3127

A GEOPHYSICAL REPORT ON AN INDUCED POLARIZATION SURVEY FORT ST. JAMES AREA OF BRITISH COLUMBIA

-for-

IMPERIAL OIL ENTERPRISES LIMITED

JUNE 1971

93N/2E

-by-

J. B. Prendergast, M.A., P.Eng.

REPORT ON

AN INDUCED POLARIZATION SURVEY

IN THE

FORT ST. JAMES AREA

BRITISH COLUMBIA

FOR

IMPERIAL OIL ENTERPRISES LIMITED

BY

KENTING EXPLORATION SERVICES LIMITED

CALGARY, ALBERTA

JUNE 1971

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INTRODUCTION

Some four (4) days of induced polarization surveying were carried out on the property near Witch Lake, British Columbia, some 110 miles northwest of Prince George, B.C. The survey disclosed two distinct areas of high chargeability. One of these has been attributed to magnetite in a basic intrusive and the other to metallic sulphides in volcanic rocks. Drilling has been recommended for two (2) of the peaks in the lavas and some further I.P. work, depending on the economic interest in the property.

LOCATION AND ACCESSIBILITY

The property consists of 68 mining claims located about one mile south of Witch Lake; Witch Lake in turn is 110 air miles northwest of Prince George, British Columbia. Campbell Lake is a small lake near the survey grid and is about 45 miles northwest from Fort St. James, British Columbia.

The property may be reached by float or ski-equipped airplane from Fort St. James, British Columbia. Fort St. James lies at the end of a branch of the Pacific Great Eastern Railway. A secondary road is available for travel to the east end of Chuchi Lake some 50 miles north of Fort St. James. It is not known whether access by water is available from the end of this road to Witch Lake; however if not, a two mile portage would be required to reach Witch Lake from Chuchi Lake.

DESCRIPTION OF PROPERTY

Refer to report by Imperial Oil Enterprises Ltd. on other activities for this property.

TIMBER, TOPOGRAPHY AND WATER AVAILABILITY

The area of the grid is generally covered with coniferous growth with moderate underbrush. The average tree size would be about 6 inches in diameter ranging up to 10 inches.

The east side of the grid, north of the lake in the area underlain by the volcanic material, the topography is moderately rough with an elevation change of about 200 feet from the lake to the high points on Lines 16E and 20E. To the west, the topography is considerably more gentle.

Water for diamond drilling would be available from the small lake in the south central part of the grid.

GEOLOGY

General Geology

The claim group optioned to Imperial Oil Enterprises Ltd. in the Witch Lake Area has been mapped by the Geological Survey of Canada by J. B. Thurber in 1944 with descriptive notes by J. E. Armstrong. The area is shown as being underlain by formations of the Takla Group which comprise more than 5,000 feet of interbedded lava, tuff, breccia, agglomerate and minor sedimentary rocks. These are Upper Triassic and later in age. At the west end of Chuchi Lake, a body of Omineca intrusive material has been mapped; also a syenite stock located just to the north which may possibly represent a late phase of Omineca activity. The Omineca instrusives are composed chiefly of granodiorite, quartz diorite and diorite, and are probably of Upper Jurassic or Lower Cretaceous age, as they intrude the Takla Group. If the syenite stock referred to above is not a late phase of these intrusions, it may possibly be younger and of Tertiary age.

The mineralization in the area includes the placer gold deposits of the Germanson and Manson Rivers. Lode deposits include galena sphalerite, pyrite-galena, tetrahedrite-pyrite-malachite-azurite-minor pyrite and disseminated chalcopyrite and pyrite. There is a tungsten deposit known as the Chuchi showing which carries minor amounts of scheelite, powellite, molybdenite and chalcopyrite disseminated in a fracture zone at the contact of a granite stock with silicified andesite.

Local Geology

Although there is not a great amount of outcrop on the grid covered by the

present survey, certain conclusions may be drawn from the results of a magnetic survey along with the surface mapping that has been carried out. The sections of the grid lying southwest of a line from 13+00N, 8+00W to 0+00, 3+00W is underlain by a large magnetic feature. Boulders found in the area suggest that this is a basic intrusive.

East of the aforementioned line are found a series of lava flows of the Takla Group consisting of basalt, in the main, and having disseminated pyrite in many specimens. The strike of the volcanics is approximately northeast with a gentle (about 20°) dip to the southeast.

The induced polarization results show a coincident chargeability high with the magnetic anomaly attributable to the basic intrusive. It is probable that the chargeability effect comes from the magnetite contained within the basic material. The large area of chargeability east of Line 0 is almost certainly due to metallic sulphide or graphite. Since there is little evidence of alteration in the area, or of shearing, the probability of the cause being graphite is not high. This moreover is supported by the presence of disseminated pyrite within the volcanics. Weak copper mineralization has been identified near the intersection of Line 4E and the base line; coincidentally, one of the chargeability anomaly traces is striking towards this copper showing. Evidently the geochemical results in the area are not overly encouraging and therefore the induced polarization features will have to be judged on their own merit.

DISCUSSION OF RESULTS

Survey Specifications

Equipment	- 2.5 KVA Transmitter and Generator Mark II Receiver
Type of Current	- Direct current - broken at periodic intervals
Period	- 1.5 seconds "current on" and 1.0 seconds "current off"
Delay Time	- 15 milliseconds
Maximum Power	- 2.5 kw
Maximum Current	- 3 amperes

Measurements taken in the field are:-

1. The current flowing through the current electrodes C1 and C2.
2. The primary voltage V_p between measuring electrodes during "current on" time.
3. The apparent chargeability, M_a, which is the secondary voltage between the measuring electrodes during the "current off" time referenced to V_p.

Array	-	Wenner
Separations	-	200' reconnaissance 100' detail

Date of Survey - June 10-13, 1971. Travel - June 9 & June 14

Miles Surveyed	-	Line 16W - 3400 ft. - 17 readings
Reconnaissance	-	Line 12W - 3200 ft. - 16 readings
		Line 8W - 2000 ft. - 10 readings
		Line 4W - 2000 ft. - 10 readings
		Line 0 - 2000 ft. - 10 readings
		Line 4E - 2000 ft. - 10 readings
		Line 8E - 2000 ft. - 10 readings
		Line 12E - 2000 ft. - 10 readings
		Line 16E - 3400 ft. - 17 readings
		Line 20E - 3400 ft. - 17 readings
		Line 24E - 3000 ft. - 15 readings
Detail	-	Line 8E - 1000 ft. - 10 readings
		Line 12E - 1000 ft. - 10 readings
		Line 16E - 1000 ft. - 10 readings

Presentation of Results

The results have been presented as contoured plans of chargeability and resistivity for all the lines surveyed, and in addition, profiles showing apparent chargeability and apparent resistivity on the three lines where some detailing was carried out. Traces of the anomalous chargeability peaks as found on the shorter electrode interval detail have also been shown on the contour map. Six areas of potential interest have been disclosed and drilling has been recommended on two of the anomalies. Drilling is in the areas where detailed I.P. work was carried out and data for positioning the cause is available. In the other four areas no detailing was done and it is suggested that before a drill hole is considered, sufficient I.P. work be done on shorter intervals to get some idea where the surface extension of the I.P. anomalies may be.

SUMMARY AND CONCLUSIONS

(1) Some 28,000 feet of I.P. surveying were done on a property near Witch Lake in the west central British Columbia for Imperial Oil Enterprises Ltd. plus 3100 feet of detailing.

(2) Some eight (8) zones of anomalous chargeability were disclosed by the survey. Three of these were further outlined by detailed I.P. work.

(3) A roughly circular area on the east side of the grid, whose northern boundary has not been completely delineated by the survey, contains six (6) chargeability peaks that are probably related to concentrations of metallic sulphides.

(4) From Line 4W to 16W generally north of the base line, a zone exists with two (2) chargeability peaks and a trend which has not been fully delineated on the west side. Information from Imperial Oil Enterprises' geologists indicates this may be due to magnetite in an intrusive since there is a magnetic high in this portion of the property.

(5) The anomaly peaks A, B, C, D, E and F are the important features for further effort. Peaks D and E should have a closer spread I.P. profiles run in each case with the profile extended northwards beyond Station 21Nsince there appear to be further chargeability features on the north side of the grid.

(6) Two (2) drill holes have been recommended for Line 12E to investigate the cause of the two parallel anomalies designated as anomalies B and C.

RECOMMENDATIONS

In view of the limited I.P. work carried out and with the suggestion of higher chargeabilities to the north of the grid, the following recommendations are made.

(1) That the two (2) drill holes on Line 12E be put down to investigate the causes of anomalies B and C.

(2) Depending on the economic interest in the property and the results of the foregoing drill holes, consideration should be given to enlarging the induced polarization coverage so that detailing of anomalies D and E and some work on the north side of the grid to complete the delineation of the area of high chargeability would be done. Depending on the distance to which this chargeability zone extends and on the economic interest in pursuing it further, another five (5) days of I.P. should probably suffice.

Respectfully submitted,

KENTING EXPLORATION SERVICES LIMITED

J. B. Prendergast, P.Eng.
Division Manager.

PROFESSIONAL ENGINEER
Expiry Date: May 28, 1972

CAMPBELL-WITCH LAKE LINE CUTTING

The sixty-eight Camp-Foe claim group is located one mile south of Witch Lake, N.T.S. 93-N-2, in the Omineca Mining Division.

Twenty-five line miles of baselines and cross-lines were cut on the northern portion of the claim group in September and October, 1970. A camp was erected on the north side of Campbell Lake at line 4W - 6S. The grid lines are shown in relation to the claim boundaries on the accompanying map.

The following is a list of the personnel who worked on the linecutting, camp erection, and prospecting:

Mr. J. Bjordal - Box 56, Smithers, B.C.
- Sept. 18 to Oct. 16 - Carpenter and Cook

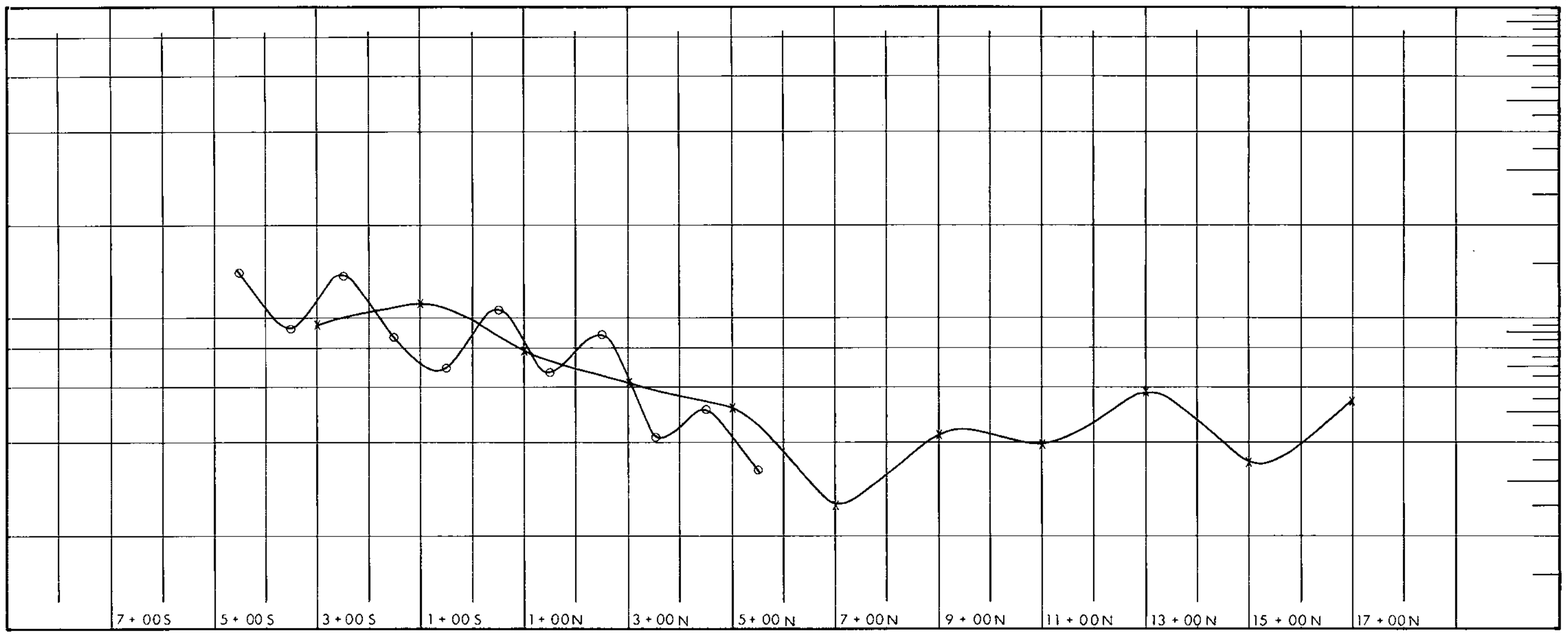
Mr. B. Fleming - Box 964, Rossland, B.C.
- Oct. 1 to Oct. 18 - Prospector and Line cutter

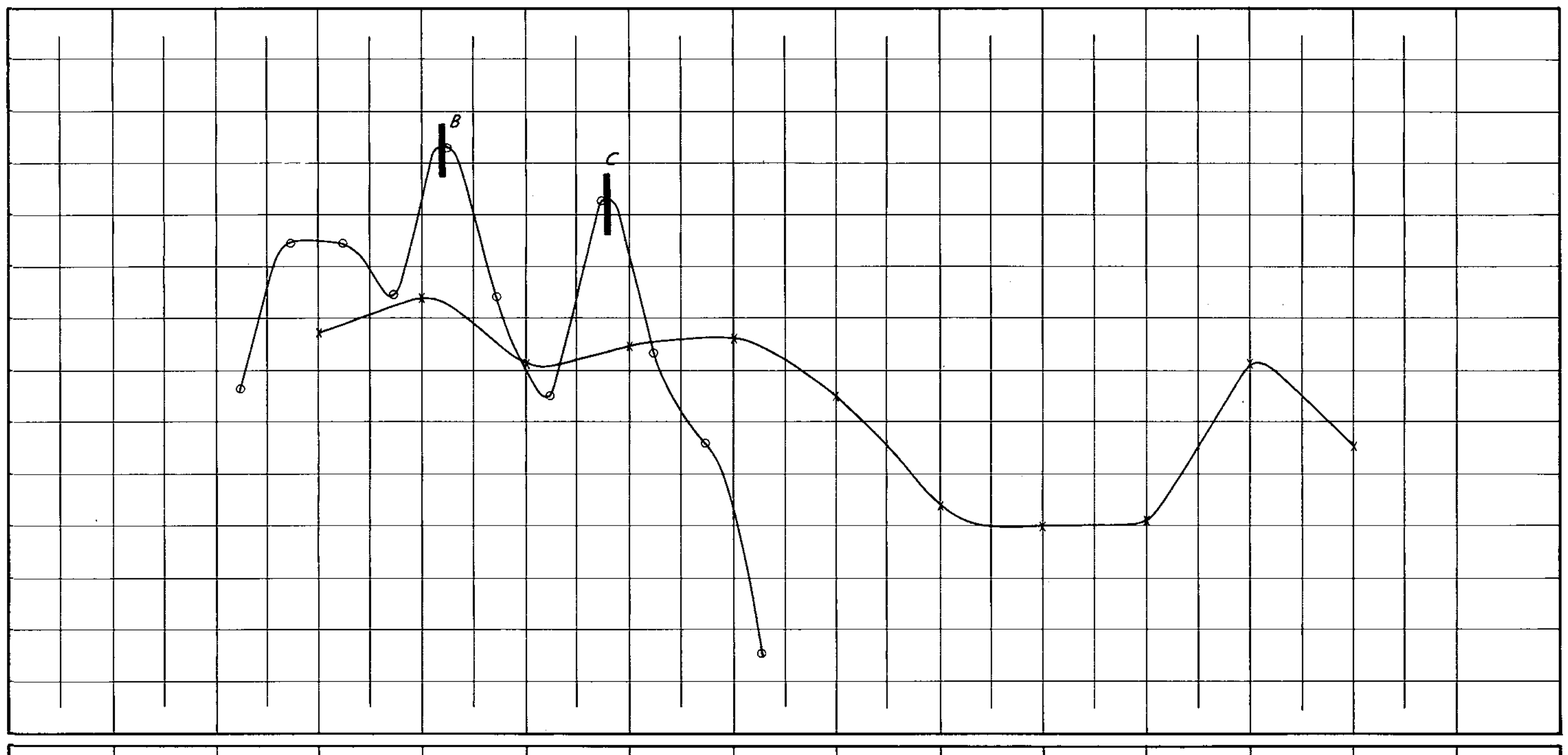
Mr. Camil Goulet - Box 64, McLease Lake, B.C.
Mr. Emile Desrochers - Box 64, McLease Lake, B.C.
- Sept. 18 to Oct. 16 - Line cutters

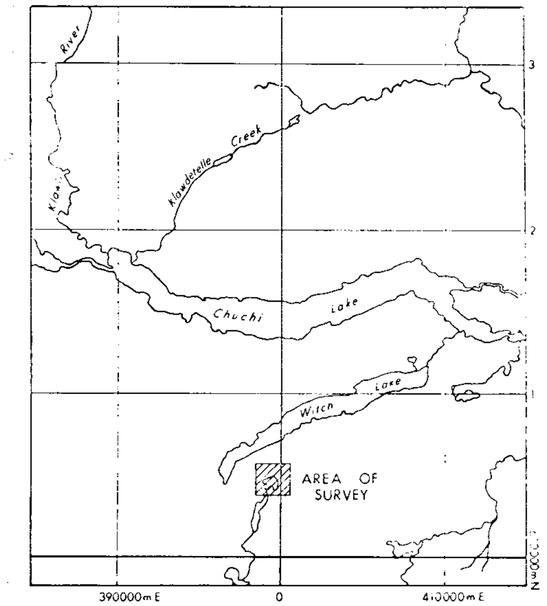
The line grid and the claim lines are used for control of a magnetometer survey and a geochemical soil survey being conducted presently, and for control of an induced polarization survey recently completed, the results of which are included in this submission.

Leo D. Kirwan

29/06/71







INDUCED POLARIZATION SURVEY

DETAIL PROFILE LINE - 8E

IMPERIAL OIL ENTERPRISES LIMITED

FORT ST. JAMES AREA

BRITISH COLUMBIA

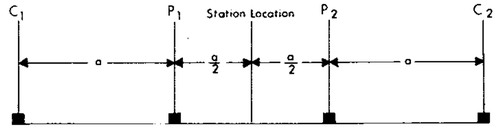
LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D.HOLE

a = 50'
a = 100'
a = 200'
a = 400'

WENNER ARRAY



HORIZONTAL SCALE: 1 inch = 200 feet

VERTICAL SCALES:

CHARGEABILITY: 1 inch = 4 milliseconds

RESISTIVITY: 3 inches = 1 logarithmic cycle (ohm-meters)

INSTRUMENT	PARAMETERS
ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

TO ACCOMPANY REPORT BY:

J. B. Prendergast

Expiry Date Aug 28, 19 82

KERTING

EXPLORATION SERVICES LIMITED

Earth Sciences Division

CALGARY ALBERTA

JOB No. 1287

FIG. No. 3

3127 M-3

CAMP-FOE

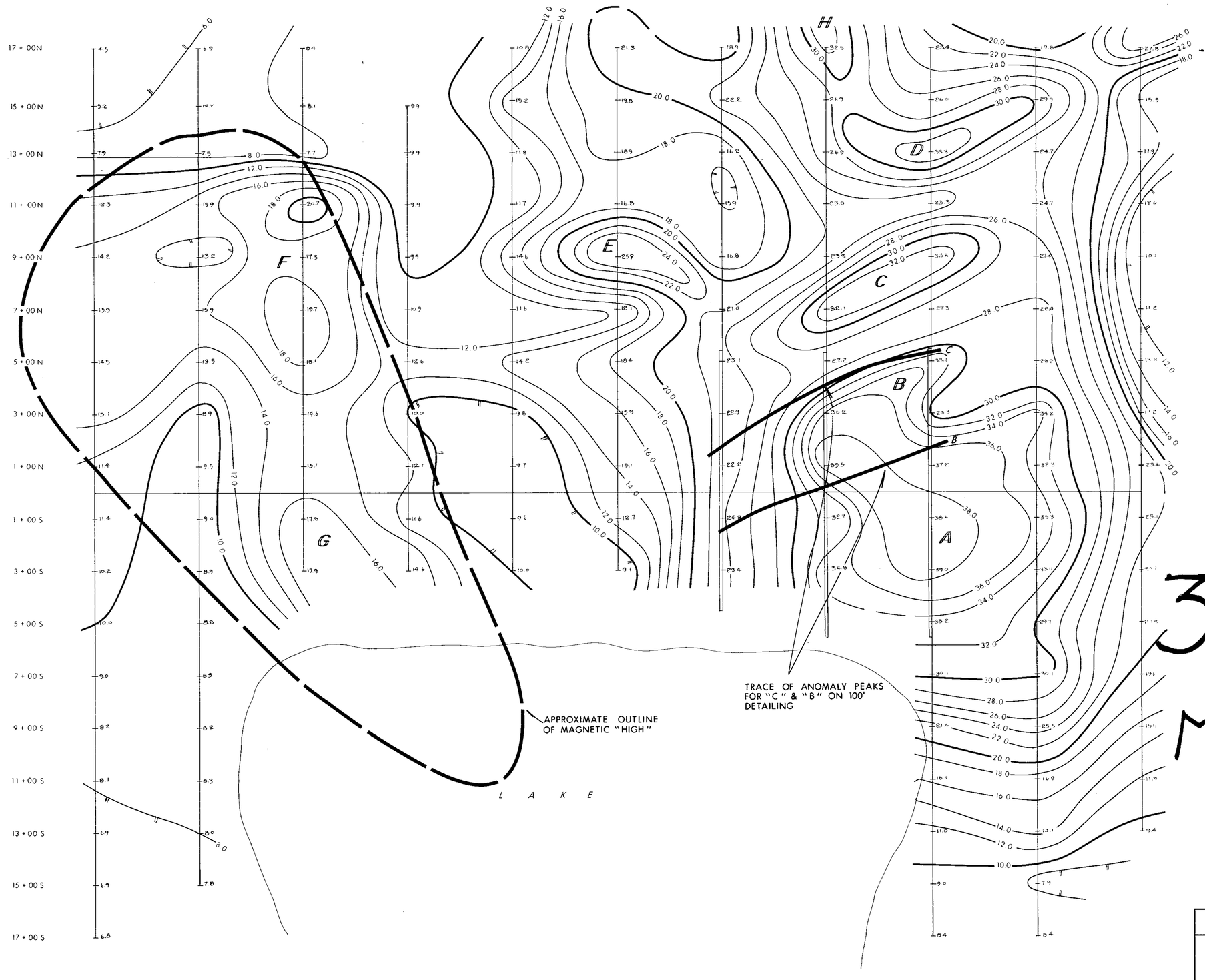
GROUP No 1

CAMP-FOE

GROUP No 2

CAMP - FOE GROUP
CAMPBELL WITCH LAKE - PROJECT
IMPERIAL OIL ENTERPRISES LTD.

LEGEND



3127

M-1

LEGEND

PORTION OF LINE COVERED BY DETAIL SURVEYING

INSTRUMENT	PARAMETERS
ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3127 MAP 41

IMPERIAL OIL ENTERPRISES LIMITED

INDUCED POLARIZATION SURVEY

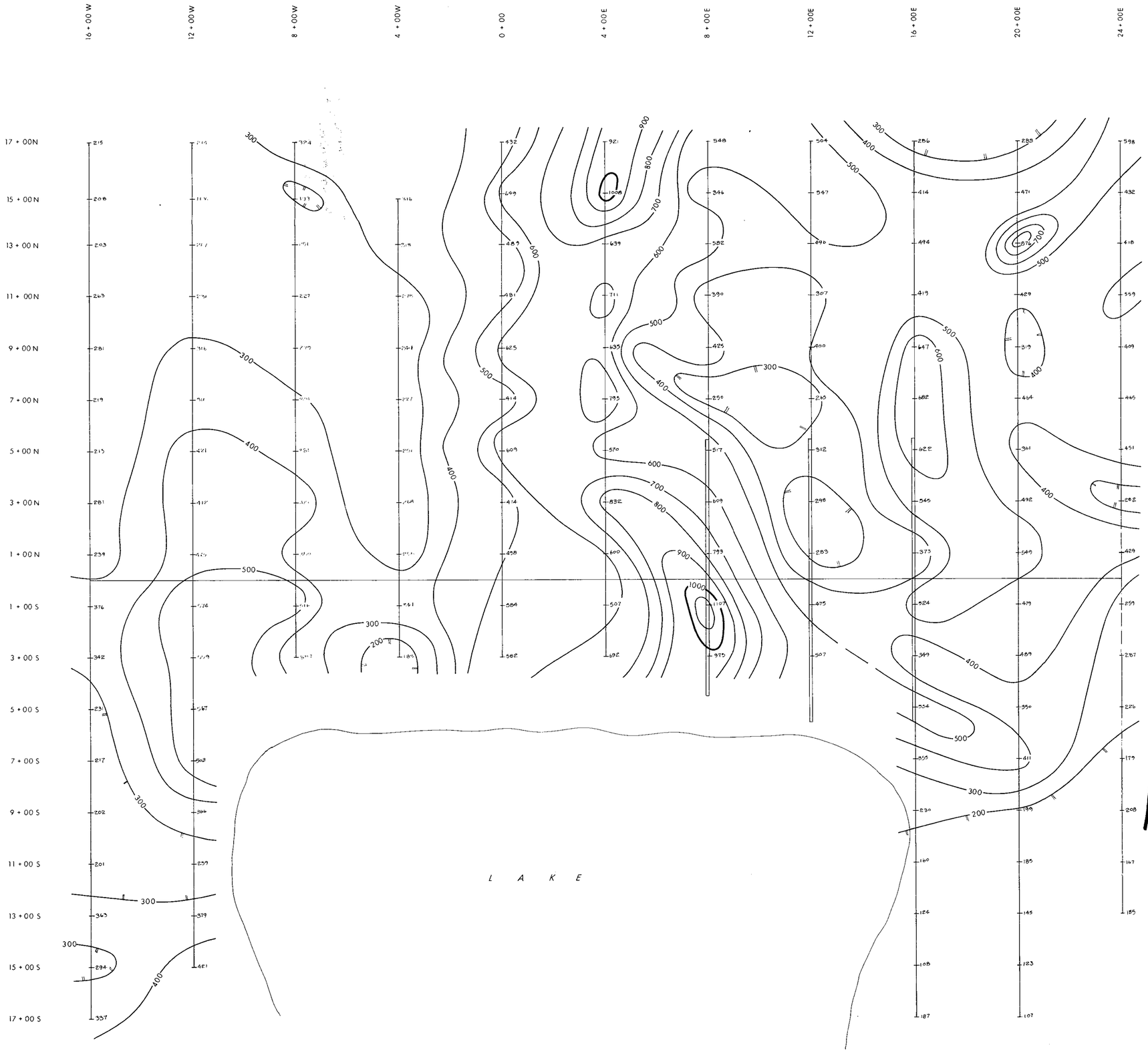
APPARENT CHARGEABILITY CONTOURS

CONTOUR INTERVAL = 2.0 milliseconds

KUNTING — EXPLORATION SERVICES LIMITED
Calgary EARTH SCIENCES DIVISION Alberta

To accompany report by:
J.B. PRENDERGAST M.A.P.Eng.

Scale: 1" = 200' | Date: June, 1971
Job No. 1287 | Fig No. 1



N

3127

M-2

LEGEND

PORTION OF LINE COVERED BY DETAIL SURVEYING

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3127 MAP #2

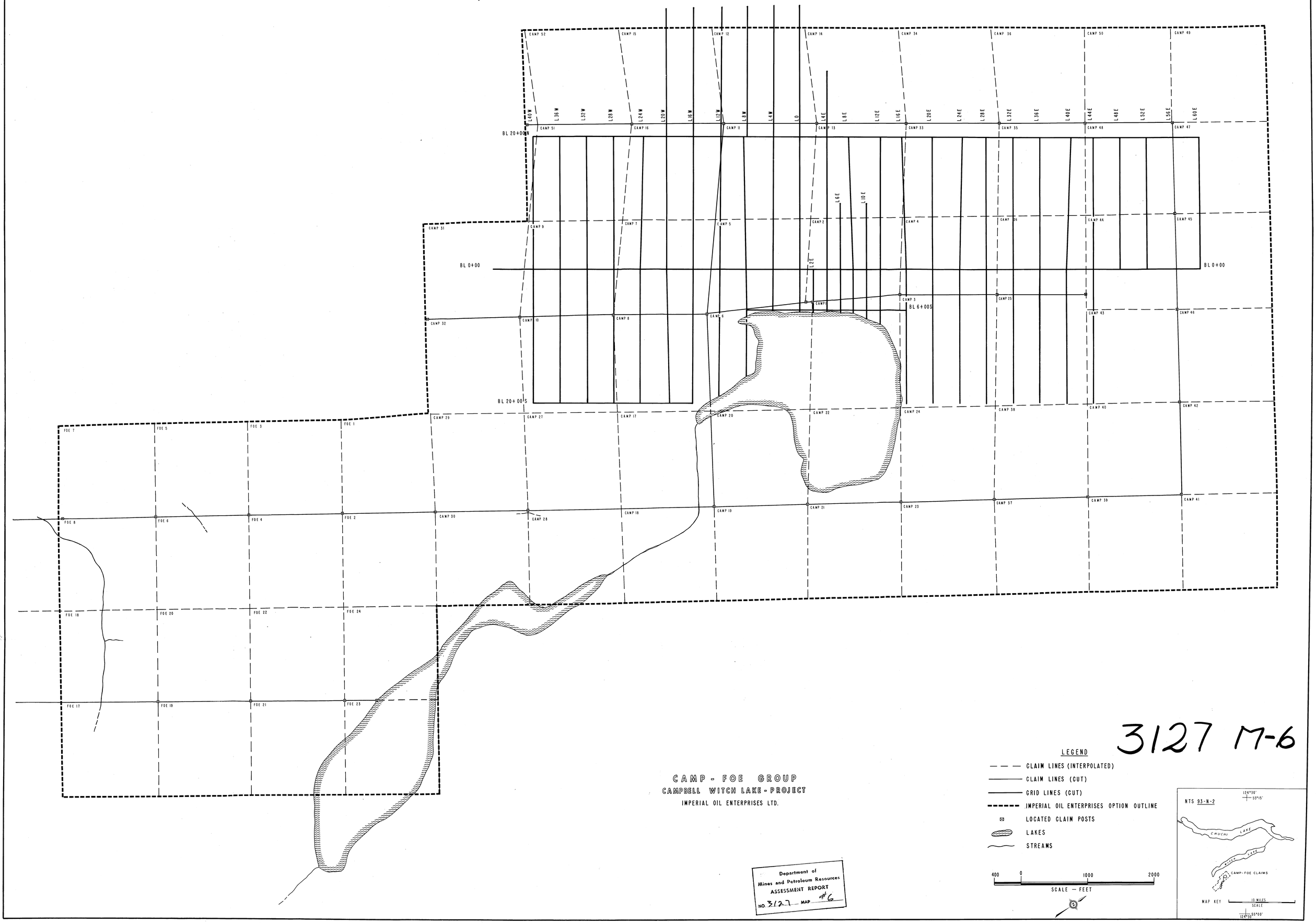
INSTRUMENT	PARAMETERS
ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

IMPERIAL OIL ENTERPRISES LIMITED

INDUCED POLARIZATION SURVEY
APPARENT RESISTIVITY CONTOURS
CONTOUR INTERVAL = 100 ohm-meters

Kenting EXPLORATION SERVICES LIMITED
Calgary EARTH SCIENCES DIVISION Alberta

To accompany report by: J. B PRENDERGAST MA PEng	Scale: 1" = 200'	Date: June, 1971
	Job No. 1287	Fig.No. 2



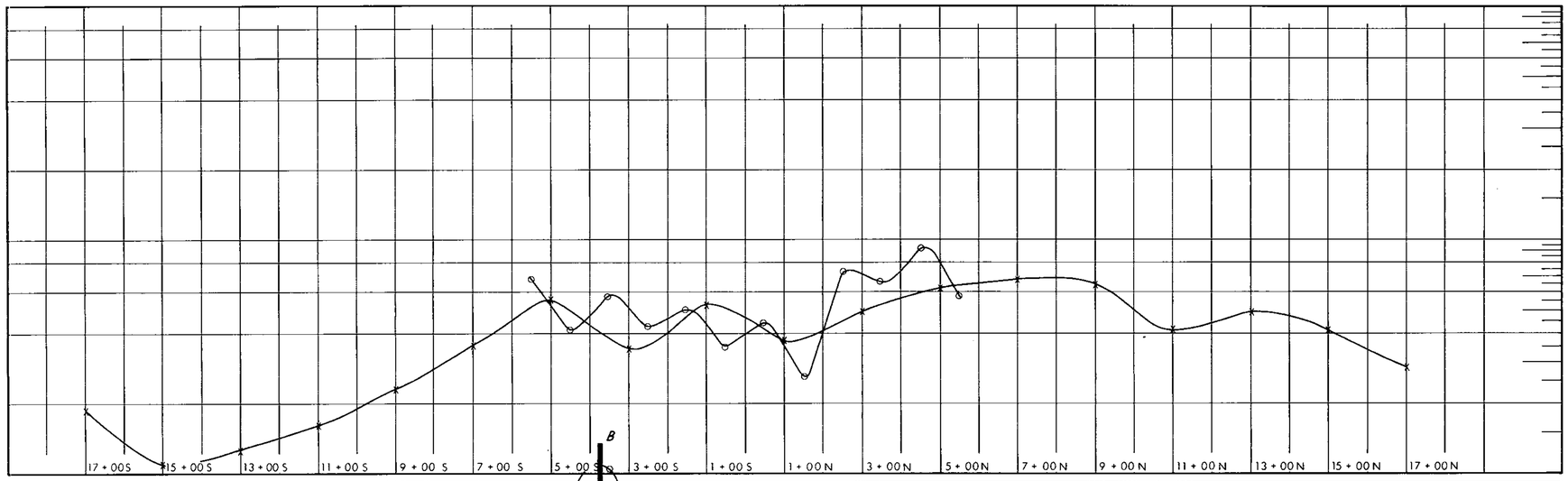
3127 M-6

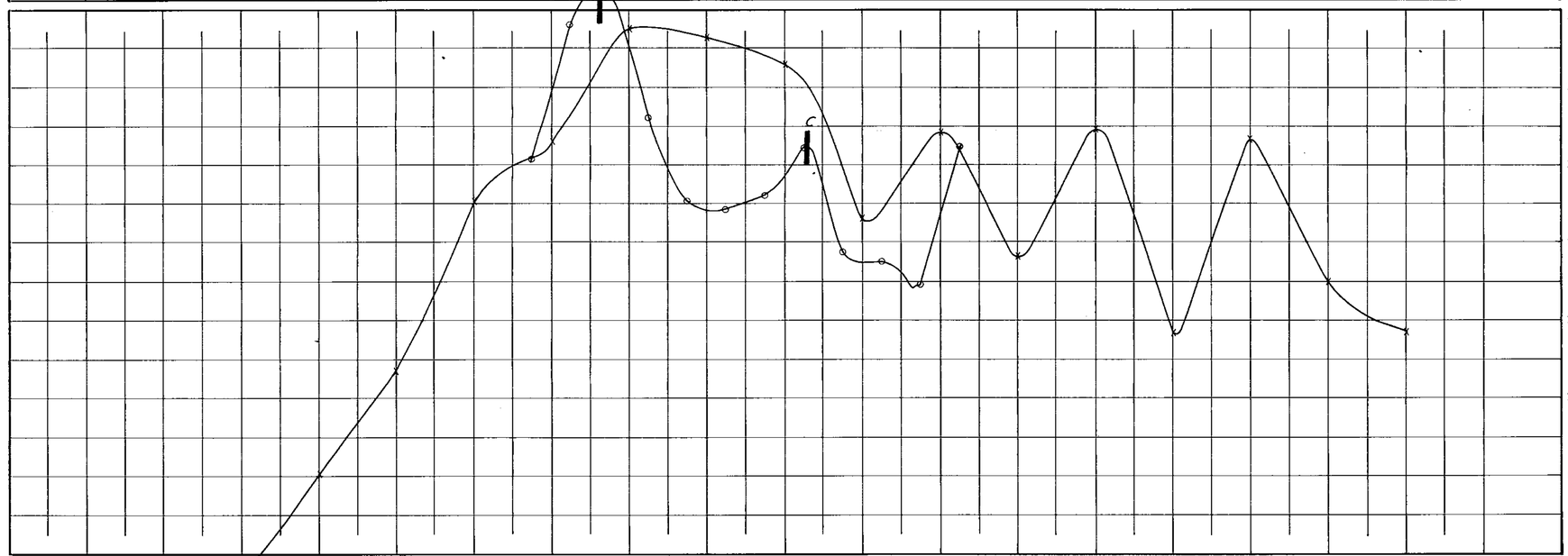
CAMP - FOE GROUP
CAMPBELL WITCH LAKE - PROJECT
IMPERIAL OIL ENTERPRISES LTD.

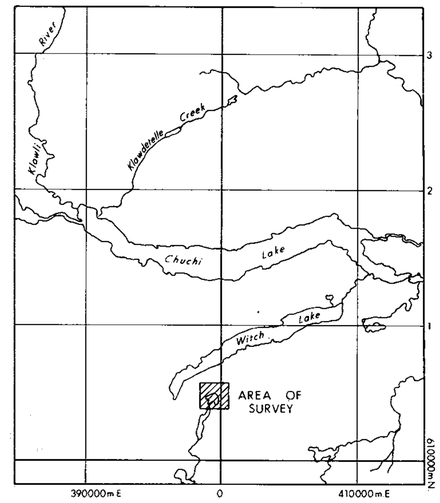
LEGEND

- CLAIM LINES (INTERPOLATED)
- CLAIM LINES (CUT)
- GRID LINES (CUT)
- IMPERIAL OIL ENTERPRISES OPTION OUTLINE
- LOCATED CLAIM POSTS
- LAKES
- STREAMS

400 0 1000 2000
SCALE — FEET







INDUCED POLARIZATION SURVEY

DETAIL PROFILE LINE - 16E

IMPERIAL OIL ENTERPRISES LIMITED

FORT ST. JAMES AREA

BRITISH COLUMBIA

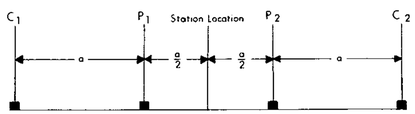
LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D.HOLE

a = 50'
a = 100'
a = 200'
a = 400'

WENNER ARRAY



HORIZONTAL SCALE: 1 inch = 200 feet

VERTICAL SCALES:

CHARGEABILITY: 1 inch = 4 milliseconds

RESISTIVITY: 3 inches = 1 logarithmic cycle (ohm-meters)

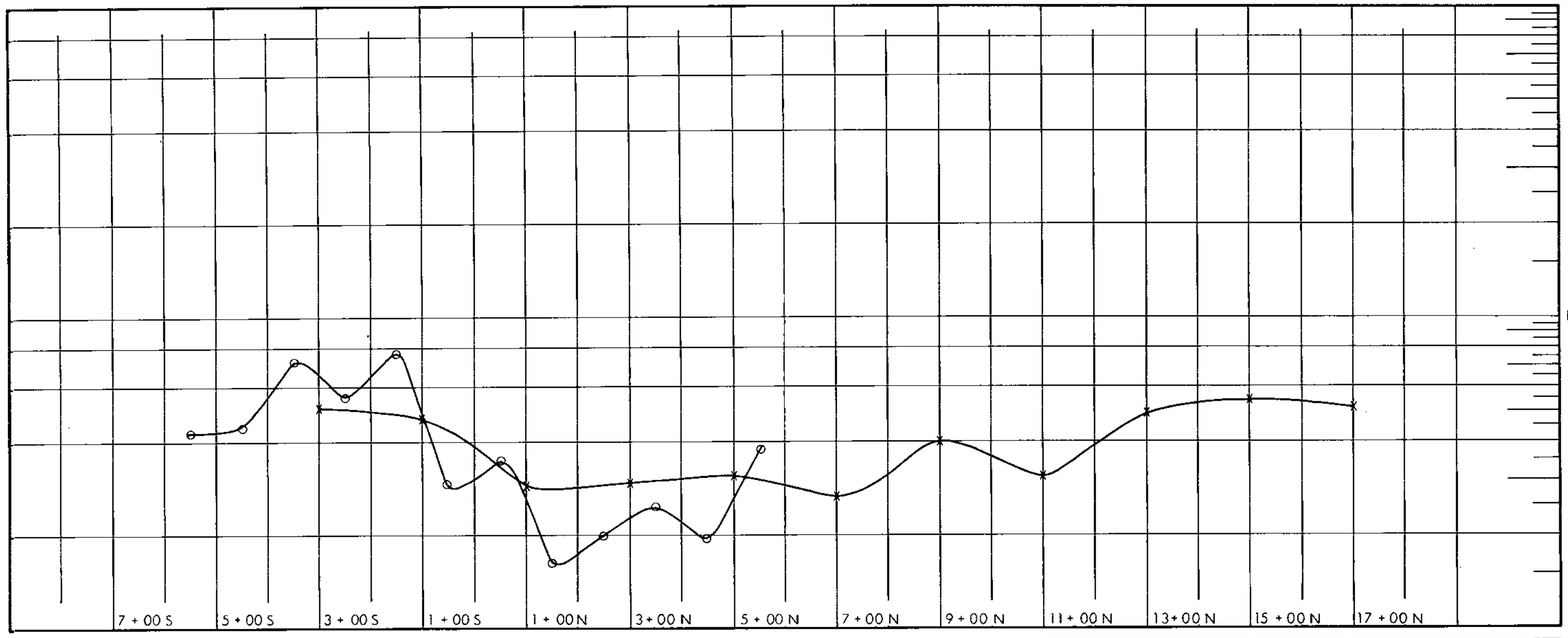
INSTRUMENT	PARAMETERS
ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

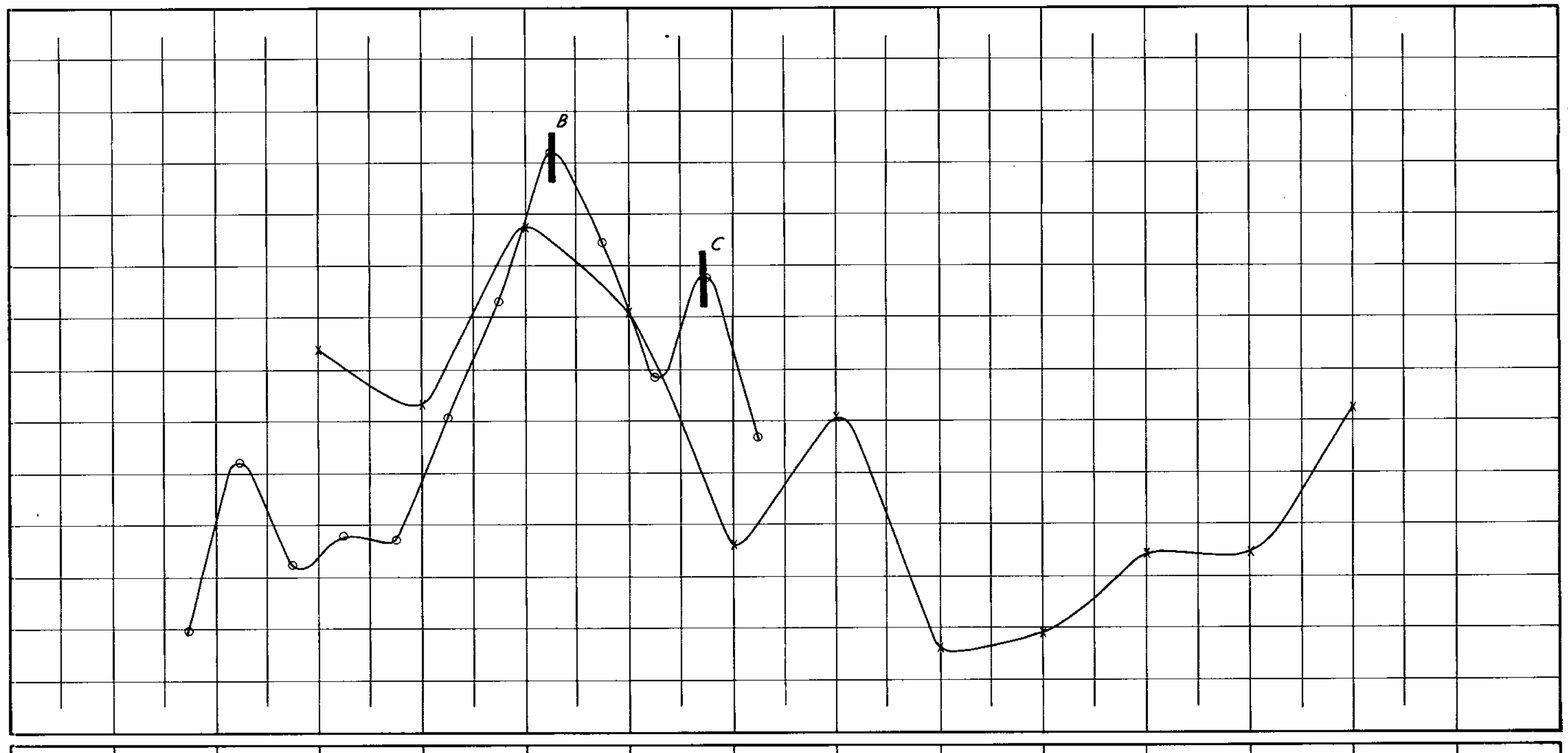
TO ACCOMPANY REPORT BY:

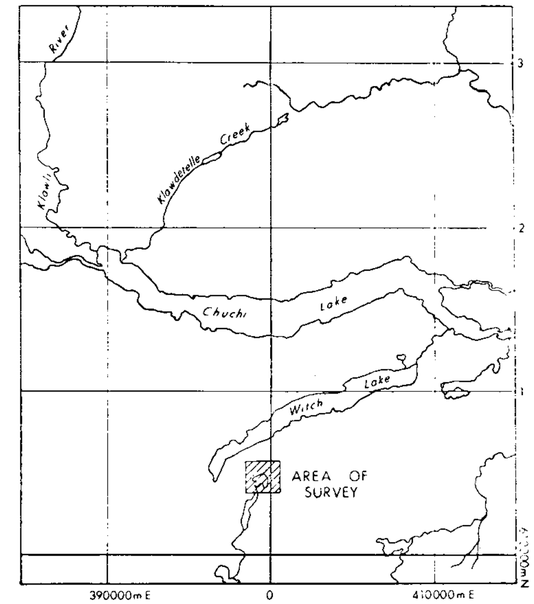
J. B. Prendergast M.A.Sc., P.Eng.

KETTLE EXPLORATION SERVICES LIMITED
Earth Sciences Division
CALGARY ALBERTA

JOB No. 1287 FIG. No. 5







INDUCED POLARIZATION SURVEY

DETAIL PROFILE LINE - 12E

IMPERIAL OIL ENTERPRISES LIMITED

FORT ST. JAMES AREA

BRITISH COLUMBIA

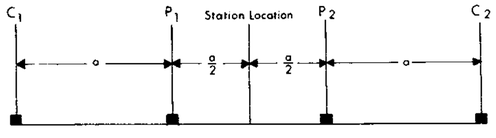
LEGEND

INTERPRETED CAUSATIVE BODY

RECOMMENDED D.D. HOLE

a = 50'
a = 100'
a = 200'
a = 400'

WENNER ARRAY



HORIZONTAL SCALE: 1 inch = 200 feet

VERTICAL SCALES:

CHARGEABILITY: 1 inch = 4 milliseconds

RESISTIVITY: 3 inches = 1 logarithmic cycle (ohm - meters)

INSTRUMENT	PARAMETERS
ON	1.5 secs.
OFF	1.0 secs.
DELAY	0.015 secs.
INTEGRATE	0.4 secs.

TO ACCOMPANY REPORT BY:

J. B. Prendergast

M.A.Sc., P.Eng.

Expiry date: May 28, 1974

KUNTING

EXPLORATION SERVICES LIMITED

Earth Sciences Division

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JOB No. 1287

FIG. No. 4

3127 M-4