

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6423

1977 GEOPHYSICAL REPORT ON
THE GK, GL, GH MINERAL CLAIMS

BY: GARRY M. DEPAOLI
GEOPHYSICIST, B.Sc.

DATE: SEPTEMBER, 1977.

1977 GEOPHYSICAL REPORT ON
THE GK, GL, GH MINERAL CLAIMS

located in

NORTHERN BRITISH COLUMBIA

in the

OMENICA MINING DIVISION

approximately

13 MILES EAST OF SMITHERS
AT COORDINATES $54^{\circ}49'$ N. LAT.; $126^{\circ}53'$ W. LONG.

work for

CANADIAN SUPERIOR EXPLORATION LIMITED

work by

MORRISON I.P. SURVEYS

work period

MARCH 14, AUG. 25-31, 1977

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ILLUSTRATIONS

LOCATION MAP	FIGURE 1	AFTER PAGE 1
CLAIM MAP	FIGURE 2	IN POCKET
IP PSEUDOSECTION PROFILES	FIGURES 3a-g	AFTER PAGE 9
LINE	FIGURE	
25400 N	3a	
26600 N	3b	
27800 N	3c	
29000 N	3d	
30200 N	3e	
31400 N	3f	
32600 N	3g	
PLAN RESISTIVITY N=1	FIGURE 4	IN POCKET
PLAN PFE N=1	FIGURE 5	IN POCKET
GEOPHYSICAL INTERPRETATION	FIGURE 6	IN POCKET

INTRODUCTION

The GK, GL, GH MINERAL CLAIMS are located in north central British Columbia. The Claims are owned by Canadian Superior Exploration Limited. They partially surround the Big Onion Mineral Prospect and are currently being investigated for the possible occurrence of additional copper, molybdenum mineralization similar to that known on the Big Onion.

During the period March 14 and August 25 to 31, 1977 a total of 8.2 miles of induced polarization/resistivity surveying were completed over the property. The work was carried out by Morrison I.P. Surveys upon the request of Canadian Superior Exploration Limited and under the direct supervision of G. Stock. The following report describes the instrumentation, field procedure and the results obtained from the survey.

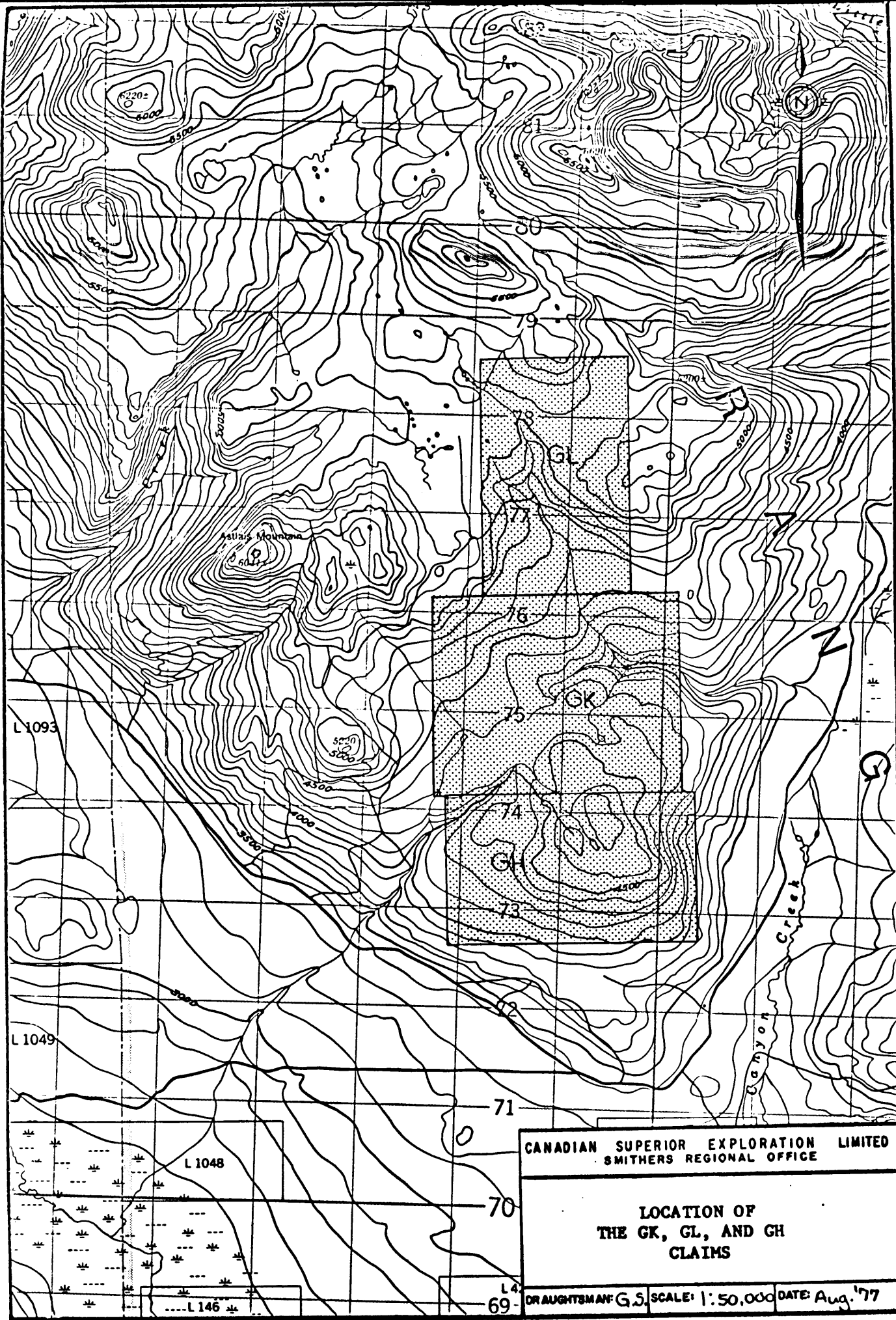
LOCATION AND ACCESS

The Claims are located in north central British Columbia approximately 13 miles east of Smithers. They are immediately adjacent to the Big Onion Prospect on Astlais Mountain. They lie within the Omenica Mining Division at $54^{\circ}49'$ North Latitude and $126^{\circ}53'$ West Longitude within NTS Block 93 L 15.

Good secondary road access exists to the Claims area via the Burnt Cabin Road which departs east from Highway 16 approximately 3 miles south of Smithers.

GRID CONTROL

The control grid consists of 11.6 line miles of cut, chained and flagged lines. The baseline strikes at azimuth 050° and



CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

**LOCATION OF
THE GK, GL, AND GH
CLAIMS**

DRAUGHTSMAN: G.S. SCALE: 1:50,000 DATE: Aug. '77

L1093

L1049

L1048

L146

71

70

L4
69

extends for over six miles. It is labelled as 19000 E. Seven perpendicular crosslines spaced 1200 feet apart were surveyed. Emplacement of the grid was done by line of sight picketing.

GENERAL GEOLOGY

On the Big Onion Prospect two highly altered dyke-like masses of quartz diorite porphyry are enveloped by quartz feldspar porphyry and intrude Jurassic volcanic and sedimentary rocks of the Hazelton Group. Chalcopyrite, bornite, chalcocite and molybdenite are associated with pyrite.

The GK, GL, GH Mineral Claims partially surround the Big Onion Prospect, largely at a lower elevation. They are mostly covered by overburden and exploration is focused on the possible discovery of fault bounded segments of mineralization related to that known on the Big Onion.

INDUCED POLARIZATION SURVEY

INTRODUCTION AND THEORY

Geologic mapping over most of the area of interest is hindered by extensive overburden and swampy ground. As a result induced polarization measurements were undertaken to search for possible sulphide concentrations within the grid area. Apparent resistivity data taken concurrently is useful in inferring overburden depths, defining abrupt lithological changes and assessing the importance of any I.P. effects obtained.

The term induced polarization means the electrical separation (ie. separation of charges) induced by an applied electric field. The cause of this polarization is changes in the mobilities of ions within a rock. At the interfaces between zones of different mobilities, excesses or deficiencies of ions occur; the concentration gradients developed oppose the current flow and cause a polarizing effect. When mineral grains block the pore passages of rocks and a current is applied, a concentration of ions builds up at the electrolyte (water) - metal interface while awaiting an electro-chemical reaction which must occur before the electric charge can be transferred from an ion in the electrolyte to a free electron in the metal. The forces which oppose the current flow are said to polarize the interface and the added voltage necessary to drive the current across the barrier is known as overvoltage.

It takes a finite time to build up overvoltage and one finds that the impedances of the zones (Warburg Impedance) decreases with increasing frequency. In the frequency domain system that was employed the decrease in the Warburg Impedance was measured between current applied at 0.3 and 5.0 hertz.

INSTRUMENT AND PROCEDURE

A multiple frequency McPhar induced polarization system, Model P660, was employed in measuring the polarization and resistivity parameters. The transmitter is a manually variable voltage source. The output current can be selected from both polarities and varies from direct current to automatically alternating output frequencies of 0.05, 0.1, 0.3, 1.25 and 5.0 hertz. Power was obtained from a $2\frac{1}{2}$ KW - 400 hertz motor generator. The maximum output current for the transmitter is 5.0 amp., while the maximum output voltage is 690 volts.

The receiver employed was the A.C. P660 Model. This is a potentiometer type where the amplified and filtered signal is compared with a reference voltage. It is powered by six 9 volt alkaline transistor batteries and draws 7.5 ma. Total weight including carrying case and batteries is 2.2 kilograms.

A symmetrical in line dipole-dipole array was employed in the survey. The dipole length was 400 feet and measurements were taken to 4 separations (N=1,2,3,4). Survey procedure required the preparation of a "set-up" station near the center of each line. The transmitter and its motor generator power supply remained stationary at the set-up position and wire in increasing 400 foot intervals were strung out in both directions. Care was taken to ensure that the wires were well separated to prevent inductive coupling effects. The ends of the wires were connected to 4 foot stainless steel rods which had been hammered into the ground. Where possible the receiving dipole also utilized the stainless steel rods for electrode connections. Once the receiver dipole moved past the last steel rod, ground connections were made via porous pots. Radio contact between the receiver and transmitter operators coordinated power on and off periods.

PRESENTATION OF DATA

The data is plotted in 7 pseudosections, Figures 3a-g after Page 9. The pseudosections are vertical profile plots displaying apparent resistivities in $\rho_a / 2\pi$ ohm feet and percent frequency effect values. All of the pseudosections are plotted on a scale of 1" = 400 feet. Contoured plan maps of the first separation (N=1) apparent resistivity and percent frequency effect data have also been prepared in Figures 4 and 5 respectively. An interpretation of the data is presented in Figure 6.

RESULTS AND INTERPRETATION

An undulating induced polarization anomaly stretching across the grid area was obtained. The anomaly is characterized by percent frequency effects of 5 to 11% and is still open on both ends. The anomaly is interpreted to be caused by a 1 to 3% sulphide concentration by volume; having a variable width of 400 to 800 feet. (See Figure 6)

The anomaly is associated with apparent resistivities of 50 to 300 $\frac{\rho_a}{2\pi}$ ohm feet. The grid area west of the anomaly is characterized by relatively high resistivities of 750 to 2000 $\frac{\rho_a}{2\pi}$ ohm feet, while the area on the east side of the anomaly has low to intermediate apparent resistivities of 200 to 750 $\frac{\rho_a}{2\pi}$ ohm feet.

Little or no outcrop occurs within the grid area, however it is thought to be predominantly underlain by fine grained black to grey mudstones of Jurassic Age. An inferred contact with a diorite to monzonite dyke has been mapped along the western portion of the grid.

In attempting to explain the anomaly the following two possible geologic sources arise. One is that the anomaly may represent a mineralized flow or interbedded polarizable unit within the mudstone. Graphitic or pyritic interbedded units are common in the Babine Environment. A second possibility is that the anomaly is reflecting a sulphide concentration along the contact zone between the intrusive dyke and the black to grey mudstones. Since no positive copper geochemical responses have been obtained in this region such a sulphide concentration is probably a pyritized contact. If this explanation is correct the higher apparent resistivities west of the anomaly would be indicative of the intrusive dyke.

CONCLUSIONS AND RECOMMENDATIONS

An induced polarization anomaly was obtained in the survey. It is interpreted to reflect a 1 to 3% sulphide concentration which is 400 to 800 feet wide and over a mile long. Outcrop is scarce in the grid area, however inferred rock types near the anomaly to date are not known to host economic sulphides such as those found on the Big Onion Property. Two suggested geological explanations for the anomaly attribute the polarizability to either graphite or pyrite mineralization.

Without further geological or geochemical support no additional work is recommended on this grid.

RESPECTFULLY SUBMITTED



GARRY M. DEPAOLI
GEOPHYSICIST, B.Sc.

SEPTEMBER 25, 1977
108 MILE RANCH, B.C.

CERTIFICATION

I Garry M. DePaoli of the Village of 100 Mile House, in the Province of British Columbia, HEREBY CERTIFY AS FOLLOWS:

1. That I am a graduate of the University of British Columbia, Vancouver, B.C. with a Bachelor of Science Degree in Combined Honours Geophysics and Geology. (1969)
2. That I have practiced my profession as a Geophysicist continuously for the past 8 years in Northern Ontario, Quebec, New Brunswick, Manitoba, Western USA, Alaska, Yukon Territories and British Columbia.
3. That I am a member in good standing of the Society of Exploration Geophysicists, The Geological Association of Canada, The Canadian Institute of Mining and Metallurgy and the B.C. Society of Exploration Geophysicists.
4. That I have no interest directly or indirectly in the GK, GL, GH Mineral Claims nor do I expect to receive any.

GARRY M. DEPAOLI
GEOPHYSICIST, B.Sc.

September 25, 1977
108 Mile Ranch, B.C.

CERTIFICATION

I Dennis F. Morrison , of the Village of Washago, in the Province of Ontario, HEREBY CERTIFY AS FOLLOWS:

1. That I have attended the University of Waterloo for 2 years enrolled in the Faculty of Science.
2. That I was employed with Bell Canada as an electronic technician during the period 1964 to 1967.
3. That I was employed with McPhar Geophysics as an Induced Polarization Operator from 1967 to 1970.
4. That I have operated as an independent Induced Polarization Contractor from 1970 to the present.
5. That I have induced polarization operating experience in Newfoundland, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, British Columbia, Yukon and Northwest Territories, Alaska and the Republic of Panama.
6. That I have no interest directly or indirectly in the GK, GL, GH Mineral Claims nor do I expect to receive any.

DENIS F. MORRISON

September 25, 1977
Washago, Ontario.

ASSESSMENT DETAILS

WORK SUMMARY

8.2 line miles of induced polarization/resistivity surveying.
MARCH 14, AUGUST 25 to 31, 1977.

PERSONNEL

Dennis F. Morrison

IP Contractor,
Morrison IP Surveys
P.O. Box 418, Gravenhurst,
Ontario POC 1G0

Garry M. DePaoli

Consulting Geophysicist
108 Ranch, Comp. #162, RR#1,
100 Mile House, B.C. VOK 2E0

Blair Taylor

Geophysicist
122 West 45 Ave.,
Vancouver, B.C.

Marcel Perreault

P.O. Box 2677
Smithers, B.C. VOJ 2N0
Geophysical Assisstant

Martin Judd

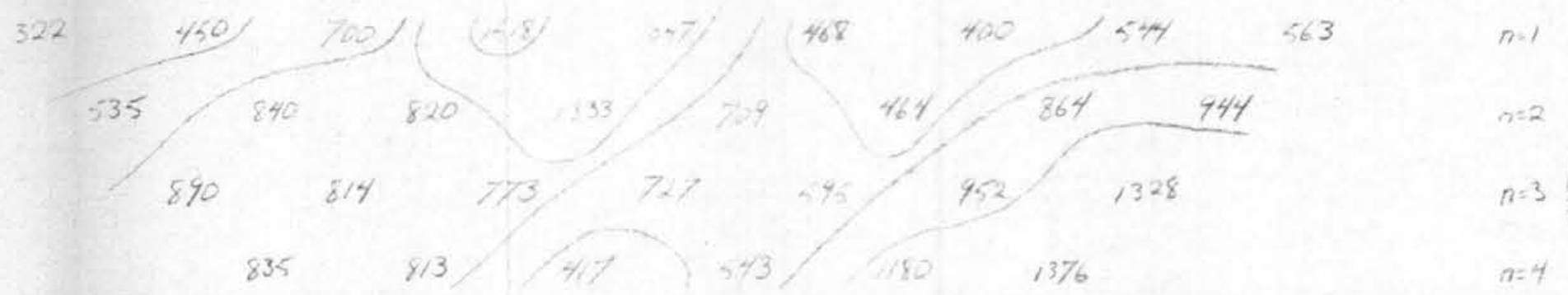
Geophysical Assisstant,
General Delivery,
Smithers, B.C. VOJ 2N0

STATEMENT OF COSTS

7.3 miles of Induced Polarization Surveys applicable for assessment purposes at an average cost of \$454.37/line mile.

Claim	Line Miles	Total Cost
GK	32,800' = 6.2	\$2817.09
GL	2900' = 0.55	\$ 249.90
GH	1800' = 0.34	\$ 154.49

156E 160E 164E 168E 172E 176E 180E 184E 188E 192E 196E 200E 204E



n=1
n=2
n=3 $\frac{P}{2H}$ (A-H)
n=4

LINE ~~26.6N~~
25.4N

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COTE OPTION
SMITHERS AREA, B.C.

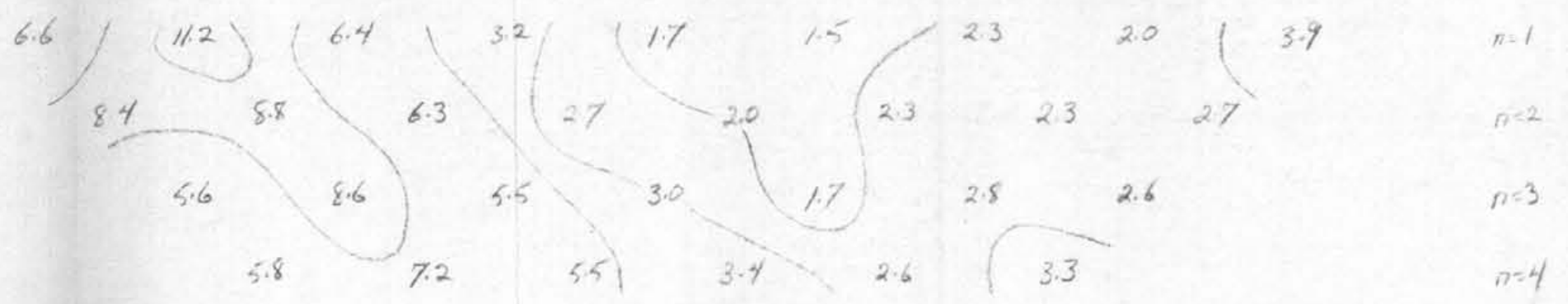
INDUCED POLARIZATION SURVEY
FREQUENCY DOMAIN @ 50 ± 0.3 Hz
DIPOLE-DIPOLE ARRAY

OPERATORS: MORRISON & TAYLOR

SCALE: 1" = 400 FT.

DATE: MARCH 14, 1977

LINE: ~~26.600N~~
25 400 N.



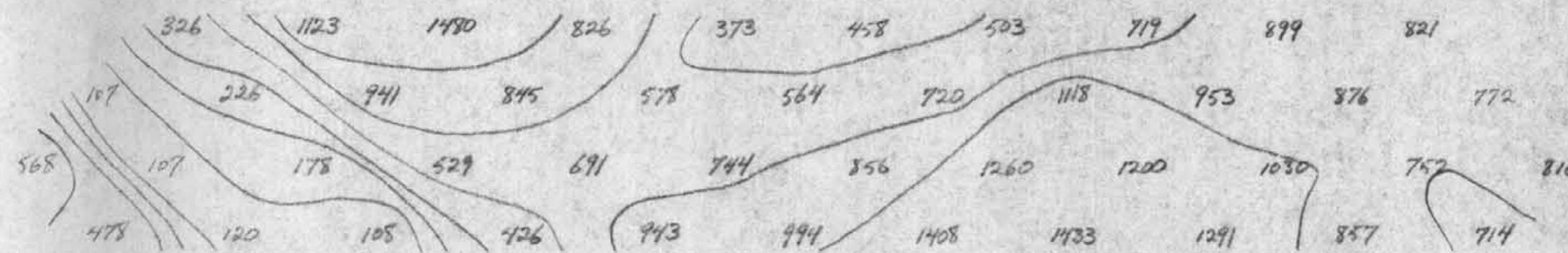
n=1
n=2
n=3 F.E.
n=4

6423

FIG. 3(a)

LINE 26,600N

156E 160E 164E 168E 172E 176E 180E 184E 188E 192E 196E 200E 204E 208E 212E 216E 220E



n=1

n=2

n=3

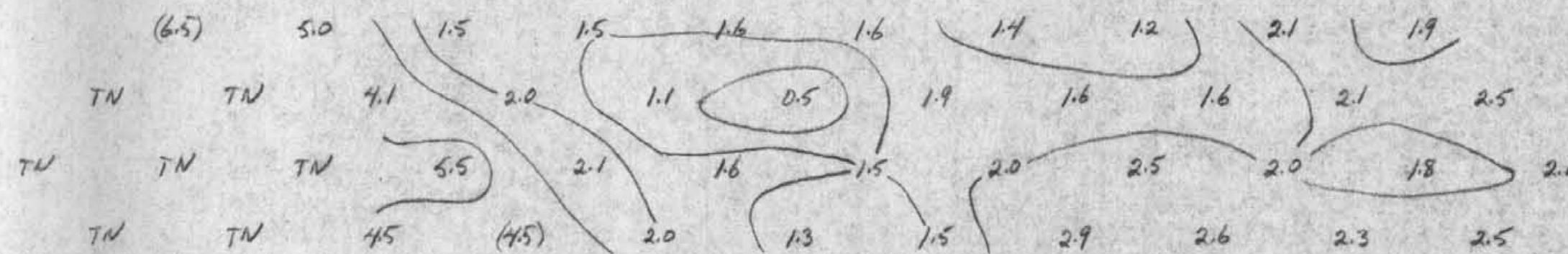
n=4

$\frac{\rho_a (1-f)}{2\pi}$

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BIG ONION CLAIMS
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INDUCED POLARIZATION SURVEY
FREQUENCY DOMAIN @ 5.0 ± 0.3 Hz
DIPOLE-DIPOLE ARRAY

OPERATORS: MORRISON & TAYLOR



n=1

n=2

n=3

n=4

F.E.

SCALE: 1" = 400 ft.

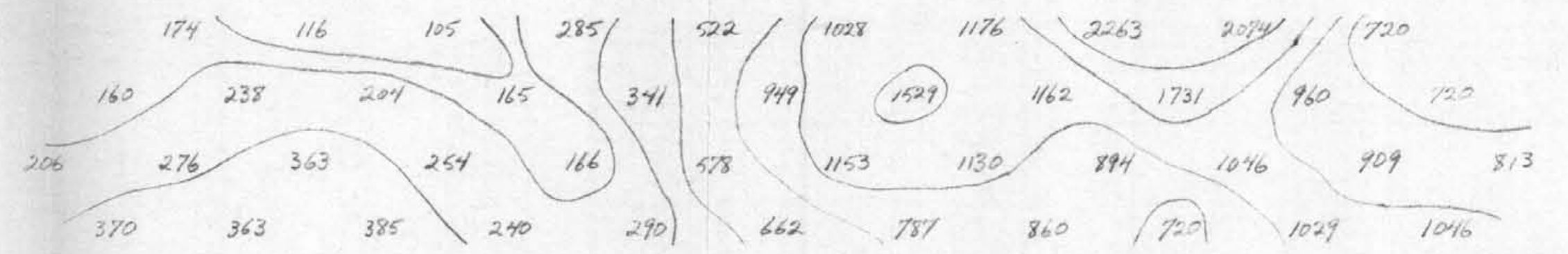
DATE: AUGUST 31ST, 1977

LINE: 26,600 N

6423

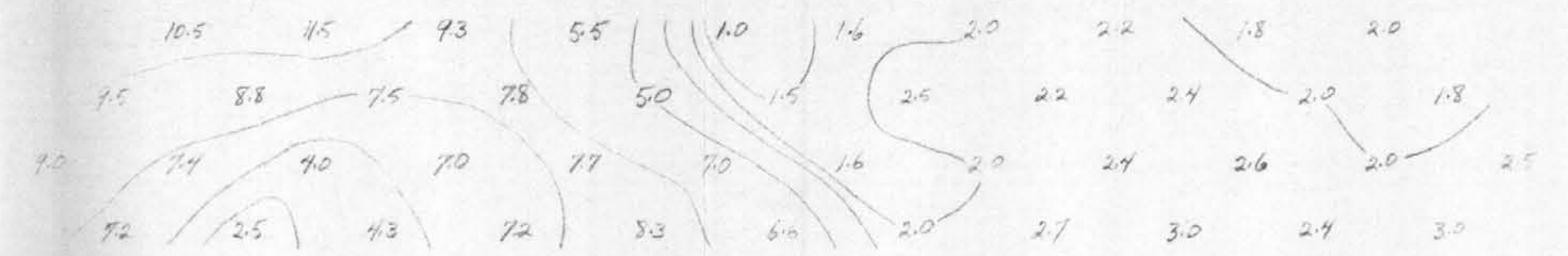
FIG. 3(b)

156E 160E 164E 168E 172E 176E 180E 184E 188E 192E 196E 200E 204E 208E 212E 216E 220E



n=1
n=2
n=3 $\frac{P}{2T}$ (J-F)
n=4

LINE 27,800 N



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SMITHERS AREA, BC

INDUCED POLARIZATION SURVEY
FREQUENCY DOMAIN @ 5.0 & 0.3 hz
DIPOLE-DIPOLE ARRAY

OPERATORS MORRISON & TAYLOR

SCALE 1"=400 FT

DATE AUGUST 30TH, 1977

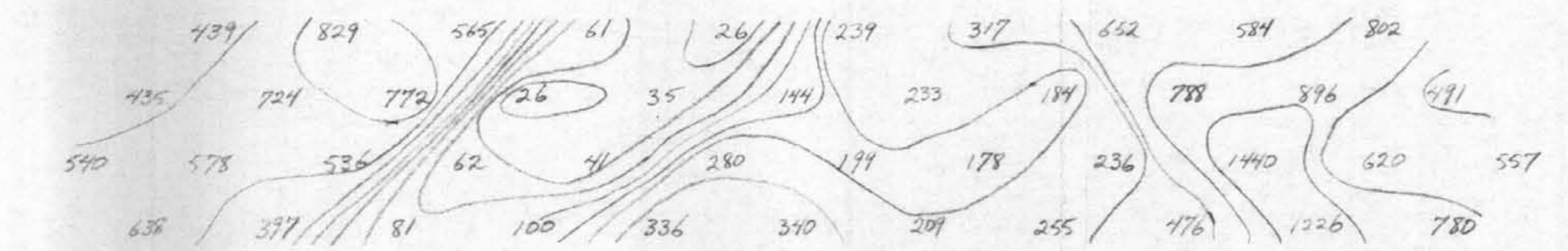
LINE 27,800 N

6423

FIG. 3(c)

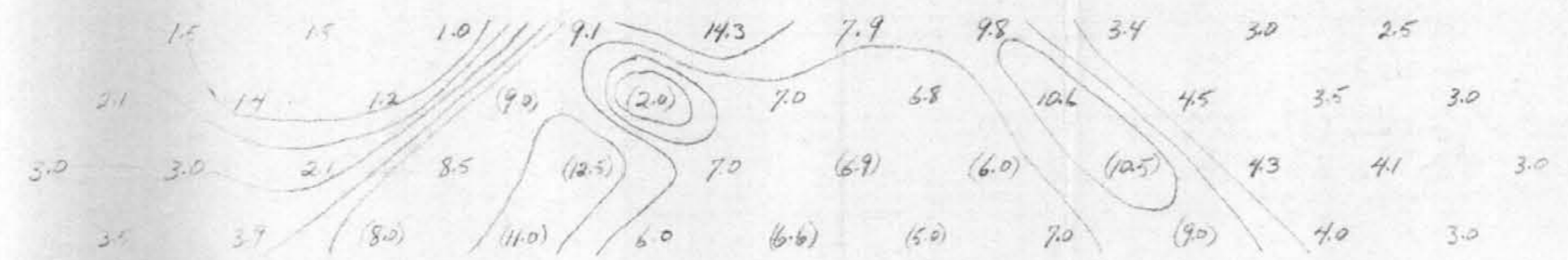
156E 160E 164E 168E 172E 176E 180E 184E 188E 192E 196E 200E 204E 208E 212E 216E 220E

LINE 29,000 N



n=1
n=2
n=3 $\frac{P_2}{2T}$ (Q-F)
n=4

(DRY) SWAMP



n=1
n=2
n=3 F.E.
n=4

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INDUCED POLARIZATION SURVEY
FREQUENCY DOMAIN @ 5.0 ± 0.3 Hz.
DIPOLE-DIPOLE ARRAY

OPERATORS: MORRISON & TAYLOR

SCALE: 1" = 400 FT.

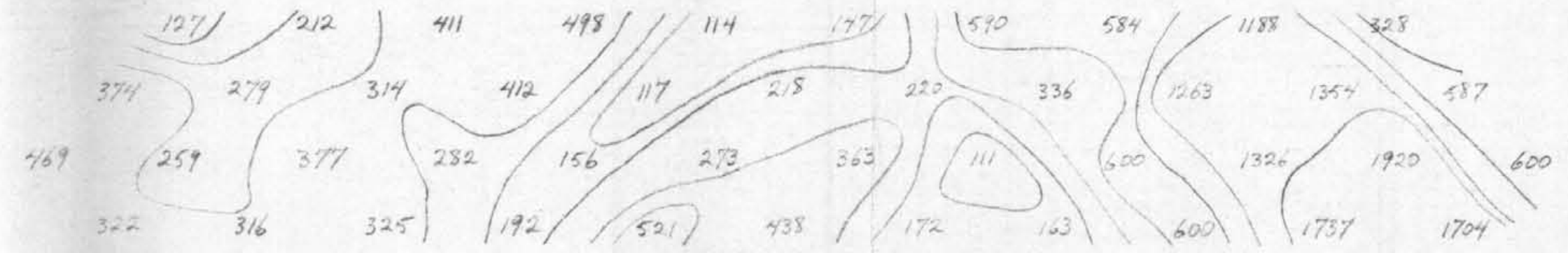
DATE: AUGUST 29, 1977

LINE: 29,000 N

6423

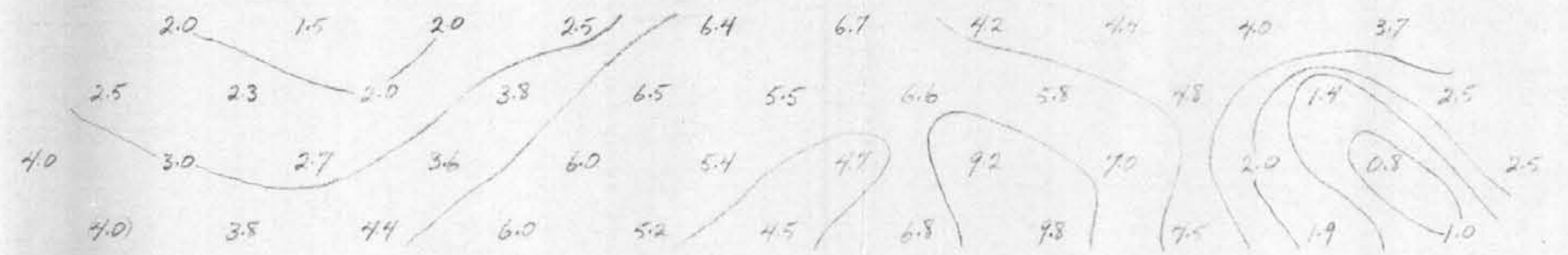
FIG. 3(d)

156E 160E 164E 168E 172E 176E 180E 184E 188E 192E 196E 200E 204E 208E 212E 216E 220E



n=1
n=2
n=3 $\frac{P}{2T} (D-A)$
n=4

LINE 30,200 N



n=1
n=2
n=3 F.E.
n=4

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BIG ONION CLAIMS
SMITHERS AREA, B.C.

INDUCED POLARIZATION SURVEY
FREQUENCY DOMAIN @ 50 ± 0.3 Hz.
DIPOLE-DIPOLE ARRAY

OPERATORS: MORRISON & TAYLOR

SCALE: 1" = 400 ft.

DATE: AUGUST 27, 1977

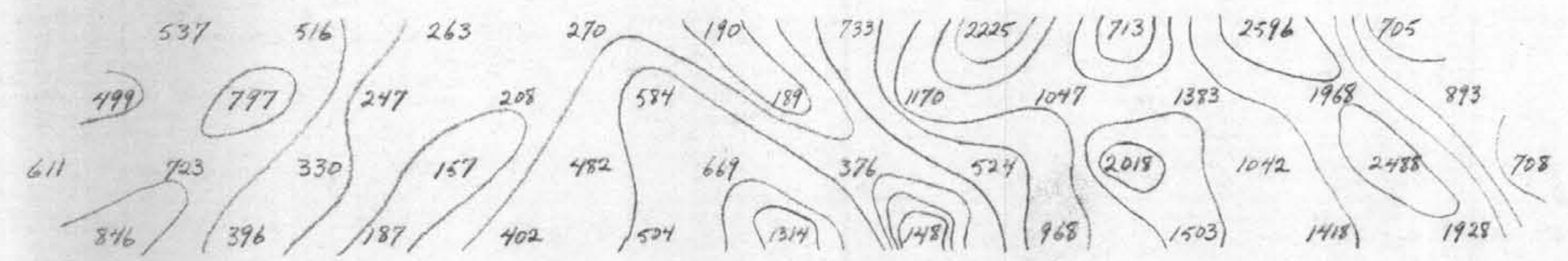
LINE: 30,200 N

6423

FIG. 3(e)

LINE 31,400N

156E 160E 164E 168E 172E 176E 180E 184E 188E 192E 196E 200E 204E 208E 212E 216E 220E



n=1
n=2 $\frac{P_a}{2\pi}$
(COUNT-FT.)
n=3
n=4

CANADIAN SUPERIOR EXPLORATION LTD
BIG ONION
SMITHERS AREA, B.C.

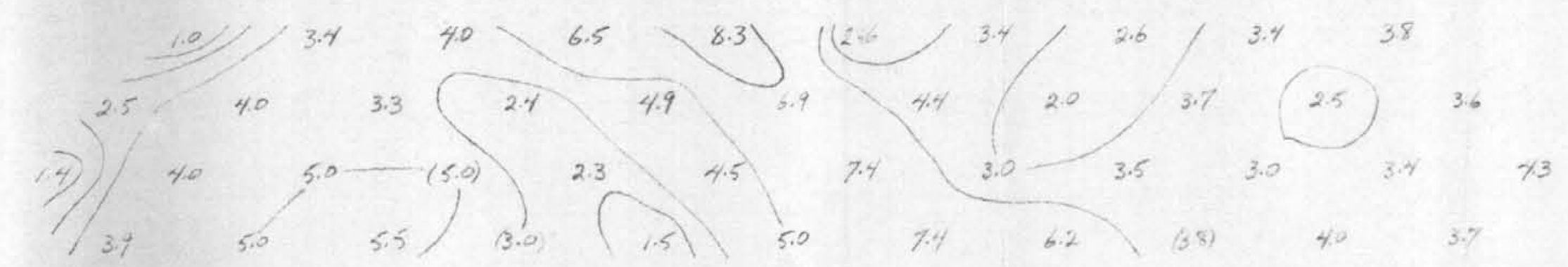
INDUCED POLARIZATION SURVEY
FREQUENCY DOMAIN @ 5.0 ± 0.3 Hz
DIPOLE-DIPOLE ARRAY

OPERATORS: MORRISON & TAYLOR

SCALE 1" = 400 ft.

DATE AUGUST 26, 1977

LINE 31,400N

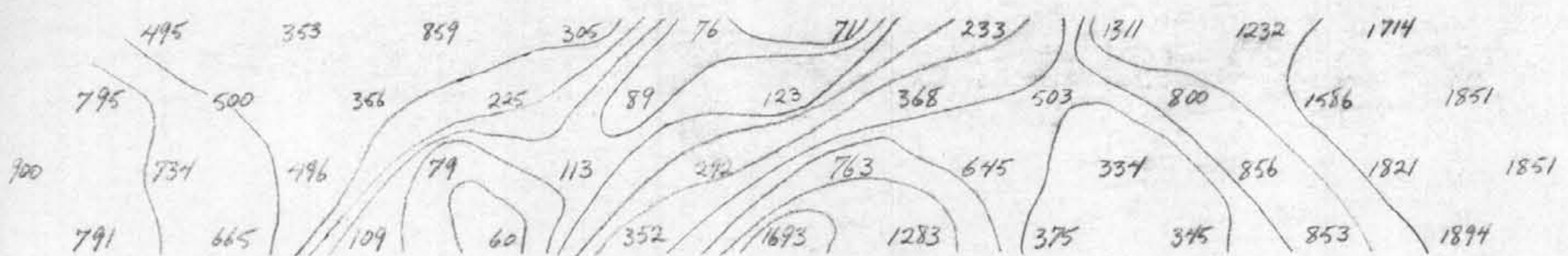


n=1
n=2 F.E.
n=3
n=4

6423

FIG. 3(f)

156E 160E 164E 168E 172E 176E 180E 184E 188E 192E 196E 200E 204E 208E 212E 216E 220E



n=1
n=2
n=3
n=4

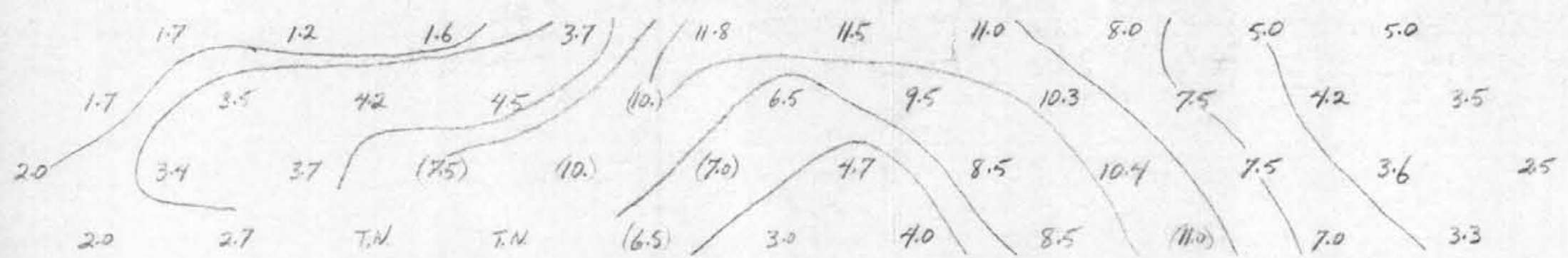
CANADIAN SUPERIOR EXPLORATION LTD.
COTE OPTION
SMITHERS AREA, B.C.

LINE 32600 N



INDUCED POLARIZATION SURVEY
FREQUENCY DOMAIN @ 5.0 ± 0.3 Hz.
DIPOLE-DIPOLE ARRAY

OPERATORS MORRISON & TAYLOR



n=1
n=2
n=3
n=4

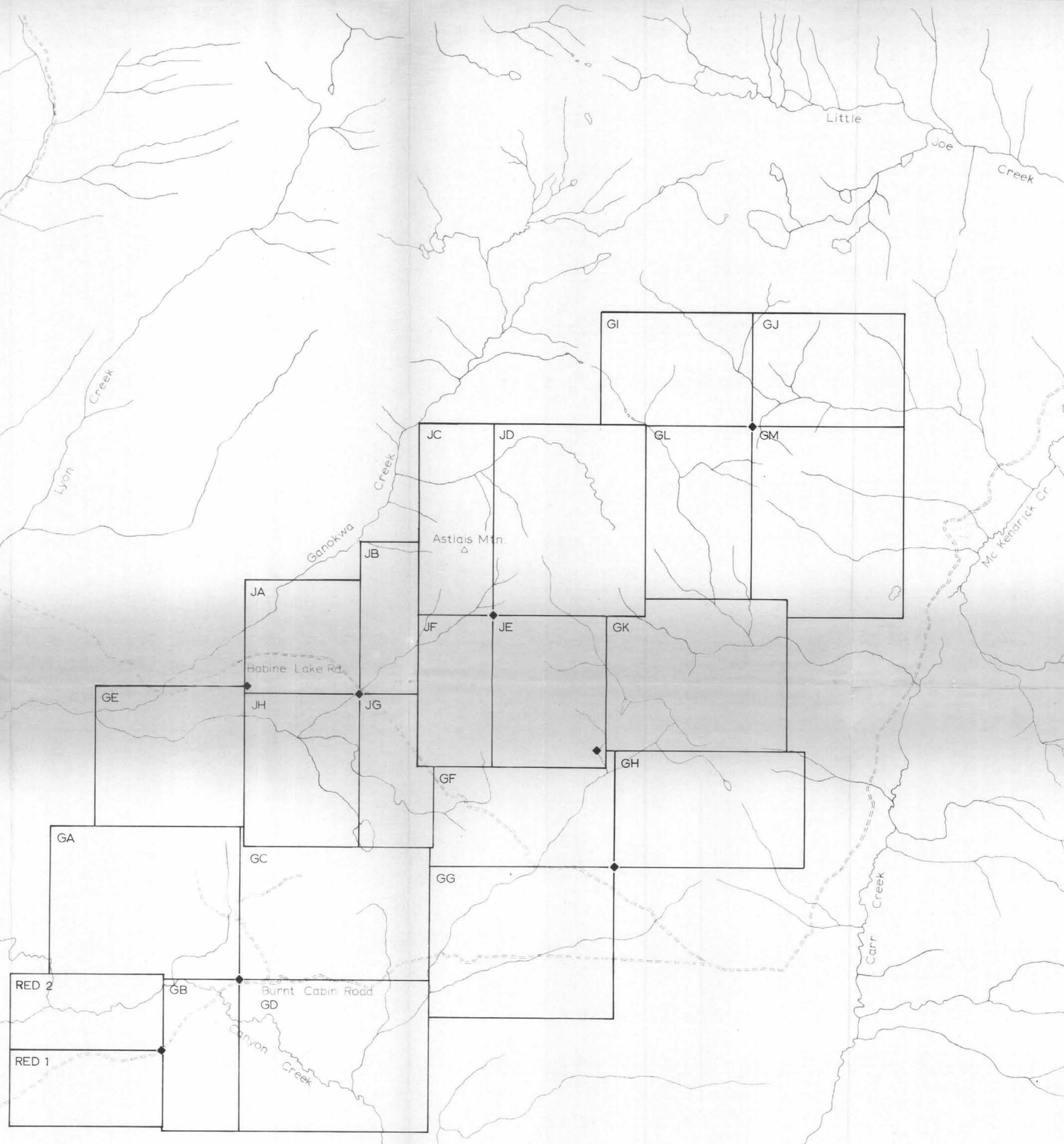
SCALE 1" = 400 ft.

DATE AUGUST 25TH 1977

LINE 32,600 N

6423

FIG. 3(g)



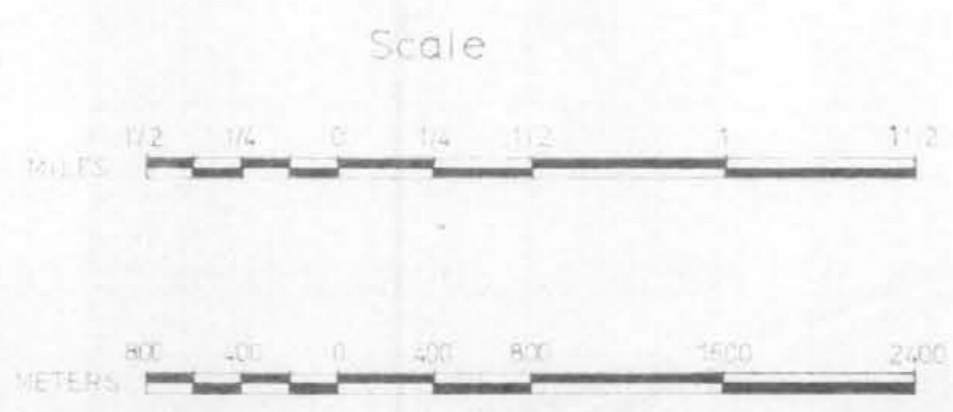
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6423

FIGURE 2

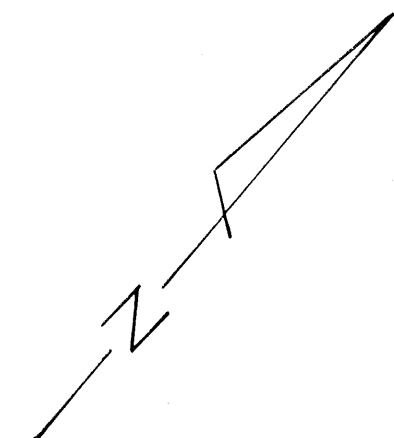
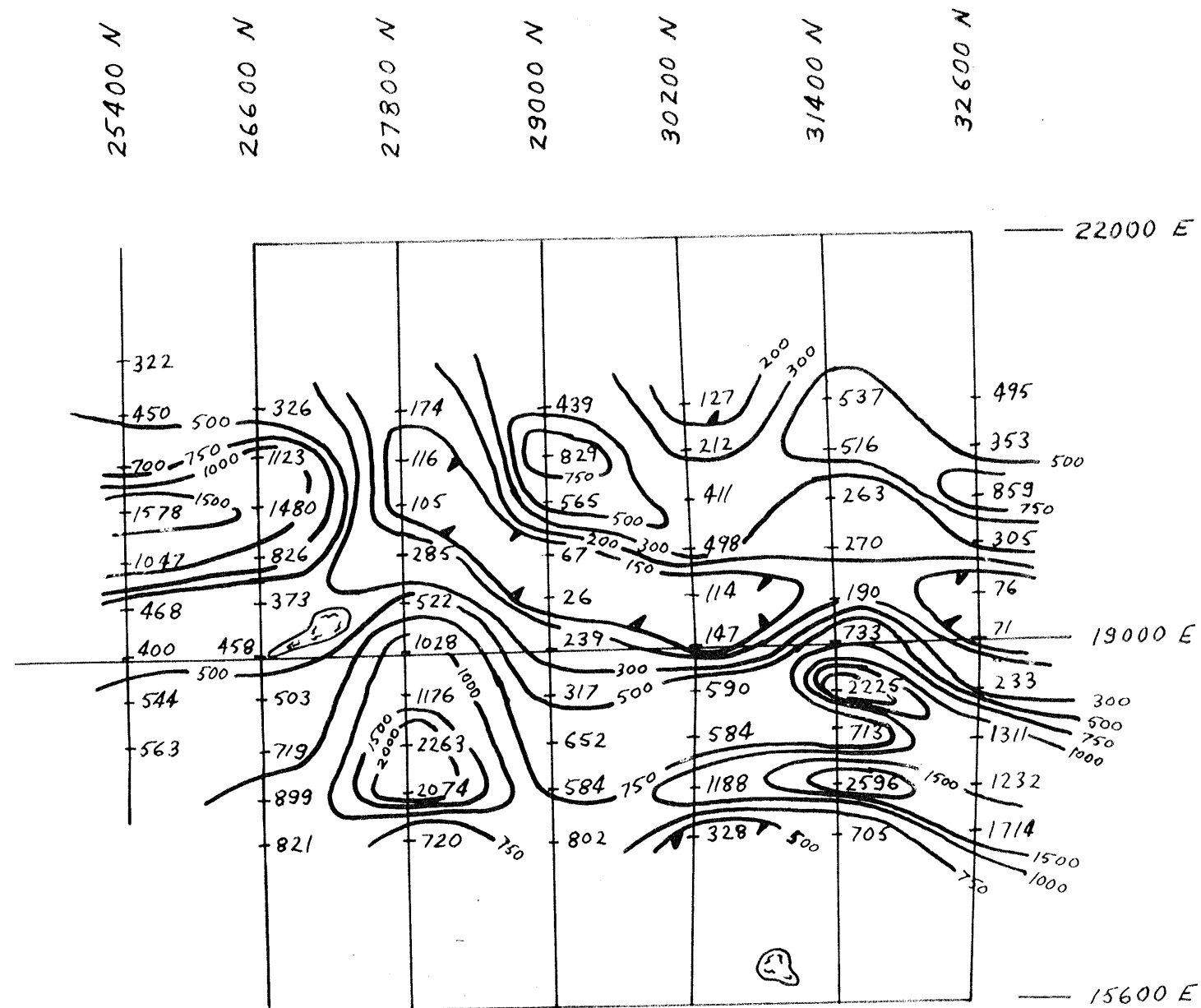
CANADIAN SUPERIOR EXPLORATION LTD.
SMITHERS REGIONAL OFFICE

CLAIM MAP

BIG ONION AREA



NTS. 93 L/15 W SCALE: 1 inch = 1/2 mile DATE: MAY 1977



LEGEND

- +—+— CUT LINE
- LAKE
- +—+— APPARENT RESISTIVITY IN $\rho_a/2\pi$ OHM FEET
- 371
- 300 — RESISTIVITY CONTOUR
CONTOUR INTERVAL SEMI LOGARITHMIC
150, 200, 300, 500, 750, 1000, 1500, 2000

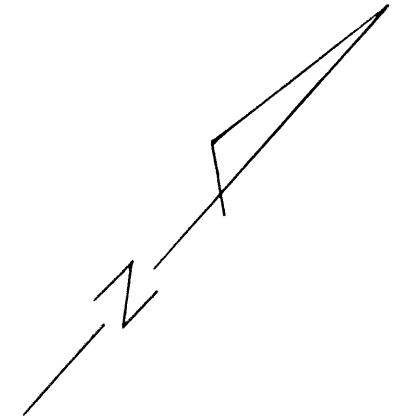
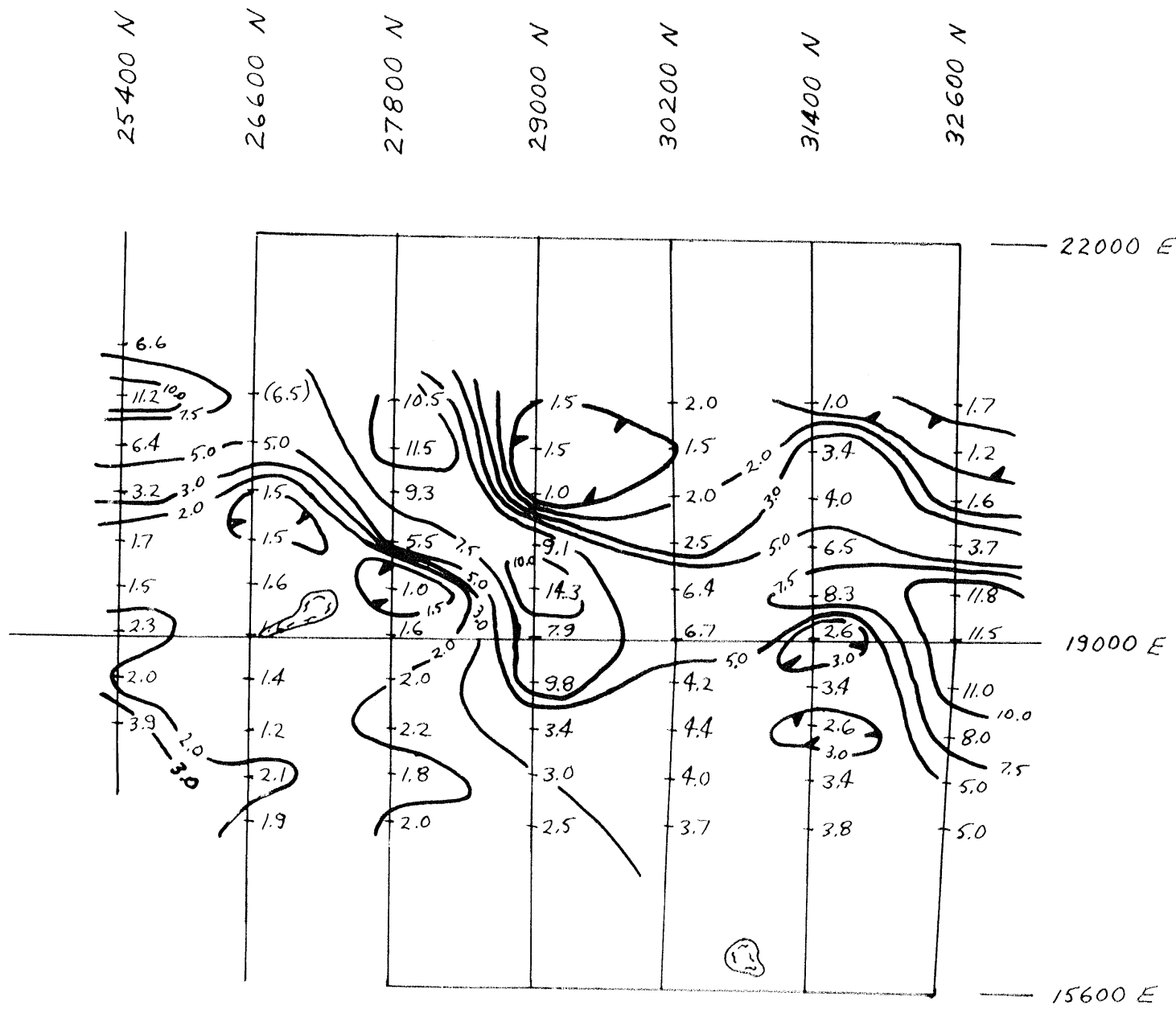
P-660 FREQUENCY DOMAIN IP
 DIPOLE-DIPOLE ARRAY $a=400'$ $N=1$
 0.3 AND 5.0 HERTZ
 OPERATORS: MORRISON + TAYLOR

MINERAL RESOURCES' BRANCH
 ASSESSMENT REPORT
 NO. 6423

CANADIAN SUPERIOR EXPLORATION LIMITED

GK, GL, GH CLAIMS
 PLAN RESISTIVITY N=1

DRAWN BY: G.M.D. DATE: SEPT. 1977 FIGURE 4
 SCALE 1" = 1/4 MILE 1/4 1/8 0 1/8 1/4 1/2 MILES
 TO ACCOMPANY: 1977 GEOPHYSICAL REPORT ON GK, GL, GH CLAIMS BY G.M. DEPAOLI



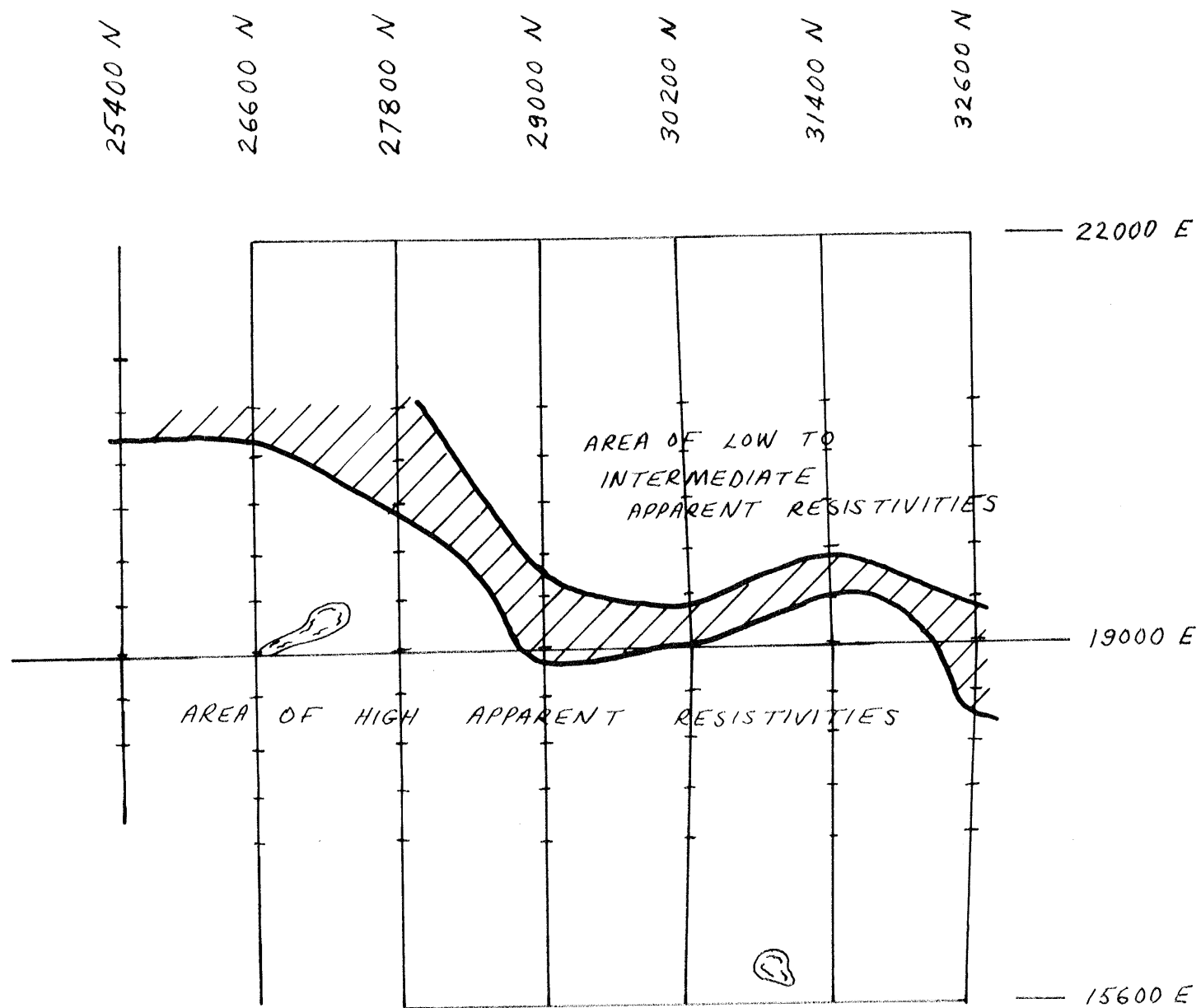
LEGEND

- CUT LINE
- LAKE
- PERCENT FREQUENCY EFFECT
- P.F.E. CONTOUR
CONTOUR INTERVAL SEMI LOGARITHMIC
1.5, 2.0, 3.0, 5.0, 7.5, 10.0


MINERAL RESOURCES BRANCH
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P-660 FREQUENCY DOMAIN IP
DIPOLE - DIPOLE ARRAY $a = 400'$ $N=1$
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON + TAYLOR

CANADIAN SUPERIOR EXPLORATION LIMITED		
GK, GL, GH CLAIMS		
PLAN P.F.E. N=1		
DRAWN BY: G.M.O.	DATE: SEPT. 1977	FIGURE 5
SCALE 1" = 1/4 MILE		
TO ACCOMPANY: 1977 GEOPHYSICAL REPORT ON GK, GL, GH CLAIMS BY G.M. DEPAOLI		



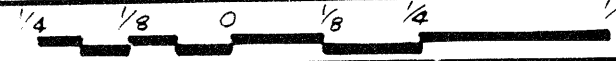
LEGEND

 INTERPRETED ZONE OF 1 TO 3%
SULPHIDES BY VOLUME

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. **6423**

CANADIAN SUPERIOR EXPLORATION LIMITED

**GK, GL, GH CLAIMS
GEOPHYSICAL INTERPRETATION**

DRAWN BY: J.M.D.	DATE: SEPT. 1977	FIGURE 6
SCALE: 1 MILE		
TO ACCOMPANY: 377 GEOPHYSICAL REPORT ON GK, GL, GH CLAIMS BY G.M. DEPAOLI		