 104N/11	DATE: JAN '11	FIG NO.: GP-5
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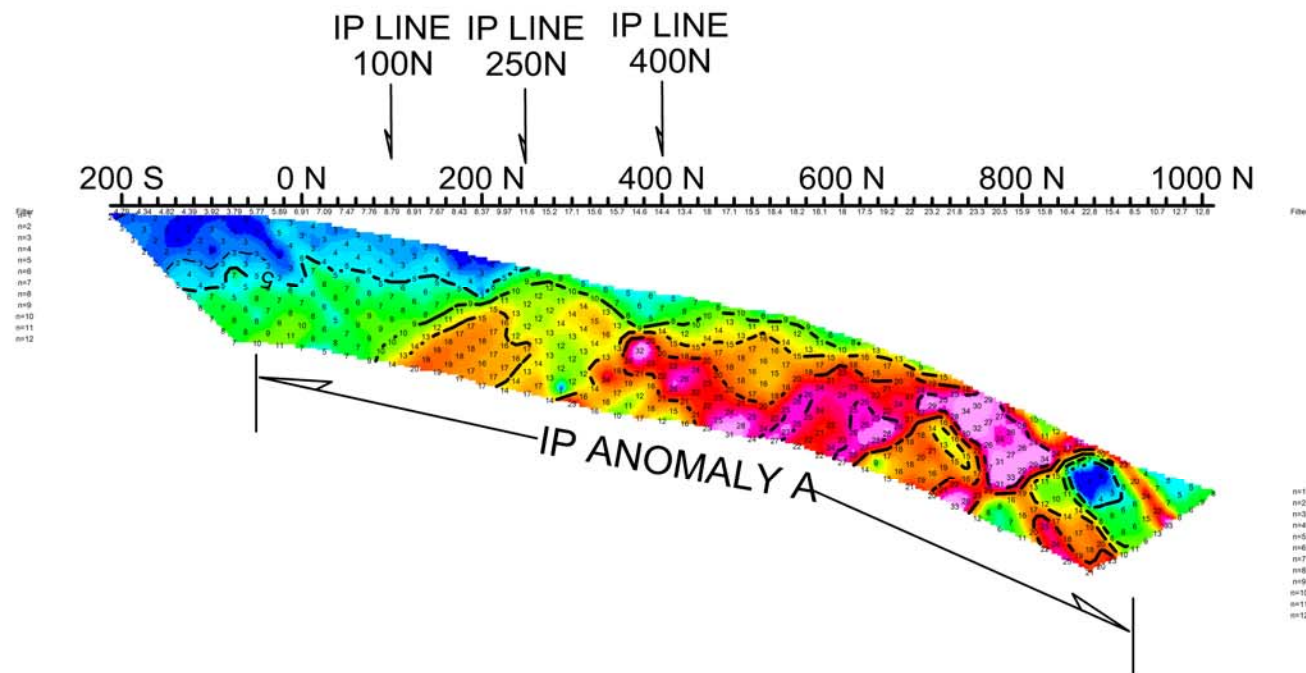
Resistivity  
Ohm\*m



Resistivity  
Ohm\*m



IP  
mV/V



IP  
mV/V

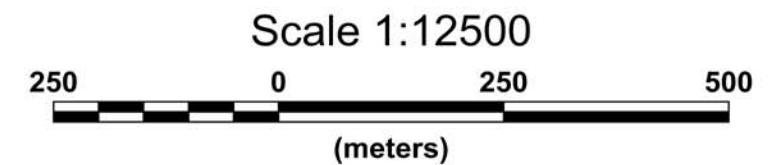


# Pseudo Section Plot

**LEGEND:**  
**CONTOUR INTERVALS:**  
Resistivity: log base 10 ohm-meters  
Chargeability (IP): log base 10 ohm-meters

**INSTRUMENTATION:**  
IP Receiver: BRGM Iris Elrec 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

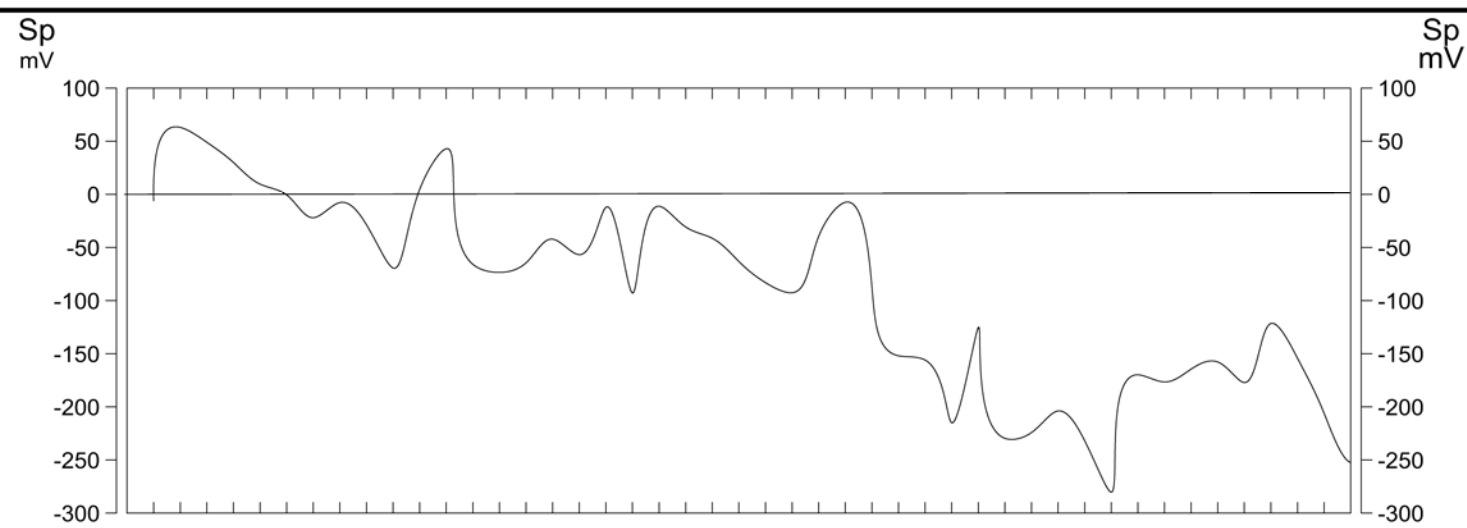
**IP SURVEY PARAMETERS:**  
Survey Mode: Time Domain  
Array: Dipole-dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration Time: 1600 milliseconds  
Charge Cycle: 8 second square wave



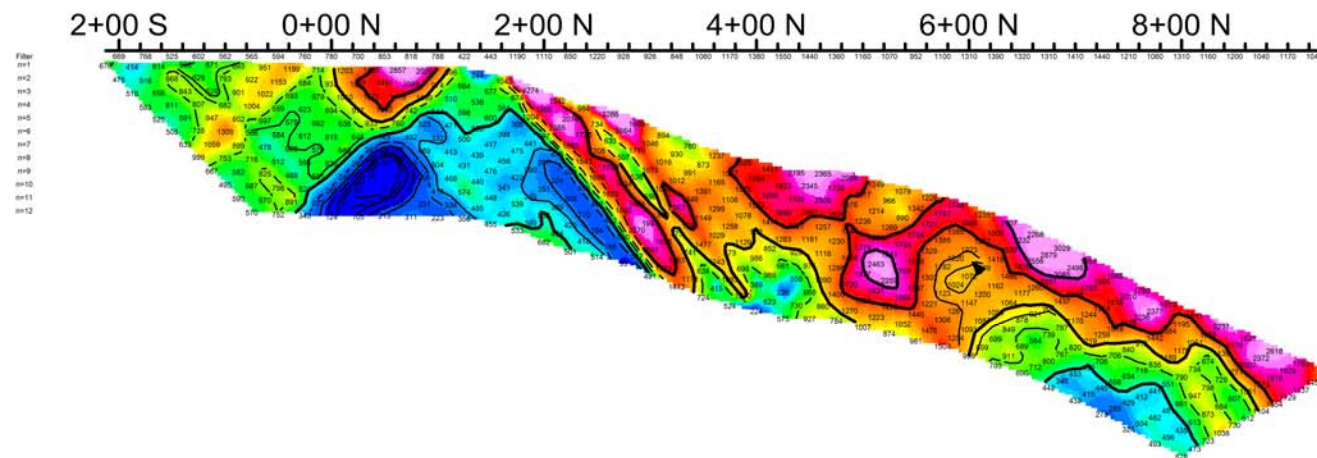
**DOUBLE CROWN VENTURES LTD.**  
**SURPRISE LAKE PROPERTY**  
Pine Creek, Atlin Area, Atlin MD, BC

**INDUCED POLARIZATION and RESISTIVITY SURVEYS**  
**PSEUDO SECTION PLOT**  
**Line 0E**

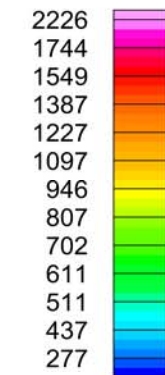
DRAWN BY: CAM	JOB NO.: 10-17	NTS: 104N/11	DATE: JAN '11	FIG NO.: GP-9
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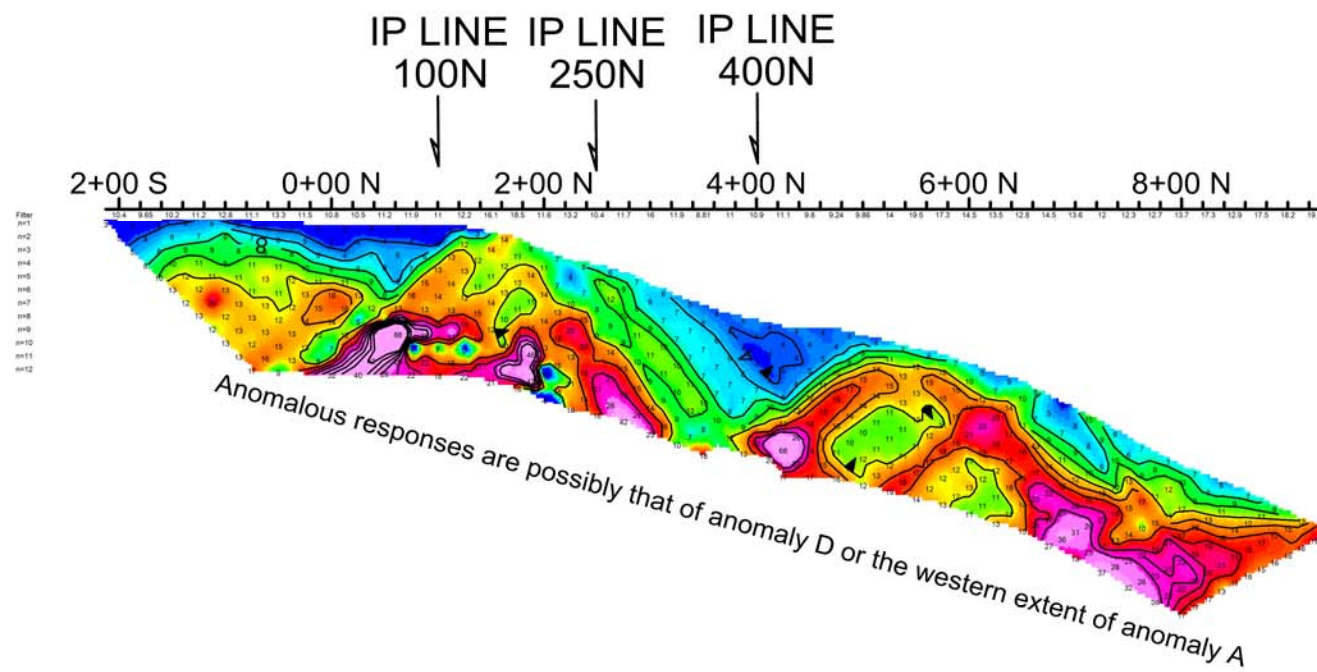
Resistivity  
Ohm\*m



Resistivity  
Ohm\*m



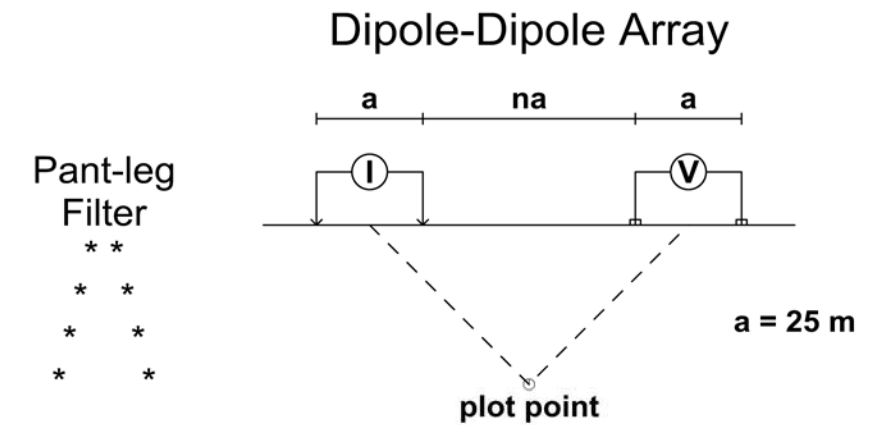
IP  
mV/V



IP  
mV/V



# Pseudo Section Plot



## LEGEND:

### CONTOUR INTERVALS:

Resistivity: log base 10 ohm-meters  
Chargeability (IP): log base 10 ohm-meters

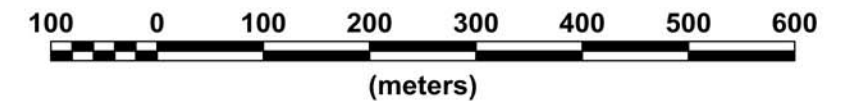
### INSTRUMENTATION:

IP Receiver: BRGM Iris Elrec 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

### IP SURVEY PARAMETERS:

Survey Mode: Time Domain  
Array: Dipole-dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration Time: 1600 milliseconds  
Charge Cycle: 8 second square wave

Scale 1:10000



**DOUBLE CROWN VENTURES LTD.**  
**SURPRISE LAKE PROPERTY**

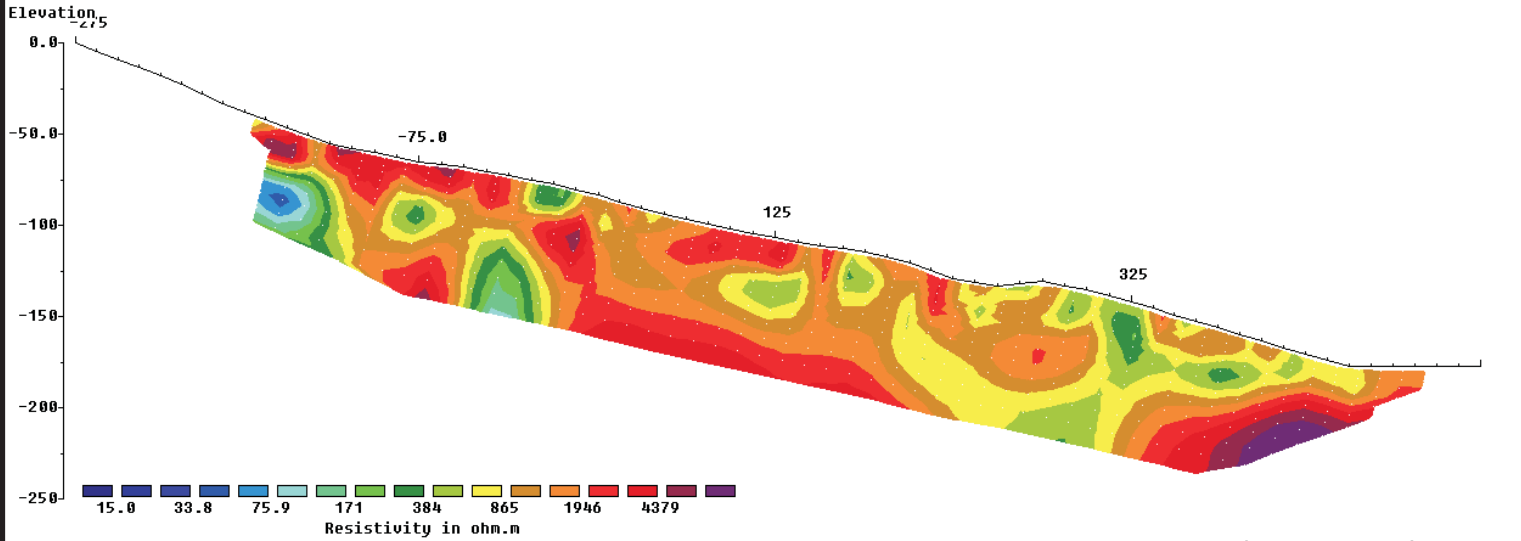
Pine Creek, Atlin Area, Atlin MD, BC

**INDUCED POLARIZATION and RESISTIVITY SURVEYS**  
**PSEUDO SECTION PLOT**  
**Line 100W**

<b>DRAWN BY:</b> CAM	<b>JOB NO.:</b> 10-17	<b>NTS:</b> 104N/11	<b>DATE:</b> JAN '11	<b>FIG NO.:</b> GP-10
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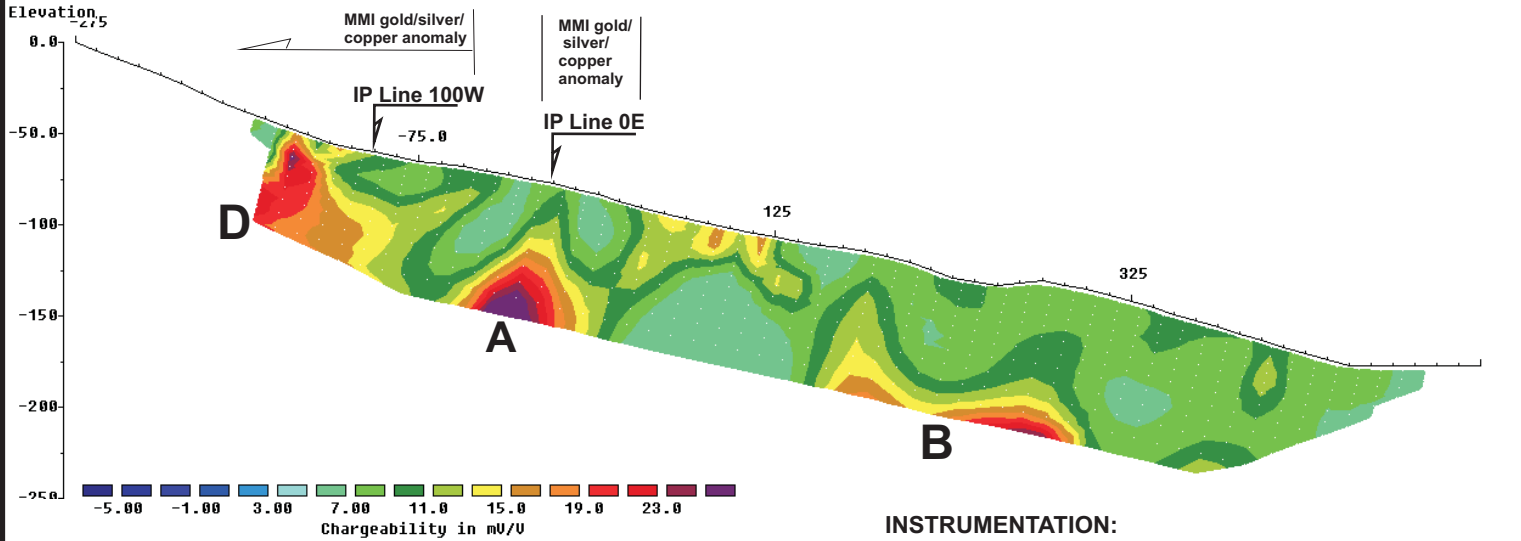
L100N.bin

Model resistivity with topography  
Iteration 5 RMS error = 8.7



Unit Electrode Spacing = 12.5 m.

Model IP with topography  
Iteration 5 RMS error = 6.2



Unit Electrode Spacing = 12.5 m.

Horizontal scale is 18.73 pixels per unit spacing  
Vertical exaggeration in model section display = 0.25  
First electrode is located at -275.0 m.  
Last electrode is located at 525.0 m.

**INSTRUMENTATION:**

IP Receiver: BRGM IRIS ELREC 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

**IP SURVEY PARAMETERS**

Survey Mode: Time Domain  
Array: Dipole-Dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration: 1600 milliseconds  
Charge Cycle: 8 second square wave

DOUBLE CROWN VENTURES LTD

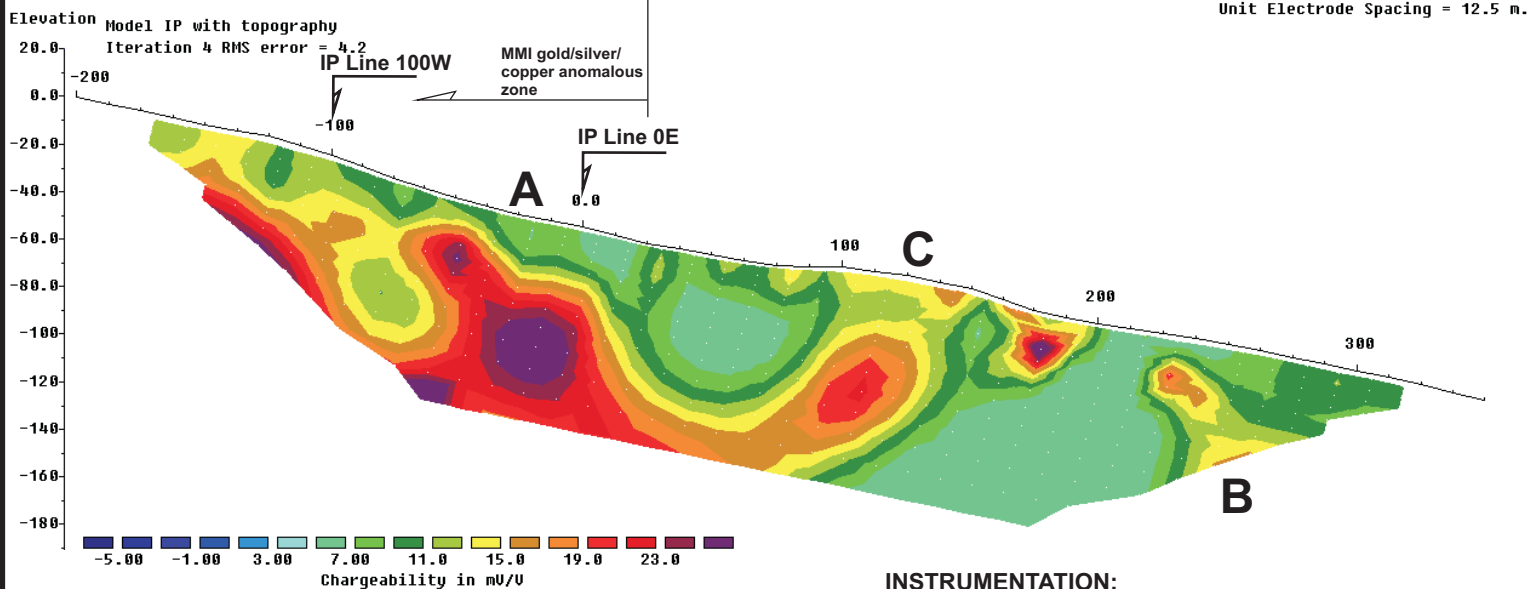
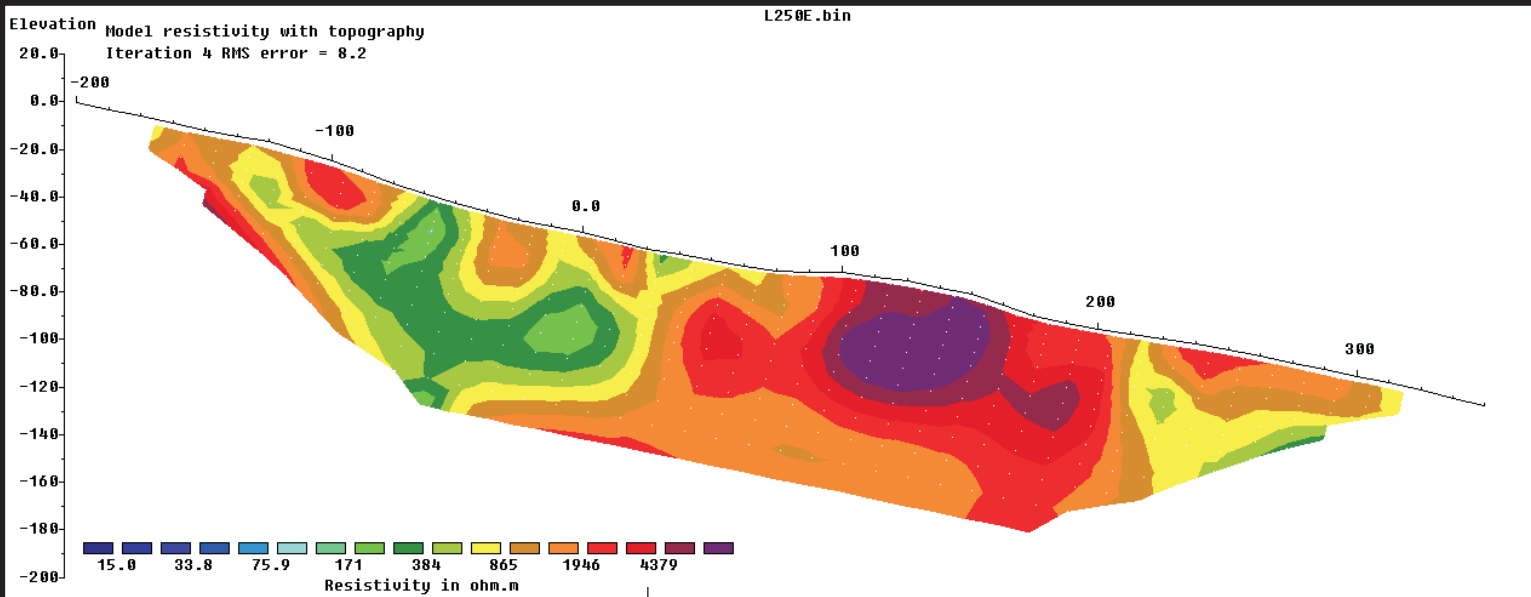
**SURPRISE LAKE PROPERTY**  
PINE CREEK, ATLIN AREA, ATLIN MD, BC

*IP and RESISTIVITY SURVEYS*  
GEOTOMO INVERSION  
**LINE 100N**

DRAWN BY:	JOB NO:	NTS:	DATE:	FIG NO:
DGM	10-17	104N/11	JAN 11	GP-6



GEOTRONICS CONSULTING INC.  
SURREY B.C.



Horizontal scale is 27.25 pixels per unit spacing  
Vertical exaggeration in model section display = 0.20  
First electrode is located at -200.0 m.  
Last electrode is located at 350.0 m.

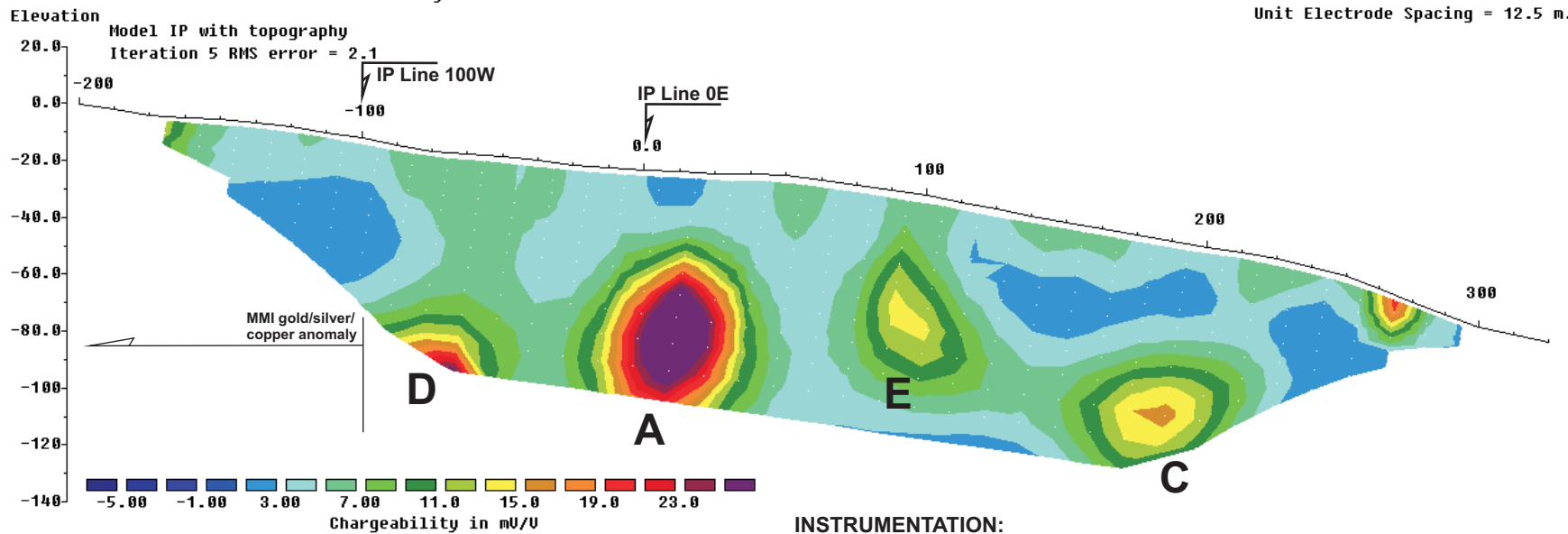
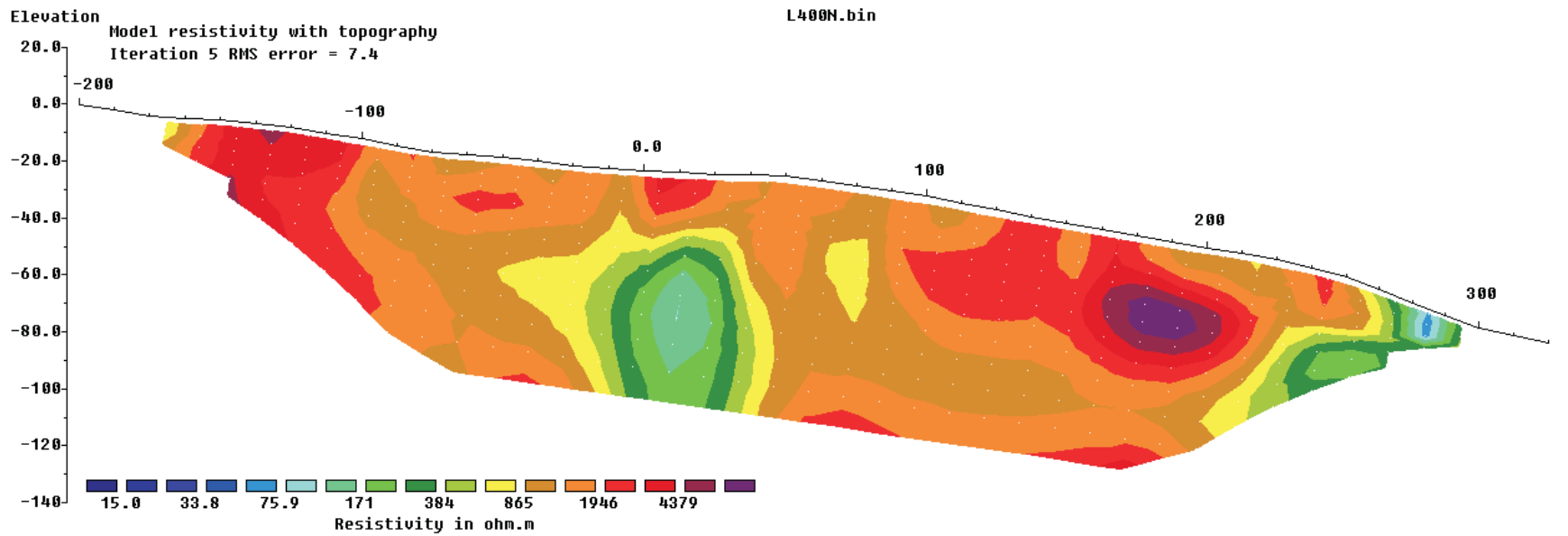
**INSTRUMENTATION:**

IP Receiver: BRGM IRIS ELREC 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

**IP SURVEY PARAMETERS**

Survey Mode: Time Domain  
Array: Dipole-Dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration: 1600 milliseconds  
Charge Cycle: 8 second square wave

DOUBLE CROWN VENTURES LTD				
SURPRISE LAKE PROPERTY PINE CREEK, ATLIN AREA, ATLIN MD, BC				
IP and RESISTIVITY SURVEYS GEOTOMO INVERSION <b>LINE 250N</b>				
DRAWN BY:	JOB NO:	NTS:	DATE:	FIG NO:
DGM	10-17	104N/11	JAN 11	GP-7



Horizontal scale is 28.55 pixels per unit spacing  
 Vertical exaggeration in model section display = 1.00  
 First electrode is located at -200.0 m.  
 Last electrode is located at 325.0 m.

**INSTRUMENTATION:**

IP Receiver: BRGM IRIS ELREC 6  
 IP Transmitter: BRGM VIP 4000  
 IP Generator: 6.5 kWatt Honda

**IP SURVEY PARAMETERS**

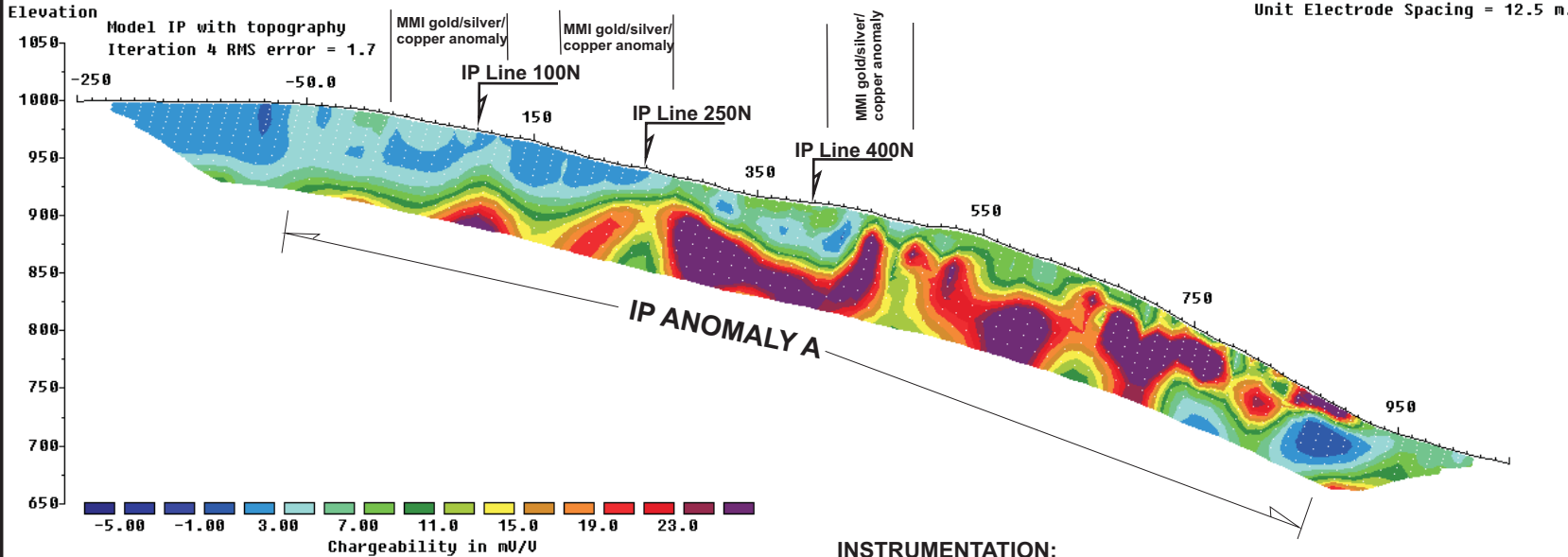
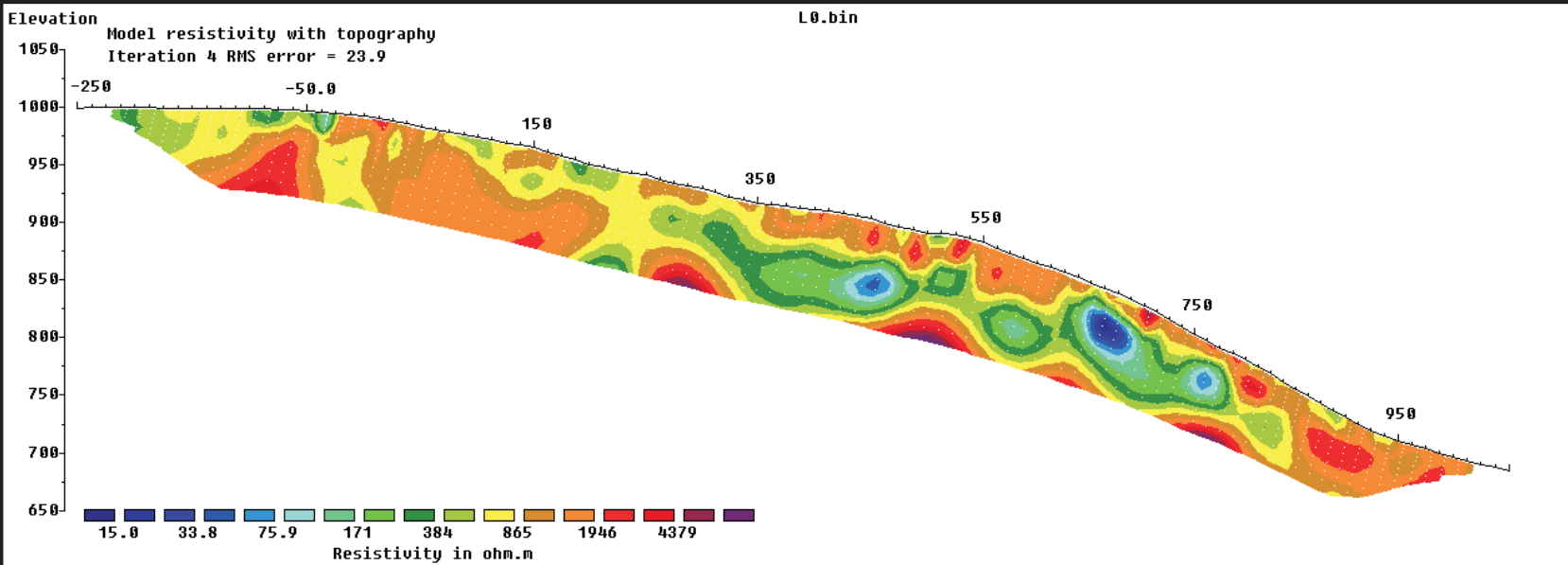
Survey Mode: Time Domain  
 Array: Dipole-Dipole  
 Dipole Length: 25 meters (82 feet)  
 Dipole Separation: n=1 to n=12  
 Delay Time: 240 milliseconds  
 Integration: 1600 milliseconds  
 Charge Cycle: 8 second square wave

Unit Electrode Spacing = 12.5 m.

DOUBLE CROWN VENTURES LTD				
SURPRISE LAKE PROPERTY PINE CREEK, ATLIN AREA, ATLIN MD, BC				
IP and RESISTIVITY SURVEYS GEOTOMO INVERSION <b>LINE 400N</b>				
DRAWN BY:	JOB NO:	NTS:	DATE:	FIG NO:
DGM	10-17	104N/11	JAN 11	GP-8



GEOTRONICS CONSULTING INC.  
 SURREY B.C.



Horizontal scale is 11.53 pixels per unit spacing  
Vertical exaggeration in model section display = 1.00  
First electrode is located at -250.0 m.  
Last electrode is located at 1050.0 m.

**INSTRUMENTATION:**

IP Receiver: BRGM IRIS ELREC 6  
IP Transmitter: BRGM VIP 4000  
IP Generator: 6.5 kWatt Honda

**IP SURVEY PARAMETERS**

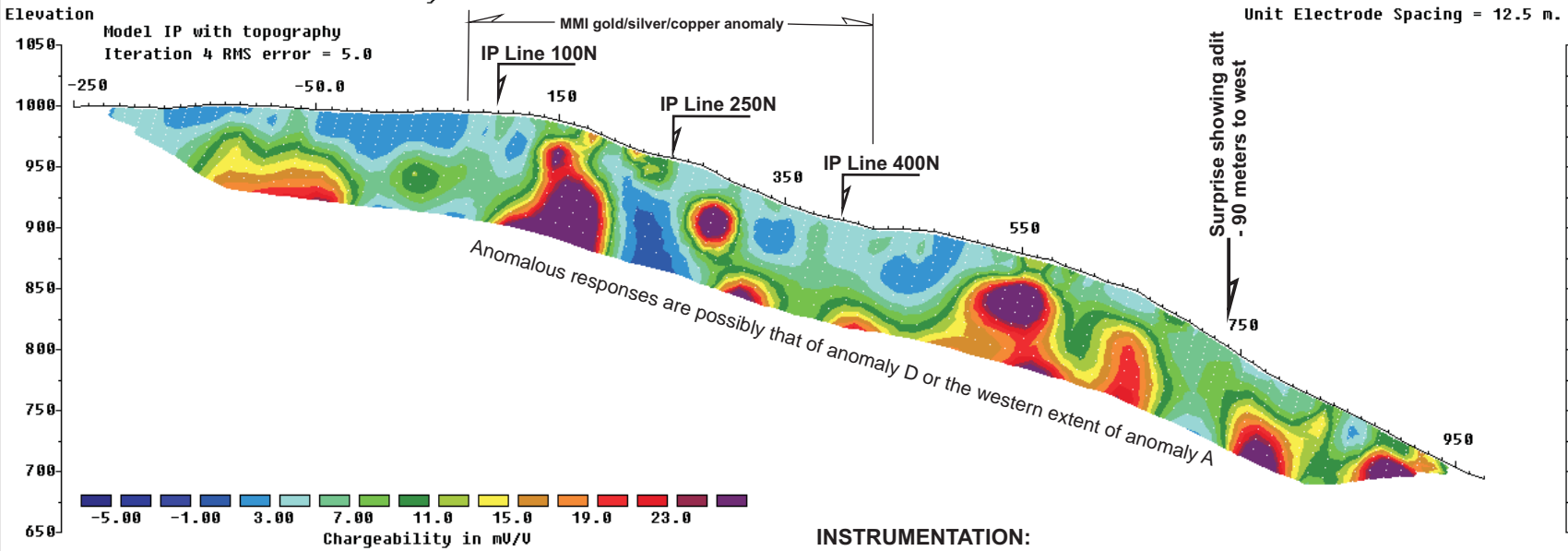
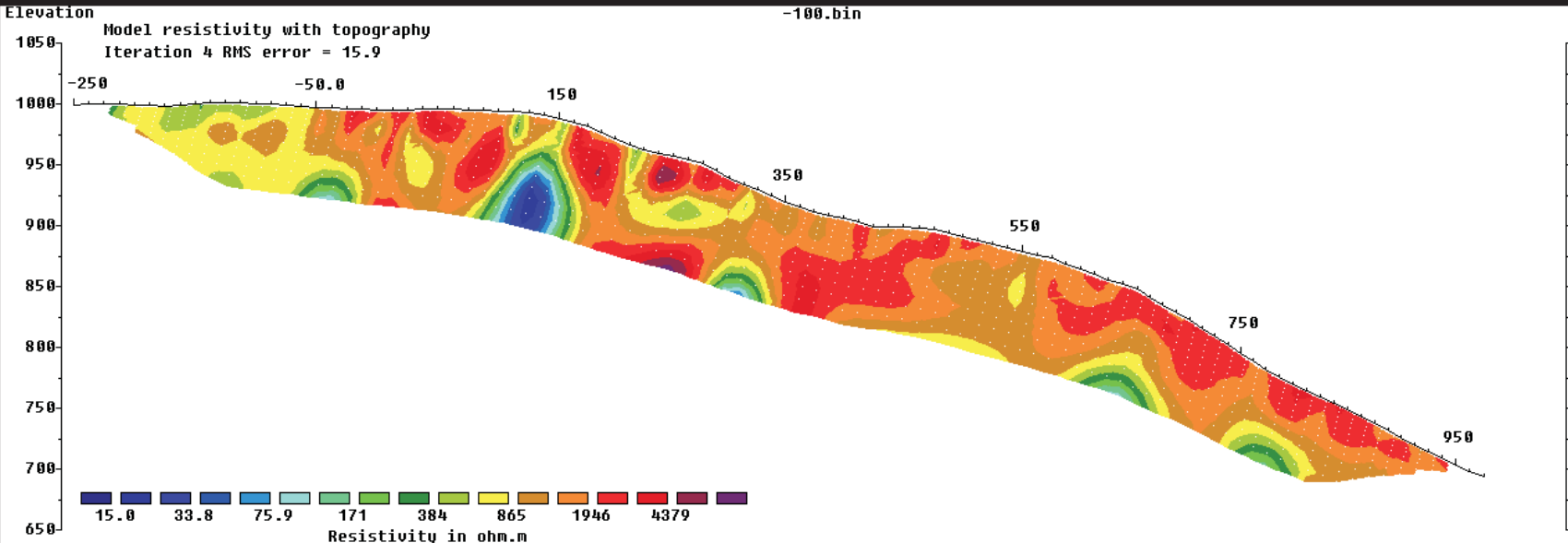
Survey Mode: Time Domain  
Array: Dipole-Dipole  
Dipole Length: 25 meters (82 feet)  
Dipole Separation: n=1 to n=12  
Delay Time: 240 milliseconds  
Integration: 1600 milliseconds  
Charge Cycle: 8 second square wave

Unit Electrode Spacing = 12.5 m.

Unit Electrode Spacing = 12.5 m.

DOUBLE CROWN VENTURES LTD				
SURPRISE LAKE PROPERTY PINE CREEK, ATLIN AREA, ATLIN MD, BC				
IP and RESISTIVITY SURVEYS GEOTOMO INVERSION <b>LINE 0E</b>				
DRAWN BY:	JOB NO:	NTS:	DATE:	FIG NO:
DGM	10-17	104N/11	JAN 11	GP-11





Horizontal scale is 12.23 pixels per unit spacing  
 Vertical exaggeration in model section display = 1.00  
 First electrode is located at -250.0 m.

**INSTRUMENTATION:**

IP Receiver: BRGM IRIS ELREC 6  
 IP Transmitter: BRGM VIP 4000  
 IP Generator: 6.5 kWatt Honda

**IP SURVEY PARAMETERS**

Survey Mode: Time Domain  
 Array: Dipole-Dipole  
 Dipole Length: 25 meters (82 feet)  
 Dipole Separation: n=1 to n=12  
 Delay Time: 240 milliseconds  
 Integration: 1600 milliseconds  
 Charge Cycle: 8 second square wave

Unit Electrode Spacing = 12.5 m.

DOUBLE CROWN VENTURES LTD				
SURPRISE LAKE PROPERTY PINE CREEK, ATLIN AREA, ATLIN MD, BC				
IP and RESISTIVITY SURVEYS GEOTOMO INVERSION <b>LINE 100W</b>				
DRAWN BY:	JOB NO:	NTS:	DATE:	FIG NO:
DGM	10-17	104N/11	JAN 11	GP-12