# 6078

#6078

SYLVIA CLAIMS - H.B.O.G. OMINECA MINING DIVISION BRITISH COLUMBIA

Report on Induced Polarization and Magnetometer Surveys

LJ. A. McCance

November 1976\_

## 93E/14E

Name	Record No.	Record Date
SYLVIA 1-16	126828-843	July 30
17-18	129380-381	October 24
20	129383	October 24
22	129385	October 24
. 24	129387	October 24
26	129389	October 24
29	129392	October 24
30	129393	October 24
33-36	129396-399	October 24



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

No. 6078

#### 93-E-14

## SYLVIA CLAIMS - H.B.O.G. OMINECA MINING DIVISION BRITISH COLUMBIA

I.P. and MAGNETIC SURVEYS, 1976

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#### 93-E-14

SYLVIA CLAIMS - H.B.O.G.

OMINECA MINING DIVISION

BRITISH COLUMBIA

I.P. and MAGNETIC SURVEYS, 1976

#### SUMMARY

In August of 1976, induced polarization and magnetometer surveys were carried out over a property, recently tendered for joint venturing by H.B.O.G., located 70 road miles southwest of Houston, British Columbia. A 4-line grid was surveyed to confirm the location of a previously recognized IP anomaly which had returned some interesting percussion hole copper assays and to extend existing IP coverage so as to clarify the dimensions and depth of this 'porphyry type' target.

The induced polarization survey revealed two anomalous zones, of which the most northerly was not previously encountered. A compass and clinometer traverse completed in conjunction with this survey allowed for the accurate location of all anomalies relative to past drilling.

The magnetic results suggest a central magnetic feature flanked to the south and west by less magnetic rocks and to the north by a complex magnetic zone.

An untested target approximately 400 meters by 200 meters may be associated with both the interesting drill intersection and the north flank of the southern IP anomaly.

This report contains a detailed interpretation of these surveys results with recommendations.

#### 1. INTRODUCTION

After examining summaries, which included geophysical and drilling information, for five properties proposed for Joint Ventures between Hudson's Bay Oil and Gas Company Limited (H.B.O.G.) and Rio Tinto Canadian Exploration Limited, Rio Tinto elected to complete a separate field investigation of a property known as the "Sylvia Claims," in the Tahtsa Area of British Columbia. A geophysical field crew was mobilized to the property to locate and detail the existing IP anomaly; to acquire additional magnetic data and field data relating to past drill efforts and to search for any extensions of the IP target at depth towards the North and West of the identified copper zone.

During the period from August 16 to August 31, 1976 inclusive, a 4-line grid was established and tied to the existing percussion holes by compass, chain and clinometer traverses. An induced polarization survey was completed using the dipole-dipole array with four separations. Subsequently a magnetometer survey was carried out over this new grid.

#### 2. LOCATION, ACCESS AND TOPOGRAPHY

The SYLVIA claims (NTS 93E/14) property lies within the Omineca Mining District of British Columbia. The property straddles the BERG road about eight miles WNW of Twinkle Lake and is located about 70 road miles Southwest of Houston B. C. As outlined in the table below the following sequence of logging and forest fire access roads provide access to the property.

}	. ROAD JUNCTIONS		ROUTE	DISTANCE	
	FROM	TO	J		
1.	Houston, B.C.	Morice River Rd	Hwy 16	2 mi W	
2.	Hwy 16	Francois Lake Rd	Morice River Rd	17 mi SW	
3.	Morice River Rd	Tahtsa Lake/ Nadina Lake Rd	Francois Lake Rd	12 mi SE	
4.	Francois Lake Rd	Twinkle Lake/ Berg Rd	Tahtsa Lake/ Nadina Lake Rd	30 mi SW	
5.	Tahtsa Lake/ Nadina Lake Rd	Sylvia Claims	Twinkle Lake BERG Rd	7 mi W	

The Tahtsa Lake-Nadina Lake road is narrow and badly pitted and the BERG road fords a sizeable creek. Consequently the use of a 4 x 4 vehicle is advised. Seven thousand feet of recent drill access road provide limited access within the claim group itself.

The topography is gentle. The gridded area within the claim group lies within a topographic low occupied by Berg Creek and associated tributaries. Relative elevations do not exceed 100 metres and nowhere are steep slopes recognized.

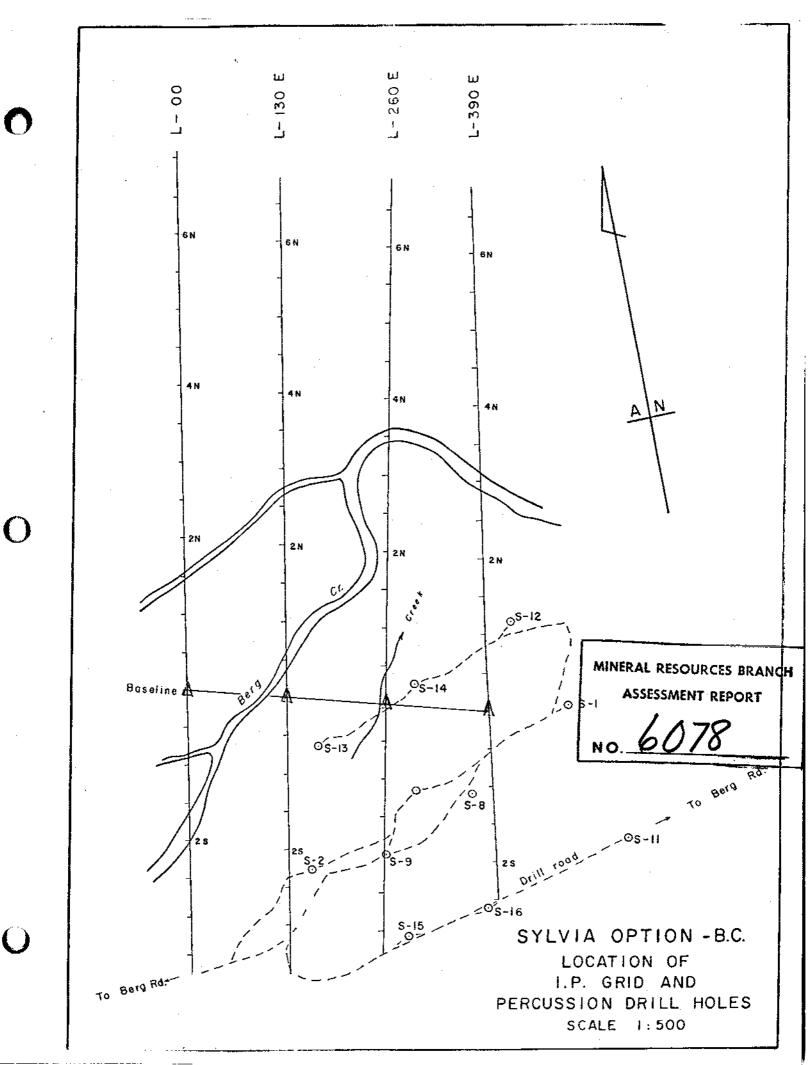
#### PREVIOUS WORK

Anomalous silts (Cu, Mo) from a 1972 regional stream sampling program are presumed to have led to further exploration by H.B.O.G. in the area of the Sylvia claims. Eventual ground acquisition resulted from follow-up soil geochemical and both reconnaissance and detail geophysical surveys in 1973 which outlined a strongly anomalous IP response with coincident magnetics and an associated attractive geochemical pattern. A geological mapping program at a scale of 1 inch = 1/4 mile was also completed in 1973. A drill road was constructed to prepare for a percussion drilling program the following season. Details of geology and geochemistry are discussed by G. I. Hall, H.B.O.G., in the Tahtsa Report 1973. The geophysical work in 1973 is discussed in "Report on the Geophysical Aspects of the Tahtsa Project 1973" by L. A. Homeniuk and J. Panenka.

In 1974, percussion holes, S-1 to S-10 totalling 1,740 feet were drilled at approximately 500 foot centers to test the IP target delineated in 1973. Hole S-8 encountered the best grades, intersecting mineralized granodiorite and quartz monzonite which averaged 0.33% Cu and 206 ppm Mo across 200 feet. Holes S-3 and S-10, located West of the present grid failed to reach bedrock. The remaining holes averaged less than 0.05% Cu.

In 1975, an additional 6 percussion holes totalling 1,140 feet were drilled. Holes S-13 and S-14 failed to reach bedrock. Assay results from the remaining 4 holes, each drilled to a depth of 250 feet, were generally non-economic. Best assays occurred in hole S-11 with 0.03% Cu and 15 ppm Mo.

The location of the IP grid and percussion drill holes are illustrated at a scale of 1:500 on the accompanying location diagram.



#### 4. SURVEY PROCEDURE

#### 4.1 Geophysical Grid

A four line grid was cut from a base line bearing magnetic East. All lines were established perpendicular to this base line at 130 metre intervals. These lines designated LOO to L390E extend from 700N to the southernmost drill road. Pace and compass extensions of all lines were flagged from 800N to 700N and from the south drill road to 800S. Cutting originated in such a manner that percussion hole S-9 was given the co-ordinates 260E, 200S. Pickets bearing the grid relative co-ordinates of the station North or South of the baseline were placed at 50 metre intervals along the lines. Chain and clinometer traverses along each line established the elevations of all stations relative to Berg Creek. Chain, compass and clinometer traverses at the North end of all lines and along the drill roads enabled accurate monitoring of line deviation and made it possible to relate the position of most of the H.B.O.G. percussion holes to the new grid. Prominent geographical features were also documented. The scale and orientation of the grid relative to all these features is indicated on the accompanying location diagram.

In total 400 metres of baseline and 4.17 kilometres of survey line were cut. Flagged line extensions by pace and compass traverses covered an additional 2.18 kilometres.

#### 4.2 Magnetometer Survey

A Scintrex MF-2 fluxgate-type magnetometer was used for this work. Requiring only "bull's-eye" levelling, it has a sensitivity of 20 gammas per scale division and a reading accuracy of 10 gammas on the most sensitive scale. On all other scales reading accuracy can be maintained at 1% of full scale. Five switch-selectable scales are available which allow the observer to monitor an overall range of relative vertical field magnetic values of \_100,000 gammas.

The base line was initially surveyed using ABAB type closed loops to establish drift free magnetic-base stations spaced at 130 metre intervals. The lines were traversed in successive hourly loops beginning and ending at one of the previously established base line magnetic bases. Readings were taken at 25 metre intervals along the lines. Hourly

drift and diurnal variations were removed from each set of daily traverses, with magnetic adjustments being applied to all observed values by a linear distribution of the observed magnetic variation over the time between base checks.

In total 186 stations were occupied over 4.55 kilometres of the grid.

#### 4.3 Induced Polarization Survey

A Huntec MK III time domain induced polarization receiver was used for this work with a 7.5 Kw transmitter and related accessories. A manufacturer's brochure outlining equipment specifications is provided in APPENDIX II. Transmitter timing parameters were set as follows:

Period = 2 seconds
Duty Ratio = 1 : 1
td = 240 ms
tp = 60 ms

The dipole-dipole array using three foot 'T' shaped stainless steel rods as electrodes was employed as past experience using this array and the symmetrical properties from this configuration were felt to be advantageous within this geologic environment. The power lines were laid out to avoid any coupling effects between the power and receiver potential lines. For every potential dipole location, data was obtained to calculate apparent resistivity and composite chargeability values for each of four dipole separations. Measurements were recorded at 100 metre intervals along all lines.

Apparent chargeability data from the Huntec MK III receiver using the above timing parameters has been converted to the equivalent Newmont response parameter, Mc, by the following operation:

$$Mc = 4.05 (M_3 + 2M_4)$$

Mc is the composite apparent chargeability expressed in millivolts per volt;  $\rm M_3$  and  $\rm M_4$  are Huntec digital voltmeter displays expressed as percentages of Vp; the primary voltage at time "t" = 0; which represent the integrals under the Vp decay curve from "t" = 420 ms to "t" = 660 ms and "t" = 660 ms to "t" = 1140 ms respectively.

Apparent resistivity data was calculated from the

following expression: Rho = K Vp/I

Rho is the apparent resistivity in ohmmetres; Vp is the observed potential difference at the receiver in volts; I is the transmitter output current in amperes and K is a composite constant combining a geometrical factor for the electrode configuration and a conversion factor to derive ohmmetres from a metric-chained grid.

Over a total line distance of 12.5 kilometres 486 stations were occupied and the following chargeability and resistivity coverage was obtained with an 'x' of 100 metres.

Approximate Depth Penetration	No. of Stations	Traverse Length
100 metres	55	5.1 Km
150 metres	51	4.7 Km
200 metres	47	4.3 Km
250 metres	43	3.9 Km

#### 5. PRESENTATION OF RESULTS

#### 5.1 Magnetometer Survey

The position of all magnetic bases are indicated by triangles on the location diagram. The magnetic data, corrected for hourly drift and diurnal variation are presented as profiles at a vertical scale of 500 gammas per centimetre against a horizontal scale of 1:5000 on all I.P. pseudosection plots. Elevation data from clinometer traverses along all lines are plotted with no vertical exaggeration and presented at a scale of 1:5000 with these magnetic profiles.

#### 5.2 Induced Polarization Survey

Chargeability and resistivity values are presented on four accompanying drawings, DWG. IP 2744-1 to IP 2744-4, all at a scale of 1:5000. The data are presented as pseudosections with no vertical exaggeration. Chargeability values, given in millivolt per volt units (termed 'mils') are contoured linearly at 2.5 mil intervals to values of 30.0 mils.

Where steep gradients exist between 20.0 mils and 30.0 mils and for chargeability values in excess of 30.0 mils, a 10 mil contour interval is used. Resistivity values are plotted to an accuracy of 1 ohmmetre. The basic contour interval for resistivity values to 1000 ohmmetres is 100 ohmmetres. For values greater than 1000 ohmmetres a contour interval of 1000 ohmmetres has been used. The data plotting points are illustrated in the legend on each drawing with the data being plotted beneath a point midway between dipoles at a depth equal to half the electrode separation. The resistivity and I.P. pseudosections are plotted as mirror images of one another, the upper section being inverted. This inversion technique of data presentation has been found convenient for interpretation purposes.

Recognizable IP anomalies have been indicated on the profile section at the top of each IP drawing. The solid and dashed bars represent the surface projection of the definite and less definite anomalies respectively, as interpreted.

#### 6. DISCUSSION OF GEOPHYSICAL RESULTS

#### 6.1 Magnetometer Survey

Although past magnetic survey results indicate a direct correlation between magnetic susceptibility and a non-porphyritic very fine grained tuffaceous volcanic rock unit, geologic correlation with the present survey results appears vague. The gradational contact between non-porphyritic tuff and granodiorite indicated as present immediately South of hole S-8 and apparently intersected in hole S-9 and S-2 shows no significant magnetic characteristics. It is assumed therefore that in the area of contact, these rock types have similar susceptibilities.

Although geological correlations are not readily apparent certainly three rather distinct magnetic zones designated the 'North' zone, the 'Central' zone and the 'South' zone are indicated. A general increase in magnetic intensity from southwest to northeast, observed on previous surveys is apparent on line 260E and line 390E only.

The 'Central' magnetic zone is characterized by long wavelength, small amplitude variations imposed on a relatively constant average background field which varies from 500 gammas

on line 130E between 100S and 600N to 300 gammas on line 390E between 100N and 450N. This average background amplitude for the 'Central' zone decreases slightly from West to East and is represented on line 260E by an average value of 400 gammas between 00 and 600N.

A 'Southern' magnetic zone recognized as less magnetic than the 'Central' zone surrounds the area of contact between granodioritic rocks and non-porphyritic tuffaceous volcanics. This 'Southern' zone, characterized by relatively constant magnetic amplitudes, suggests that these two-rock units have similar magnetic properties although apparently quite varied with regard to grain size and general composition. Average intensities vary from +100 gammas on line 00 between 350S and 500N to -100 gammas on line 260E between 50S and 350S. On line 130E this zone extends South from 100S with average magnetic intensities near zero. On line 390E this zone, while recognized by average amplitudes of 50 gammas, is limited in size located only betwen 150N and 225S.

Magnetic amplitudes typical of 'Central' zone material surround this 'Southern' zone response on line 390E.

The 'Northern' zone is recognizable by both higher amplitudes and complex magnetic features. This zone characterized as uniform with intensities near 850 gammas on line 390E peaks above 1000 gammas on line 260E. A slight 'cosine' shape to the profile between 600N and 750N on line 260E may indicate the Easternmost influence of a strongly dipolar near surface magnetic feature on line 130E between 675N and 700N. A narrow near vertical, shallow and depth limited source is indicated on line 130E.

Although magnetic intensity averages -250 gammas for this zone on line 00 the 'cosine' shape of the response between 625N and 725N is similar to that recognized on line 260E suggesting that this zone is under the influence of the strongly magnetic near surface source identified on line 130E.

No additional magnetic features are recognized.

#### 6.2 <u>Induced Polarization Survey</u>

Two features (Zone A and Zone B) can be recognized from the chargeability data. Both appear to be deeper on line 00 and move to progressively shallower depths towards line 390E indicating a general plunge towards the West. The previously recognized IP anomaly is identified as the current Zone A response, an intensely anomalous chargeability zone extending from approximately the baseline to 300 south on all lines. Unfortunately the anomaly suggests a polarizable body that appears to be sharply cut off towards the North and perhaps of limited depth extent.

The following are descriptions of the salient features of each zone as observed line by line.

#### Line 390 East

Chargeabilities on this line range from 7.2 mils to 86.0 mils. The most prominent feature designated Zone A is a strong chargeability response with prominent pantleg geometry, centred on n = 1 at 200S. This zone correlates with a transition between a broad magnetic 'low' extending from 250S to 100N and higher magnetics south of 250S. The abrupt termination near 50N coincides with a topographical drop to the river flats. This topographic feature marks the approximate northern limit of this IP anomaly on all other lines. A near vertical low resistivity lineament projects to surface near 200S and consequently correlates directly with the surface projection of the pantleg chargeability feature. Overall this anomaly appears to have a more polarizable narrow, central core surrounded by a larger body of less chargeable material.

A second chargeability anomaly designated Zone B, is located between 300N and 500N. Generally much weaker than the A zone this feature has a maximum chargeability of 24.7 mils Higher resistivities and positive magnetics indicate that this zone originates from a different source than that responsible for the A zone anomaly.

#### Line 260 East

Chargeabilities on this line range from 2.9 mils to 103.3 mils, the strongest response encountered during this survey. The A zone response appears to be broader than recognized on L390E and is centered from 200S to 300S. This feature correlates directly with low magnetics and a broad zone of lower resistivities. Decreasing amplitudes with increasing dipole separations may suggest that the source is of limited extent.

Zone B, indicated to approach surface from 250N to 300N appears narrow and correlates with resistivity values similar to those associated with the A zone. Zone B definitely has a positive magnetic association which suggests that the source may be the generally more magnetic volcanic tuffs. A central chargeability low may be a 'shadow' effect caused by the proximity of the zone A and zone B sources relative to the 'x' spacing used during this survey.

#### Line 130 East

Zone A appears less extensive, located from 400S to 100S. It suggests a less chargeable zone with a maximum chargeability response of 76.5 mils. This zone once again appears to be depth limited and correlates with a magnetic low. Highest chargeabilities appear to correlate with the South flank of a prominent low resistivity feature situated between 250S and 400N.

Zone B is weakly anomalous on this line situated between 350N and 500N. High resistivities near 500N at depth appear to correlate with this feature which again appears associated with a more magnetic source than that of zone A.

#### Line 00

The zone A chargeability response centred at 250S extends from 400S to 100S. Generally less chargeable the peak chargeability is 60.0 mils recorded on the largest dipole separation. The zone appears broad and at a greater depth which may either suggest a greater depth of poorly chargeable cover materials or that the A zone has terminated between line 130E and line 00 with the larger separations responding to sources at greater lateral distances from the line of traverse than the shorter separations. If an increased depth of cover can be assumed then a generally more chargeable environment has been recognized which for the first time may suggest an extension to depth.

Zone B with 'signature like' higher resistivities and positive magnetic features is again delineated between 400N and 450N.

#### CONCLUSIONS

Two separate chargeability anomalies have been recognized. Zone A is characterized by strong chargeabilities generally low magnetics and variable to low resistivities. It appears to plunge towards the West and may possibly terminate before line 00. Zone B is only marginally anomalous appears narrow and correlates with higher magnetics. Resistivities associated with the B zone vary from moderately low to high with the zone appearing to be at greater depths towards the West.

Geological correlation with these zones must be considered speculative as very little outcrop was located. However, the intensity, relatively consistent line to line response and sharp termination of these electrical features seem to be most directly correlative with the relatively high percentages of pyrite, magnetite clay coated plagioclase, sericite and other IP responsive minerals within the tuffaceous volcanic rocks. Similarly the higher magnetic intensities associated with the Zone B IP feature may simply correspond to a more magnetite rich band within the bedded non-porphyritic tuffs recognized in outcrop near the eastern claim boundary.

It must also be concluded that the medium grained relatively non mineralized granodiorite intersected by previous percussion drilling may not respond to the IP technique, perhaps a result of the absence of pyrite and general lack of alteration. Therefore; although the interesting copper intersection from percussion hole S-8 (near 100S L390E) appears to be associated with the Zone A IP response it is concluded that only the north flank of the Zone A chargeability feature or that part of the intrusive near the contact with the volcanic tuff unit remains untested and a possible copper zone. If such speculation can be substantiated then limits on the size of the target must be reduced to approximately 400 meters by 200 metres.

#### CERTIFICATE

- I, John A. McCance of the City of Toronto, Province of Ontario do hereby certify:
- 1. That I am a geophysicist and reside at 113 Hendon Avenue, Willowdale, Ontario.
- 2. That I graduated from Queen's University at Kingston in 1970 with the degree of Bachelor of Applied Science and have completed post-graduate courses at the University of Western Ontario, London.
- 3. That I am a member of the Association of Professional Engineer's of the Province of Ontario (Mining Branch).
- 4. That I have been practising my profession for a period of five years.
- 5. That I am employed by Rio Tinto Canadian Exploration Limited.
- 6. That I supervised this survey program.

November 1976

J. A. McCance, P.Eng.



#### COST STATEMENT

### RIO TINTO CANADIAN EXPLORATION LTD. GEOPHYSICAL SURVEY

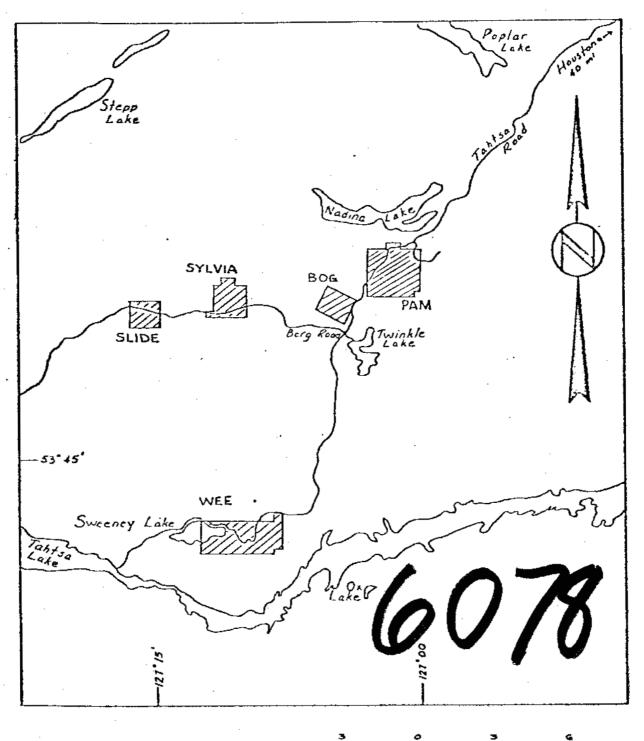
SYLVIA GROUP, TAHTSA LAKE AREA, B.C. AUGUST 16 THROUGH SEPTEMBER 4, 1976

SALARIES & WAGES		
C.D. Spence Aug 30 1 day @ \$100/day D. Sexsmith Aug 16 - Sept 4 20 days@ \$ 43/day K. Gossen Aug 16 - Sept 4 20 days@ \$ 37/day A. Loo Aug 16 - Sept 1 17 days@ \$ 37/day H. Ngo Aug 16 - Sept 2 18 days@ \$ 36/day S. Lowe Aug 16 - Sept 1 17 days@ \$ 37/day J. Lindsey Aug 16 - Sept 4 20 days@ \$ 37/day	860.00 740.00 629.00 648.00 629.00	\$ 4,346.0
EMPLOYEE BENEFITS		869.2
FOOD & ACCOMMODATION		·
Super-Valu #77 Rio Tinto Camp Equipment (84 man days @ \$3.00/day) Cascade Motel Houston Hotel-Cafe	625.01 252.00 15.75 201.30	1,094.0
TRANSPORTATION	•	
Dearborn Motors 4x4 Rio Tinto Truck Ford ½ Ton (14 days @ \$10.00 day) Marketway Gulf (Repairs)	334.62 140.00 203.01	677.6
FUEL		·
Imperial Oil Lynjune Holding Ltd. Texaco Canada	83.24 14.18 124.00	221.4:
EQUIPMENT & SUPPLIES	·	
Rio Tinto: MF-1 Magnetometer (2 weeks @ \$50/week) and I.P. Huntec (2 weeks @ \$150/week)	100.00 300.00	400.00
REPORT PREPARATION		415.2

TOTAL \$ 8,023.5

APPENDIX I
LIST OF PERSONNEL EMPLOYED

<u>Name</u>	Position	Sign-on Point	Employment Period
D. Sexsmith	Party Chief	Permanent Staff	August 16 to August 31, 1976.
J. Lindsey	Junior Geophysicist	Toronto	August 16 to August 31, 1976.
K. Gossen	Geophysical Assistant	Vancouver	August 16 to August 31, 1976.
A. Loo	Geophysical Assistant	Vancouver	August 16 to August 31, 1976.
S. Lowe	Geophysical Assistant	Victoria	August 16 to August 31, 1976.
H. Ngo	Geophysical Assistant	Kamloops	August 16 to August 31, 1976.



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MAP NO. 2



Hudson's Bay Oll and Gas Company Limited

MINERALS EXPLORATION
VANCOUVER BRITISH COLUMBIA

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TAHTSA PROJECT

LOCATION MAP
PAM. BOG, SYLVIA. SLIDE, WEE

CLAIM BLOCKS

Fig. 2 October, 1975

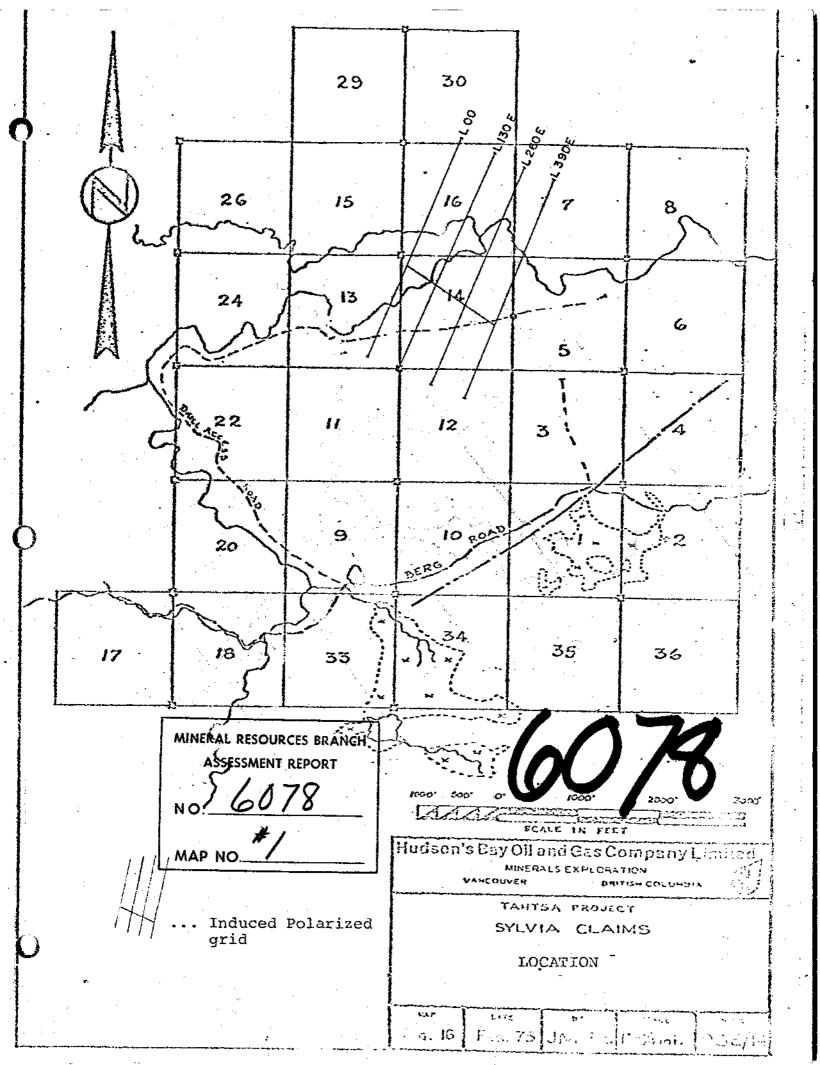
KAP

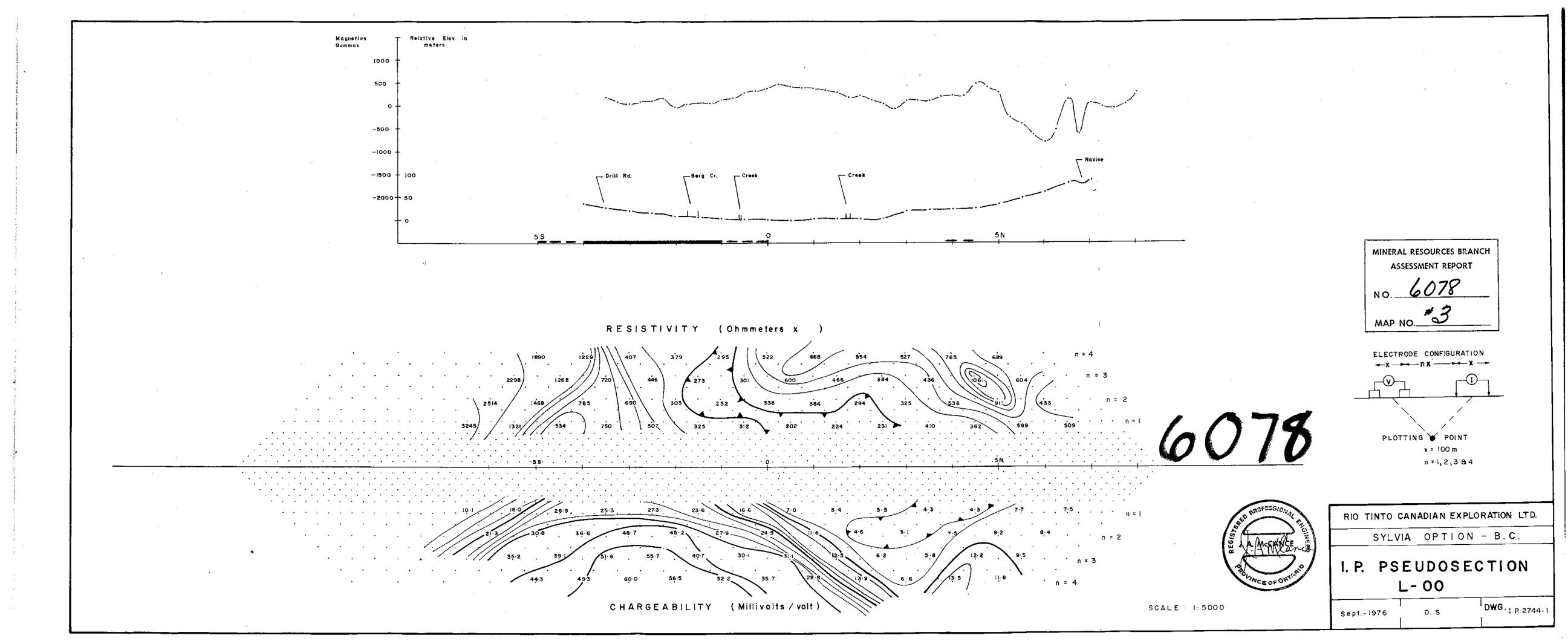
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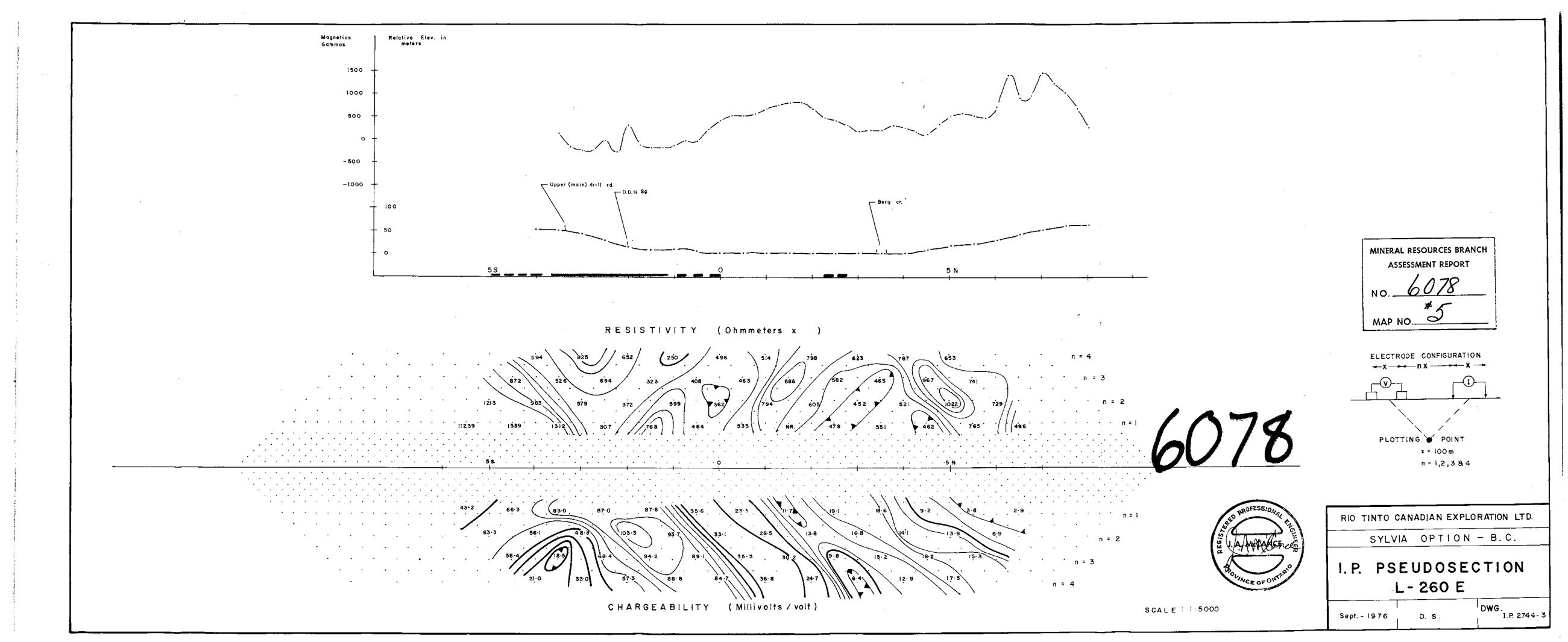
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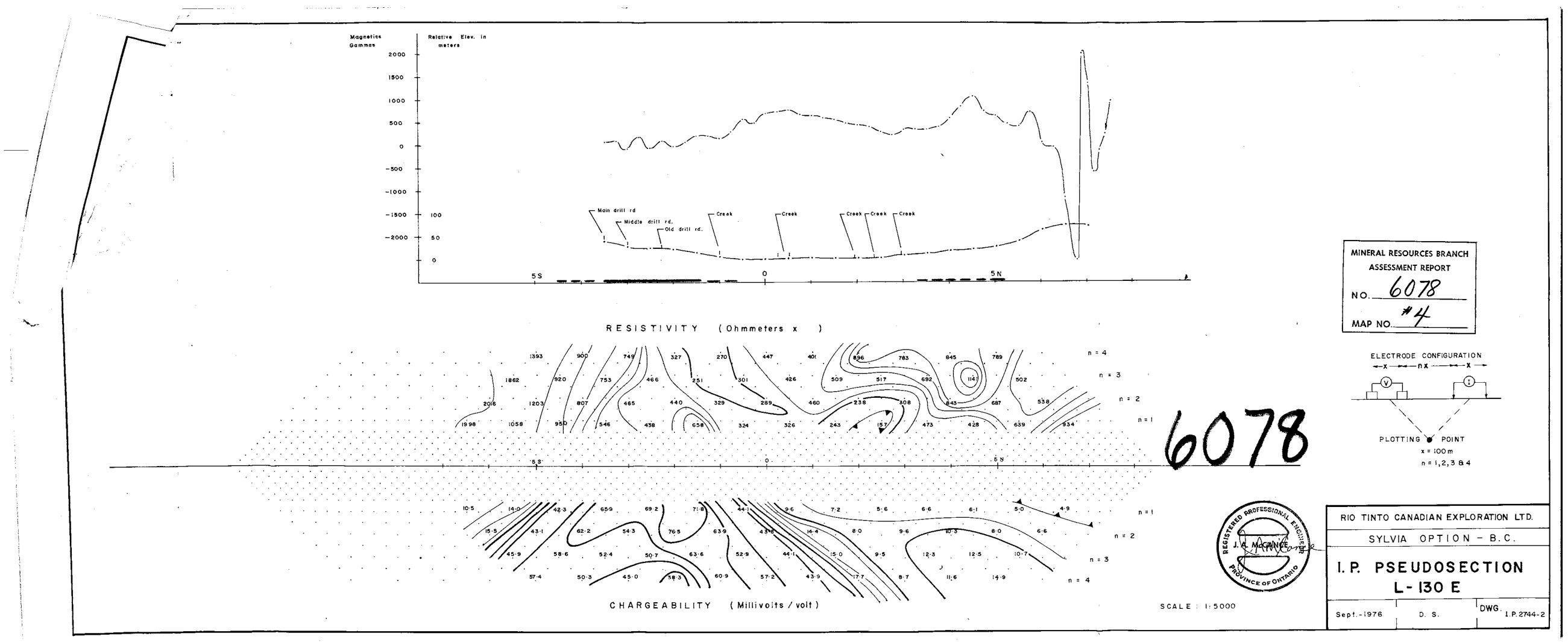
SCALE

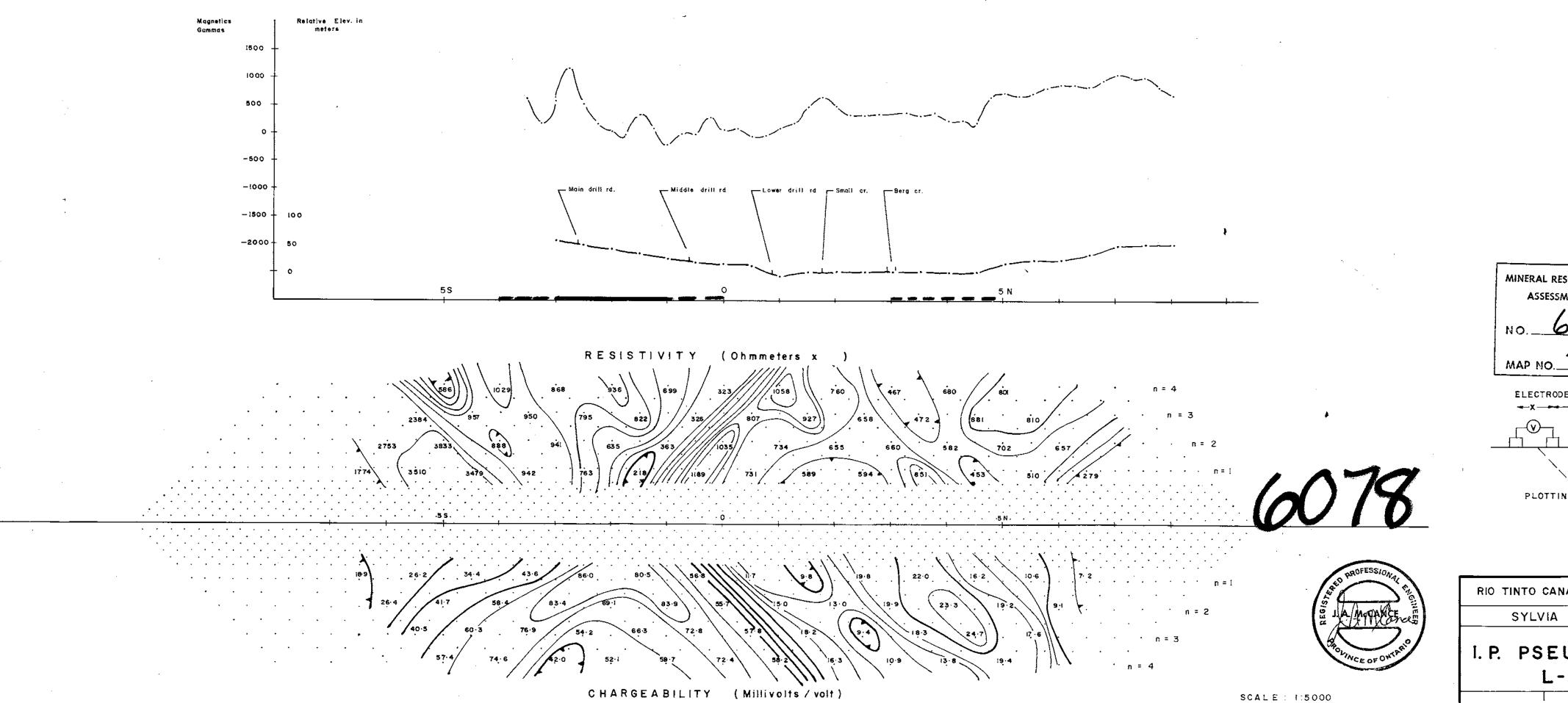
3E/IL14,15











MINERAL RESOURCES BRANCH ASSESSMENT REPORT

PLOTTING 😿 POINT x = 100 m

RIO TINTO CANADIAN EXPLORATION LTD.

SYLVIA OPTION - B.C.

n = 1, 2,3 & 4

I.P. PSEUDOSECTION L- 390 E

Sept. - 1976 D. S. DWG.

