'81-#37-#8867

REPORT ON

GEOPHYSICAL SURVEYS

CARMI MINERAL CLAIMS

BEAVERDELL

BRITISH COLUMBIA

GREENWOOD.

49°29'N 119°08'W.

82E/6E

f o r

KELVIN ENERGY LIMITED

Calgary, Alberta
November, 1980

Frank Dalidowicz, P.Eng.

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2. Apparent Resistivity-Fraser Filtered Contour Plan Map
3. VLF Profile Map
4. Magnetic Contour Map

C-I Compilation Map for the four surveys

1. SUMMARY

A programme of linecutting and geophysical surveying consisting of Induced Polarization-resistivity, VLF electromagnetic and magnetic surveys was completed on behalf of Kelvin Energy Ltd. over a portion of their Carmi Mineral Claims in the Beaverdell area of southern British Columbia. The surveys were carried out in order to map the subsurface distribution of sulphides that are known to be present within three old gold workings present on the property namely, the Butcher Boy Shaft, the Carmi Shaft and the River Adit.

There are no anomalous volumes of sulphide mineralization in the vicinity of the Butcher Boy and Carmi shafts, considering the IP results.

A major Induced Polarization-resistivity anomaly which has a continuous strike length of over 800 meters was outlined over the River Adit. The resistivity 'low' suggests that the IP anomaly may be due to a core of stringer-like to massive sulphide mineralization surrounded by a halo of disseminated sulphides.

Two other anomalous but only partially defined IP zones were mapped. One of these may relate to sulphide mineralization while the other is interpreted to reflect a local

rock type having a higher polarizable background.

There are two dominant VLF conductor trends. A northwest-southeast trend dominates the eastern sector of the survey area and is subparallel to IP trends. A northeast-southwest trend is predominant within the western sector.

The majority of the VLF conductors are relatively weak and are interpreted to be due to shearing or faulting. Two of the conductors are related to cultural features. One good quality bedrock VLF conductor correlates directly with the River Adit IP-resistivity anomaly.

The magnetic pattern is complex. There are three sets of magnetic trends present, two of which subparallel the VLF trends. The third magnetic feature trends north-south. One magnetically-interpreted structural break subparallels the western portion of the River Adit anomaly.

Three diamond drill holes totalling 290m are recommended in an initial evaluation of the River Adit geophysical anomaly. If there is encouragement from the drill programme, further ground geophysics is also recommended.

2. INTRODUCTION

During the period from September 3rd to October 14th, 1980, M P H Consulting Limited completed a programme of linecutting and Induced Polarization-resistivity surveying over a portion of Kelvin's Carmi Mineral Claims in the Beaverdell Area of southern British Columbia.

A VLF electromagnetic and a total field magnetic survey were also completed over the same grid by personnel of Kelvin Energy Ltd.

The purpose of these surveys was to outline the subsurface distribution of sulphide mineralization that is known to be present within the Butcher Boy, Carmi and the River Adit gold workings.

The field programme was carried out under the direction of F. Dalidowicz, P.Eng. of M P H Consulting Limited. Overall supervision was provided by L. Bell, Senior Project Geologist, Kelvin Energy Ltd.

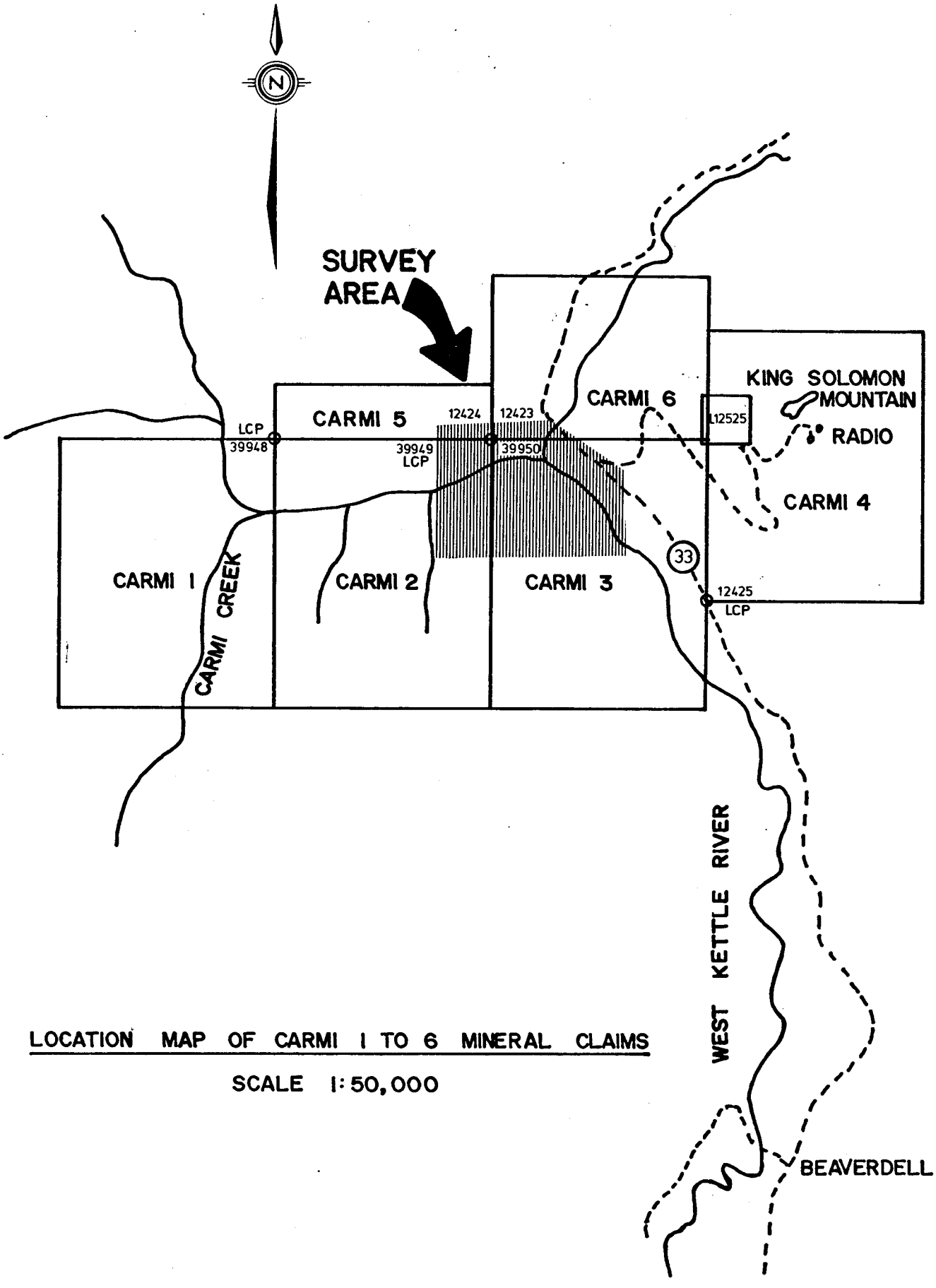
This report outlines the results of the geophysical surveys and presents an interpretation of the data. Recommendations are made for a three hole diamond drill programme and for further ground geophysical investigations.

3. LOCATION AND ACCESS

The survey area is approximately 5.5 kilometers north of the town of Beaverdell in southern British Columbia (Figure 1).

Easiest access to the area is by road. Highway 33 crosses the Carmi #3 and #6 claims. This highway links the city of Kelowna to the town of Beaverdell and continues southward towards the American border.

FIGURE 1



LOCATION MAP OF CARMI 1 TO 6 MINERAL CLAIMS

SCALE 1:50,000

4. PERSONNEL

The following is a list of individuals with M P H Consulting Limited who were directly involved with the geophysical programme:

Geophysicist	F. Dalidowicz, M.Sc.(A), P.Eng. Calgary, Alberta
Party Chief	D. Morrison Toronto, Ontario
Geophysical Helper-Linecutter	W. Keeshig
Geophysical Helper-Linecutter	M. Nadjiwan
Geophysical Helper	P. O'Donnell

L. Bell, B.Sc. of Kelvin Energy Ltd. was present during the programme and assisted in the field geophysical surveying. A. Bell acted as cook.

M. Archambault, B.Sc. of Kelvin Energy Ltd. carried out the magnetic survey.

5. GEOPHYSICAL GRID

The survey grid was designed to cover three old gold workings, the Butcher Boy, Carmi and the River Adit. These three showings occur along a linear trend. A baseline was established at an azimuth of 100° in order to subparallel this trend. The 0+00 position on the baseline is located over the Butcher Boy workings. A total of 34.8 kilometers of crosslines was cut and chained with the crosslines established at 75 meter intervals. Survey stations were picketed at 25 meter intervals. One tie-line was cut at 9+50S.

6. INSTRUMENTATION

6.1 Induced Polarization Equipment

A McPhar P660 variable frequency Induced Polarization system was employed for the IP survey.

The transmitter is powered by a motor generator rated at 2.5 kw and can transmit alternating currents ranging in frequencies from 0.125 Hz to 5 Hz. Frequency pairs can be selected by the operator to minimize inductive coupling effects which are a function of local ground resistivities and of the type of electrode array used.

The receiver is a solid state unit that has a built-in 2 mega-ohm impedence and has a detectable voltage range between 100 microvolts and 10 volts.

The specifications for the Induced Polarization unit are given in Appendix I.

6.2 VLF Electromagnetic Unit

A Geonics ME-16 VLF Electromagnetic Unit was used for the VLF surveying. Technical specifications for this instrument are presented in Appendix II.

This receiver employs fixed military transmitter stations used for submarine communications as the source of the primary signal. The frequencies generated by these stations vary from 15 kHz to 23 kHz.

The presence of a subsurface conductor is indicated by a distortion of the transmitted plane wave due to secondary EM fields generated by the conductor. The conductor axis is indicated by a characteristic 'cross-over' or inflection in the dip angle measurement recorded by the VLF receiver.

6.3 Magnetometer

A proton precession Geometrics G-816 magnetometer was used for the magnetic survey. This system utilizes the precession of spinning protons within a hydrocarbon fluid. These spinning magnetic dipoles are polarized by applying a magnetic field created by a current within a coil of wire inside the instrument. When the current is discontinued, the protons precess about the earth's magnetic field. The absolute value of the earth's total field can then be read directly in gammas.

The specifications for the G-816 total field magnetometer are presented in Appendix III.

7. SURVEY PROCEDURES AND DATA REDUCTION

7.1 Induced Polarization-Resistivity Survey

A 'dipole-dipole' electrode array was employed for the Induced Polarization-resistivity. As shown in Figure 2, both the potential (P1-P2) and current (C1-C2) electrode dipoles are at a fixed 'a' separation. In this case the separation distance is 50 meters. For different depths of penetration, the dipoles are moved apart from each other at 'na' increments (n = 1 to 5). One line of 'detail' surveying was completed on line 6+00E with an 'a' separation of 25 meters.

Both the potential and current electrode dipoles move in unison along the survey line. The readings are taken at 50 meter station intervals.

For every 'na' (current electrode to potential electrode separation), a voltage difference is measured between the two potential electrodes. One is measured at the low transmitter frequency (F_ℓ) and the other at the high transmitter frequency (F_h). For this survey F_ℓ was 0.3 Hz and F_h was 5.0 Hz.

The 'apparent' resistivity in ohm-meters for the 'dipole-dipole' array is given by the formula -

$$\rho a = n(n+1)(n+2)a\Delta \frac{V}{I}$$

where ΔV is the potential difference between the(P1-P2) electrodes and I is the transmitted current at the C1-C2 electrodes.

For a constant transmitting current, the voltage between the potential electrodes and hence the 'apparent' resistivity increases as the frequency decreases.

DIPOLE DIPOLE ARRAY

Apparent Resistivity $\rho_a = \frac{V}{I} \cdot G$
where G is a geometric factor dependant on survey array.
For Dipole—Dipole array
$G = n(n+1)(n+2)\pi a$

TRANSMITTED WAVE FORMS

F_l = low frequency
F_h = high frequency

$$F_l = \frac{V_{F_l}}{I} \cdot G$$

$$F_h = \frac{V_{F_h}}{I} \cdot G$$

$$PFE = 100(\rho F_l - \rho F_h) / \rho F_h$$

$$MF = PFE / \rho F_l$$

FIGURE 2

8. PRESENTATION OF RESULTS

8.1 Induced Polarization-Apparent Resistivity Survey

The Induced Polarization and apparent resistivity data are presented both as contoured pseudo-sections and contoured plan maps at scales of 1:2500 and 1:2000 respectively.

Figure 3 shows the plotting position for the IP and resistivity data. The plotting point is midway between the two electrode dipoles, and the section is thus a depth sounding which outlines the IP and the 'apparent' resistivity responses at different intervals of penetration. As the current penetration is dependent upon the resistivities in the ground and the resistivity contrasts between the overburden and bedrock, the depth of penetration is not a linear function of the electrode separation, but is heavily influenced by these inherent 'local' resistivities. Thus the section is not a true vertical representation of the subsurface.

The presence of significant IP anomalies outlined by the pseudosection is designated by solid anomaly bars. The width of these bars gives a crude estimate of the width of the polarizable zone. The dashed bars are representative of weaker or probable IP responses (see drawings 1 - 28).

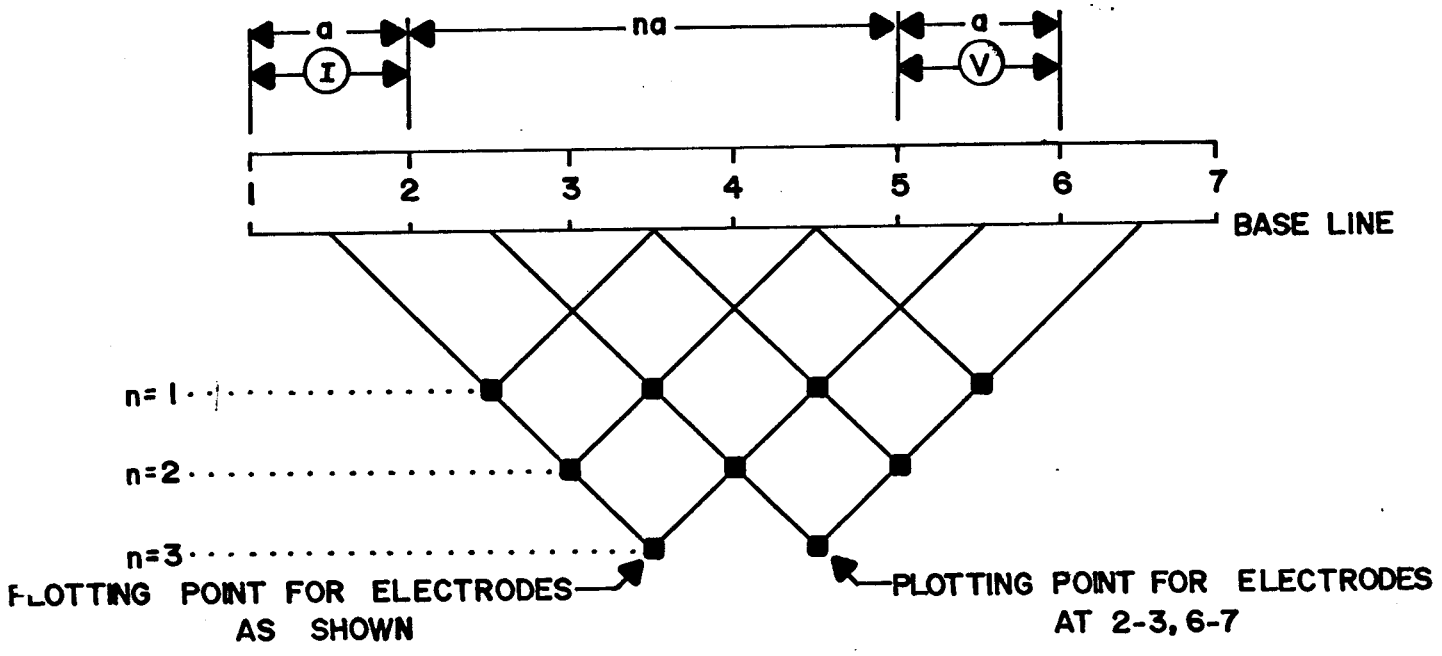
If the polarizable body is shallow relative to the electrode separation used, the IP response from this source will''double peak'' at the larger 'na' separations. Any data contoured at these larger separations would show two IP highs with the polarizable body centred between the two peaks. To clarify the data presentation, readings at the various 'na' spacing for each station were filtered for both IP and resistivity values using a simple averaging method developed by D. C. Fraser (Northern Miner, June 19, 1980). This method yields a single value for each station from all levels of the pseudo-section. The most anomalous values overlie the polarizable body. Figure 4 describes the filtering technique.

On Maps 1 and 2, the IP data is contoured at intervals of 1 PFE and the apparent resistivity data is contoured at intervals of 200 ohm-meters.

The pseudo-sections are contoured in logarithmic increments.

8.2 VLF Electromagnetic Survey

Both the dip angle and the quadrature are plotted in profile form at a vertical scale of 1 cm to 20 percent. Location of conductor axes and conductor width are shown for each interpreted conductor.



DIPOLE DIPOLE ARRAY

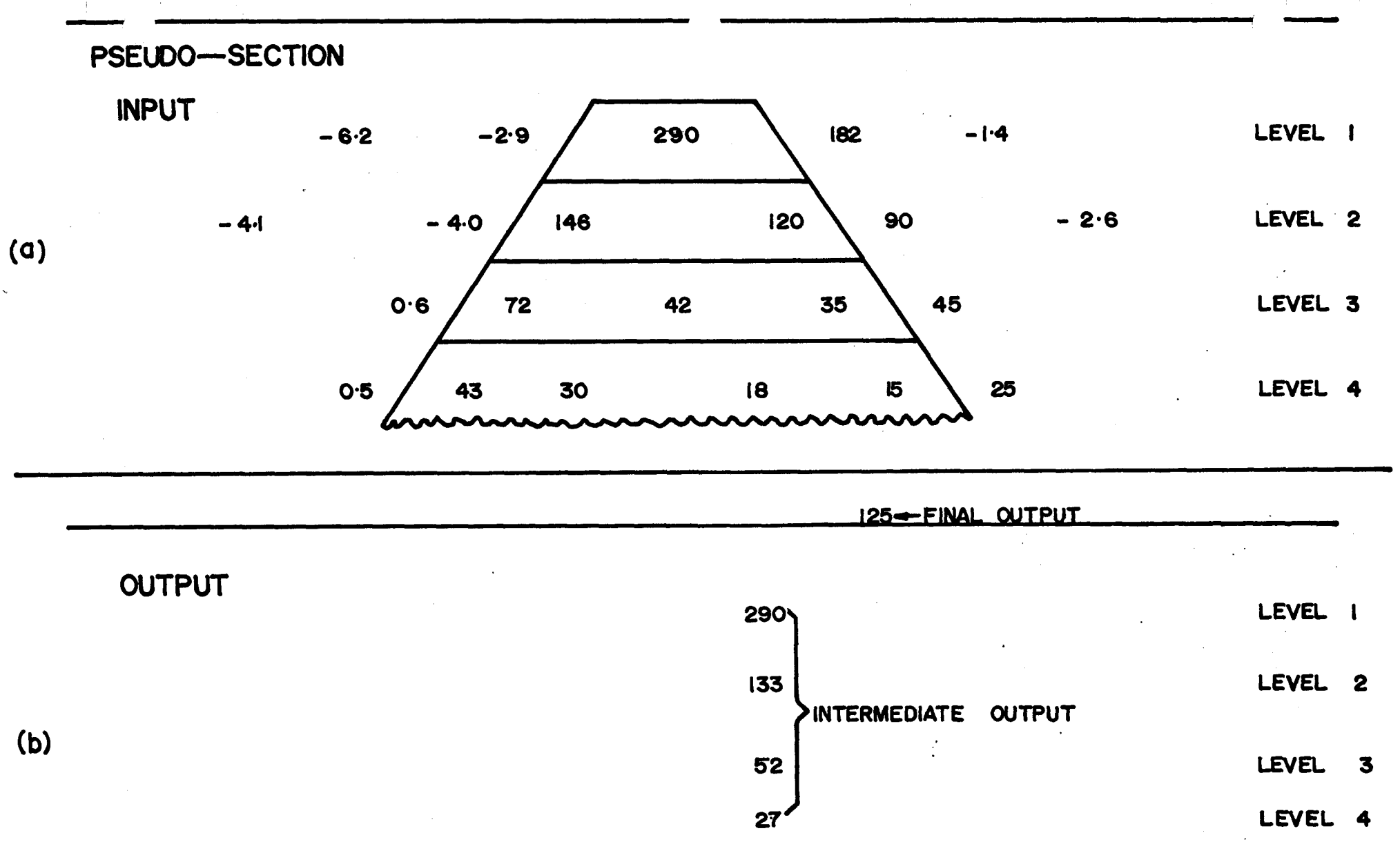


Fig. 4. (a) The sliding window operator is shown superimposed on the pseudo—section input. (b) The intermediate outputs are the average values for each level, and the final output is the average value of the intermediate outputs. The window then is moved one station and the operation is repeated.

FIGURE 4

The VLF data is presented at a horizontal scale of 1:2000.

8.3 Magnetic Survey

The magnetic data are presented at a horizontal scale of 1:2000.

The magnetic data are presented as isomagnetic contours superimposed upon a plot of the corrected magnetic values at each station. A value of 50,000 gammas has been subtracted from each reading in order to facilitate data presentation. The contour interval is 25 gammas except in areas of steep gradient where a 100 gamma interval has been employed.

9. INTERPRETATION OF RESULTS

9.1 Induced Polarization-Resistivity Survey

No significant volume of polarizable material was outlined in the vicinity of the Butcher Boy and Carmi showings indicating that there are no substantial sulphide concentrations present.

The baseline covering the two showings was also surveyed (Drawing 1) but no positive response was observed.

There is also no discernible resistivity contrast associated with these two showings.

There is a major IP anomalous zone which correlates directly with a resistivity 'low' in the vicinity of the River Adit.

Maps 1 and 2 indicate that the River Adit anomaly is an arcuate, northwest-southeast trending zone. It is adjacent to a discrete zone of 1000-3000 ohm-meter material that probably reflects a specific rock type, possibly an intrusive.

The anomalous trend is continuous between lines 2+25E to 11+25E. Beyond these two limits, the zone appears to terminate as suggested by the rapid closing of both the PFE and resistivity contours along strike.

The IP response increases in amplitude eastward away from the River Adit with the highest response located between lines 6+00E to 8+25E. Map 2 shows that the lowest, i.e. most anomalous, resistivity values were also found between lines 6+00E to 8+25E in direct correlation with the increased IP response.

West of Line 8+25E, the polarizable body is interpreted to be less than 25 meters in width. Eastward, anomaly width appears to increase and is interpreted to be up to 50 meters.

East of line 9+75E the PFE contours tend to indicate a possible narrowing of the main polarizable zone. Alternatively, a second, possibly multiple, zone located at approximately 4+00S between 10+50E and 12+00E may be present.

The form of the River Adit IP anomaly is consistent with that of a stringer-like to massive polarizable source with a surrounding halo of disseminated material.

The observed presence of sulphides in the River Adit

suggests that sulphides are the polarizable causative source of the IP anomaly and its previously unknown eastern extension as mapped by the IP-resistivity survey.

The dip of the body is interpreted to be between 60° and 90° to the south.

Depth to top is interpreted to be in the order of 25 meters between lines 4+50E to 6+75E and 35 to 50 meters between lines 7+50E and 8+25E. East of line 8+25E, depth to top is difficult to determine as the zone widens and is oriented oblique to the survey lines.

This anomalous zone appears to be continuous to depth. The higher IP values are representative of at least 3 percent polarizable material by volume over a 50 meter width.

There are two other partially defined IP anomalies within the survey area. One zone occurs at the northern extremity of line 1+50W as outlined by the 5 PFE contour. This IP anomaly may reflect a local change in rock type rather than a discrete sulphide source. There is no associated resistivity contrast. The zone abuts onto the 1000-3000 ohm-meter central resistivity zone described previously.

The third anomalous zone is partially defined by the 3 PFE contour in the southwestern extremity of the survey area between lines 6+00W and 6+75W. Inspection of drawing Nos. 27 and 28 show that this zone widens dramatically between the two lines. A change in bedrock lithologies with one having a higher polarizable background is suspected as the cause of these higher PFE readings.

There are three major resistivity zones mapped within the survey area. The most predominant zone is the central core of 1000-3000 ohm-meter material. The compilation map C-1 shows the approximate outline of this zone at the 1000+ ohm-meter contour. Both the River Adit IP zone and the northwestern (5 PFE Contour Level) zone are peripheral to this resistive zone.

The second major anomaly is a large area of low resistivity (200-400 ohm-meters) which borders the central resistivity high at line 0+00E along a north-south trend. This resistivity low extends to the western extent of the survey area.

Gradients between the two resistivity zones suggest the possibility of a north-south structural break in the vicinity of crossline 0+00. The resistivity contrast across this postulated break indicates the presence of two different rock units.

The third resistivity zone hosts the River Adit IP trend. The IP zone as mentioned correlates directly with a distinct resistivity 'low' (less than 400 ohm-meters).

9.2 VLF Electromagnetic Survey

Inspection of VLF profiles (Map #3) shows two prominent sets of conductor trends. An eastern set strikes in an overall northwest-southeast direction and is subparallel to the River Adit IP trend. The second set in the western sector of the survey area, strikes northeast-southwest.

The majority of these VLF conductors are of poor quality and are interpreted to relate to shear or fault zones. There appears to be a fundamental change in structure between the east and west sectors of the grid. The 'VLF Trend Line' on the compilation map (Map C-1) divides the area into two interpreted structural domains.

Two of the VLF conductors appear to be related to cultural features; one VLF trend follows an abandoned railway line in the eastern sector of the area while the second VLF trend follows Highway 33. Readings taken in the vicinity of the highway were extremely noisy due to the presence of a power line paralleling the highway.

One good quality VLF bedrock conductor was mapped (Map 3).

The 'good quality characteristic' is indicated by the reverse quadrature profile in the vicinity of the dip angle 'cross-over'. For the remaining poorer conductors, the quadrature is a direct image of the dip angle profile.

There is a direct correlation of this conductor with the IP-resistivity anomaly between lines 4+50E, 8+25E and in the vicinity of the River Adit. Eastward beyond line 8+25E, this VLF anomaly is less well defined and appears to be of poorer quality.

Between lines 11+25E and 12+00E, there is a broad conductive zone mapped between stations 4+00S and 5+00S. The broadness is interpreted to represent the presence of two conductive zones. This area is located within the centre of an anomalous IP zone.

9.3 Magnetic Survey

The magnetic contours (Map 4) indicate that the survey area is within a complex magnetic environment. There are no well defined magnetic signatures which could relate to specific structural trends or individual rock units. There are no magnetic responses directly attributed to the Butcher Boy, Carmi or River Adit gold workings.

There are relatively gentle magnetic gradients within the western and northeastern portions of the survey

area. These areas are therefore probably underlain by rocks having a lower bulk magnetic susceptibility than the remainder of the grid.

Compilation map C-1 shows the outline of 3 weak trends on the property interpreted from the magnetic pattern.

The northwest-southeast and northeast-southwest trends follow a pattern similar to the VLF trends. A north-south set of weak magnetic trends does not correlate with any of the remaining geophysical responses.

A magnetically-interpreted structural break crosses the River Adit IP anomaly between lines 9+00E and 9+75E. A structural break that subparallels the western portion of this anomaly is also interpreted.

10. CONCLUSIONS

The Induced Polarization-resistivity survey has successfully mapped a potential extension of the River Adit sulphide zone. The anomaly extends for a minimum of 800 meters along strike. The IP anomaly has a coincident resistivity 'low' which is interpreted to reflect a zone of stringer to massive sulphides as the causative IP source.

There are no IP, resistivity or VLF electromagnetic responses over the Butcher Boy and Carmi showings, indicating the absence of substantial amounts of any conductive/polarizable material.

VLF electromagnetic conductors mainly reflect structural trends. The western portion of the survey area is dominated by northeast-striking conductors. Within the eastern section, conductors are oriented predominantly in a northwest-southeast direction. The latter set sub-parallels IP trends. A strong VLF conductor correlates with the River Adit IP anomaly.

The magnetic pattern is complex. There are three sets of shear or fracture sets interpreted. Two of these subparallel VLF trends. The third appears to trend north-south.

11. RECOMMENDATIONS

The Induced Polarization-resistivity anomaly associated with the River Adit should be evaluated by a programme of diamond drilling involving 290m in three holes. The holes are oriented such as to intersect the anomalous zone at right angles to its trend and are summarized as follows:

Hole No.	Collar	Azimuth	Dip	Length(m)
1	4+50E,0+27N	010°	-45°	75
2	6+40E,0+38S	045°	-45°	65
3	7+80E,1+90S	051°	-45°	150

The centres of the IP anomalous zones should be intersected at core lengths of 50m, 50m and 85m in holes 1, 2 and 3 respectively.

Further drilling should be contingent on the results of the above.

If the initial drilling is encouraging, further ground geophysics is recommended. The eastern portion of the River Adit IP zone should be re-surveyed with IP coverage extended to the southeast on a new grid.

A second detail survey grid should be established in the

north-central portion of the grid in the vicinity of the legal corner post for Mineral Claim Nos. 2, 3, 5 and 6 and surveyed with IP, magnetics and VLF. This area is near two converging structural and VLF trends and covers a portion of the River Adit IP zone and a second IP zone previously described. This area is of interest as structure may be of importance in controlling sulphide distribution.

Respectfully submitted,

FD:g

F. Dalidowicz, P.Eng.

Calgary, Alberta
November, 1980

CERTIFICATE

I, F. Dalidowicz of Calgary, Alberta certify that

1) I hold a Bachelor of Applied Science degree from Queen's University in Kingston, Ontario and a Master of Science (Applied) degree in Mineral Exploration from McGill University in Montreal, Quebec.

2) I am a Member of the Association of Professional Engineers of the Province of Ontario and have practised my profession continuously since graduation.

3) I have based my conclusions and recommendations contained in this report on my experience and knowledge of interpretation and application of geophysical methods and on my previous experience in similar geological environments.

4) I hold no interest, directly or indirectly in this property, other than professional fees, nor do I expect to receive any interest in the property or in Kelvin Energy Limited.

REGISTERED PROFESSIONAL ENGINEER
F. DALIDOWICZ
PROVINCE OF ONTARIO

F. Dalidowicz

Calgary, Alberta
November, 1980

Frank Dalidowicz, P.Eng.

STATEMENT OF EXPENDITURES

1) Linecutting Personnel Expenses

	Dates	Rate	Amount
W. Keeshig	Sept. 2-18	$115	1,955
M. Nadjiwan	Sept. 2-18	115	1,955
L. Bell	Sept. 2-24	125	2,875
C. Niles	Sept. 2-8	100	700
M. Archambault	Sept. 9-24	100	1,600
			9,085

2) Geophysical Survey Personnel Expenses

W. Keeshig	Sept. 19-Oct. 14	125	3,250
M. Nadjiwan	Sept. 19-Oct. 14	125	3,250
P. O'Donnell	Sept. 19-Oct. 14	125	3,250
D. Morrison	Sept. 19-Oct. 15(½day)	200	5,300
F. Dalidowitcz	Oct. 23-26	250	1,000
M. Archambault	Sept. 19-Oct. 14	100	2,600
L. Bell	Sept. 19-Oct. 14	125	3,250
			21,900

3)	Food and Accommodation 239 mandays @ $25/day	5,975
4)	Truck rental (2 trucks)	1,833
5)	Mob-demob I.P. crew	1,000
6)	Mob-demob linecutters	1,635
7)	Geophysical instrument rental	3,361
8)	Drafting and reproduction charges	2,870
9)	Professional fees for F. Dalidowitcz	3,750
10)	10% administration charge	329
		$51,738

APPENDIX I

Induced Polarization Equipment Specifications

McPHAR

P660 Variable Frequency Induced Polarization Equipment

A 5-frequency system designed for general purpose use

Operates on 0.125, 0.3125, 1.25 2.5 and 5 Hz

2.5 KVA solid-state transmitter

pair electrode selector switch

Telluric filtering on receiver

"High - Low" frequency selection switch to reduce reading errors

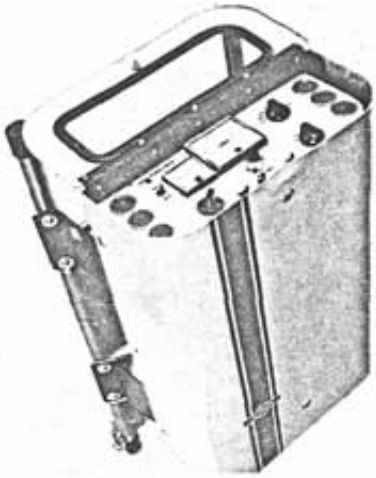
Model P660 is a multi-frequency induced polarization equipment system combining high power with the ability to make precise measurements. Its rugged mechanical and electrical design plus a choice of frequencies makes it an ideal instrument for a wide variety of geological conditions and climates.

Flexibility to meet the widest range of operating conditions without sacrificing surveying efficiency has been designed into the P660. The frequency range from 0.125 to 5 Hz enables frequency pairs to be selected to reduce the effect of inductive coupling due to large spreads or low ground resistivity. Frequency selection is made by an internal switch adjustment on the transmitter and an external adjustment on the receiver. To eliminate frequency selection error both the transmitter and receiver have a two-position switch to operate on the "high" or "low" frequency.

To obtain maximum power transfer a 10-position switch enables the operator to match the 2.5 KVA transmitter output to the electrode load. This feature is of particular importance in low resistivity ground where power loss could significantly affect results.

The receiver has a continuously variable damping time constant, which allows the operator to adjust the instrument to the optimum degree of damping for the noise level encountered. Rather than taking readings for a pre-set time, variable damping permits minimum reading time to be achieved without reducing the accuracy of the measurement.

Transmitter and generator are packboard mounted



Transmitter:
Completely solid state resulting in increased reliability and a weight reduction to under 35 pounds. A built-in electrode wire selector (up to 7 pairs) and its improved panel layout to reduce operator switching errors, make its operation easier. The transmitter is adaptable to a coherent filter system or to other I.P. modes where custom designs require this.

Receiver:
The miniaturized receiver weighs 4½ pounds and latest "state of the art" integrated circuits have been effectively employed. Other features include; special telluric filtering, continuously variable time constant to optimize reading time in high noise areas, and built-in calibration resistor. Its battery drain is low. Regular transistor radio batteries can be used to operate it. The input is fused to help prevent lightning damage.

Specifications

Frequencies: 0.125, 0.3125, 1.25, 2.5 and 5 Hz

Receiver:

Input Impedance: 2 megohms.
Voltage ranges: full scale 100 micro volt to 10 volts in five range positions. 10 micro volt full scale with reduced accuracy.
Frequency effect indicator: −10 to +20%.
Frequency effect repeatability: to 0.1%.
Temperature and time drift: negligible.
Filter characteristics: 20 db per octave below 0.1 Hz and 13 db per octave above each operating frequency.
Power line rejection (50 amd to 60 Hz): 70 db.
Battery Supply: 6 transistor type 9V batteries (drain 7.5 ma. at 15 to 30 volt).
Weight: 4½ pounds, less carrying case.

Transmitter:

Operating Voltage Range: 30-700V R.M.S.
Maximum current at full voltage: 5 amps.
Minimum current at full voltage: 20 ma.
Current regulation: .3% (max) output current change for 10% input voltage change; .1% is typical.
Operating temperature: −40°C to 60°C
Weight: 34 pounds packboard mounted with nylon waterproof hood.

Motor generator:
Output frequency: 400 Hz nominal
Output voltage: 125 Volts (nominal)
Output power: 2.5 KVA
Voltage regulation: −5% no load to full load
Weight: Back pack mounted:— 79 pounds.

Accessories available: Citizens band transceiver signalling set; speedwinders and spools with 1,000 feet of field wire; geo reel with 5,000 feet of field wire; porous pots; stainless steel electrodes; clip leads; multimeter; fuses; a tool kit with tape; a plastic sheet.

McPhar Geophysics

Head Office:

55 Tempo Avenue
Willowdale, Ontario, Canada M2H 2R9
Tel: (416) 497-1700 Telex: 065-25305
Cable: McPHAR TOR

Sales agents in:

Africa, Asia, Australia, Europe, North & South America

Contact McPhar Geophysics head office for the agent in your area.

APPENDIX II

Geonics EM16 VLF Electromagnetic Unit Specifications

EM16

VLF Electromagnetic Unit

ioneered and patented exclusively by *Geonics Limited, the* VLF method of electromagnetic surveying has been proven to be a major advance in exploration geophysical instrumentation.

Since the beginning of 1965 a large number of mining companies have found the EM16 system to meet the need for a simple, light and effective exploration tool for mining geophysics.

The VLF method uses the military and time standard VLF transmissions as primary field. Only a receiver is then used to measure the secondary fields radiating from the local conductive targets. This allows a very light, one-man instrument to do the job. Because of the almost uniform primary field, good response from deeper targets is obtained.

The EM16 system provides the *in-phase* and *quadrature* components of the secondary field *with the polarities indicated.*

Interpretation technique has been highly developed particularly to *differentiate deeper* targets from the many surface indications.

Principle of Operation
The VLF transmitters have vertical antennas. The magnetic signal component is then horizontal and concentric around the transmitter location.

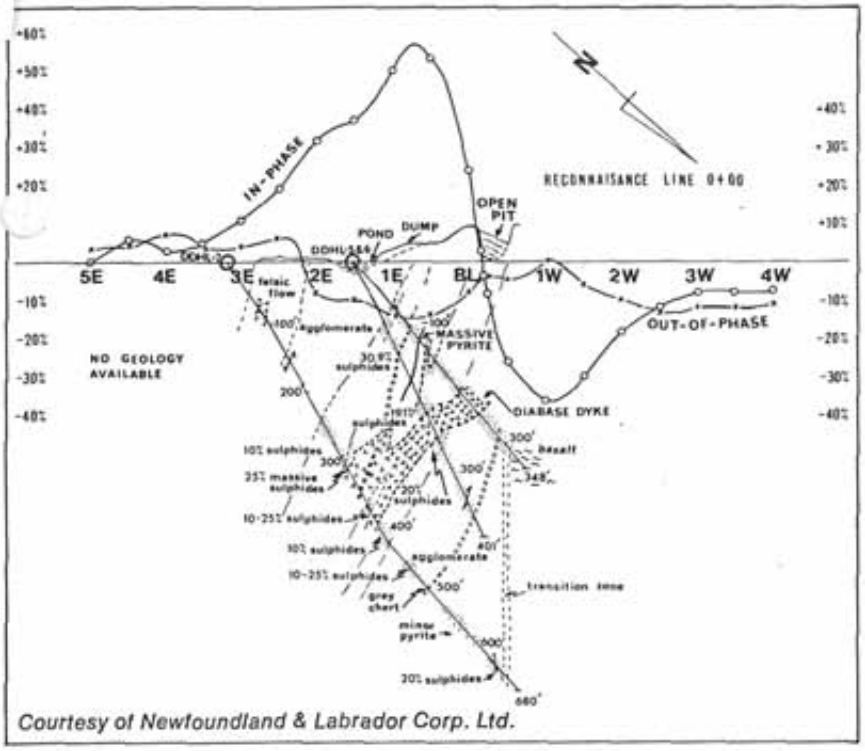
Specifications

Source of primary field	VLF transmitting stations.
Transmitting stations used	Any desired station frequency can be supplied with the instrument in the form of plug-in tuning units. Two tuning units can be plugged in at one time. A switch selects either station.
Operating frequency range	*About 15-25 kHz.*
Parameters measured	(1) The vertical in-phase component (*tangent of the tilt angle of the* polarization ellipsoid). (2) The vertical out-of-phase (quadrature) component (*the short axis of the* polarization ellipsoid compared to the long axis).
Method of reading	In-phase from a mechanical inclinometer and quadrature from a calibrated dial. Nulling by audio tone.
Scale range	In-phase ± 150%; quadrature ± 40%.
Readability	± 1%.
Reading time	10-40 seconds depending on signal strength.
Operating temperature range	*—40 to 50° C.*
Operating controls	ON-OFF switch, battery testing push button, station selector, switch, volume control, quadrature, dial ± 40%, inclinometer dial ± 150%.
Power Supply	6 size AA (penlight) alkaline cells. Life about 200 hours.
Dimensions	42 x 14 x 9 cm (16 x 5.5 x 3.5 in.)
Weight	1.6 kg (3.5 lbs.)
Instrument supplied with	Monotonic speaker, carrying case, manual of operation, 3 station selector plug-in tuning units (additional frequencies are optional), set of batteries.
Shipping weight	4.5 kg (10 lbs.)

GEONICS LIMITED
Designers & manufacturers of geophysical instruments

subsidiary of
Deering Milliken Inc.

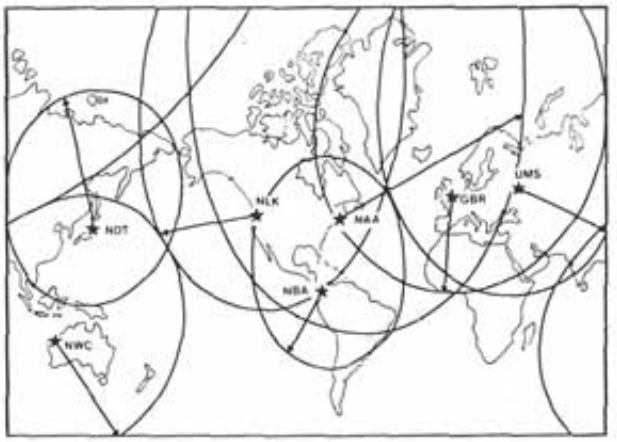
2 Thorncliffe Park Drive,
Toronto/Ontario/Canada
M4H 1H2
Tel: 425-1824
Cables: Geonics



Courtesy of Newfoundland & Labrador Corp. Ltd.

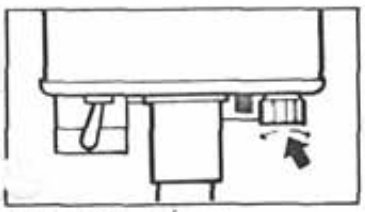
EM 16 Profile over Lockport Mine Property, Newfoundland

Additional case histories on request.



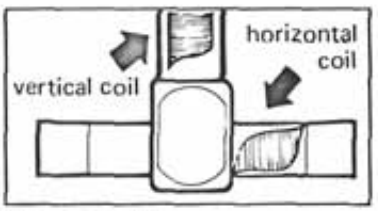
Areas of VLF Signals

Coverage shown only for well-known stations. Other reliable, fully operational stations exist. For full information regarding VLF signals in your area consult Geonics Limited. Extensive field experience has proved that the circles of coverage shown are very conservative and are actually much larger in extent.



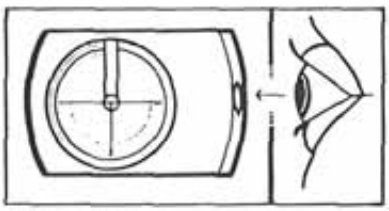
Station Selector

Two tuning units can be plugged in at one time. A switch selects either station.



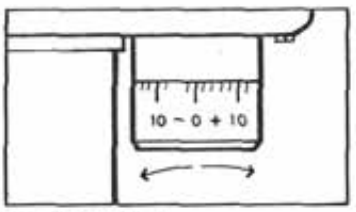
Receiving Coils

Vertical receiving coil circuit in instrument picks up any vertical signal present. Horizontal receiving coil circuit, after automatic 90° signal phase shift, feeds signal into quadrature dial in series with the receiving coil.



In-Phase Dial

shows the tilt-angle of the instrument for minimum signal. This angle is the measure of the vertical in-phase signal expressed in percentage when compared to the horizontal field.



Quadrature Dial

is calibrated in percentage markings and nulls the vertical quadrature signal in the vertical coil circuit.

By selecting a suitable transmitter station as a source, the EM 16 user can survey with the most suitable primary field azimuth.

The EM 16 has two receiving coils, one for the pick-up of the horizontal (primary) field and the other for detecting any anomalous vertical secondary field. The coils are thus orthogonal, and are mounted inside the instrument "handle".

The actual measurement is done by first tilting the coil assembly to minimize the signal in the vertical (signal) coil and then further sharpening the null by using the reference signal to buck out the remaining signal. This is done by a calibrated "quadrature" dial.

The tangent of the tilt angle is the measure of the vertical in-phase component and the quadrature reading is the signal at right angles to the total field. All readings are obtained in per centages and do not depend on the absolute amplitude of the primary signals present.

The "null" condition of the measurement is detected by the drop in the audio signal emitted from the patented resonance loudspeaker. A jack is provided for those preferring the use of an earphone instead.

The power for the instrument is from 6 penlight cells. A battery tester is provided.

APPENDIX III

Geometrics Portable Proton Magnetometer - Model G-816

geoMetrics

Instrument Division

PORTABLE PROTON MAGNETOMETER
MODEL G-816

- ★ 1 gamma sensitivity and repeatability
- ★ Very small size and weight: less than 12 lbs complete with batteries and sensor
- ★ Over 10,000 readings per set of alkaline "D" cell (flashlight) batteries
- ★ Provision to attach sensor to carrying harness for use without staff
- ★ Pushbutton operation—numeric display directly in gammas
- ★ Total field measurements—independent of orientation—no calibration—no leveling

The Model G-816 is a complete portable magnetometer for all man-carry field applications. As an accurate yet simple to operate instrument, it features an outstanding combination of one gamma sensitivity and repeatability, compact size and weight, operation on standard universally available flashlight batteries, ruggedized packaging and very low price.

The G-816 magnetometer allows precise mapping of very small or large amplitude anomalies for ground geophysical surveys, or for detail follow-up to aeromagnetic reconnaissance surveys. It is a rugged, lightweight, and versatile instrument, equally well suited for field studies in geophysics, research programs or other magnetic mapping application where low cost, dependable operation and accurate measurements are required.

For marine, airborne or ground recording systems consider GeoMetrics Models G-801, G-803, and G-826A.

"Hands-free" Back Pack Sensor

Based upon the principle of *nuclear precession (proton)* the G-816 offers absolute drift-free measurements of the total field directly in gammas. (The proton precession *method* is the officially recognized standard for measurement of the earth's magnetic field.) Operation is worldwide with *one* gamma sensitivity and repeatability maintained throughout the range. There is no temperature drift, no set-up or leveling required, and no adjustment for orientation, field polarity, or arbitrary reference levels. Operation is very simple with no prior training required. Only 6 seconds are required to obtain a measurement which is always correct *to one gamma*, regardless of operator experience. Only the Proton Magnetometer offers such repeatability—an important *consideration* even for 10 gamma survey resolution.

Complete Field Portable System

The Model G-816 comes complete, ready for portable field *operation and consists of:*

1. Electronics console with internally mounted and easily replaced "D" cell battery pack.
2. Proton sensor and *signal cable for attachment* to carrying harness or staff.
3. Adjustable carrying harness.
4. 8 foot collapsible aluminum staff.
5. Instruction manual, *complete set of spare* batteries, applications manual, and rugged field suitcase.

Price and lease rates on the G-816 magnetometer are available upon request.

SPECIFICATIONS

Sensitivity: ±1 gamma throughout range

Range: *20,000 to 100,000 gammas* (worldwide)

Tuning: Multi-position switch with signal amplitude indicator light on display

Gradient Tolerance: Exceeds 800 gammas/ft

Sampling Rate: Manual push-button, one reading each 6 seconds

Output: 5 digit numeric display with readout directly in gammas

Power Requirements: Twelve self-contained 1.5 volt "D" cell, universally available flashlight-type batteries. Charge state or replacement signified by flashing indicator light on display.

Battery Type		Number of Readings
Alkaline	over	10,000
Premium Carbon Zinc	over	4,000
Standard Flashlight	over	1,500

NOTE: Battery life decreases with low temperature operation.

Temperature Range: Console and sensor: −40° to +85°C

Battery Pack: 0° to +50°C (limited use to −15°C; lower temperature battery belt operation—optional)

Accuracy (Total Field): ±1 gamma through 0° to +50°C temperature range

Sensor: High signal, noise cancelling, interchangeably mounted on separate staff or attached to carrying harness

Size:
Console: 3.5 x 7 x 10.5 inches (9 x 18 x 27 cm)
Sensor: 3.5 x 5 *inches* (9 x 13 *cm*)
Staff: 1 inch diameter x 8 ft length (3 cm x 2.44 m)

Weight:

	Lbs.	Kgs.
Console (w/batteries):	5.5	2.5
Sensor & signal cable:	4	1.8
Aluminum staff:	2	0.9
Total:	11.5	5.2

All magnetometers and parts are covered by a one year warranty beginning with the date of receipt but not to exceed fifteen months from the shipping date.

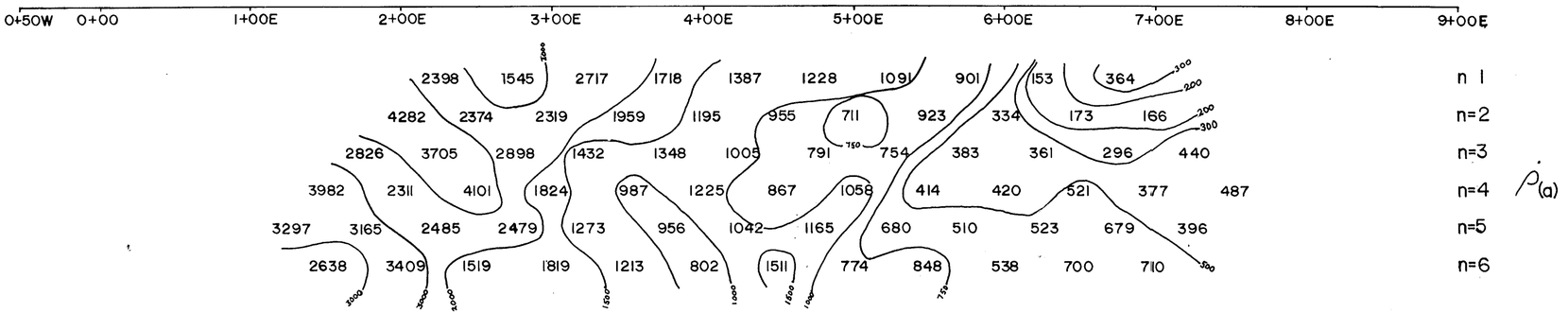
geoMetrics, INC. A SUBSIDIARY OF EG&G
395 JAVA DRIVE
SUNNYVALE, CA. 94086 U.S.A.
TEL: (408) 734-4616
CABLE: "GEOMETRICS"
TELEX NO: 357-435

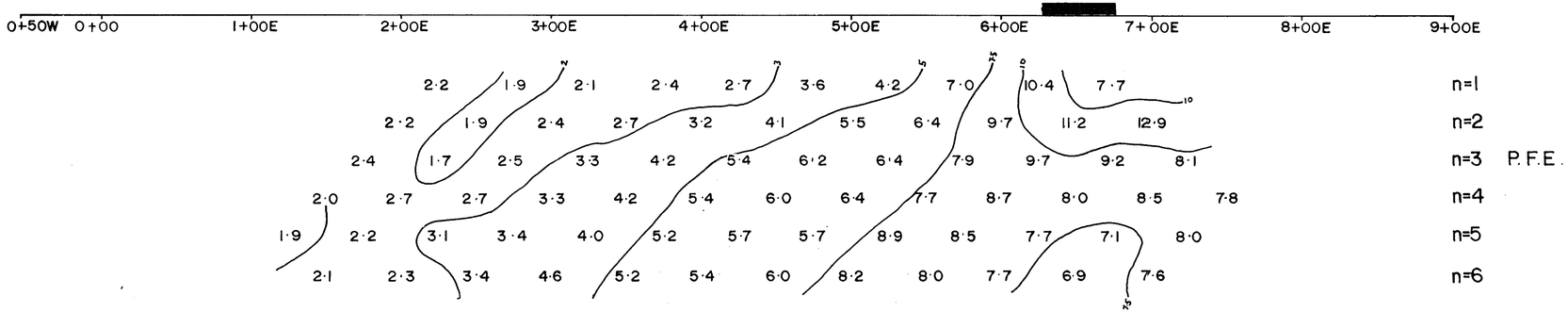
geoMetrics SERVICES (CANADA) LTD.
436 LIMESTONE CRESCENT
DOWNSVIEW (TORONTO),
ONTARIO, CANADA
TEL: (416) 661-1966
TELEX NO: 06-22694

geoMetrics INTERNATIONAL CORP.
80 ALFRED ST.,
MILSON'S POINT
SYDNEY NSW 2061
AUSTRALIA
TEL: 929-9942
TELEX NO: 790-22624

WORLD-WIDE AGENTS: EUROPE • SCANDINAVIA • UNITED KINGDOM • JAPAN • SO. AFRICA • SO. AMERICA

BASE LINE





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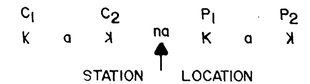
DOUBLE DIPOLE ARRAY



a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I.P. RESPONSE

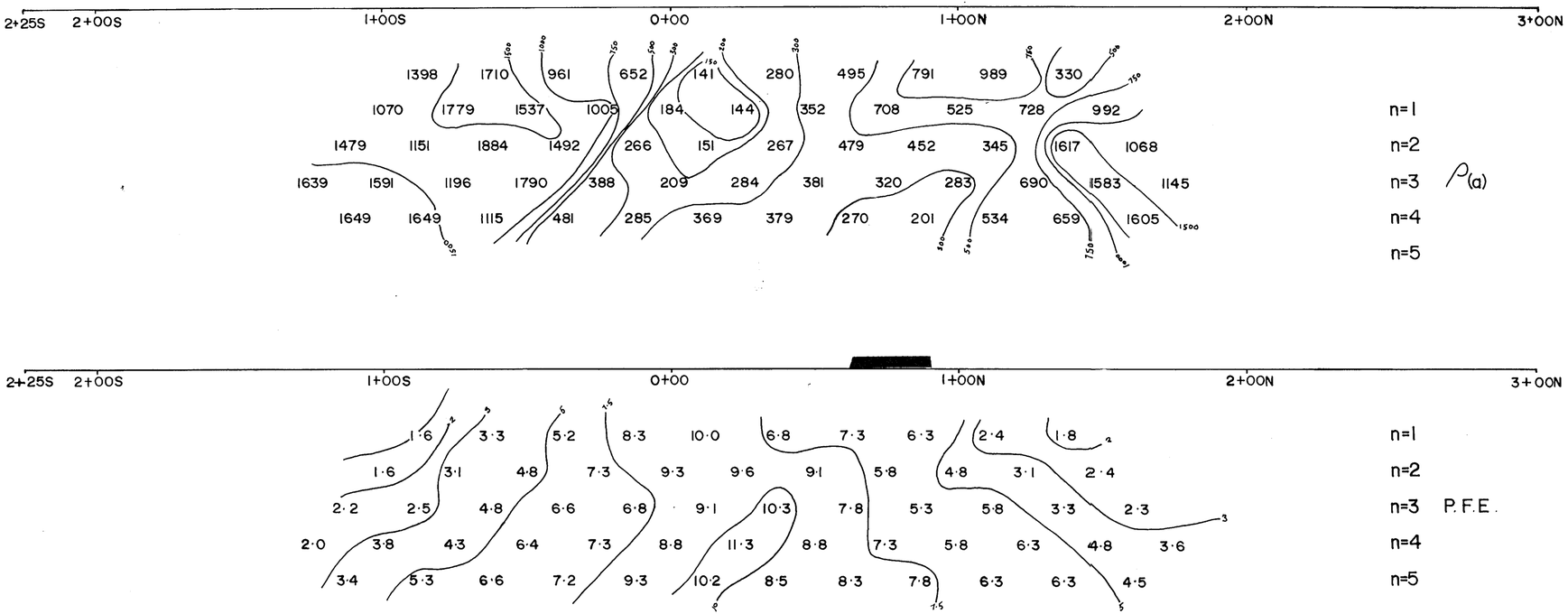
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d.m.d.
Drawing No: 1	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 6+00E DETAIL



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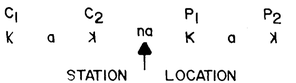
DOUBLE DIPOLE ARRAY



a=25m n=1,2,3,4,5

500 APPARENT RESISTITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

6+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I.P RESPONSE

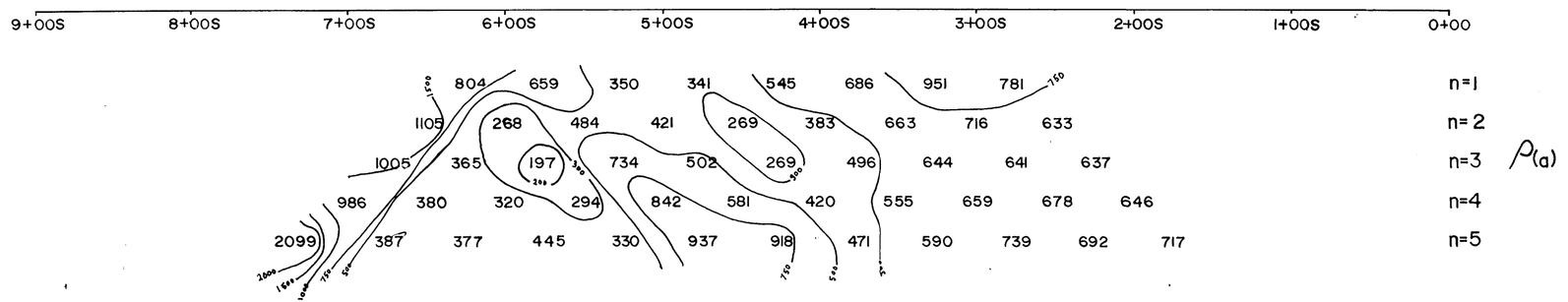
KELVIN ENERGY LIMITED

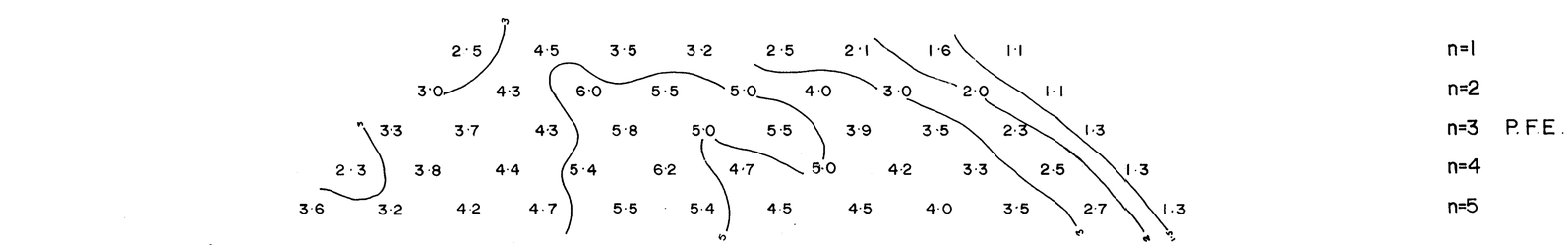
INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d.m.d.
Drawing No: 11	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 12+00E





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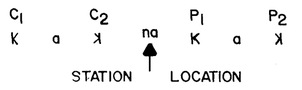


a=50m n=1,2,3,4,5

500 APPARENT RESISTITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I. P. RESPONSE

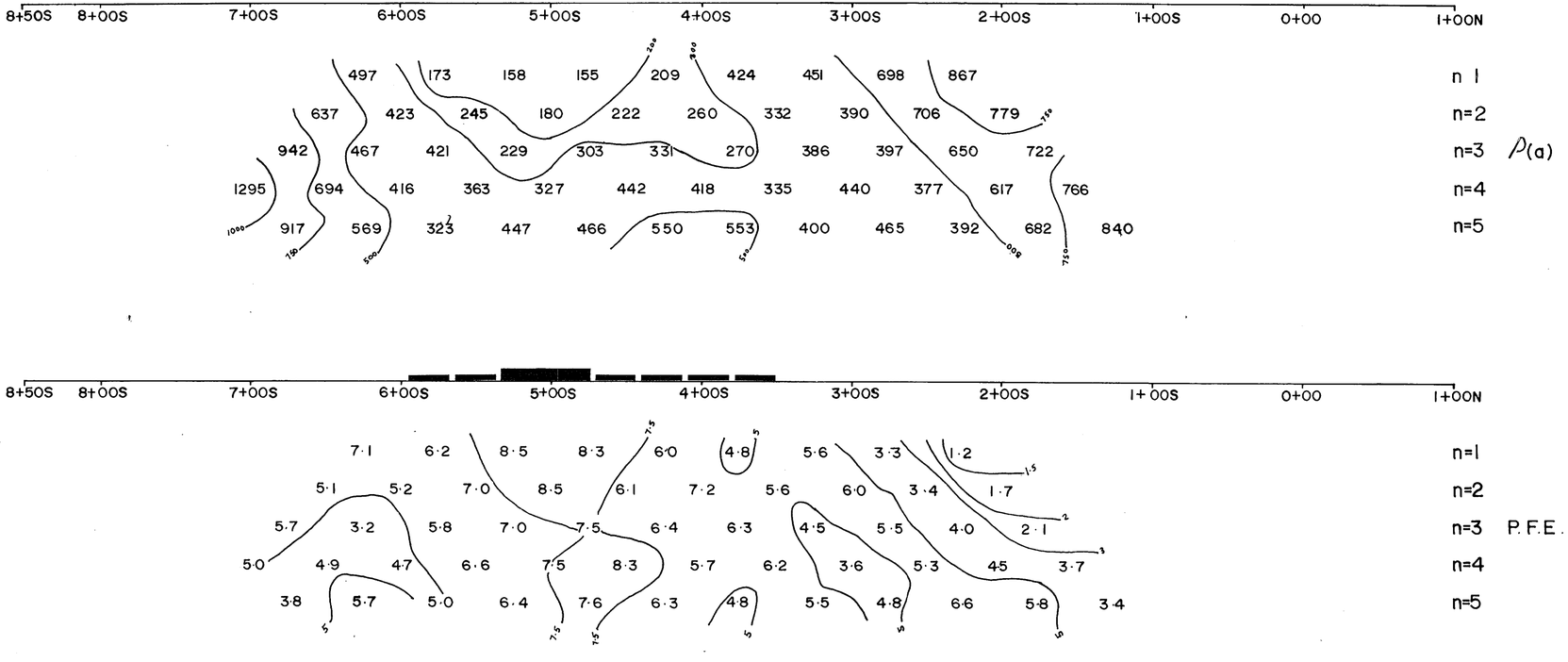
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d.m.d.
Drawing No: 2	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 11+25E



LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2

K a K na K a K

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I.P. RESPONSE

KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

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Scale: 1:2500	Drawn: d.m.d.
Drawing No: 3	Date: OCTOBER, 1980

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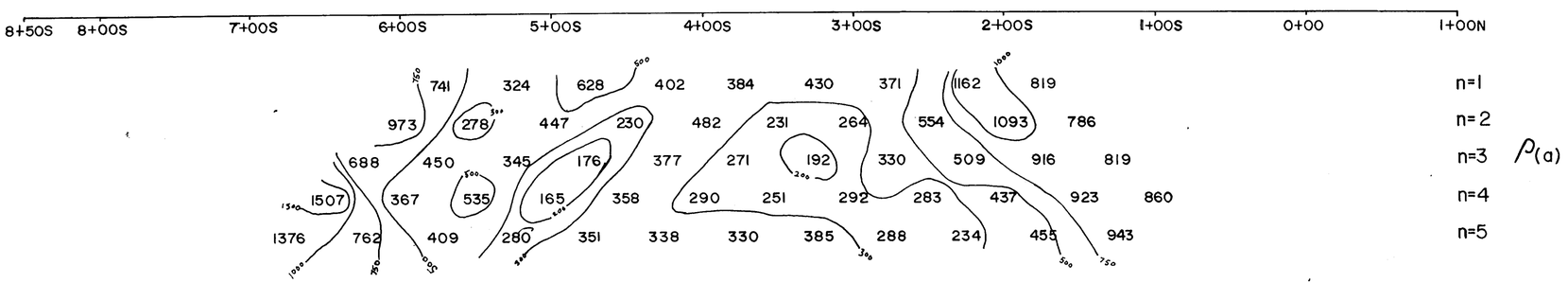
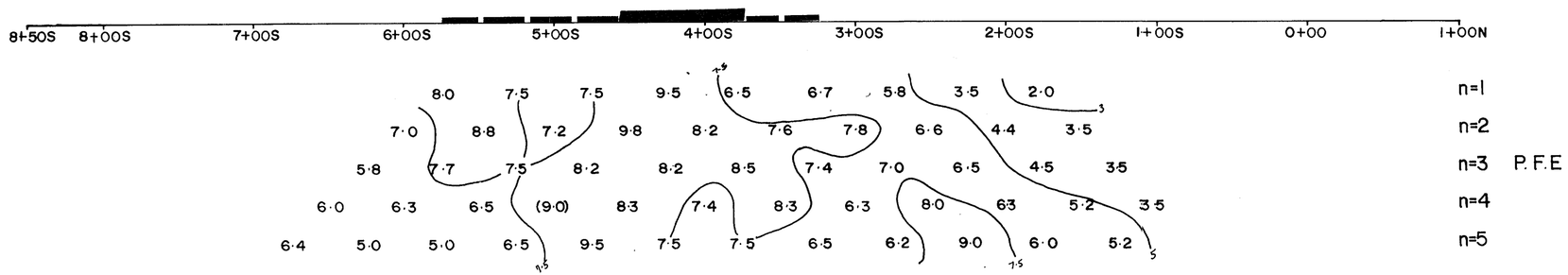
LINE 10+50E





LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
K a K na K a K

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I.P. RESPONSE

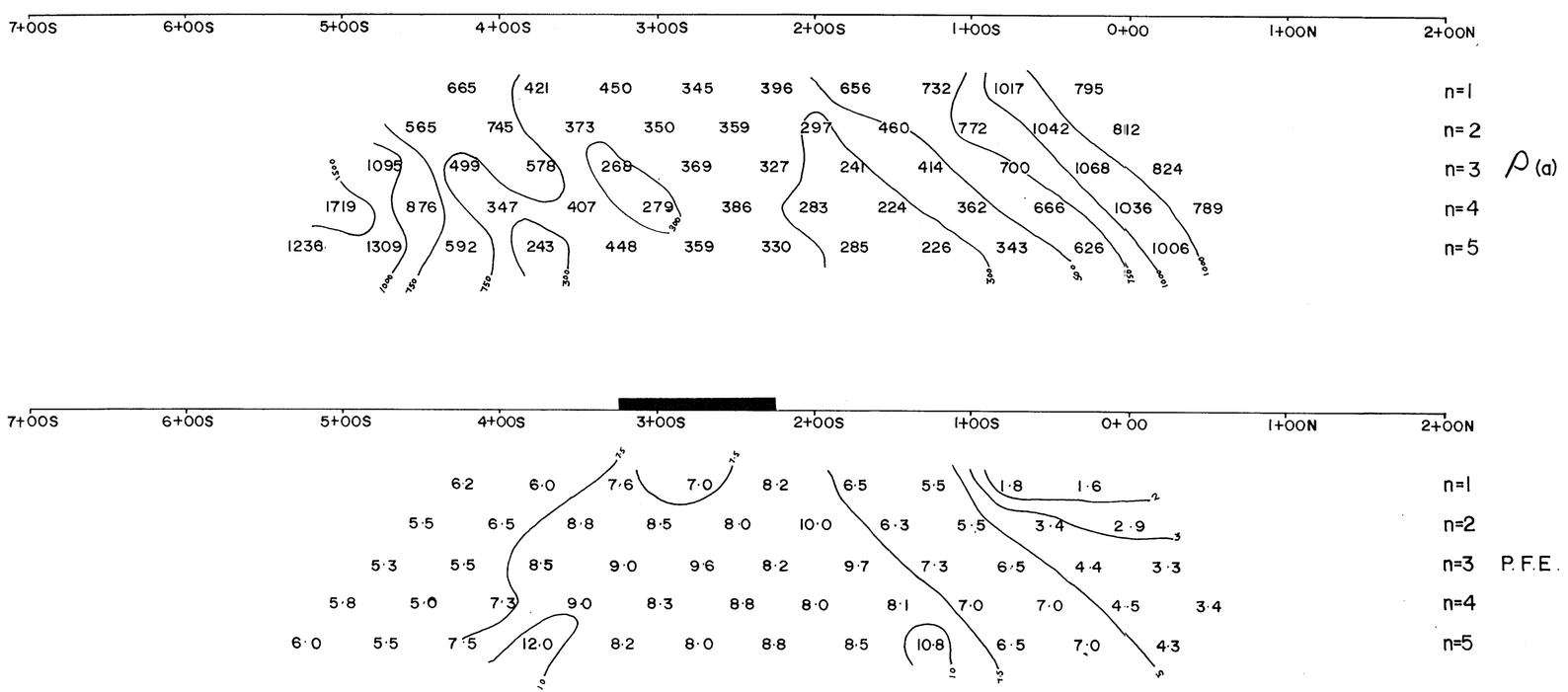
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO-SECTION

Project No: C-505	**By:** F. DALIDOWICZ
Scale: 1:2500	**Drawn:** d.m.d.
Drawing No: 4	**Date:** OCTOBER, 1980

MPH Consulting Limited

LINE 9+75E



LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
K a K na K a K

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I.P. RESPONSE

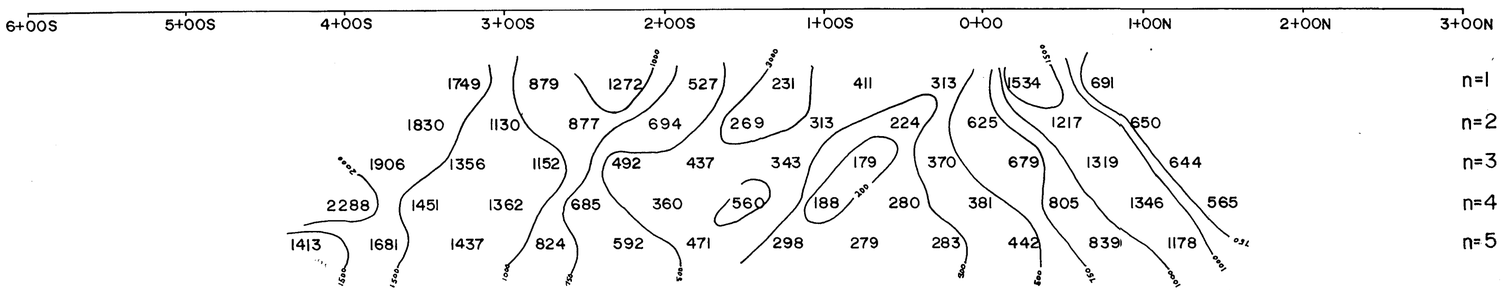
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C-505	**By:** F. DALIDOWICZ
Scale: 1:2500	**Drawn:** d.m.d.
Drawing No: 5	**Date:** OCTOBER, 1980

MPH Consulting Limited

LINE 8+25E



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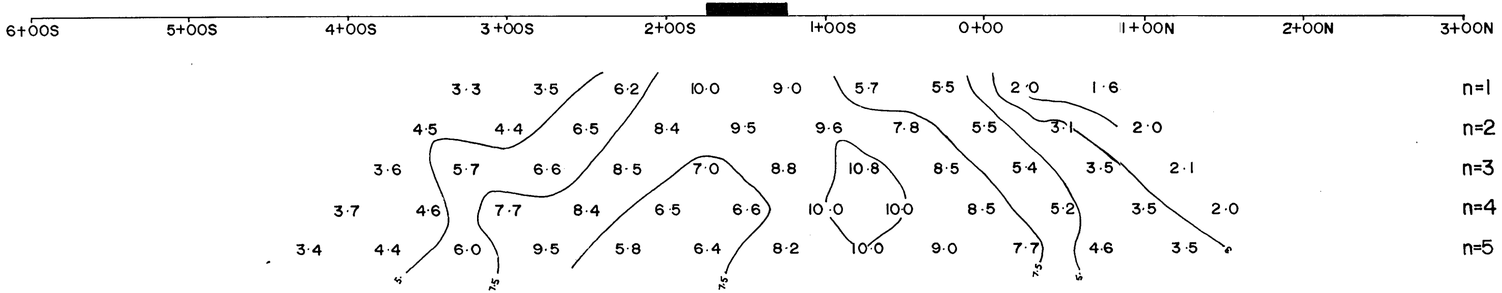


P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
K a x na K a x

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I.P. RESPONSE

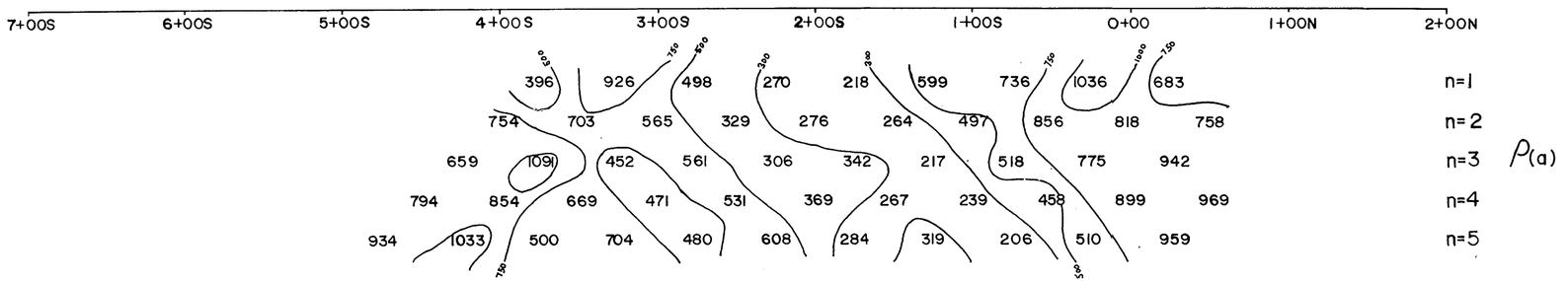
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d.m.d.
Drawing No: 7	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 9+00E



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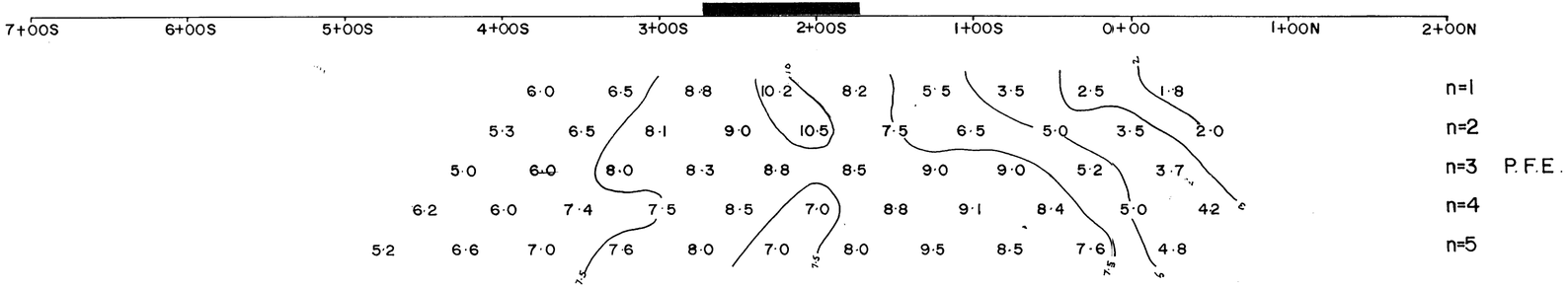


P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
K a K na K a K

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I. P. ANOMALY

WEAKER I.P. RESPONSE

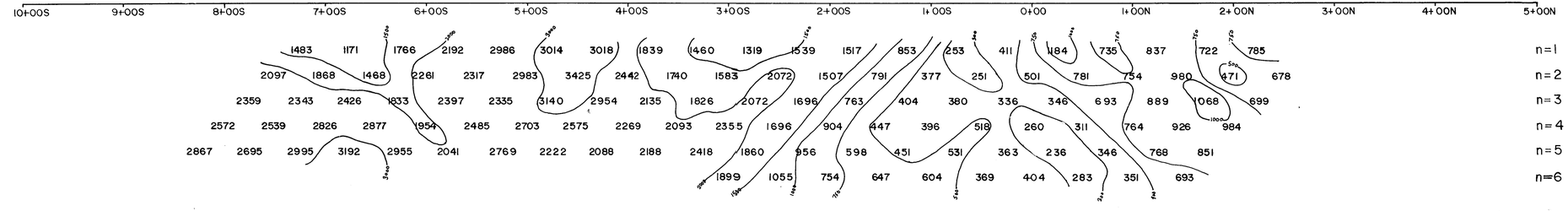
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d.m.d.
Drawing No: 6	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 7+50E



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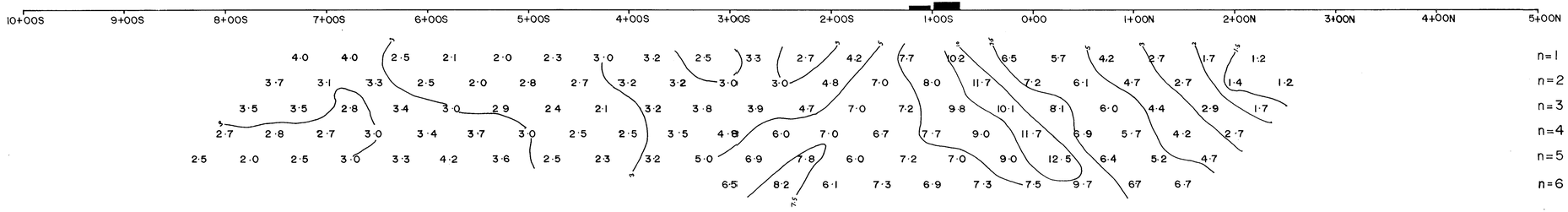

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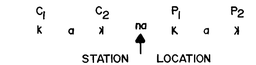
LEGEND

DOUBLE DIPOLE ARRAY



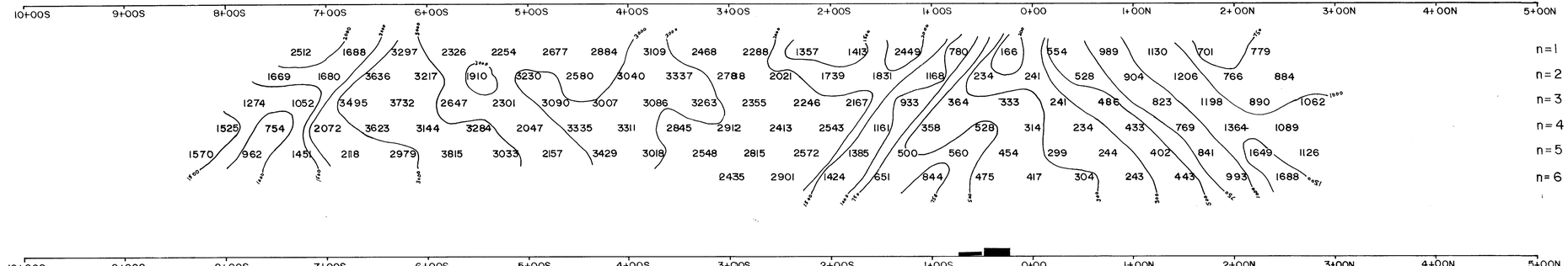
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 8	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 6+75E



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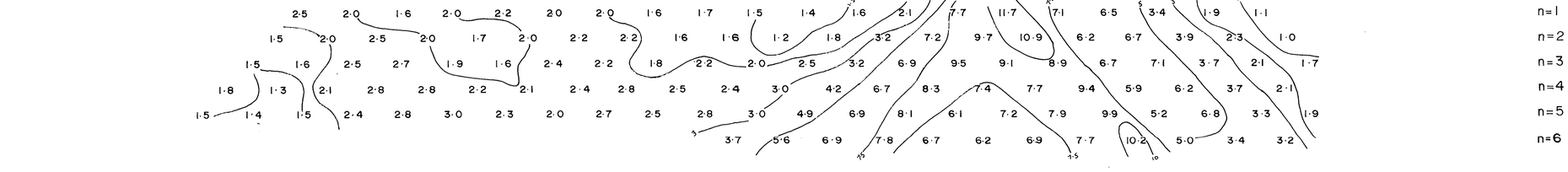


P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na k a k

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

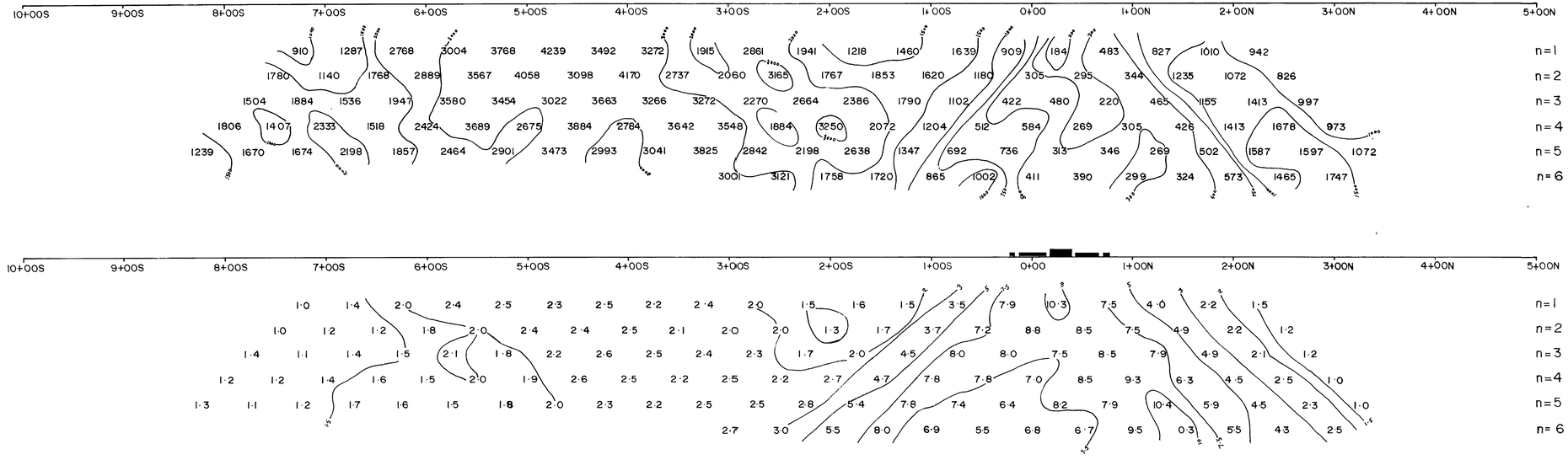
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 9	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 6+00E



LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2

k a x na k a x

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

6+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

MIN... BRANCH

8867

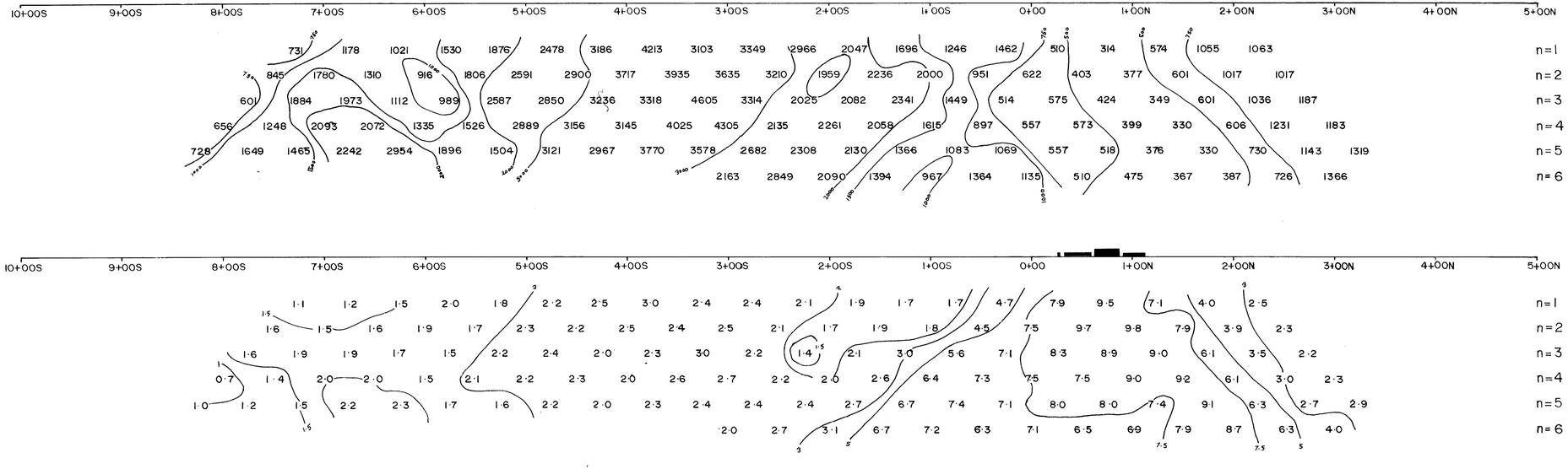
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 10	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 5+25E



$\rho_{(a)}$

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na k a k

STATION LOCATION

a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

6+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

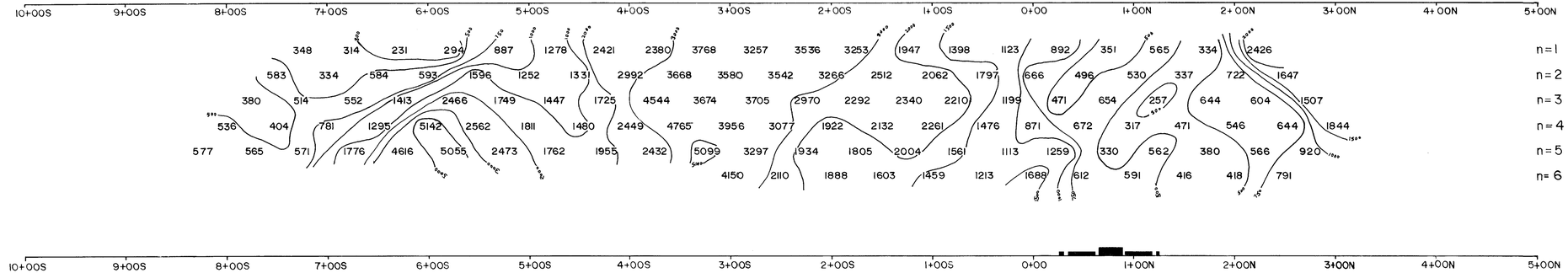
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

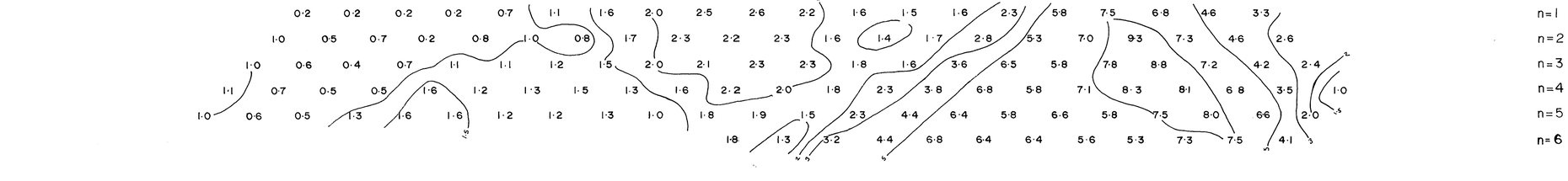
Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 12	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 4+50E



P(a)



P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C1 C2 P1 P2
K a K na K a K

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

0+00S 1+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

8867

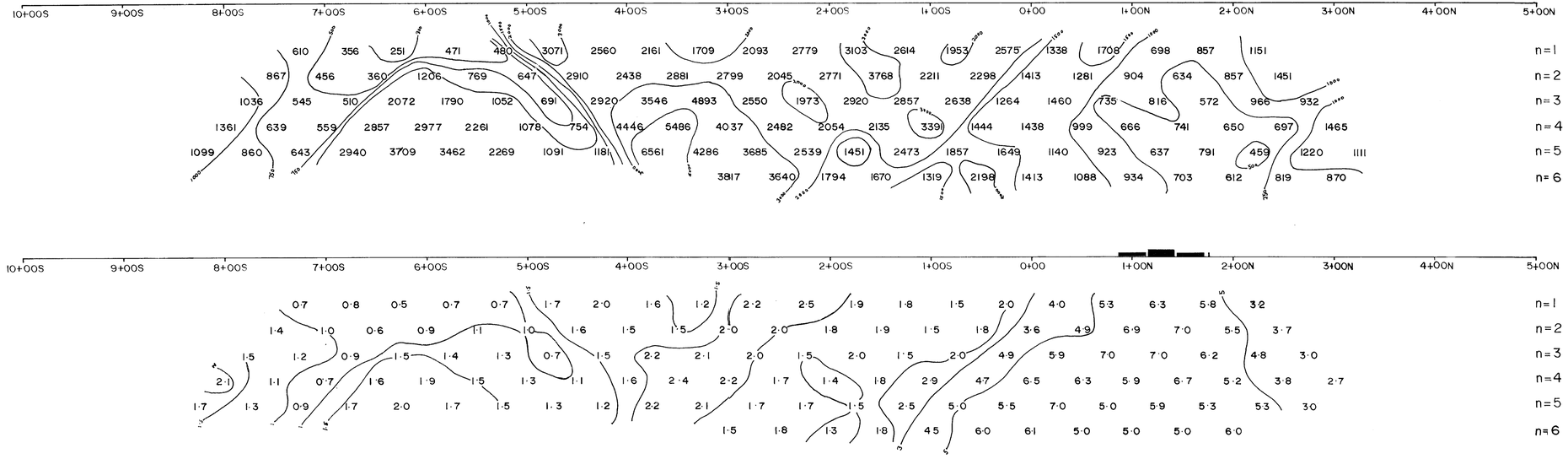
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 13	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 3+75E

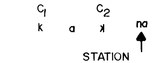


$\rho_{(a)}$

P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY



a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

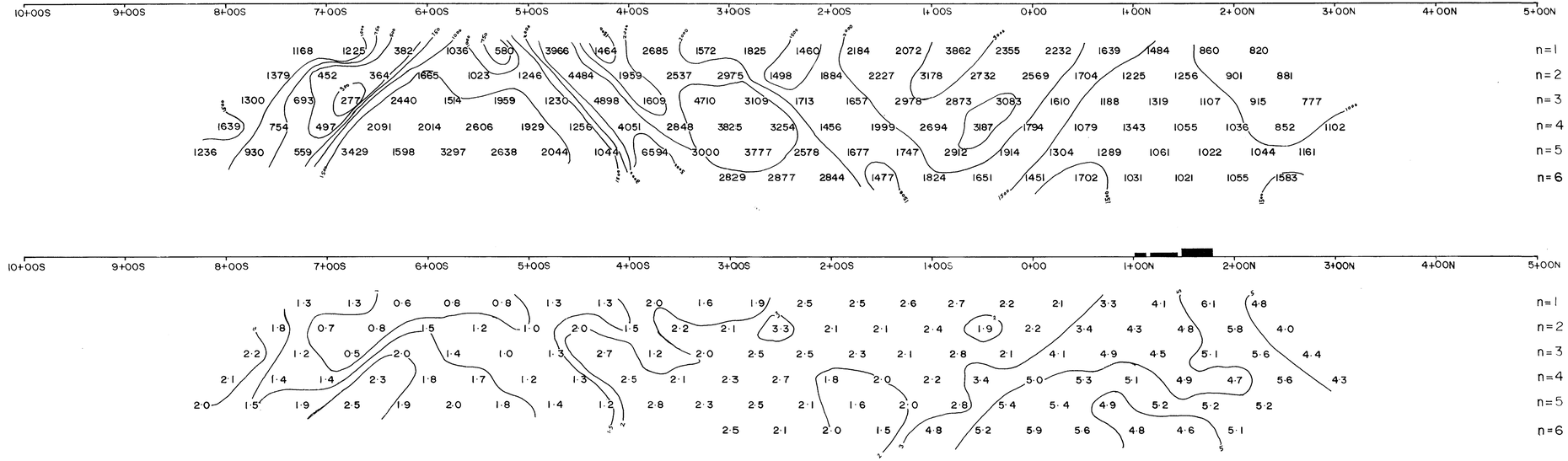
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d m d
Drawing No: 14	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 3+00E



P(a)

P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a (k+1)a k a (k+1)a

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

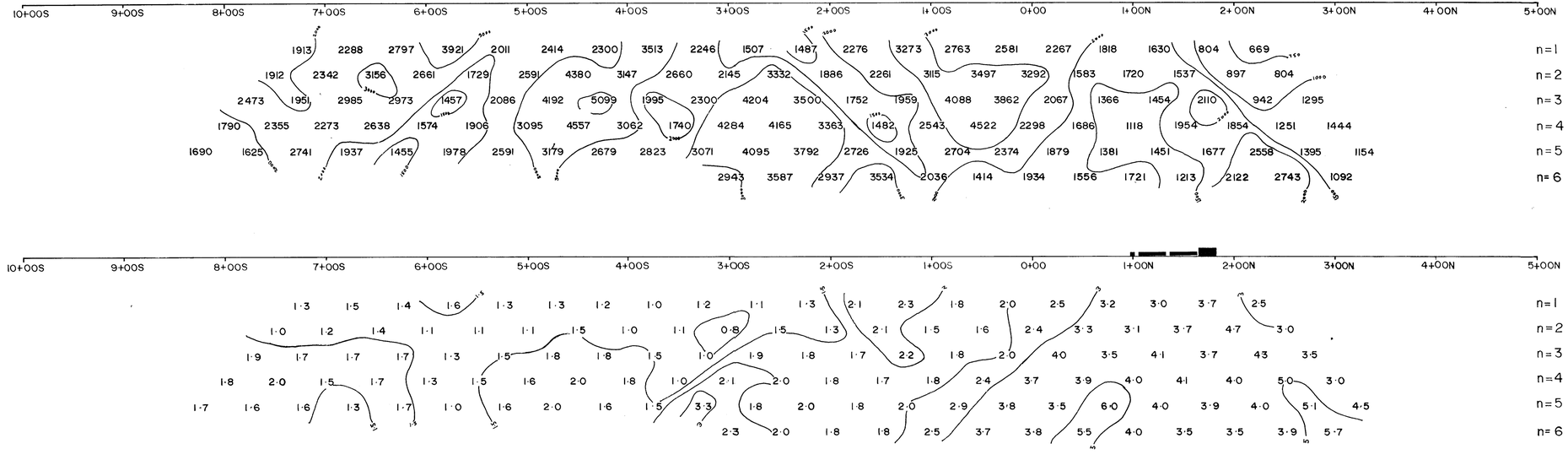
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No:15	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 2+25E



LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na k a k

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

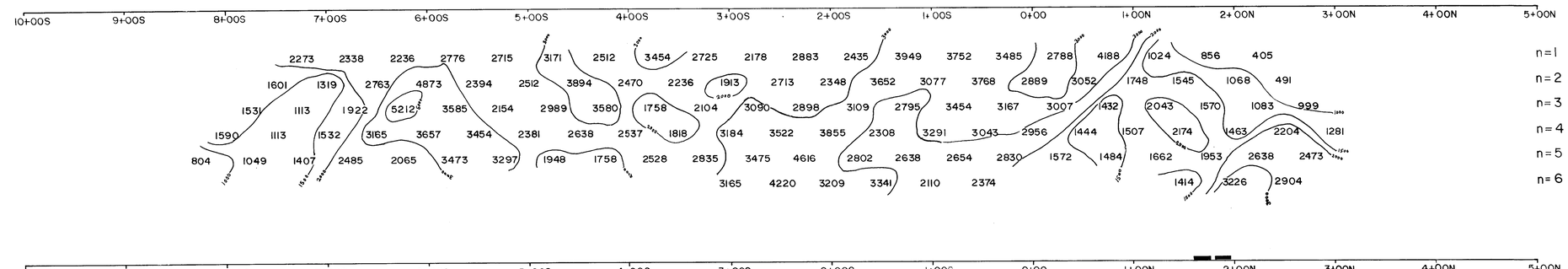
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO-SECTION

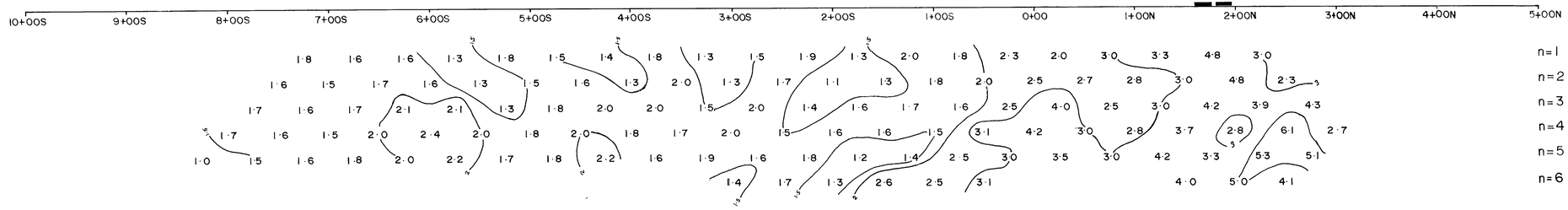
Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 16	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 1+50E



P(a)



P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 k C_2 a P_1 k P_2 na

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

6+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

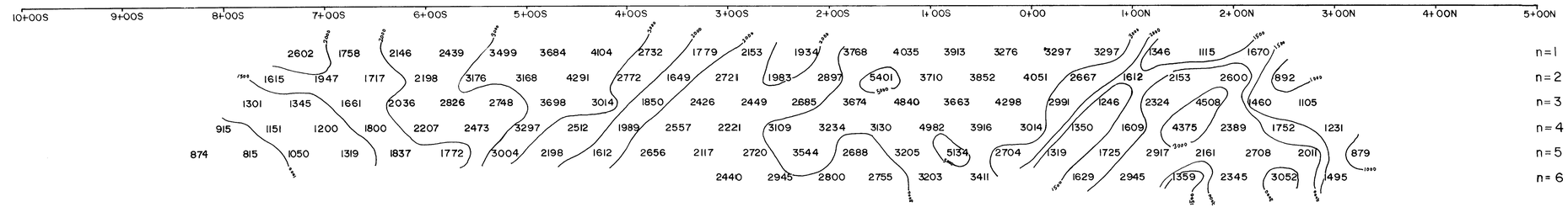
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No:17	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 0+75E



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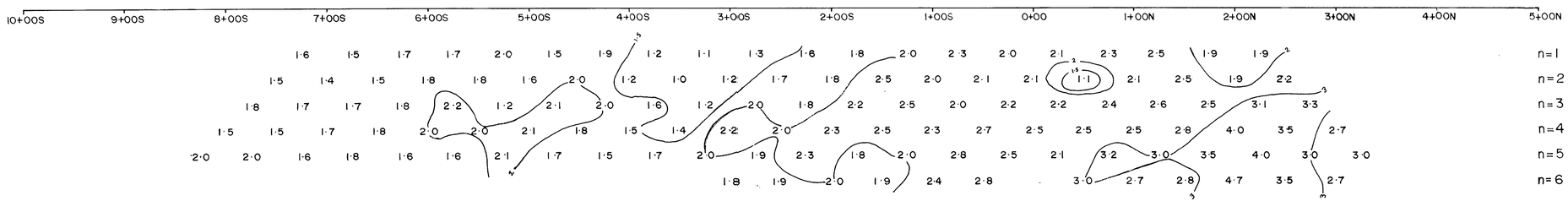


P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na K a k

STATION LOCATION

a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

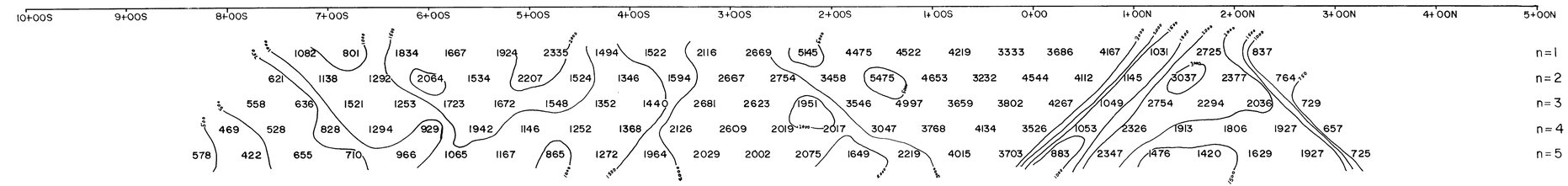
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO—SECTION

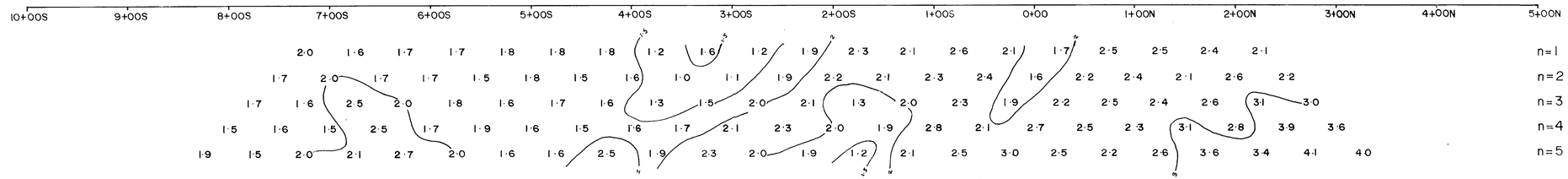
Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 18	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 0+00



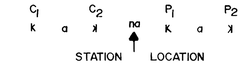
P(a)

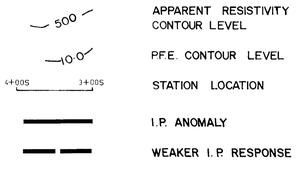


P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY





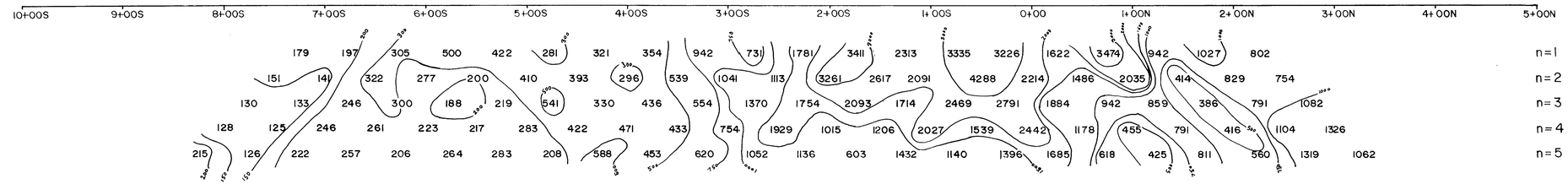
KELVIN ENERGY LIMITED

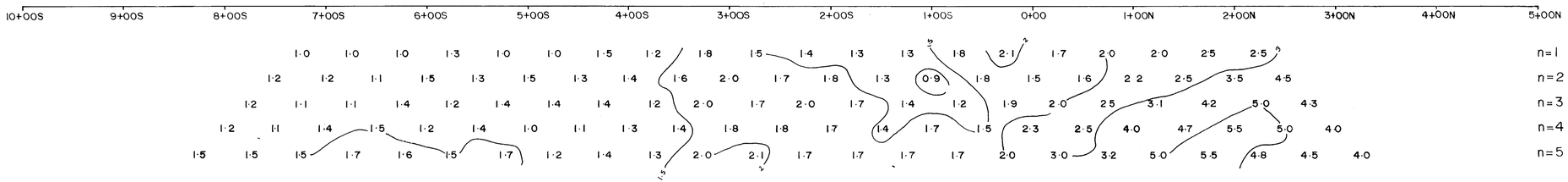
INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d m d
Drawing No: 19	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 0+75W





LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na k a k

STATION LOCATION

a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

6+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

MINING LAND TITLES BRANCH

8867

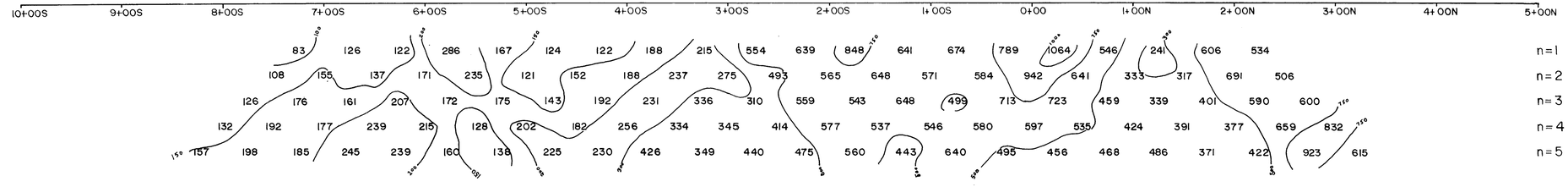
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 20	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 1+50W



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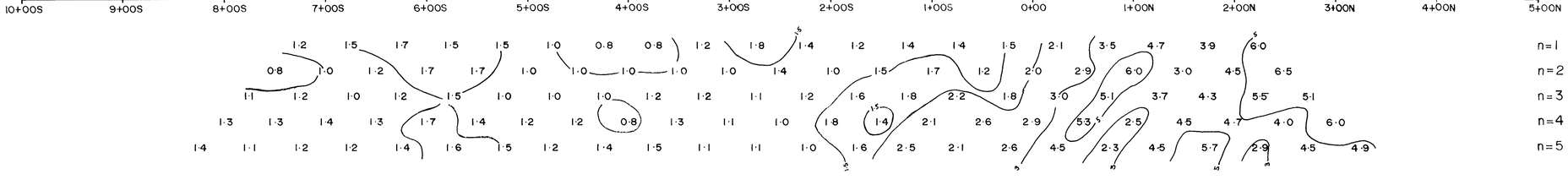
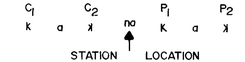


P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY



500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

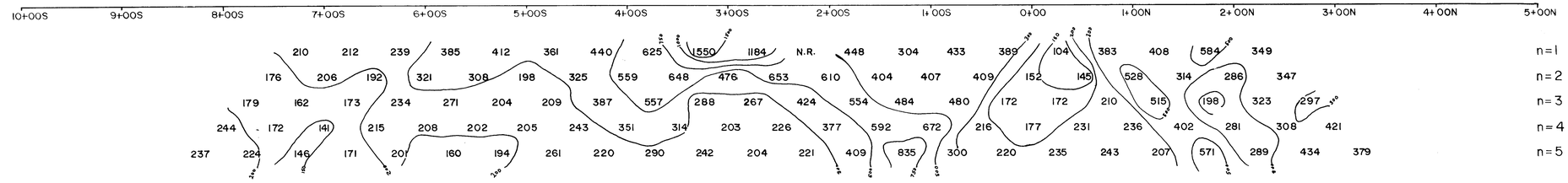
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 21	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 2+25W



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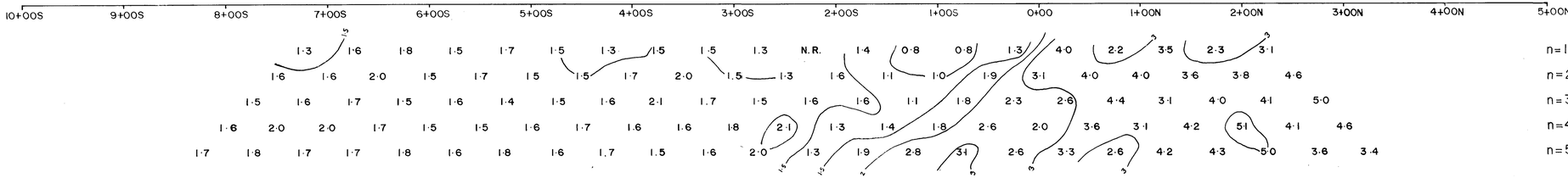


P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na k a k

STATION LOCATION

a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

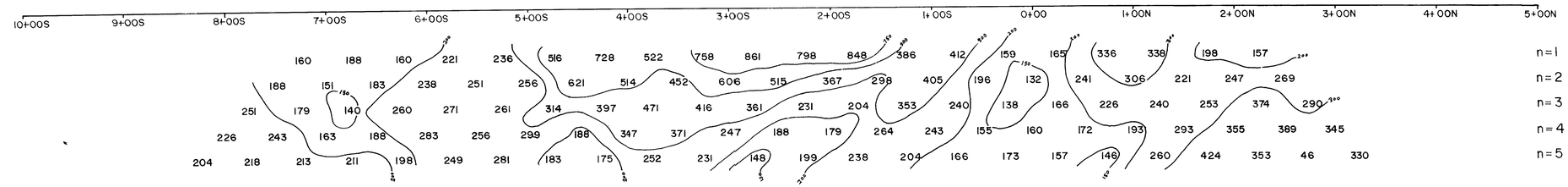
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d m d
Drawing No: 22	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 3+00W



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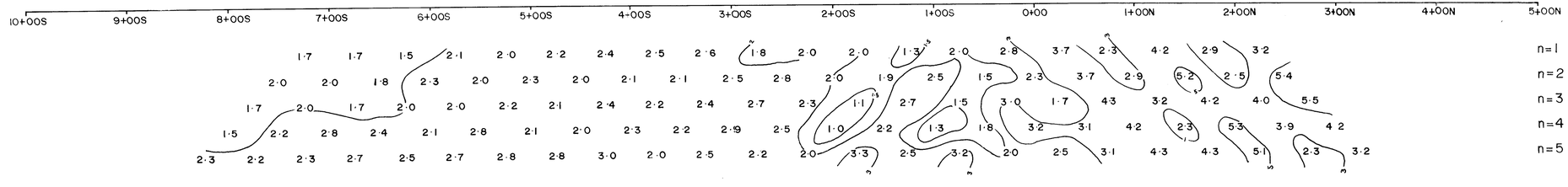

P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na k a k

STATION LOCATION

a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

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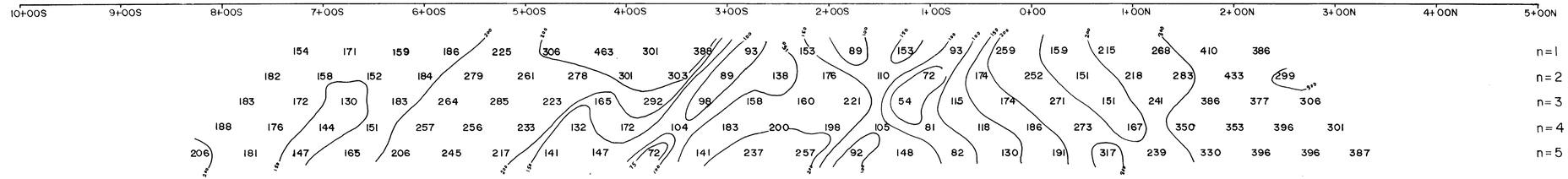
KELVIN ENERGY LIMITED

INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO—SECTION

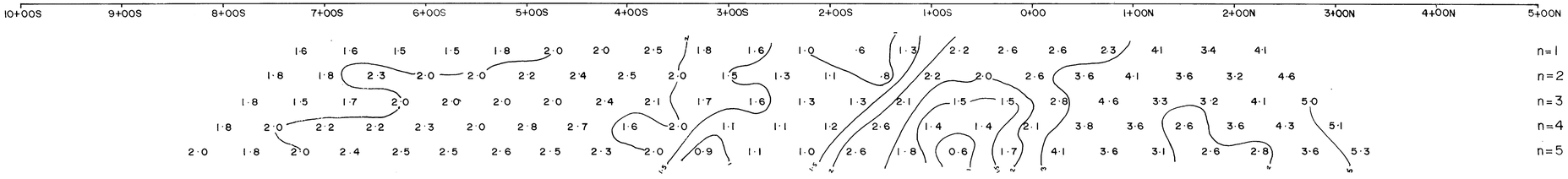
Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 23	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 3+75W



P(a)



P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na k a k

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

8867

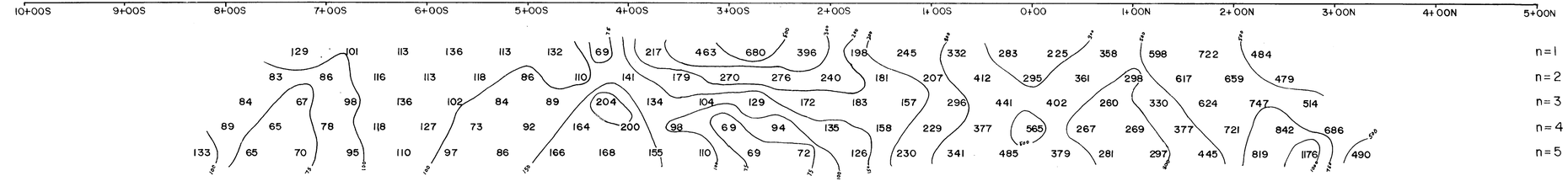
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

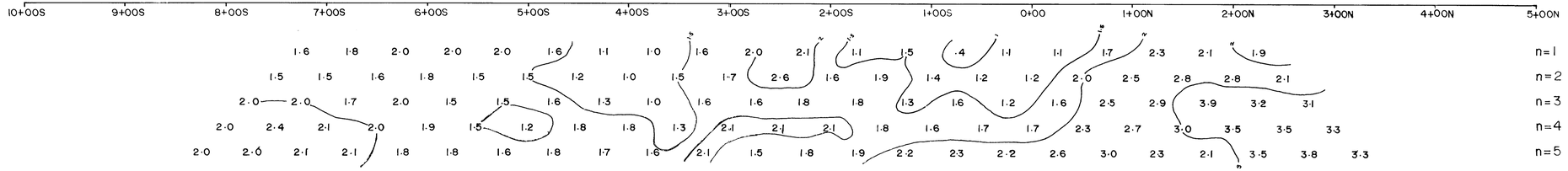
Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 24	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 5+25W



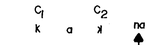
P(a)



P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY



a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

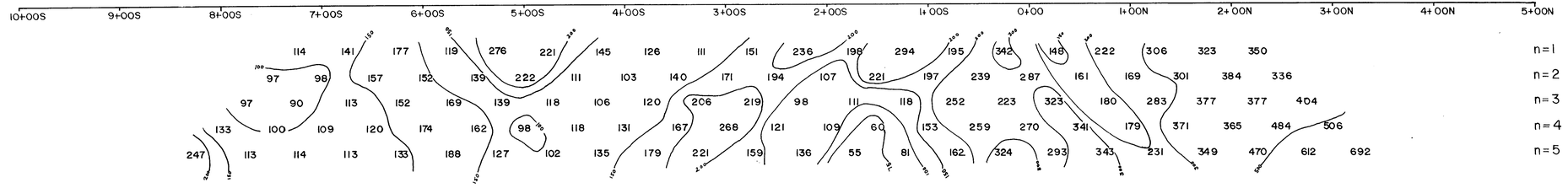
KELVIN ENERGY LIMITED

INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO-SECTION

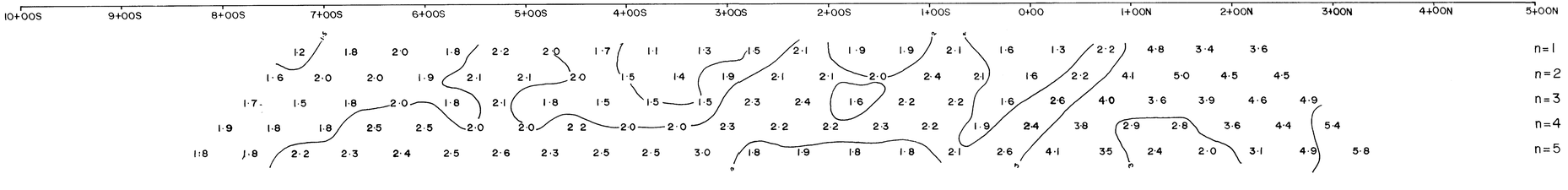
Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: d m d
Drawing No: 26	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 4+50W



$\rho_{(a)}$



P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 k C_2 a P_1 na P_2 k a k

STATION LOCATION

a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

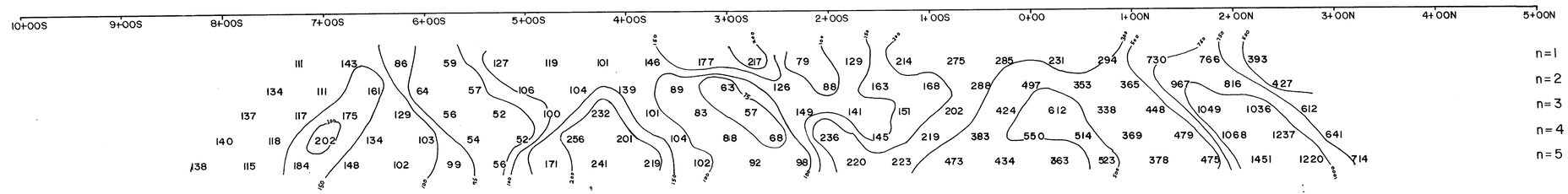
KELVIN ENERGY LIMITED

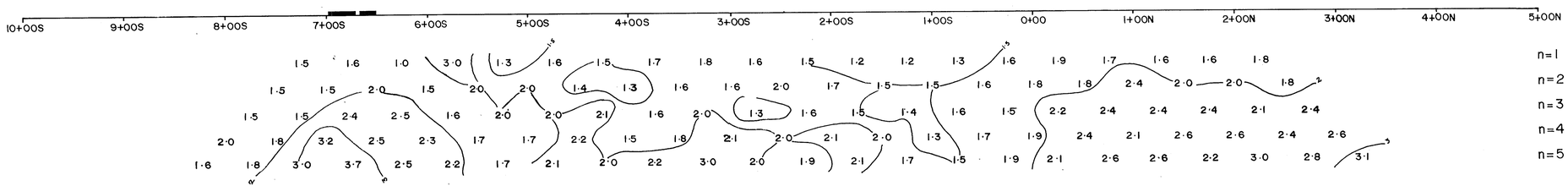
INDUCED POLARIZATION APPARENT RESISTIVITY PSEUDO-SECTION

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 25	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 6+00W





ρ(a)

P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a k na K a k

STATION LOCATION

a=50 m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10·0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

MINISTRY OF NATURAL RESOURCES
ASSESSMENT FILE
8867

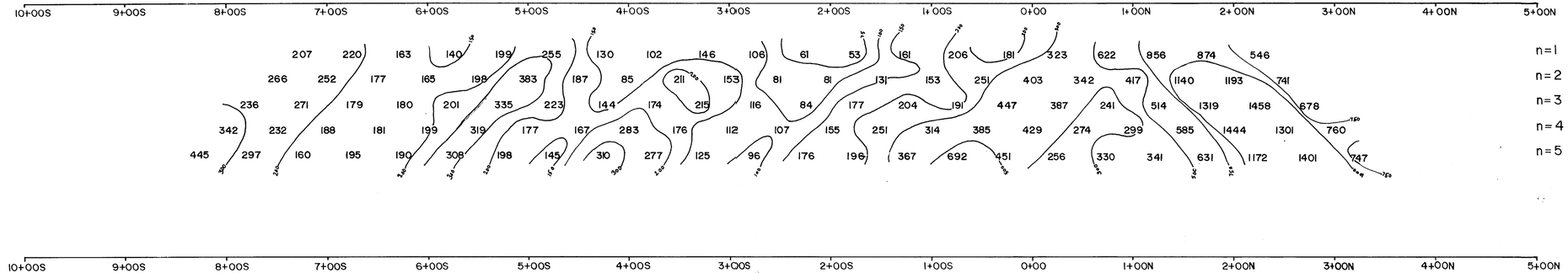
KELVIN ENERGY LIMITED

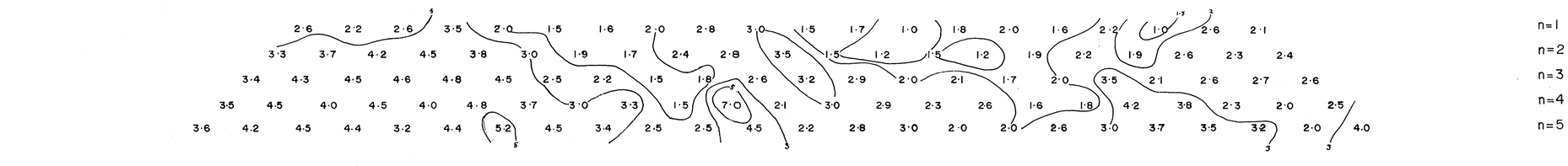
INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 27	Date: OCTOBER, 1980

MPH Consulting Limited

LINE 6+75W





P(a)

P.F.E.

LEGEND

DOUBLE DIPOLE ARRAY

C_1 C_2 P_1 P_2
k a x na k a x

STATION LOCATION

a=50m n=1,2,3,4,5

500 APPARENT RESISTIVITY CONTOUR LEVEL

10.0 P.F.E. CONTOUR LEVEL

4+00S 3+00S STATION LOCATION

I.P. ANOMALY

WEAKER I.P. RESPONSE

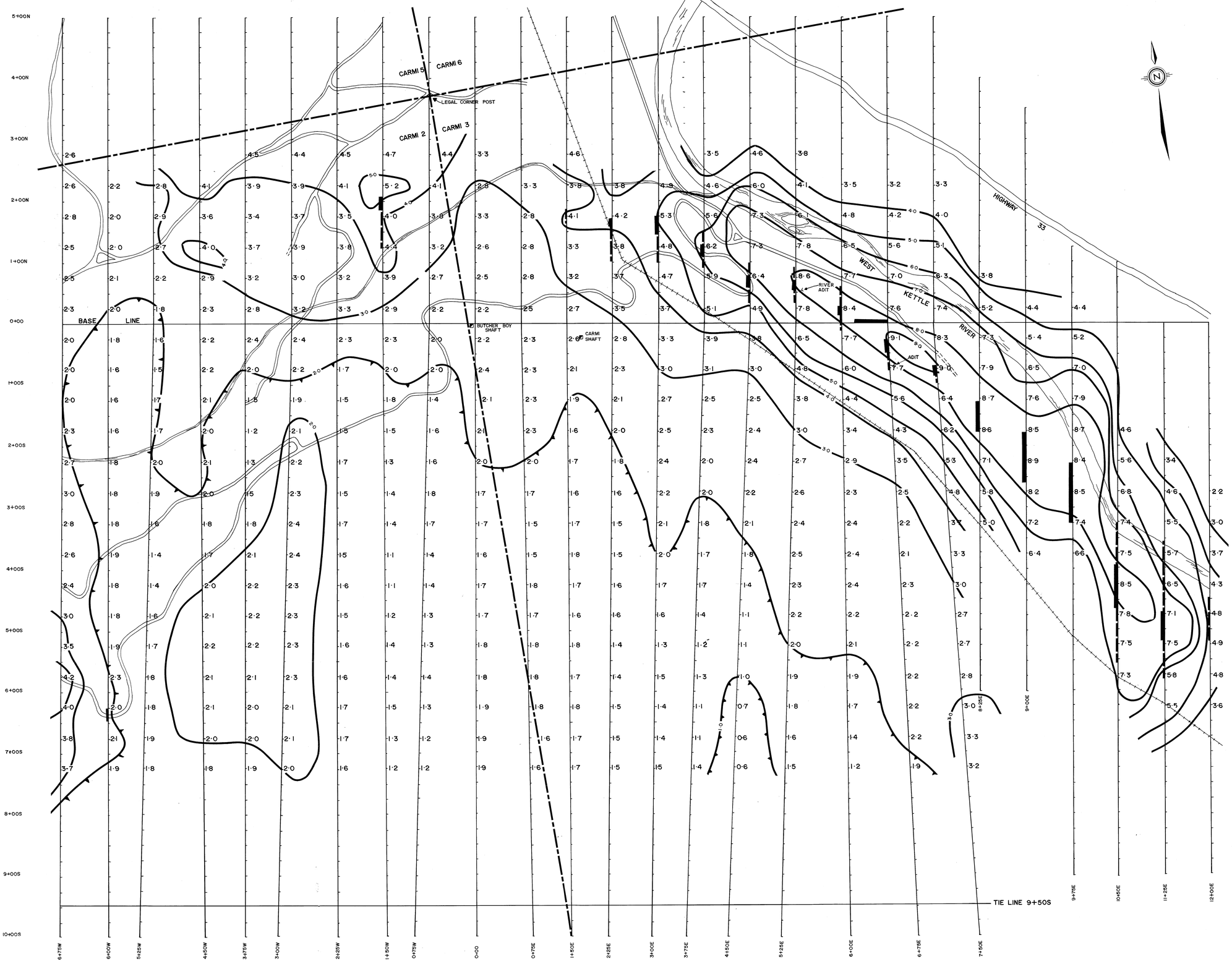
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8867

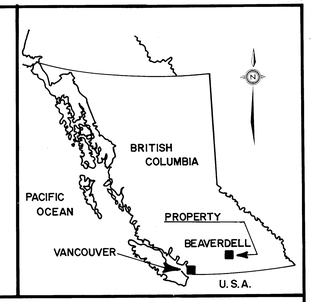
KELVIN ENERGY LIMITED

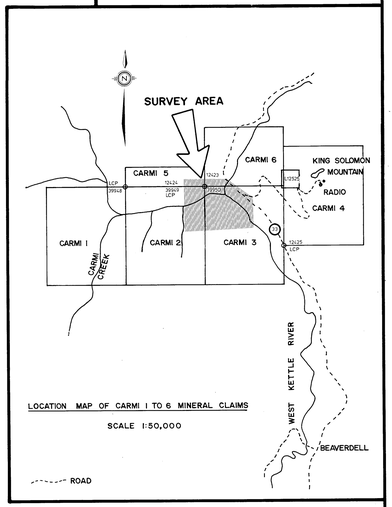
INDUCED POLARIZATION
APPARENT RESISTIVITY
PSEUDO—SECTION

Project No: C—505	By: F. DALIDOWICZ
Scale: 1:2500	Drawn: dmd
Drawing No: 28	Date: OCTOBER, 1980

MPH Consulting Limited







LEGEND

- 2·3 — P.F.E. VALUES
- 2·0 — P.F.E. CONTOURS
- 1·0 — CONTOUR INTERVALS
- P.F.E. LOW
- ANOMALY BARS (DEFINITE)
- WEAKER RESPONSE (PROBABLE) FROM PSEUDO-SECTION DATA BASE
- RAILWAY
- ROAD

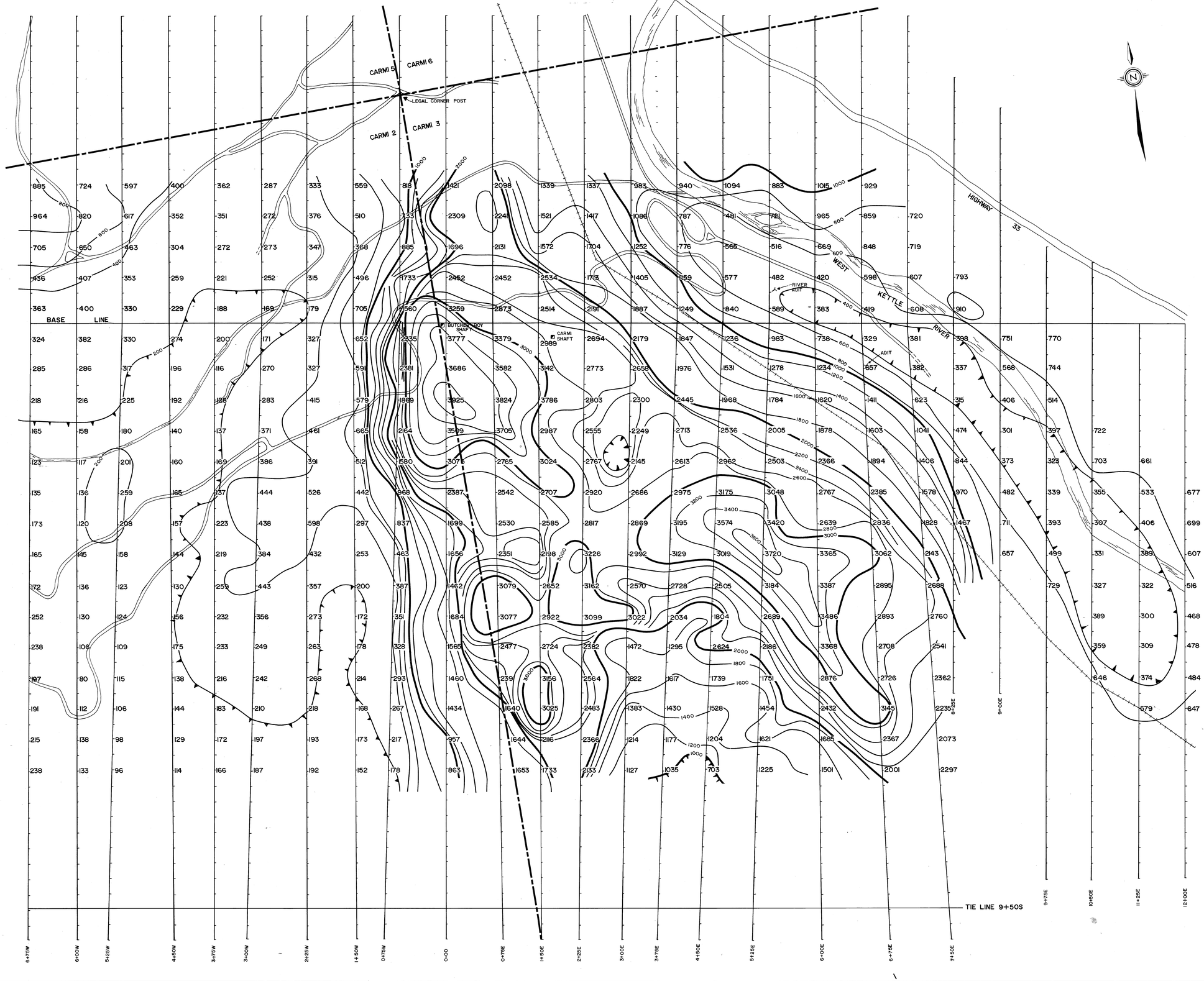
KELVIN ENERGY LTD.

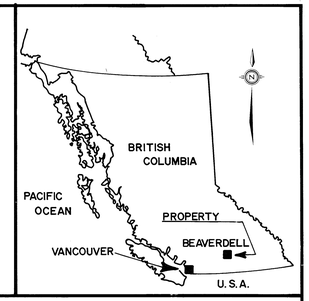
CARMI MINERAL CLAIMS
BEAVERDELL AREA — BRITISH COLUMBIA
INDUCED POLARIZATION
FRASER FILTERED

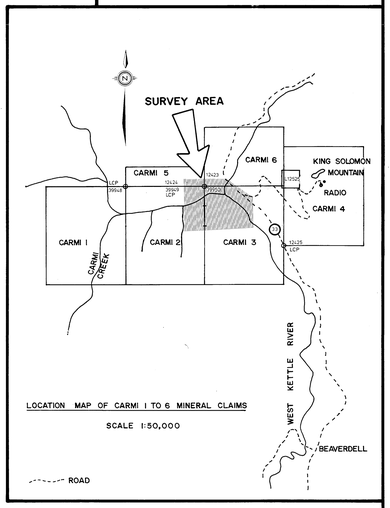
Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2000	Drawn: dmd.
Drawing No: 1	Date: OCTOBER, 1980

F. DALIDOWICZ — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

MPH Consulting Limited







LOCATION MAP OF CARMI 1 TO 6 MINERAL CLAIMS

SCALE 1:50,000

LEGEND

- 3160 — RESISTIVITY VALUES IN OHM METERS
- 1000 — RESISTIVITY CONTOURS
- 200 ohm meters — CONTOUR INTERNAL
- RESISTIVITY LOW
- RAILWAY
- ROAD

0867

KELVIN ENERGY LTD.

CARMI MINERAL CLAIMS
BEAVERDELL AREA — BRITISH COLUMBIA
APPARENT RESISTIVITY
FRASER FILTERED

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2000	Drawn: dmd.
Drawing No: 2	Date: OCTOBER, 1980

MPH Consulting Limited

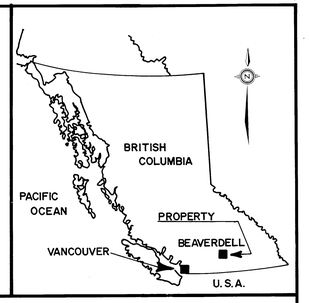
5+00N
4+00N
3+00N
2+00N
1+00N
0+00
1+00S
2+00S
3+00S
4+00S
5+00S
6+00S
7+00S
8+00S
9+00S
10+00S

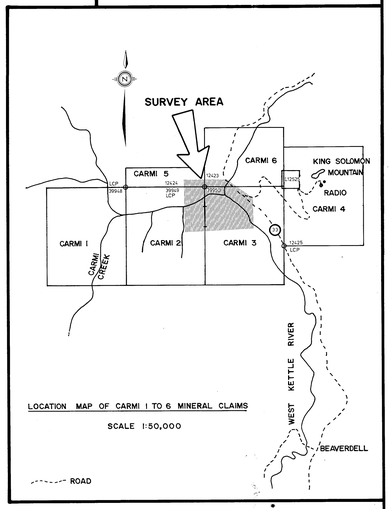
CARMI 5
CARMI 6
CARMI 2
CARMI 3
LEGAL CORNER POST
BASE LINE
BUTCHER BOY SHAFT
CARMI SHAFT
RIVER ADIT
ADIT
WEST KETTLE RIVER
HIGHWAY 33
TIE LINE 9+50S

6+75W 6+00W 5+25W 4+50W 3+75W 3+00W 2+25W 1+50W 0+75W 0+00 0+75E 1+50E 2+25E 3+00E 3+75E 4+50E 5+25E 6+00E 6+75E 7+50E 8+25E 9+00E 9+75E 10+50E 11+25E 12+00E

READING DIRECTION

STATION DIRECTION (CUTLER MAINE 17·8 K·Hz.)





LOCATION MAP OF CARMI 1 TO 6 MINERAL CLAIMS

SCALE 1:50,000

LEGEND

- CONDUCTOR AXIS POOR QUALITY
- CONDUCTOR AXIS GOOD QUALITY
- CONDUCTOR WIDTH
- DIP ANGLE (IN-PHASE)
- QUADRATURE
- +40% / +20% / 0 / -20% / -40% — VERTICAL SCALE
- RAILWAY
- ROAD

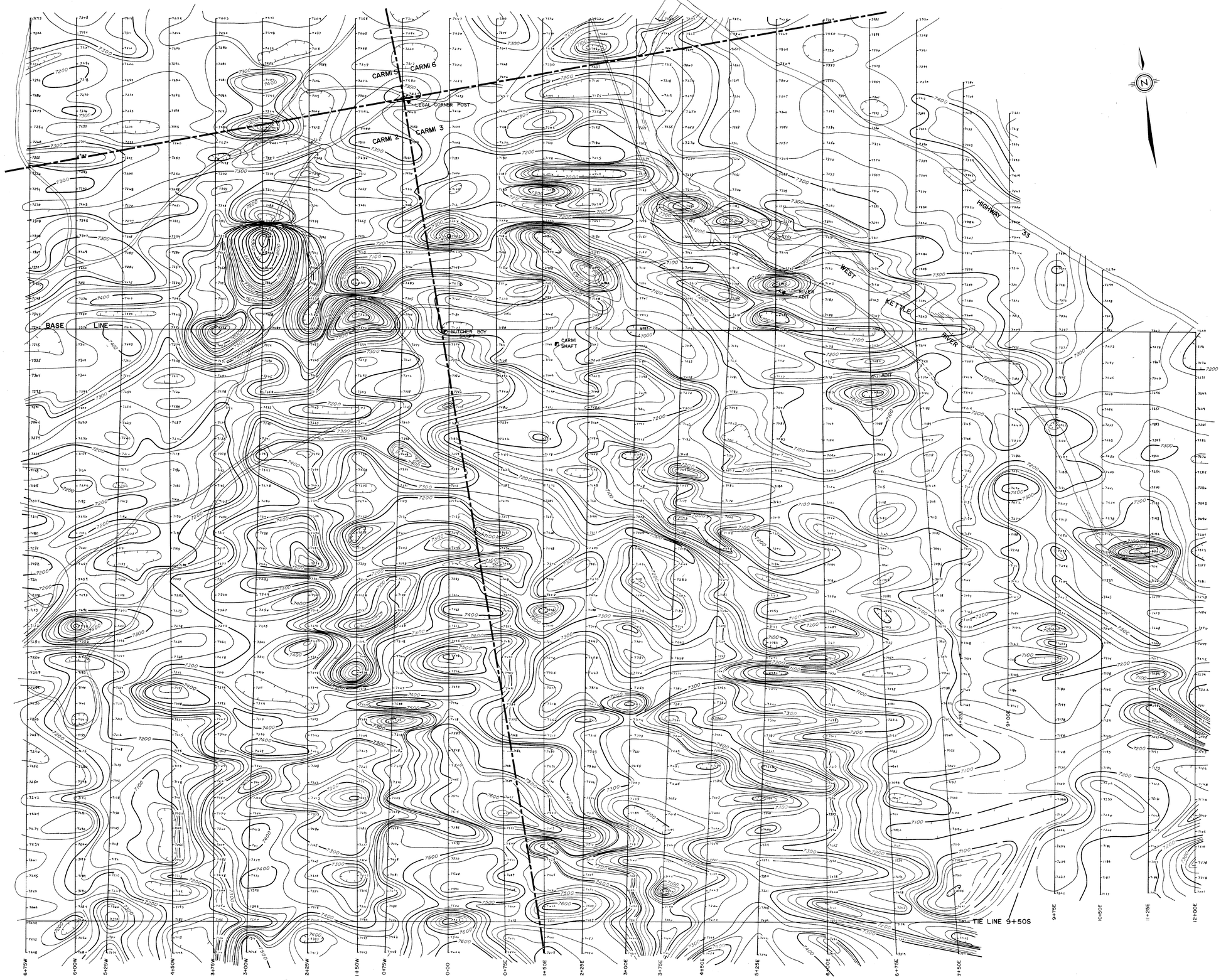
KELVIN ENERGY LTD.

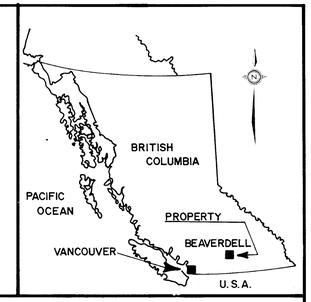
CARMI MINERAL CLAIMS
BEAVERDELL AREA — BRITISH COLUMBIA
VLF ELECTROMAGNETIC SURVEY

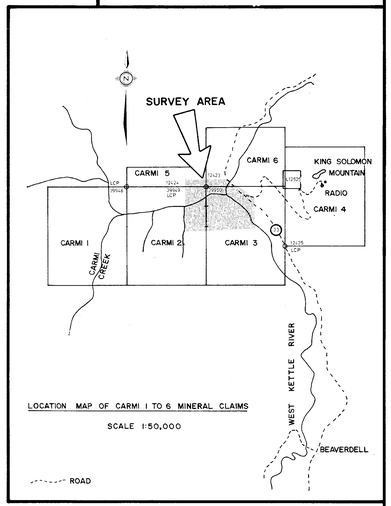
Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2000	Drawn: dmd.
Drawing No: 3	Date: OCTOBER, 1980

F. DALIDOWICZ — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

MPH Consulting Limited







LOCATION MAP OF CARMI 1 TO 6 MINERAL CLAIMS

SCALE 1:50,000

ROAD

LEGEND

- 7214 — MAGNETIC VALUES IN GAMMAS (CORRECTED)
- MAGNETIC CONTOURS
- 25,100 gammas — CONTOUR INTERVALS
- MAG LOW

NOTE ALL READINGS MINUS 50,000 GAMMAS

8867

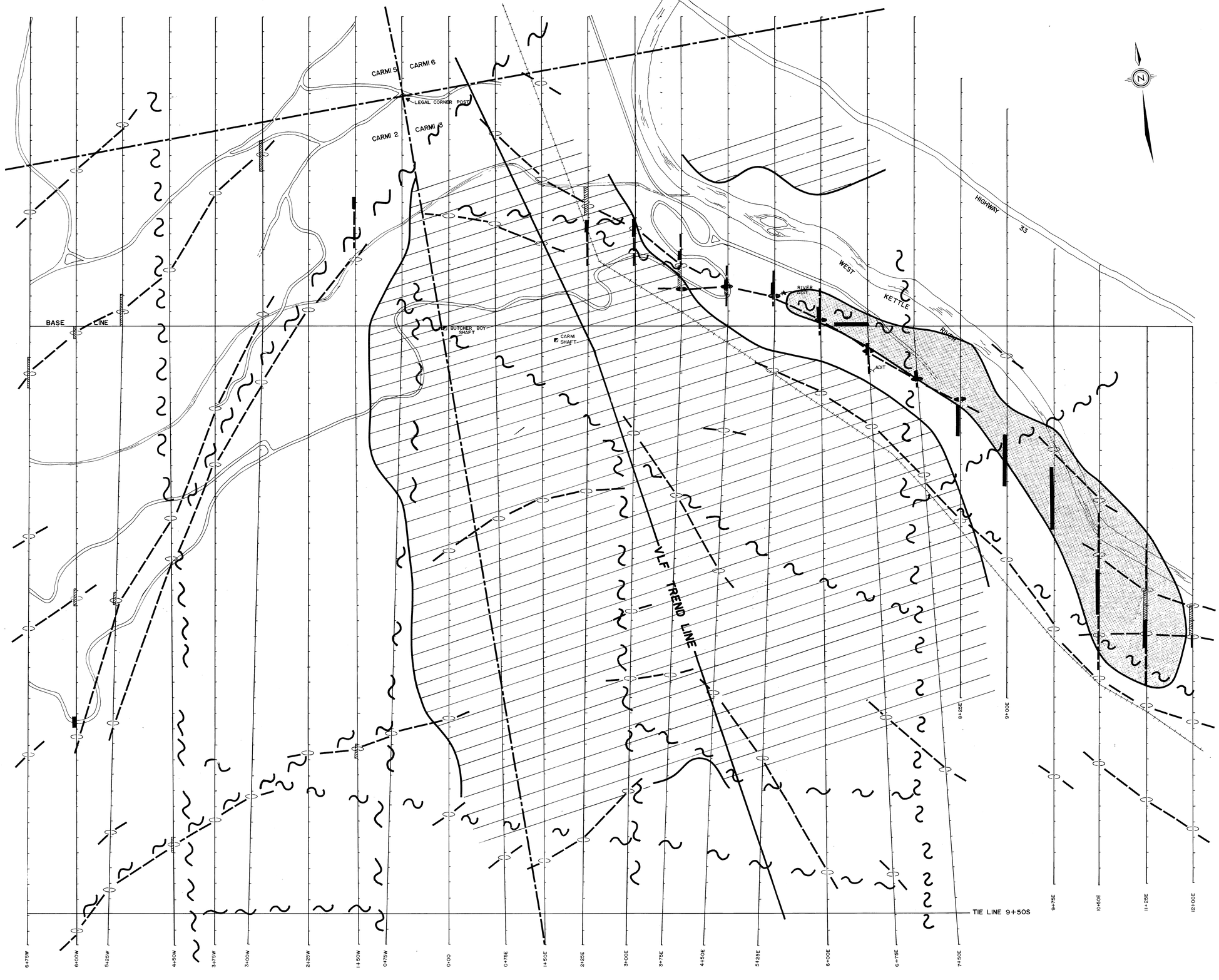
KELVIN ENERGY LTD.

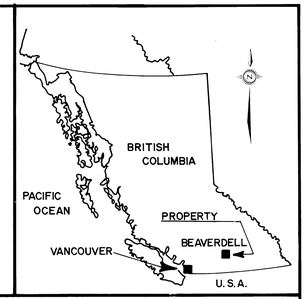
CARMI MINERAL CLAIMS
BEAVERDELL AREA — BRITISH COLUMBIA

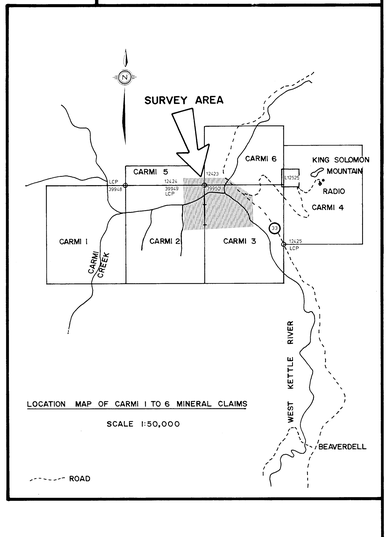
MAGNETOMETER SURVEY

Project No. C-505	By: F. DALIDOWICZ
Scale: 1:2000	Drawn: dmd
Drawing No. 4	Date: OCTOBER, 1980

MPH Consulting Limited







LEGEND

INDUCED POLARIZATION

- I.P. ANOMALY (DEFINITE)
- WEAKER RESPONSE (PROBABLE)

RESISTIVITY

- >1000 OHM-METER MATERIAL
- ANOMALOUS RESISTIVITY 'LOW'

MAGNETICS

- INTERPRETED STRUCTURAL BREAK

VLF

- POOR CONDUCTOR
- GOOD CONDUCTOR
- CONDUCTOR WIDTH

- RAILWAY
- ROAD

KELVIN ENERGY LTD.

CARMI MINERAL CLAIMS
BEAVERDELL AREA — BRITISH COLUMBIA

COMPILATION MAP

Project No: C-505	By: F. DALIDOWICZ
Scale: 1:2000	Drawn: dmd.
Drawing No: C-1	Date: OCTOBER, 1980

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