85-1019-14425

CARTIER RESOURCES INC. 09/86
GEOPHYSICAL REPORT
ON A
MULTIPOLE INDUCED POLARIZATION SURVEY
ON THE
TEXADA ISLAND PROJECT, NANIAMO M.D.

LAT.49°42'N, LONG.124°32'W, NTS92F/10
92F/15

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DATE OF WORK: DECEMBER 1984

DATE OF REPORT: FEBRUARY 1985

Part 2 of 2

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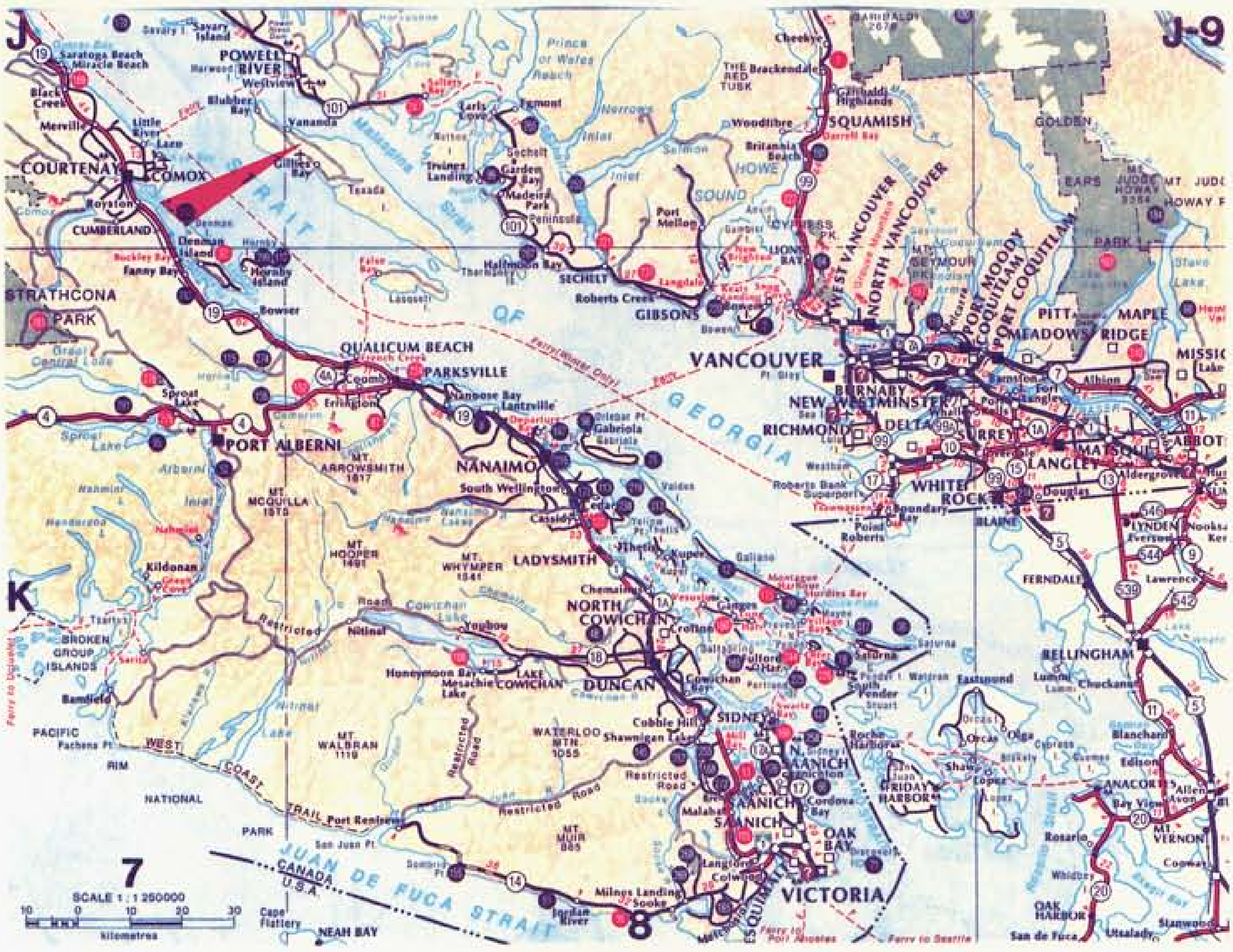
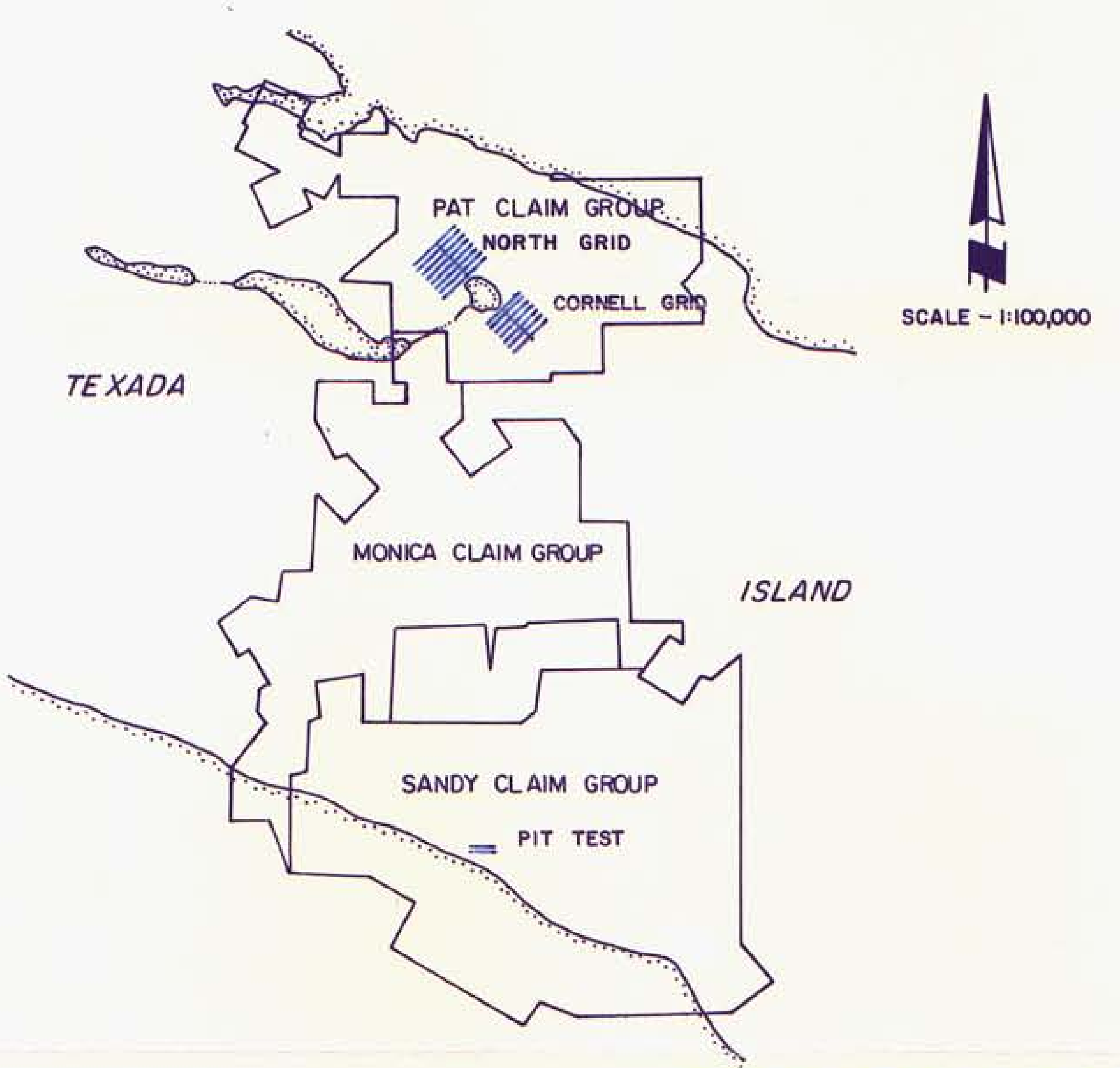
ILLUSTRATIONS





CARTIER RESOURCES INC.

— TEXADA ISLAND PROJECT, N.T.S. 92 F/10 —

LOCATION AND CLAIMS MAP

Glen E. White geophysical consulting & services ltd.

FIGURE 1

INTRODUCTION

During December of 1984 Glen E. White Geophysical Consulting and Services Ltd. conducted a program of multipole induced polarization surveying on the Texada Island Property on behalf of Cartier Resources Inc. The objective of this survey was to provide detailed multi-separation induced polarization data as an aid to drill target delineation in a skarn type mineralization environment.

PROPERTY

Cartier Resources Inc. acquired the outstanding shares of Marble Bay Holdings Ltd., thereby acquiring an option on the claims, grants and leases comprising the Texada Island Property. This property is a contiguous block of 96 staked claims, 31 crown granted claims and 3 mineral leases. The original option is with Ideal Basic Industries Inc. and Ideal Cement Company (B.C.) Ltd. The land tenure is very complex and is tabulated in reference (25), Schedule Index, Texada Island Mineral Properties - Marble Bay Holdings Ltd.

The property covers an area of approximately 2100 hectares.

LOCATION AND ACCESS

The claim block is at the north end of Texada Island located in the Strait of Georgia approximately 50 miles northwest of Vancouver. The central point of the property is at 49° - 43'N latitude, 124° -32'W longitude. (Figure 1). The property is located in the Naniamo Mining Division on NTS map sheets 92F/10E and 92F/15E.

Access is via paved highway north from Vancouver to Powell River then by ferry from Powell River to Vananda village on Texada Island. AIR B.C. flies regularly scheduled flights to the airport located between Vananda and Gillies Bay 5 miles to the south. Roads are present primarily along the coasts and provide access to most of the property.

HISTORY AND PREVIOUS WORK

The history of the Texada Island Property is described by L.D.S. Winter in his report dated June 19, 1984, excerpted:

> "Copper, gold and silver mineralization was discovered on Texada Island in the early 1870's and reports of mining activity were first made to the British Columbia Minister of Mines in 1874. By 1886 G.M. Dawson of the Canadian Geological Survey recognized that the best showings were located in the north end of the island. By 1897 both the Cornell and the Little Billie deposits were in production followed by the Marble Bay in 1899. Texada Mine (limited production for flux) in 1900 and in 1907 by the Copper Queen. In 1914 R.G. McConnell of the Geological Survey of Canada produced Memoir 58 describing the geology and mineral resources of Texada Island. Mining continued until 1952 at one or more of the deposits with the Little Billie the last to close. Up to this time all the discoveries were made by prospecting and land ownership was very fragmented.
>
> In 1961 Kaiser Aluminum and Chemical Company re-opened the Texada Mine, primarily for its iron content, but significant amount of copper, gold and silver were recovered by the time the mine closed in 1976. The production history from the property now held by Cartier Resources Inc. is summarized in table 2.
>
> Exploration since the 1950's was centred on the search for magnetite deposits and thus consisted of air-borne magnetics followed by ground surveys. This work was primarily done by Texada Mines who also contracted several electromagnetic surveys in 1971 but no new discoveries resulted.

Ideal Basic Industries and Ideal Cement Company acquired the present claim block in 1977, including the Texada Mine property. In 1978 a lease agreement was concluded with Shima Resources Ltd. for exploration of the property, excluding limestone, which was and is being mined by Ideal. Shima Resources Ltd. completed extensive gravity surveys over the property in an attempt to outline the diorite intrusives and associated skarn-hosted mineralization. Detailed magnetic, VLF-EM and induced polarization surveys were completed over three of the gravity highs. As a result of these surveys 6 diamond drill holes tested the Little Billie gravity anomaly area.

In a report dated March 7, 1980 K.C. Fahrni, P.Eng., recommended 12 additional drill holes; 8 holes on the Little Billie anomaly and 2 each on the Basic II and Lake North anomalies. Holes SR80-1 to 5 inclusive were completed on the Little Billie anomaly while holes SR80-6 to 8 inclusive tested the Lake North anomaly. Two additional holes, SR80-9 and 10, tested the Basic II anomaly. The drill results were not encouraging; SR80-1 encountered 0.069% molybdenum over 7.5 feet and holes SR80-2 to 5 failed to detect the mineralization intersected in hole SR79-1. Hole SR80-7 cut 3.3 feet of 0.082 ounces gold per ton in basement volcanic and no mineralization was encountered in the Basic II anomaly drilling."

REGIONAL AND PROPERTY GEOLOGY

The geology of the Texada Island property and region is described in the above mentioned report and is excerpted as follows:

"The first systematic mapping of Texada Island was by the Geological Survey of Canada (Richardson, 1873) followed by Dawson's survey of the coastline in 1885. In 1897 Kimball published an article on the magnetite deposits and descriptions of the area in the Annual Reports of the B.C. Minister of Mines in 1897, 1899 and 1903 followed. Leroy, (1908) of the Geological Survey of Canada studied the area and Lindeman, also of the G.S.C. described the iron deposits in 1907. Memoir 58 by McConnell for the G.S.C. in 1914 was the most comprehensive study of the area.

The Anderson Bay Formation occurs mainly on the southern end of Texada Island and consists of an alternating series of slates, quartzites, conglomerates, marbles, tuffs, agglomerates, schists and amygdaloidal basalts. They are well bedded and have been intensely metamorphosed and tilted to a sub-vertical position. The formation is approximately 3500 feet thick, strikes north-south and dips steeply west. The Anderson Bay Formation is unconformably overlain by the Marble Bay Formation and is in extrusive contact with the Texada Formation. No significant mineralization is known from the Anderson Bay Formation.

The northern end of Texada Island is underlain by the Marble Bay Formation limestones which are at least 1000 feet thick and which rest unconformably on the Anderson Bay Formation. They have been gently folded and complexly faulted, both pre- and post-mineralization. These sediments are poorly-bedded, low-magnesium limestones with minor chert beds and they have been partially recrystallized. Skarn areas within the Marble Bay Formation contain large amounts of calc-silicate minerals such as diopside, wollastonite, epidote, grossularite and andradite plus quartz feldspar and barite. The known copper-gold-silver deposits are confined to this formation.

The Texada Formation covers the majority of Texada Island and consists of massive, mafic volcanic rocks (porphyrites) which are a mixture of plagioclase, augite, hornblende, epidote and iron minerals. A few minor limestone beds occur within the formation. It is considered that the Texada Formation is both extrusive and intrusive (sub-volcanic) in nature based on local relationships. The Texada Formation contains numerous fissure zones carrying small quantities of iron and copper minerals, galena, sphalerite and infrequently native gold. In addition, magnetite lenses are found in limestone beds within the Texada Formation.

Diorite and quartz diorite stocks and dikes intrude the Marble Bay and Texada Formations. These intrusions are considered to be related to the Coast Plutonic Complex and most skarn mineralization is proximal to these dikes and stocks. McConnell (1914) and most other workers in the area have considered the diorites to be the source of the mineralizing fluids responsible for the Texada Island deposits. The structures that controlled the localization of the intrusives are also considered to have controlled the localization of mineralization.

Cretaceous sandstones occur in isolated pockets along the west coast of Texada Island and are considered to represent the erosional surface of the Texada Formation. Mineralization is not known in the Cretaceous units.

On Texada Island both the Texada Formation and the Marble Bay Formation are more or less mineralized. However, the most important zones of mineralization are confined to a small area near to and south of Vananda village on the northeast side of the island and a small area on the west coast, both in the Marble Bay Formation.

There are numerous small mineral showings on the island that have been staked and re-staked since the 1870's. These showings plus the main deposits can be divided into two main types: skarn contact replacements and quartz veins. The skarn contact replacement deposits are by far the most important type and in turn they can be divided into two types:
A) Copper-gold-silver deposits and,
B) Iron-copper-(gold-silver) deposits.

Type A is represented by former producers such as the Marble Bay, Little Billie, Copper Queen and Cornell while the Texada Mine represents the Type B deposits.

The economically important copper-gold-silver deposits are confined to a 0.6 mile radius to the south of Vananda village. These deposits are usually in skarn in limestones at or near the contact with later diorite intrusions. This Type A mineralization is also known along the Marble Bay - Texada Formation contact but is usually uneconomic. The Marble Bay and Cornell Mines both occur at the contact of small diorite plugs while the Copper Queen Mine is situated along a diorite dike. The Little Billie Mine occurs near a felsic quartz-diorite stock.

These copper-gold-silver deposits consist of irregularly shaped bodies containing bornite and chalcopyrite with pyrite, magnetite, sphalerite, galena, molybdenite, scheelite, gold and silver. The Marble Bay, Cornell and Copper Queen deposits carried average gold values of approximately 0.50 ounces gold per ton (McConnell, 1914) with free gold being reported from the Cornell and Copper Queen deposits. Native silver has been described from the Marble Bay property."

MULTIPOLE INDUCED POLARIZATION SURVEY

The multipole induced polarization method is a technique which exploits the rapid signal acquisition and processing capabilities available with current micro computer technology. With this technique the potential field information is obtained through a multiconductor cable having 36 takeouts at 25 metre intervals. The cable is presently configured as up to six end and position interchangeable cables of 150 metre length. The takeouts are addressed by the 40 channel multiplexer assembly in a specially configured HP-3497A data acquisition system as 25 metre to 275 metre dipoles. The data acquisition system is driven by a HP-85 computer, allowing the data to be stacked in the computer for a number of cycles at full precision until a criteria is reached. Ten windows on the secondary voltage are compiled, as well as the primary voltage information. Time zero is sensed by direct reference to the transmitter timing circuitry. The cable is scanned simultaneously in groups of five dipoles and the decay curves presented graphically for acceptance and logging or rejection and rescan by the operator. The data is logged on digital tape cartridges and is readily accessed in the field in order to produce pseudo-sections. These tapes are read by a HP-9845 computer for further processing and production of final report ready sections.

The primary field power is provided by a Huntec MK IV 2.5 kw transmitter operated in time domain mode which is driven by a 400 H_z, 120 volt three phase motor generator. The transmitted signal is an alternate cycle reversing current pulse of two second on and two second off time. The current is introduced into the ground through two current electrodes for each scan of the potential cable. By scanning the cable for each of several current stake positions both along the cable and off the ends of the cable a strong measure of redundancy of coverage of a given depth point is assured. The stacking of this multiple scan information in the computer results in an improved determination of the geoelectric section.

The apparent resistivity is obtained from the ratio of the primary voltage measured on the potential dipole during the current on part of the cycle to the current flowing through the current electrodes. A geometric factor is computed from the electrode locations to arrive at the apparent resistivity, measured in ohm-metres.

The apparent chargeability is calculated from the ten secondary voltage windows as the area under the secondary decay curve and is measured in milliseconds.

DISCUSSION OF RFSULTS

North Grid

The data is presented in pseudo section format on Figures 7-16. The 50 metre dipole apparent chargeability and apparent resistivity data is posted and contoured on Figures 2 and 3 as an aid to line to line correlation of anomalous trends.

The chargeability anomalies show considerable variation from line to line in amplitude, extent and character. As is to be expected in a skarn situation, the response have the character of complex, but generally ellipsoid zones rather than strike extended or tabular zones.

The strongest response observed on this grid occurs on line 00N. This zone, illustrated in pseudo section on Figure 16 is a complex extended feature. The core of the apparent chargeability response occurs to a depth of six separations and is correlated with an apparent resistivity low. The apparent chargeability responses of greater than 10 times background without regard to depth or depth extent of response are shaded as anomalous areas on both Figures 2 and 3. As with Zone A these features have a large halo of lower chargeability response and are flanked by numerous weaker or more limited chargeability highs. The resistivity lows are very often correlated within the diorite intrusive. The chargeability responses are not as well correlated with either an apparent resistivity low or the intrusive. An example of a distinct apparent resistivity anomaly without a strong polarizable expression occurs on line 300N, Figure 11, between 25E and 175E and the contrary, between 200W and 275W on line 700N, Figure 7.

Zone A, the strong chargeability response discussed in example above, is correlated onto line 100N and is evident, but weak on line 200N. Zone B flanks this feature and occurs within a very broad apparent resistivity low which is open to the east. The apparent resistivity low continues through line 300N and on line 400N correlates with Zone C, an isolated response present only in the upper separations.

Zone D is an anomaly of large areal extent but poor depth extent narrowing from between stations 75W to 50E on line 700N to a single dipole anomaly on line 500N, Figure 9. Zone E is present only on line 600N and is open to the east. Zone F which correlates between lines 700N and 600N is complex somewhat poorly defined anomaly.

Apart from the apparent resistivity anomalies that are associated with chargeability responses a number of apparent resistivity contrasts are present. Away from the disruptive influence of the intrusive, an apparent resistivity high is traceable over 700 metres of strike length from 250W on line 00N through to 350W on line 700N. To the east of this a moderate low extends from 150W on line 00N to 175W on line 400N. The apparent resistivity low offset to the east of Zone F may be a resumption of this trend.

Lines 200N and 300N were tested immediately southeast of the Copper Queen mine site. The strongest feature detected was Zone H on line 200N, Figure 14, which possesses good depth extent, registering in all separations. It is possible that the anomaly on line 200N is correlated with a moderate high on line 300N, Figure 12, near 675E. Zone G is a somewhat diffuse response although of high amplitude.

Both these lines occur in an area of overall low apparent resistivities and no direct correlation of the chargeability response and apparent resistivity lows are evident.

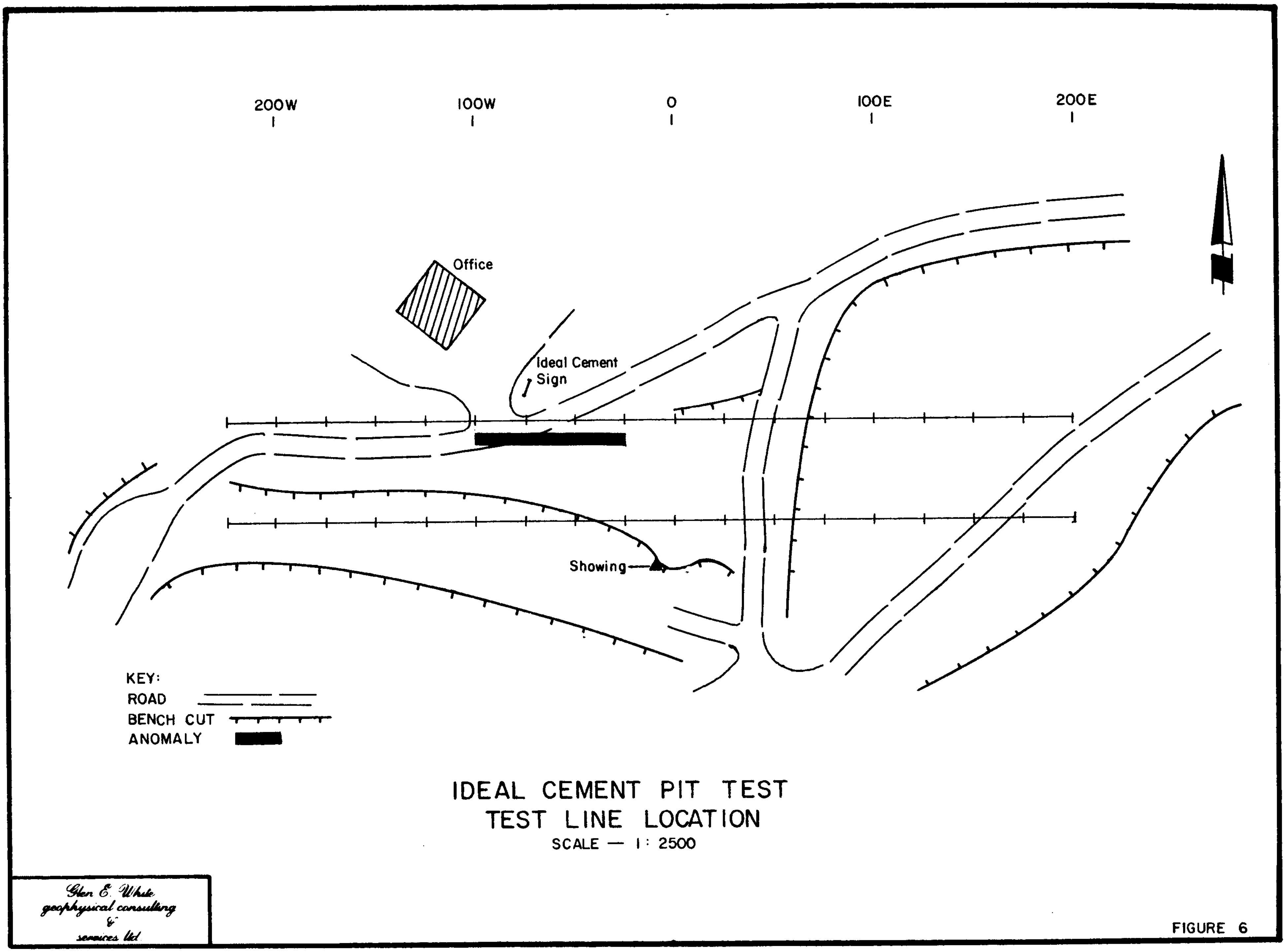
Cornell Grid

The apparent chargeability and apparent resistivity data are illustrated in pseudo-section on Figures 17-30. As above, the fifty metre dipole data is posted and contoured on Figures 4 and 5. The Cornell Grid was sampled at 50 metre line spacings allowing close scrutiny of strike behavior. The responses are as irregular in extent as those observed on the North Grid. Again the interpreted plan projection of the chargeability anomalous zones are shaded as an aid to documentation on both Figures.

A similar overall pattern is evident in the plan maps to that observed on the North Grid. An extensive apparent resistivity low occurs in the vicinity of the diorite intrusive. An apparent chargeability response, labelled Zone A on Figures 4 and 5, is present in this area. Zone A exhibits a very linear and well defined western boundary and a complex eastern boundary. This may be due to a strong structural control element very near the baseline.

The Zone A chargeability response is offset to the west side of the 100-300 ohm-m low on lines 00S and 50S. Further to the south it undergoes marked changes in character and amplitude. In several locations, such as on line 200S, Figure 22, two or more chargeable zones are resolved within or periferal to the apparent resistivity low. Progressively towards the south the resistivity low becomes less pronounced and any associated chargeability responses are registered in shallow separations only.

Zone B occurs as a more deep seated feature on line 50S and is most strongly expressed on line 100S as a very compact zone. It may be possible to correlate this across lines to the most eastern appendage of Zone A on line 150S.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100W
0
100E
200E
Office
Ideal Cement
Sign
Showing
KEY:
ROAD
BENCH CUT
ANOMALY
IDEAL CEMENT PIT TEST
TEST LINE LOCATION
SCALE — 1: 2500
Glen E. White
geophysical consulting
&
services ltd

FIGURE 6

Zone C is similar to Zone F on the North Grid in as much as the apparent chargeability response occurs without the association of a pervasive apparent resistivity low. As with Zone A the zone is resolved into discrete sources at two points along strike, lines 150S and 250S.

Three isolated apparent chargeability highs are observed, Zone D on line 300S and Zones E and F on line 550S. Zone F is imbedded within a well defined apparent resistivity low.

Ideal Cement Pit Test

Two lines traversing the mineralized showing in the Ideal Cement limestone pit were run. The line locations are illustrated on Figure 6 and the data is displayed in pseudo-section Figures 31 and 32. Line 00N did not exhibit apparent chargeability responses above background. Line 50N, however, possesses a very well defined response through eight separations. The core of the anomaly exists within a marked apparent resistivity low, with the remainder within a moderate low.

SUMMARY AND CONCLUSIONS

A program of multipole induced polarization surveying was undertaken on the Texada Island Project on behalf of Cartier Resources Inc. This survey delineated numerous anomalous responses in coverage obtained in four main areas.

The data obtained on the North and Cornell Grids is dominated by the apparent chargeability and apparent resistivity responses associated with and periferal to the diorite intrusive. The most favourable targets in these areas are high apparent chargeability responses occurring near the edges of the apparent resistivity lows associated with the diorite.

Examples of these include the western edge of the chargeability high at 0W on line 00N and the zone at 25E on line 200S. As a part of the analysis of the Phase I program data the potential of apparent chargeability anomalies remote from the diorite which occur without apparent resistivity lows, such as Zone B at 100W on line 00S, should be evaluated.

Apparent chargeability anomalies were detected in the survey coverage of extension lines 300N and 200N in the Copper Queen mine site area and on line 50N of the Ideal Cement limestone pit test. These anomalies warrant trenching and or diamond drill followup.

Respectfully submitted,

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Geophysicist

Glen E. White B.Sc.,P.Eng.,
Consulting Geophysicist

HP-85A Specifications

OPERATING SYSTEM

ROM .... 32K bytes

USER READ/WRITE MEMORY

Standard .... 16K bytes
Expansion memory module .... 16K bytes

DYNAMIC RANGE

Real precision: -9.99999999999E499 to -1E-499, 0 and 1E-499 to 9.99999999999E499
Short precision: -9.9999E99 to -1E-99, 0, 1E-99 to 9.9999E99
Integer precision: -99999 to 99999

BUILT-IN FUNCTIONS

Mathematical and trigonometric functions are included in the following table with average execution times in msec.

Absolute (ABS)	0.83
Fractional part (FP)	1.01
Integer part (IP)	2.56
Maximum (MAX)	6.42
Minimum (MIN)	6.19
Modules (MOD)	2.21
ln (LOG)	32.11
log (LGT)	26.63
e^x (EXP)	24.54
Raise to power (Y↑X)	43.92
Random number (RND)	3.54
Sign (SGN)	0.90
Square root (SQR)	8.74
Sine (SIN)	45.62
Cosine (COS)	45.69
Tangent (TAN)	27.27
Arcsine (ASN)	43.23
Arccosine (ACS)	43.98
Arctangent (ATN)	22.76
Cosecant (CSC)	51.68
Secant (SEC)	51.72
Cotangent (COT)	27.29
+	1.08
−	1.12
÷	5.92
•	2.85
Ceiling (CEIL)	2.91
Floor (FLOOR)	3.33

Built-in Operators
Logic: AND, OR, NOT, EXOR
Relational: =, >, <, <=, >=, <> (or #)

CRT DISPLAY

Size .... 127 mm (5 in.) diagonal
Capacity:
Alphanumeric ...... 16 lines × 32 characters
Graphics .... 192 × 256 dots
Scrolling capacity ..... 64 lines
Character set .... 256 characters; set of 128 + same set underscored
Character font .... 5- × 7-dot matrix
Intensity .... adjustable to 32 ft-lamberts
Cursor .... underline

CLOCK AND TIMERS

Time is maintained as seconds since midnight, along with year and day in year. Three timers can be programmed to generate individual interrupts periodically, at intervals from 0.5 msec to 99,999,999 msec (1.16 days).

BEEPER

The beeper is programmable with parameters for duration and tone. The frequency range is appro›'mately 0 to 4,575 Hz.

OPERATING REQUIREMENTS

Source .... 115 Vac nominal (90-127 Vac)
230 Vac nominal (200-254 Vac)
Line frequency .... 50-60 Hz
Consumption ..... 40 watts nominal
HP-85A operating temperature .... 5° to 40°C (40° to 105°F)
HP-85A storage temperature .... -40° to 65°C (-40° to 150°F)
HP-83A operating temperature .... 0° to 55°C (32° to 131°F)
HP-83A storage temperature .... -40° to 75°C (-40° to 167°F)
Ambient humidity .... 5% to 80% at 40°C

SIZE AND WEIGHT

Height .... 15.9 cm (6.3 in.)
Width .... 41.9 cm (16.5 in.)
Depth .... 45.2 cm (17.8 in.)
HP-85A Weight:
net .... 9.1 kg (20 lbs)
shipping .... 16.8 kg (37 lbs)
HP-83A Weight:
net .... 7.3 kg (16 lbs)
shipping .... 15.0 kg (33 lbs)

BASIC FUNCTIONS AND STATEMENTS

System Functions

ABS—Absolute value of the numeric expression.
ACS—Principal value (1st or 2nd quadrant) of the arccosine of the numeric expression in the current angular units.
ASN—Principal value (1st or 4th quadrant) of the arcsine of the numeric expression in the current angular units.
ATN—Principal value (1st or 4th quadrant) of the arctangent of the numeric expression in the current angular units.
ATN2—Arctangent of Y/X in proper quadrant.
CEIL—Smallest integer greater than or equal to the numeric expression.
COS—Cosine.
COT—Cotangent.
CSC—Cosecant.
DATE—Julian date in the format YYDDD, assuming system timer was set.
DTR—Converts the value of the numeric expression from degrees to radians.
EPS—A constant equal to the smallest positive real precision number, 1E-499.
ERRL—Line number of latest error.
ERRN—Error number of latest error.
EXP—Value of Napierian e raised to the power of the computed expression.
FLOOR—Largest integer less than or equal to the evaluated expression.
FP—Fractional part of the evaluated expression.
INF—A constant equal to the largest real number possible, 9.99999999999E499.
INT—Largest integer less than or equal to the evaluated expression (equivalent to FLOOR).
IP—Integer part of the numeric expression.
LGT—Common logarithm (base 10) of a positive numeric expression.
LOG—Natural logarithm (base e) of a positive numeric expression.
MAX—Larger of two values.
MIN—Smaller of two values.
PI—Numerical value of pi.
RMD—Remainder resulting from a division operation according to X-(Y*IP(X/Y)).
RND—Generates a number that is greater than or equal to zero and less than one, using a predetermined, pseudo-random sequence.
RTD—Converts the value of the numeric expression from radians to degrees.
SEC—Secant.
SGN—Returns a 1 if the expression is positive, -1 if negative, and 0 if exactly 0.
SIN—Sine.
SQR—Square root of a positive numeric expression.
TAN—Tangent.
TIME—Returns the time in seconds since midnight if the timer is set, or since machine turn-on otherwise, resetting automatically after 24 hours.

String Functions

CHR$—Converts a numeric value between 0 and 255 into a character corresponding to that value.
LEN—Returns the number of characters in a string.
NUM—Returns the decimal value corresponding to the first character of the string expression.
POS—Returns the position of the first character of a substring within another string or 0 if the substring is not found.
UPC$—Converts all lowercase letters in a string to uppercase letters.
VAL—Returns as a numeric value, including exponent, a string of digits so that the value may be used in calculations.
VAL$—Returns the value of a numeric expression as a string of digits.

General Statements and Programmable Commands

BEEP—Outputs a tone of specified frequency for a specified duration.
CLEAR—Clears the CRT.
COM – Dimensions and reserves memory so chained programs can access the same data.
CRT IS—Allows the definition of either a printer or the actual CRT as the current CRT.
DATA—Provides constants and text characters for use with READ statements.
DEFAULT ON—Makes numeric overflows, underflows, and the use of uninitialized variables non-fatal by substituting an appropriate approximate value.
DEFAULT OFF—Makes numeric overflows, underflows, and the use of uninitialized variables fatal.
DEF FN—Defines a single- or multiple-line function.
DEG—Sets degree mode for evaluation and output of the arguments and results of trigonometric functions.
DIM—Declares the size and dimensions of array and string variables.
DISP—Outputs the values or text on the current CRT.
DISP USING—Displays values and text according to format specified by IMAGE statement or literal IMAGE.
END—Terminates program execution (same as STOP).
FLIP—Changes the keyboard from BASIC mode to typewriter mode or vice versa.
FN END—Terminates a multiple-line function.
FOR/NEXT—Defines a program loop and the number of iterations.
GOSUB—Transfers program control to a subroutine and allows subsequent return of control.
GOTO—Transfers program execution to the specified line.
GRAD—Sets grad mode for evaluation and output of the arguments and results of trigonometric functions.
IF...THEN...ELSE—Allows statements to be either executed or bypassed depending on the outcome of a logical expression.
IMAGE—Specifies the format used with PRINT USING or DISP USING statements.
INPUT—Allows entry of values or text from the keyboard during program execution.
INTEGER—Declares variables as integers as well as the size and dimensions of integer arrays.
KEY LABEL—Displays in the lower portion of the CRT, an eight-character prompt for each Special Function Key defined by an ON KEY statement. Also returns cursor to upper left corner of the CRT.
LET—Assigns a value to a variable or array element.
LIST—Lists the program on the CRT IS device. Also outputs bytes remaining at the end of a program.
NORMAL—Cancels the effect of the PRINT ALL, AUTO, or TRACE statements.
ON ERROR—Sets up a branch to the specified line or subroutine anytime an error occurs.
OFF ERROR—Cancels any ON ERROR statement previously executed.
ON KEY #—Sets up a branch to the specified line or subroutine each time the Special Function Key is pressed.

SPECIFICATIONS TABLES

SYSTEM ACCURACY SPECIFICATIONS

These system specifications combine individual accuracy specifications to result in a total measurement accuracy specification. For example, the resistance specifications combine the DVM, current source and acquisition assembly error terms.

Voltage Measured Through Acquisition Assembly

3497A Configuration:
DVM: 5½ digit, auto zero on
Relays Switches: Tree Switched

Accuracy: ±(% of reading + number of counts)

90 Days 23°C ± 5°C

Voltmeter Range	Digits Displayed 5½ digits	4½ digits	3½ digits
0.1V	0.007 + 5	0.01 + 2	0.1 + 1
1.0V	0.006 + 1	0.01 + 1	0.1 + 1
10.0V	0.006 + 1	0.01 + 1	0.1 + 1
100.0V	0.006 + 1	0.01 + 1	0.1 + 1

Resistance Measured Through an Acquisition Assembly

3497A Configuration:
DVM: 5½ digit, auto zero on
Current Source: As indicated
Relay Switches: Configured for a 4-terminal resistance measurement

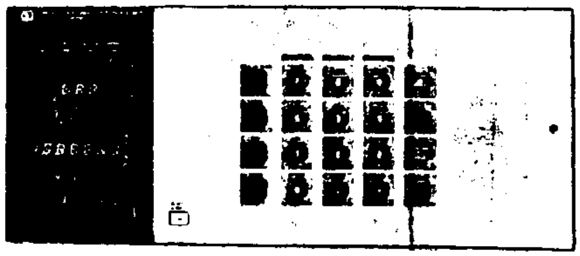
Characteristics

Effective Resistance Range	Effective Resistance Resolution	Current Source Range	Range
100 Ω	1 mΩ	1 mA	.100000
1 kΩ	10 mΩ	100 μA	1.00000
10 kΩ	100 mΩ	100 μA	10.0000
100 kΩ	1 Ω	10 μA	10.0000

Accuracy: ±(% of reading + number of counts)

90 Days 23°C ± 5°C

Range Relays (Opt. 010)	Digits Displayed 5½ digits	4½ digits	3½ digits
100 Ω	.032 + 5	.035 + 2	0.125 + 1
1 kΩ	.032 + 5	.035 + 2	0.125 + 1
10 kΩ	.032 + 5	.035 + 2	0.125 + 1
100 kΩ	.031 + 2	.035 + 2	0.125 + 1



System Noise Rejection

Normal Mode Rejection (NMR): (50 or 60 Hz + .09%)

DVM Digits Displayed	Rejection
5½	60 dB
4½	0 dB
3½	0 dB

NMR is a function of the 3497A DVM configuration only and is not affected by the number of channels in the system.

Effective Common Mode Rejection (ECMR): The ECMR of a 3497A based system is a combination of the ECMR of the 3497A DVM and the effects of adding multiplexer assemblies and 3498A extenders.

ECMR: 1(kΩ imbalance in low lead, using tree switching, ac at 50 or 60 Hz, 25°C, <85% R.H.)

Voltmeter Configuration

Number of Acquisition Channels (Options 10,20)		5½ digits	4½ digits	3½ digits
0	AC	150 dB	90 dB	90 dB
	DC	120 dB	120 dB	120 dB
<100	AC	150 dB	90 dB	90 dB
	DC	104 dB	104 dB	104 dB
<400	AC	140 dB	80 dB	80 dB
	DC	92 dB	92 dB	92 dB
<1000	AC	130 dB	70 dB	70 dB
	DC	85 dB	85 dB	85 dB

Measurement Speeds

For the 3497A DVM and the relay multiplexer. Speeds are given for measurements on random channels (using software channel selection) and sequential channels (using external hardware increment). Speeds include I/O times to the indicated computers.

	Number of Digits Selected	85	Computer 9826*	1000L	1000E,F
Sequential Channels using external increment	5½ digits	39(33)**	39	39(25)	30(25)
	4½ digits	97(88)	103	108(79)	88(79)
	3½ digits	112(107)	123	127(99)	107(99)
Random Channels using software	5½ digits	13(15)	27	21(16)	22(16)
	4½ digits	14(21)	51	31(28)	35(30)
	3½ digits	14(23)	55	33(29)	35(32)

*9826 speeds for BASIC operating system

**50 Hz speeds in ( )

TIMER/REAL TIME CLOCK

Clock Format

Month:Day:Hours:Minutes:Seconds (Option 230)
Day:Month:Hours:Minutes:Seconds (Option 231)

	Maximum Time	Resolution	Accuracy	Output
Real Time Mode	1 year	1 second	±(.005% of time + .1s)	Display and HP-IB
Elapsed Time Mode	10^6 seconds	1 second	±(.005% of time + .1s)	Display and HP-IB
Time Alarm Mode	24 hours	1 second	±(.005% of time + .1s)	HP-IB SRQ
Time Interval Mode	24 hours	1 second	±(.005% of time + .1s)	50 μS TTL Pulse + HP-IB SRQ
Time Output Mode	1 second	100 μS	±(.02% of time)	16 μS TTL Pulse
Power Failure Protection: Battery back-up for >24 hours for time and elapsed time only				

3497A MAINFRAME AUXILIARY INPUTS/OUTPUTS

Ext Trig. Input: TTL Compatible
Minimum pulse width: 50 n seconds

Ext Incr. Input: TTL Compatible
Minimum pulse width: 50 μ seconds

BBM Sync: TTL Compatible
This terminal serves as a break before make synchronizing signal to the 3497A and other equipment. The terminal is both an input and output with a low level indicating a channel is closed. The 3497A will not close any additional channels until the line is sensed high and the line will float high when all channels are open.

VM Complete Output: TTL Compatible
Pulse width = 500 n seconds

Channel Closed Output: TTL Compatible
Pulse width = 500 n seconds

Timer Interval Output: TTL Compatible
Output port for the time interval and time output functions.

Physical Parameters

Size (3497A or 3498A): 190.5 mm (7½ in.) high
428.6 mm (16 7/8 in.) wide
520.7 mm (20½ in.) deep
An additional two inches in depth should be allowed for wiring.

Net Weight:

	3497A	3498A
Maximum (with assemblies in all slots)	20.4 kg (45 lbs.)	20.4 kg (45 lbs.)

STATEMENT OF QUALIFICATIONS

Name:	CANDY, Clifford, E.
Profession:	Geophysicist
Education:	B.Sc., Geophysics University of British Columbia
Professional Associations:	Society of Exploration Geophysicists British Columbia Geophysical Society
Experience:	Six years Geophysicist with Glen E. White Geophysical Consulting and Services Ltd., with work in B.C., Yukon, Quebec, Saskatchewan, southwestern U.S.A. and Ireland.

STATEMENT OF QUALIFICATIONS

NAME:	WHITE, Glen E., P.Eng.
PROFESSION:	Geophysicist
EDUCATION:	B.Sc. Geophysicist - Geology University of British Columbia.
PROFESSIONAL ASSOCIATIONS:	Registered Professional Engineer, Province of British Columbia. Associate member of Society of Exploration Geophysicists. Past President of B.C. Society of Mining Geophysicists.
EXPERIENCE:	Pre-Graduate experience in Geology - Geochemistry - Geophysics with Anaconda American Brass. Two years Mining Geophysicist with Sulmac Exploration Ltd. and Airborne Geophysics with Spartan Air Services Ltd. One year Mining Geophysicist and Technical Sales Manager in the Pacific north-west for W.P. McGill and Associates. Two years Mining Geophysicist and supervisor Airborne and Ground Geophysical Divisions with Geo-X Surveys Ltd. Two years Chief Geophysicist Tri-Con Exploration Surveys Ltd. Twelve years Consulting Geophysicist. Active experience in all Geologic provinces of Canada.

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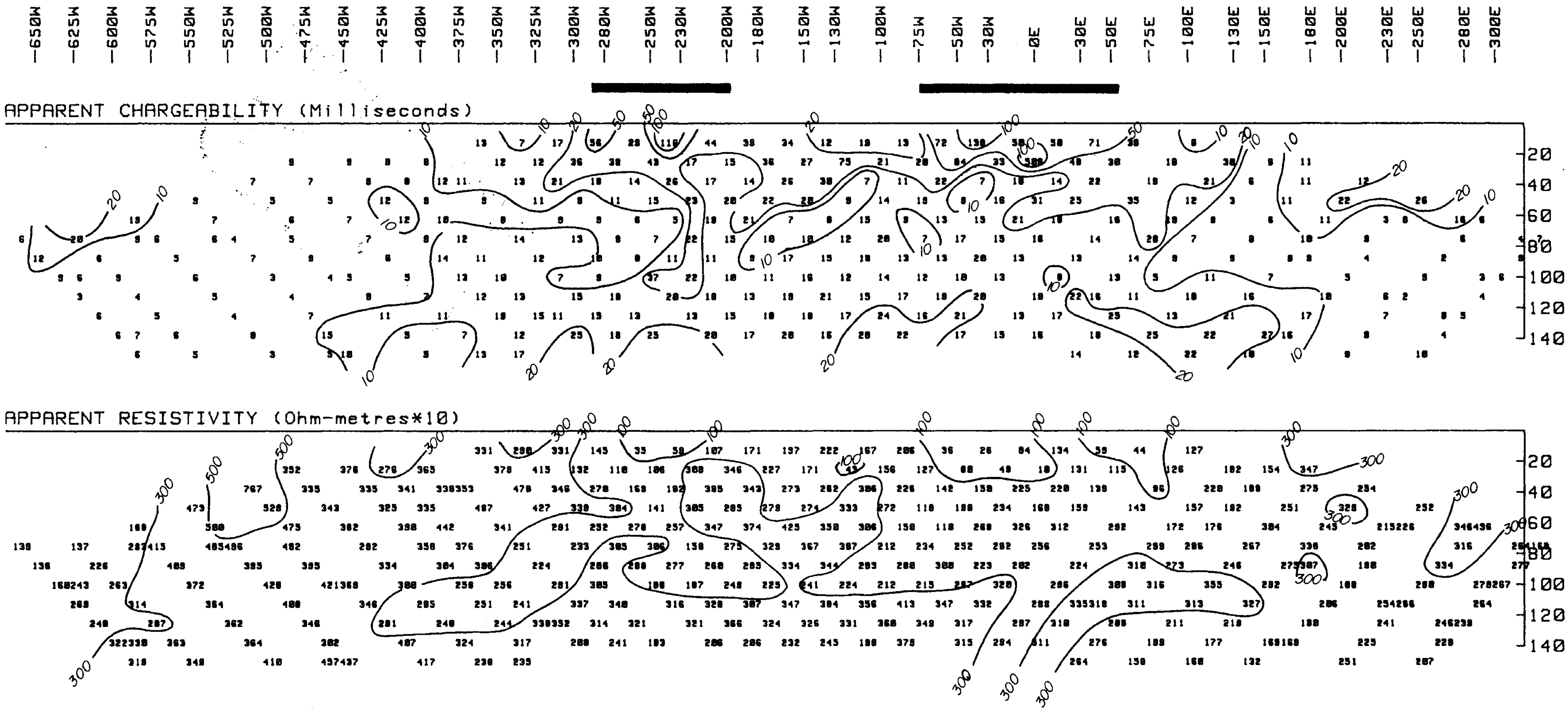


METRES
0 25 50 75 100

CARTIER RESOURCES INC.

NORTH GRID

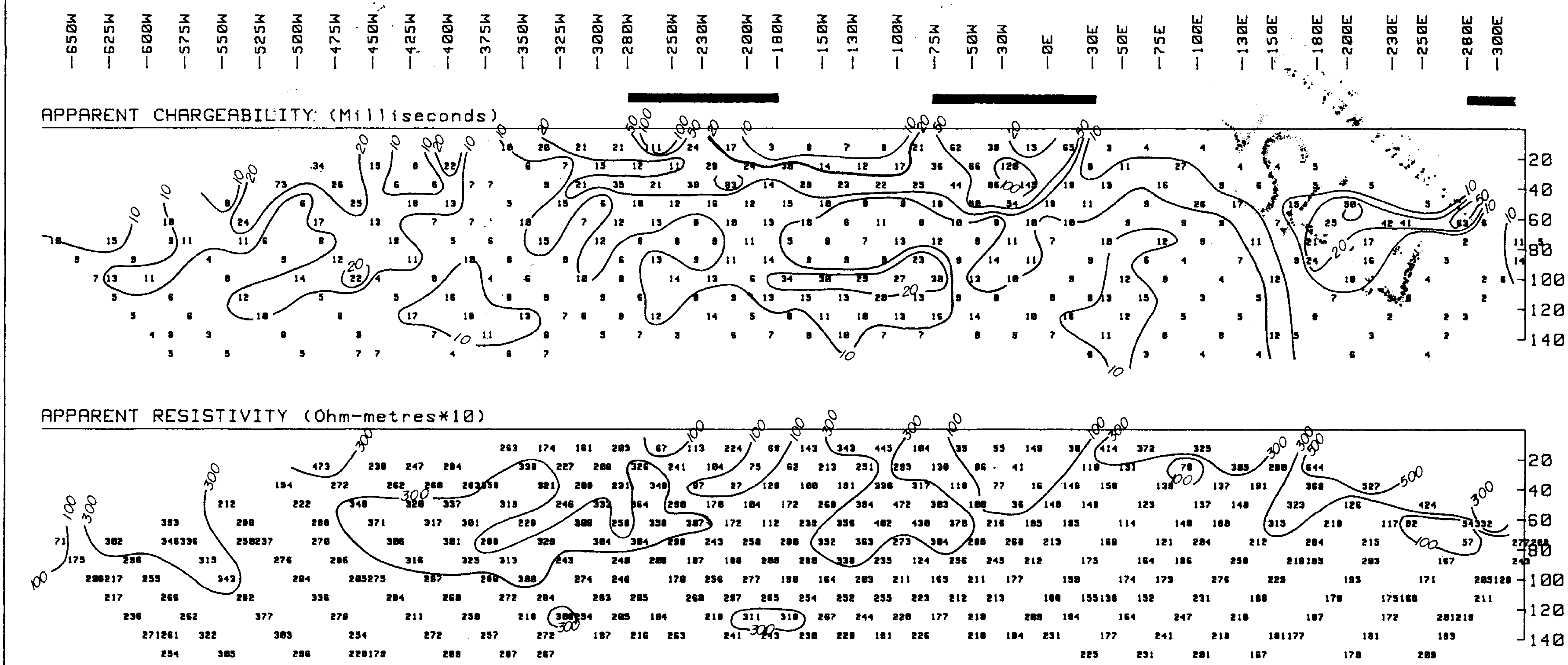
MULTIPOLE INDUCED POLARIZATION SURVEY

LINE 700N

DATE: DEC/84	FIG.: 7

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

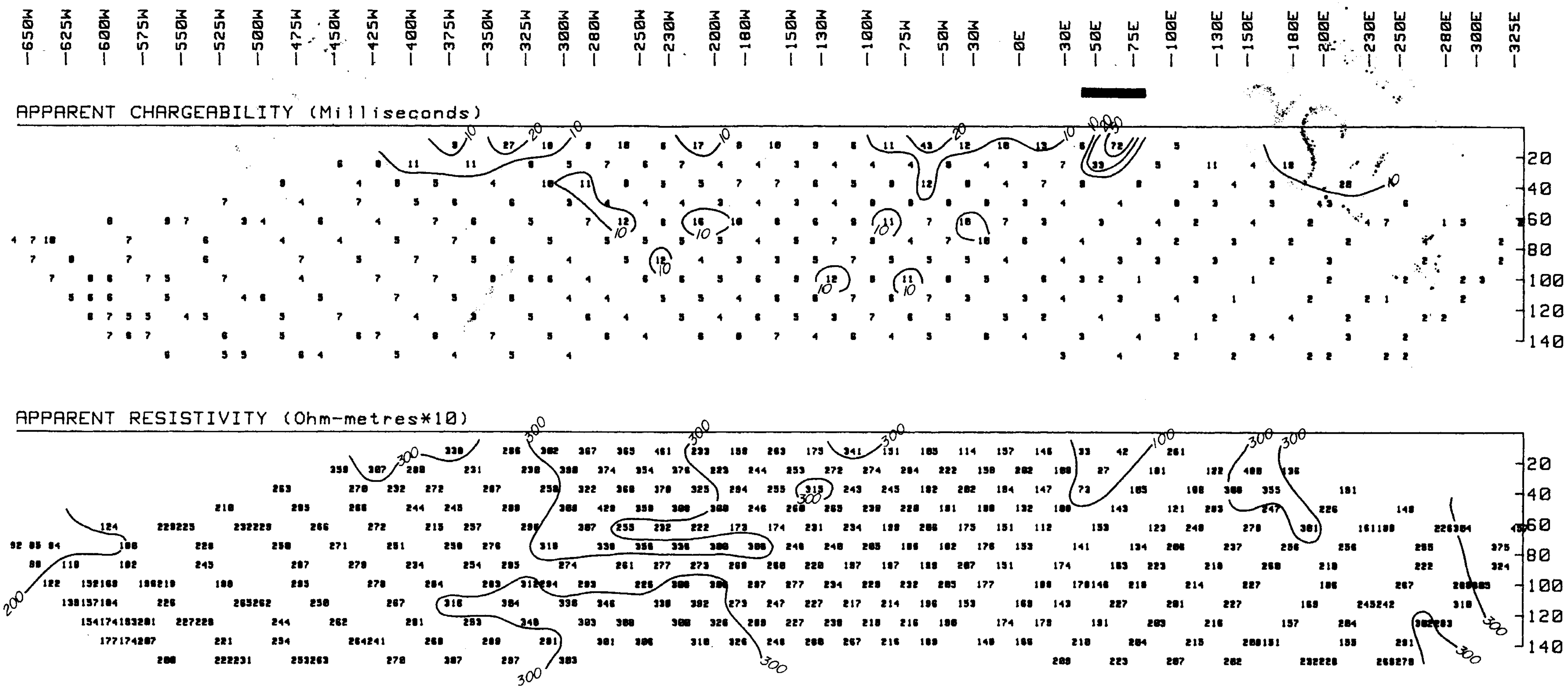
LINE 600N

DATE: DEC/84

FIG.: 8

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

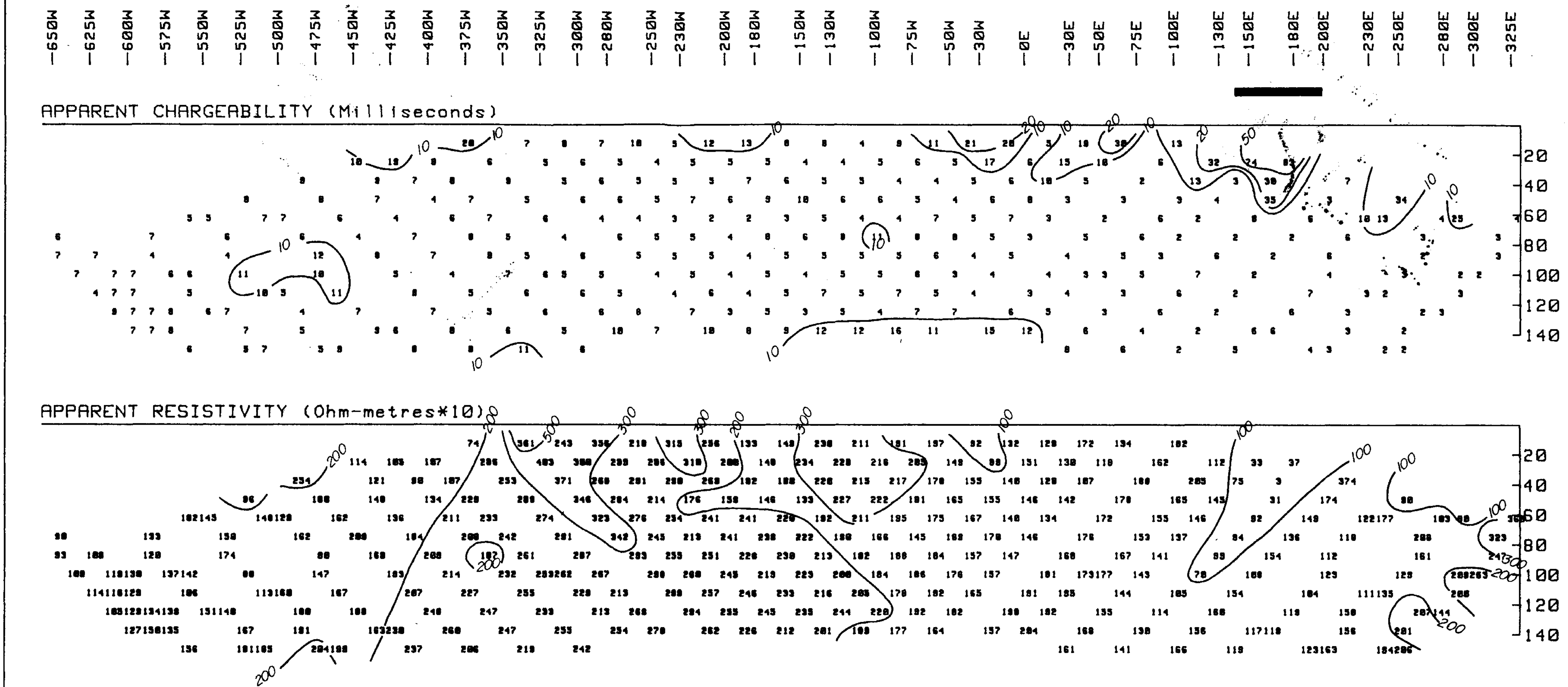
LINE 500N

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

DATE: DEC/84

FIG.: 9



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

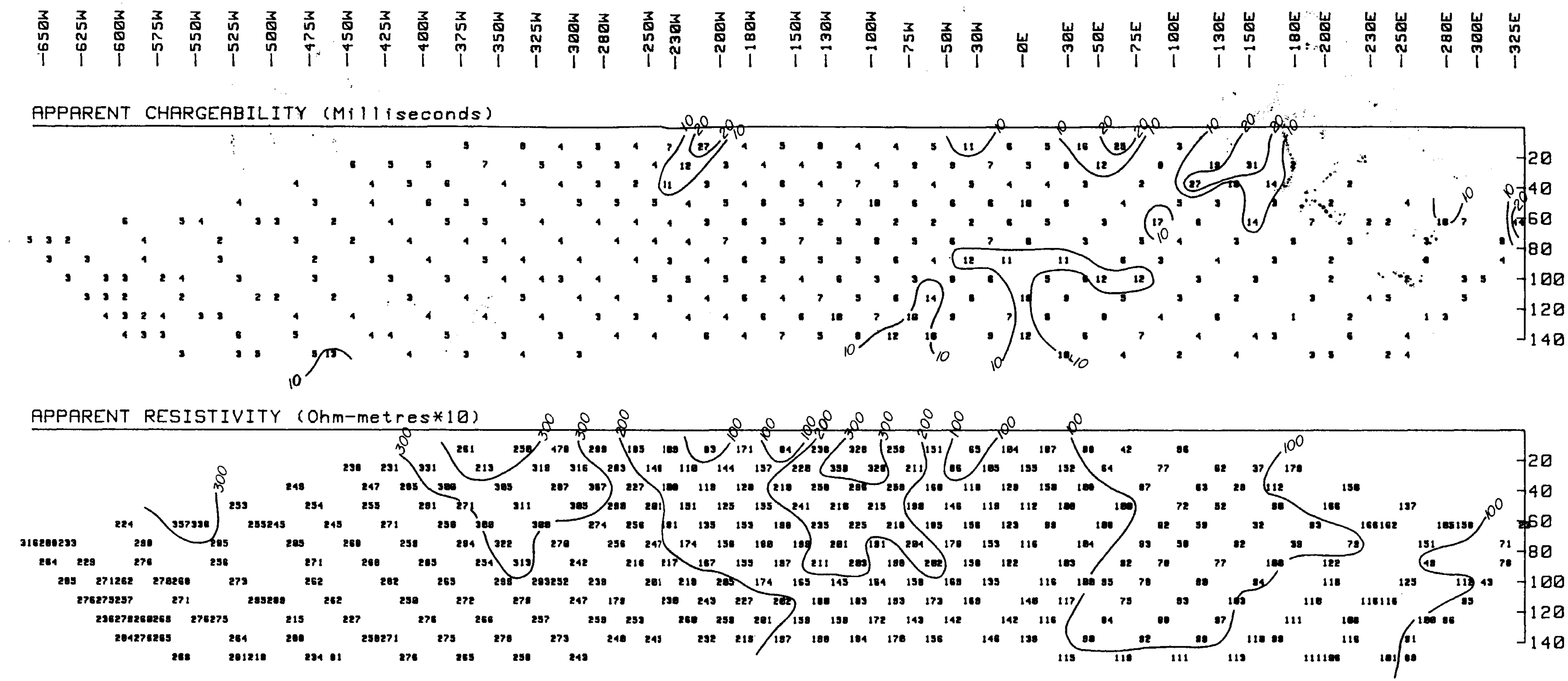
LINE 400N

DATE: DEC/84

FIG.: 10

INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.



CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

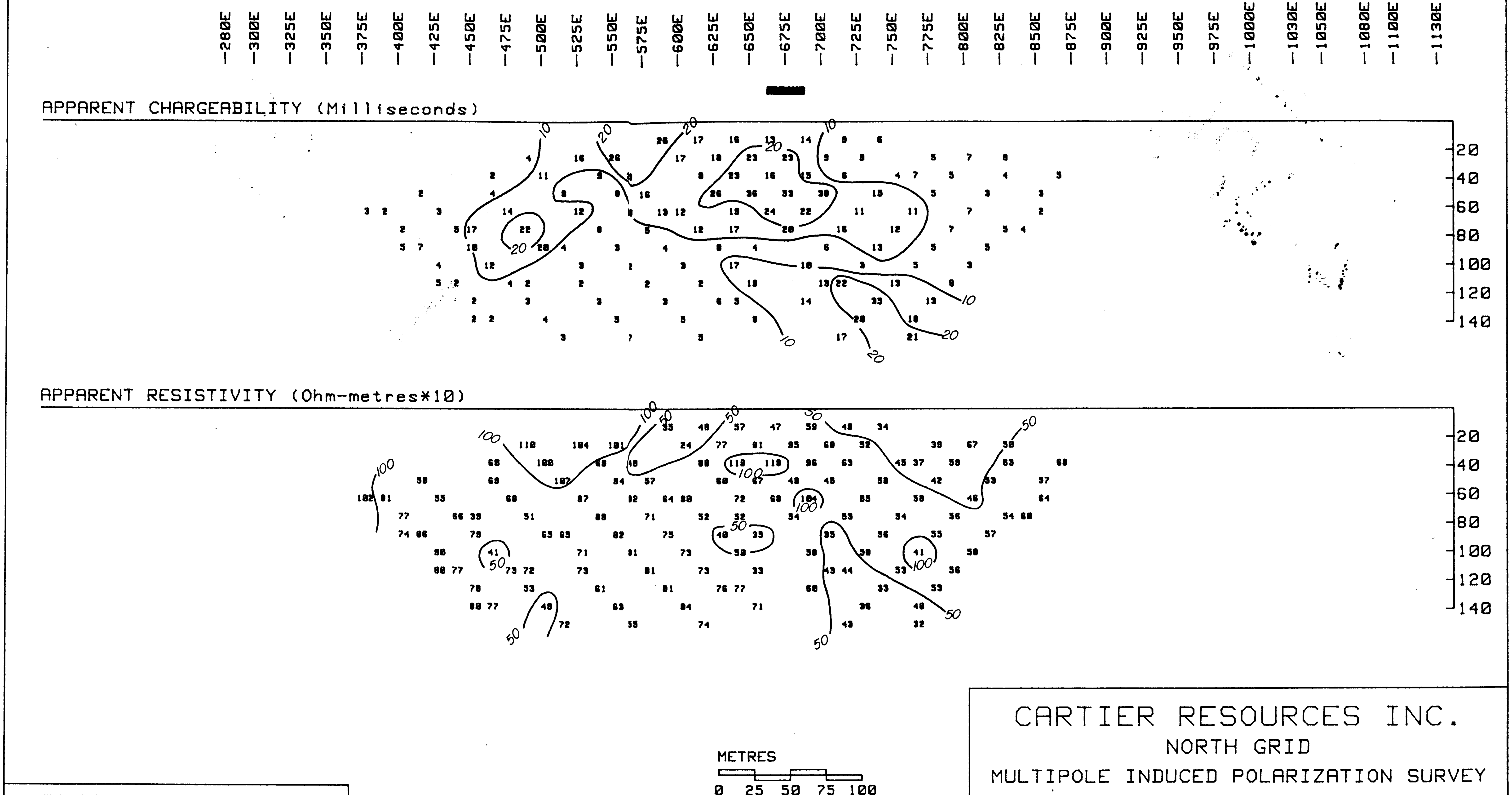
LINE 300N

DATE: DEC/84

FIG.: 11

INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.



CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

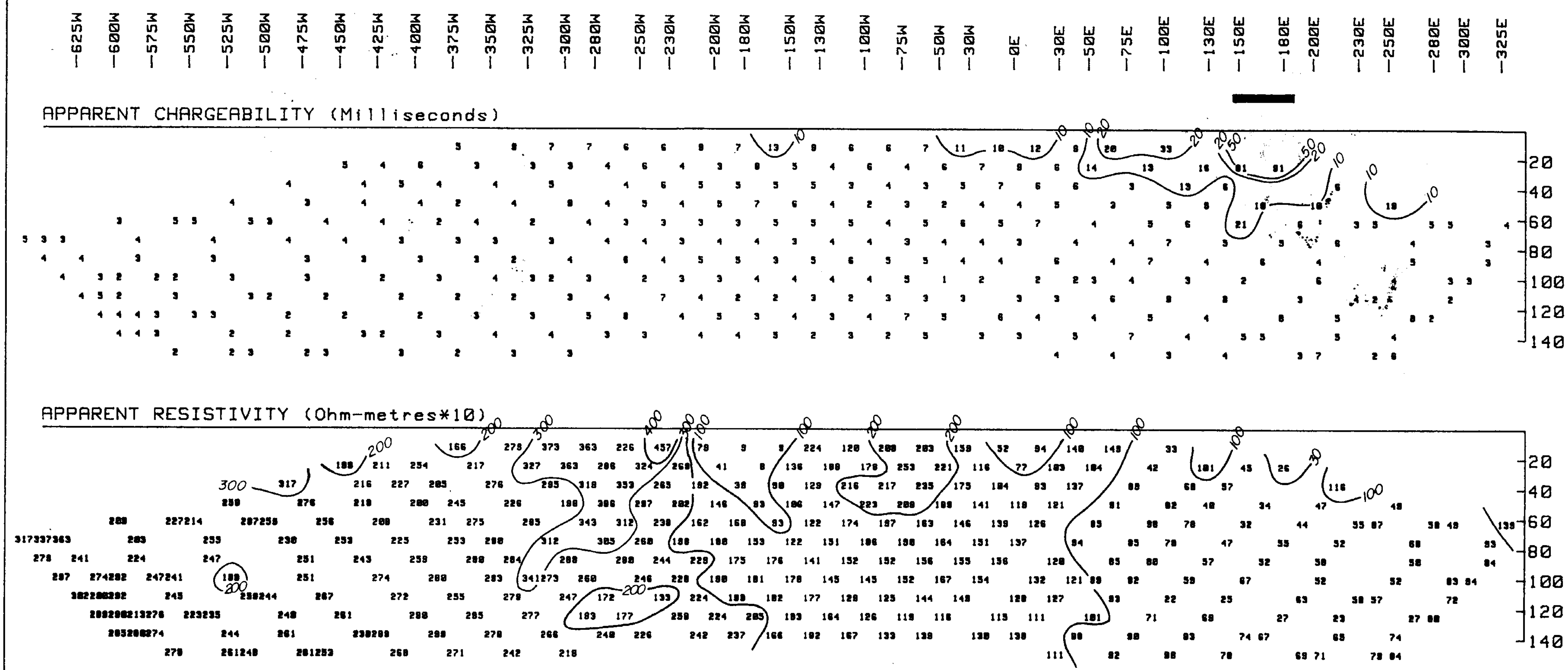
LINE 300N

DATE: DEC/84

FIG.: 12

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

NORTH GRID

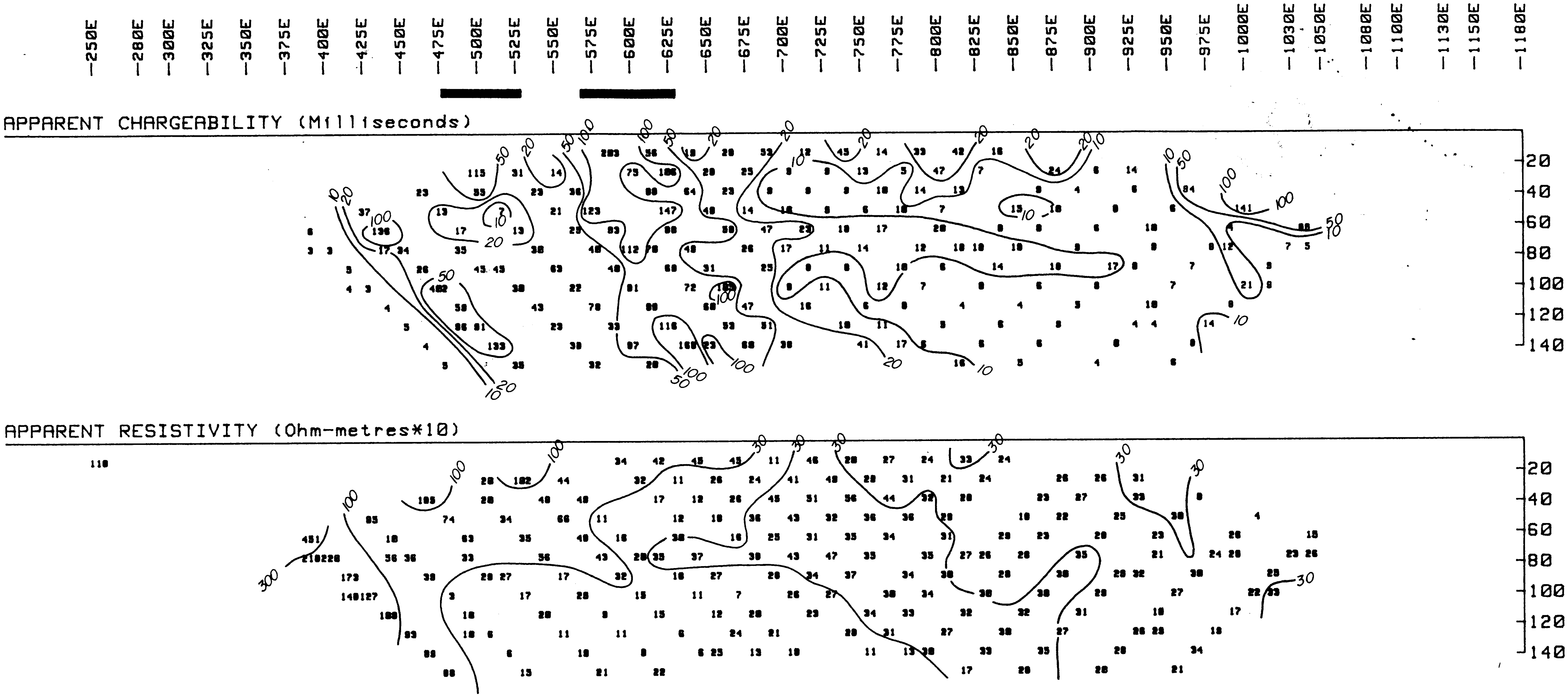
MULTIPOLE INDUCED POLARIZATION SURVEY

LINE 200N

DATE: DEC/84 | FIG.: 13

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

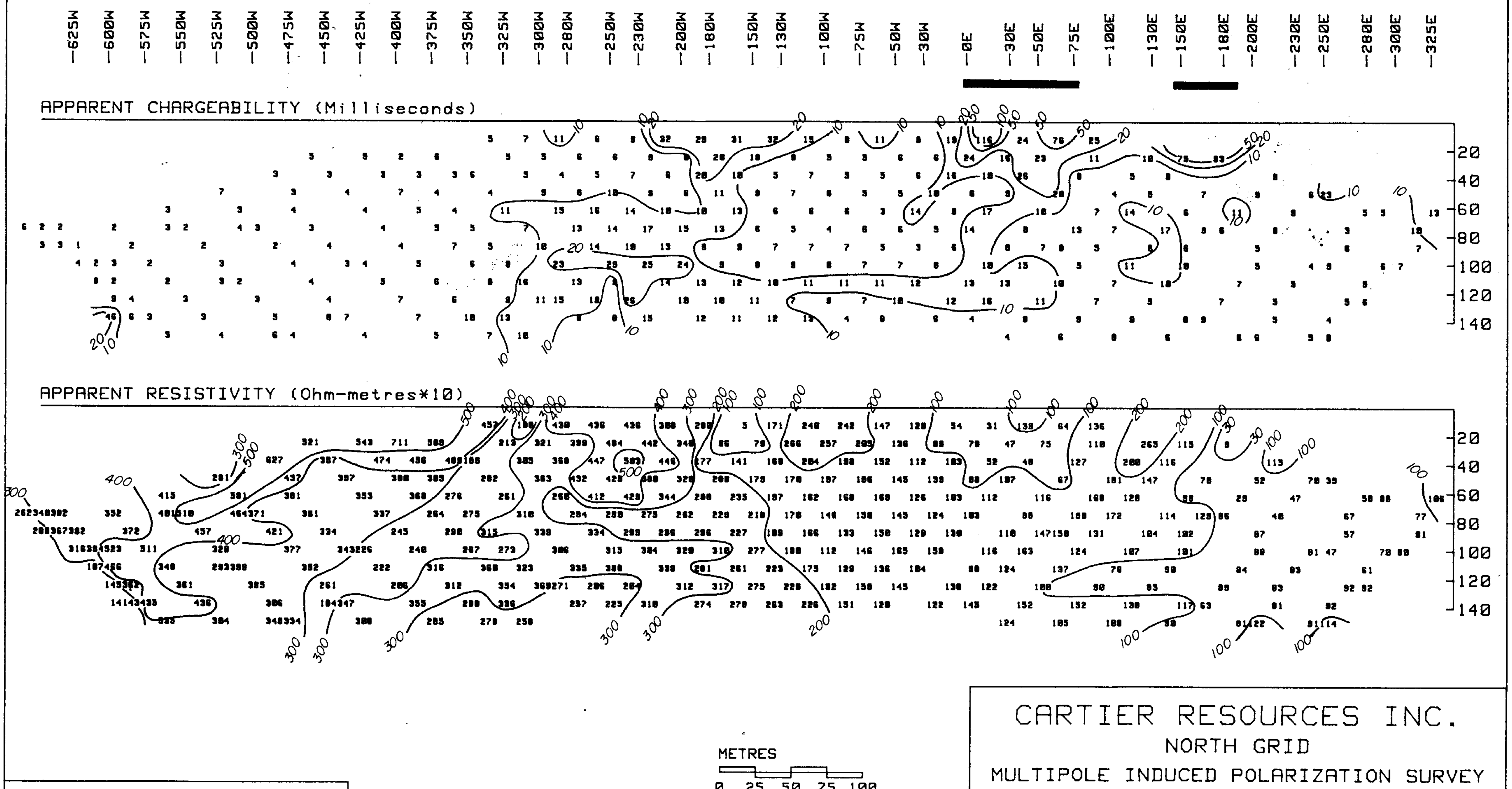
LINE 200N

DATE: DEC/84

FIG.: 14

INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.



CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

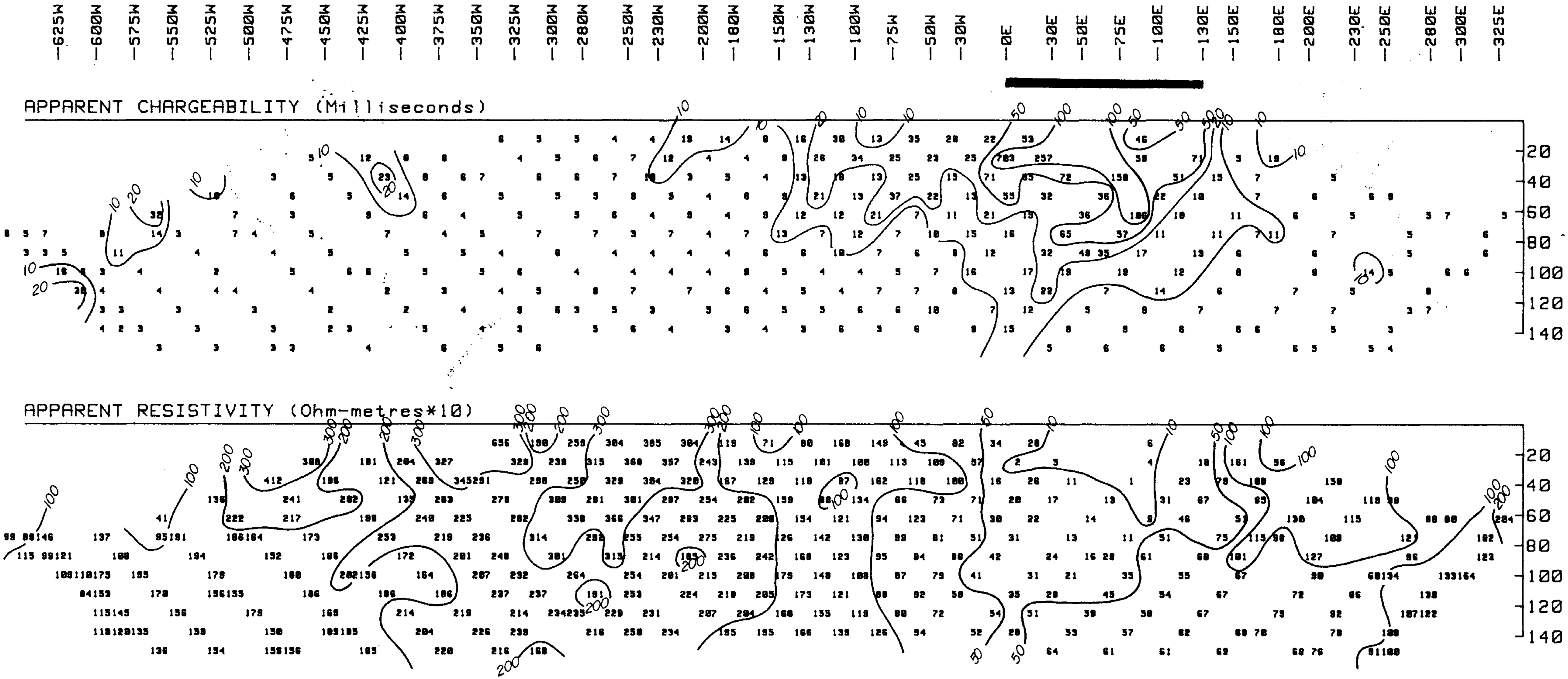
LINE 100N

DATE: DEC/84

FIG.: 15

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

NORTH GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

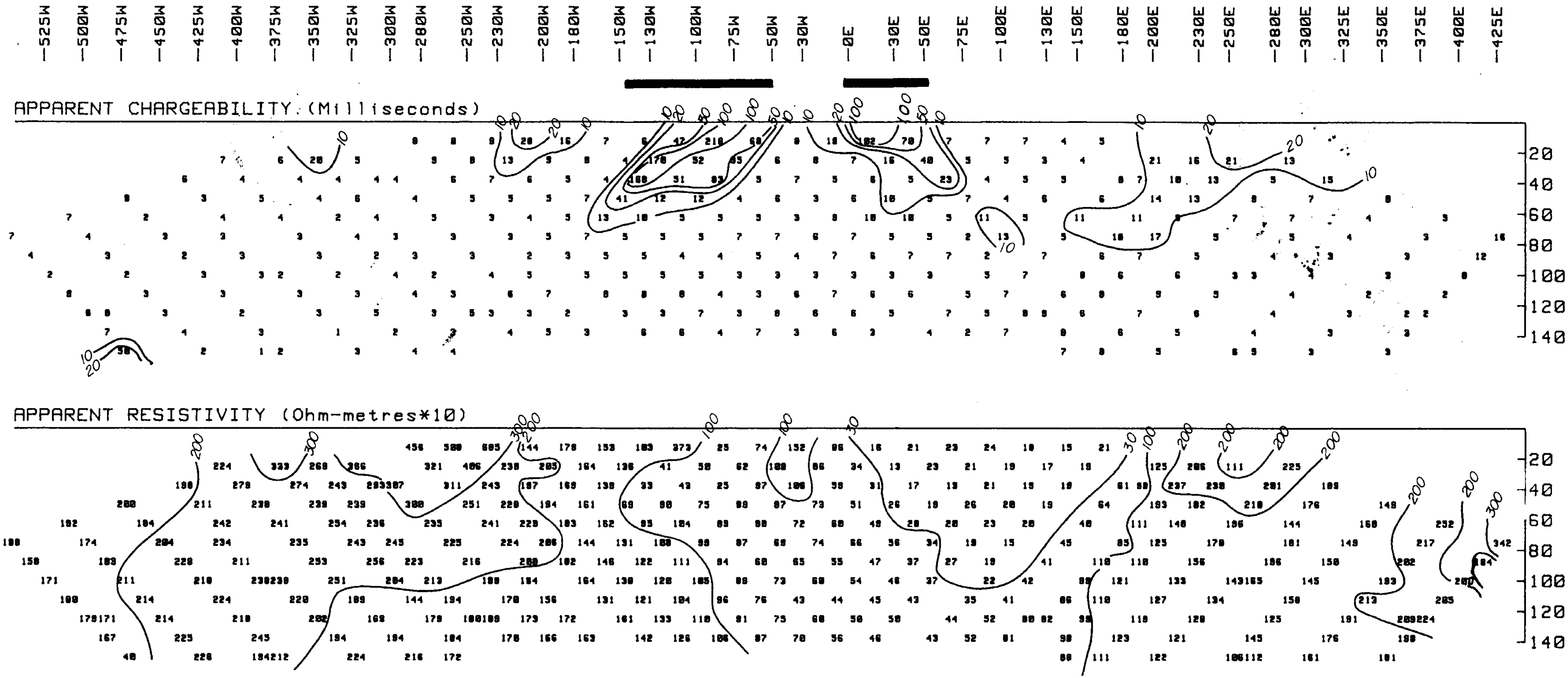
LINE 00N

DATE: DEC/84

FIG.: 16

INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.



INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

CARTIER RESOURCES INC.

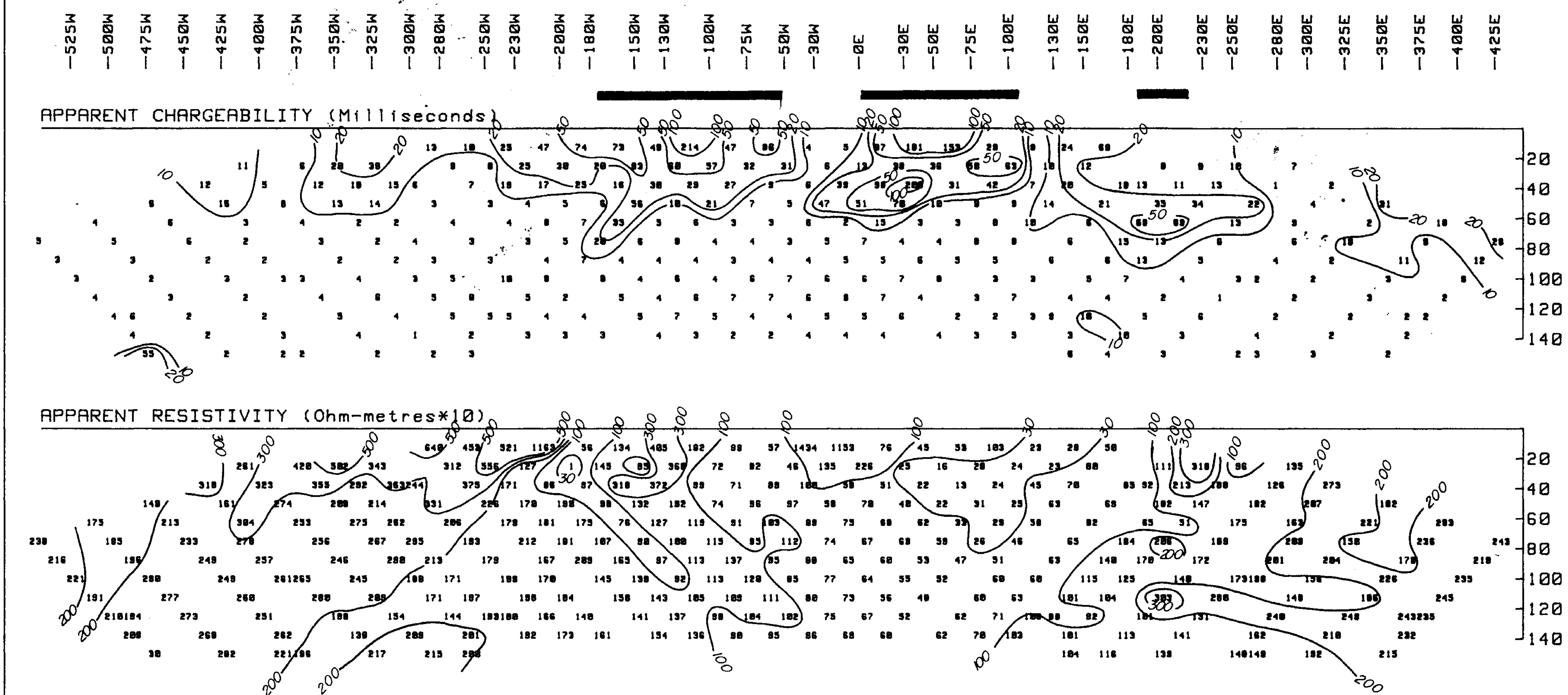
CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

LINE 00S

DATE: DEC/84

FIG.: 17



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

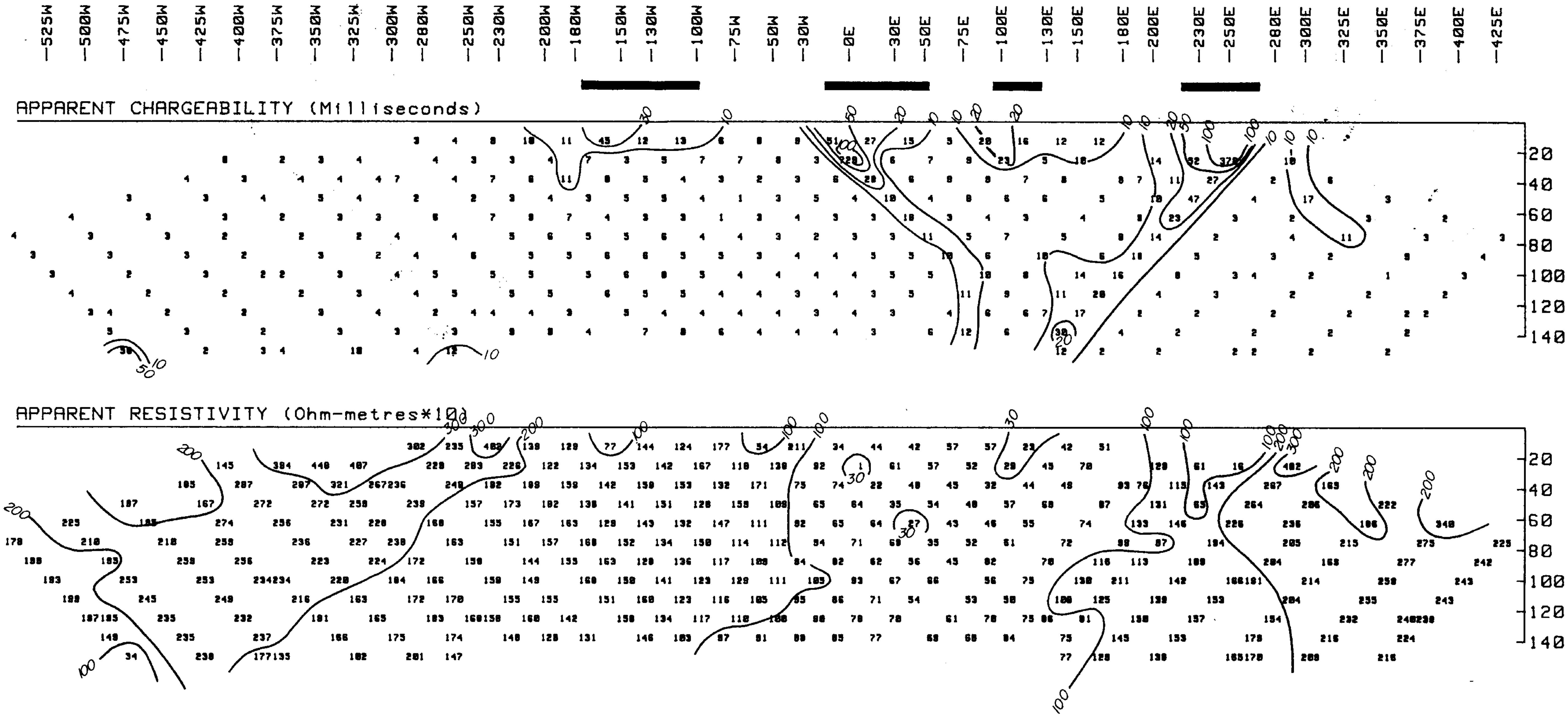
LINE 50S

DATE: DEC/84

FIG.: 18

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

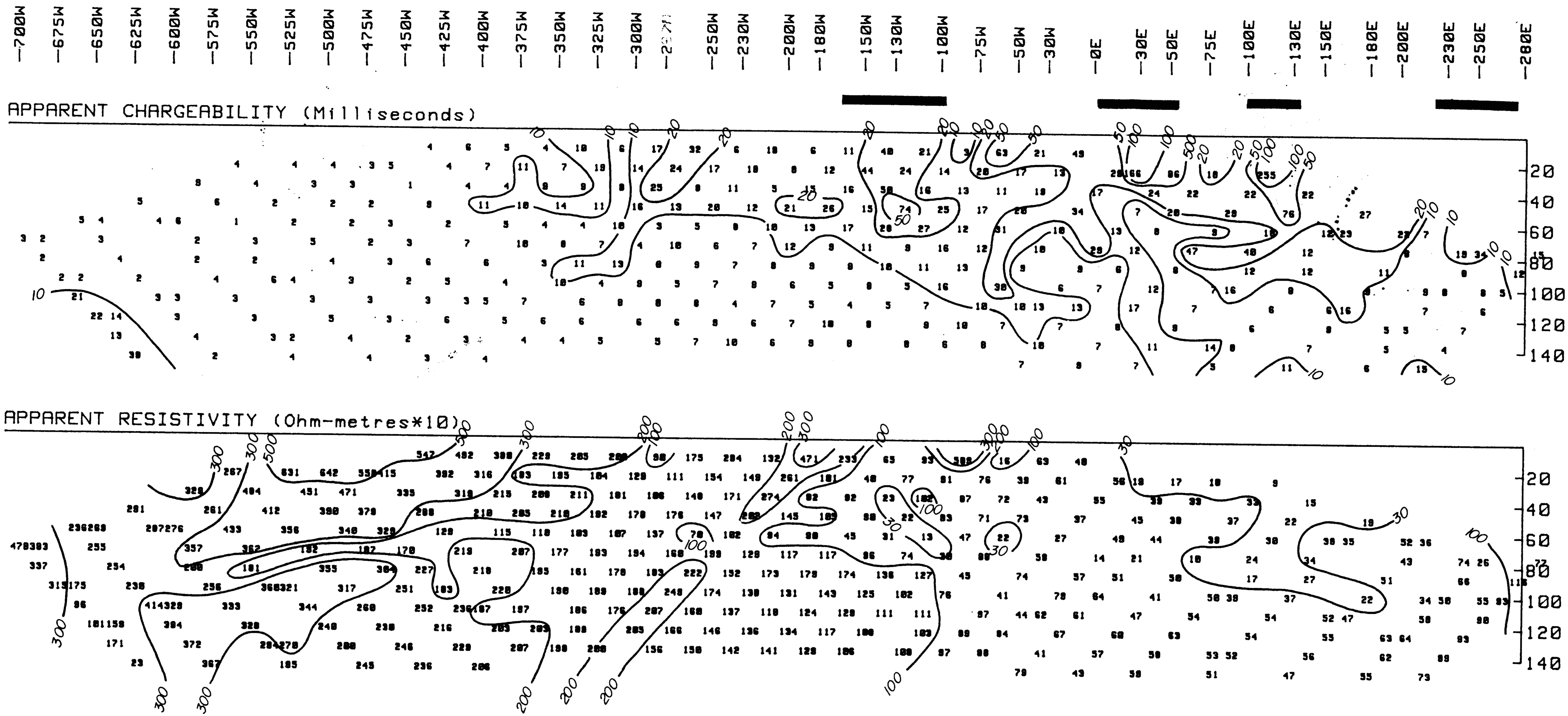
LINE 100S

DATE: DEC/84

FIG.: 19

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES

0 25 50 75 100

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

CARTIER RESOURCES INC.

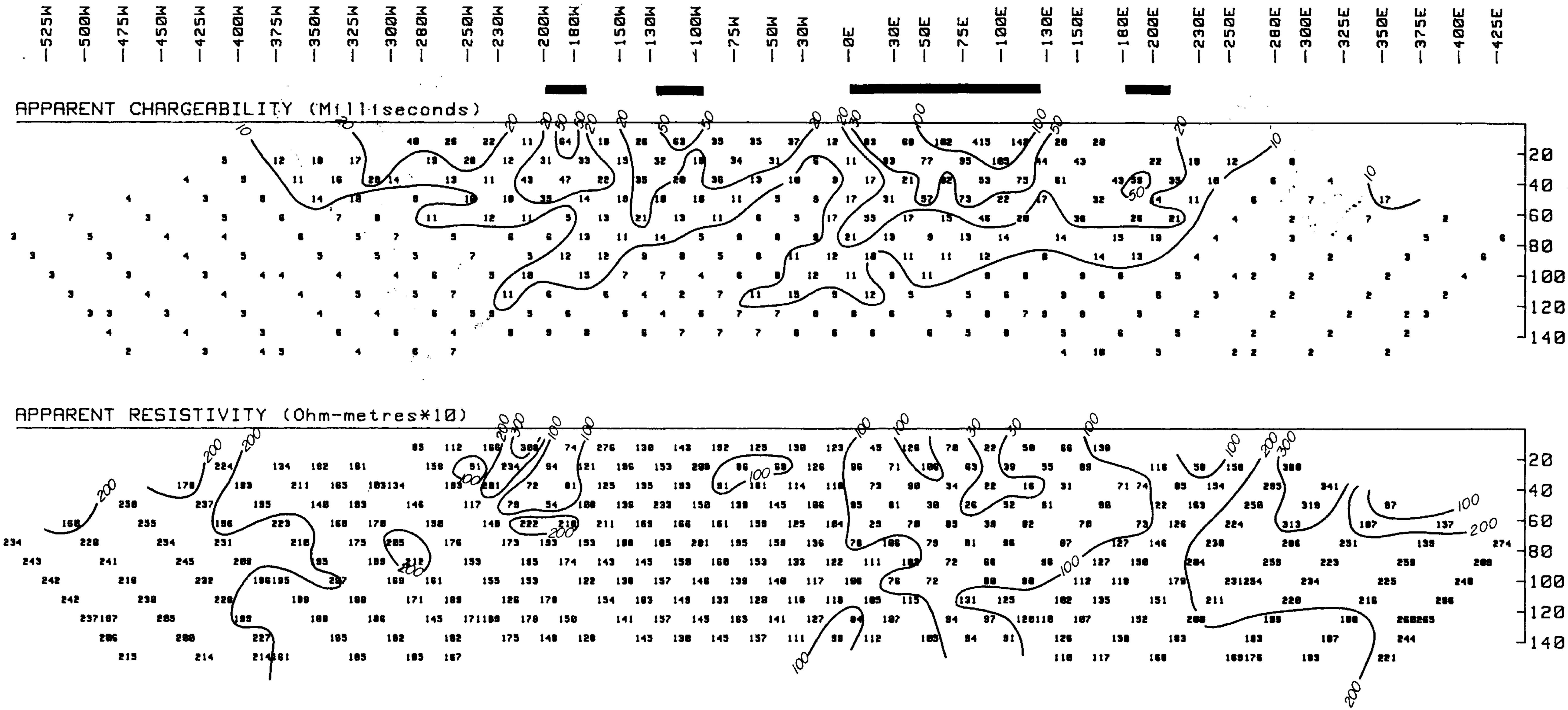
CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

LINE 100S

DATE: DEC/84

FIG.: 20



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

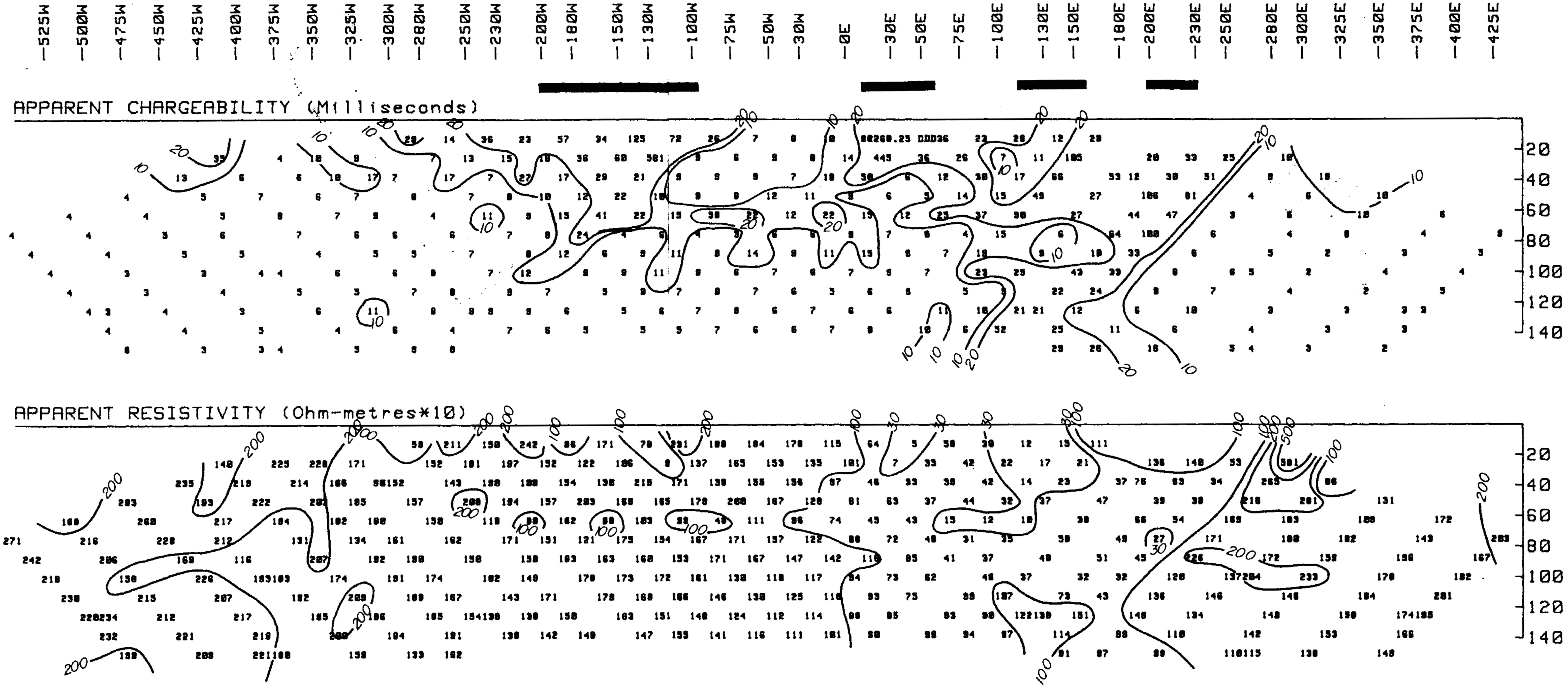
LINE 150S

DATE: DEC/84

FIG.: 21

INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

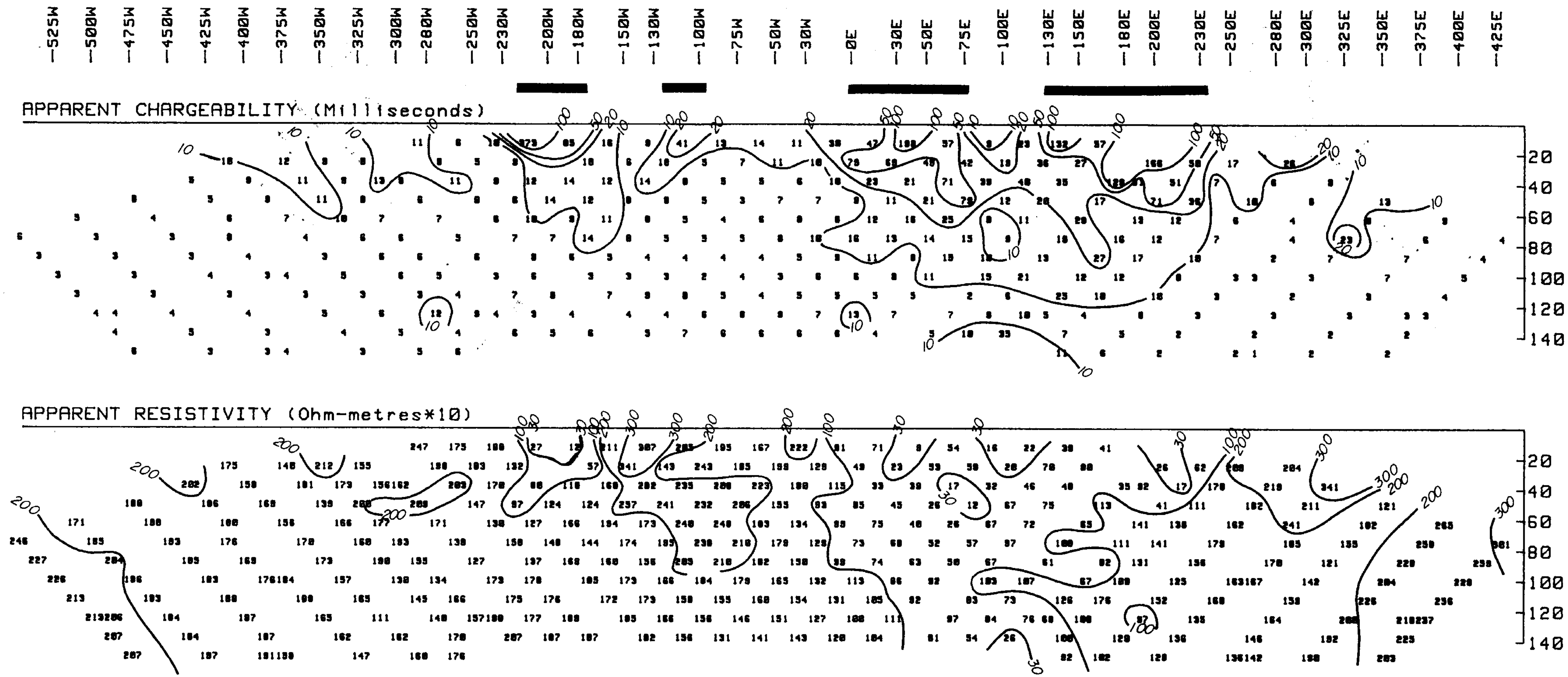
LINE 200S

DATE: DEC/84

FIG.: 22

INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

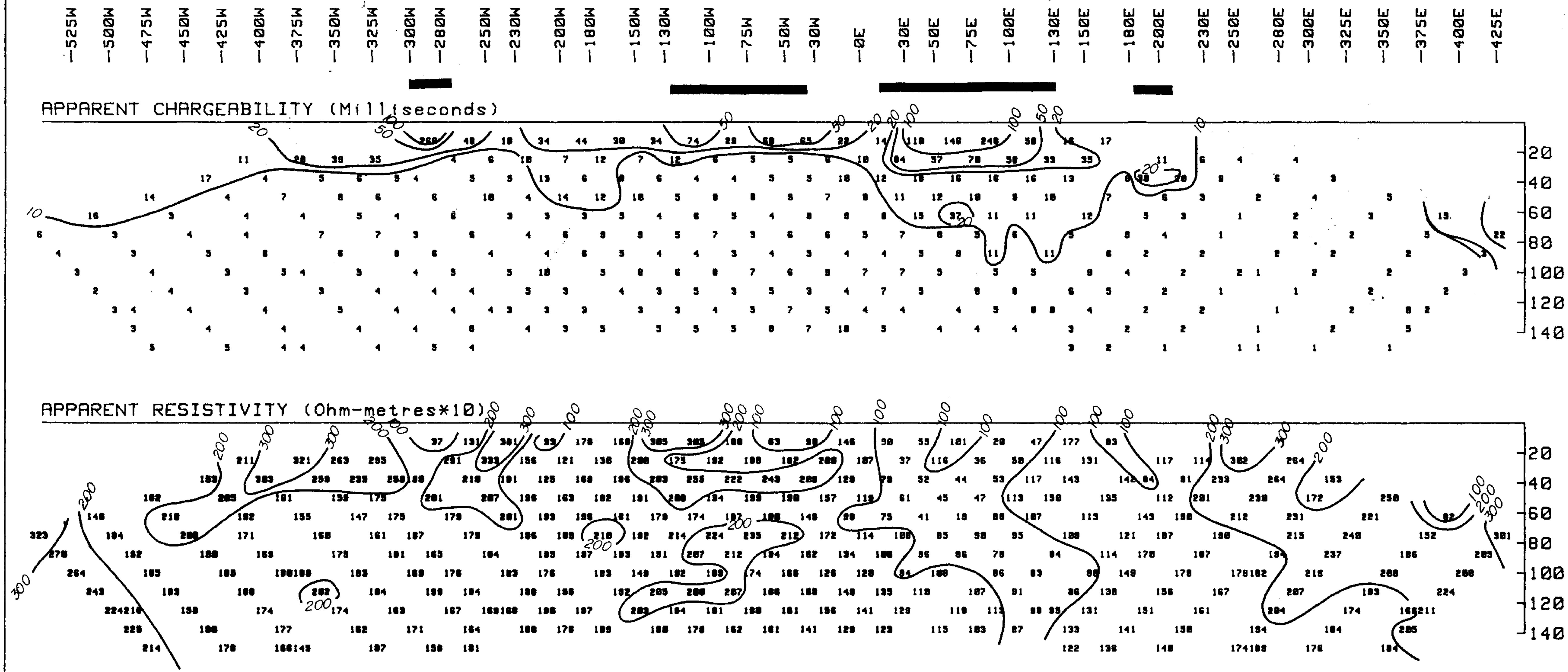
LINE 250S

DATE: DEC/84

FIG.: 23

INST: 36 CHANNEL MULTIPOLE I.P.

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.



METRES

0 25 50 75 100

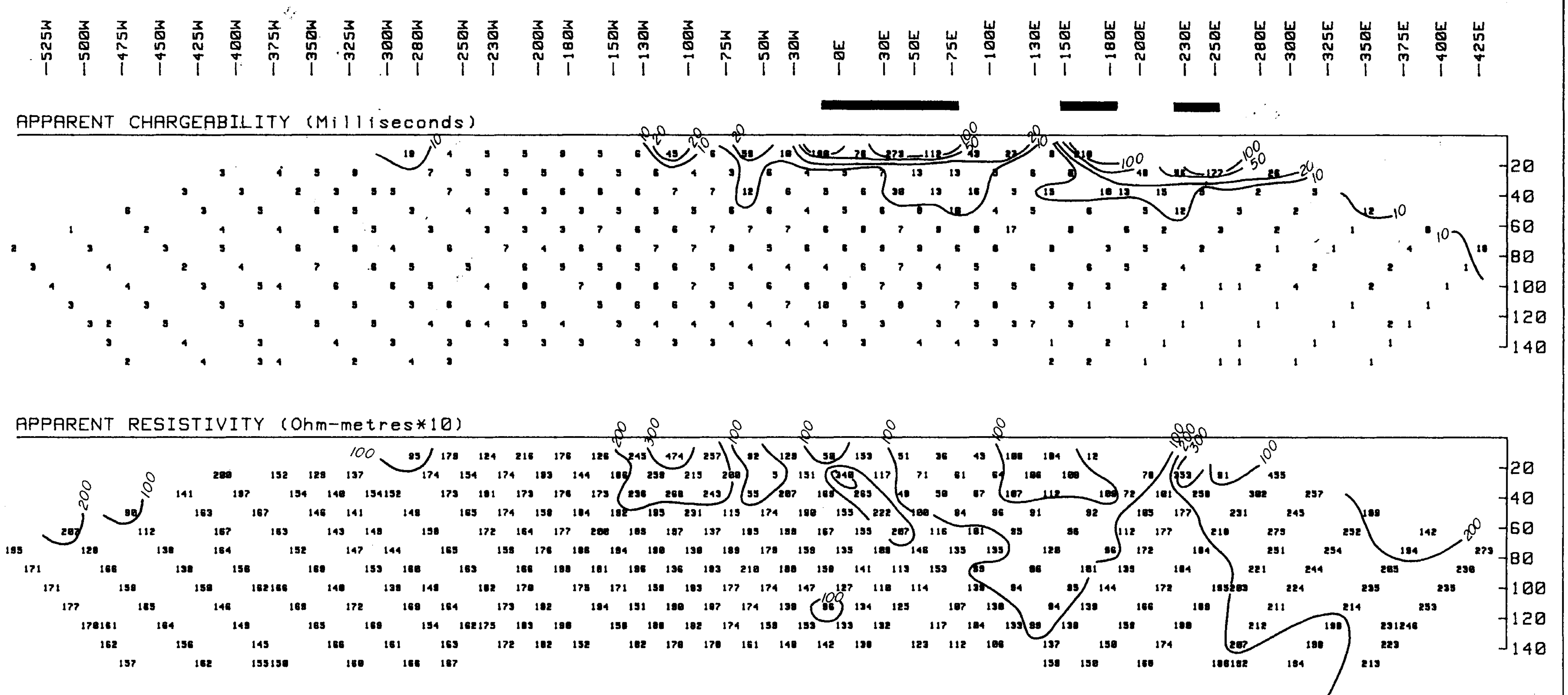
GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

CARTIER RESOURCES INC.
CORNELL GRID
MULTIPOLE INDUCED POLARIZATION SURVEY
LINE 300S

DATE: DEC/84

FIG.: 24



METRES
0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

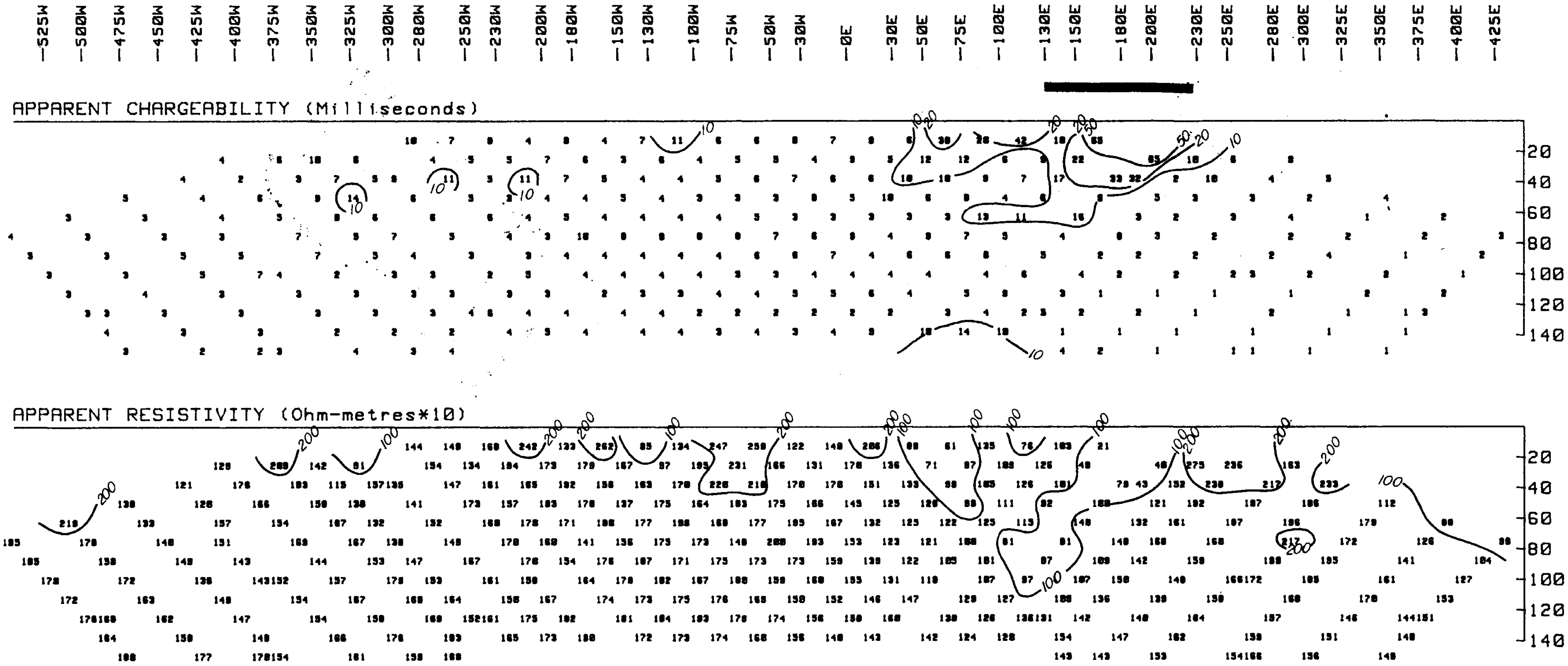
LINE 350S

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

DATE: DEC/84

FIG.: 25



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

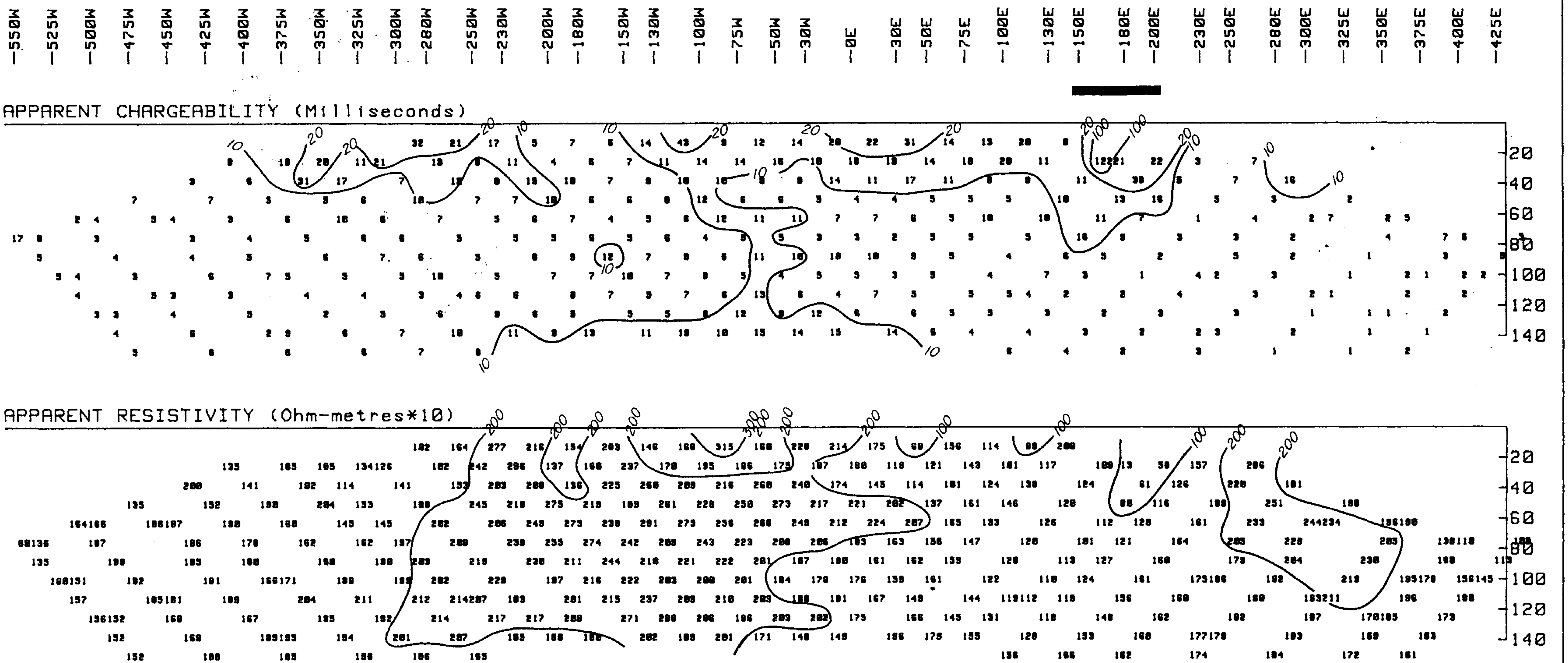
MULTIPOLE INDUCED POLARIZATION SURVEY

LINE 400S

DATE: DEC/84	FIG.: 26

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

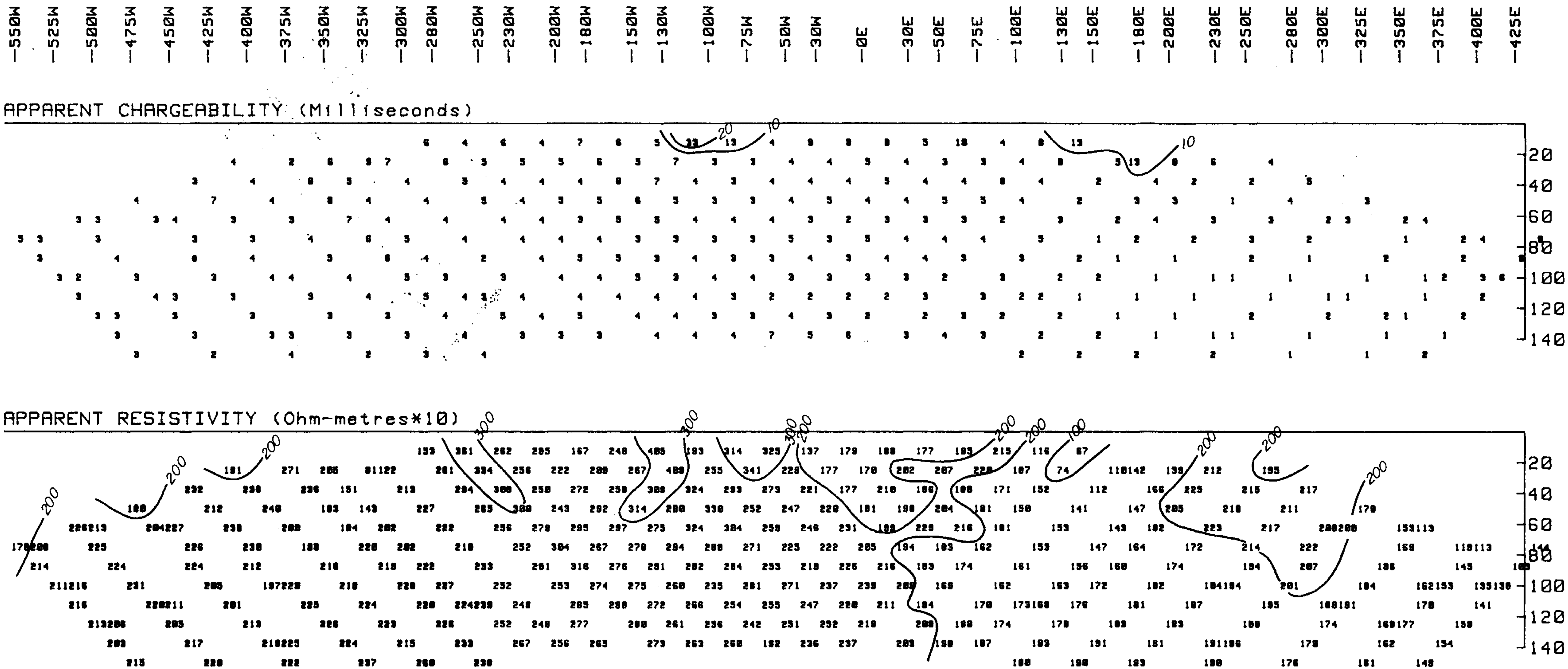
LINE 450S

DATE: DEC/84

FIG.: 27

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

CORNELL GRID

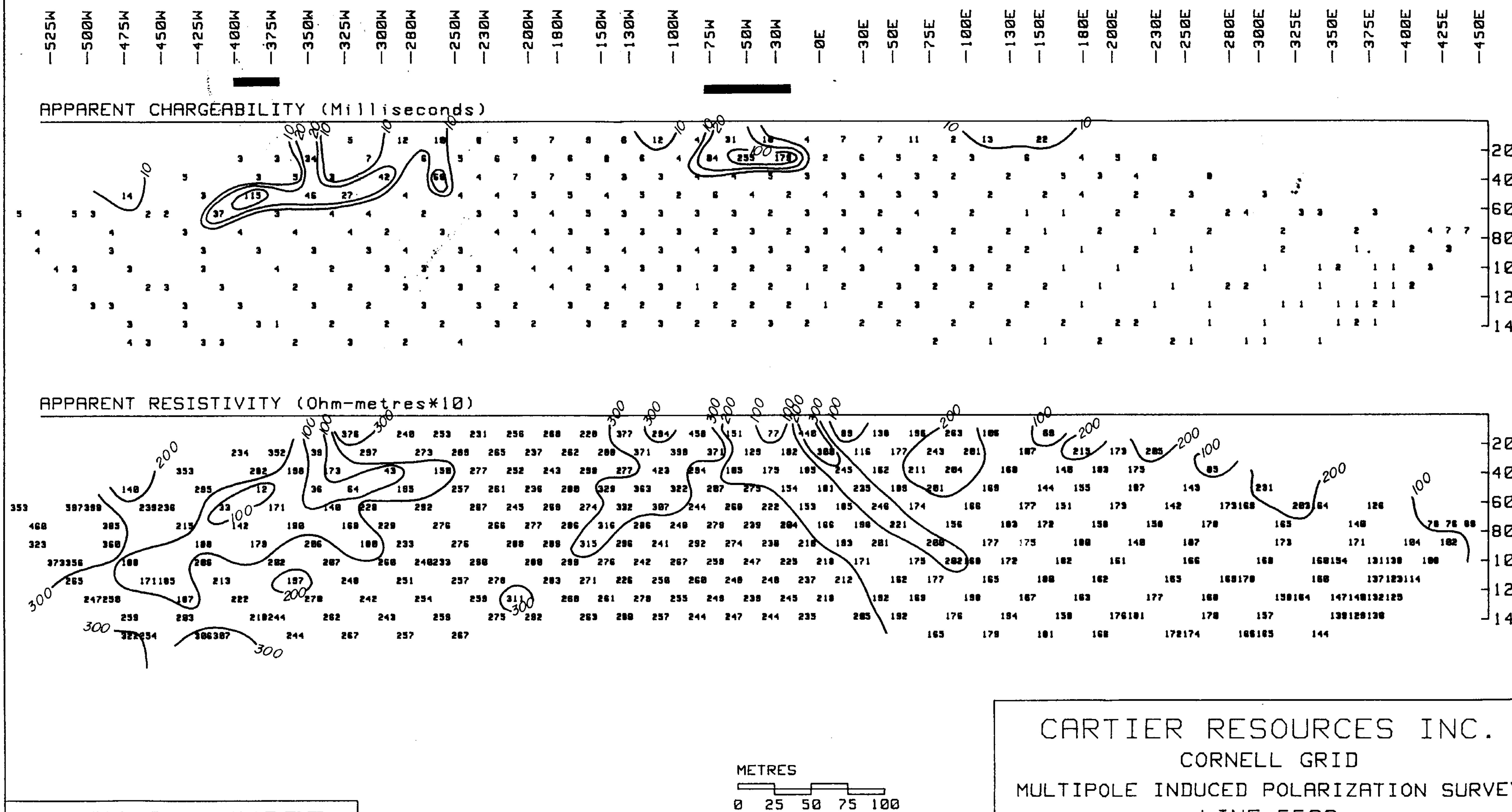
MULTIPOLE INDUCED POLARIZATION SURVEY

LINE 500S

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

DATE: DEC/84	FIG.: 28



CARTIER RESOURCES INC.

CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

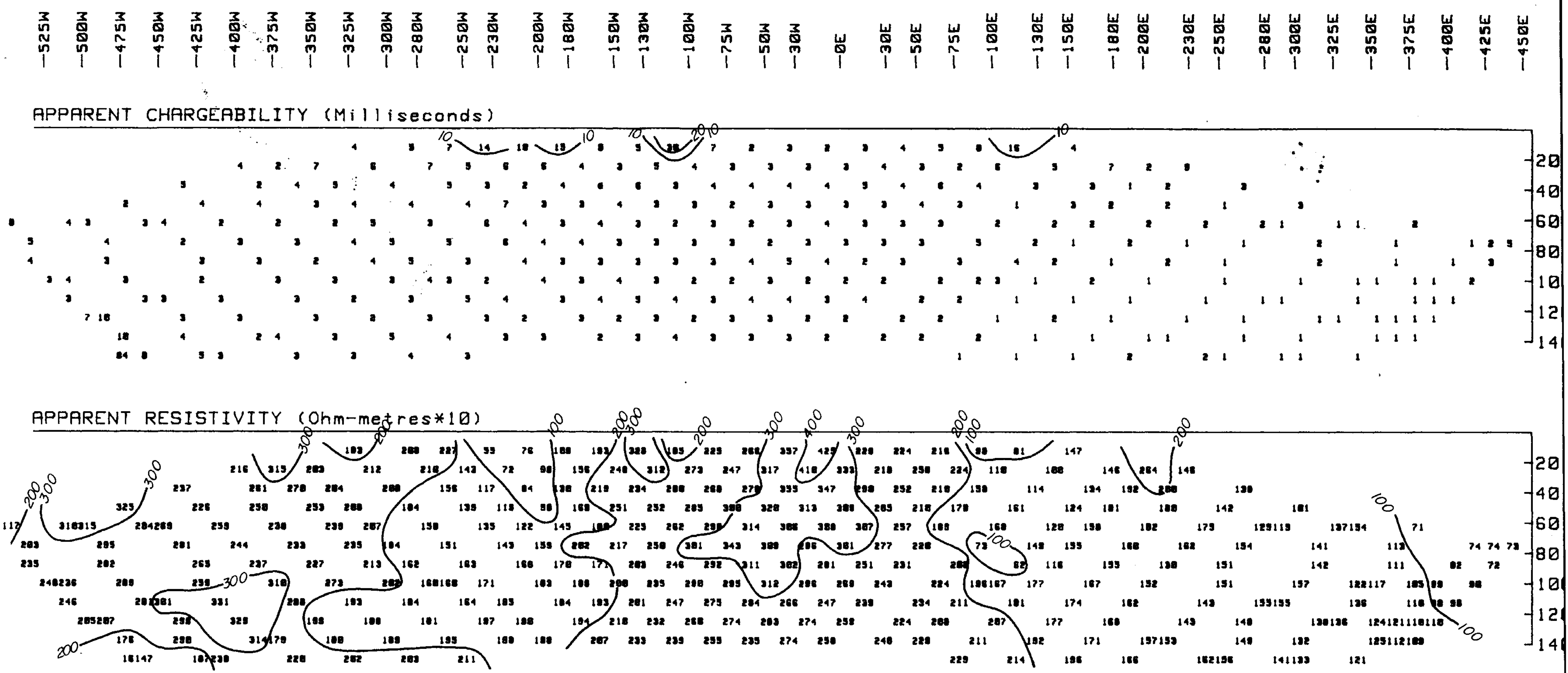
LINE 550S

DATE: DEC/84

FIG.: 29

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.



METRES
0 25 50 75 100

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

CARTIER RESOURCES INC.

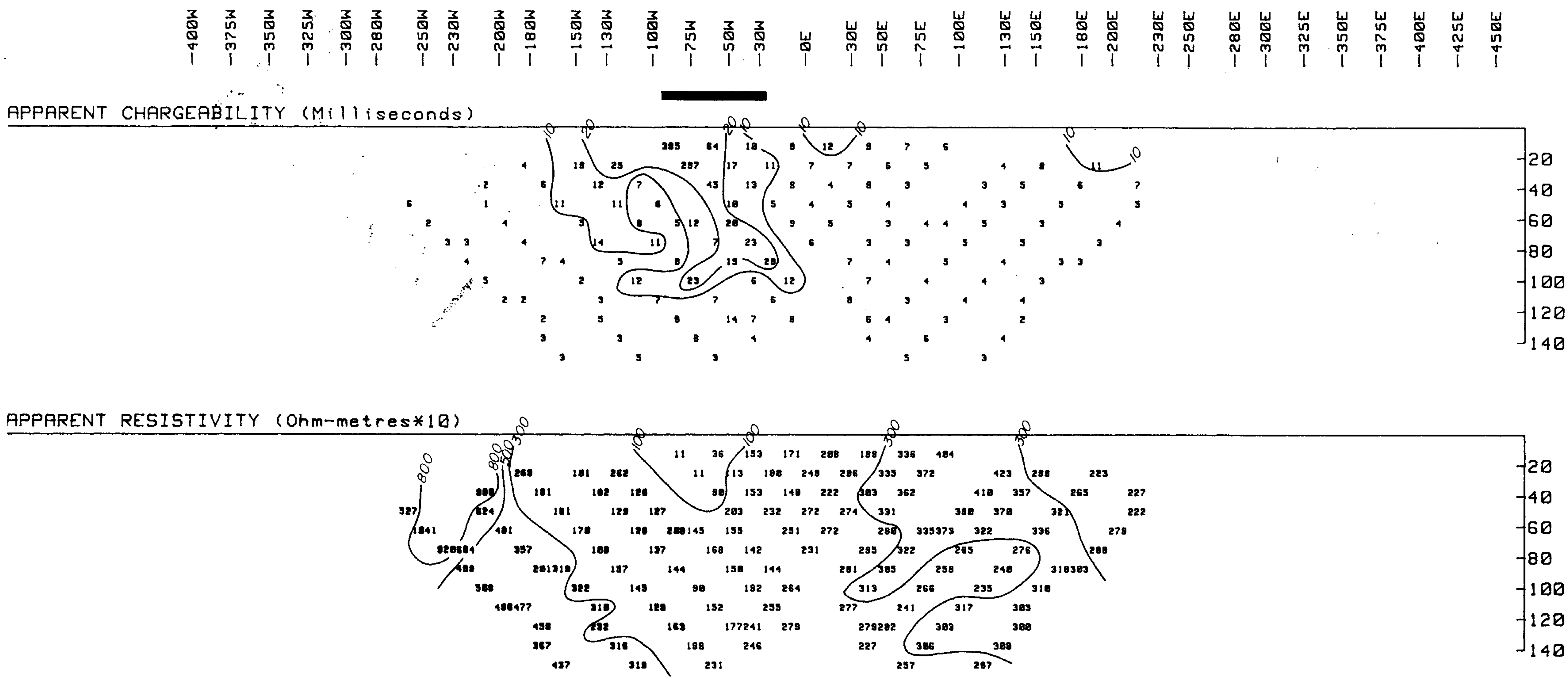
CORNELL GRID

MULTIPOLE INDUCED POLARIZATION SURVEY

LINE 650S

DATE: DEC/84

FIG.: 30



METRES
0 25 50 75 100

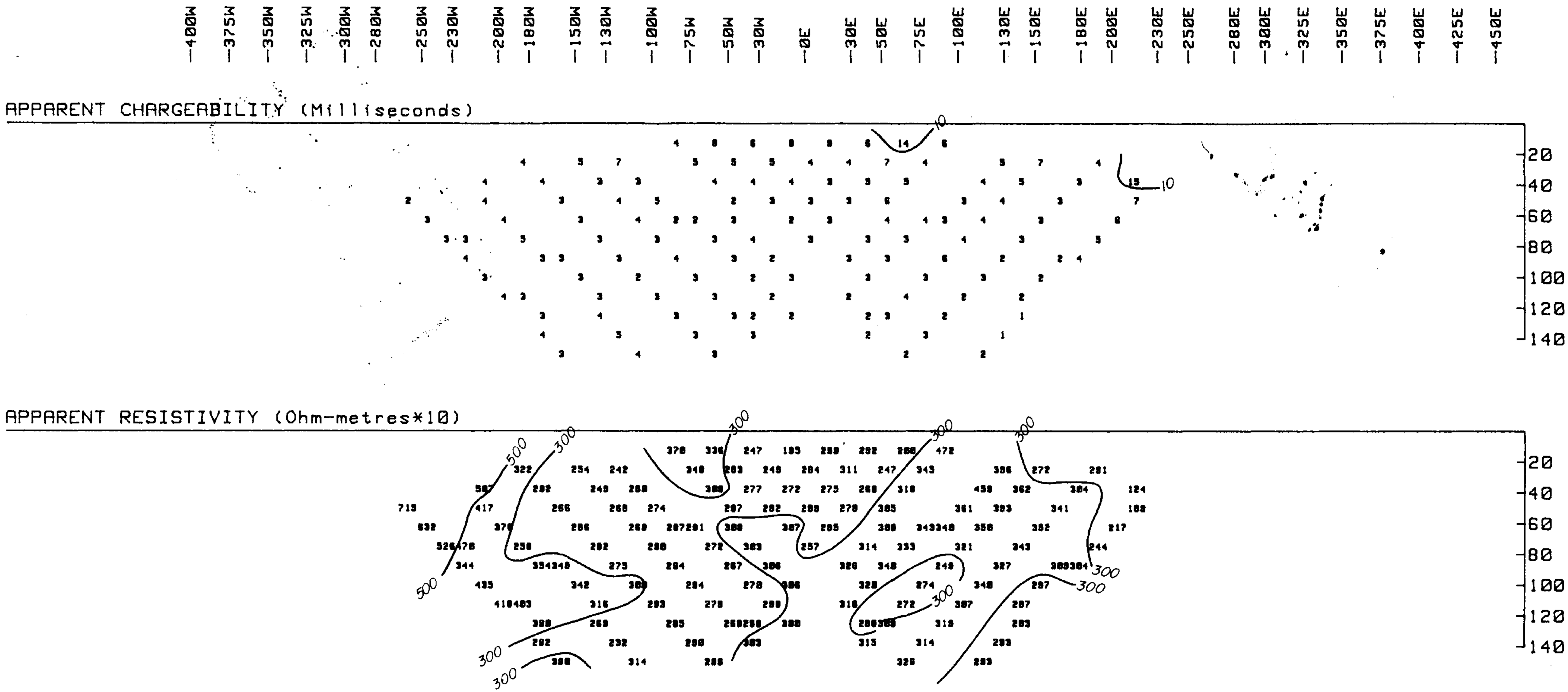
CARTIER RESOURCES INC.
IDEAL LIMESTONE PIT TEST
MULTIPOLE INDUCED POLARIZATION SURVEY
LINE 50N

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

DATE: DEC/84

FIG.: 31



METRES

0 25 50 75 100

CARTIER RESOURCES INC.

IDEAL LIMESTONE PIT TEST

MULTIPOLE INDUCED POLARIZATION SURVEY

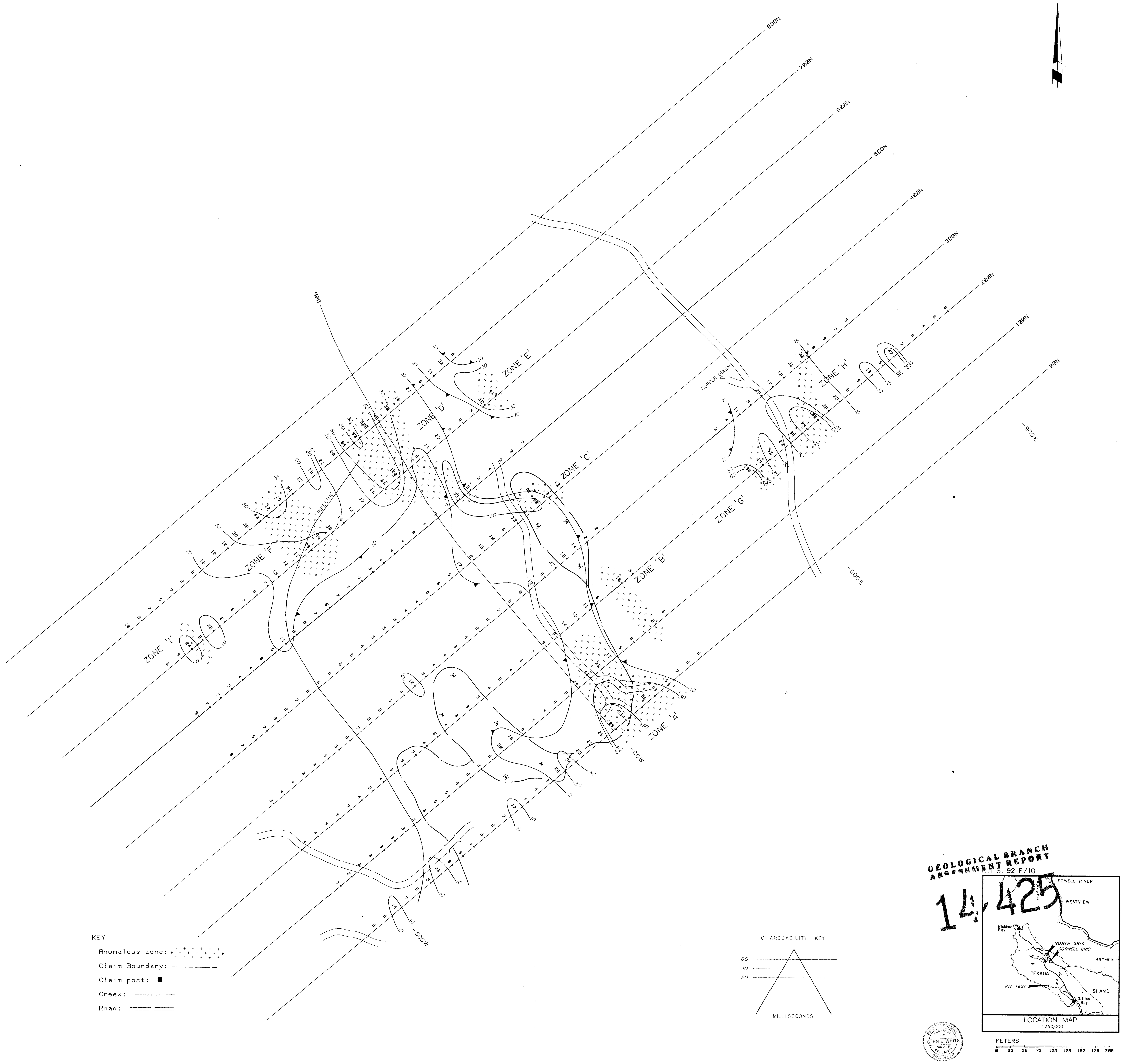
LINE 00N

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INST: 36 CHANNEL MULTIPOLE I.P.

DATE: DEC/84

FIG.: 32



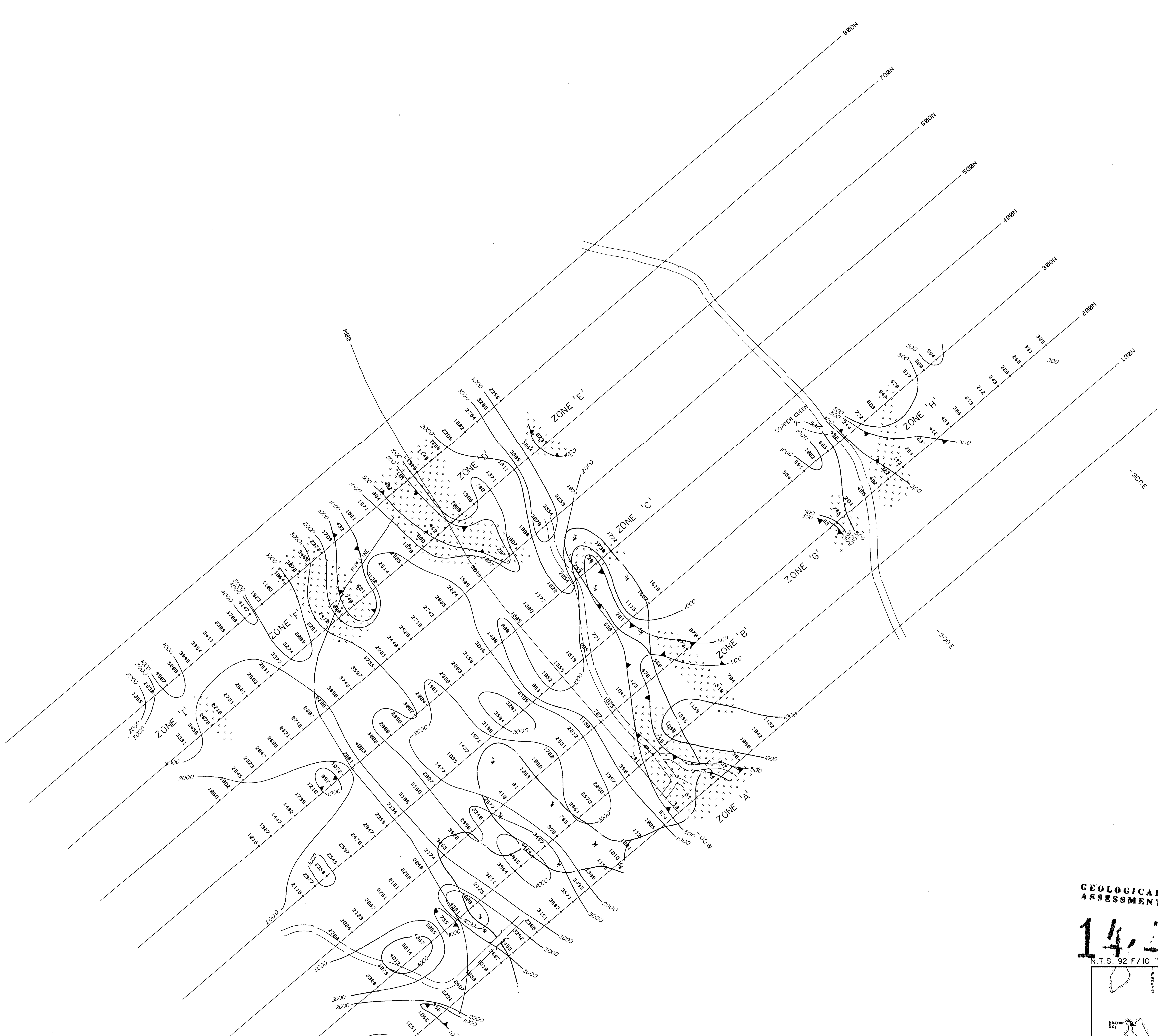
GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.

INSTRUMENT: 36 CHANNEL MULTIPOLE I.P.

To accompany Geophysical Report on the NORTH GRID

CARTIER RESOURCES INC.
NORTH GRID
APPARENT CHARGEABILITY (MSEC)
FIFTY METRE DIPOLE

DATE: DEC/84 | FIG.: 2



KEY

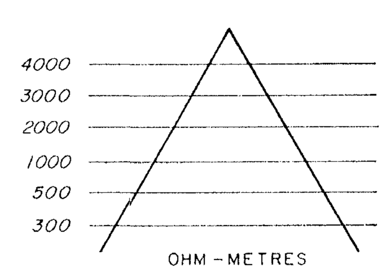
Anomalous zone:

Claim Boundary:

Claim post: ■

Creek:

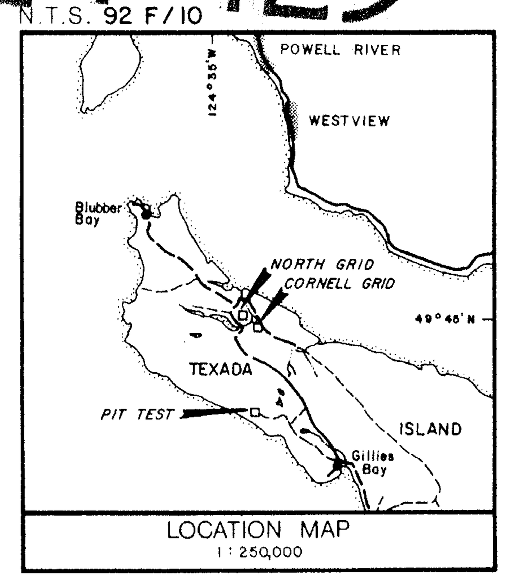
Road:



GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,425

N.T.S. 92 F/10



LOCATION MAP
1:250,000

METERS
0 25 50 75 100 125 150 175 200

1:2,500

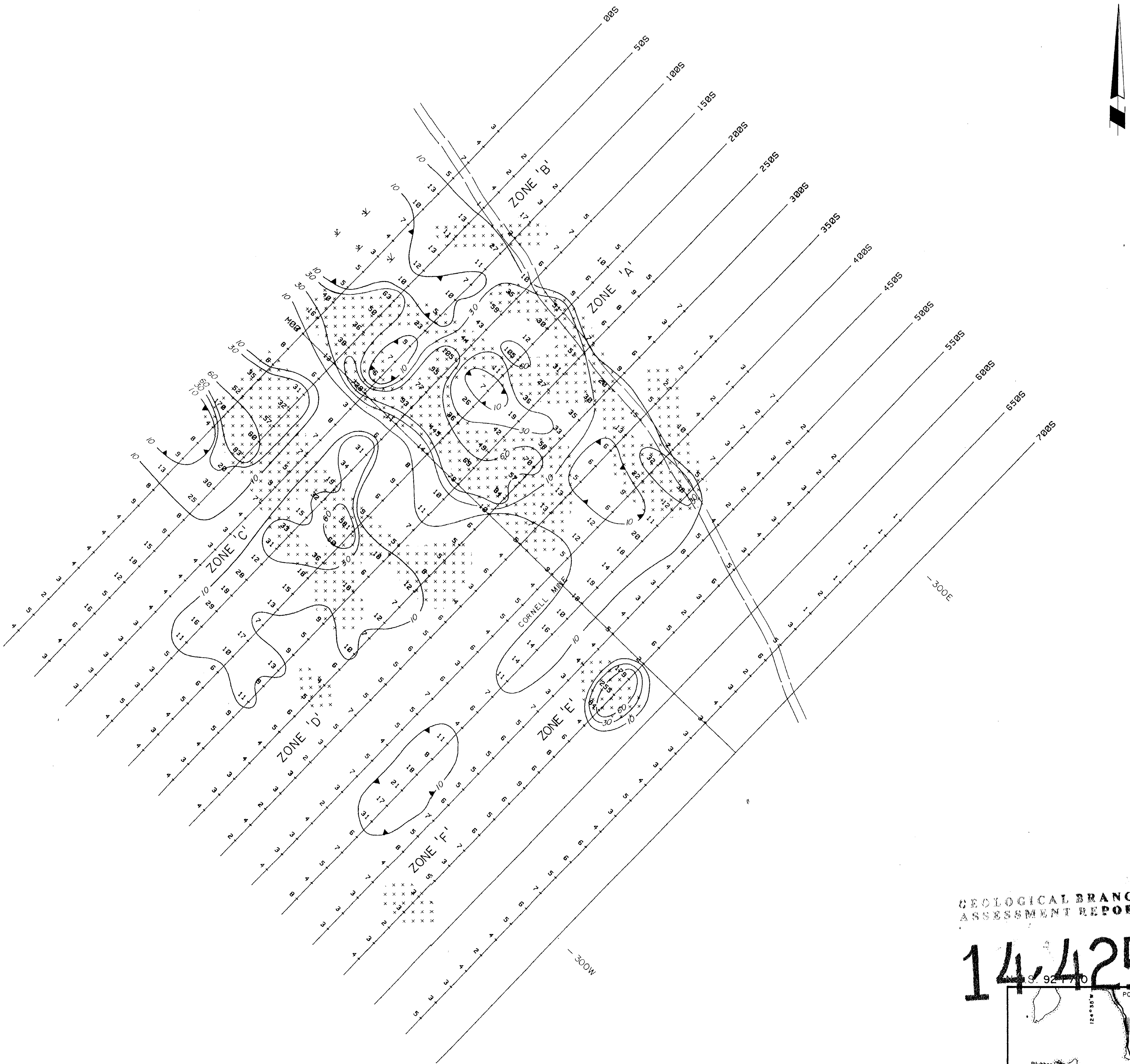
CARTIER RESOURCES INC.
NORTH GRID
APPARENT RESISTIVITY (OHM-M)
FIFTY METRE DIPOLE

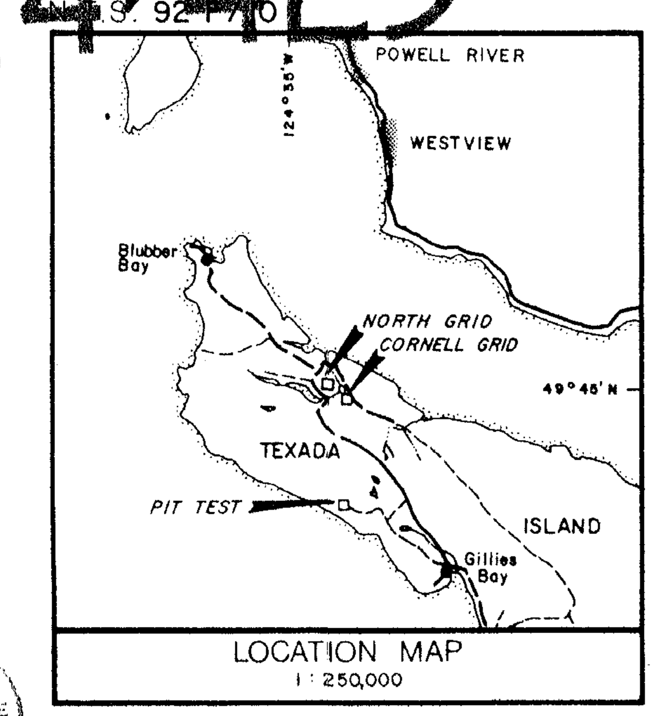
INSTRUMENT: 36 CHANNEL MULTIPOLE I.P.

To accompany Geophysical Report on the NORTH GRID

DATE: DEC/84	FIG.: 3

GLEN E. WHITE
GEOPHYSICAL CONSULTING
& SERVICES LTD.





LOCATION MAP
1:250,000

METERS
0 25 50 75 100 125 150 175 200

KEY

Anomalous zone: + + + + +

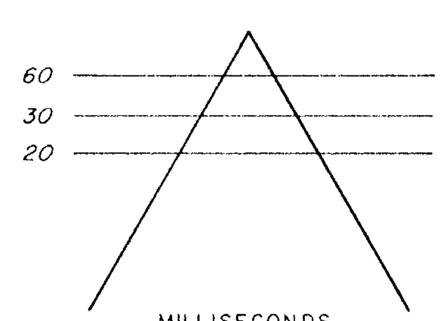
Claim Boundary: — — — —

Claim post: ■

Creek: ———

Road: ═══

CHARGEABILITY KEY



INSTRUMENT: 36 CHANNEL MULTIPOLE I.P.

To accompany Geophysical Report on the CORNELL GRID

CARTIER RESOURCES INC.
CORNELL GRID
APPARENT CHARGEABILITY (MSEC)
FIFTY METRE DIPOLE

DATE: DEC/84 | FIG.: 4

GLEN E. WHITE
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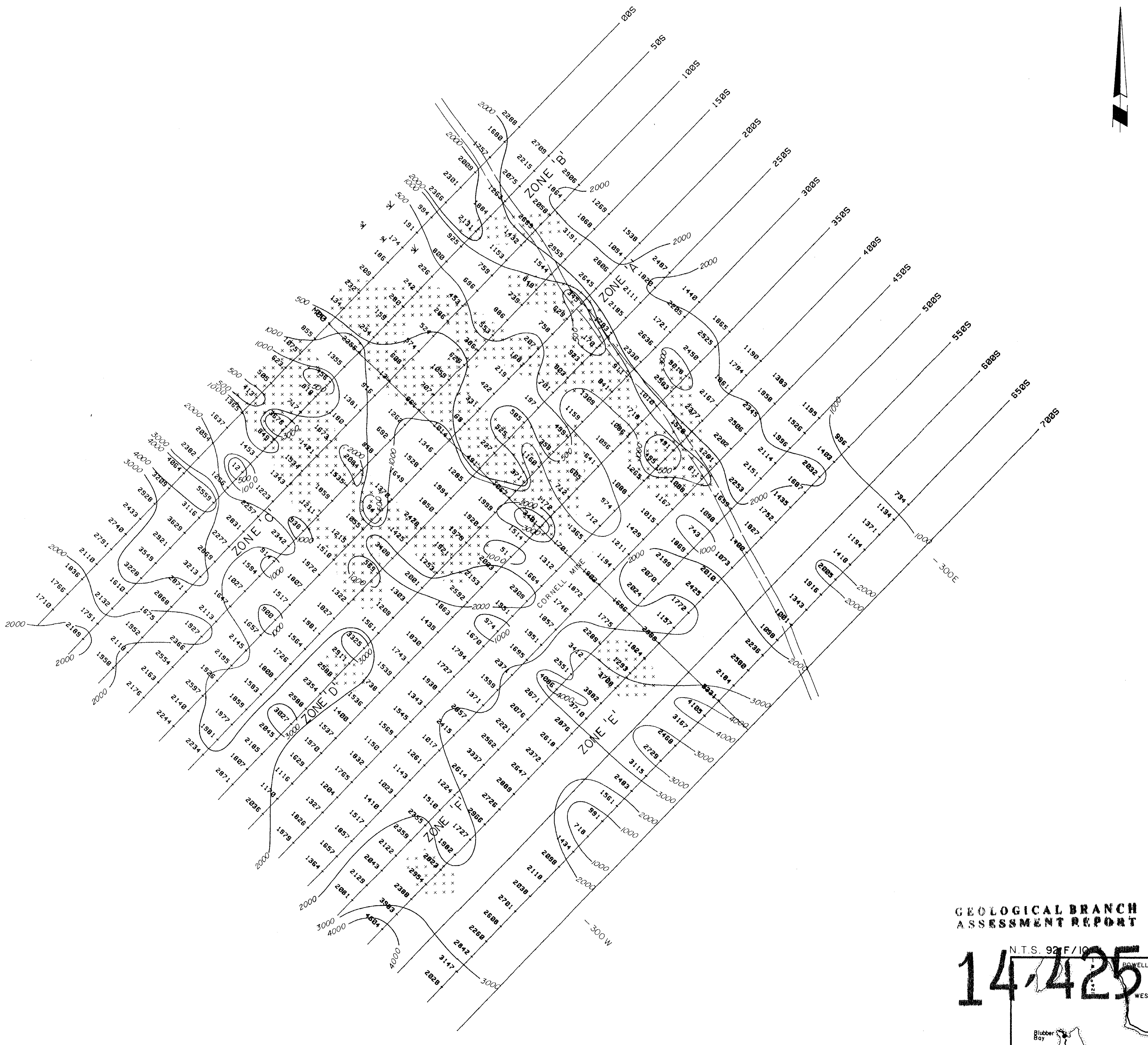
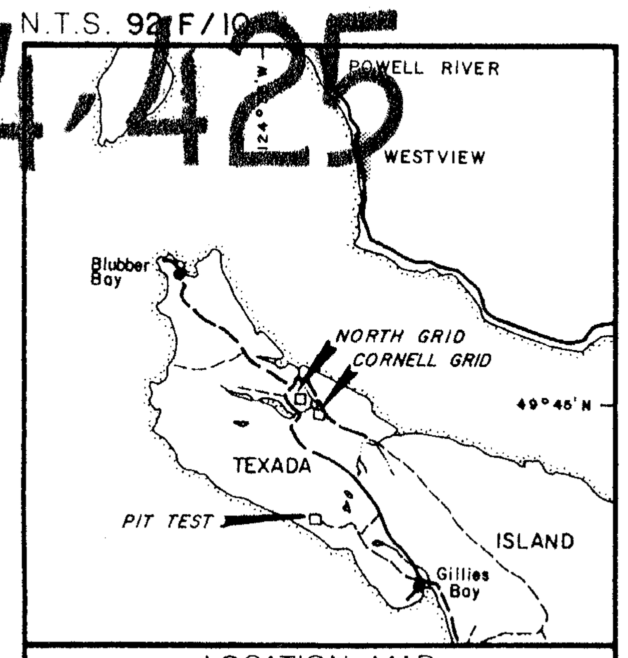
& SERVICES LTD.



GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,425

N.T.S. 92 F/10



LOCATION MAP
1:250,000

METERS
0 25 50 75 100 125 150 175 200

KEY

Anomalous zone:

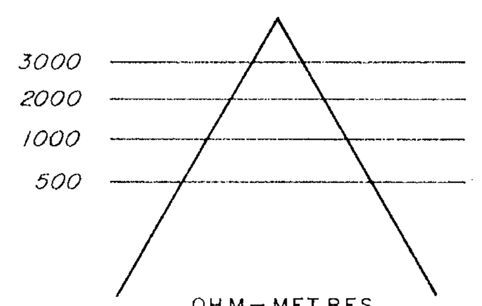
Claim Boundary:

Claim post:

Creek:

Road:

RESISTIVITY KEY



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& SERVICES LTD.

INSTRUMENT: 36 CHANNEL MULTIPOLE I.P.

To accompany Geophysical Report on the CORNELL GRID

CARTIER RESOURCES INC.
CORNELL GRID
APPARENT RESISTIVITY (OHM-M)
FIFTY METRE DIPOLE

DATE: DEC/84

FIG.: 5