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A New look at Historical Data from Induced Polarization, VLF-EM and Total Field Magnetic Surveys

on the Macklem-Thomas Claims

Macklem and Thomas Townships, Ontario

for

Kraken Gold Corporation
Timmins, Ontario

By

January 3, 2020 Matthew Johnston

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Overview

The purpose of this report is to present the results of reprocessing historical geophysical data from the Macklem-Thomas Claim block to generate new exploration targets on the property. The geophysical datasets included Induced Polarization, VLF-EM and Total Field Magnetic Surveys. The surveys were completed in 2010, however the final processing and interpretation of the results was never completed and are presented herein.

Location and Access

The Macklem-Thomas property is located in south Macklem and north Thomas Townships, approximately 3 km east of Night Hawk Lake and 37 km east of the city of Timmins (Figure 1). The property is readily accessed by travelling approximately 13 km south from Highway 101 on the Gibson Lake Road to the Gibson Lake waste disposal site. An ATV drivable road tracks westward from the waste disposal site, which eventually accesses the southern and central portions of the property. The north part of the property can also be accessed by travelling 3 kms by canoe along Bottley Creek, which discharges eastward out of Night Hawk Lake; the north property area lies immediately south of Bottley Creek.

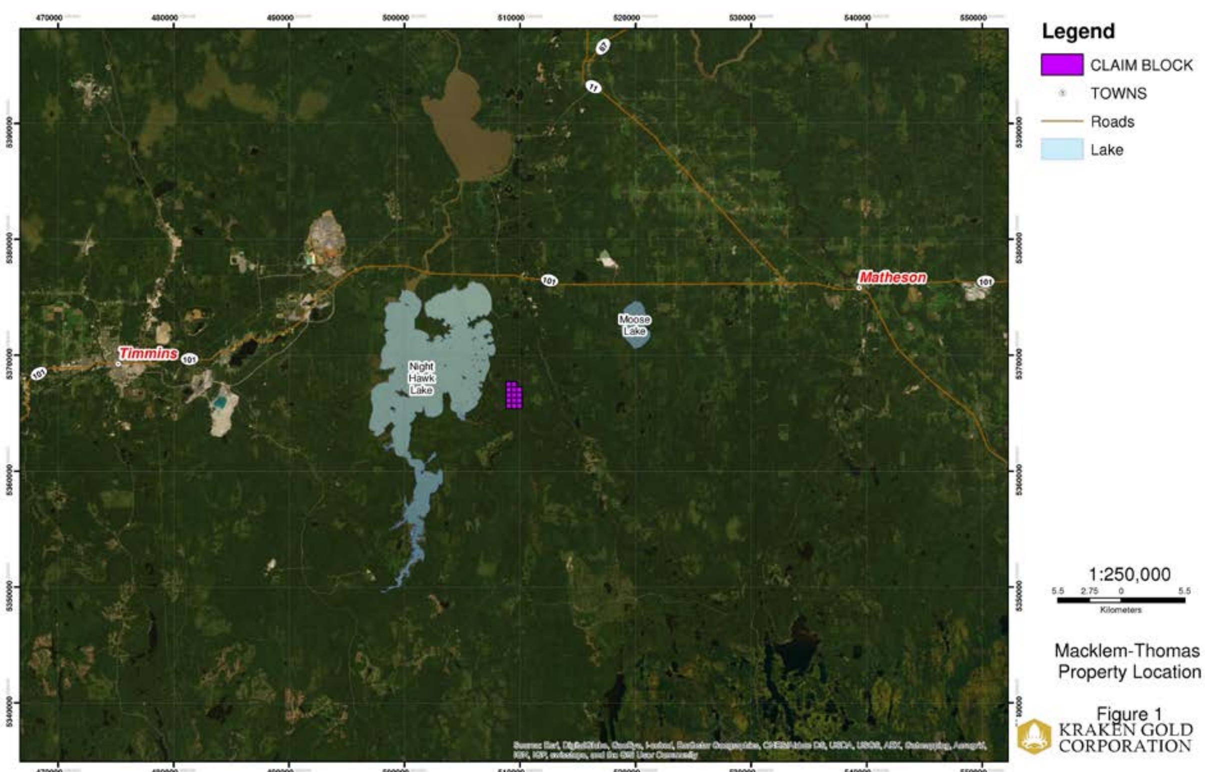


Figure 1: Location Map

Claim Status

The property is situated in south Macklem and north Thomas Townships, Porcupine Mining Division, and consists of 14 contiguous claims listed in Table 1 and Shown in Figure 2.

Table 1: Macklem-Thomas Claims

Township / Area	Tenure ID	Tenure Status	Work Required	ISSUE_DATE	ANNIVERSARY	EXTENSION_
THOMAS	119048	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM,THOMAS	158374	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM	164989	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM,THOMAS	183927	Active	400	4/10/2018	7/6/2019	1/6/2020
THOMAS	183928	Active	400	4/10/2018	7/6/2019	1/6/2020
THOMAS	223754	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM	231714	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM	243925	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM	279749	Active	200	4/10/2018	7/6/2019	1/6/2020
THOMAS	279750	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM,THOMAS	298378	Active	400	4/10/2018	7/6/2019	1/6/2020
THOMAS	298379	Active	400	4/10/2018	7/6/2019	1/6/2020
THOMAS	298380	Active	400	4/10/2018	7/6/2019	1/6/2020
MACKLEM	327005	Active	200	4/10/2018	7/6/2019	1/6/2020

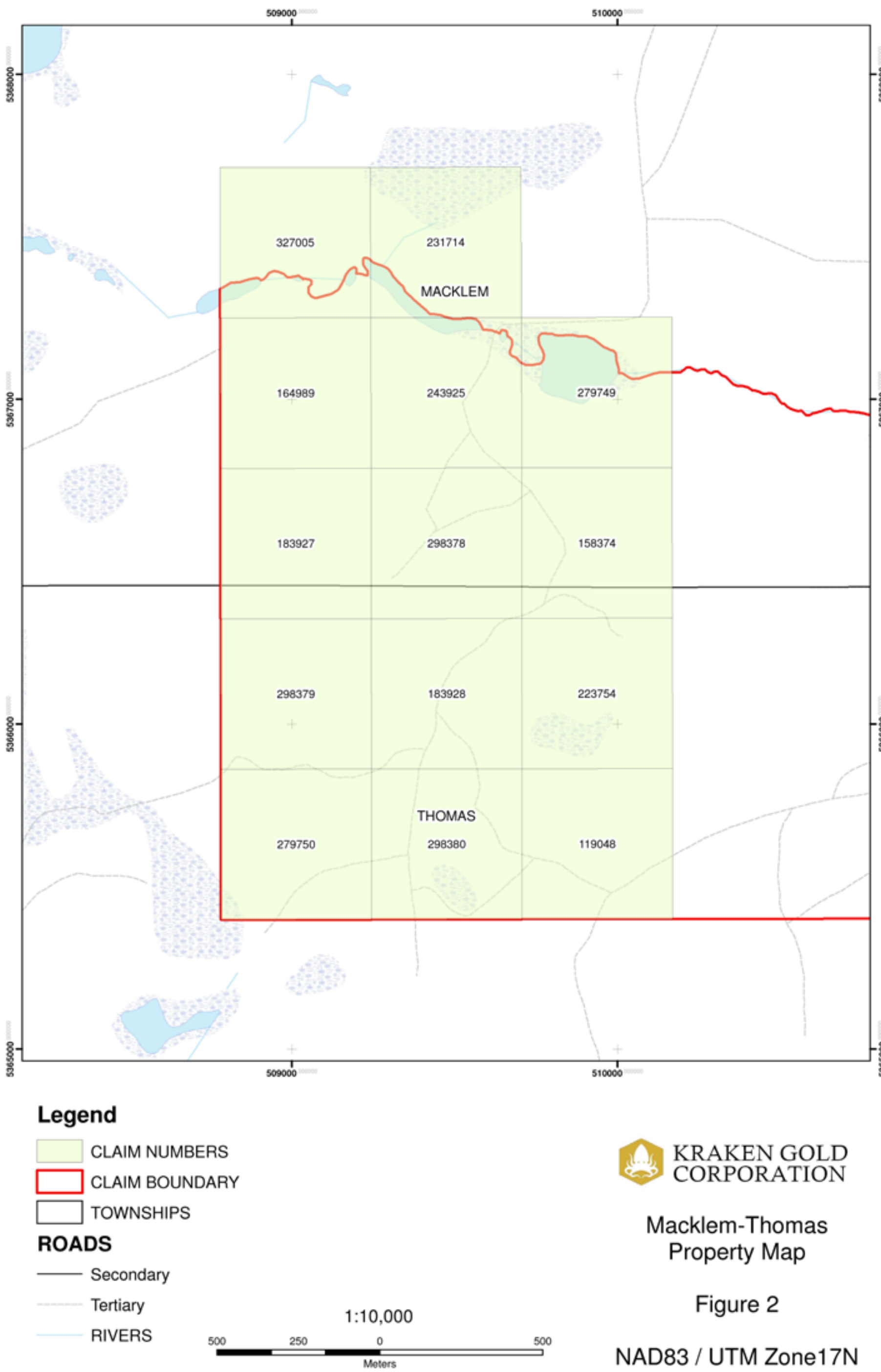


Figure 2: Macklem-Thomas Claims

Regional Geology

The Macklem-Thomas property is situated in the Abitibi Greenstone belt of which stretches in an east-west direction across northeastern Ontario and eastern Quebec. These Archean rocks are divided into stratigraphic assemblages which include metavolcanics, synvolcanic intrusions, metasediments, calc-alkaline rocks and Proterozoic dykes. The dominant structural feature is the Porcupine-Destor fault zone which crosses the region a few kilometers to the north of the property. Regional east-west deformation zones commonly occur at assemblage boundaries and these rocks have been metamorphosed to the greenschist and upper greenschist grade.

Most of the gold deposits in the area are clustered around the major fault zone, generally in splays that extend from this structure. Over eighty million ounces have been produced from quartz-carbonate shear and extensional veins and stockworks generally in mafic volcanic rocks. Gold also occurs in disseminated or massive sulfides in altered volcanic rocks of various compositions. A map of the regional geology is presented in Figure 3.

The Macklem-Thomas property is is underlain predominantly by intermediate to felsic tuffs and flows, which are mainly calc-alkalic, with some feldspar porphyries or crystal tuffs. Dioritic and gabbroic rocks have intruded these in several places, as well as quartz-feldspar porphyries. These formations belong to and are typical of the Upper Tisdale assemblage (2706-2704 Ma.)
The Tisdale assemblage hosts most of the gold deposits in the area.

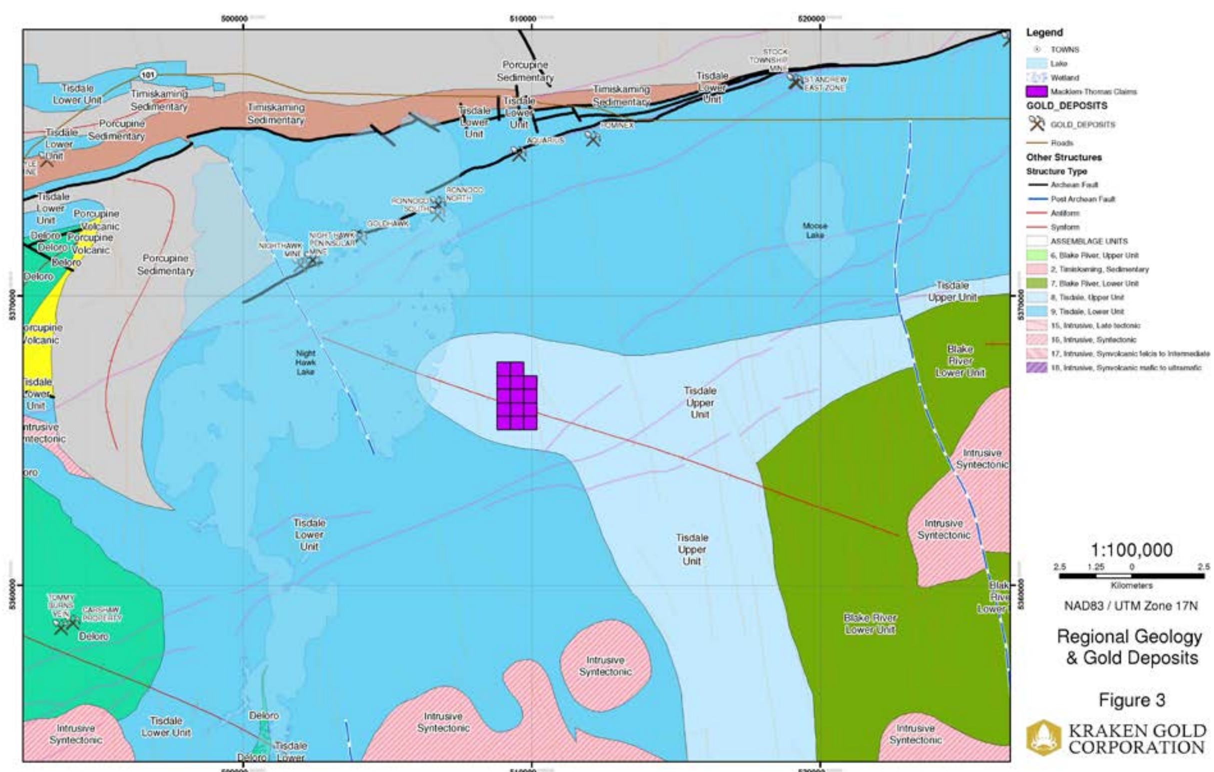


Figure 3: Regional Geology and Gold Deposits

Previous Work and Exploration History

The following is a summary and brief description of previous exploration work carried out on an around the property.

In 1938, Porcupine McNabb Gold Mines carried out a program of diamond drilling, stripping and trenching, and bulk sampling on portions of its 16-claim property in the southern part of Macklem Township, which comprises the north central portion of the current SGX Night Hawk East property. Most of the exploration work was carried out on surveyed claim 8858, where two old prospect shafts had been sunk on quartz-tourmaline veined felsite dykes in carbonated rock. A considerable amount of stripping and trenching were done on other parts of the property as well. The diamond drilling and surface sampling reportedly gave irregular gold values and the bulk sampling very low gold values. (Leahy, 1971; Berry, 1940; Assessment File T-274).

In 1938, Erie Canadian Mines Limited reported on a visible gold showing on the Brisson group of claims, located in south Macklem Township, adjoining the Porcupine McNabb claims to the south and east (Assessment File T-1465). The report states that minor fine visible gold occurs in quartz filled joints within a northwest trending, steeply southwest dipping 40-meter wide quartz porphyry dyke. Historic assays of up to 4.40 dwt/ton (6.82 grams per ton) were reported from the dyke; however, the best assay returned from the six samples taken by Erie personnel was 0.40 dwt/ton (0.62 gpt). The former Brisson claims are in the central portion of the current property.

In 1939, L.G. Berry mapped the Langmuir-Sheraton area, including Carman, Thomas and the southern part of Macklem townships (Berry, 1940). Berry's report includes maps of the main gold showing area in south Macklem Township, which occurs on the current property.

In 1956, the Geological Survey of Canada published Aeromagnetic maps covering the Night Hawk Lake area (Geol. Surv. Canada, 1956c and 1956d). These maps were published from data supplied by the Dominion Gulf Company from work done from 1947 – 1949.

From 1964 – 1968, E. J. Leahy mapped Macklem, Thomas, Cody and Carman townships at a scale of 1 inch to ½ mile, as part of the Night Hawk Lake Area mapping project (Leahy, 1971).

In 1965, Markay Mining Corporation Limited carried out ground magnetic and Crone EM electromagnetic surveys over most of their property in north Thomas Township. Three drill holes, totalling 484 meters were put down during the summer of 1965, to test magnetic anomalies. No significant gold assays were reported from the drilling program. (Assessment File T – 1133).

In 1981, Dome Exploration Ltd carried out ground magnetic and electromagnetic Max-Min surveys over an extensive area in south Macklem and north Thomas townships. Several diabase dykes were delineated by the magnetic survey and no conductors were outlined by the Max-Min survey (Assessment File T-2402).

In July-August of 1983, Dome Exploration Ltd drilled 16 diamond drill holes on the above property, for a total of 6, 539 feet (1,993.6m). Fifteen of the holes were drilled in Macklem Township, mainly testing the main gold showing area formerly held by Porcupine McNabb Gold Mines. Only one hole was put down in north Thomas Township. Assay results were reported for seven of the drill holes, with the highest assays ranging from 0.40 – 0.60 dwt/ton (0.62 – 0.93 gpt). (Assessment File T-2402).

In 1986, B A Resources Ltd carried out a prospecting, sampling and geological mapping program on their 25-claim property in northeast Thomas Township. A total of 55 grab and chip samples were collected for gold assay; two of the samples returned assays of 0.042 and 0.034 ounces/ton gold (Assessment File T-3083).

In 2000, airborne magnetic and electromagnetic surveys were carried out over Macklem and Thomas Townships, as part of the Operation Treasure Hunt $SPECTRUM_{2000}$ airborne geophysical survey of the Matheson area (Ontario Geological Survey, 2000).

In 2005, the Ontario Geological Survey published a new series of airborne magnetic and electromagnetic maps for the Matheson area, based on data reassessment of the Operation Treasure Hunt $SPECTRUM_{2000}$ airborne geophysical survey of the Matheson area (Ontario Geological Survey, 2005). This work was part of the Discover Abitibi Initiative.

In 2010, SGX Resources Inc. carried out a program of line cutting and magnetometer, VLF and I.P. surveys over the East Night Hawk Lake property. The surveys were carried out on north-south grid lines spaced at 100-meter intervals.

In 2011, SGX Resources Inc. followed up the 2010 geophysical work with a limited diamond drill program of 4 holes totaling 404 meters. One hole, NH-11-02, intersected possible specs of visible gold hosted in quartz-carbonate veinlets from 58.28-58.80m (0.36 g/t Au) and from 70.06-70.36m (0.17 g/t Au). Another sample taken from an ankerite-sericite altered felsic to intermediate fragmental returned 1.48 g/t Au over 1.0m (65.90 – 66.90m). (Assessment File T-6433)

Current Work

Data from geophysical surveys conducted in 2010 for SGX Resources Ltd. was located by Kraken Gold Corporation and subsequently re-processed and interpreted for this report by the author (Table 2).

The geophysical program consisted of induced polarization and resistivity surveying (I.P.) and total field magnetic surveys as well as VLF-EM surveys. These surveys were carried out on a grid of cut lines oriented at 0° spaced every 100 meters and chained and marked every 25 meters. The grid lines were surveyed every 100 meters along a baseline 2.9 km. in length and ranged in length between 600 and 1200 meters.

The I.P. survey was performed using a pole-dipole electrode configuration. The dipole 'a' spacing was measured at 25 meters for all lines with increasing separations of n=1, n=2, n=3, and n=4, and n=5 times the dipole spacing was measured in order to map the response at depth. A total of approximately 12.8 km. of I.P. data was measured and recorded. The I.P. equipment used for the survey consisted of a Phoenix IPT-1 3000-watt transmitter operating in the time domain powered by a 2-kilowatt motor generator. The chargeability (measured in mV/V) between the transmitted current and the received voltage is recorded by an Iris Elrec IP Pro receiver which records the chargeability and the apparent resistivity for each set of dipoles. The chargeability measured in this survey is a measure of the polarization of the underlying lithology.

The total field magnetic survey and VLF-EM survey, using a GEM GSM-19 magnetometer/VLF system, totaled 30.0 kilometers with readings collected every 12.5 meters along all lines.

A description of the survey method and equipment used can be found in Appendix 1.

Table 2: Data Sources for Reprocessing and Interpretation.

Geophysical Survey Data	Data Source	Reprocessing and Modelling
Induced Polarization data	Company archives	Reprocess 2010 Induced Polarization data and generate contoured and posted pseudo-sections of the apparent resistivity and recorded chargeability. Interpretation and location of I.P. anomalies.
VLF-EM data	Company archives	Reprocess 2010 VLF-EM geophysical data and generate profile and posting maps. Interpretation and location of VLF- EM conductor axis.
Total Field Magnetic data	Company archives	Reprocess 2010 Total Field Magnetic Survey data and generate contour and posting maps. Interpretation and location of magnetic anomalies.

Discussion of Results

The results of the I.P. survey are presented as contoured and posted pseudo-sections of the apparent resistivity and recorded chargeability's at a scale of 1:2500. In addition, plan maps at a scale of 1:5,000 showing the contours of the filtered apparent resistivity and I.P. chargeability with the interpretation and location of the I.P. anomalies are also presented. All maps generated and described in this report are in the attached Appendices 2 & 3.

The magnetic data has been presented on plan maps at a scale of 1:5000, showing the contours and postings, as well as the interpretations (Appendix 4).

The VLF-EM geophysical data has been presented on plan maps at a scale of 1:5000, showing the profiles and postings of the VLF-EM survey as well as the interpreted VLF-EM conductor axis locations (Appendix 5).

The resistivity data as displayed by the contoured resistivity plan map shows a moderate variation of measured resistivities in the range of 64 to 32756 ohm-m with a mean background resistivity of approximately 3048 ohm-m. The higher resistivity areas of the grid may likely be mapping areas of bedrock ridges and sub-cropping bedrock areas. These areas are quite evident on the plan map. It is also possible the high resistivity zones may be outlining more resistive felsic lithology or silica altered horizons as well.

A prominent area of resistivity highs can be observed between lines 1100W and 600W, 500 metres north of the baseline. I.P. anomalies IP1, IP2 and IP3 are within or closely proximal to this higher resistivity area.

The I.P. anomalies have been interpreted and are displayed on the plan map of the filtered resistivity as well. Emphasis was placed on identifying I.P. anomalies, which were thought to originate within the bedrock as opposed to cultural sources; and those I.P. anomalies that, may be associated with bedrock relief. Eight anomaly trends were identified and labeled on the plan map as IP1 through IP8. In addition, several isolated, moderate and strong IP anomalies were also mapped which are not readily grouped into trends. Most of the IP chargeability responses are weak to moderate strength IP responses. If possible, the anomalies and trends should be followed up by prospecting and geological mapping in order to determine their sources. These anomalies may reflect underlying lithology containing sulphide or graphitic mineralization which could be considered prospective to gold or base metals. Anomalies N1 and N2 are weak to moderate strength IP anomaly trends which may represent weakly mineralized lithology. These anomalies may represent weakly mineralized horizons containing sulphides or graphitic mineralization. The depths of all the identified I.P. anomalies are interpreted to be shallow; within the range of 4 to 20 meters below surface.

The magnetic survey on the Thomas-Macklem grid indicates a relatively quiescent magnetic background with magnetic values ranging between 56487 and 58208 nT. The background magnetic field strength is 57082 nT. The overall magnetic pattern is somewhat indistinct with the east portion of the grid area (east of 300W) displaying slightly higher magnetic relief than the western portion of the grid area. This may indicate slightly shallower overburden depths in this area of the grid and deeper overburden in the central/west areas of the grid.

The overall magnetic pattern is disrupted by two strong linear anomalous magnetic highs striking at approximately 340 degrees azimuth. These magnetic anomalies have been identified and labeled as M1 and M2 and located in the east portion of the grid area and are easily seen on the magnetic contour map. These magnetic anomalies may represent diabase dikes, common to this geologic setting or possibly mafic or ultramafic lithology. The isomagnetic contour pattern suggests an underlying lithology striking in a generally easterly direction through the grid area. All the anomalies are easily identified and are labeled on the plan maps.

Several fault zones have been interpreted within the grid area. These anomalies may represent major lithological contacts or structural anomalies which may be significant in this area. These anomaly locations are indicated and shown on the contour map.

The VLF-EM survey over the Thomas-Macklem grid was successful in mapping several electromagnetic conductive trends. Nine conductive trends were interpreted and identified as V1 to V9 and are shown on the VLF profile map. The VLF-EM conductive trends display an approximate east-west strike. These conductive trends may be reflecting faults or structures containing mineralization which may be significant to the present exploration program. None of the VLF conductive zones are coincident with the IP anomalies. They may represent overburden troughs with slightly conductive clay minerals or possibly may represent slightly mineralized structures with the grid area.

Conclusions and Recommendations

The induced polarization, VLF-EM, and magnetic surveys completed over the Thomas-Macklem grid were successful in mapping several zones of anomalous I.P. effects, VLF-EM conductors and magnetic anomalies, as well as mapping the bedrock resistivity. All the interpreted I.P. anomalies are weak to moderate in strength and will likely require further investigation in order to determine their causes. The most promising I.P. anomalies, which are thought to arise from bedrock sources, have been interpreted and identified.

It is always difficult to quantitatively rate all the I.P. anomalies in terms of their economic potential when searching for exploitable mineral deposits, but it is possible that some of the I.P. anomalies mapped by this survey are caused by disseminated to semi-massive metallic mineralization. This type of mineralization is often associated which valuable deposits of massive sulphides, gold and platinum group minerals.

All the responses should be investigated further in order to determine the priority of follow-up needed. The anomalies should be further screened utilizing any other different types of geophysical surveys that may have been undertaken on the Thomas-Macklem grid. This would aid greatly in further refining the interpretation of the I.P. survey. Any existing geological, diamond drilling (Figure 4) or geochemical information that may exist in the mining recorder assessment files should be investigated and compiled prior to further exploration of the Thomas-Macklem property in order to accurately assess the area of the current geophysical surveys and to determine the most effective follow-up exploration method for this property.

Respectively Submitted,

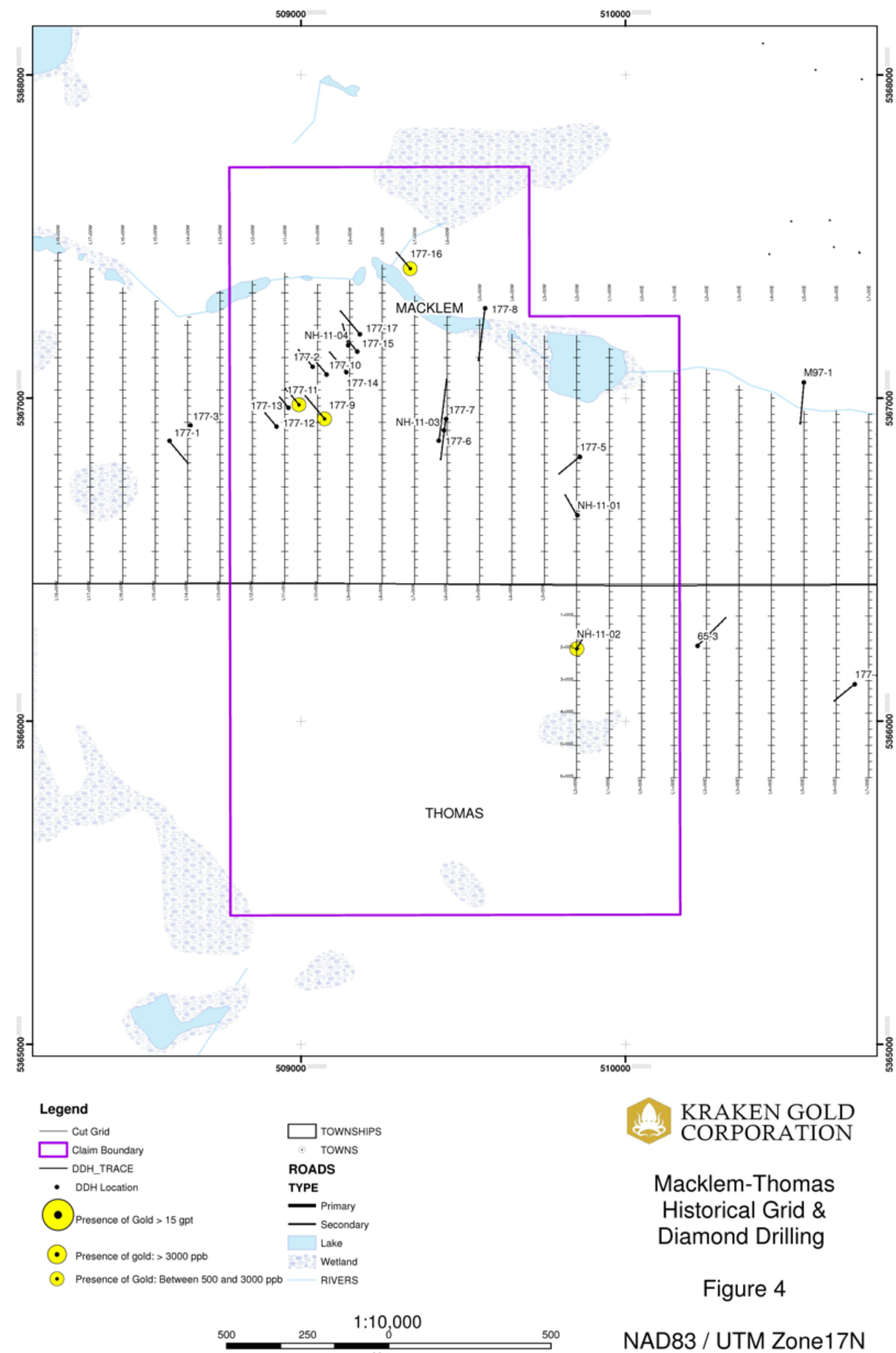


Figure 4: Location of historical grid and Diamond Drill Hole locations.

Statement of Qualifications

This is to certify that: MATTHEW JOHNSTON

I am a resident of North Bay; province of Ontario since November 1, 2017.

I am self-employed as a Consulting Geophysicist, based in North Bay, Ontario.

I have received a B.Sc. in geophysics from the University of Saskatchewan; Saskatoon, Saskatchewan in 1986.

I have been employed as a professional geophysicist in mining exploration, environmental and other consulting geophysical techniques since 1986.

I am a member in good standing with the Association of Professional Geoscientists of Ontario as a Practicing member; membership no. 2046

Signed in North Bay, Ontario, this January 2, 2020.

Appendix 1

Geophysical Instruments and Survey Methods

Induced Polarization Surveys

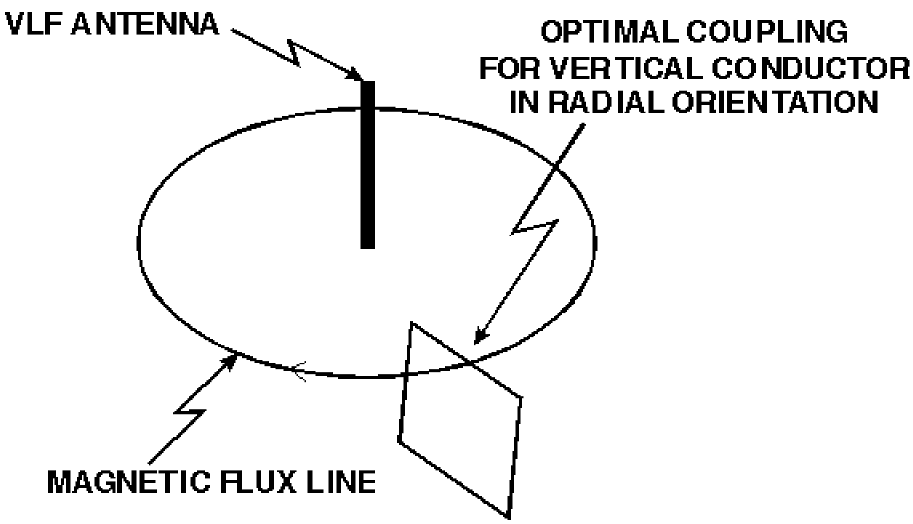
Time domain IP surveys involve measurement of the magnitude of the polarisation voltage (Vp) that results from the injection of pulsed current into the ground.

Two main mechanisms are known to be responsible for the IP effect although the exact causes are still poorly understood. The main mechanism in rocks containing metallic conductors is electrode polarisation (overvoltage effect). This results from the build up of charge on either side of conductive grains within the rock matrix as they block the flow of current. On removal of this current the ions responsible for the charge slowly diffuse back into the electrolyte (groundwater) and the potential difference across each grain slowly decays to zero. The second mechanism, membrane polarisation, results from a constriction of the flow of ions around narrow pore channels. It may also result from the excessive build up of positive ions around clay particles. This cloud of positive ions similarly blocks the passage of negative ions through pore spaces within the rock. On removal of the applied voltage the concentration of ions slowly returns to its original state resulting in the observed IP response. In TD-IP the current is usually applied in the form of a square waveform, with the polarisation voltage being measured over a series of short time intervals after each current cut-off, following a short delay of approximately 0.5s. These readings are integrated to give the area under the decay curve, which is used to define Vp. The integral voltage is divided by the observed steady voltage (the voltage due to the applied current plus the polarisation voltage) to give the apparent chargeability (Ma) measured in milliseconds or mV/V. For a given charging period and integration time the measured apparent chargeability provides qualitative information on the subsurface geology.

The polarisation voltage is measured using a pair of non-polarising electrodes similar to those used in spontaneous potential measurements and other IP techniques.

The VLF Method

- The very low frequency (VLF) method is a reconnaissance electromagnetic technique used mainly in mineral exploration
- The method makes use of powerful VLF transmitters (3-30 kHz) that are used for military communications
- The U.S. Navy operates 11 transmitters that serve as standard VLF sources for geophysical work



- The VLF method is essentially a tilt-angle technique. In the absence of any conductive body, the secondary field is zero, and the resultant (primary) magnetic field is thus horizontal. If a conductor is present, the associated secondary field will cause the resultant to be tilted.

- Flux linkage analysis can be used to show that vertically above the conductor, the tile angle passes through zero (see Reynolds, 1997, p. 656).

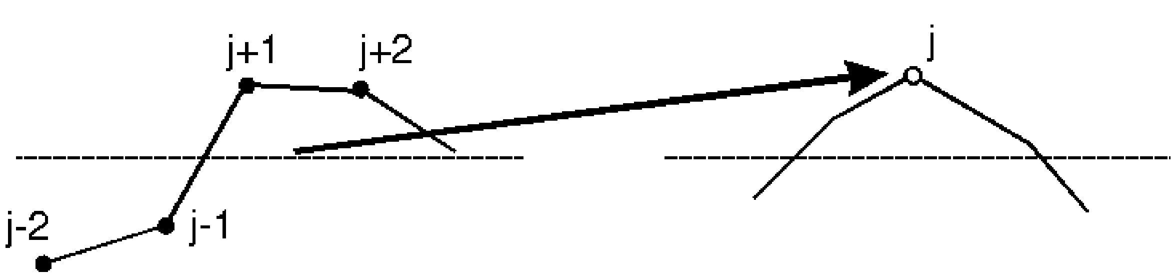
- VLF signal strength diminishes rapidly with depth (i.e., the skin depth is small). Consequently, VLF methods are primarily used to detect near-surface features, and not for depth-sounding.
  Data acquisition:
- The most common field technique (VLF-EM) uses a hand-held antenna. In older systems, an audio signal is nulled to determine the tilt angle. In newer systems, data acquisition is entirely digital (push one button, the electronics do the rest). The measured parameters are tilt angle (in degrees) and quadrature component (in %).

- Another field technique, known as VLF-R, uses an electrical dipole. Measured parameters are apparent resistivity (Ohm-m) and quadrature component (%).

Data Processing:

- The most common data processing technique is called **Fraser Filtering**. This filter operator smooths the data, and applies a phase shift such that a peak is situated above the conductive target, rather than a zero crossing. The formula for the Fraser filter operator is:

$$F_j = (M_{j+2} + M_{j+1}) - (M_{j-2} + M_{j-1})$$



Geonics Em-16 VLF Receiver

Features

Measures the local tilt and ellipticity of VLF broadcasts and resolves values into inphase and quadrature components of VLF response.

Maps resistive alteration for gold exploration.

General

The EM16 is a widely used EM instrument. The unit measures the local tilt and ellipticity of VLF broadcasts, and resolves values into inphase and quadrature components of VLF response. EM16 units have discovered several base and precious-metal ore bodies, and many water-bearing faults.

Specifications

EM16 Measured Quantities:

EM16: In-phase and quadrature components of the secondary VLF field, as percentages of the primary field

Sensors:

EM16: Ferrite-core coil, tuned by plug-in crystal.

Measurement Ranges:

EM16: In-phase: ±150%, Quadrature: ±40%

Weights:

EM16: Operational: 1.8kg, Shipping: 6.2kg

Primary Field Source: VLF broadcast stations
Operating Frequency: 15 to 30kHz, depending on VLF broadcasting station
Power Supply: EM16/16R - 6 alkaline 'AA' cells
Dimensions: EM 16 and/or EM16R: 53 x30 x 22cm

Survey Theory - Total Field Magnetics

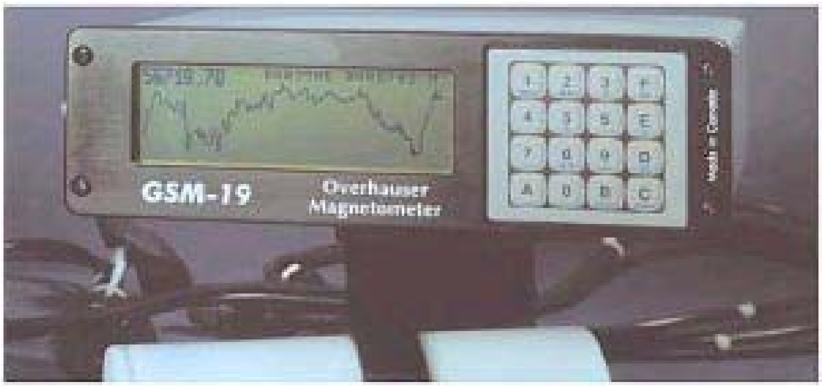
Magnetic Survey

Theory:

The magnetic method is based on measuring alteration in the shape and magnitude of the earth's naturally occurring magnetic field caused by changes in the magnetization of the rocks in the earth. These changes in magnetization are due mainly to the presence of the magnetic minerals, of which the most common is magnetite, and to a lesser extent illuminate, pyrrhotite, and some less common minerals. Magnetic anomalies in the earth's filed are caused by changes in two types of magnetization: (1) Induced, caused by the magnetic field being altered and enhanced by increases in the magnetic susceptibility of the rocks, which is a function of the concentration of the magnetic minerals. (2) Remanent magnetism is independent of the earth's magnetic field, and is the permanent magnetization of the magnetic particles (magnetite, etc.) in the rocks. This is created when these particles orient themselves parallel to the ambient field when cooling. This magnetization may not be in the same direction as the present earth's field, due to changes in the orientation of the rock or the field. The **unit** of measurement (variations in intensity) is commonly known as the Gamma which is equivalent to the nanotesla (nT).

Method:

The magnetometer, a GEM Systems **GSM-19** with an Overhauser sensor measures the **Total Magnetic Field** (TFM) perpendicular to the earth's field (horizontal position in the polar region). The unit has no moving parts, produces an absolute and relatively high resolution measurement of the field and displays the measurement on a digital lighted display and is recorded (to memory). Initially, the tuning of the instrument should agree with the nominal value of the magnetic field for each particular area. The Overhauser procession magnetometer collected the data with a **0.2 nanoTesla accuracy.** The operator read each and every line at a 12.5 **m** intervals with the sensor attached to the top of four (56cm), aluminum tubing sections. The readings were corrected for changes in the earth's magnetic field (diurnal drift) with a similar GSM-19 magnetometer, acting as a stationary base station which automatically read and stored the readings at every 15 seconds. The data from both units was then downloaded to PC and base corrected values were computed.



GSM-19 v7.0

Overhauser Magnetometer / Gradiometer / VLF

Introduction

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 Ordenance Detencion**
- **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 measurement.

In comparison with proton precession methods, RF signal generation also keeps power consumption to an absolute minimum and reduces 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).

The unique Overhauser unit blends physics, data quality, operational efficiency, system design and options into an instrumentation package that ... exceeds proton precession and matches costlier optically pumped cesium capabilities.

And the latest v7.0 technology up-grades provide even more value, including:

- **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
- **<1.5m standard GPS** for high-resolution surveying
- **<1.0 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 prices and warranty in the business!

Terraplus Inc.
52 West Beaver Cr. Rd. #12, Richmond Hill, ON. Canada L4B 1L9
Tel: 905-764-5505
Fax: 905-764-8093
Email: sales@terraplus.ca
Website: www.terraplus.ca

Maximizing Your Data Quality with the GSM-19

Data quality is a function of five key parameters that have been taken into consideration carefully in the design of the GSM-19. These include sensitivity, resolution, absolute accuracy, sampling rates and gradient tolerance.

Sensitivity is a measure of the signal-to noise ratio of the measuring device and reflects both the underlying physics and electronic design. The physics of the Overhauser effect improves sensitivity by an order of magnitude over conventional proton precession devices. Electronic enhancements, such as high-precision precession frequency counters enhance sensitivity by 25% over previous versions.

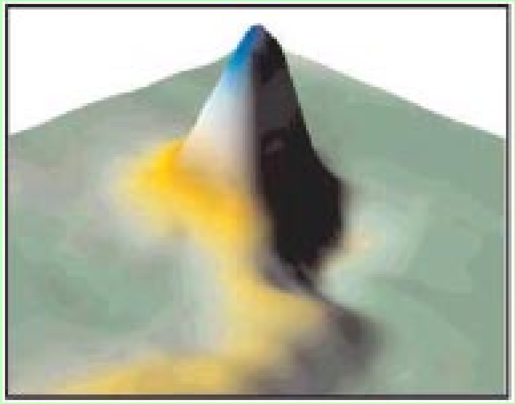
The result is high quality data with sensitivities of 0.022 nT / vHz. This sensitivity is also the same order-of magnitude as costier optically pumped cesium systems.

Resolution is a measure of the smallest number that can be displayed on the instrument (or transmitted via the download process). The GSM-19 has unmatched resolution (0.01mT)

This level of resolution translates into well-defined, characteristic anomalies; improved visual display; and enhanced numerical data for processing and modeling.

Absolute accuracy reflects the closeness to the "real value" of the magnetic field -- represented by repeatability of readings either at stations or between different sensors. With an absolute accuracy of +/- 0.1 nT, the GSM-19 delivers repeatable station-to-station results that are reflected in high quality total field results.

Similarly, the system is ideal for gradient installations (readings between different sensors do not differ by more than +/- 0.1 nT) -- maintaining the same high standard of repeatability.



Data from Kalahari Desert kimberlites. Courtesy of MPH Consulting (project managers), IGS c. c. (geophysical contractor) and Aegis Instruments (Pty) Ltd., Botswana.

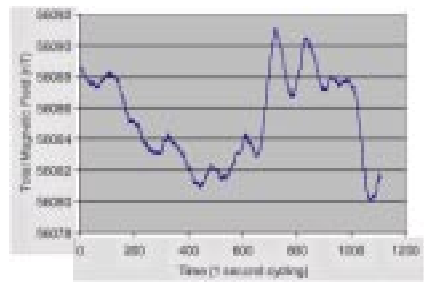
The GSM-19 gradiometer data are consistently low in noise and representative of the geologic environment under investigation.

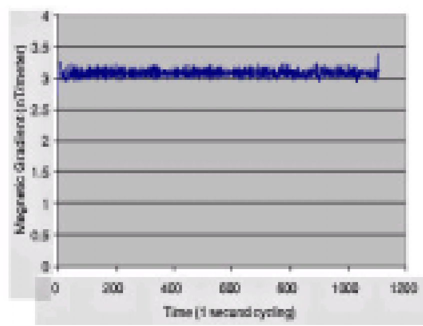
Sampling rates are defined as the fastest speed at which the system can acquire data. This is a particularly important parameter because high sampling rates ensure accurate spatial resolution of anomalies and increase survey efficiency.

The GSM-19 Overhauser system is configured for two "measurement modes" or maximum sampling rates -- "Standard" (3 seconds / reading), and "Walking" (0.2 seconds / reading) These sampling rates make the GSM-19 a truly versatile system for all ground applications (including vehicle-borne applications).

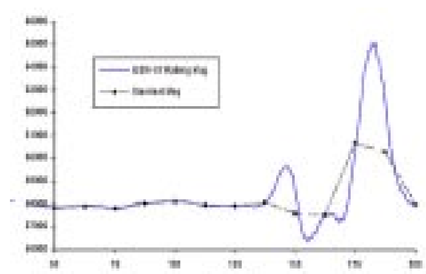
Gradient tolerance represents the ability to obtain reliable measurements in the presence of extreme magnetic field variations. GSM-19 gradient tolerance is maintained through internal signal counting algorithms, sensor design and Overhauser physics. For example, the Overhauser effect produces high amplitude, long-duration signals that facilitate measurement in high gradients.

The system's tolerance (10,000 nT / meter) makes it ideal for many challenging environments -- such as highly magnetic rocks in mineral exploration applications, or near cultural objects in environmental, UXO or archeological applications.





Total Field and Stationary Vertical Gradient showing the gradient largely unaffected by diurnal variation. Absolute accuracy is also shown to be very high (0.2 nT/meter).



Much like an airborne acquisition system, the GSM-19 "Walking" magnetometer option delivers very highly-sampled, high sensitivity results that enable very accurate target location and / or earth science decision-making.

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52 West Beaver Cr. Rd. #12, Richmond Hill, ON. Canada L4B 1L9
Tel: 905-764-5505
Fax: 905-764-8093
Email: sales@terraplus.ca
Website: www.terraplus.ca

Increasing Your Operational Efficiency

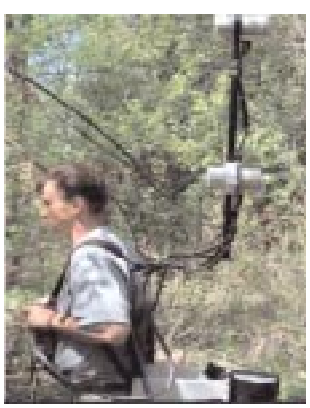
Many organizations have standardized their magnetic geophysical acquisition on the GSM-19 based on high performance and operator preference. This preference reflects performance enhancements such as memory capacity; portability characteristics; GPS and navigation; and dumping and processing.

Memory capacity controls the efficient daily acquisition of data, acquisition of positioning results from GPS, and the ability to acquire high resolution results (particularly in GSM-19's "Walking" mode).

V7.0 upgrades have established the GSM-19 as the commercial standard for memory with over 1,465,623 readings (based on a basic configuration of 32 Mbytes of memory and a survey with time, coordinate, and field values).

Portability characteristics (ruggedness, light weight and power consumption) are essential for operator productivity in both normal and extreme field conditions.

GSM-19 Overhauser magnetometer is established globally as a robust scientific instrument capable of withstanding temperature, humidity and terrain extremes. It also has the reputation as the lightest and lowest power system available -- reflecting Overhauser effect and RF polarization advantages.



In comparison with proton precession and optically pumped cesium systems, the GSM-19 system is the choice of operators as an easy-to-use and robust system.

GPS and navigation options are increasingly critical considerations for earth science professionals.

GPS technologies are revolutionizing data acquisition -- enhancing productivity, increasing spatial resolution, and providing a new level of data quality for informed decision-making.

The GSM-19 is now available with real-time GPS and DGPS options in different survey resolutions. For more details, see the GPS and DGPS section.

The GSM-19 can also be used in a GPS Navigation option with real-time coordinate transformation to UTM, local X-Y coordinate rotations, automatic end of line flag, guidance to the next line, and survey "lane" guidance with cross-track display and audio indicator.

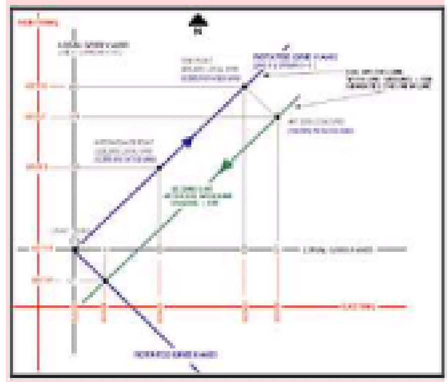
Other enhancements include way point pre-programming of up to 1000 points. Professionals can now define a complete survey before leaving for the field on their PC and download points to the magnetometer via RS-232 connection.

The operator then simply performs the survey using the way points as their survey guide. This capability decreases survey errors, improves efficiency, and ensures more rapid survey completion.

Dumping and processing effectiveness is also a critical consideration today. Historically, up to 60% of an operator's "free" time can be spent on low-return tasks, such as data dumping.

Data dumping times are now significantly reduced through GEM's implementation of high-speed, digital data links (up to 115 kBaud).

This functionality is faciliated through a new RISC processor as well as the new GSM-19 data acquisition / display software. This software serves as a bi-directional RS-232 terminal. It also has integrated processing functionality to streamline key processing steps, including diurnal data reduction. This software is provided free to all GSM-19 customers and regular updates are available.

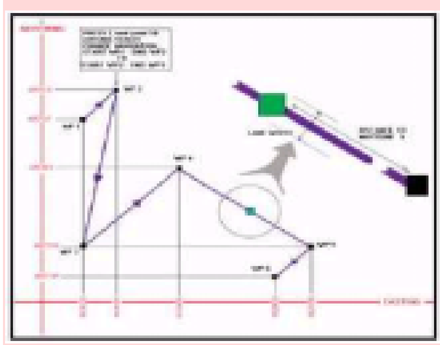


Navigation and Lane Guidance

The figure above shows the Automatic Grid (UTM, Local Grid, and Rotated Grid). With the Rotated Grid, you can apply an arbitrary origin of your own definition. Then, the coordinates are always in reference to axes parallel to the grid. In short, your grid determines the map, and not the NS direction.

The Local Grid is a scaled down, local version of the UTM system, and is based on your own defined origin. It allows you to use smaller numbers or ones that are most relevant to your survey.

The figure below shows how programmable-waypoints can be used to plan surveys on a point-by-point basis. Initially, you define waypoints and enter them via PC or the keyboard. In the field, the unit guides you to each point.



While walking between waypoints, lane guidance keeps you within a lane of predefined width using arrows (< - or - >) to indicate left or right. Within the lane, the display uses horizontal bars (- -) to show your relative position in the lane. The display also shows the distance (in meters) to the next waypoint.

Adding Value through Options

When evaluating the GSM-19 as a solution for your geophysical application, we recommend considering the complete range of options described below. These options can be added at time of original purchase or later to expand capabilities as your needs change or grow.

Our approach with options is to provide you with an expandable set of building blocks:

* **Gradiometer**
* **Walking- Fast Magnetometer / Gradiometer**
* **VLF (3 channel)**
* **GPS (built-in and external)**

GSM-19G Gradiometer Option

The GSM-19 gradiometer is a versatile, entry level system that can be upgraded to a full-featured "Walking" unit (model GSM-19WG) in future.

The GSM-19G configuration comprises two sensors and a "Standard" console that reads data to a maximum of 1 reading every three seconds.

An important GSM-19 design feature is that its gradiometer sensors measure the two magnetic fields concurrently to avoid any temporal variations that could distort gradiometer readings. Other features, such as single-button data recording, are included for operator ease-of-use.

GSM-19W / WG "Walking" Magnetometer / Gradiometer Option

The GSM-19 was the first magnetometer to incorporate the innovative "Walking" option which enables the acquisition of nearly continuous data on survey lines. Since its introduction, the GSM-19W / GSM-19WG have become one of the most popular magnetic instruments in the world.

Similar to an airborne survey in principle, the system records data at discrete time intervals (up to 5 readings per second) as the instrument is carried along the line.

At each survey picket (fiducial), the operator touches a designated key. The system automatically assigns a picket coordinate to the reading and linearly interpolates the coordinates of all intervening readings (following survey completion during post-processing).

A main benefit is that the high sample density improves definition of geologic structures and other targets (UXO, archeological relics, drums, etc.).

It also increases survey efficiency because the operator can record data almost continuously. Another productivity feature is the instantaneous recording of data at pickets. This is a basic difference between the "Walking" version and the GSM-19 / GSM-19G (the "Standard" mode version which requires 3 seconds to obtain a reading each time the measurement key is pressed).

GSM-19 "Hands-Free" Backpack Option

The "Walking" Magnetometer and Gradiometer can be configured with an optional backpack-supported sensor. The backpack is uniquely constructed - permitting measurement of total field or gradient with both hands free.

This option provides greater versatility and flexibility, which is particularly valuable for high-productivity surveys or in rough terrain.

GSM-19GV "VLF" Option

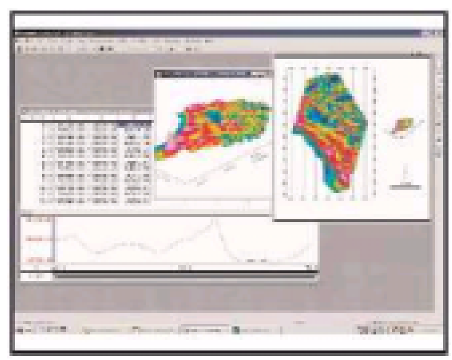
With its omnidirectional VLF option, up to 3 stations of VLF data can be acquired without orienting. Moreover, the operator is able to record both magnetic and VLF data with a single stroke on the keypad.

3rd Party Software - A One-Stop Solution for Your Potential Field Needs

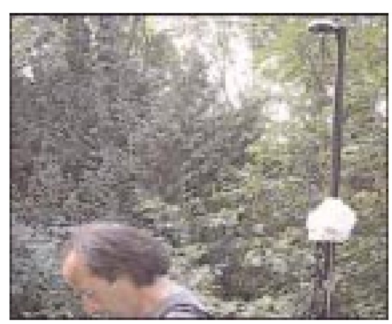
As part of its complete solution approach, Terraplus offers a selection of proven software packages. These packages let you take data from the field and quality control stage right through to final map preparation and modeling.

Choose from the following packages:

* **Contouring and 3D Surface Mapping**
* **Geophysical Data Processing & Analysis**
* **Semi-Automated Magnetic Modeling**
* **Visualization and Modeling / Inversion**



Geophysical Data Processing and Analysis from Geosoft Inc.



GSM-19 with internal GPS board. Small receiver attaches above sensor

Terraplus Inc.
52 West Beaver Cr. Rd. #12, Richmond Hill, ON. Canada L4B 1L9
Tel: 905-764-5505
Fax: 905-764-8093
Email: sales@terraplus.ca
Website: www.terraplus.ca

Version 7 -- New Milestones in Magnetometer Technology

The recent release of v7.0 of the GSM-19 system provides many examples of the ways in which we continue to advance magnetics technologies for our customers.

Enhanced data quality:

* 25% improvement in sensitivity (new frequency counting algorithm)
* new intelligent spike-free algo rithms (in comparison with other manufacturers, the GSM-19 does not apply smoothing or filtering to achieve high data quality)

Improved operational efficiency:

* Enhanced positioning (GPS engine with optional integrated / external GPS and real-time navigationl)
* 16 times increase in memory to 32 Mbytes
* 1000 times improvement in processing and display speed (RISC microprocessor with 32-bit data bus) 2 times faster digital data link (115 kBaud through RS-232)

Innovative technologies:

* Battery conservation and survey flexibility (base station scheduling option with 3 modes - daily, flexible and immediate start)
* Survey pre-planning (up to 1000 programmable waypoints that can be entered directly or downloaded from PC for greater efficiency)
* Efficient GPS synchronization of field and base units to Universal Time (UTC)
* Cost saving with firmware up grades that deliver new capabilities via Internet

More About the Overhauser System

In a **standard Proton magnetometer,** current is passed through a coil wound around a sensor containing a hydrogenrich fluid. The auxiliary field created by the coil (>100 Gauss) polarizes the protons in the liquid to a higher thermal equilib-rium.

When the current, and hence the field, is terminated, polarized protons precess in the Earth's field and decay exponentially until they return to steady state. This process generates precession signals that can be measured as described below.

Overhauser magnetometers use a more efficient method that combines electronproton coupling and an electron-rich liquid (containing unbound electrons in a solvent containing a free radical). An RF magnetic field -- that corresponds to a specific energy level transition -- stimulates the unbound electrons.

Instead of releasing this energy as emitted radiation, the unbound electrons transfer it to the protons in the solvent. The resulting polarization is much larger, leading to stronger precession signals.

Both Overhauser and proton precession, measure the scalar value of the magnetic field based on the proportionality of precession frequency and magnetic flux density (which is linear and known to a high degree of accuracy). Measurement quality is also calculated using signal amplitude and its decay characteristics. Values are averaged over the sampling period and recorded.

With minor modifications (i.e. addition of a small auxiliary magnetic flux density while polarizing), it can also be adapted for high sensitivity readings in low magnetic fields. (ex. for equatorial work)

GPS - Positioning You for Effective Decision Making

The use of Global Positioning Satellite (GPS) technol-ogy is increasing in earth science disciplines due to the ability to make better decisions in locating and follow-ing up on anomalies, and in improving survey cost effectiveness and time management.

Examples of applications include: Surveying in remote locations with no grid system (for example, in the high Arctic for diamond exploration)

* **High resolution exploration mapping**
* **High productivity ferrous ordnance (UXO) detection**
* **Ground portable magnetic and gradient surveying for environmental and engineering applications**
* **Base station monitoring for observing diurnal magnetic activity and disturbances with integrated GPS time**

The GSM-19 addresses customer requests for GPS and high-resolution Differ-ential GPS (DGPS) through both the industry’s only built-in GPS (as well as external GPS).

Built-in GPS offers many advantages such as minimizing weight and removing bulky components that can be damaged through normal surveying. The follow-ing table summarizes GPS options.

GPS Options:

Description	Range	Services
GPS Option A		Time Reception only
GPS Option B	<1.5m	DGPS*
GPS Option C	<1.0m	Ag 114 DGPS*, OmniStar
GPS Option D	<0.7m <1.2m <1.0M	CDGPS, DGPS *, OmniStar.
Output		
Time, Lat / Long, UTM, Elevation and number of Satellites		
*DGPS with SBAS (WASS/EGNOS/MSAS)		

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

Overhauser 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 its software. The benefit is that instrumentation can be enhanced with the latest technology without returning the system to us -- resulting in both timely implementation of updates and reduced shipping / servicing costs.

Performance

Sensitivity:	0.022 nT / vHz@1Hz
Resolution:	0.01 nT
Absolute Accuracy:	+/- 0.1 nT
Dynamic Range:	15,000 to 120,000 nT
Gradient Tolerance:	> 10,000 nT/m
Sampling Rate:	60+, 3, 2, 1, 0.5, 0.2 sec
Operating Temp:	-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 - 32Mbytes (# of Readings)

Mobile:	1,465,623
Base Station:	5,373,951
Gradiometer:	1,240,142
Walking Magnetometer:	2,686,975

Dimensions

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

Weights

Console:	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/USB 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 the horizontal field amplitude and total field strenght in pT
Resolution:	0.1% of total field

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52 West Beaver Cr. Rd. #12, Richmond Hill, ON. Canada L4B 1L9
Tel: 905-764-5505
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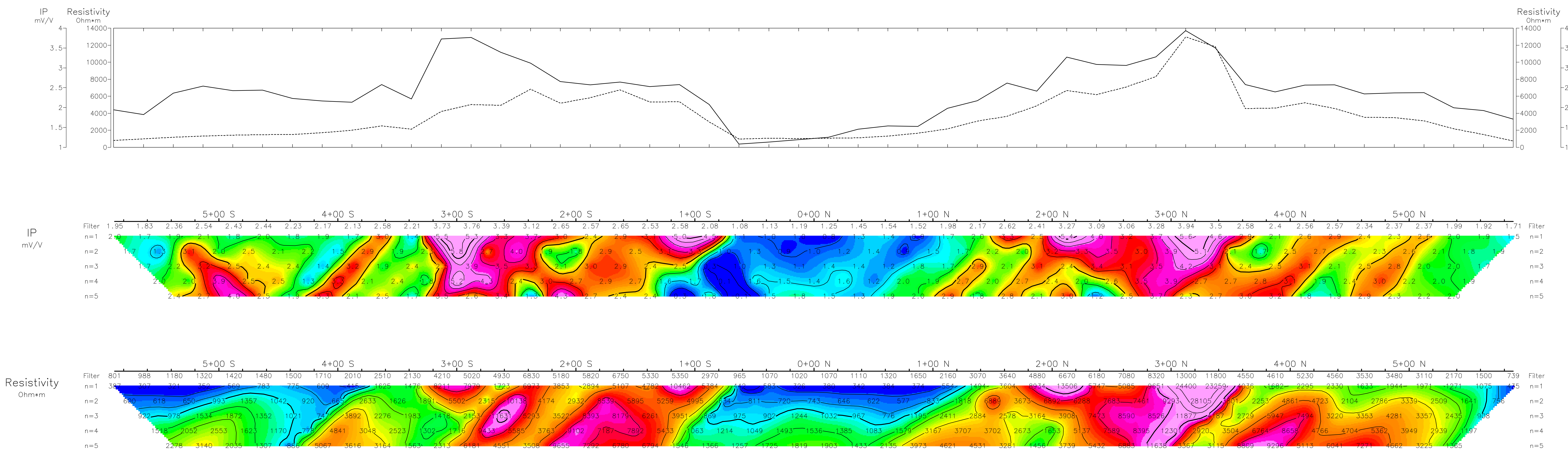
Email: sales@terraplus.ca
Website: www.terraplus.ca

Appendix 2

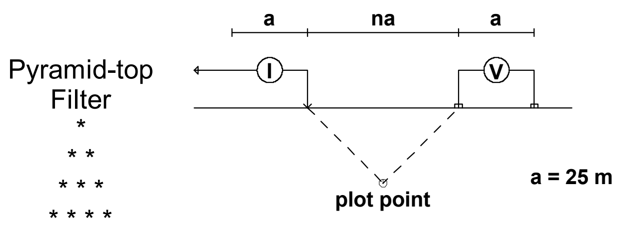
I.P./Resistivity Pseudo-Sections Lines 0E to 1300W (1:2500)



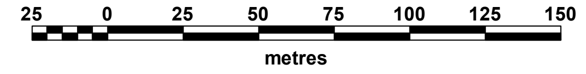
Pseudo Section Plot

0+00 E

Pole-Dipole Array



Scale 1:2500



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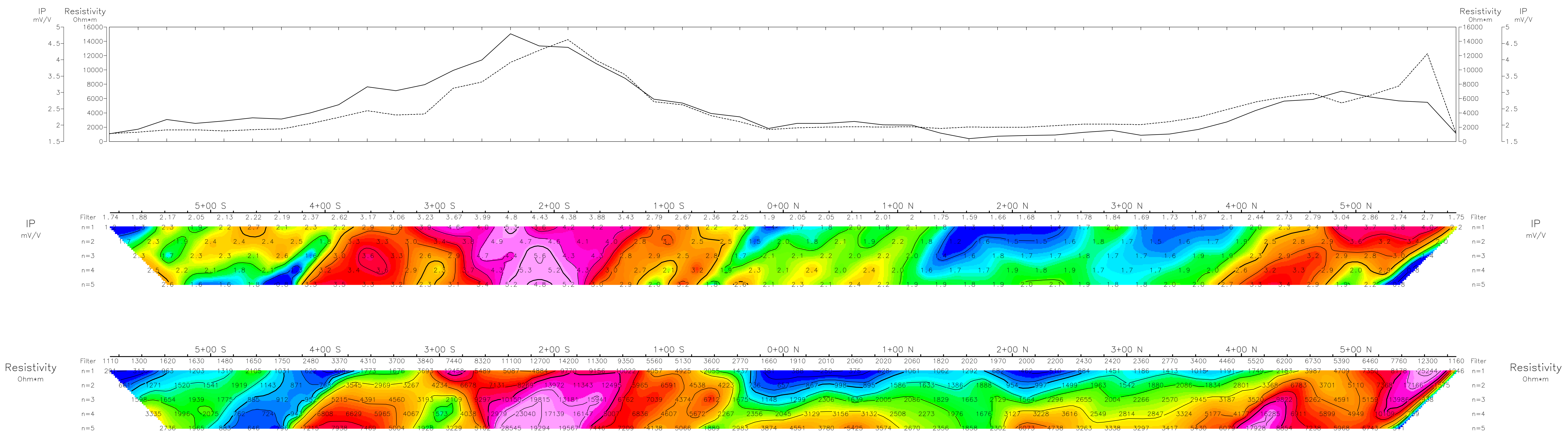

Pseudo Section Plot
1+00 W

Pole-Dipole Array

Pyramid-top Filter

a = 25 m

Scale 1:2500

metres

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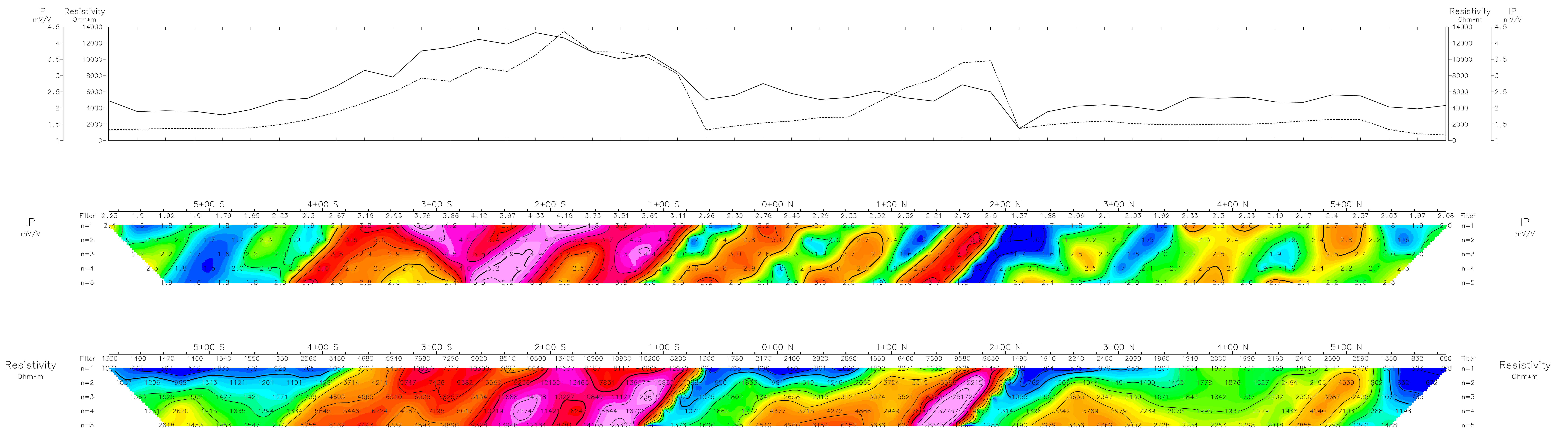
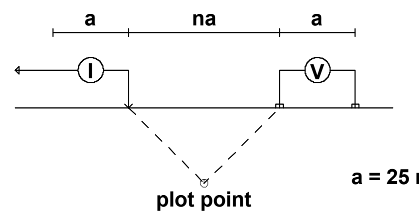


Pseudo Section Plot

2+00 W

Pole-Dipole Array



Pyramid-top Filter

*

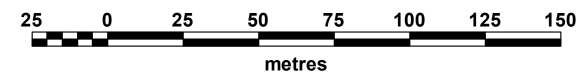
* *

* * *

* * * *

a = 25 m

Scale 1:2500



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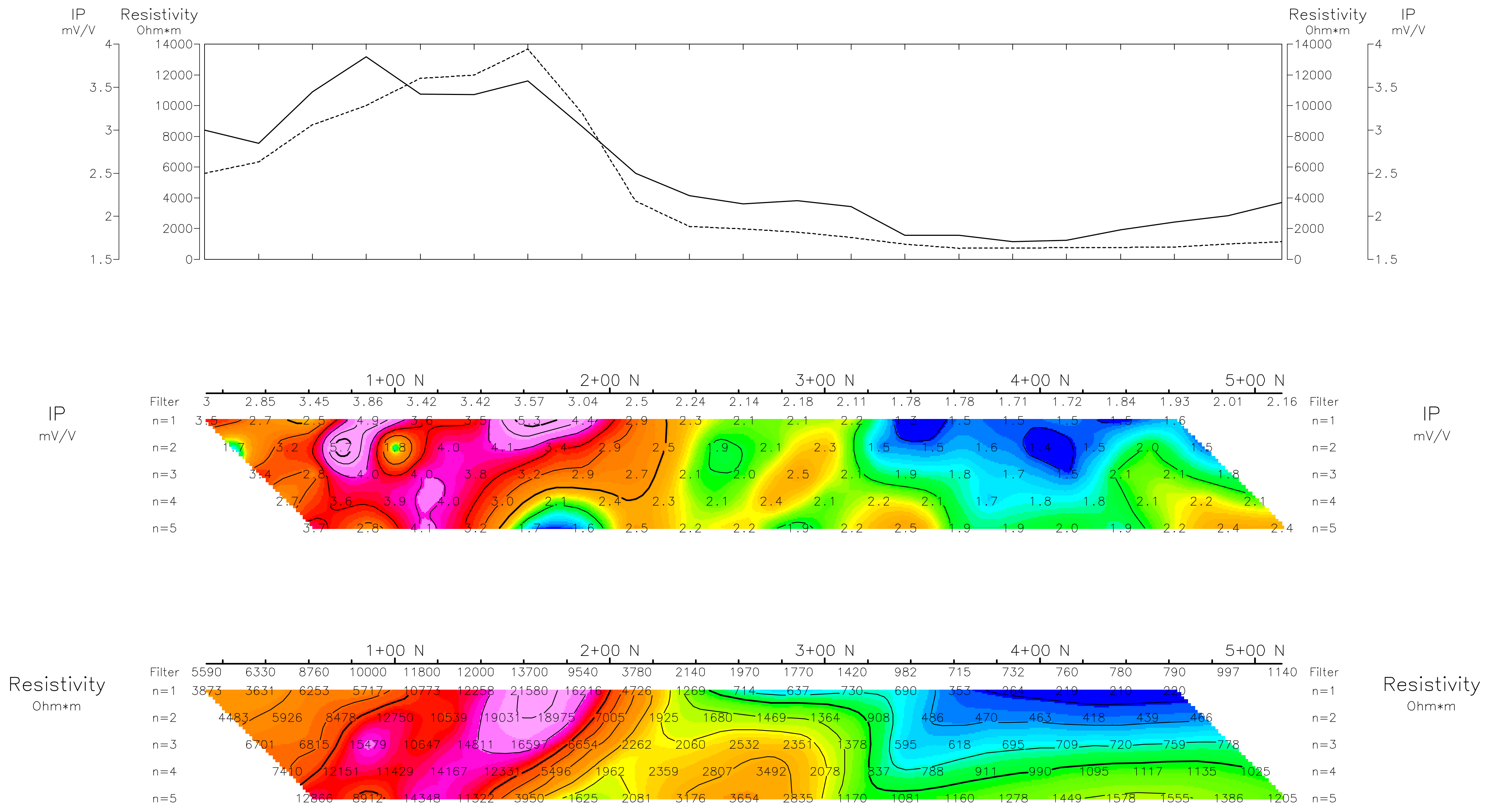

Pseudo Section Plot

3+00 W

Pole-Dipole Array

Pyramid-top Filter
*
* *
* * *
* * * *

Scale 1:2500

25 0 25 50 75 100 125 150

metres

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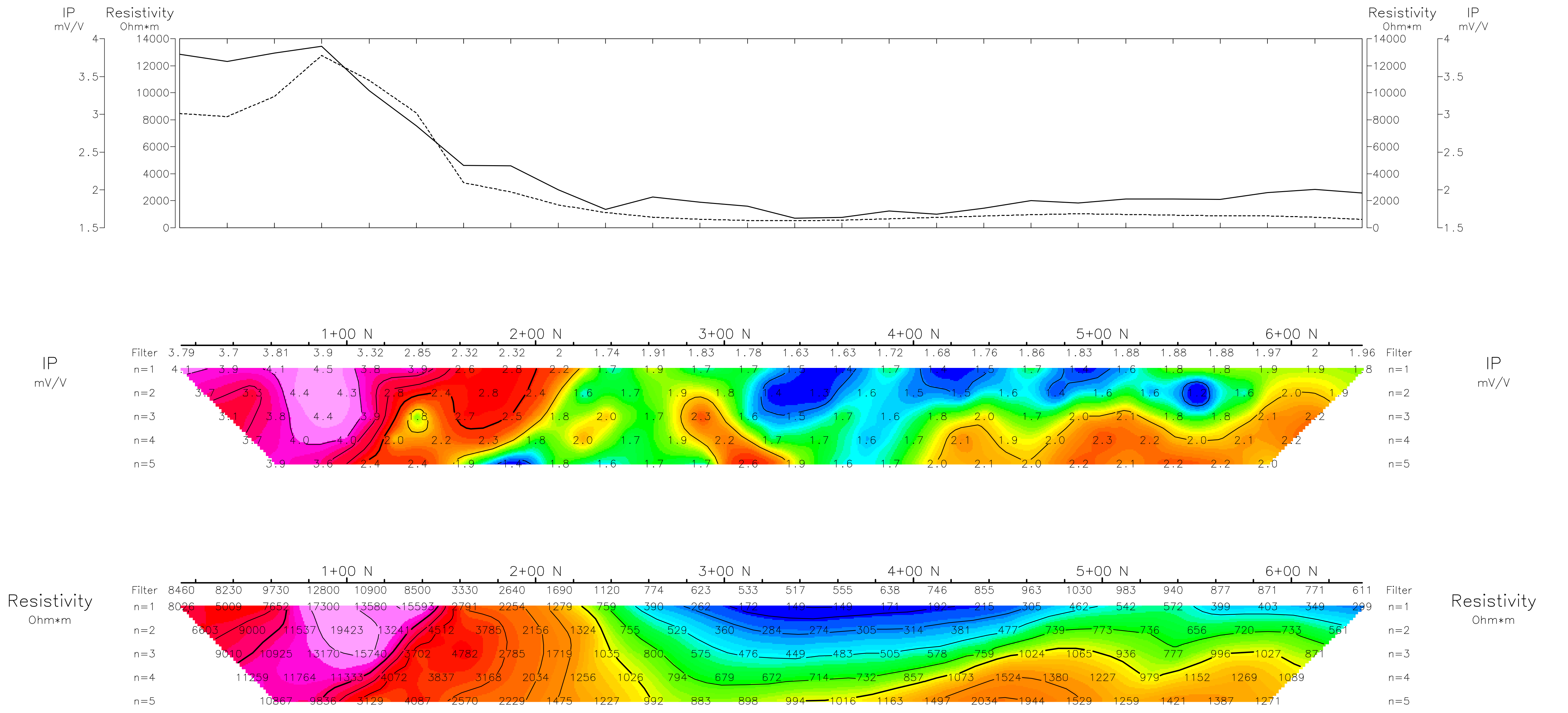
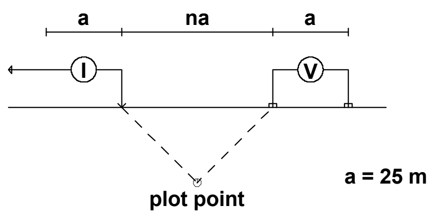


Pseudo Section Plot

4+00 W

Pole-Dipole Array

Pyramid-top Filter
*
* *
* * *
* * * *



Scale 1:2500

25 0 25 50 75 100 125 150

metres

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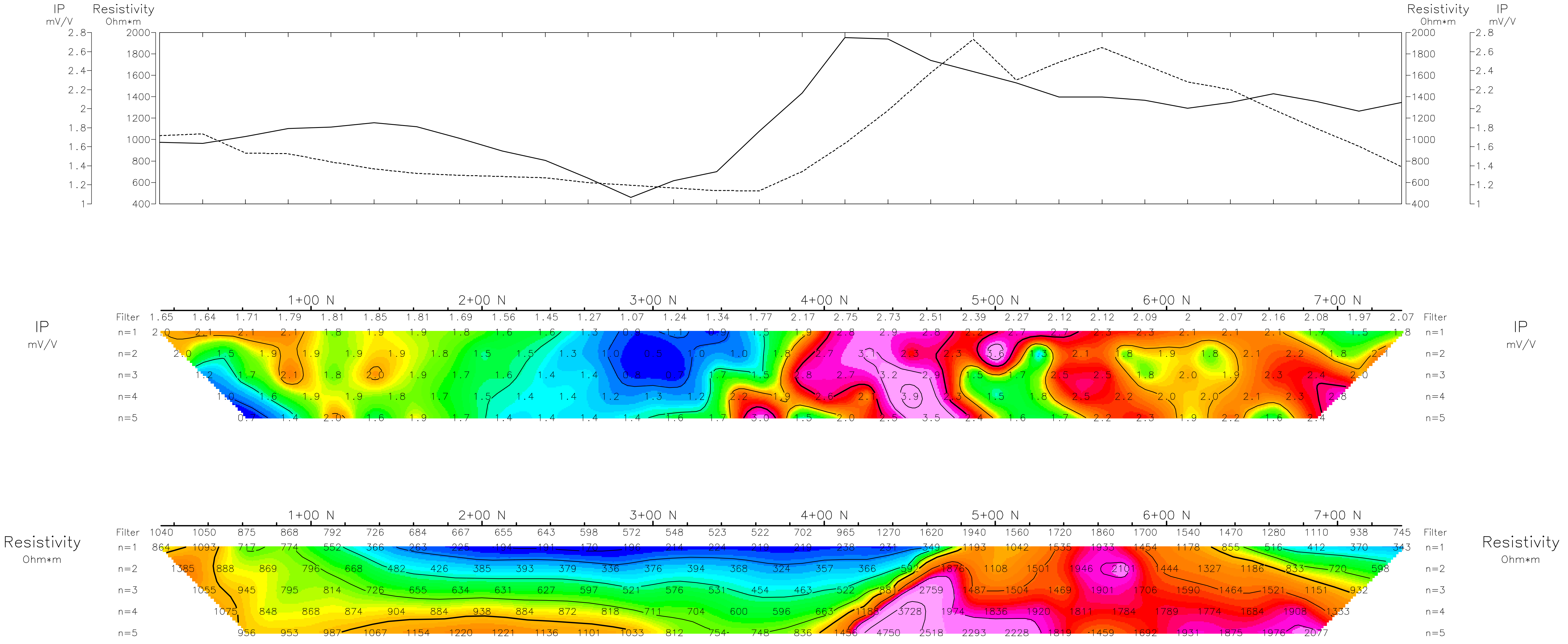
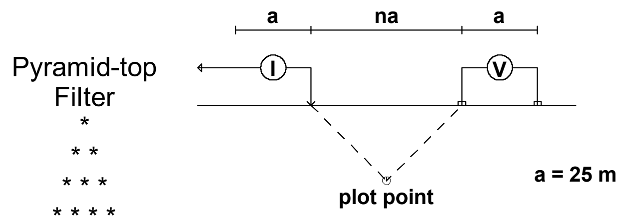


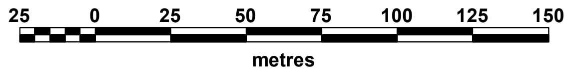
Pseudo Section Plot

5+00 W

Pole-Dipole Array



Scale 1:2500



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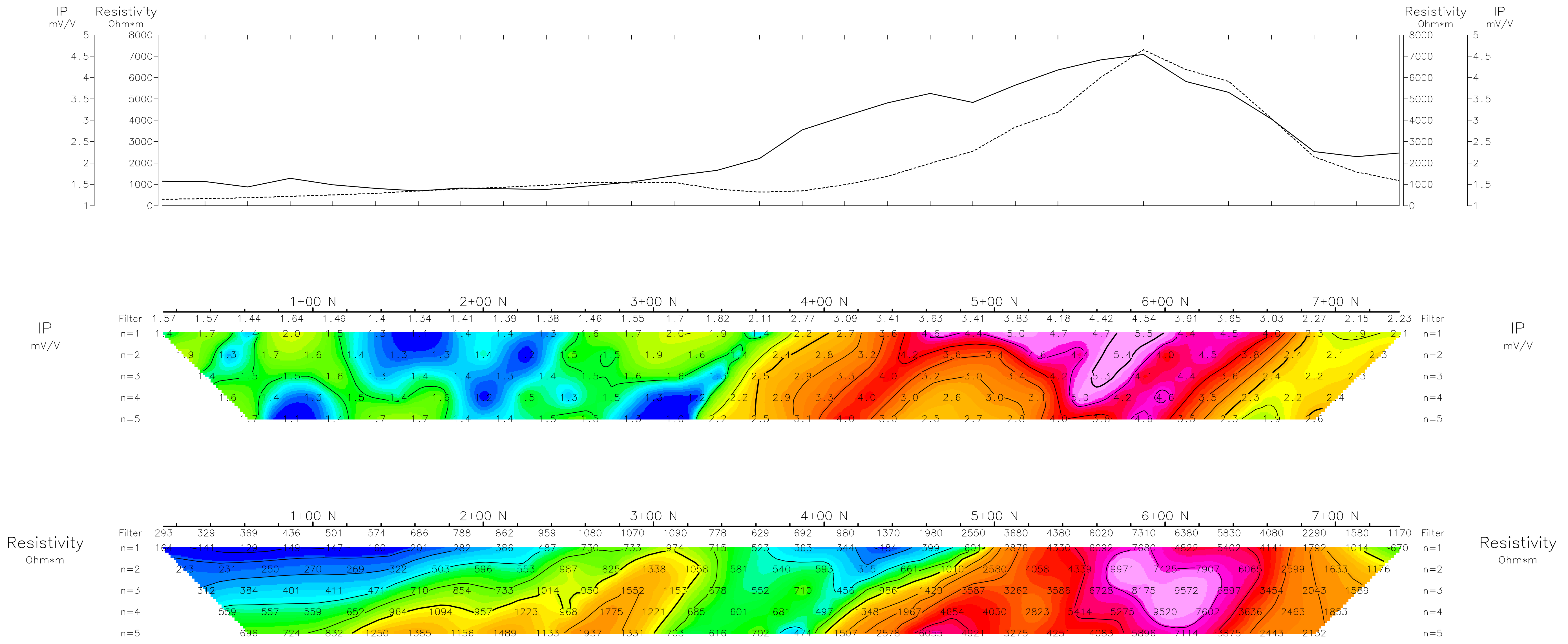
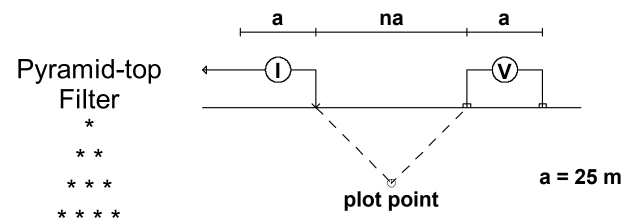
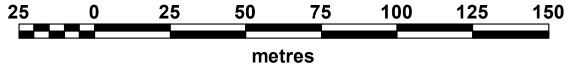


Pseudo Section Plot
6+00 W

Pole-Dipole Array



Scale 1:2500



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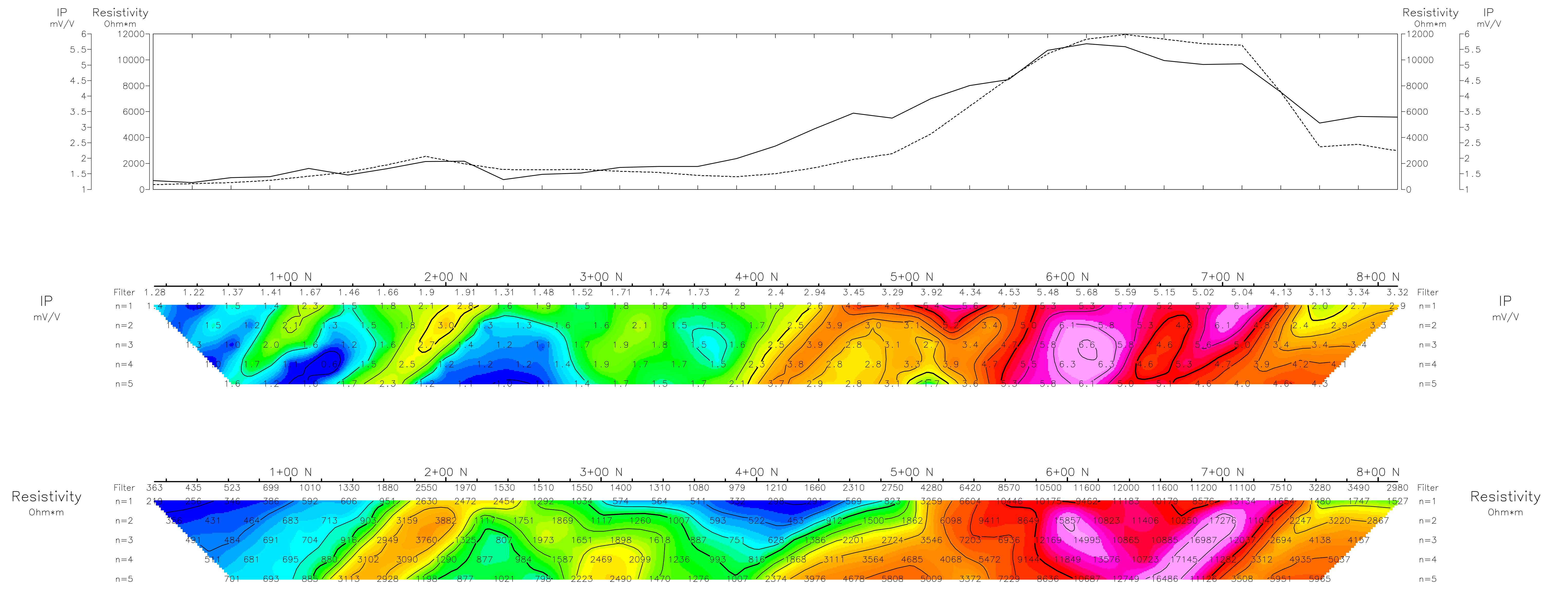
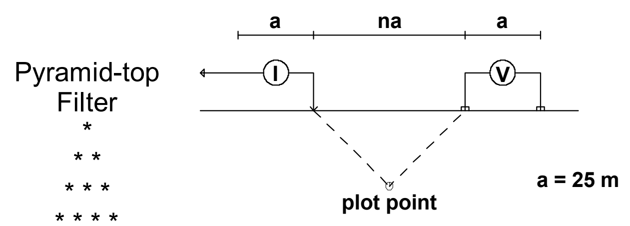


Pseudo Section Plot
7+00 W

Pole-Dipole Array



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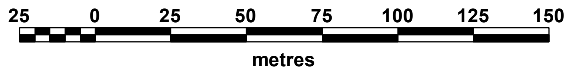

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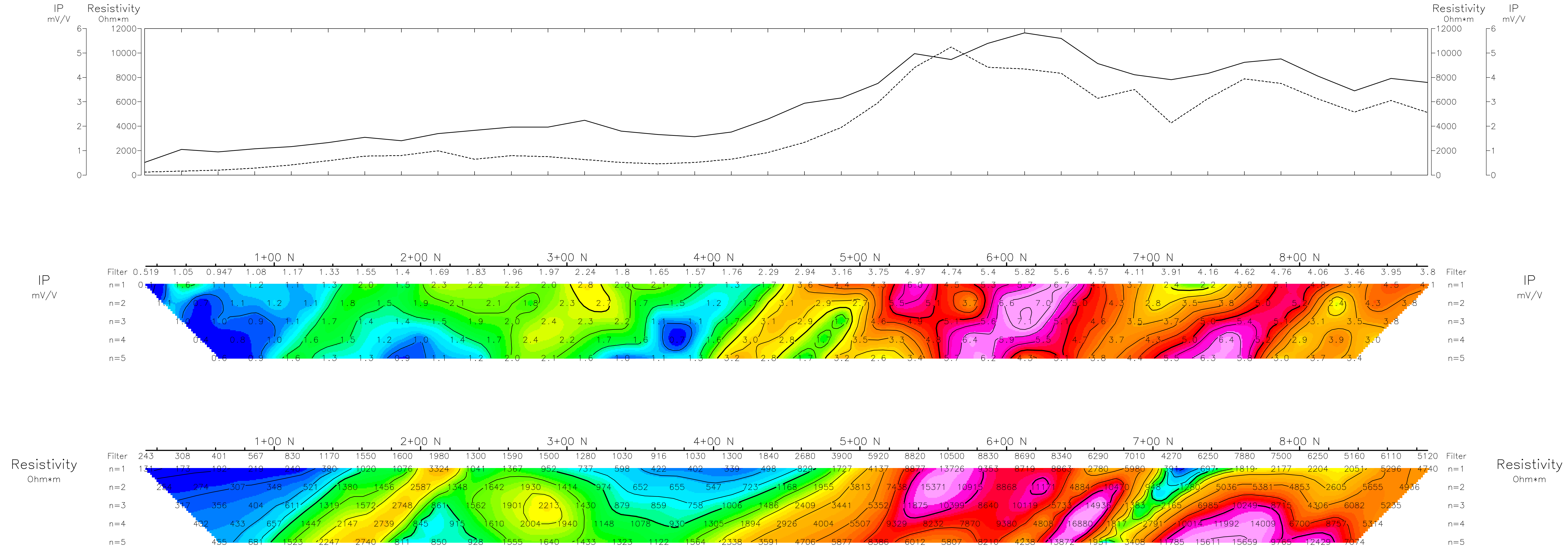
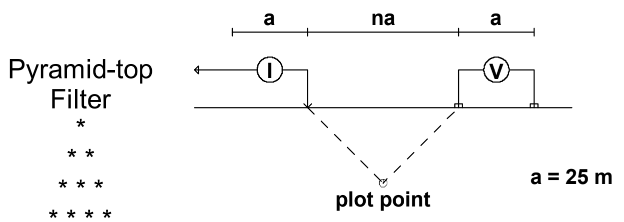


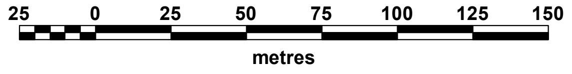
Pseudo Section Plot

8+00 W

Pole-Dipole Array



Scale 1:2500



KRAKEN GOLD CORPORATION

INDUCED POLARIZATION SURVEY

MACKLEM-THOMAS PROJECT

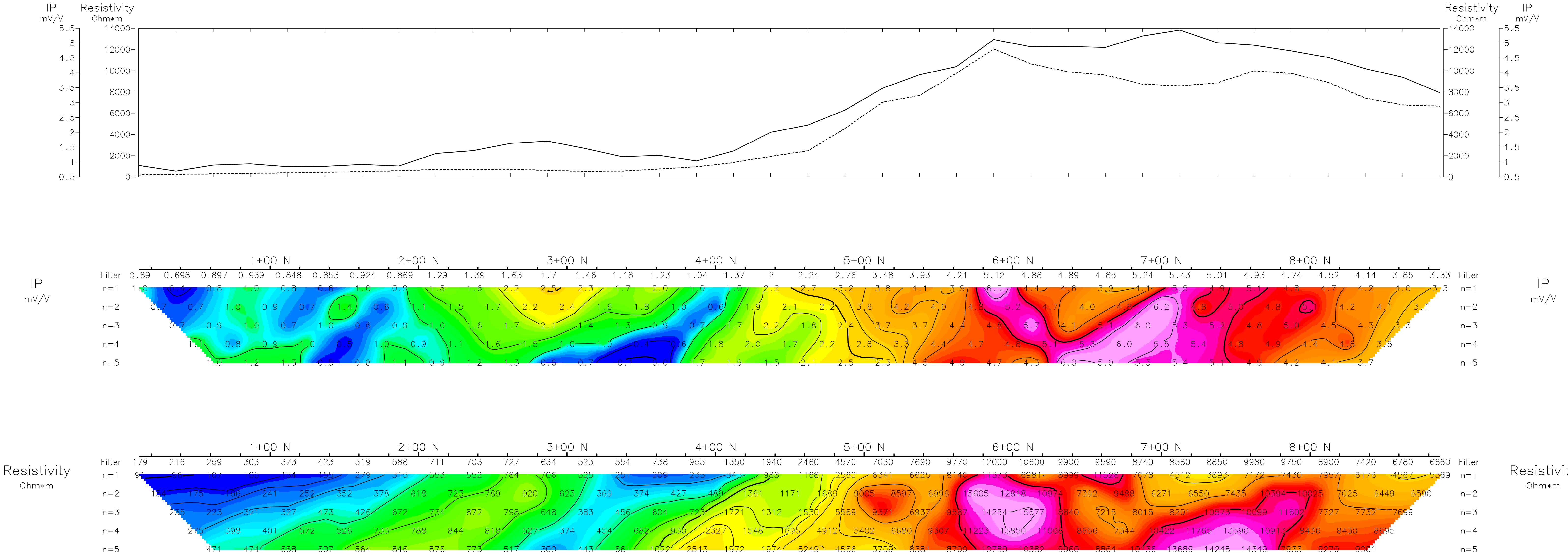
REPROCESSED FROM 2010 DATA

Macklem Township
Porcupine Mining Division

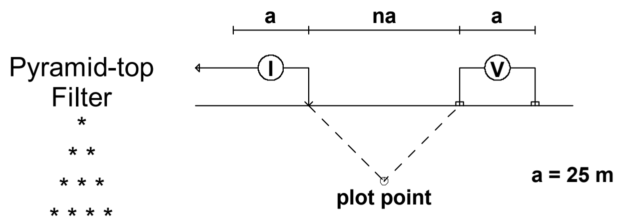
SURVEYED BY: R J MEIKLE AND ASSOCIATES

Pseudo Section Plot

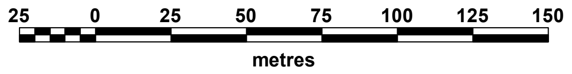
9+00 W



Pole-Dipole Array



Scale 1:2500



KRAKEN GOLD CORPORATION

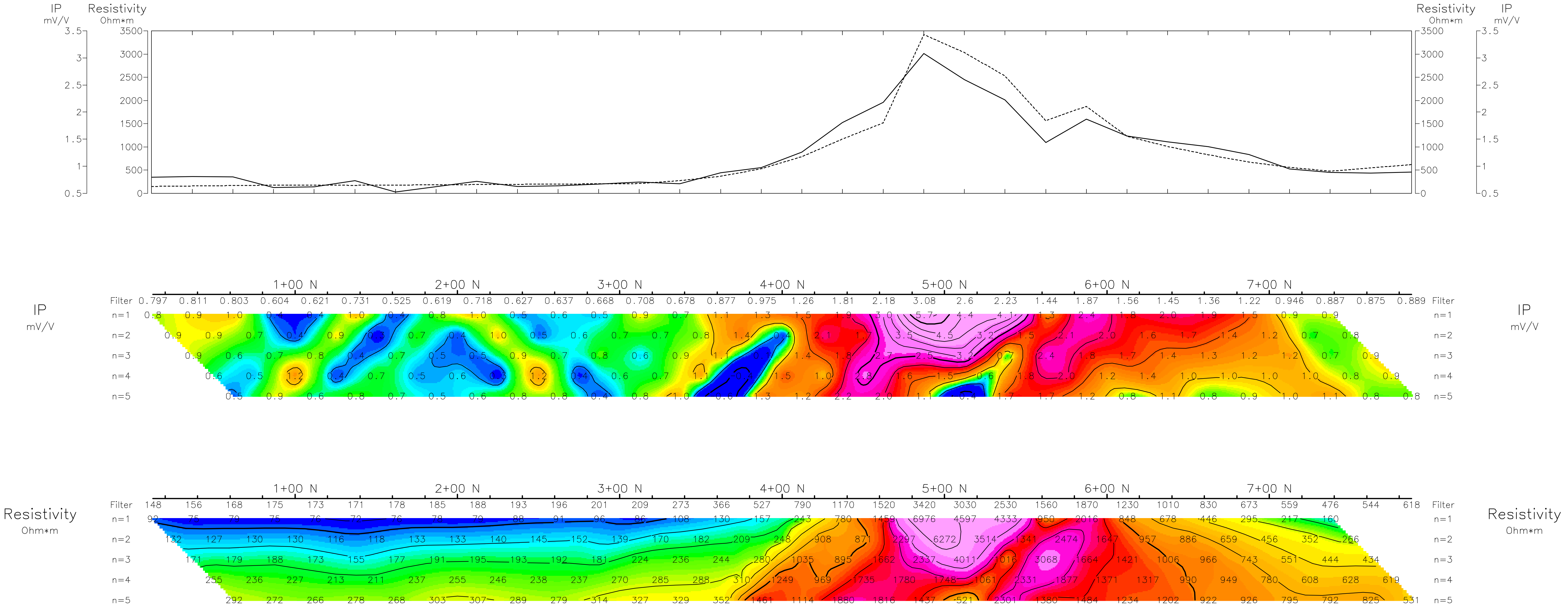
INDUCED POLARIZATION SURVEY

MACKLEM-THOMAS PROJECT

REPROCESSED FROM 2010 DATA

Macklem Township
Porcupine Mining Division

SURVEYED BY: R J MEIKLE AND ASSOCIATES



Pseudo Section Plot
11+00 W

Pole-Dipole Array

Pyramid-top Filter

a na a

plot point

a = 25 m

Scale 1:2500

metres

KRAKEN GOLD CORPORATION

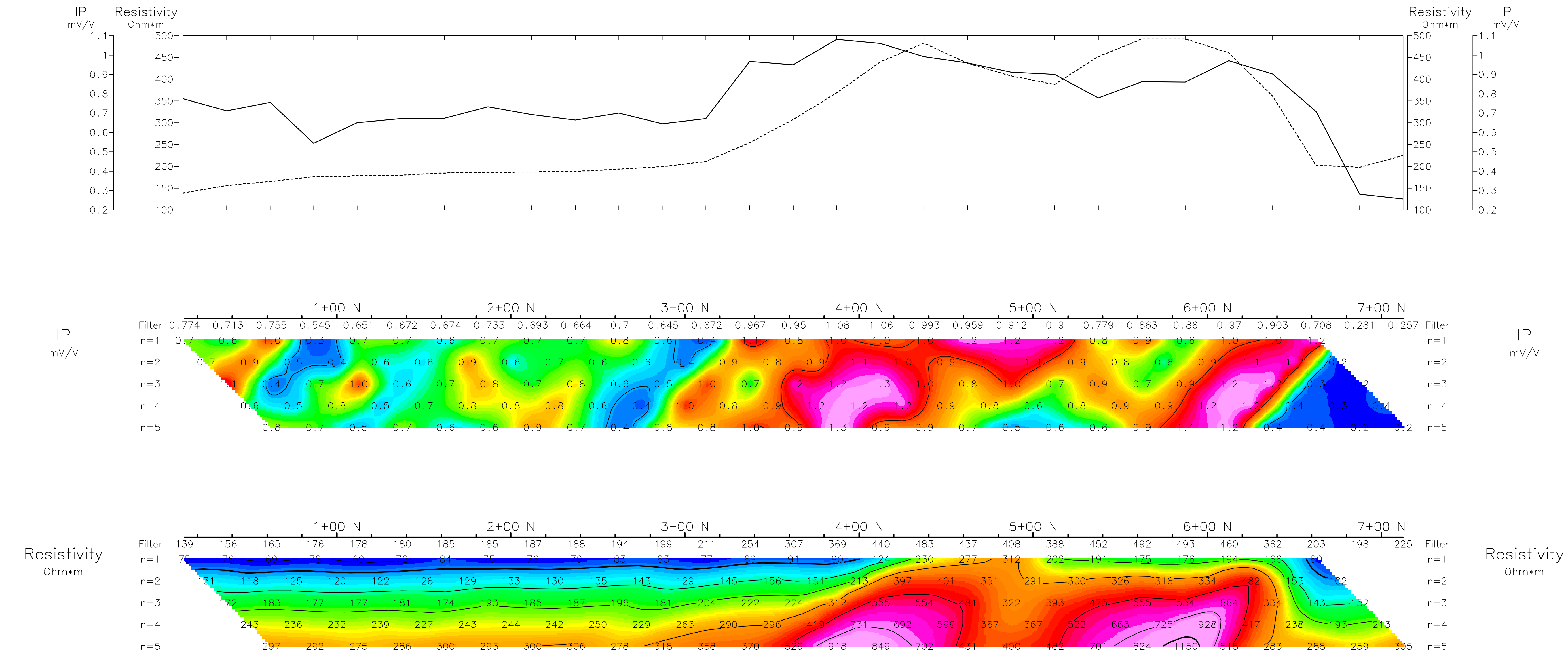
INDUCED POLARIZATION SURVEY

MACKLEM-THOMAS PROJECT

REPROCESSED FROM 2010 DATA

Macklem Township
Porcupine Mining Division

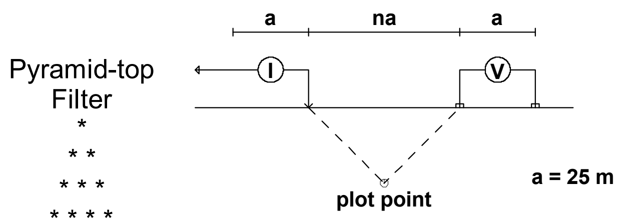
SURVEYED BY: R J MEIKLE AND ASSOCIATES



Pseudo Section Plot

12+00 W

Pole-Dipole Array



Scale 1:2500

25 0 25 50 75 100 125 150

metres

KRAKEN GOLD CORPORATION

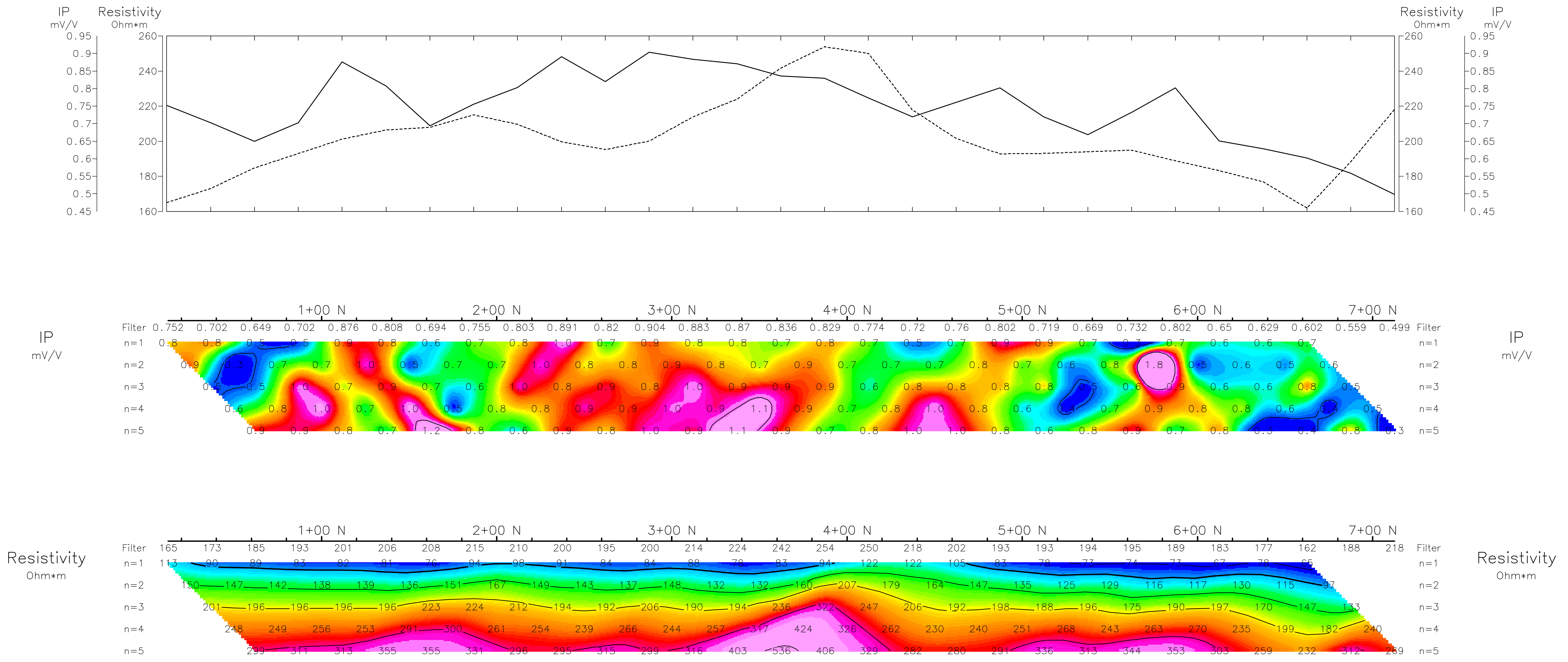
INDUCED POLARIZATION SURVEY

MACKLEM-THOMAS PROJECT

REPROCESSED FROM 2010 DATA

Macklem Township
Porcupine Mining Division

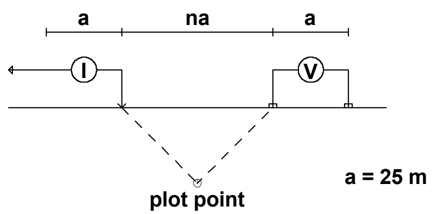
SURVEYED BY: R J MEIKLE AND ASSOCIATES



Pseudo Section Plot

13+00 W

Pole-Dipole Array



Pyramid-top Filter

*

* *

* * *

* * * *

Scale 1:2500

25 0 25 50 75 100 125 150

metres

KRAKEN GOLD CORPORATION

INDUCED POLARIZATION SURVEY

MACKLEM-THOMAS PROJECT

REPROCESSED FROM 2010 DATA

Macklem Township
Porcupine Mining Division

SURVEYED BY: R J MEIKLE AND ASSOCIATES

Appendix 3

Filtered Resistivity Contours with I.P. Anomalies Plan Map (1:5000)

KRAKEN GOLD CORPORATION
MACKLEM-THOMAS PROJECT
FILTERED RESISTIVITY - CONTOURS
REPROCESSED 2010 DATA
MACKLEM & THOMAS TOWNSHIPS - PORCUPINE MINING DIVISION
CLAIMS: POSTED ON MAP
CONTOUR INTERVAL = 100, 500 OHM-M
INSTRUMENT: IRIS ELREC TD IP RECEIVER
SURVEYED BY: YVAN VERRONEAU
Filtered Resistivity
ohm-m
Interpreted Magnetic Lineament/Fault Location
Interpreted IP Anomaly Location/Trend
Intrepreted Magnetic Anomaly Location
Interpreted VLF-EM Conductor Location
Scale 1:5000
metres
NAD83 / UTM zone 17N
BL0
327005
231714
243925
279749
164989
183927
298378
158374
223754
298379
183928
279750
298380
119048
IP1
IP2
IP3
IP4
IP5
IP6
IP7
IP8
V1
V2
V3
V4
V5
V6
V7
V8
V9
M1
M2
508200E
508400E
508600E
508800E
509000E
509200E
509400E
509600E
509800E
510000E
510200E
510400E
510600E
510800E
511000E
511200E
5367600N
5367400N
5367200N
5367000N
5366800N
5366600N
5366400N
5366200N
5366000N
5365800N

Appendix 4

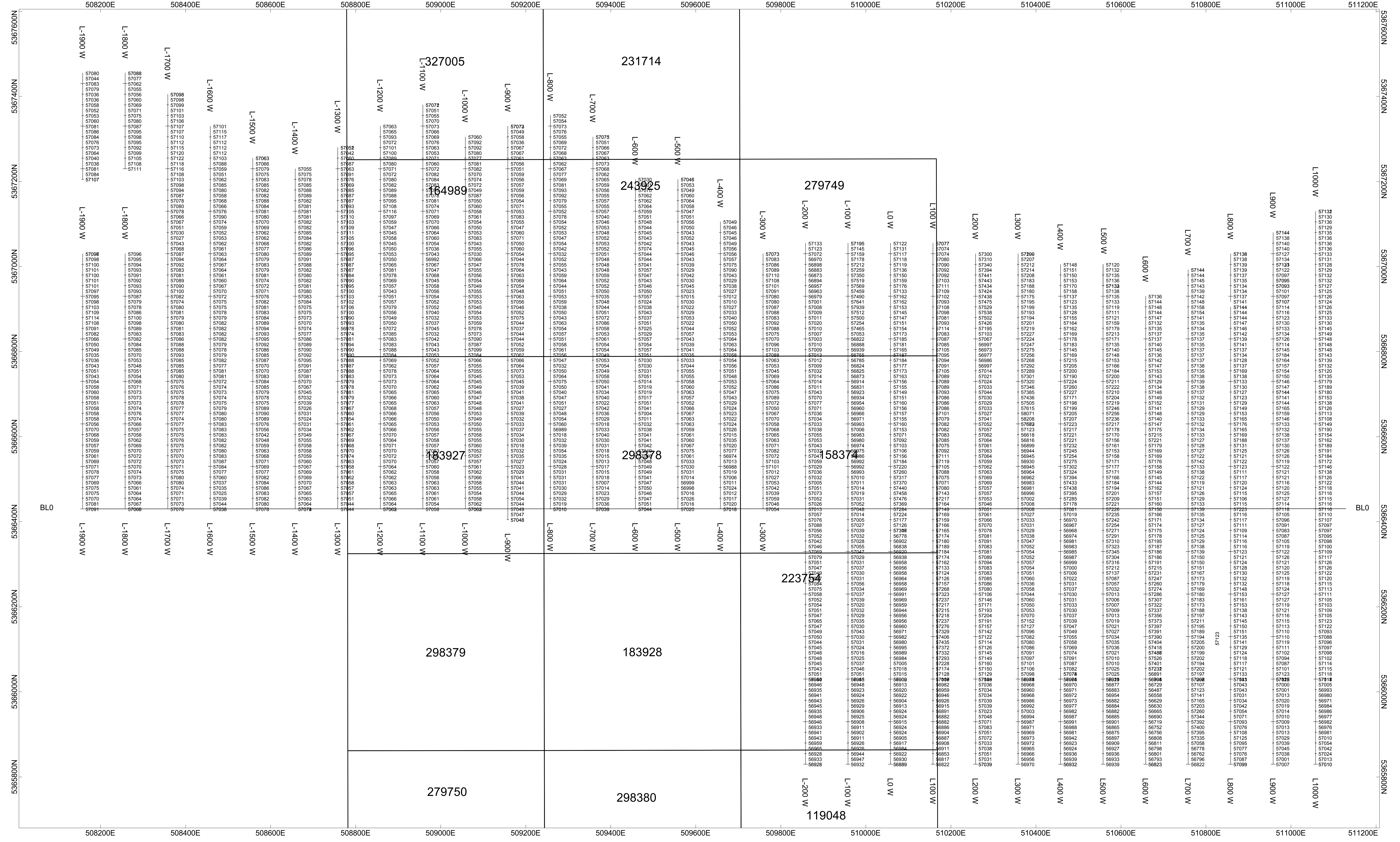
Total Field Magnetic Survey-Contours & Posted Data (1:5000)

KRAKEN GOLD CORPORATION

MACKLEM-THOMAS PROJECT
TOTAL FIELD MAGNETIC SURVEY - CONTOURS
REPROCESSED 2010 DATA

MACKLEM & THOMAS TOWNSHIPS - PORCUPINE MINING DIVISION
CLAIMS: POSTED ON MAP
CONTOUR INTERVAL - 10, 50 nT
INSTRUMENT: GEM GSM-19 MAGNETOMETER/VLF

SURVEYED BY: YVAN VERRONEAU



KRAKEN GOLD CORPORATION

MACKLEM-THOMAS PROJECT
TOTAL FIELD MAGNETIC SURVEY - POSTED DATA
REPROCESSED 2010 DATA

MACKLEM & THOMAS TOWNSHIPS - PORCUPINE MINING DIVISION
CLAIMS: POSTED ON MAP
MAGNETIC FIELD REFERENCE = 57,000 nT
INSTRUMENT: GEM GSM-19 MAGNETOMETER/VLF

SURVEYED BY: YVAN VERRONEAU

Appendix 5

VLF-EM Profiles and Interpreted Conductors (1:5000)

KRAKEN GOLD CORPORATION

MACKLEM-THOMAS PROJECT
VLF-EM PROFILES - 24.0 kHz.
REPROCESSED 2010 DATA

MACKLEM & THOMAS TOWNSHIPS - PORCUPINE MINING DIVISION
CLAIMS: POSTED ON MAP
NEAGTIVE PROFILE DIRECTION TO WEST
INSTRUMENT: GEM SYSTEMS GSM-19 MAG/VLF

SURVEYED BY: YVAN VERRONEAU