Ontario

We are committed to providing accessible customer service.
If you need accessible formats or communications supports, please contact us.

Nous tenons à améliorer l'accessibilité des services à la clientèle.
Si vous avez besoin de formats accessibles ou d'aide à la communication, veuillez nous contacter.

GEOPHYSICAL REPORT
OF THE IP SURVEY
FOR
CAMBRIAN MINING CORPORATION
ON THE
ATACAMA 3 PROPERTY
OTTO AND TECK TOWNSHIPS
LARDER LAKE MINING DIVISION
NORTHEASTERN, ONTARIO

Prepared by: J. C. Grant, CET, FGAC
February 2023

TABLE OF CONTENTS

PROPERTY HISTORY

-Limited previous work is recorded on the Teck Township portion of the claim group prior to 1977, when the claims were staked by Jomi Minerals and Expediting Ltd., although several historic pits and trenches are noted in the field and shown on the geological map by Thomson (1948). Assessment data by Duffy, Hansen and Gray on the ‘Duffy’ showing area, in the southeastern part of Teck Township, are incomplete in the Resident Geologist’s files.
-Very early work, however, is recorded in Lebel Township on the Dane copper prospect.

The exploration history is summarized as:

1911-15: Dane Mining; 2 shafts - #1 to 200 ft with 200 ft lateral development of the 50 and 100-ft levels, #2 to 100 ft; some ‘ore’ shipped between 1911 and 1913 (data on production unclear).
1948: Chavigny Gold Mines, diamond drilling, Northeast section and in the southwest section north of Blanche River
1951: Consular Harker Mines; #1 shaft dewatered, 2 x-ray drillholes.
1952: Bergey, W. R.; self-potential survey (Dane copper area).
1956: Iso Uranium Mines (option); #1 shaft dewatered, 5 drillholes (481 m).
1963: Duffy, Dennis; prospecting, stripping and trenching (the Duffy showing area).
1968: Hansen, Albert; 2 drillholes (62 m). 1969-70: Nucleonic Mines; 6 surface drillholes (614 m) – Lebel Twp.
1971: Gray, James; 4 drillholes (123 m).
1974-76: Duffy, Dennis; stripping, trenching. 1977-81: Jomi Minerals and Expediting Ltd; prospecting, magnetic, radiometric and VLF-EM surveys.
1982: Labrador Exploration; mapping, magnetic, HLEM surveys; 5 drillholes (594 m).
1985: Rio Algom Exploration; prospecting, IP survey; 4 drillholes (653.5 m).
1987: Rivard, diamond drilling, one hole and minimal stripping.
1988-89: HSK Minerals; mapping, soil Geochem, magnetic, VLF and IP surveys; discover ‘DK’ showing.
1989-91: Battle Mountain Canada; airborne magnetic and VLF-EM survey; ground magnetic, VLF, overburden stripping, sampling, mapping surveys; 3 drillholes (348 m).
1990: Crichton, R.; 3 drillholes (137 m) in Lebel Twp.
1992: S.J. Carmichael, Report on the Ottow Township Property, F. Rivard
1996-2001: Queenston – Franco-Nevada joint venture; reconnaissance mapping (1998).
2019-2020: Atacama/Cambrian Mining, detailed ground magnetic and VLF-EM surveys, Atacama 3 Property, Teck, Otto Townships.

<u>INTRODUCTION/SUMMARY</u>:

The services of Exsics Exploration Limited were retained by Cambrian Mining Corporation, to complete a detailed ground geophysical program across a portion of their claim holdings, Atacama 3, located in the Townships of Otto and Teck of the Larder Lake Mining division in northeastern Ontario.

The purpose of the program was to follow up on the results of a detailed total field magnetic and VLF-EM survey that was done in 2019 to test the property for a geological setting that would be considered a favorable environment for gold and or base metal deposition. **The IP survey was carried out between December 2019 and the end of January 2020. The work program was never submitted for assessment**.

The northern boundary of Atacama 3 lies approximately 3 kilometers to the south of the Macassa Mine, one of the richest gold mines in the area. The Macassa is situated on a branch of the Kirkland Lake Main Break that lies to the north and parallel to the Larder Lake Break. Both structures have been crosscut by north to northwest striking faults, one which can be followed south from the two main breaks across the central section of Atacama 3. Refer to Property Geology map.

<u>PROPERTY LOCATION AND ACCESS</u>:

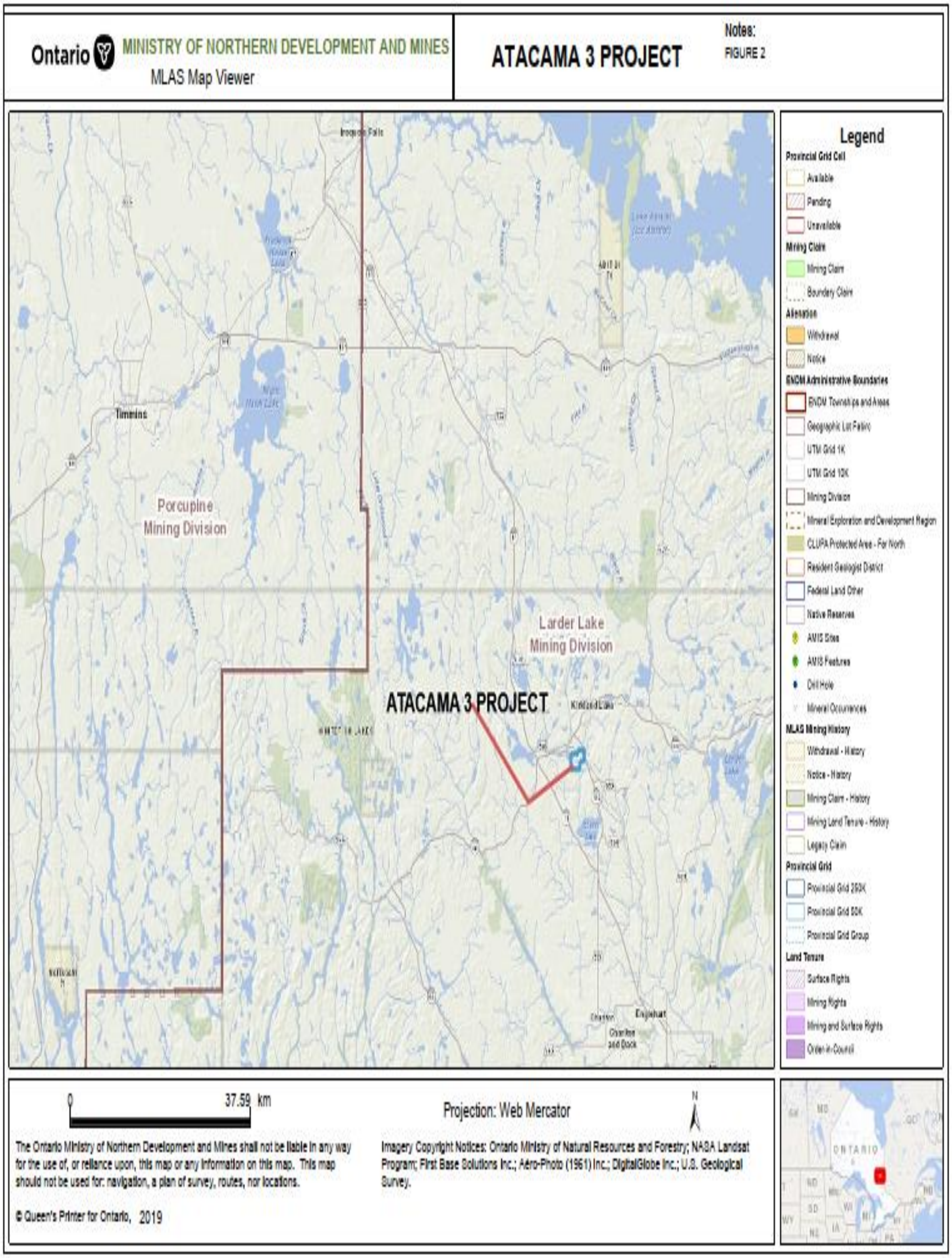
The Atacama 3 property lies approximately 7 kilometers southwest of the Town of Kirkland Lake and about 2.4 kilometers southeast of the Town of Swastika such that the northern section of the claim block straddles the Township line between Teck and Otto. The entire block lies about 200 meters to the east of Otto Lake and the Blanch River cuts across the southern and central section of the claim block. Figure 1 and 2.

Access to the property was relatively straight forward. The IP survey crew was lodged in Kirkland Lake for the program. The grid can be accessed by travelling west-southwest from the Town to the junction of highways 66 and 112. Travelling south along highway112 allowed access to a parking spot along the western shoulder of the road at **UTM point 570054E and 5327267N. A short foot traverse of 330 meters west would bring access to Line 200MW and the base line which was the eastern starting point of the grid.**

Alternately the western edge of the claim block can be accessed by boat travelling southeast across Otto Lake to the central east shore and then a 250-meter traverse east to line 2300MW and the base line. The travelling time from Kirkland Lake to the grid was about 30 minutes.

LOCATION MAP FIGURE 1

PROPERTY LOCATION MAP FIGURE 2

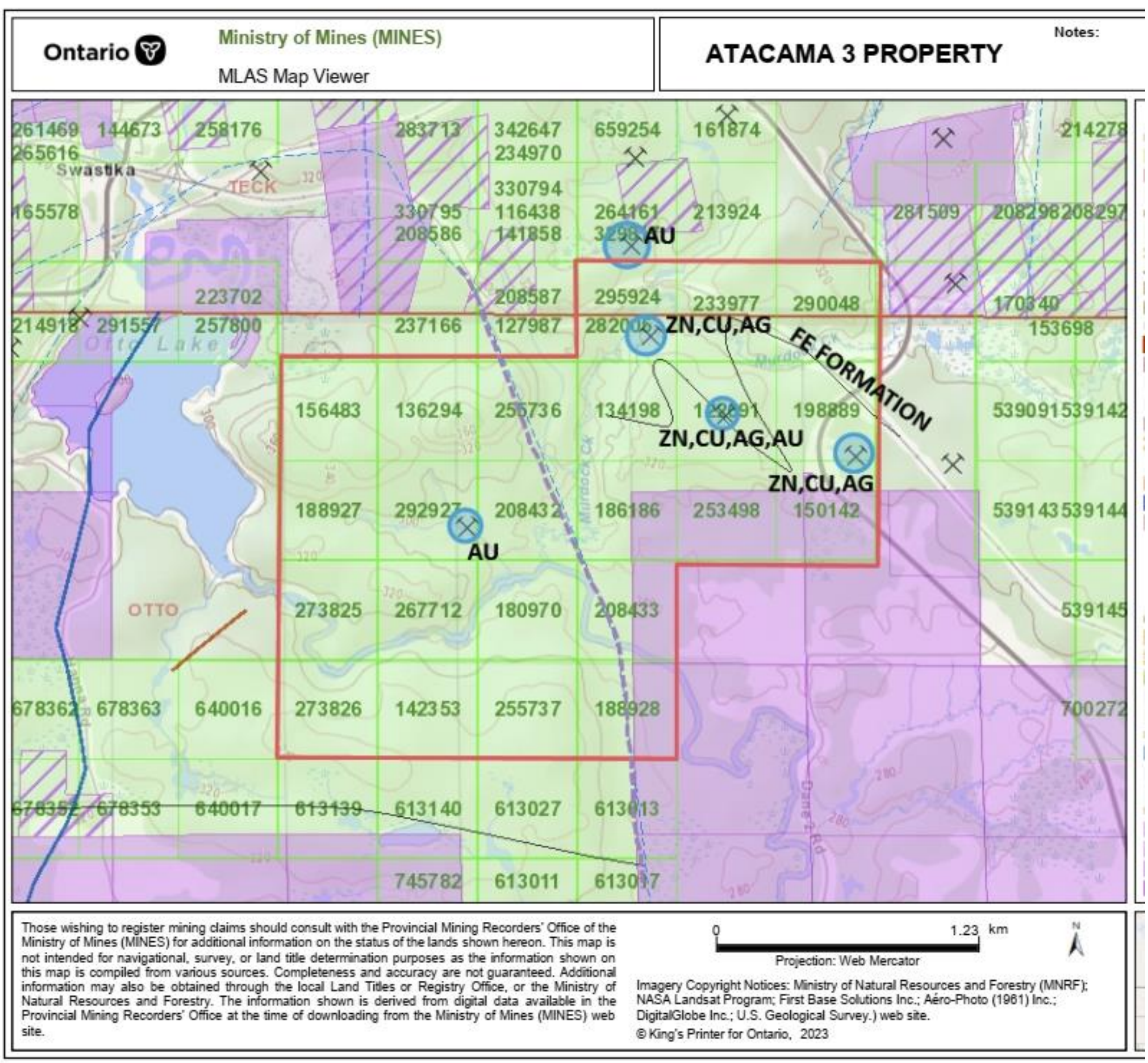


<u>CLAIM BLOCK</u>:

The Atacama 3 claim group consists of 23 single cells comprised of the following numbers. 134198, 292927, 273826, 273825, 267712, 255737, 255736, 208433, 208432, 188928, 188927, 180970, 156483, 142353, 136294, 122691, 290048, 282005, 233977, 253498, 198889, 186186, 150142

Refer to Figure 3 copied from MNDM Plan Maps of Teck and Otto Township for the positioning of the claim numbers within the Township.

FIGURE 3 CLAIM BLOCK MAP



PERSONNEL:

The field crew directly responsible for the collection of all the raw IP data were as follows.

J. Francoeur	Timmins, Ontario
R. Bradshaw	Timmins, Ontario
D. Porier	Timmins, Ontario
J. Hamelin	Timmins, Ontario
DJ Gibson	Timmins, Ontario

The plotting and interpretation as well as the report were completed by J. C. Grant of Exsics Exploration Limited.

INITIAL GROUND PROGRAM, 2019:

The initial ground program consisted of the establishment of a detailed metric grid across the claim block that was to be then covered by a total field magnetic survey that was done in conjunction with a VLF-EM survey.

The grid consisted of compassed, paced and flagged grid lines that commenced on the eastern edge of the property at a UTM point of 569730E and 5327240N. This point represented Line 200MW and the base line 0. This base line was then flagged with GPS controlled for 2300 meters to the western section of the property. Cross lines were then turned off of this base line at 200 meter and 100-meter intervals from 2300MW to line 200MW. The grid lines were labelled 2300W, 2100W, 1900W, 1700W, 1600W, 1500W, 1400W, 1300W, 1200W, 1100W, 1000W, 900W, 800W, 600W, 400W and 200W. **In all a total of 25.0 kilometers of grid lines were compassed paced and flagged across the survey area between August 29th and September 23rd, 2019**.

This survey was completed using the Terra Plus, GSM-19W Overhauser magnetometer and VLF unit. Stations were read at 25-meter intervals across all of the grid lines. Specifications for this unit can be found in Appendix A of this report.

FOLLOW UP IP PROGRAM, 2019- 2020. (REFERNCE,MNDM PLAN PL-19-000131)

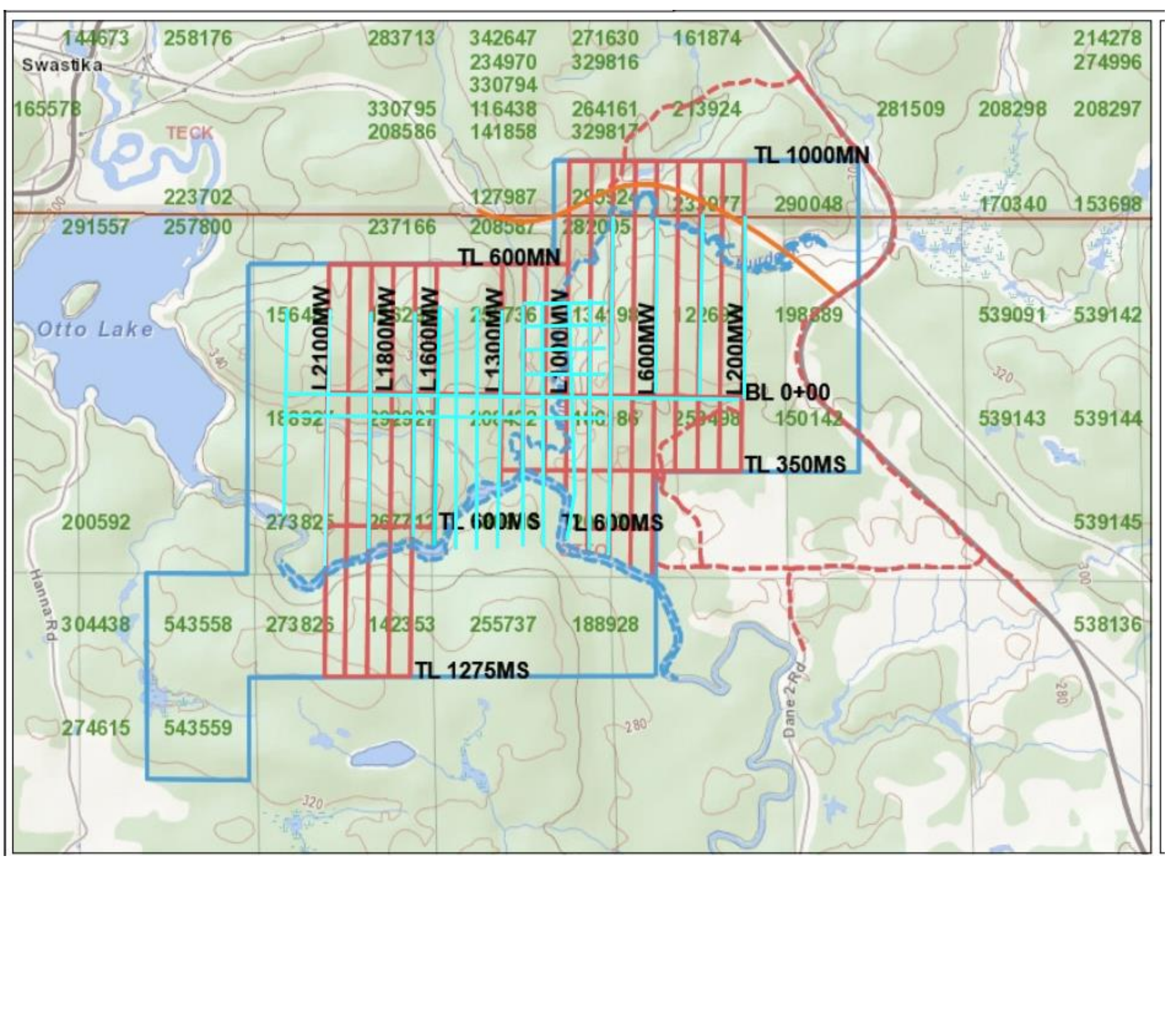
In December 2020, a detailed metric grid was cut across the Atacama 3 property to follow up the results of the magnetic and VLF-EM survey results. Once this grid was completed, a detailed IP survey was done to better define the anomalous zones and to better define the cross faults. **The IP survey grid map, Figure 4 is below showing the IP cut lines outlined in red and the historical Mag and VLF-EM lines outlined in blue**. **In all a total of 32.5 kilometers of cut lines were completed across the property and 27.0 kilometers of IP surveys were read between the middle of December 2019 and the end of January 2020.**

The IP survey was completed using the Instrumentation G.D.D. System, found as Appendix B of this report. The following survey parameters were kept constant throughout the survey.

Line spacing	100 meters.
IP method	Time Domain
IP array	Pole-Dipole array
Receiver	Instrumentation GDD 8 channels
Transmitter	Instrumentation GDD 3.6 Kilowatt
Power supply	Honda 5000-watt generator
Electrode spacing	25 meters.
Electrode number	6 stainless steel electrodes
Parameters measured	Apparent Chargeability in millivolts/volt.
Sampling mode	20 time slices, M1-M20, Apparent Resistivity in ohms/meter
Transmitter cycle;	2 seconds on, 2 seconds off

Once the IP survey was completed, the lines were plotted as individual line pseudo-sections showing the color contour results for the chargeability in millivolts/volt, the apparent resistivity in ohms/meter and a calculated metal factor. These individual sections are included in the IP interpretations section.

<u>FIGURE 4, COMBINED HISTORICAL GRID, (BLUE LINES) AND IP GRID, (RED LINES</u>), Note: The IP survey terminated at the river, due to flooding and topography and at the railroad tracks to the north.



REGIONAL GEOLOGY:

The Kirkland Lake area is underlain by Archean volcanic, sedimentary and intrusive rocks which are part of the Abitibi Greenstone Belt. The volcanic rocks form a basin between the Lake Abitibi batholith, northeast of Timmins and the Round Lake batholith, south of Kirkland Lake (**Jensen and Langford, 1983**).

Basin margin faults formed on the north by the Porcupine-Destor Fault Zone and the Larder Lake- Cadillac Break Zone on the south (Figure 4). The Abitibi belt in the Kirkland Lake area is subdivided into a series of assemblages referred to as Groups in order of decreasing age; Larder Lake, Kinojevis, Blake River, and Timiskaming Groups (**Stevenson et al 1995**). The historical names of these groups in the Timmins and Kirkland Lake areas were changed by Ayers (2005) to unify the lithologies chronologically according to the vast numbers of age dates available.

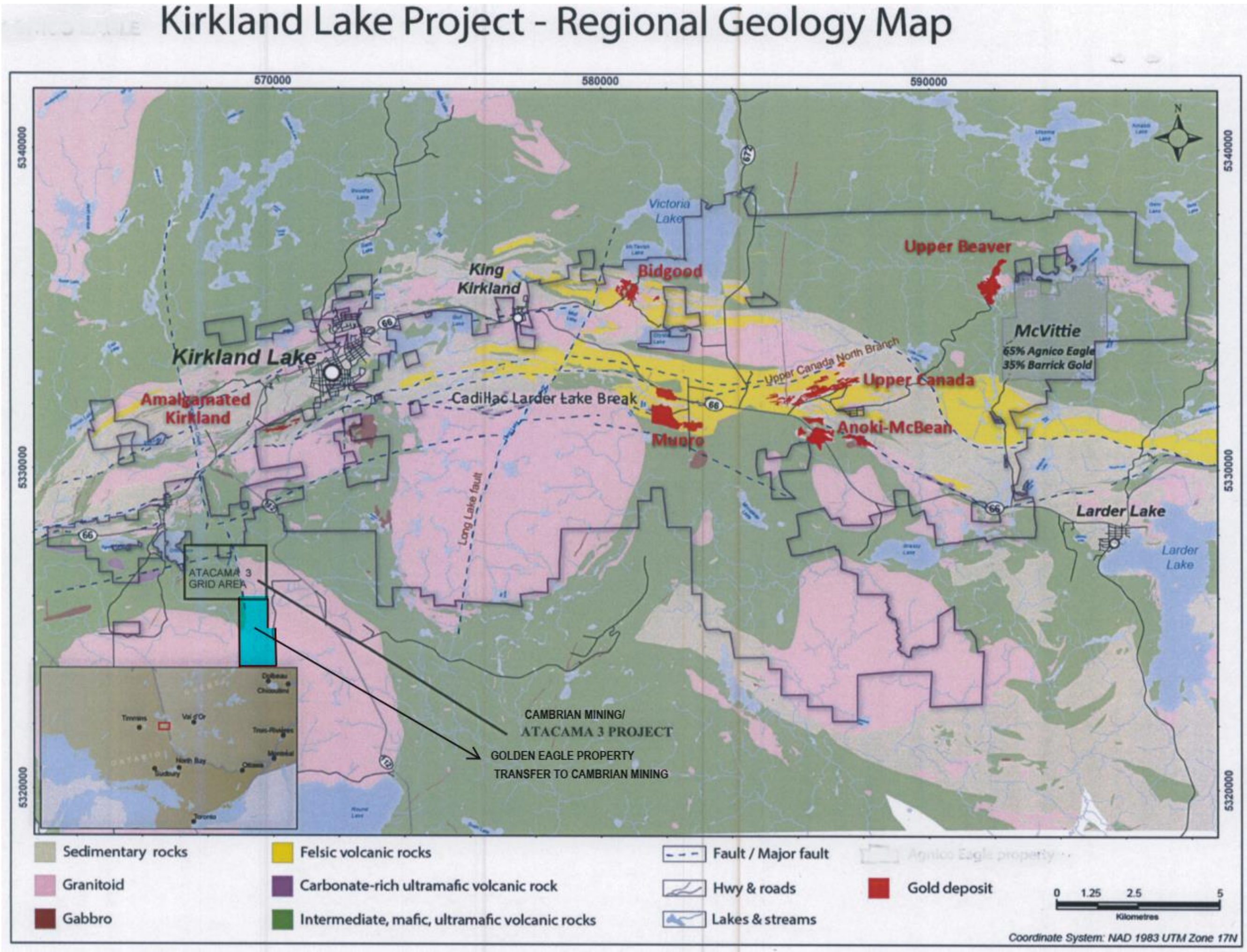
The Kerr Addison deposit, which produced almost 11 million ounces of gold, is situated along the Larder Lake Cadillac Break in the town of Virginiatown approximately 39 kilometers to the east of the Atacama Groups. The host lithologies for the mineralization include pillowed mafic flows and spinifex textured komatiite flows cut by lamprophyre dikes that have been strongly altered.

Other former producing mines clustered around the Dobie area located halfway between the Kirkland Lake mines and the Kerr Addison deposit, include the Upper Canada, Upper Beaver, and McBean deposits. These all occur in different geological assemblages despite the fact that they are all clustered within a 10 km radius of each other.

The McBean deposit occurs within a green carbonate altered ultramafic package intruded by felsitic dikes, somewhat similar to the Kerr Addison associated with the Larder Lake-Cadillac Break, whereas the Upper Beaver probably represents a magmatic related gold- copper deposit associated with a composite mafic intrusive and series of syenite porphyry dikes (Masson, 2012).

The third of these deposits, the Upper Canada Mine, lies within the Timiskaming Group trachytic volcanic and sedimentary package. It appears to be related to strong albitite alteration associated with a possible splay from the Larder Lake Cadillac Break.

FIGURE 5 REGIONAL GEOLOGY WITH GOLD DEPOSITS



PROPERTY GEOLOGY: (Hawkins P.Eng, June 2011), Figure 6

Generally, the property is underlain by Mafic Metavolcanics and Metasediments which cover the northern and western sections of the grid area. The southeast and eastern sections of the grid area is underlain by the Otto Stock.

The metavolcanic rocks immediately north of Otto Stock are concentrated in a belt and can be described as contact metamorphosed mafic tuffs (plagioclase-garnet-epidote amphibolite and amphibolite gneiss) interbedded with massive basalt, carbonate and felsic metavolcanics. As these rocks are within the metamorphic aureole of the Otto Stock, the metavolcanics have been metamorphosed to amphibolite and amphibolite gneiss.

The mafic volcanics underlie the felsic volcanics, however, in many places along the intrusive contact, the alkalic intrusions has destroyed the mafic metavolcanics leaving the felsic metavolcanics in direct contact with the stock. The felsic metavolcanics range in composition from dacite to rhyolite. Dacite tuff is most common, with rhyodacite tuff and agglomerate comprising most of the remainder. These rocks are hard, fine-grained, greenish grey to pale greyish white that weather to light brownish green or brownish grey. They are composed of plagioclase, mica, carbonate minerals and epidote.

Also interbedded with the felsic metavolcanics are carbonatized rocks that are of sedimentary origin. These carbonatized rocks are generally green in colour and are the equivalent of Algoma-type iron formation. This iron formation is part of a stratigraphic zone traceable from Eby Township across Otto Township to Boston Township, in which the Adams Iron Mine is found. Consequently, these iron formations may be very useful as marker strata. Small bodies of syenite and lamprophyre, likely related to the Otto Stock, intrude the overlying metavolcanic rocks.

Quartz syenite and syenite make up the bulk of the Otto Stock. These rocks are pink and coarse-grained. Porphyritic syenite is common and has a high proportion of phenocrysts. Feldspar grains stand out as tabular crystals on weathered surfaces. Weathering has bleached the reddish pink feldspar to pale pink. Small dark pyroxenes are sparsely disseminated through the syenite as well as rounded inclusions of country rocks metamorphosed to biotite, amphibole and pyroxene. These inclusions can be quite variable in size.

The syenites are generally composed of feldspar (microperthite predominates); pyroxene; amphibole; and minor amounts of apatite, sphene, zircon, and magnetite. Pyroxene forms between 3 to 14 percent of the syenitic rocks. Some pyroxene has undergone replacement by acicular to prismatic light green hornblende, which comprises less than 3 percent of the syenitic rocks. Apatite and sphene form about 0.5 percent, and zircon and magnetite are rare. The composition of the Otto Stock also includes historically unrecognized mafic and ultramafic alkalic gabbro, hornblendite and lamprophyre phases.

A contact metamorphic aureole surrounds the Otto Stock and is approximately 400 meters in width. The aureole is most developed along the northern contact of the stock, within the Property’s northern claim group. The outer parts of the aureole have undergone recrystallization and development of new mineral assemblages, while the inner parts have been transformed into migmatite.

It has been reported that radioactive minerals, including allanite, are present in a pegmatite dike cutting altered county rock in the Highway 11 rock-cut in the northern contact of the Otto Stock. Lamprophyre dikes are found throughout the stock. The lamprophyre dikes are dark grey, less than 1 metre in average width. The dikes are composed of biotite, augite, hornblende, tremolite, albite, microcline, calcite, apatite, magnetite and sphene.

Faults:

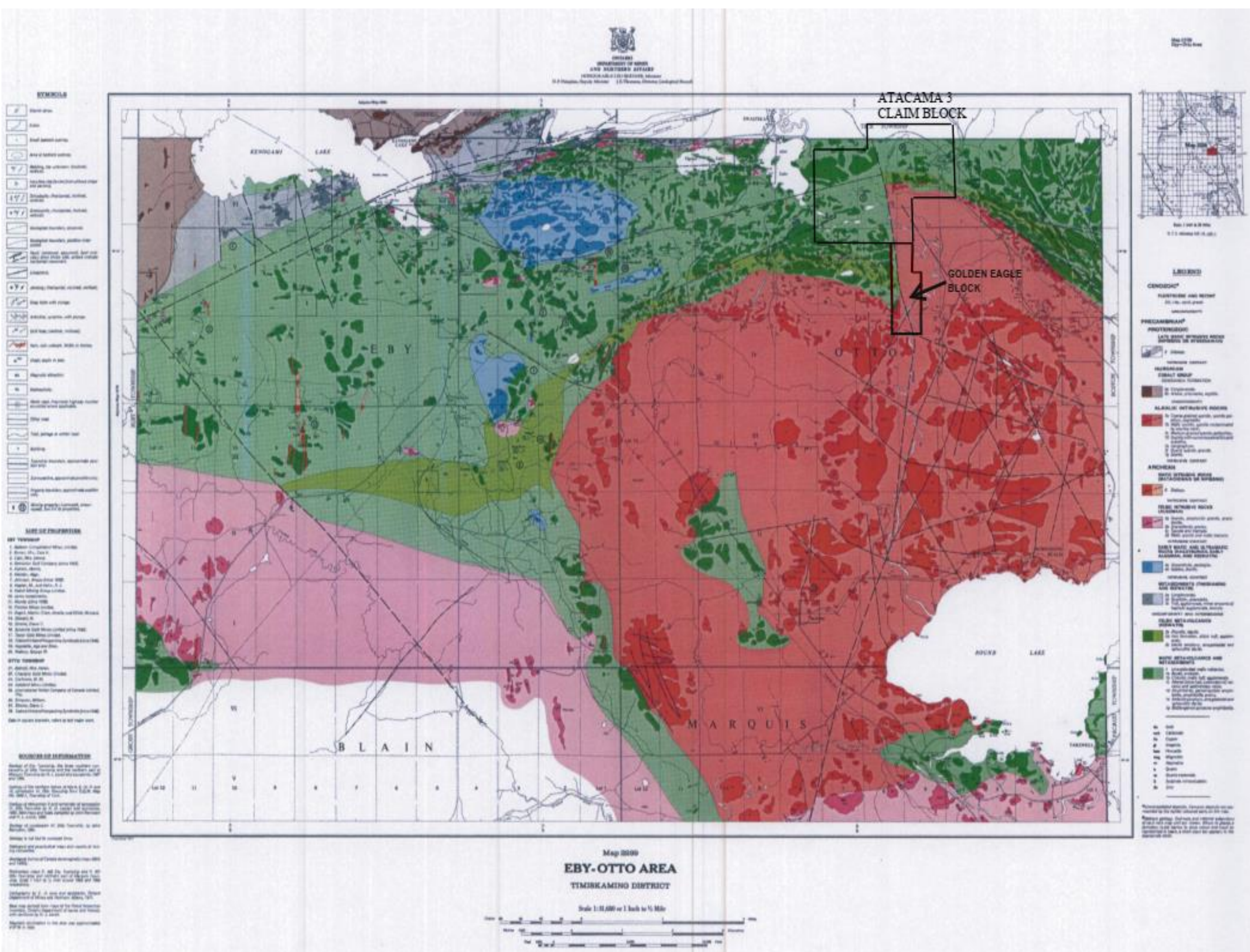
A prominent fault, (the Amikougami Fault), has offset the western half of Otto Stock. Apart from the Otto Stock, the major structural geology feature on the Property is a splay of the Larder-Cadillac Deformation Zone that potentially cross cuts the southwest and western section of the grid area and appear to terminate next to the Amikougami Fault. These cross-cutting structures have a strike of approximately 60 degrees. Localized shearing within the Otto Stock has been described as extensive, especially along the northern edge of the stock in historical assessment reports. Shearing within the volcanic rocks has also been noted in historical assessment reports, however not as prevalent as in the stock.

Mineralization within the Otto Stock generally occurs as pyrite deposition along fracture planes that have been hematized and/or chloritized, and or intervals that have been silicified. Analytical results for diamond core samples containing this type of mineralization have not been provided in historical assessment reports (i.e., those of Argentex), therefore their economic potential is unknown at this time.

Mineralization in the Otto Stock may also be associated with lamprophyre dikes. OGS chip sampling of 12 malachite-stained lamprophyre along a road cut on Highway 11 in Otto Township returned anomalous values for gold, platinum and palladium. Within the metavolcanic rocks, disseminated sulphide minerals (mainly pyrite) are associated with quartz-carbonate stockworks and veinlets.

Pyrite mineralization also occurs within fracture planes or as fine disseminations within felsic tuff intervals that have been chloritized. Very minor massive sulphide mineralization in these rocks has been encountered to date. Sampling of these mineralized zones in previous diamond drilling programs (particularly that of Minorex) has yielded low or trace values for precious and base metals. Figure 5.

FIGURE 6 PROPERTY GEOLOGY:



MAGNETIC AND VLF-EM SURVEY RESULTS FROM 2019 GROUND PROGRAM:

The 2019 magnetic and VLF-EM survey was successful in locating and outlining the suspected geological structures of the property. The most predominant magnetic feature on the grid is a broad magnetic high unit that covers most of the southeast sections of lines 200MW to 1100MW and extends off the grid to the east and south. The feature correlates to the mapped Otto Stock, Figure 6. The western edge of the magnetic high terminates next to the north to northwest trending Amikougami major fault that is also well defined in Figure 6. This main fault correlates to the direction of the Blanch River at the southern 1000MW and the direction of Murdock Creek running between lines 1000MW and 1100MW. Distortions in the magnetic highs also correlate to the direction of this fault.

Several strong and parallel VLF conductors lie within or along the northern and southern edges of the high possibly relating to contact zones or sulphide rich veinlets and or shears. These conductive trends also pinch out as the come in contact with the major fault.

There is another good and narrow magnetic high that strikes west across lines 400MW to 800MW and parallels the northern edge of the Otto stock. This zone has two strong VLF conductors lying along both edges that continue off the grid to the east. The western extension of these two zones appears to be cut off by a suspected northeast striking fault that emanates from the main fault. This cross fault can be traced generally from line 2100MW at the southern tip to line 800MW at the northern tip by following a series of weak magnetic lows and by offsets in the main magnetic high features. There appears to be a slight offset in this cross structure in the vicinity of the main fault around line 1200MW 200MN. The northern section of this fault generally parallels the direction of the Murdock creek in the same area.

Another cross structure may be evident striking northeast from the southern end of line 1600MW to 1200MW at about 200MN that terminates at the main fault. The southern section of this structure correlates to the direction of the Blanch River and it also seems to distort or offset the magnetic high units trapped between this structure and the parallel one to the west.

Several of the VLF conductive trends also appear to either terminate at these structures or appear to be offset by them.

There is a well-defined magnetic low unit that strikes east into the grid and crosses the southern sections of lines 2300MW to at least line 1100MW. This unit is also offset and or crosscut by both of the two northeast striking structures. There is a good VLF conductor correlating with the entire strike of this magnetic low unit. A second parallel VLF zone lies just to the north of the northern edge of the low and it also represents a good conductor.

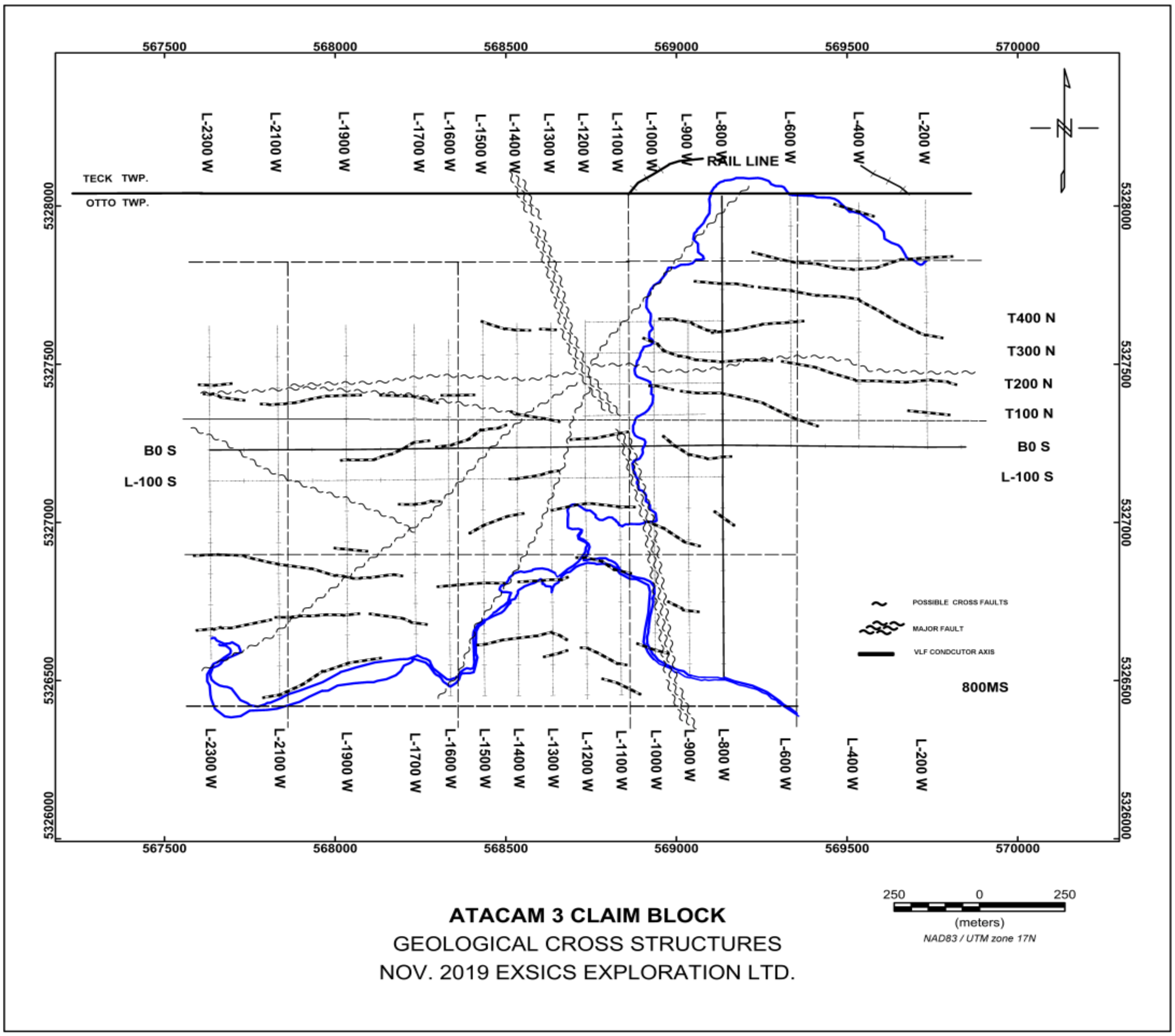
Two possible structures also appear to emanate from the northeast striking structures. One is interpreted to strike northwest from line 1700MW to line 2300MW and a second striking west from line 1400MW to 2300MW. Both cross structures lie along the edges of magnetic highs and correlate to modest magnetic lows. A VLF conductor correlates directly with the northern, west striking unit and can be followed from 1400MW to 2300MW and continues off the grid to the west.

A final possible structure may be evident striking east-west across the entire grid, and it can be followed from 2300MW at about 100MN to the main fault where it appears to be offset slightly to the north and then continue from line 1200MW at 275MN to line 200MW at about 200MN and continues off of the grid to the east. A good VLF conductor correlates to the entire eastern section of this structure.

A final area of interest would be the significant magnetic low that appears to strike into the western edge of the Otto Stock and can be followed from line 900MW to 800MW. The unit is crosscut by two east striking VLF conductors as well as the east striking cross structure. It may represent a possible iron rich unit lying next to the Otto Stock thus causing a dipole effect represented by the magnetic low cutting into the magnetic high.

Refer to plan map below, a plan map of the interpreted geological cross structures outlined by the magnetic and VLF-EM surveys of 2019.

PLAN MAP OF CROSS STRUCTURES FROM THE MAG/EM SURVEYS, Figure 7:



The initial magnetic and VLF-EM surveys outlined the expected geological environment of the grid area. The Otto Stock is well defined as the major fault structure referred to as the Amikougami Fault. Of particular interest are the two parallel secondary fault structures that strike generally northeast to southwest across the survey area. These cross structures could be emanating from the main fault, and they appear to control the majority of the VLF conductors as well as to define some of the offsets in the magnetic highs.

A series of at least 4 east-west to slightly northwest cross structures seem to emanate from these two zones and appear to run along geological contacts and for the most part they seem to define the edges of significant magnetic units as well. As would be expected, there are good VLF conductors associated with most of these east-west striking features.

Of particular interest is the secondary cross structure that strikes northeast across the entire grid and continues off of the grid to the northeast. The main Kirkland Lake Break and Larder Lake Break lie just to the immediate north of the property which may add more significance to these structures should it prove to intersect either of those two main breaks. The strike of this cross structure, if it is traceable further to the north-northeast, may put it in close proximity to developments happening north of Atacama's north boundary by Agnico Eagle.

The north boundary of the Atacama 3 claim block lies approximately 3 kilometers to the south-southwest of the Macassa Gold Mine.

IP SURVEY RESULTS FROM THE 2020 IP PROGRAM

The map below represents the grid lines that were covered by the IP survey of late 2019 and early 2020. There are potentially 5 to 6 moderate to strong IP trends that were outlined generally striking east-west across the entire grid.

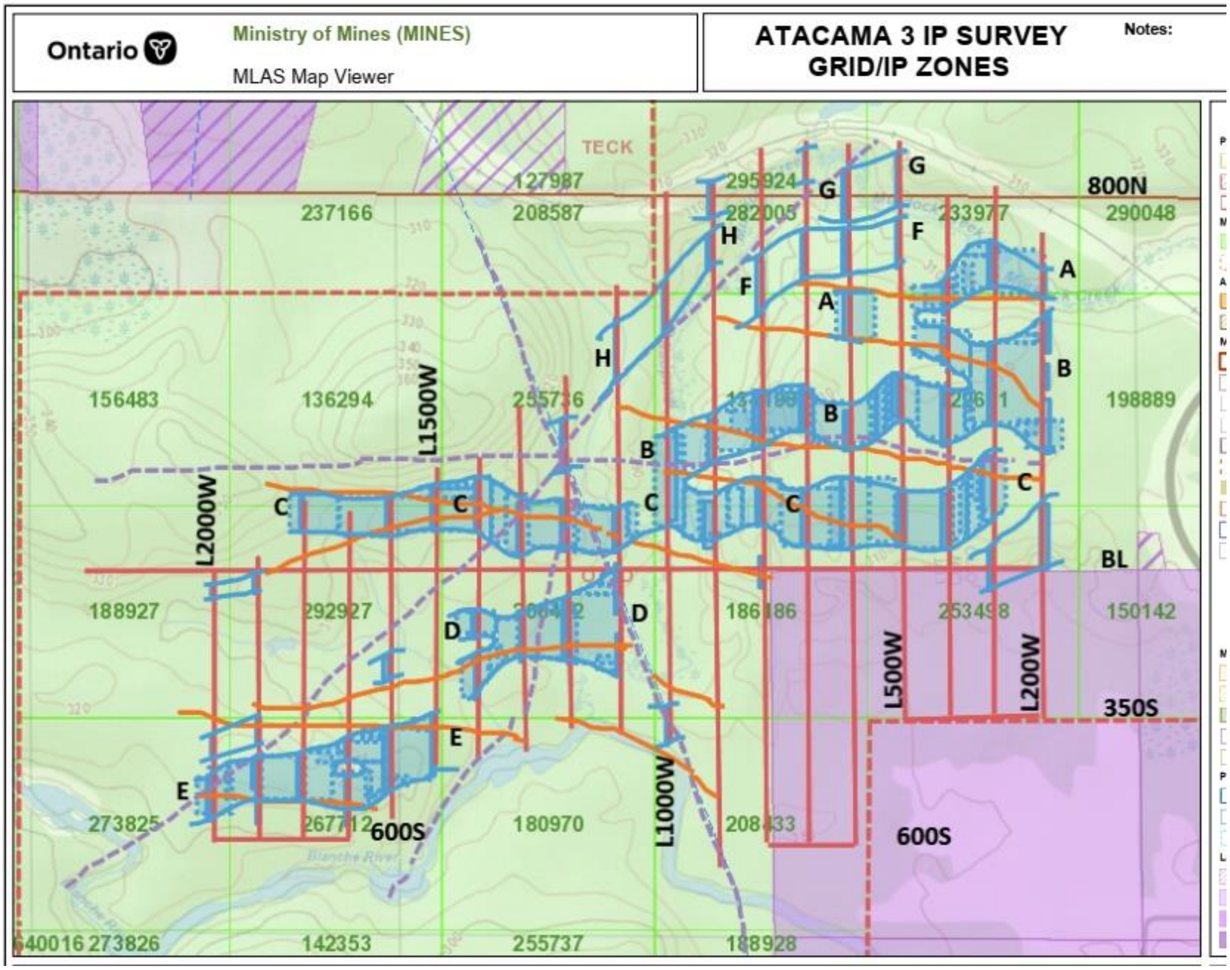
At least 3 of the zones have been offset and or faulted along their strike by the cross faults that are outlined cutting across the property in a northwest, northeast and possibly east-west direction.

The main IP trends also appear to continue off of the grid in both directions.

MAP LEGEND, FIGURE 8

-The dash lines represent the potential faults and cross faults
-The orange lines represent the VLF EM zones outlined by the historical survey done initially across the property
-The IP cut lines are outlined in red
-IP zones are labelled, and the main zones are shaded in blue.

FIGURE 8 IP ZONES



IP ZONE E:

This zone represents a moderate chargeability high that can be traced from line 2000MW to 1500MW where it seems to run into the northeast striking cross fault that was interpreted from the magnetic survey results. The western section of the zone correlates to a moderate resistivity low. As the zone continues to the east is correlates to a good resistivity high that has a narrow resistivity low on its north flank. The remainder of the zone correlates to a south flanking resistivity high lying to the immediate south of a good resistivity low.

The majority of this IP zone correlates to a modest magnetic low and it lies between two VLF conductive zones.

IP ZONE D:

This zone lies between lines 1100MW and 1400MW where it seems to split into two parallel zones as it approaches the northeast striking fault. The southern edge of the IP zone correlates directly with a VLF conductor for its entire strike length. This zone is represented by a modest chargeability high that may extend to depth along its strike length. The zone correlates to a good resistivity high that may be relatively shallow in the area of line 1400MW.

The IP zone correlates to a modest magnetic low situated between to moderate northeast and north striking highs. An interpreted cross fault appears to crosscut the center of this zone in a north to northeast direction. The eastern flank of the zone also appears to terminate next to the main northwest trending major fault structure.

IP ZONE C:

This zone represents one of the more predominant zones outlined on the grid. The zone appears to continue off of the grid in both directions. The center of the zone is crosscut by all three major fault structures as well as the interpreted east west striking zone. The zone is represented by moderate chargeability high striking west to east up to line 1100MW and this section of the grid correlates with a good and relatively shallow resistivity high. As the zone continues across lines 1000MW to 400MW the zone is represented by a good strong chargeability high that correlates to a good strong resistivity high that appears to be quite shallow and comes to surface. The eastern tip of the zone becomes a bit broader but still has a good chargeability high that lies on the contact between the resistivity high and low feature.

The eastern section of the zone between lines 1100MW and 300ME correlates directly with the strongest magnetic feature on the grid. The western extension of the zone between 1200MW and 1800MW correlates to a narrow magnetic high that is somewhat offset and shifted by the cross faults.

Zone C represents one of the predominant zones of the grid and should be considered for follow up geological surveys and or drilling.

IP ZONE B:

This zone represents a well-defined IP zone that lies along the northern flank of ZONE C. It is represented by a good chargeability high that correlates to a good resistivity low from line 1000MW to 600MW, then on the north flank of the low on line 500MW but then directly with the low from line 400MW to 200MW. The southern edge of the zone appears to lie along the strike of the east-west striking fault that runs across the property. A VLF conductor also cuts across the western extension of the zone.

The center portion of Zone B correlates to a good magnetic high unit that is flanked on both ends by magnetic lows.

This zone also represents one of the more predominant features of the grid. It appears to broaden on line 200MW. The zone should be considered in any ground follow up surveys and or drilling.

IP ZONE A:

This zone closely parallels the northern edge of B and can be followed from line 200MW to 400MW and may extend as far as line 600MW. The zone is represented by a good chargeability high that appears to be relatively shallow in places if not possibly come to surface. The zone also correlates to a good resistivity low feature for most of its strike length.

The zone also correlates to two VLF zones that parallel the strike of the IP trend. The southern edge of the eastern section of the zone correlates to the northern edge of a good narrow magnetic high unit but the zone itself lies within a modest magnetic low feature.

This zone should also be considered in any ground follow up program as well as any follow up drilling.

At this writing, IP Zones F, G and H appear to correlate to the northeast striking fault structure. The strike of the zones closely parallels the fault and do not appear to have any direct magnetic correlation. The zones are represented by good chargeability highs, spotty in places and correlate to a resistivity low possibly due the presence of the suspected fault. Ground follow-up geological surveys would help in defining the strike of the zones as they appear to be very shallow possibly outcropping. The terrain in the area of the zones is quite rugged in places.
The IP zone striking across lines 200MW and 300MW generally paralleling the base line is represented by a good chargeability high and resistivity high which should be followed up with any geological surveys as well.

A copy of the ground magnetic survey with the interpreted VLF zones is included in the back under Appendix A of the report. Color copies of all of the individual IP sections showing the contoured results of the Chargeability, resistivity and calculated metal factors are also included in Appendix B. Appendix C is a list of the IP system.

CONCLUSIONS AND RECOMMENDATIONS.

The IP survey was quite successful in outlining several good IP horizons across the survey grid. Zones A, B, C, D and E represent the most predominant features on the survey grid, and all are represented by good chargeability highs that correlate to resistivity highs and good resistivity lows. **The zones with the predominant resistivity lows suggest a very good conductive horizon. Each of these trends require further ground surveys to better define their source. A geological survey would be a primary follow up program which would then determine which of the zones would be followed up with diamond drilling.**

REFERENCES

Jensen, L.S. and Langford F.F.
(1985): Geology and Petrogenesis of the Archean Abitibi Belt in the Kirkland Lake Area, Ontario; O.G.S. - Miscellaneous Paper 123.

Lovell, H.L.
(1972): Geology of the Eby and Otto Area, District of Timiskaming, Geological Report 99, Map **2239.**

Pigeon, L & Berger, B. R.
(2004): Precambrian Geology, Eby & Otto Townships, Ontario Geological Survey, Preliminary Map P.3634, Scale 1:20000.

Ploeger, F. R.
(2012): Geology and Mineralization of the Upper Canada Mine, Presentation at the Northern Prospectors Mines and Minerals Symposium, Kirkland Lake.

Robinson, D.
(1995): Ontario Prospectors Assistance Program, Otto Township, Ontario For Arnold Allsopp.

Sharpley, F. J.
(1999): Exploration Report on Allsopp- Huston Property, Eby and Otto Townships, Kirkland Lake Area, Larder Lake Mining Division, Ontario, for Mask Resources Inc.

Smith, J.P., Spooner, E.T.C., Broughton, D.W., Ploeger, F.R.
(1993): Archean Au-Ag-(W) Quartz Vein/Disseminated Mineralization within the Larder Lake - Cadillac Break, Kerr Addison - Chesterville System, Northeast Ontario, Canada; OGS - Open File Report 5831.

Stevenson, D.B., Broughton, D.W., Cruji, D.R., Masson, **M.W.** and Parry, S.E.
(1995): Geology and Exploration History of the Amalgamated Kirkland Deposit, Kirkland Lake, Ontario; Exploration Mining Geol. Vol. 4. Pp 187-196; **CIMM**

Thomson, J.E.
(1950): Geology of Teck Township and the Kenogami Lake Area, Kirkland Lake Gold Belt; Geology of the Main Ore Zone at Kirkland Lake.

CERTIFICATION

I, John Charles Grant, of 108 Kay Crescent, in the City of Timmins, Province of Ontario, hereby certify that:

1). I am a graduate of Cambrian College of Applied Arts and Technology, 1975, Sudbury Ontario Campus, with a 3 year Honors Diploma in Geological and Geophysical Technology.

2). I have worked subsequently as an Exploration Geophysicist for Teck Exploration Limited, (5 years, 1975 to 1980), and currently as Exploration Manager and Chief Geophysicist for Exsics Exploration Limited, since May, 1980.

3). I am a member in good standing of the Certified Engineering Technologist Association, (CET), since 1984.

4). I am in good standing as a Fellow of the Geological Association of Canada, (FGAC), since 1986.

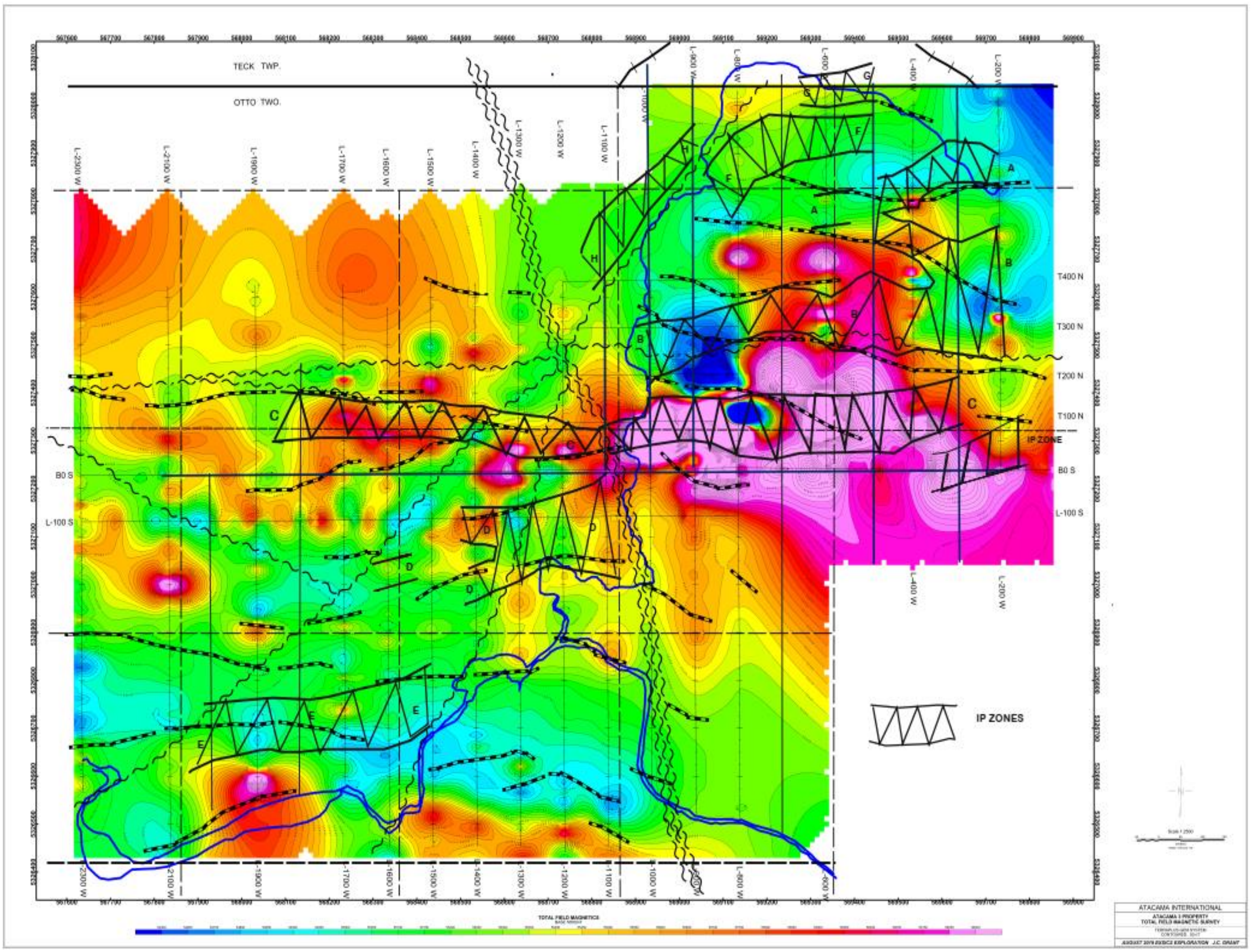
5). I have been actively engaged in my profession since the 15th day of May, 1975, in all aspects of ground exploration programs including the planning and execution of field programs, project supervision, data compilation, interpretations and reports.

6). I have no specific or special interest nor do I expect to receive any such interest in the herein described property. I have been retained by the property holders and or their Agents as a Geological and Geophysical Consultant and Contract Manager.

John Charles Grant, CET., FGAC.

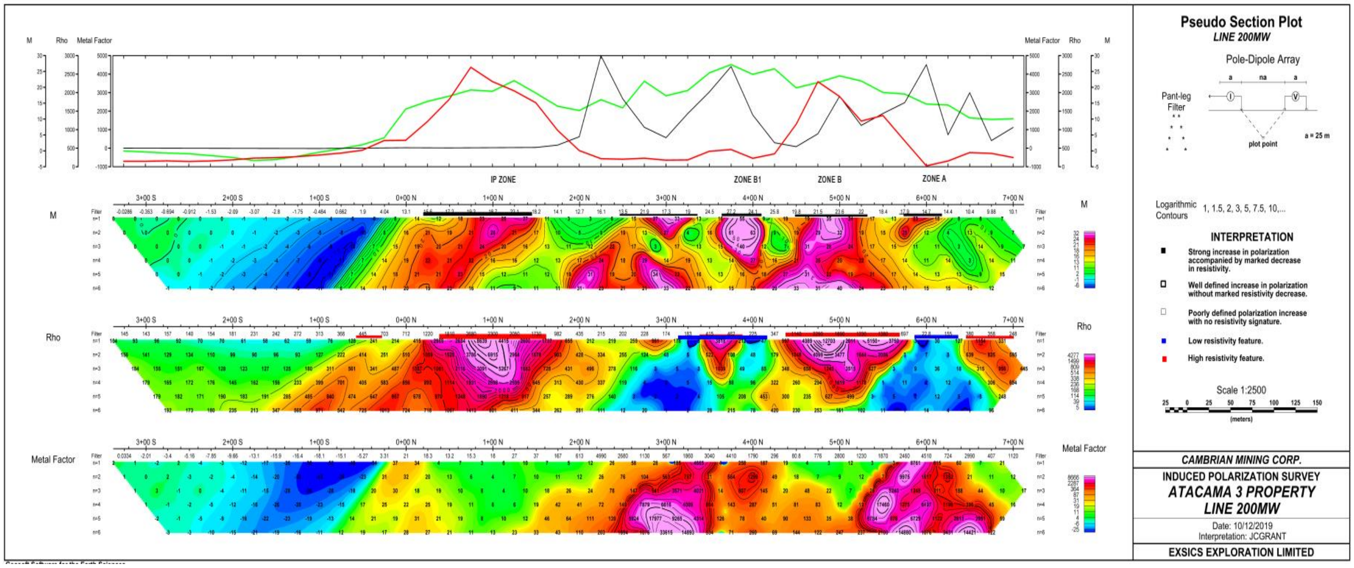
GEOLOGICAL ASSOCIATION OF CANADA
JOHN GRANT
FELLOW

COMPILATION OF TOTAL FIELD MAGNETIC, VLF-EM SURVEY, AUGUST 2019, WITH GEOLOGICAL STRUCTURES AND IP ZONES

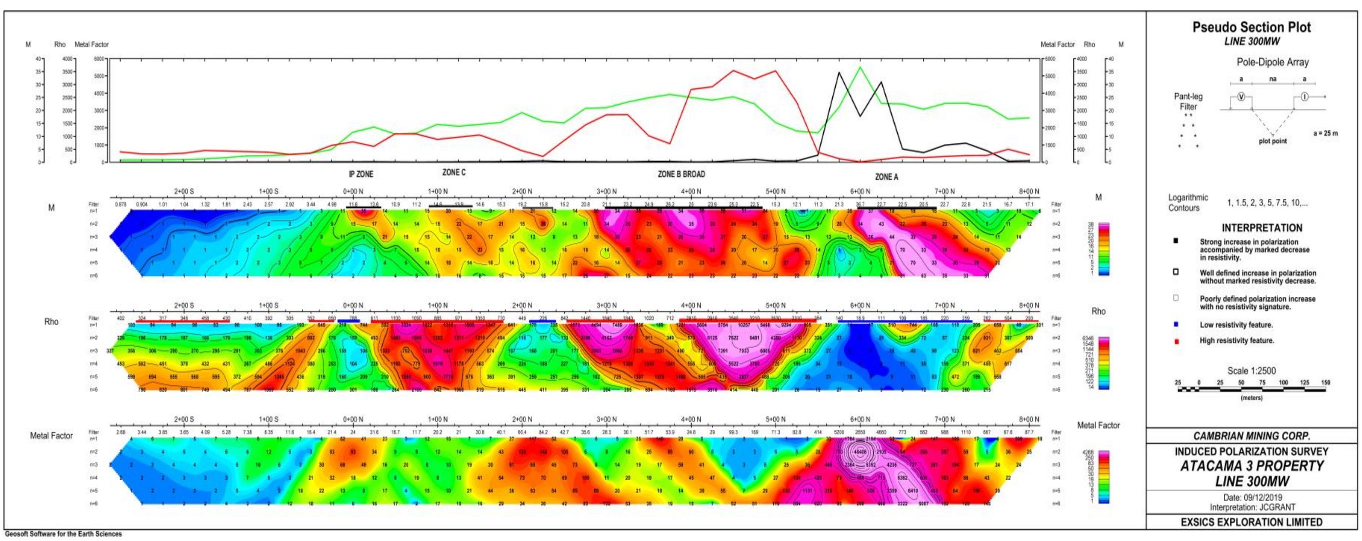


INDIVIDUAL IP LINE PSEUDO-SECTIONS

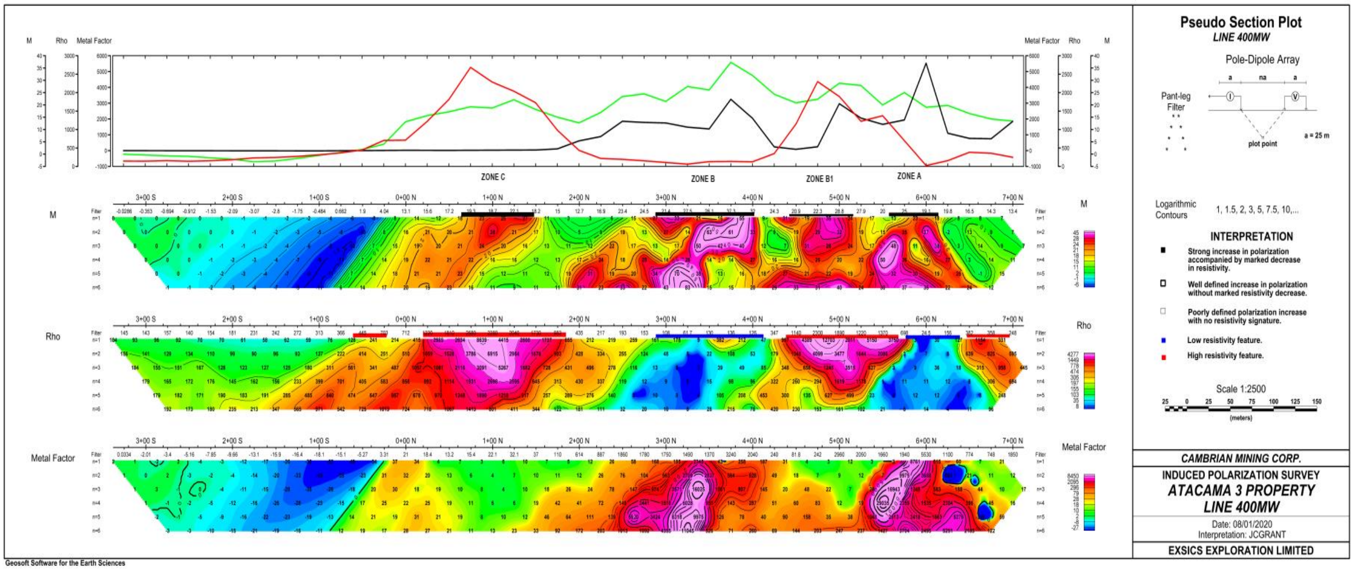
LINE 200MW



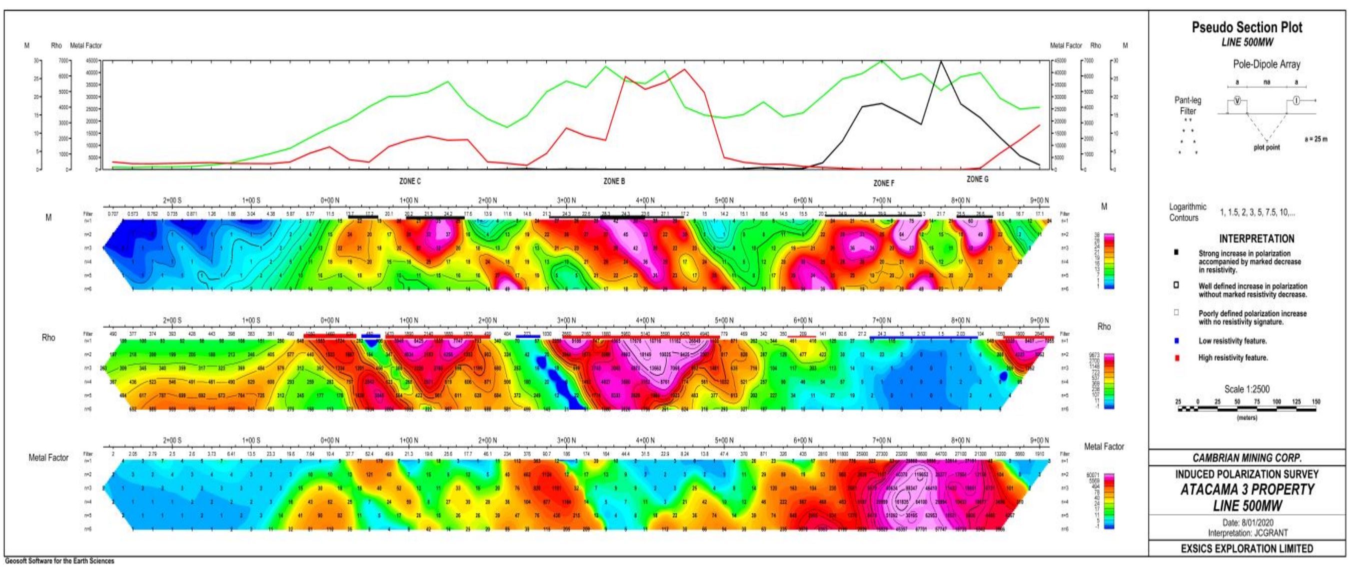
LINE 300MW



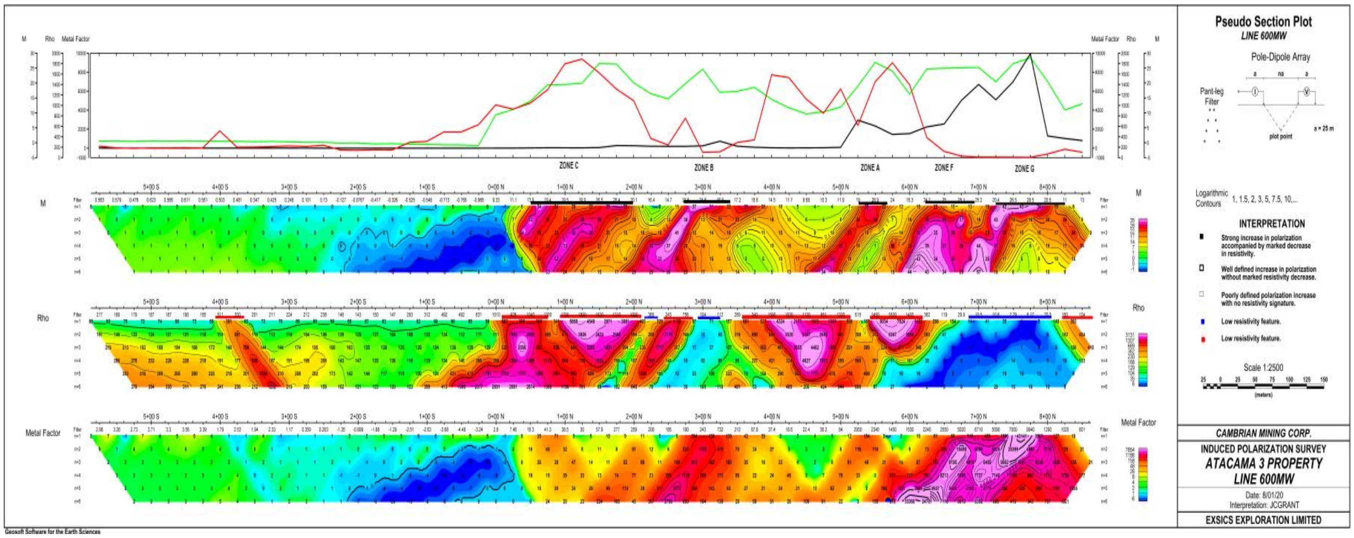
LINE 400MWIP



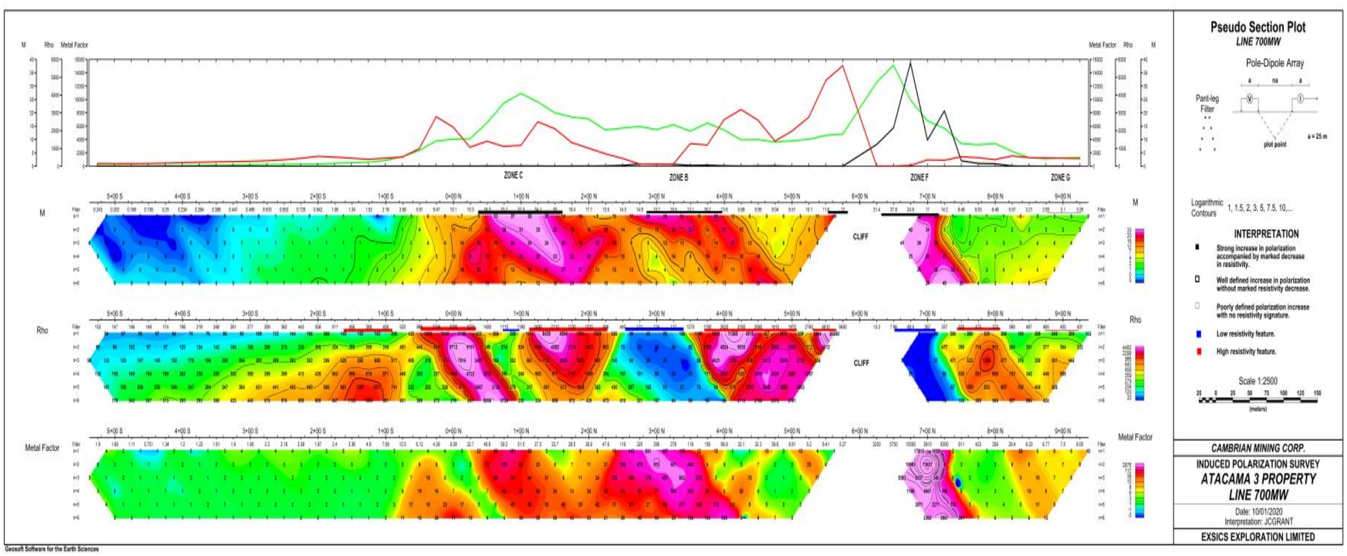
LINE 500MWIP



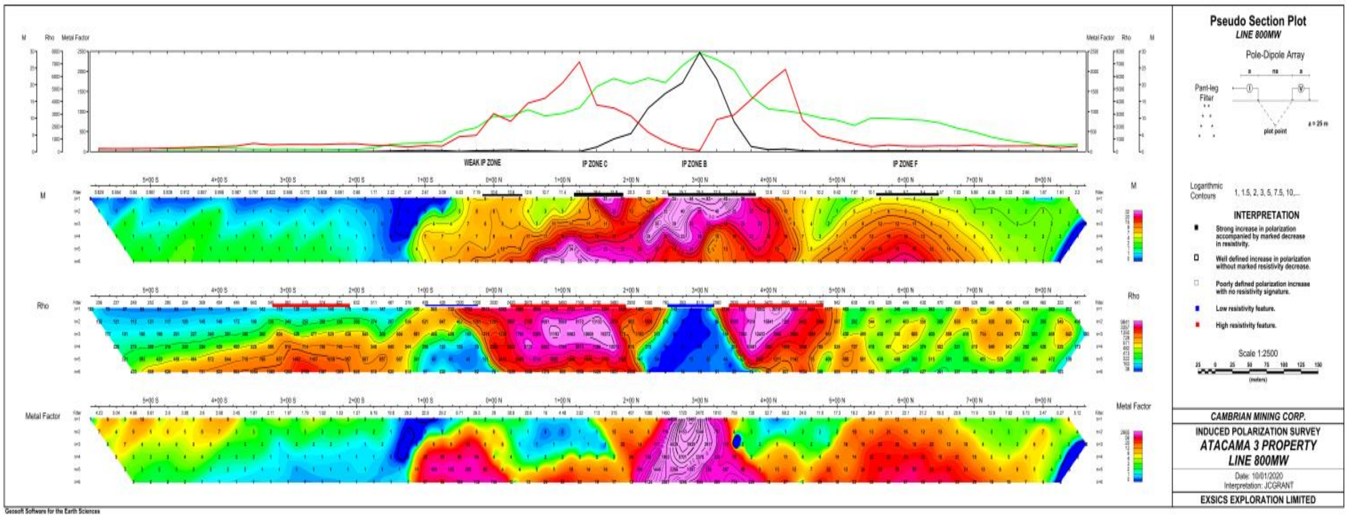
LINE 600MWIP



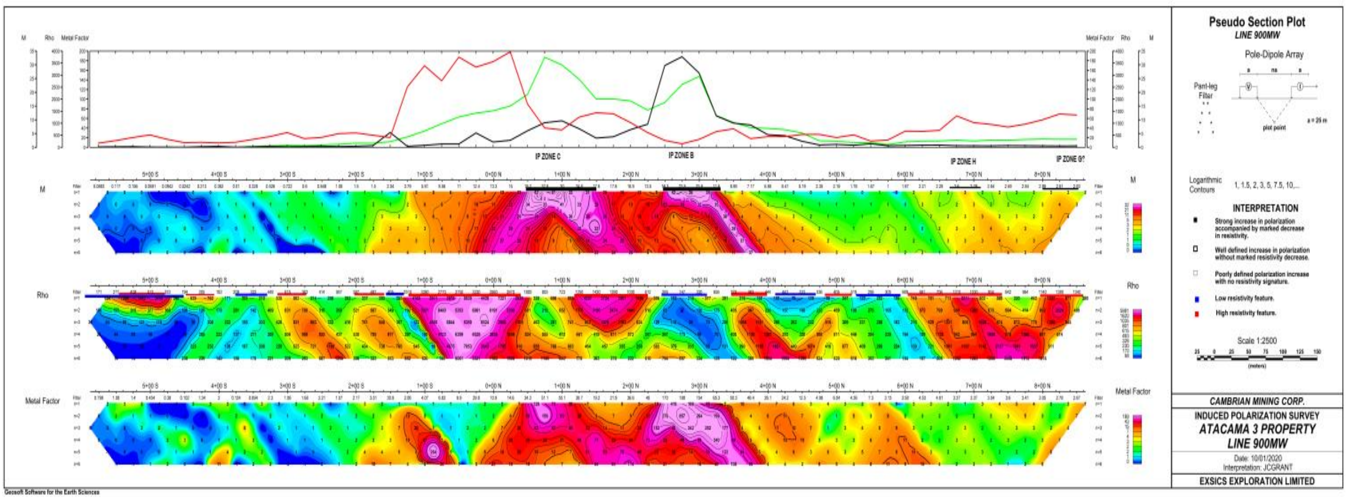
LINE 700MWIP



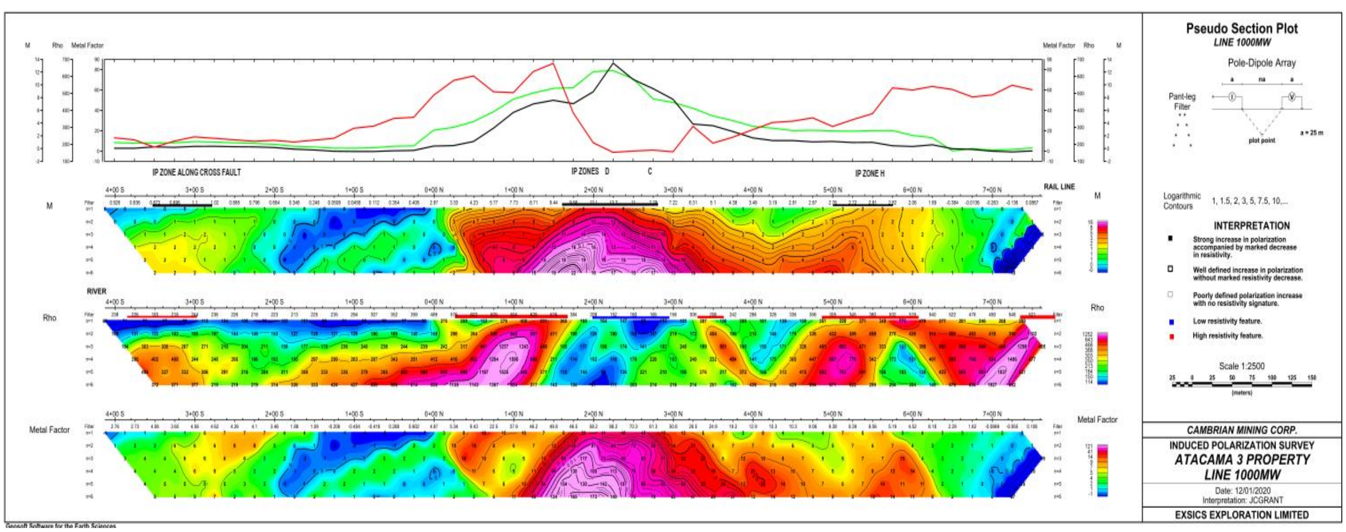
LINE 800MWIP



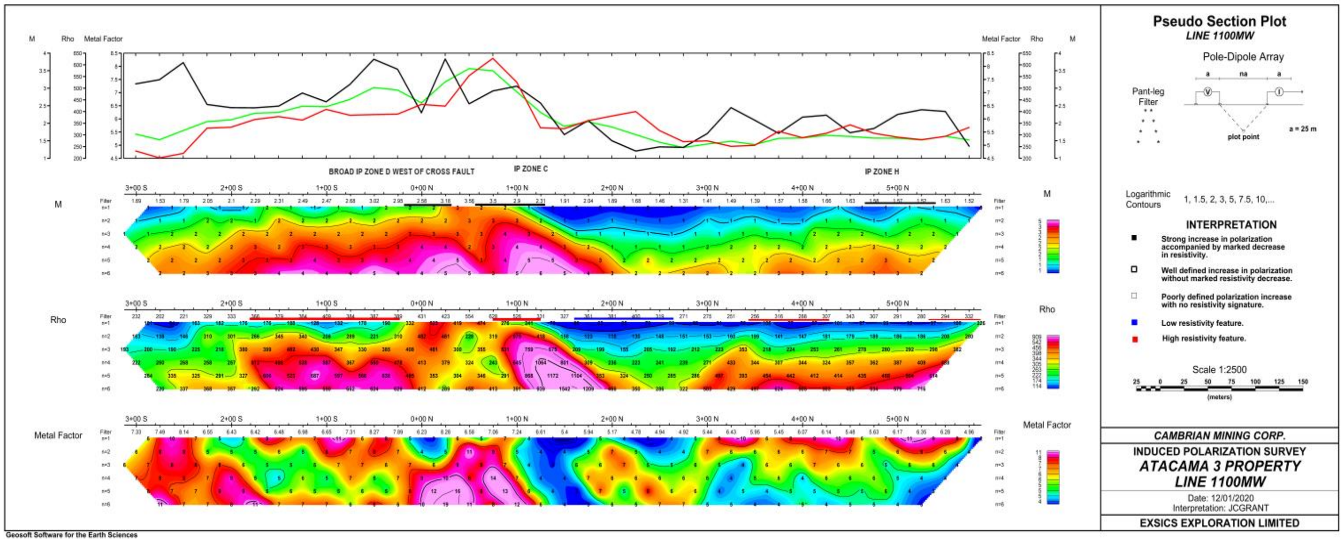
LINE 900MWIP



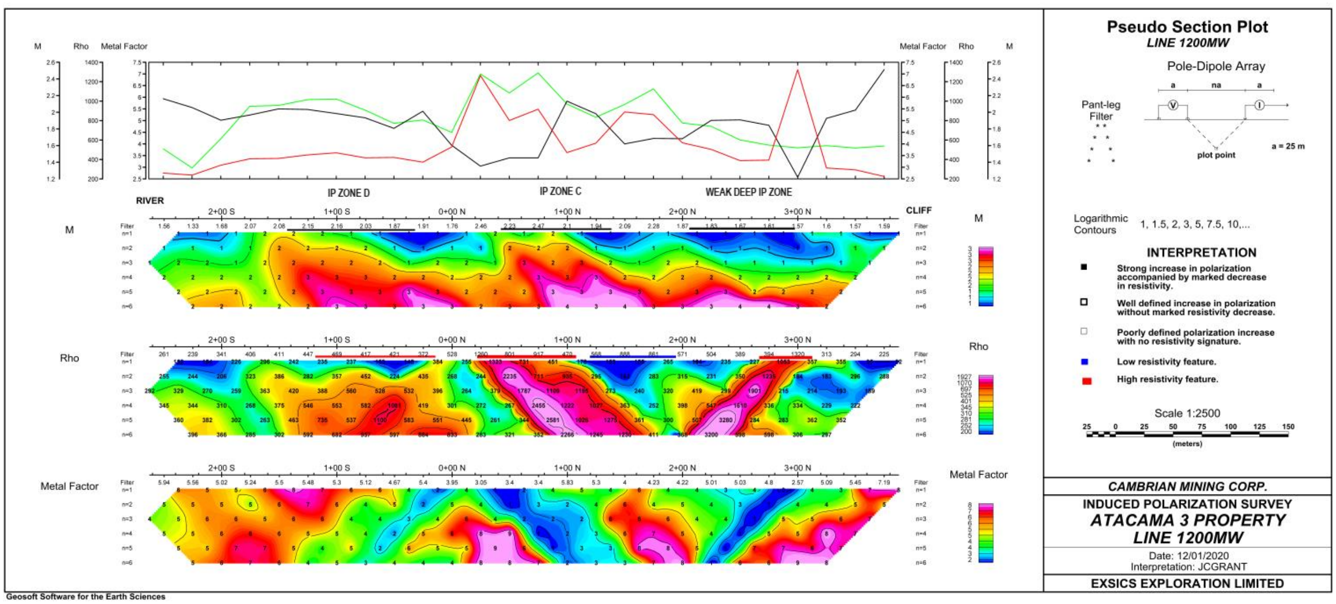
LINE 1000MWIP



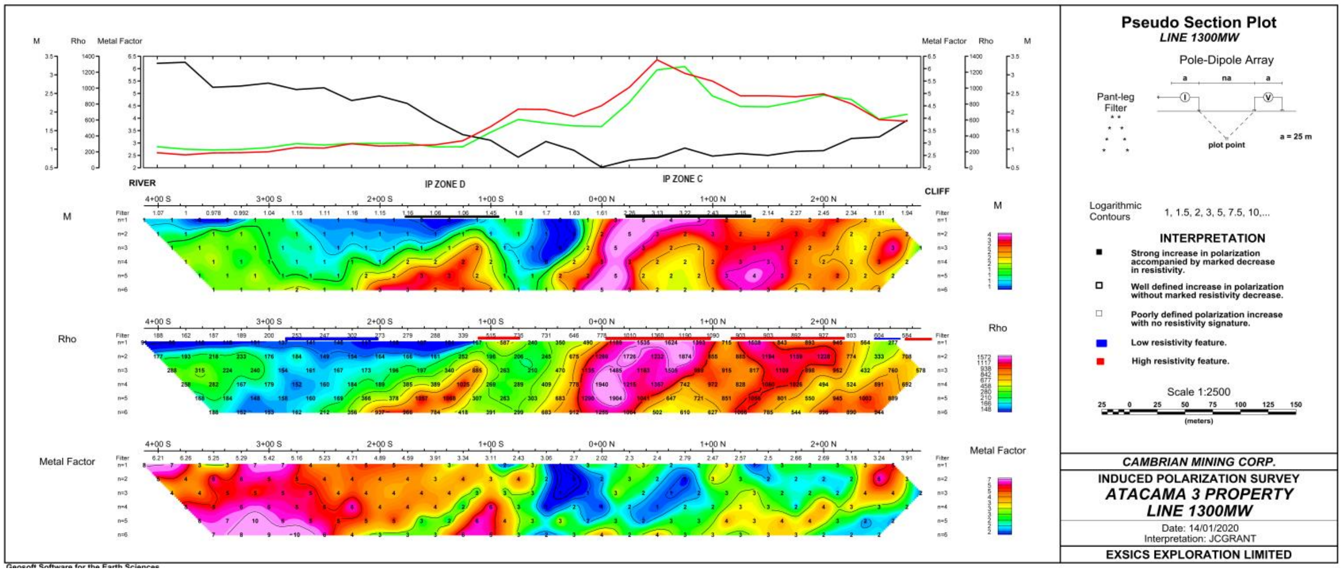
LINE 1100MWIP



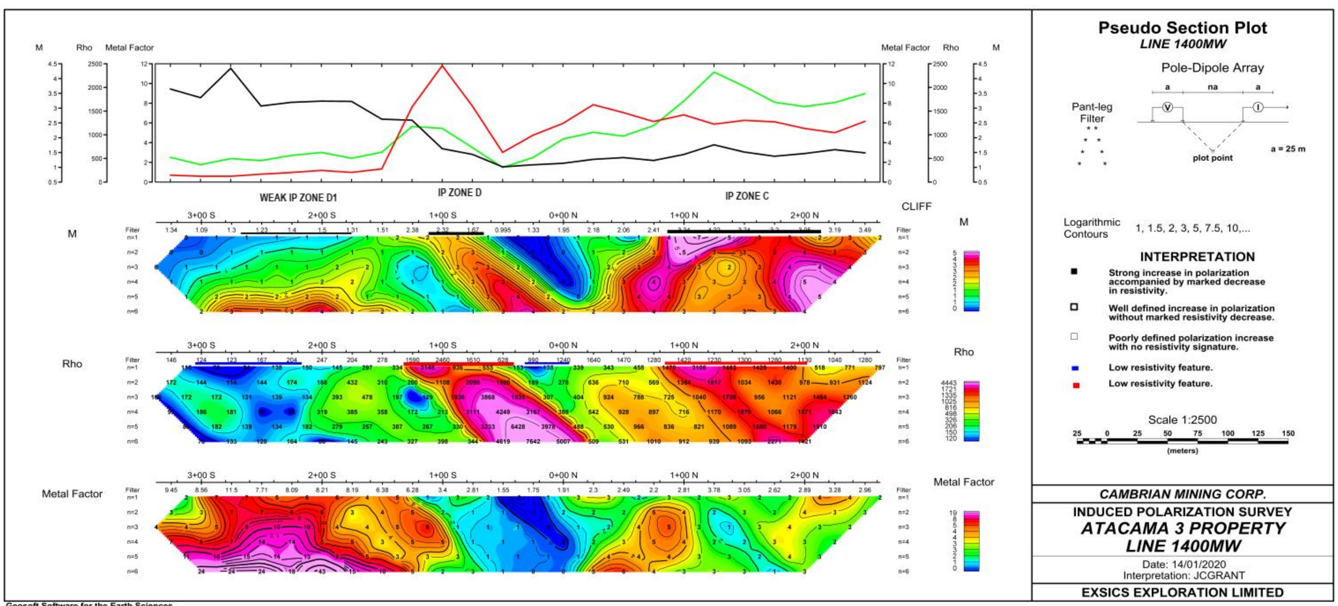
LINE 1200MWIP



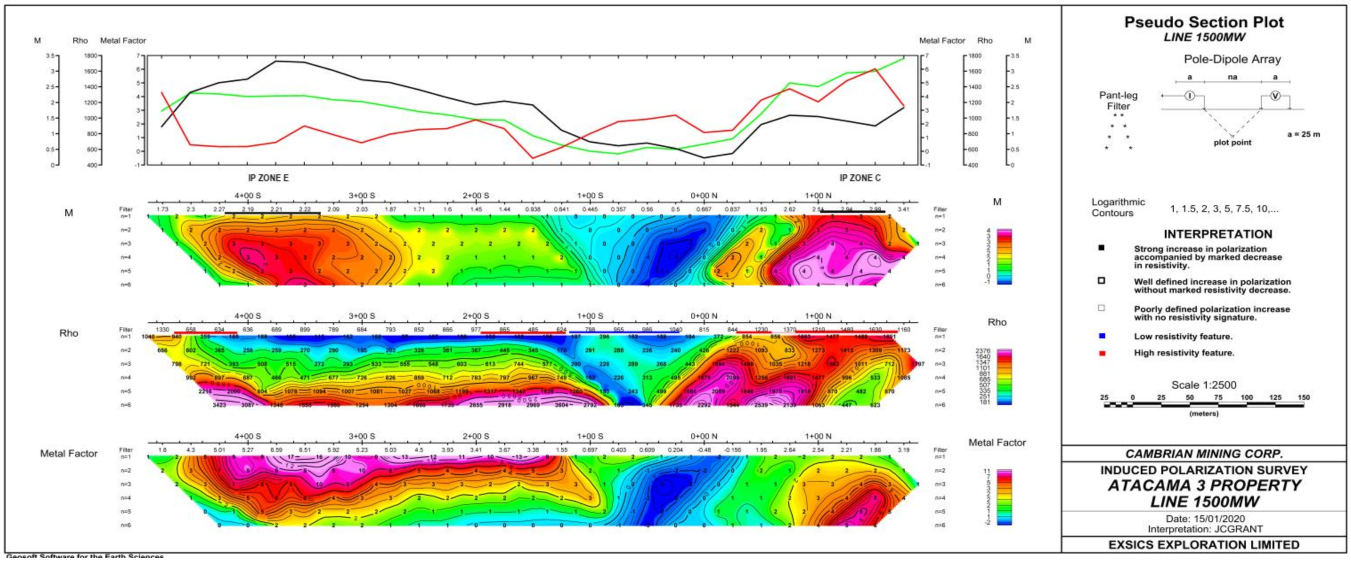
LINE 1300MWIP



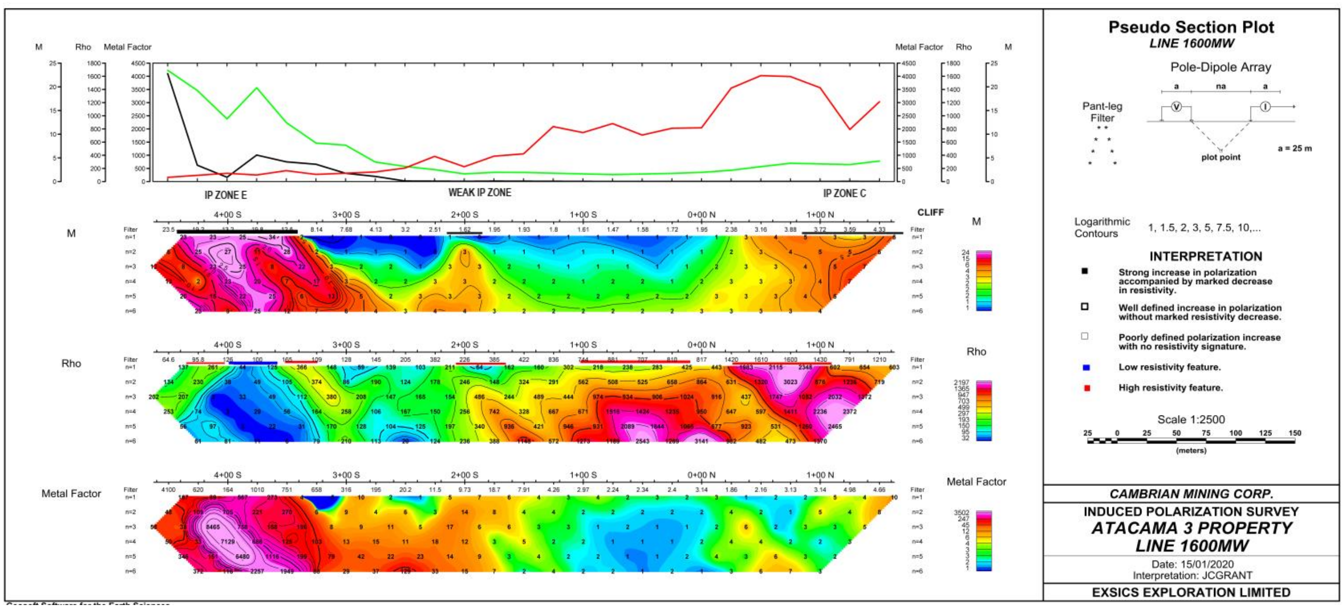
LINE 1400MWIP



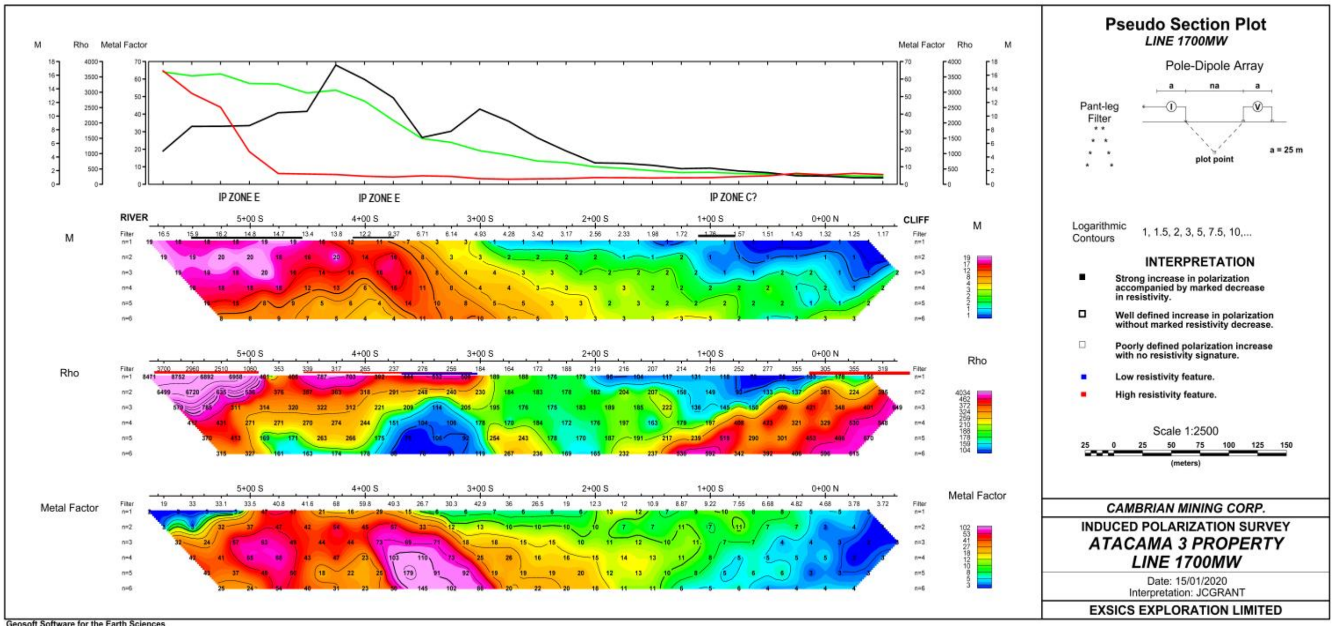
LINE 1500MWIP



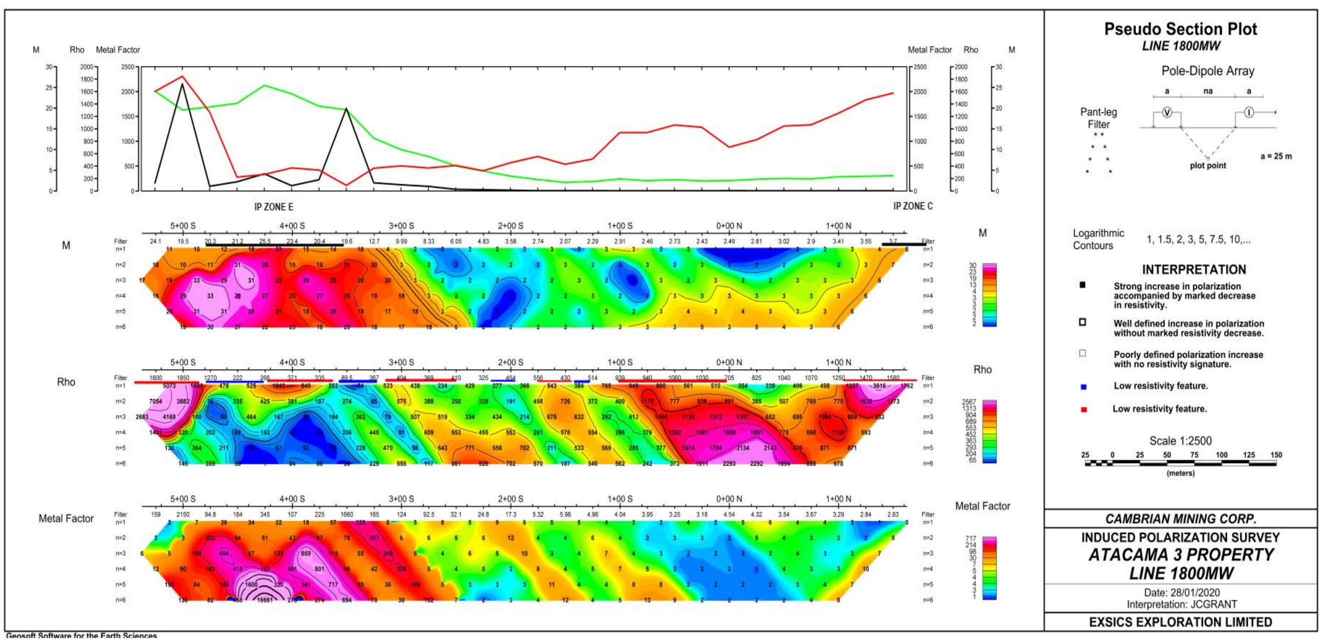
LINE 1600MWIP



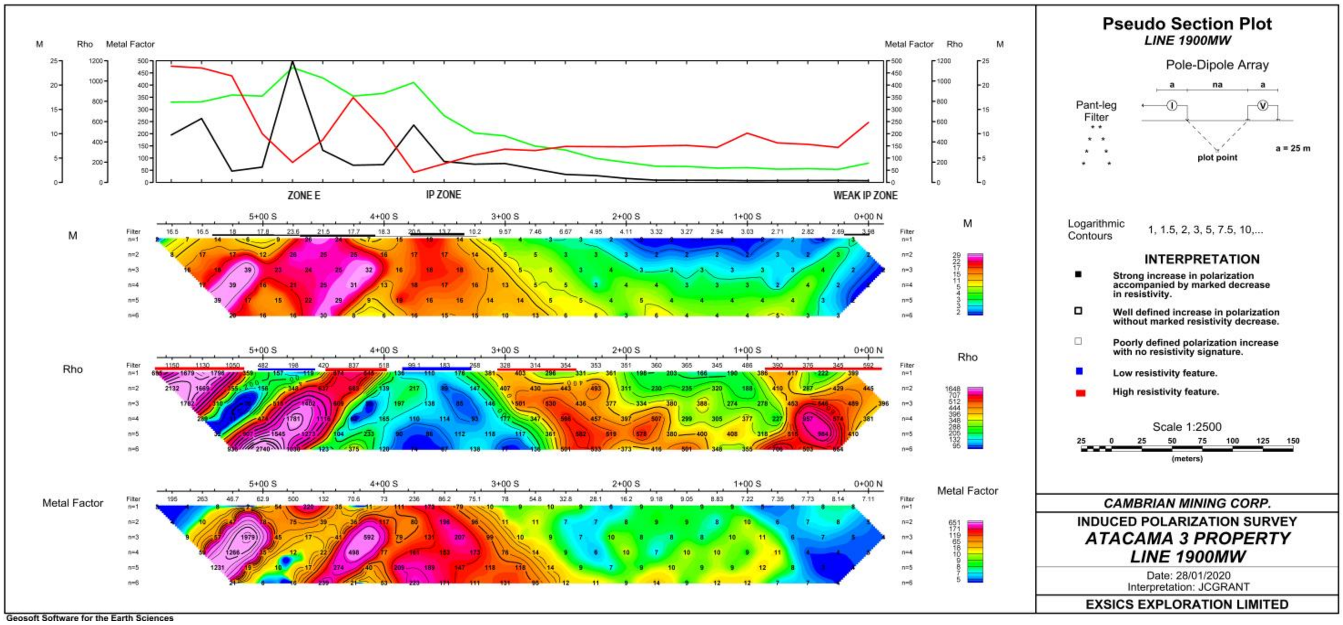
LINE 1700MWIP



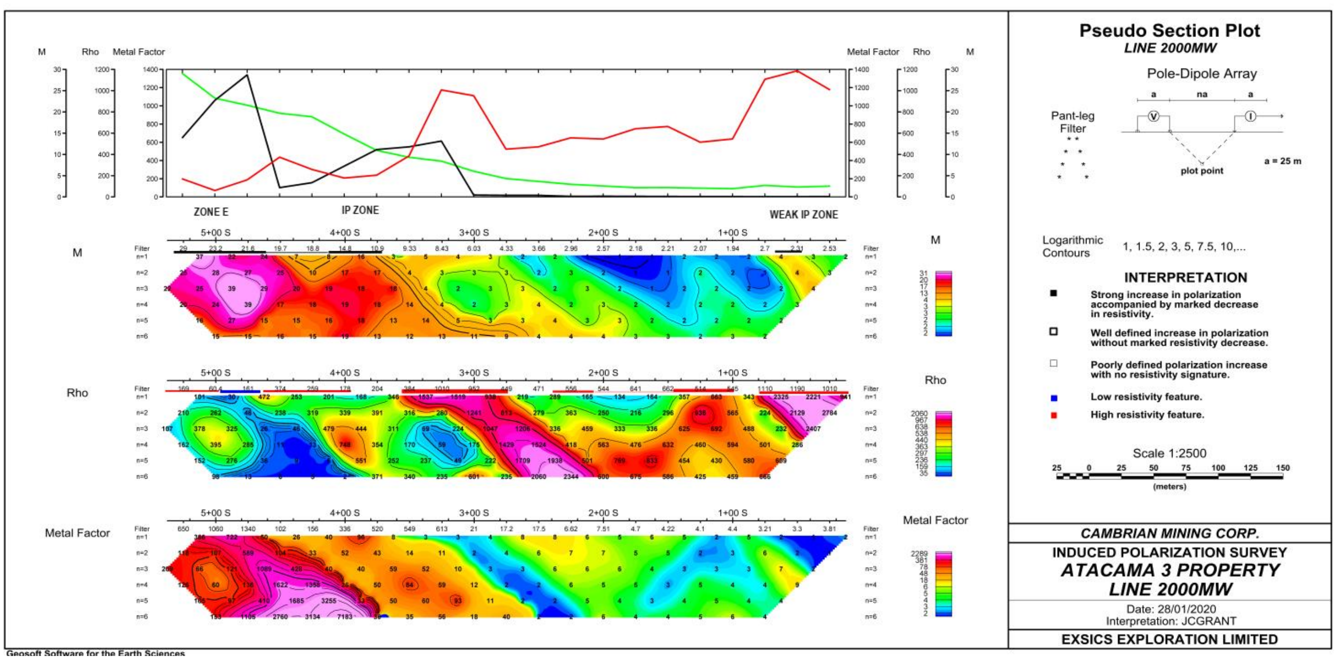
LINE 1800MWIP



LINE 1900MWIP



LINE 2000MWIP



APPENDIX A

v7.0

GEM SYSTEMS
ADVANCED MAGNETOMETERS

Overhauser

Magnetometer / Gradiometer / VLF (GSM-19 v7.0)

GEM's unique Overhauser system combines data quality, survey efficiency and options into an instrument that matches costlier optically pumped Caesium devices.

And the latest v7.0 technology upgrades provide even more value:

Data export in standard XYZ (i.e. line-oriented) format for easy use in standard commercial software programs

Programmable export format for full control over output

GPS elevation values provide input for geophysical modeling

Enhanced GPS positioning resolution
<1.5m standard GPS for high resolution surveying
<1.0m OmniStar GPS
<0.7m for newly introduced CDGPS

Multi-sensor capability for advanced surveys to resolve target geometry

Picket marketing / annotation for capturing related surveying information on-the-go

And all of these technologies come complete with the most attractive savings and warranty in the business!

Overhauser (GSM-19) console with sensor and cable. Can also be configured with additional sensor for gradiometer (simultaneous) readings.

The GSM-19 v7.0 Overhauser instrument is the total field magnetometer / gradiometer of choice in today's earth science environment -- representing a unique blend of physics, data quality, operational efficiency, system design and options that clearly differentiate it from other quantum magnetometers.

With data quality exceeding standard proton precession and comparable to costlier optically pumped cesium units, the GSM-19 is a standard (or emerging standard) in many fields, including:

- Mineral exploration (ground and airborne base station)
- Environmental and engineering
- Pipeline mapping
- Unexploded Ordnance Detection
- Archeology
- Magnetic observatory measurements
- Volcanology and earthquake prediction

Taking Advantage of the Overhauser Effect

Overhauser effect magnetometers are essentially proton precession devices -- except that they produce an order-of-magnitude greater sensitivity. These "supercharged" quantum magnetometers also deliver high absolute accuracy, rapid cycling (up to 5 readings / second), and exceptionally low power consumption.

The Overhauser effect occurs when a special liquid (with unpaired electrons) is combined with hydrogen atoms and then exposed to secondary polarization from a radio frequency (RF) magnetic field.

The unpaired electrons transfer their stronger polarization to hydrogen atoms, thereby generating a strong precession signal -- that is ideal for very high-sensitivity total field measurements.

In comparison with proton precession methods, RF signal generation also keeps power consumption to an absolute minimum and eliminates noise (i.e. generating RF frequencies are well out of the bandwidth of the precession signal).

In addition, polarization and signal measurement can occur simultaneously -- which enables faster, sequential measurements. This, in turn, facilitates advanced statistical averaging over the sampling period and/or increased cycling rates (i.e. sampling speeds).

Other advantages are described in the section called, "GEM's Commercial Overhauser System" that appears later in this brochure.

Key System Components

Key components that differentiate the GSM-19 from other systems on the market include the sensor and data acquisition console. Specifications for components are provided on the right side of this page.

Sensor Technology

GEM's sensors represent a proprietary innovation that combines advances in electronics design and quantum magnetometer chemistry.

Electronically, the detection assembly includes dual pick-up coils connected in series opposition to suppress far-source electrical interference, such as atmospheric noise. Chemically, the sensor head houses a proprietary hydrogen-rich liquid solvent with free electrons (free radicals) added to increase the signal intensity under RF polarization.

From a physical perspective, the sensor is a small size, light-weight assembly that houses the Overhauser detection system and fluid. A rugged plastic housing protects the internal components during operation and transport.

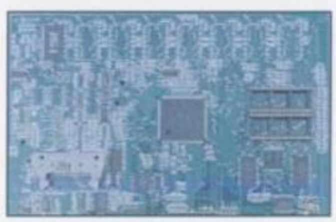
All sensor components are designed from carefully screened non-magnetic materials to assist in maximization of signal-to-noise. Heading errors are also minimized by ensuring that there are no magnetic inclusions or other defects that could result in variable readings for different orientations of the sensor.

Optional omni-directional sensors are available for operating in regions where the magnetic field is near-horizontal (i.e. equatorial regions). These sensors maximize signal strength regardless of field direction.

Data Acquisition Console Technology

Console technology comprises an external keypad / display interface with internal firmware for frequency counting, system control and data storage / retrieval. For operator convenience, the display provides both monochrome text as well as real-time profile data with an easy-to-use interactive menu for performing all survey functions.

The firmware provides the convenience of upgrades over the Internet via the GEMLinkW software. The benefit is that instrumentation can be enhanced with the latest technology without returning the system to GEM -- resulting in both timely implementation of updates and reduced shipping / servicing costs.



About GEM Advanced Magnetometers

GEM Systems, Inc. delivers the world's only magnetometers and gradiometers with built-in GPS for accurately-positioned ground, airborne and stationary data acquisition. The company serves customers in many fields including mineral exploration, hydrocarbon exploration, environmental and engineering, Unexploded Ordnance Detection, archeology, earthquake hazard prediction and observatory research.

Key products include the QuickTracker™ Proton Precession, Overhauser and SuperSenser™ Optically-Pumped Potassium instruments. Each system offers unique benefits in terms of sensitivity, sampling, and acquisition of high-quality data. These core benefits are complemented by GPS technologies that provide metre to sub-metre positioning.

With customers in more than 50 countries globally and more than 20 years of continuous technology R&D, GEM is known as the only geophysical instrument manufacturer that focuses exclusively on magnetic technology advancement.

"Our World is Magnetic"

Specifications

Performance

Sensitivity:	< 0.015 nT / √Hz @ 1 Hz
Resolution:	0.01 nT
Absolute Accuracy:	+/- 0.1 nT
Range:	10,000 to 120,000 nT
Gradient Tolerance:	> 10,000 nT/m
Samples at:	60+, 5, 3, 2, 1, 0.5, 0.2 sec
Operating Temperature:	-40C to +55C

Operating Modes

Manual: Coordinates, time, date and reading stored automatically at minimum 3 second interval.

Base Station: Time, date and reading stored at 3 to 60 second intervals.

Remote Control: Optional remote control using RS-232 interface.

Input / Output: RS-232 or analog (optional) output using 6-pin weatherproof connector.

Storage - 16 MB (# of Readings)

Mobile:	738,769
Base Station:	2,708,821
Gradiometer:	625,112
Walking Mag:	1,354,410

Dimensions

Console:	223 x 69 x 240 mm
Sensor:	175 x 75mm diameter cylinder

Weights

Console with Belt:	2.1 kg
Sensor and Staff Assembly:	1.0 kg

Standard Components

GSM-19 console, GEMLinkW software, batteries, harness, charger, sensor with cable, RS-232 cable, staff, instruction manual and shipping case.

Optional VLF

Frequency Range: Up to 3 stations between 15 to 30.0 kHz

Parameters: Vertical in-phase and out-of-phase components as % of total field. 2 components of horizontal field amplitude and total field strength in pT.

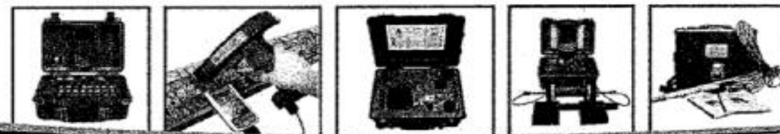
Resolution: 0.1% of total field

GEM Systems, Inc.
52 West Beaver Creek Road, 14
Richmond Hill, ON
Canada L4B 1L9
Tel: 905-764-8008
Fax: 905-764-2949
Email: info@gemsys.ca
Web: www.gemsys.ca

Represented By:

APPENDIX B

INSTRUMENTATION GDD INC.



Canadian Manufacturer of Geophysical Instrumentation since 1976
Sales, Rental, Customer Service, R&D and Field training

WWW.GDD.CA

IP Receiver Model GRx8-32

«Field users have reported that the GDD IP Receiver provided more reliable readings than any other time domain IP receiver and it reads a few additional dipoles. »

FEATURES

- 8 channels expandable to 16, 24 or 32
- Reads up to 32 ch. simultaneously in poles or dipoles
- PDA menu-driven software / simple to use
- 32 channels configuration allows 3D Survey:
  4 lines X 8 channels - 2 lines X 16 channels
  1 line X 32 channels
- Link to a PDA by wireless communication or a serial cable
- Real-time data and automatic data stacking (Full Wave)
- Screen-graphics: decay curves, resistivity, chargeability
- Automatic SP compensation and gain setting
- 20 programmable chargeability windows
- Survey capabilities: Resistivity and Time domain IP
- One 24 bit A/D converter per channel
- Gain from 1 to 1,000,000,000 (10^9)
- Shock resistant, portable and environmentally sealed

GRx8-32: This new receiver is a compact and low consumption unit designed for high productivity Resistivity and Induced Polarization surveys. Its high ruggedness allows it to work under any field conditions.

User modes available: Arithmetic, logarithmic, semi-logarithmic, Cole-Cole, IPR-12 and user defined.

IP display: Chargeability values, Resistivity values and IP decay curves can be displayed in real time. The GRx8-32 can be used for monitoring the noise level and checking the primary voltage waveform.

Internal memory: A 4 Go (or more) Compact Flash memory card is used to store the readings. Each reading includes the full set of parameters characterizing the measurements for all channels; the full wave signal for post-treatment processing. The data is stored in flash type memory not requiring any battery power for safekeeping.

Manufactured in Canada by Instrumentation GDD Inc.

New IP Receiver Model GRx8-32 with PDA

GRX8-32: This new receiver is a compact and low consumption unit designed for high productivity Resistivity and Induced Polarization surveys. It features high ruggedness allowing to work in any field conditions

Reception poles/dipoles: 8 simultaneous channels expandable to 16, 24 or 32, for dipole-dipole, pole-dipole or pole-pole arrays.

Programmable windows: The GRX8-32 offers twenty fully programmable windows for a higher flexibility in the definition of the IP decay curve.

User modes available: Arithmetic, logarithmic, semi-logarithmic, Cole-Cole and user define.

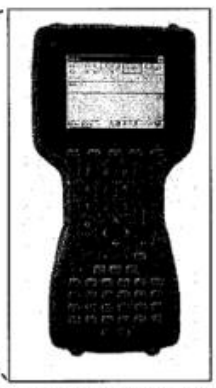
IP display: Chargeability values, Resistivity values and IP decay curves can be displayed in real time. The GRX8-32 can be used for monitoring the noise level and checking the primary voltage waveform.

Internal memory: The memory of 64 megabytes can store 64,000 readings. Each reading totalizes one kilobyte and includes the full set of parameters characterizing the measurements on 8 channels. The data is stored in flash memories not requiring any lithium battery for safeguard. The memory can hold many days worth of data. It also stores fullwave form of the signal at each electrode for post-treatment.

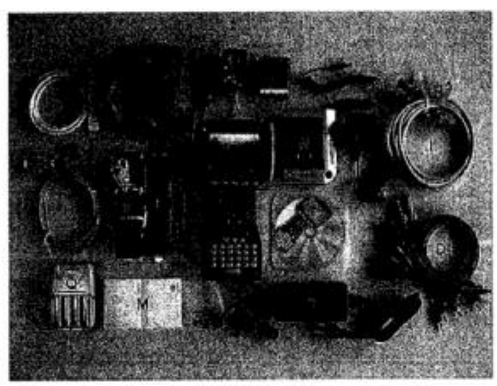
Features:

- 8 channels expandable to 16, 24 or 32
- Reads up to 32 ch. simultaneously in poles or dipoles configuration
- PDA menu-driven software / simple to use
- 32 channels configuration allows 3D Survey: 4 lines X 8 channels, 2 lines X 16 channels or 1 line X 32 channels
- Link to a PDA by Bluetooth or RS-232 port
- Real-time data and automatic data stacking
- Self-test diagnostic
- Screen-graphics: decay curves, resistivity, chargeability
- Automatic SP compensation and gain setting
- 20 programmable chargeability windows
- Survey capabilities: Resistivity and Time domain IP
- One 24 bit A/D converter per channel
- Gain from 1 to 1,000,000,000 (10^8)
- Shock resistant, portable and environmentally sealed

GDD IP Receiver model GRx8-32



PDA included with GRX8-32 Standard Juniper - Allegro CX mobile PDA

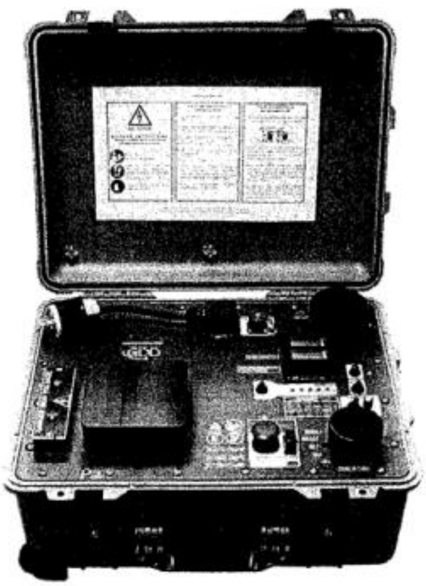


Components included with GDD IP Receiver GRx8-32

IP Transmitter

Model TxII
5000W-2400V-15A

Instruction Manual



INSTRUMENTATION GDD INC.

860 boul. de la Chaudière, suite 200
Québec (Qc), Canada, G1X 4B7
Tel.: +1 (418) 877-4249
Fax: +1 (418) 877-4054
E-Mail: gdd@gdd.ca
Web site: www.gdd.ca

6. MASTER / SLAVE MODE

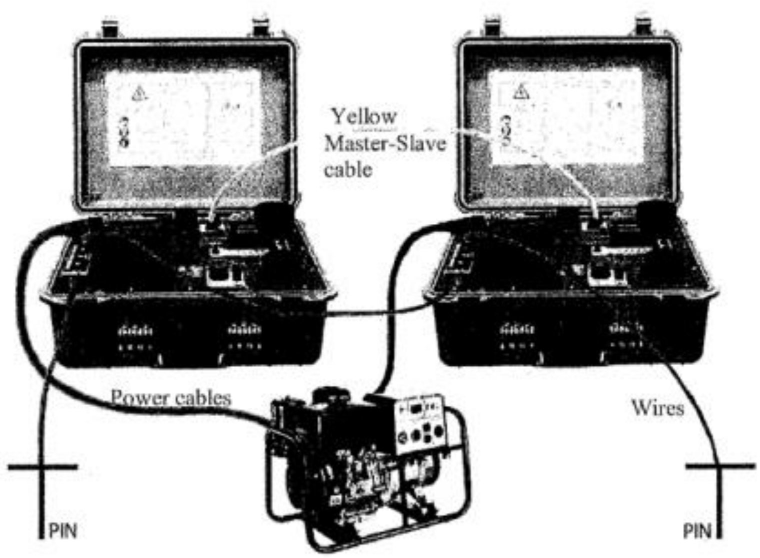
Here are the basic steps for a Master/Slave operation of the TxII:

1. Connect the yellow synchronization cable (Master/Slave) to the transmitters. The Master/Slave cable terminations are different: one is labeled *MASTER* and the other one *SLAVE*. The transmitter is *MASTER* or *SLAVE* according to the termination of the cable connected on its interface. The *MASTER* and *SLAVE* LEDs indicate the mode of each transmitter. (see figure 2, yellow line)

2. Connect an insulated wire between the terminal (A) of one transmitter and the terminal (B) of the other one. (see figure 2, blue line)

3. Connect the two power cables from the transmitters to the generator. (see figure 2, red lines)

4. Drive the electrodes into the ground and connect them to the unused terminals (A) and (B) by using insulated wires. (see figure 2, blue lines)



9. SPECIFICATIONS

Size :	TxII-5000W with a blue carrying case: 34 x 52 x 76 cm TxII-5000W only: 26 x 45 x 55 cm
Weight :	TxII-5000W with a blue carrying case: ~ 58 kg TxII-5000W only: ~ 40 kg
Operating Temperature :	-40°C to 65°C (-40°F to 150°F)
Time Base:	2 s ON+, 2 s OFF, 2 s ON- DC, 1, 2, 4, 8 or 16 s
Output current :	0.030A to 15A (normal operation) 0.0A to 15A (cancel open loop) Maximum of 7.5A in DC mode
Rated Output Voltage :	150V to 2400V Up to 4800V in a master/slave configuration
LCD Display :	Output current, 0.001A resolution Output power Ground resistance (when the transmitter is turned off)
Power source :	220-240V / 50-60Hz