92I/10E

ASSESSMENT WORK REPORT ON AN INDUCED POLARIZATION SURVEY OF FORTY CLAIMS OWNED BY CONCORDE EXPLORATIONS LTD. LOCATED APPROXIMATELY 11 MILES WEST OF THE CITY OF KAMLOOPS, B.C. KAMLOOPS MINING DIVISION (LAT. 50° 40' N; LONG. 120° 34' W)

for

AGILIS EXPLORATION SERVICES LTD.

by

SANDNER ASSOCIATES
VANCOUVER, B.C.

APRIL 1, 1972

Instrument Operator:
J. Denham

Report by:
S.L. Sandner BSc.
Geologist/Geophysicist

3593

S. L. SANDNER & ASSOCIATES
GEOLOGISTS/GEOPHYSICISTS
6-815 W. HASTINGS ST.
VANCOUVER 1, B.C.

INDEX

ASSESSMENT WORK REPORT ON
AN INDUCED POLARIZATION SURVEY OF FORTY CLAIMS
OWNED BY CONCORDE EXPLORATIONS LTD.
LOCATED APPROXIMATELY 11 MILES WEST OF THE
CITY OF KAMLOOPS, B.C.
KAMLOOPS MINING DIVISION
for
AGILIS EXPLORATION SERVICES LTD.

SUMMARY:

1. An I.P. survey covering 9.6 line miles conducted under the supervision of S.L. Sandner on Concorde Explorations Ltd. claims near Ned Roberts Lake approximately 11 miles west of the City of Kamloops for Agilis Exploration Services Ltd., Kamloops Mining Division.
2. The survey was carried out on N-S lines spaced 400' apart. A Hewitt Enterprises pulse-type I.P. instrument was used with a standard Wenner electrode array with "a" spacings of 400'. One line was run E.W. in the northwestern sector of the survey area, also using 400' "a" spacing and Wenner array.
3. Chargeability (normalized Induced Polarization) results indicate a substantial north to northwestern trending anomaly in the area of the Win #6 and #8 claims. A smaller but similar trending peak is noted near the boundary of Win #3 and Win #4. These anomalies appear reasonable in that they follow a normal "build up" and "drop off" over a series of stations along the survey direction. Readings along parallel lines support the concurrence of a reasonable anomalous condition. The chargeability anomaly accentuates and agrees with the known regional trend of the geology in the area.
4. Apparent resistivity results show general low values over the areas of high chargeability. This is a favourable condition in regions where sulfide mineralization is sought.
5. Self potential results display general high values coincident

with chargeability highs and resistivity lows. This also supports the favourable indications that sulfide mineralization may exist in this coincidental anomalous area.

6. Regional airborne magnetic data show a very well defined northwest-southeast trend through the area. Locally a westward dipping gradient exists through the area of the surveyed claim group. A marked magnetic high and general broadening of the gradient coincident with the location of the ground I.P. anomaly supports the possibility of a local near surface intrusive condition. A xerox copy of this section of the Government aeromagnetic map is included in the report.

INTRODUCTION:

During the period February 15, 1972 through February 27th, a field party under the supervision of S.L. Sandner conducted an I.P. survey of 40 contiguous claims known as the Kon 1-10; Win 1-22; Zip 1-2; and Ken 1-6, mineral claims located some 11 miles west of the City of Kamloops, B.C. The claims are owned by Concorde Explorations Ltd. The survey was carried out under contract with Agilis Exploration Services Ltd. who manage the said claims.

The purpose of the survey was to carry out assessment work requirements of the mineral claim group, with the objective to determine the possibility of locating further exploration targets and drilling if warranted.

The 40 full size, contiguous claims shown on the accompanying claim map, lie in a group having the tag numbers as follows: Kon 1-10, 76136-76145 inclusive; Win 1-22, 76146-76167 inclusive; Zip #1 - 76170; Zip #2 - 79223; and Ken 1-6, 79224-79229 inclusive.

Mr. J. Denham, electronic technician and experienced I.P. operator, carried out instrumentation operations during the survey.

Due to the anniversary dates of assessment field work requirements, the coverage of Kon 1-10, Win 1-22 and Zip #1 were completed prior to February 18. Zip #2 was completed prior to February 22. In order to obtain the most meaningful coverage and extend early anomalous indications, the survey was extended to cover a total of 9.6 line miles from the original minimum of 5 line miles.

The claim group lie in an area mapped as Upper Triassic Nicola Group near the inferred contact with the overlain Kamloops volcanic group. The general northwest trend in the area follows that of the Iron Mash batholith which lies exposed some 2 miles to the east of the claim group. Recent drilling indications and apparent geophysical data indicate the volcanic cover in the claim area is variable but shallow in places. Copper mineralization is known in the immediate area. Considerable evidence of iron stain and alteration is also present locally.

Recent important copper mineralization discovery made by Afton Mines Ltd. lie approximately 1.5 miles to the east. Geologically and geophysically indications are that the regional

trend from the Afton area may extend through the Concorde claims.

Ground control for the survey was obtained by locating claim posts on the ground and following a previously laid out grid used earlier for geochemical and geological mapping. Survey lines were run following the old grid in a N-S direction with reading taken at 400 foot intervals along the lines. One east-west line was run in the northwest sector of the property.

Later fill-in lines were surveyed in the area north-northwest of Ned Roberts Lake in an effort to tie in the wider spread high I.P. readings.

Total line mileage for the Induced Polarization survey was 9.6 miles. The normalized Induced Polarization resistivity and self potential data are shown on the accompanying figures with a horizontal scale of 1" = 400'.

THE INDUCED POLARIZATION SURVEY

General Considerations of the Pulse Type Induced Polarization Method

Two varieties of induced polarization surveys are in common use today in mineral exploration. The first is the time domain or pulse type method in which a steady direct current is impressed on the ground for a few seconds and then abruptly terminated. A fraction of a second after cessation of current impulse, the decay voltage, (caused by sub-surface capacitive-like storage) is measured. The second method is the variable (dual) frequency technique or frequency domain. In this variety, the percentage difference between the impedance (a.c. resistance) offered at two separate frequencies, is measured.

The Hewitt (HEW 100) I.P. unit is a time domain unit and the exact method of measurement is outlined in the field procedure section.

The reader is referred to Wait, J.R. (1966), for a thorough treatment of frequency domain, and Seigel, H.O. (1966) and/or Brant (1966), for a discussion of time domain.

I.P. effect occurs when a current is passed through a volume of rock containing electrical conductors. Geophysical conductors, or "metallic minerals" include most sulphides, (pyrite, chalcopyrite, bornite, molybdenite) certain oxides, clays, graphite and certain micas.

Empirical methods have shown, however, that sulphides differ from other geophysical conductors in that charge builds up on them in an exponential manner. In the field, this means that the impressed dV measured by the receiving pots climbs steadily during the current pulse. Also, sulphides sometimes demonstrate an almost unique polarization response, known as metallic polarization. Either type of response is the best test available for distinguishing sulphide response from that of other geophysical electronic conductors. Apart from the sulphides, minerals with highly unsatisfied basal lattice surfaces act as leaky condensers and give rise to I.P. effects. All common rocks are responsive to some degree, and this response is designated background. It is commonly equivalent to one volume percent of scattered pyrite, and probably due to unsatisfied charges at lattice imperfections, mineral and rock boundaries, fractures, and so on.

Factors other than the amount of metallic conductors which affect I.P. response are grain size, conductivity of mineral, porosity, tortuosity (pore geometry), type of gangue minerals, composition and amount of pore fluid, degree of alteration, and mode of mineralization (disseminated, lode, vein type, etc.).

The apparent resistivity is also measured during the I.P. survey. Rogers, (1966), has pointed out that the resistivity of rock is only slightly influenced by changes

in the sulphide content at low levels. Much of the change is due to other effects such as moisture content, fracturing, pore space, ground water, extent, degree and type of alteration, type of sulphides and mode of sulphide distribution, etc. However, alteration in combination with increased sulphide content, not uncommonly affects the resistivity significantly. Unfortunately, there are many additional causes for resistivity variation and rarely can sulphides be recognized or predicted from resistivity data alone.

Previous to current impression, the receiving pots are balanced, and thus, the self-potential value in millivolts is often a useful geophysical tool. When metallic lustered sulphide minerals are situated in a suitable geological-hydrological environment, the sulphides oxidize and a natural or spontaneous "battery effect" occurs. Often the self-potential effect over sulphide bodies is negative and in the order of a few hundred millivolts.

With a Wenner electrode configuration, the self-potential and first derivative of the self-potential are valuable information if the transit interval is equal to, or is one-half the "a" spacing distance. In other cases, where the "a" spacing and transit interval are not evenly proportional, the self-potential results are of little useful value.

Bibliography

(1) Frequency Domain:

Wait, J.R. (1951) Editor, Overvoltage Research and Geophysical Applications. Longon, Pergamon Press.

(2) Time Domain:

Brant, A.A. (1966) Examples of Induced Polarization Field.

Results in the Time Domain - Society of Exploration Geophysicists' Mining Geophysics, Volume I, Case Histories.

Seigel, H.O. (1966) Three Recent Irish Discovery Case Histories using Pulse Type Induced Polarization - S.E.G. Volume I, Case Histories - p.p. 341.

Rogers, G.R. Introduction to the Search for Disseminated Sulphides, S.E.G. Volume I.

Field Procedure

A Hewitt Enterprises Pulse Type IP was used throughout the survey.

The standard Wenner electrode array was employed with an "a" spacing (one-third the distance between the current electrodes) of 400 feet. A brief description of the field procedure follows.

Prior to voltage application, the self-potential is balanced, and recorded, between the two receiving pots "a" feet apart. Normally a voltage of 250, 500 or 1,000 volts is impressed between the back electrode (one "a" behind the instrument) and front electrode (two "a" in front of the

instrument). The electrodes consist of a single (or multiple) steel stake. A four second pulse of d.c. current is applied, during which time the I (current in milliamperes) and dV (impressed EMF in millivolts) is observed and recorded. Three-tenths seconds after cessation of pulse, the residual (decay) voltage is integrated for 0.8 seconds (on integration function #1). From these data, the apparent d.c. resistivity and normalized induced polarization value may be calculated, as described in the data reduction portion of this report.

The transit interval was 400 feet along all the cross lines, and the front electrode positive.

Induced Polarization Data Reduction

The following information was recorded by Mr. J. Denham, the instrument operator, at each pulse station:

1. The property, operator's initials, job and page number, "a" spacing, transit interval and remarks on topography.
2. The line and station co-ordinates;
3. The self-potential reading in millivolts (S.P. mv);
4. The current in milliamperes (I ma);
5. The impressed EMF in millivolts (dV mv);
6. The induced polarization decay voltage in millivolts (IP mv);
7. The resistor capacitor switch (R.C.) setting;
8. The current electrode voltage switch value;
9. The integration function switch (I.F.) setting;
10. The pulse time in seconds.

From this data, the apparent resistivity is calculated from the following relation:

$$\text{Rho} = \frac{2\text{pi} \times a \, dV}{I \text{ (ma)}}$$

Where: Rho = apparent resistivity in ohm-feet

Pi = 3.1416

"a" = 1/3 distance between the current electrodes

The normalized IP value is obtained by utilization of the following relation:

$$\text{IP norm} = \frac{\text{IP (mV)} \times 100 \times k \times \text{R.C.}}{dV \text{ (mV)}}$$

Where: IP norm = normalized IP in millivolt seconds per millivolt or milliseconds

K = a constant depending on the IF setting.

R.C. = resistor - capacitor shunt.

DISCUSSION OF RESULTS:

Results of the survey are shown on three contour maps and one profile, each on a scale of 1" = 400'. These are (1) Normalized Induced Polarization, figure #2; (2) Apparent Resistivity, figure #3, and (3) Self Potential, figure #4. Profiles of the E-W line are included as figure #7. The profile chart shows I.P., Resistivity, and S.P. on one figure by symbols. In addition, a xerox copy of a portion of the Government areomagnetic map covering this area is included as figure #5.

CHARGEABILITY:

Chargeability data was analyzed in an effort to determine a threshold or background value. Experience with other I.P. surveys in this general area produce a very low background. Analysis here demonstrate the normalized I.P. values threshold in the order of 2 milliseconds. Therefore, we consider areas of 8-12 milliseconds or 4 to 6 times background to be anomalous. Two pronounced areas in the vicinity of Win #6 and #8 MC and near the boundary of Win #3 and #4 MC as shown on figure #2, are considered important anomalies. The fact that the I.P. results coincide well with the general geological and magnetic trends is also encouraging.

Indications obtained to date suggest further I.P. coverage should be along northwesterly trend of the high chargeability zone.

APPARENT RESISTIVITY:

Contoured apparent resistivity are shown in figure #3. The most significant aspect of this map is the very close correlation of low resistivity value with high chargeability areas. This combination of high I.P. and low resistivity often is a good indication for the presence of sulfide mineralization. Therefore coincident anomalous areas shown on the figures over portions of Win #6 and Win #8 plus the claim boundary area between Win #3 and #4 should be further investigated.

SELF POTENTIAL:

Self potential results shown in figure #4 indicate general high values over the zones of high I.P. and low resistivity. This phenomena further supports the potential validity and importance of the same anomalous areas referred to above.

CONCLUSION:

The Coincidental I.P. Resistivity and S.P. anomalies combined with the regional magnetic gradient condition, indicate a very important target for further examination. Known copper mineralization in the area gives a high priority on these anomalous conditions.

The northwestern sector of the survey area should be extended to determine the full extent of the anomalous area.

Respectfully submitted:

S.L. Sandner, BSc.
Geologist/Geophysicist

S. L. SANDNER & ASSOC[illegible]
GEOLOGISTS/GEOPHYSIC[illegible]
6-815 W. HASTINGS ST.
VANCOUVER I B C

APPENDIX I

PERSONNEL AND DATES WORKED

A. FIELD WORK

(a) J. Denham, Operator: Feb. 15-24 and Mar. 6-7, 1972.
(b) helper 1: (Same dates)
(c) helper 2: (Same dates)
(d) helper 3: (Same dates)

B. REPORT PREPARATION

(a) A. Mlcuch, data processor: Feb. 24, 25, 28, 29.
Mar. 10, 27, 28, 29.

(b) S.L. Sandner, Report writing: (Same dates)

C. DRAFTING AND REPRODUCTION

(a) T. Malesku: Feb. 28, 29.
Mar. 1, 2, 3.

APPENDIX II

COST BREAKDOWN

The following is a cost breakdown of an Induced Polarization Survey conducted over a group of forty claims known as Kon 1-10, 76136-76145 inclusive; Win 1-22, 76146-76167 inclusive; Zip #1 - 76170; Zip #2 - 79223; and Ken 1-6, 79224-79229 inclusive, owned by Concorde Explorations Ltd., located approximately 11 miles west of the City of Kamloops, for Agilis Exploration Services Ltd. through an agreement with Sandner Associates.

9.6 line miles I.P. Survey @ $500/line mile	$4,800.00

S.L. Sandner, [redacted]

S. L. SANDNER & ASSOCIATES
[redacted]TS/GEOPHYSICISTS
[redacted] W. HASTINGS ST.
VANCOUVER [redacted]

APPENDIX III

CERTIFICATE

I, Stanley L. Sandner, of the Municipality of Vancouver, Province of British Columbia, hereby cretify that:

1. I am a geologist and geophysicist and reside at 6187 Granville Street, Vancouver, B.C.

2. I am a graduate of the University of British Columbia (B.Sc. Honours) in 1963.

3. I have practiced my profession since 1959 while working for McKinney Gold Mines 1959-60, Panamerican Commodities (Peru) 1960-62, Geo-X Surveys Ltd. 1964-71.

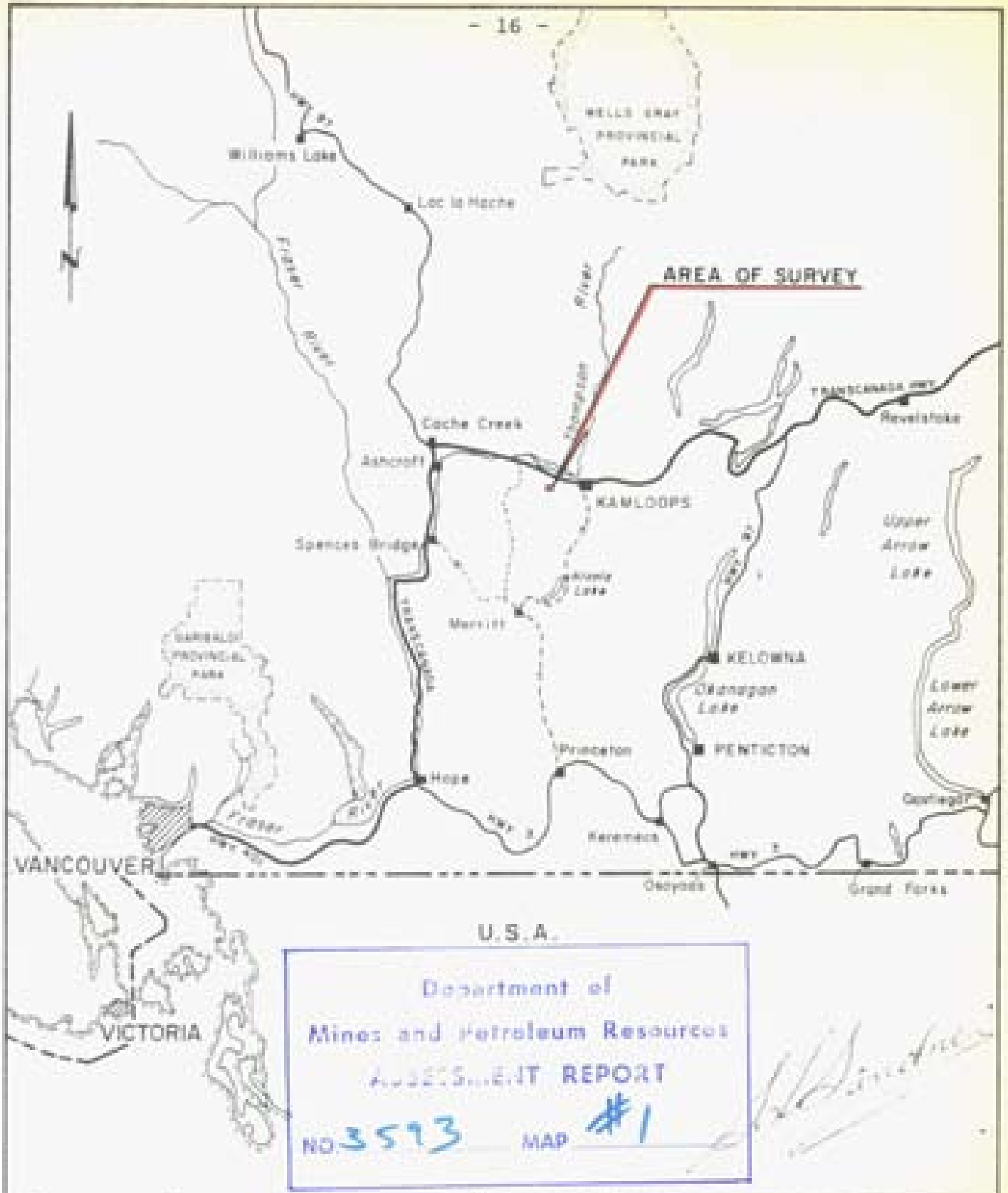
4. My registration in the Association of Professional Engineers is pending in April 1972.

5. I have no interest, direct nor indirect, in the property or securities of

6187 Granville Street,
Vancouver, B.C.

S. L. Sandner

Stanley L. Sandner B.Sc.



0 40 80 120
SCALE : MILES

CONCORDE EXPLORATIONS LTD.
KAMLOOPS LAKE AREA - KAMLOOPS M.D.
BRITISH COLUMBIA

LOCATION MAP

S. L. SANDNER & ASSOCIATES
GEOLOGISTS/GEOPHYSICISTS
6-815 W. HASTINGS ST.
VANCOUVER 1, B.C.

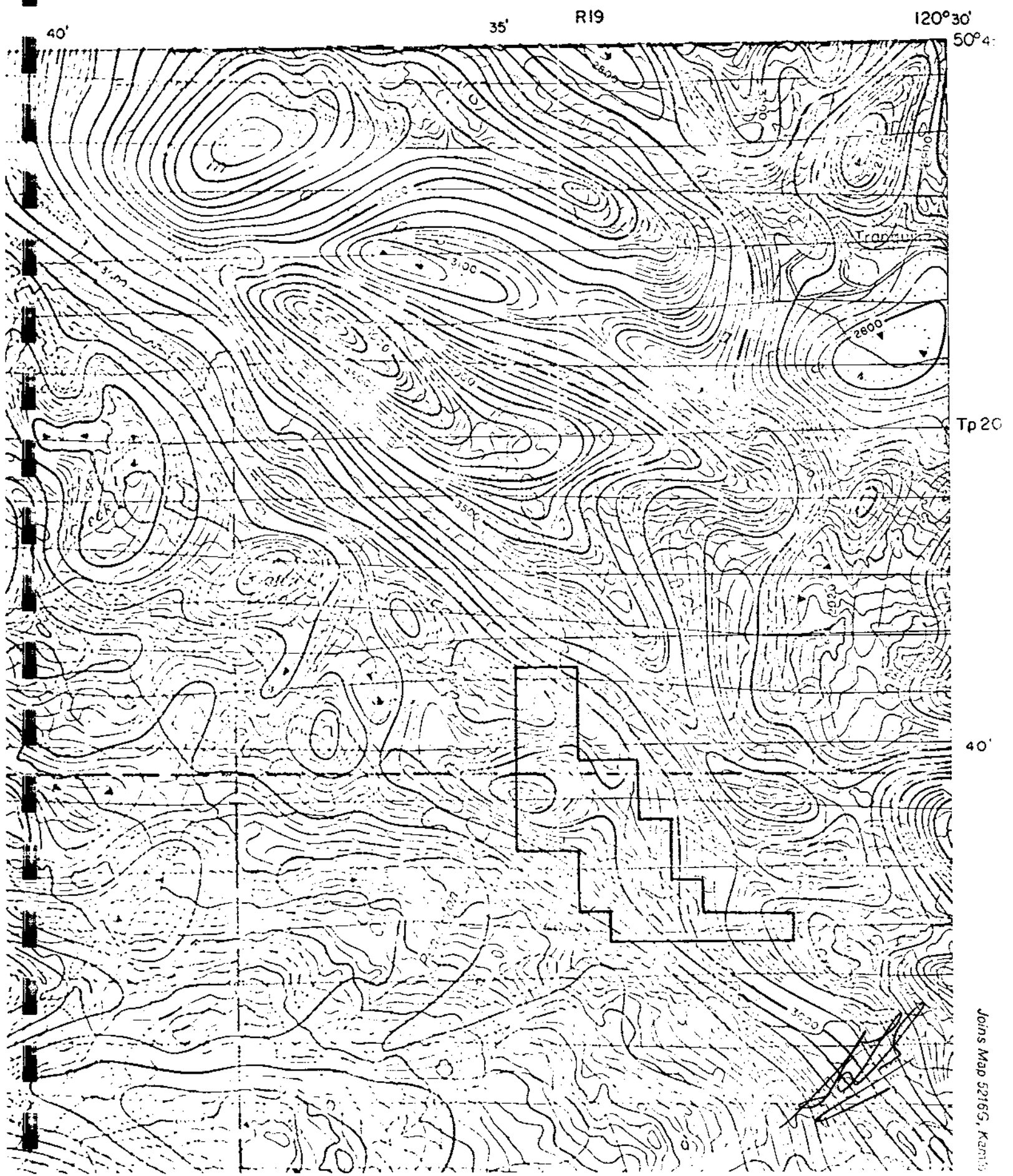
DRAWN T.M.	DATED MAR. 1, 1972	FIG. NO. 1
CHECKED	JOB NO. 1201	

FIGURE 5

AEROMAGNETIC MAP
(Scale: 1" = 1 Mile)

SOURCES
CANADA

SHEET 92 1/10



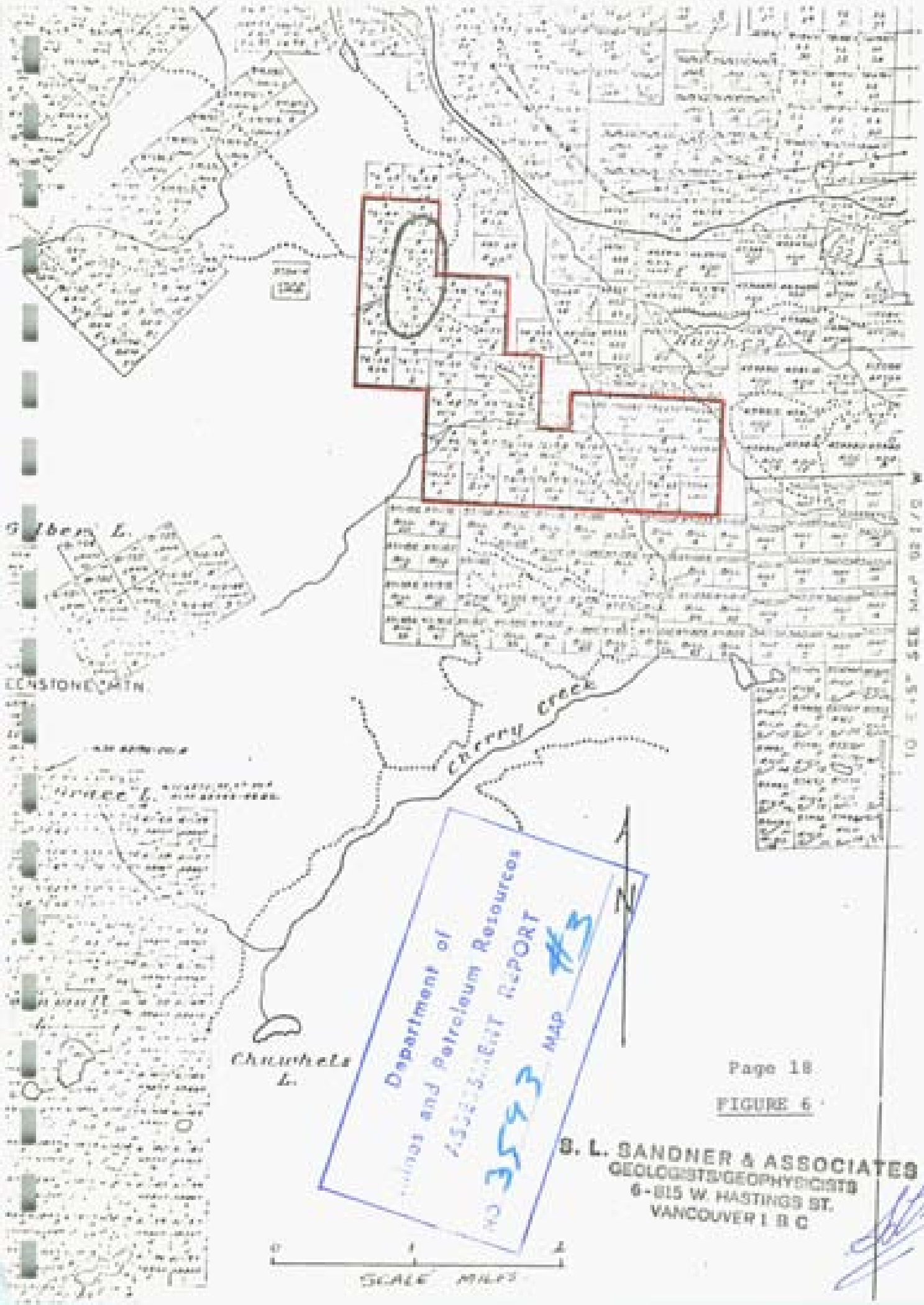


FIGURE 6

S. L. SANDNER & ASSOCIATES
GEOLOGISTS/GEOPHYSICISTS
6-815 W. HASTINGS ST.
VANCOUVER I B C

S. L. SANDNER & ASSOCIATES
GEOLOGISTS/GEOPHYSICISTS
6-815 W. HASTINGS ST.
VANCOUVER 1 B C

FOLD MAPS PERTAINING TO

ASSESSMENT WORK REPORT ON AN INDUCED POLARIZATION SURVEY OF FORTY CLAIMS OWNED BY CONCORDE EXPLORATIONS LTD. LOCATED APPROXIMATELY 11 MILES WEST OF THE CITY OF KAMLOOPS, B.C. KAMLOOPS MINING DIVISION (LAT. 50° 40' N; LONG. 120° 34' W)

for

AGILIS EXPLORATION SERVICES LTD.

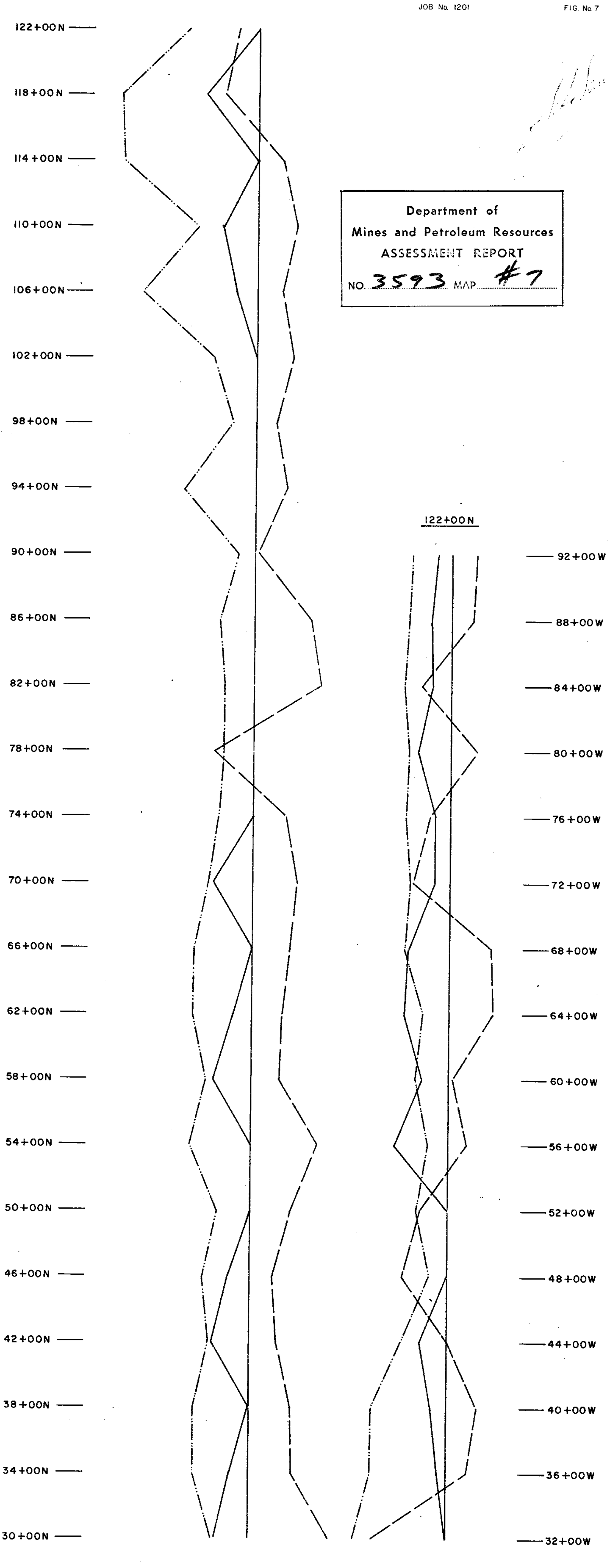
by

SANDNER ASSOCIATES
VANCOUVER, B.C.

APRIL 1, 1972

PROFILE LAYOUT

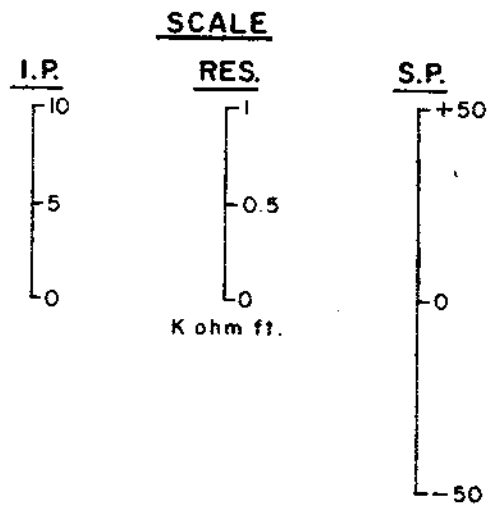
CONCORDE EXPLORATIONS LTD.
KAMLOOPS LAKE AREA – KAMLOOPS M.D.
BRITISH COLUMBIA
JOB No. 1201 FIG. No. 7

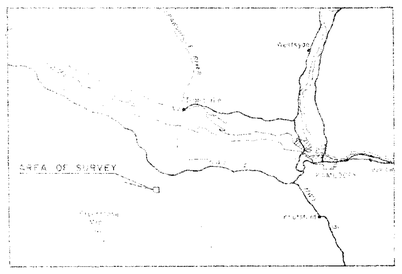


LEGEND
— I.P.
– – S.P.
—·— RES.

SCALE 1" = 400'

SCALE





LOCATION MAP

KON 7 | KON 8 | KON 5 | KON 6 | KON 3 | KON 4 | KON 1 | KON 2

WIN 9 | WIN 10 | WIN 7 | WIN 8 | WIN 5 | WIN 6 | WIN 21 | WIN 3 | WIN 4 | WIN 22 | WIN 1 | WIN 2 | WIN 11 | ZIP 2 | ZIP 1 | WIN 12

KEN 6 | KEN 5 | KEN 4 | KEN 3 | WIN 13 | WIN 17 | WIN 19 | KEN 2 | WIN 15 | WIN 20 | WIN 14 | WIN 16 | WIN 18 | KEN 1

Hughes Lake

Cherry Creek

Ned Roberts Lake

Road

Road

Road

SCALE: FEET 400 0 400 800 1200

Department of Mines and Petroleum Resources ASSESSMENT REPORT NO. 3593 MAP #6

CONCORDE EXPLORATIONS LTD.
KAMLOOPS LAKE AREA - KAMLOOPS M.D.
BRITISH COLUMBIA

SELF POTENTIAL
CONTOUR INTERVAL : 10

DRAWN	T.M.	JOB NO	FIG NO
DATED	MARCH 1, 1972	1201	4
CHECKED			

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
TO WIT:

In the Matter of the I.P. survey and gridding on the Concorde Property, Kamloops, M.D., B.C.

I, M. Tekler, bookkeeper
c/o Agilis Exploration Services Ltd.,
of 107 - 325 Howe Street,
Vancouver 1, B.C.

in the Province of British Columbia, do solemnly declare that the following personnel were employed and costs incurred in conducting the surveys.

PERSONNEL:

Re: I.P. survey (see attached report) - 1/3 of charges prior to February 18 anniversary date.		$1,600.00
Re: gridding & support for I.P. V.W. Shuttleworth - geologist, party chief - 12 days @ $80.00/day		960.00
F.Wismer - helper - 6 days @ $37.50/day		225.00

DISBURSEMENTS:

Meals & accomodation 18 man-days @ $10.00/day	$180.00	
Miscellaneous supplies, gas, etc.	125.00	
Truck transportation	330.00	
	$635.00	
+ 10% service charge	63.50	
		698.50
Total costs		$3,483.50

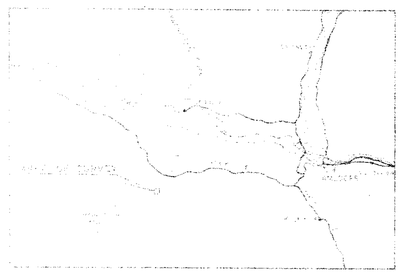
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 14 day of April 1972., A.D.

M. Marie Tekler

A Commissioner for taking Affidavits for British Columbia or
A Notary Public in and for the Province of British Columbia.

Sub-mining Recorder



3593 M4

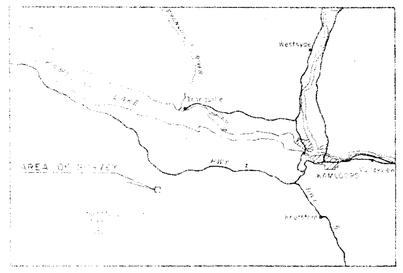
SCALE FEET

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3593 MAP M4

CONCORDE EXPLORATIONS LTD.
KAMLOOPS LAKE AREA - KAMLOOPS M.D.
BRITISH COLUMBIA

NORMALIZED
INDUCED POLARIZATION
CONTOUR INTERVAL = 2 MILLISECONDS

DRAWN	T.M.	JOB NO.	FIG NO.
DATE	MARCH 1, 1972	1201	2
CHECKED			



CONCORDE EXPLORATIONS LTD.
KAMLOOPS LAKE AREA - KAMLOOPS M.D.
BRITISH COLUMBIA

APPARENT RESISTIVITY
CONTOUR INTERVAL : 200 ohm ft.

DRAWN	T M	JOB NO	FIG NO
DATED	MARCH 1, 1972	1201	3
CHECKED			

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO 3593 MAP #5