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Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 342 MAP

INDEX

Enclosed Maps

1 A. Claim and Geophysical Survey Map
Scale 1" = 1000'

2 B. Induced Polarization Profile Map
Scale 1" = 400'

3 C. Resistivity Profile Map
Scale 1" = 400'

CLAIMS

The thirty claims covered by this geophysical report have been divided into three groups, i.e. Mox, CN and SB, and are part of the holdings of Trojan Consolidated Mines Ltd. They are situated in the Highland Valley area of the Kamloops Mining Division approximately 8 to 9 miles north east of Divide Lake. The claim groups and individual claims are as follows:

(1) Mox Group

Mox 1	Tag	No.	B90106	Record	No.	21962
Mox 2	"	"	B90107	"	"	21963
Mox 1 Fr.	"	"	A64155	"	"	22303

(2) CN Group

Mars 2	Tag	No.	217726	Record	No.	24528
Lil 4 Fr.	"	"	B79672	"	"	33190
CN 7	"	"	B41519	"	"	14855
CN 5	"	"	B41517	"	"	14853
CN 3	"	"	B41515	"	"	14851
CN 1	"	"	B41513	"	"	14849
CN 4	"	"	B41516	"	"	14852
CN 2	"	"	B41514	"	"	14850

(3) <u>SB Group</u>

Venus 1 Fr.	Tag No. 218093	Record No. 24397
Venus 2 Fr.	" " 218094	" " 24398
Tom Fr.	" " B98054	" " 26283
Mafeking Fr.	" " B90108	" " 24068
B E Fr.	" " 217730	" " 24532
Lil 7 Fr.	" " 254235	" " 33355
Lil 7	" " 254232	" " 33354
SB 1	" " B50141	" " 23842
SB Fr.	" " B50142	" " 23841
SB 2	" " B50145	" " 23843
SB 3	" " B50147	" " 23844
Lil 5 Fr.	" " 254236	" " 33191
CN 6	" " B41518	" " 14854
CN 8	" " B41520	" " 14856
CN 6 Fr.	" " B87024	" " 33578
Lil 2 Fr.	" " B79675	" " 32972
DD 1 Fr.	" " 200325	" " 22905
DD 2 Fr.	" " 200326	" " 22906
SD I	" " 266252	" " 33821

Expenditures

The Induced Polarization and Resistivity equipment requires a qualified geophysicist, foreman and three labourers for operation. The survey also requires clean, accurately picketed lines. The following personnel, at indicated pay rates, were employed on this survey.

J. B. Boniwell and N. G. Mattocks - Graduate geophysicists in charge of survey		$ 35.00/day
W. Rorison - foreman	15.00/day	
J. Ellefsen - labourer	15.00/day	
G. Halbert - labourer	14.00/day	
A. MacDougal- labourer	12.00/day	
		56.00/day
Supervision		
L. B. Gatenby, P. Eng. (half allowable $35.00/day)		17.50/day
Miscellaneous		
Unemployment Insurance and Workmen's Compensation		6.00/day
Instrument maintenance		20.00/day
Vehicle costs		10.00/day
Total direct cost		$144.50/day

Using a 300' spaced 3 pole array at 100' stations and including line cleaning and picketing an average survey advance of 2,200 feet per day was obtained, excluding major equipment breakdowns and unfavourable weather conditions. This gives a cost of 6.5¢ per linear foot of surveyed lines. The work was performed from June 26th to 30th and August 5th to 25th, 1960.

The following are the Induced Polarization and Resistivity survey footages and expenditures on the three claim groups.

(1) Mox Group

Three claims with total survey footage = 7,200'

Cost - 7200 x 6.5¢ = $ 468.00

(2) CN Group

Eight claims with total survey footage = 28,500'

Cost - 28,500 x 6.5¢ = $ 1,852.50

(3) SB Group

19 claims with total survey footage = 7,850'

Cost - 7,850 x 6.5¢ = $ 510.25

Signed L. B. Gatenby
L. B. Gatenby, P.Eng.

A P P E N D I X

THE INDUCED POLARIZATION PHENOMENON AND METHOD

When an electrical field is applied to the ground, current is passed by virtue of the normal electrolytic properties of rocks in situ. However, metallic particles, such as sulphides, conduct electronically, and their presence in a rock mass materially affects current behaviour. At the interfaces between metallic and non-metallic materials, a resistance to current passage has been observed (the so-called "over-voltage" phenomenon), which, in effect, is analogous to a condenser action. Due to the influence of the applied field, an ionic movement, not clearly understood, causes a polarization of charges at the interface which builds up with time. On interruption of the primary current, these ions revert to their previous balance, thereby producing a discharge of a small transient or secondary voltage. A measurement of this voltage decay provides a means to detect the presence of metallic particles, and through interpretation, to arrive at a quantitative estimate.

It is possible to measure the polarization effect in two ways: either collect the discharge voltage as a function of time, and measure it direct in millvolt-second units, or observe, in a volume earth, the change of apparent resistivity with the frequency of the applied alternating field. The latter approach relies upon the fact that the electrical impedance of a circuit that can be polarized is dependent upon the frequency of the measuring current.

In the present survey, the measuring is accomplished in the first, or time domain. Theory, procedures, and the actual field unit used have been developed by Dr. H. O. Seigel of Toronto. As the secondary voltage is also directly proportional to the magnitude of the applied current, results are presented as a ratio of secondary to primary voltages, that is, millivolt-seconds : volts, giving to the polarization effect a millisecond unit. This parameter, VS/VP, is often referred to as the "chargeability", and is given the symbol 'm'.

Field practice revolves about four grounded electrodes, two introducing current to the ground and two providing the reference points between which the voltage measurements are made. The latter need to be of the non-polarizing type, and porous pots are used. Several electrode arrays are possible, each with its own advantages and disadvantages. To generalize, and given a sufficient power supply with respect to ground resistivities, it is normally desirable to operate with a two-or three-electrode line array, with the remaining electrode(s) at electrical infinity. These arrays, as distinct from the more classic four-electrode Wenner array, provide a higher degree of resolution and a greater depth penetration in terms of electrode spacing. For reconnaissance traversing, the line electrodes move in unison, the spacing between them remaining equal and fixed. The selection of the array and the spacing is governed, not only by the obvious need to cater to the size, depth and composition of the target body, but also by the depth of overburden and the range of ground resistivities expected.

A by-product of the polarization measurement is data sufficient for the determination of apparent resistivity. This auxiliary value is often informative, if not actually diagnostic to the polarization effect. It often provides evidence of bedrock relief, and, as might be expected, of resistivity contrasts distinctive to areas of anomalous polarization. Commonly, a resistivity low accompanies a polarization high, but it is not unusual in cases of intense silicification, to have a resistivity high in correlation with a polarization anomaly.

Results are plotted in profile form. Contouring, apart from major anomalies, is not normally attempted, as it is considered, too many spurious and unrealistic events would be thus emphasized. Varying conditions of near-surface conductivities, contact resistances and natural earth currents provide room for false measurements and rough profiles. All these factors are carefully monitored, but not necessarily entirely eliminated. Further, as all rocks exhibit polarization effects, even when totally lacking sulphides, there is a background level which itself varies.

Polarization indications are not necessarily due to sulphides. For example, magnetite, graphite and certain clay minerals can also give rise to appreciable anomalies. Discrimination of the first can be readily accomplished by use of the magnetometer, the latter not so certainly by resorting to expanding arrays and local geologic knowledge. And as a final note, it should be pointed out that the induced polarization method is most effective in detecting moderately disseminated sulphide incidences, that with increasing concentrations a critical point is reached beyond which effectiveness decreases. In fact, optimum efficiency has been shown to exist when the disturbing body is just twice as conductive as its surroundings.

November 28th, 1960. J. B. Boniwell.

Checked and approved
L. B. Gatenby P. Eng.

GEOPHYSICAL RESULTS

Some 15.7 line miles of induced polarization surveying, excluding repeat lines, and 2.5 line miles of auxiliary magnetic traversing were carried out on the Trojan property during 1959 - 1960. Operations were interrupted by the winter months, December 1959 - May 19€0, and a certain amount of check work in the Spring of 1960 was necessary to relate reliabilities and backgrounds with the previous year's work.

A three-electrode line array was employed, the spacing fixed at 300' with the current electrode leading west. Observations are ascribed to the point midway between the current and nearest potential electrode. Further general descriptions of the induced polarization method and survey techniques are attached in an appendix.

Profiles of chargeability and apparent resistivity are presented in plans accompanying this report. Background polarization levels ranged between 1.5 - 2.5 milliseconds, and plots have been referred to a datum of 1.0 millisecond. The Tertiary covered areas to the east and north are characterized by low resistivities, values decreasing to the north with increasing thickness. Resistivities as low as 50 ohm-metres were encountered, and the consequent attenuation of the primary field led to many unreliable polarization measurements, e.g. the anomalies on line 32N.

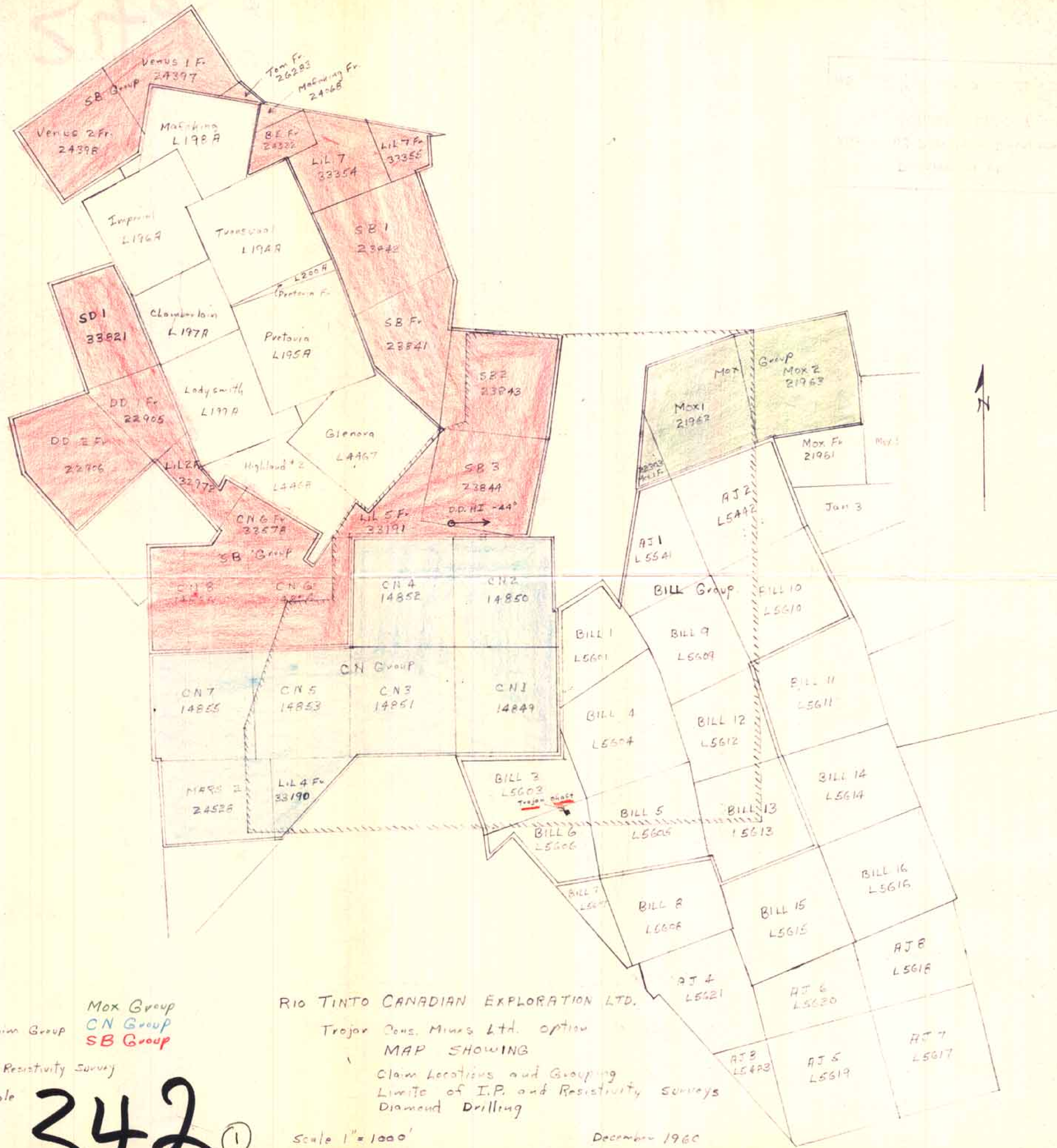
From the profiles, it is seen at once that the response from the Trojan ore-body itself provides the most outstanding polarization anomaly of the survey. The Trojan mineralization is characteristically a dissemination of large blebs of chalcopyrite. As a fine-grained sulphide dissemination would be expected to give a larger response, there appeared little promise for the relatively small outside anomalies unless they, too, were derived from coarse-grained mineralization and/or from depth.

The one anomaly that might fit these criteria peaked on line 20N at Station 40.5E. An expanding array at this point, however, did not indicate a depth of cover greater than 50', and potential seemed restricted to a smaller repetition of the Trojan body. Nonetheless, a fair strike dimension was indicated, and once it was shown by magnetic traversing that a magnetite incidence could be excluded, the anomaly was recommended for drilling.

November 28th, 1960.

J. B. Boniwell.

Checked and approved
L. B. Gatenby P. Eng.



LEGEND

Boundary of Claim Group

Limit of I.P. and Resistivity Survey

Diamond Drill Hole

Mox Group
CN Group
SB Group

RIO TINTO CANADIAN EXPLORATION LTD.

Trojan Cons. Mines Ltd. option

MAP SHOWING

Claim Locations and Grouping
Limits of I.P. and Resistivity Surveys
Diamond Drilling

Scale 1" = 1000'

December 1960

B. Gatenby P. Eng.

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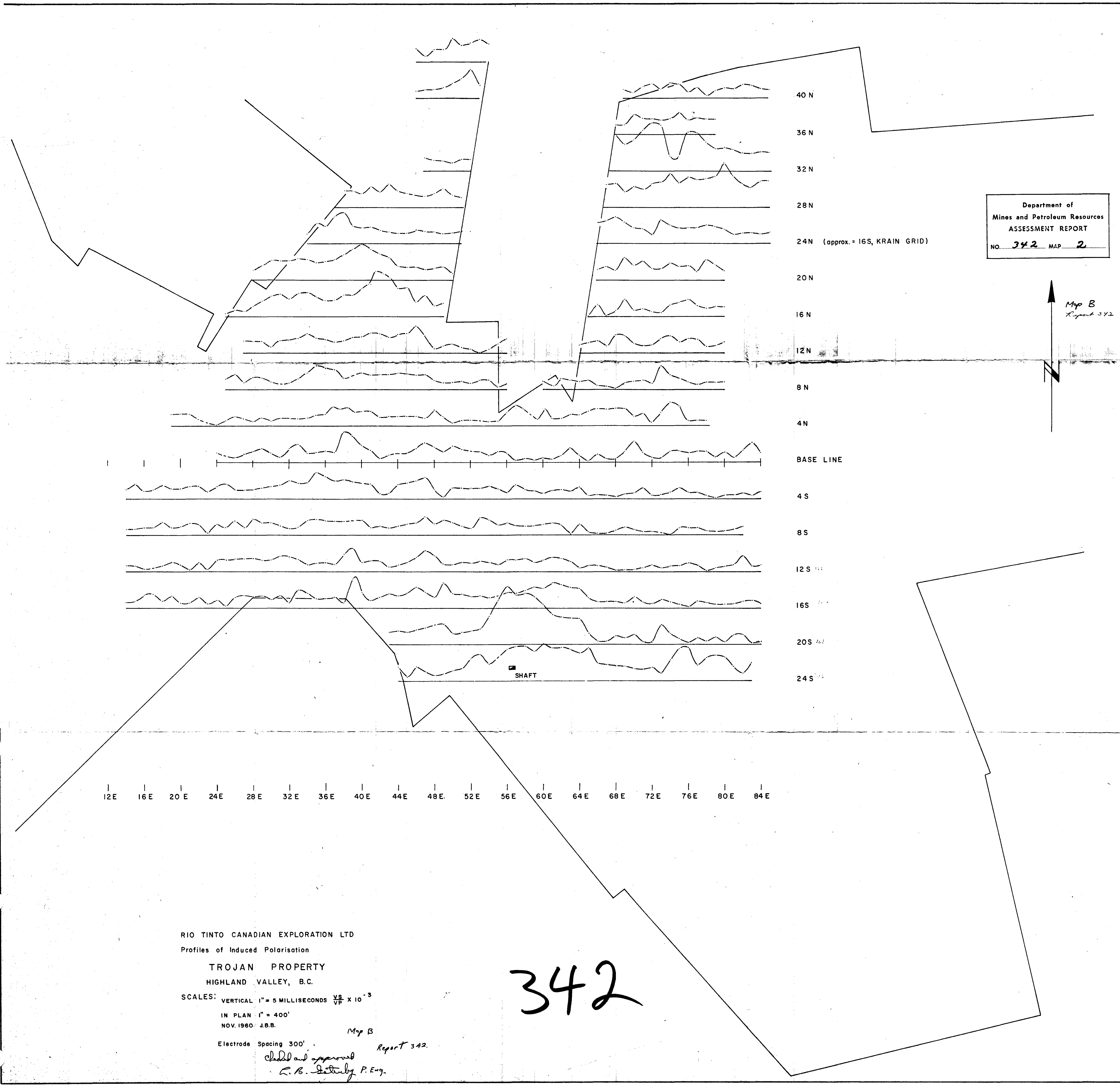
Map A


40 N
36 N
32 N
28 N
24 N (approx. = 16S, KRAIN GRID)
20 N
16 N
12 N
8 N
4N
BASE LINE
4 S
8 S
12 S
16S
20S
24 S
SHAFT
12E
16 E
20 E
24E
28 E
32 E
36E
40E
44E
48E.
52 E
56 E
60E
64 E
68 E
72 E
76 E
80 E
84 E
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
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Map B
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RIO TINTO CANADIAN EXPLORATION LTD
Profiles of Induced Polarisation
TROJAN PROPERTY
HIGHLAND VALLEY, B.C.
SCALES: VERTICAL 1" = 5 MILLISECONDS VS/VP X 10^-3
IN PLAN 1" = 400'
NOV. 1960 J.B.B.
Electrode Spacing 300'
Map B
Report 342.
Checked and approved
P. Eng.
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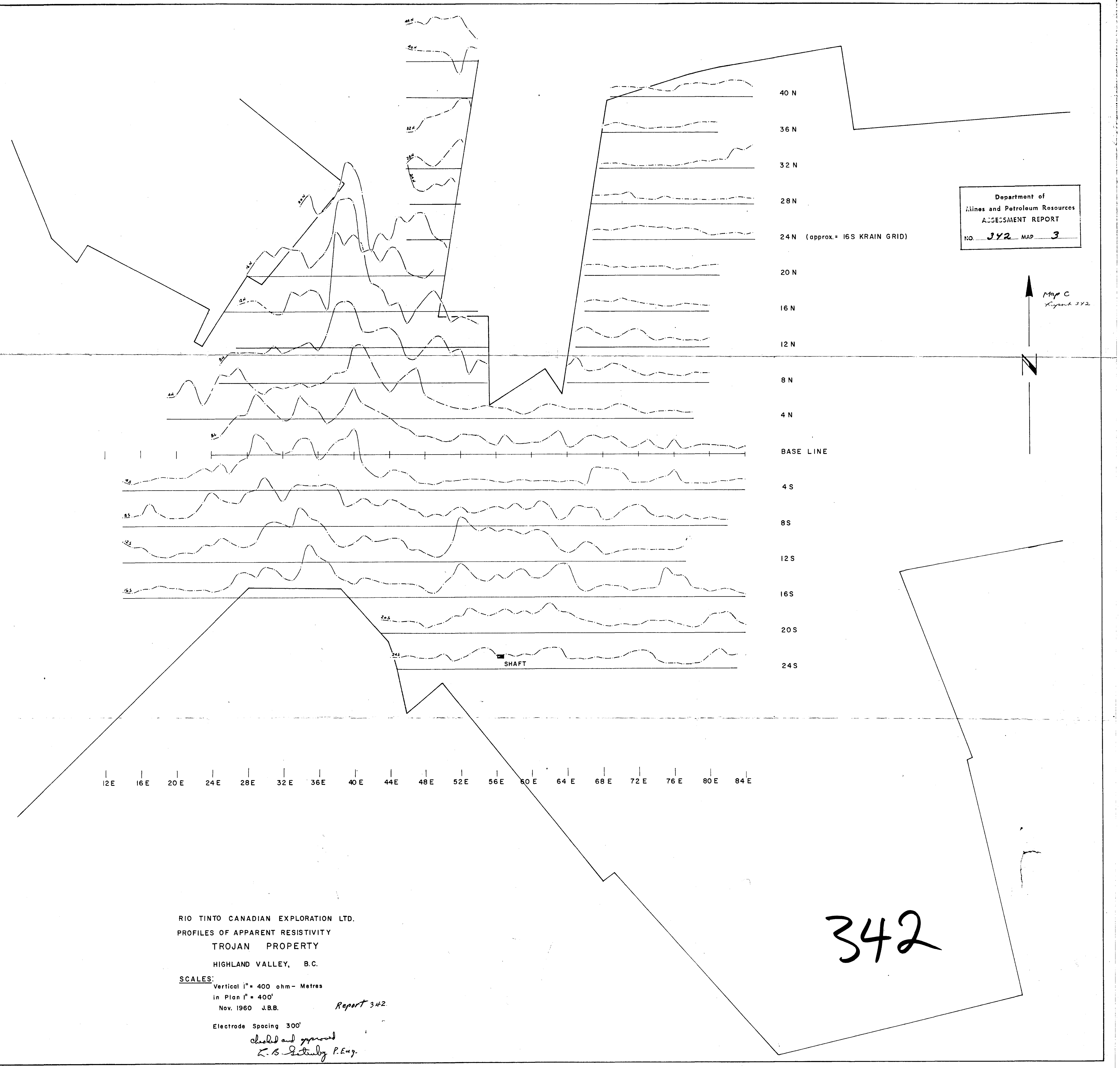

RIO TINTO CANADIAN EXPLORATION LTD.

PROFILES OF APPARENT RESISTIVITY

TROJAN PROPERTY

HIGHLAND VALLEY, B.C.

SCALES:

Vertical 1" = 400 ohm- Metres

in Plan 1" = 400'

Nov. 1960 J.B.B.

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Electrode Spacing 300'

checked and approved

L. B. Gatenby P.Eng.