

6418

INDUCED POLARIZATION  
AND  
RESISTIVITY SURVEY

ON THE  
KETTLE 6, 9, 12, 19, 22, 23 and 103 M.C.

IN THE  
OSOYOOS MINING DIVISION

KETTLE 7, 8, 11 and 21 M.C.

IN THE  
GREENWOOD MINING DIVISION

KETTLE 14, 104 and 105 M.C.

IN THE  
VERNON MINING DIVISION

49°48'N, 119°12'W  
82E

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
NO. \_\_\_\_\_

BY

NORANDA EXPLORATION COMPANY, LIMITED  
(NO PERSONAL LIABILITY)

Sept. 2, 1976 to Oct. 28, 1976  
May 3, 1977 to May 23, 1977

September 7, 1977

L. Bradish

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
LOCATION AND ACCESS	1
CLAIM STATISTICS	1
GRID PREPARATION	1
GEOLOGY	2
INDUCED POLARIZATION AND RESISTIVITY SURVEY	2
METHOD	2
PRESENTATION OF RESULTS	3
DISCUSSION OF RESULTS	3 & 4
STATEMENT OF QUALIFICATIONS	
COST STATEMENT	

LIST OF ILLUSTRATIONS

Drawings No. 1 (3) Percent Frequency Effect	In Pocket
Drawings No. 2 (3) Resistivity	" "
Drawings No. 3 Claim Map	" "
Fig. A Location Map	Following Page 1

## INTRODUCTION

The claims referred to in this report are owned by Tye Lake Resources Ltd. and optioned to Noranda Exploration Company, Limited and Kerr Addison Mines Limited.

The Induced Polarization and Resistivity Survey was carried out by Noranda Exploration Company, Limited between the dates October 28, 1976 and September 2, 1976, May 3, 1977 and May 23, 1977. The survey was carried out by L. Bradish, G. Fenton, Geophysicists and a crew of three men all under the supervision of J.T. Walker, Geophysicist. All personnel are Noranda employees.

## LOCATION AND ACCESS

The mineral claims referred to in this report are located 30 kilometers southeast of Rutland, British Columbia with access from Rutland via Highway 33. The grid co-ordinates are 49°48'N, 119°12'W (NTS 82E) and shown on Figure A.

## CLAIM STATISTICS

The claims pertaining to this report are shown on drawing No. 3 and listed on pages 1 and 2.

## GRID PREPARATION

An extensive control grid was developed requiring six baselines. A total of 94.48 line kilometers were cut. The grid work was contracted out to Amex Exploration Services Ltd., of Kamloops.

<u>CLAIM NAME</u>	<u>RECORD NO.</u>	<u>RECORD DATE</u>	<u>OWNER</u>	<u>OPERATOR</u>	<u>Km. OF I.P.</u>
Kettle 6	25	Sept.9/75	Tye Lake Resources Ltd.	Noranda Expl. Co., Ltd. and Kerr Addison Mines Limited	13.5
Kettle 7	116	Sept.9/75	"	"	8.7
Kettle 8	117	Sept.9/75	"	"	8.25
Kettle 9	26	Sept.9/75	"	"	3.2
Kettle 11	118	Sept.9/75	"	"	6.5
Kettle 12	70	May 5/76	"	"	10.2
Kettle 14	48	May 5/76	"	"	5.55
Kettle 19	73	May 25/76	"	"	1.2
Kettle 21	345	May 25/76	"	"	1.3
Kettle 22	74	May 25/76	"	"	1.35
Kettle 23	75	May 25/76	"	"	0.5
Kettle 103	180	Jan.13/77	"	"	1.75
Kettle 104	208	Jan.13/77	"	"	0.45

ending 13 m

Vernon 20 m / 3

15' 4

5

119°W

6

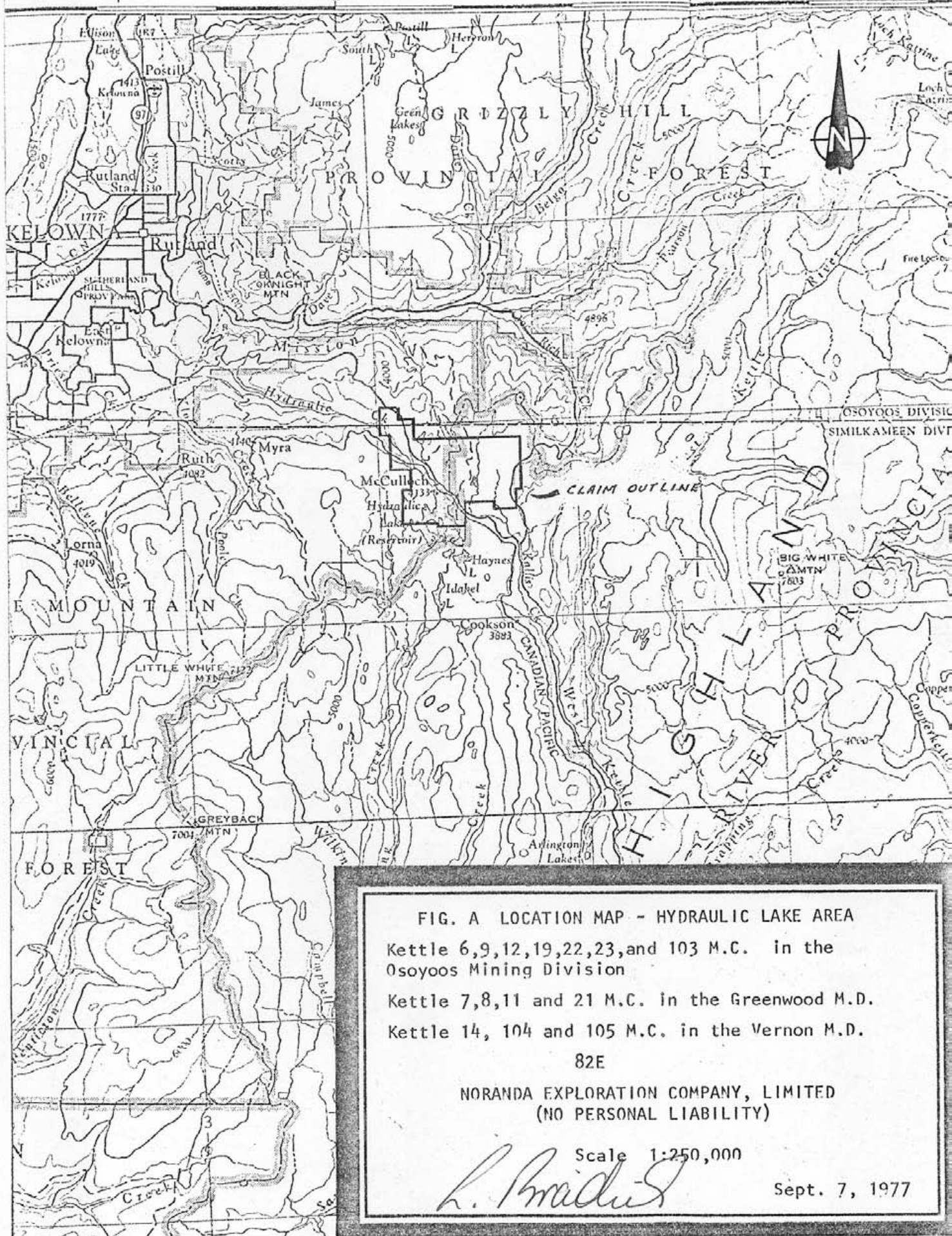


FIG. A LOCATION MAP - HYDRAULIC LAKE AREA  
 Kettle 6,9,12,19,22,23, and 103 M.C. in the Osoyoos Mining Division  
 Kettle 7,8,11 and 21 M.C. in the Greenwood M.D.  
 Kettle 14, 104 and 105 M.C. in the Vernon M.D.

82E

NORANDA EXPLORATION COMPANY, LIMITED  
 (NO PERSONAL LIABILITY)

Scale 1:250,000

*L. Prud'homme*

Sept. 7, 1977

<u>CLAIM NAME</u>	<u>RECORD NO.</u>	<u>RECORD DATE</u>	<u>OWNER</u>	<u>OPERATOR</u>	<u>Km. OF I.P.</u>
Kettle 105	210	Jan.13/77	Tyee Lake Resources Ltd.	Noranda Expl. Co., Ltd. and Kerr Addison Mines Ltd.	3.25
TOTAL LINE KILOMETERS OF SURVEY					65.7 Km

### GEOLOGY

The geology has been mapped and reported by P. McAndless and G. Gibson in Noranda Exploration Company, Limited Assessment Report dated November 16, 1976. They state:

"The map area is underlain by lithologies including "basement" metamorphics of the Monashee Group, granitic intrusives of the Valhalla/Coryell Plutonic Rock and volcanic/sedimentary cover rocks of the Cache Creek, Kettle River and Plateau Basalt Formations."

### INDUCED POLARIZATION AND RESISTIVITY SURVEY

Frequency Domain equipment, manufactured by Sabre Electronic Instruments Ltd., was utilized for the survey.

A "square array" was employed throughout the survey with dipole lengths of 100m and frequencies of 0.3Hz and 5.0Hz.

A total of 65.7 line kilometers of readings were obtained.

### METHOD

The survey, using the square electrode array is carried out with the current dipole and the potential dipole on adjacent lines with a 100 meter separation. The two current and two potential electrodes forming the corners of a square 100 x 100 meters. This dipole configuration is maintained throughout the survey and is "set up" along the lines at 100 meter intervals.

At each "set up" the grid co-ordinates of each dipole are recorded and the following electrical measurements are made and recorded.

- (1) Transmitter current at 5 Hz.  
(milliamperes)
- (2) Induced voltage  
(millivolts)
- (3) Frequency of transmitter current changed to 0.3 Hz.  
(current maintained constant)
- (4) Receiver measures percent deviation of inducted voltage caused solely by change of frequency. (recorded as percent frequency effect).

Since the transmitted current is maintained constant at each frequency, the deviation in induced voltage indicates a change in resistivity with frequency.

This by definition is Frequency Effect. Apparent resistivity is calculated from the recorded current and voltage measurements and the array geometry and dimensions:

$$\text{Apparent Resistivity} = 2\pi x \frac{V}{I} K$$

where V = millivolts

I = milliamperes

x = dipole length (100 meters)

k = array constant (1.5)

### PRESENTATION OF RESULTS

All results of the survey, Percent Frequency Effect (dwg.1) and Apparent Resistivity (dwgs. 2) are presented on a grid plan map at a scale of 1:10,000. The Percent Frequency Effect data is contoured at 3.0, 5.0, 7.5, 10.0 and 15% intervals, and the Apparent Resistivity is contoured at 10, 20, .50, 100, 200 ... ohm - meter intervals.

The plotting points for all data lies at the centre of the square defined by the four electrodes.

### DISCUSSION OF RESULTS

#### Drawings No. 1, 2 - Sheet No. 1

The Percent Frequency Effect values on this map sheet indicate a higher background than occurs on the other map sheets. Resistivity values show a smooth variation with values ranging from 15 ohm - meters to 431 ohm meters. A distinct low trough, trending north-south occurs near the 125E Baseline. A broad P.F.E. (>5.0%) high occurs on the east flank of this trough. The higher resistivity values east of 133E is indicative of thinning of the overburden.

#### Drawings No. 1, 2 - Sheet No. 2

The central area within the Kettle 12 M.C. are the results of the 1976 I.P. Survey. A distinct resistivity low (<10  $\Omega$ .m) trendings N.W. - S.E. is coincident with a circular percent Frequency Effect (P.F.E.) high. This low "trough" extends from approximately L.101+50N/92E to L.98N/93+50E. The sharp increase in resistivity on the flanks is indicative of decreasing overburden thickness. The high P.F.E. response west of the 92EBL, between L.96N and 101N is coincident with these high resistivity values.

Several anomalies greater than 5.0 P.F.E. exist, the most prominent at L. ~~89~~+50N/97E with a sharp high of 12.25%. Resistivity values are highly variable but a moderately prominent feature is the low "trough" striking approximately NW - SE from L.101+50N/92E down to L.85N/100E. The high 12.25 P.F.E. is situated within this low trough. Other, less significant, low troughs occur, centered at L.93+50N/99E and L.93N/101+75E.

Drawings No. 1, 2 - Sheet No. 3

The P.F.E. background in this area ranges between 0% and 3.0%. Many small anomalies exist, some the result of only one high reading, the largest (118+50N/81+00E) being 14.75% with little build up by adjacent readings. The other anomaly worth mentioning is in the south-east quadrant. 500 meters by 250m in extent, the maximum P.F.E. is 7.75%. Most of these P.F.E. anomalies are coincident with high resistivity values which may be indicative of "bedrock highs" overburden thinning as the resistivity variation in part is caused by varying overburden thickness. The resistivity values range from 2 ohm-meters to 352 ohm-meters. A prominent feature of the Resistivity map is the low trough west of the 78E Baseline and north of line 121N.

*L. Prud'homme*

STATEMENT OF QUALIFICATIONS



STATEMENT OF QUALIFICATIONS

I, Lyndon C. Bradish of the City of Vancouver, Province of British Columbia, do certify that:

1. I have been an employee of Noranda Exploration Company, Limited since May 1973.
2. I am a graduate of the University of British Columbia with a Bachelor of Science Degree in Geophysics.
3. I am a member of the Canadian Institute of Mining and Metallurgy.
4. I am a member of the British Columbia Geophysical Society.
5. I have held the position of Geophysicist for Noranda Exploration Company, Limited since May 1973.



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L.C. Bradish  
Geophysicist  
Noranda Exploration Company, Limited  
(No Personal Liability)

COST STATEMENT

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT: Tyee-Peregrine

TYPE OF REPORT: I.P.

(a) Employees: L. C. Bradish, J. T. Walker, M. Vetterli, P. Wilson,  
G. Fenton, A. Saunders, C. Desjardins, D. Warwarick, A. Dickinson

Number of days: 133

Dates worked: Between Oct. 25/76 and Aug. 31/77

(b) Average cost per day \$	49.40	
Total cost \$ 49.40 X 133		\$ 6,570.20
(c) Cost of food & accomodation		\$ 3,371.55
(d) Cost of transportation		
i. During work period		
type: trucks		
cost:	1,068.18	
ii. To and from Claims from within B.C.		
cost:	687.70	1,755.88
(e) Cost of aircraft		
i. Fixed wing:		
ii. Helicopter:		
(f) Cost of instruments		
i. Rental:	2,460.00	
ii. Supplies	0	2,460.00
(g) Cost of geochem analysis (details attached ):		
(h) Cost of report preparation:		1,788.21
(i) Other: Supervisor: R. C. Heim, P. Eng. PhD., G. E. Dirom, P. Eng.	1,755.18	
Comp & Field Supplies	346.13	
B. C. Tel.	<u>25.14</u>	2,126.45

18,072.29

TOTAL

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT: Tyee Peregrine

TYPE OF REPORT: Line Cutting

(a) Employees: M. Lowrie, R. Johnson  
Number of days: 3  
Dates worked: Between Nov. 18/76<sup>d</sup> June 1/77

(b) Average cost per day \$ 29.67  
Total cost \$ 29.67 X 3 \$ 89.01

(c) Cost of food & accomodation \$ 130.32

(d) Cost of transportation  
i. During work period  
type: truck  
cost: 39.41  
ii. To and from Claims from  
within B.C. 19.71 59.14  
cost:

(e) Cost of aircraft  
i. Fixed wing:  
ii. Helicopter:

(f) Cost of instruments  
i. Rental:  
ii. Supplies

(g) Cost of geochem analysis  
(details attached ):

(h) Cost of report preparation:

(i) Other: Supervision R. C. Heim P. Eng, PhD,  
G. E. Dirom, P. Eng. 186.00  
Field & Comp. supplies 133.20  
Contractor - Amex Exploration Service,  
Kamloops 11,810.00

12,129.20  
12,407.67

TOTAL

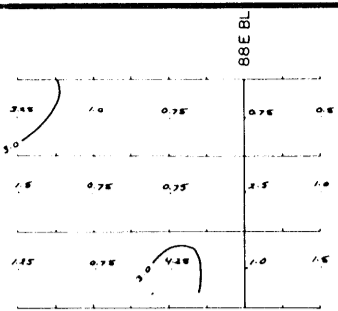
Tyee Peregrine

Line cutting and geophysics

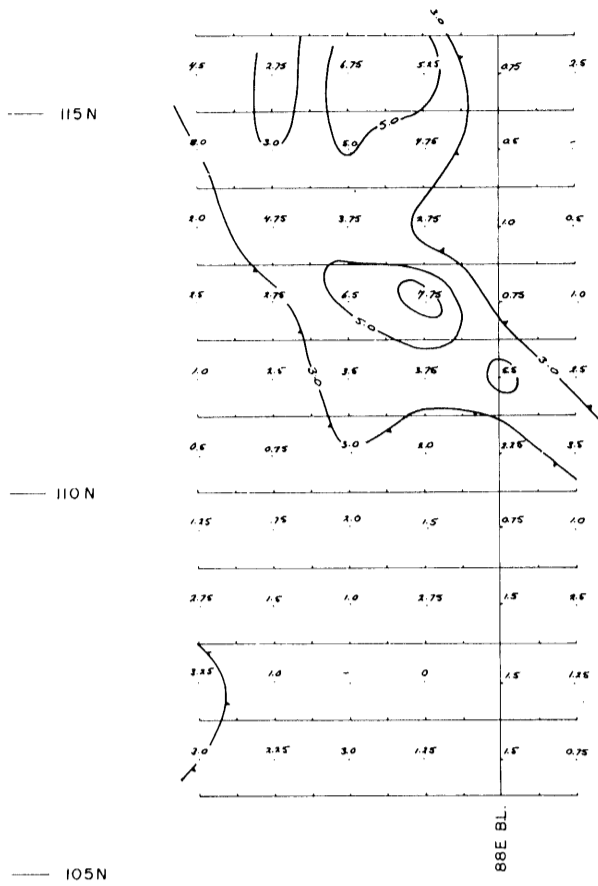
Summary and allocation of costs.

Linecutting	\$ 12,407.67
Geophysics	<u>18,072.29</u>
	<u>30,479.96</u>
Lines	65.7 km.
Cost per kilometre	\$ 463.93

<u>Allocation</u>	Km.	
Kettle 6	13.5	\$ 6,263.02
Kettle 7	8.7	4,036.16
Kettle 8	8.25	3,827.39
Kettle 9	3.2	1,484.56
Kettle 11	6.5	3,015.52
Kettle 12	10.2	4,732.05
Kettle 14	5.55	2,574.79
Kettle 19	1.2	566.71
Kettle 21	1.3	603.10
Kettle 22	1.35	626.30
Kettle 23	0.50	231.96
Kettle 103	1.75	811.87
Kettle 104	0.45	208.77
Kettle 105	3.25	1,507.76
	<u>65.7</u>	<u>\$ 30,479.96</u>



122 N  
120 N

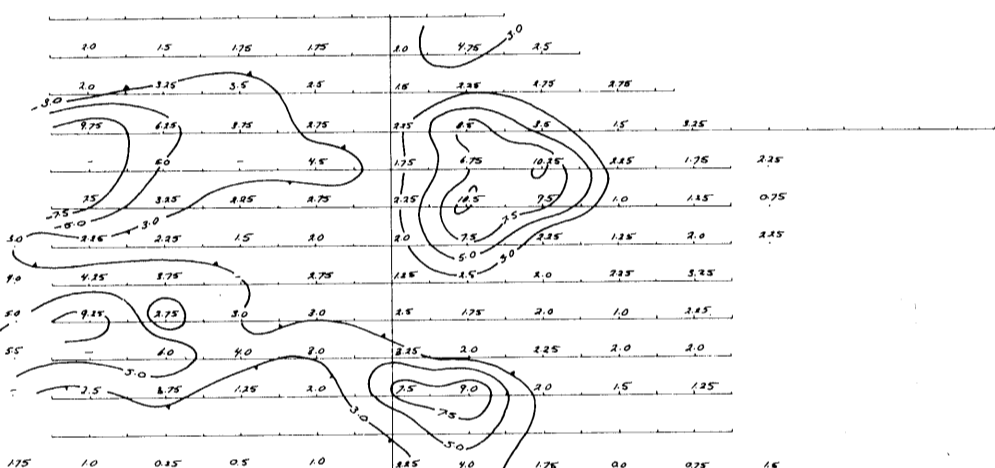


116 N  
114 N  
112 N  
110 N  
108 N  
106 N

88 E BL  
92 E BL  
96 E  
100 E BL  
104 E  
108 E BL  
112 E BL  
116 E

105 N

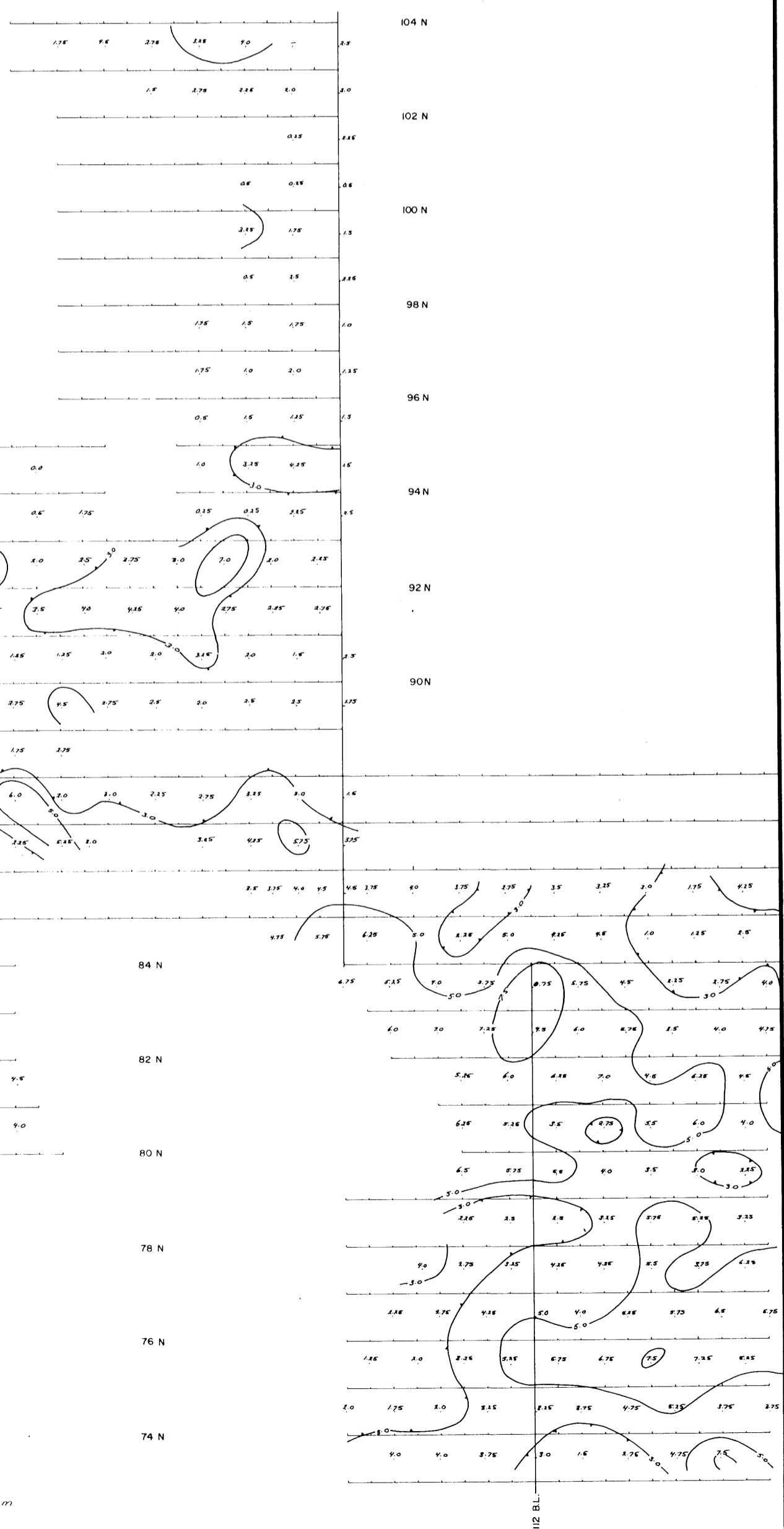
100 N



95 N

90 N

85 N



104 N  
102 N  
100 N  
98 N  
96 N  
94 N  
92 N  
90 N  
84 N  
82 N  
80 N  
78 N  
76 N  
74 N

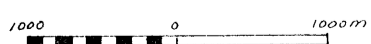
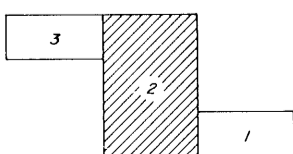
100 E BL

112 E BL

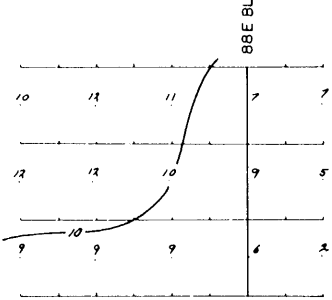
MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
No. **6418**

TO ACCOMPANY ASSESSMENT REPORT ON I.P. & RESISTIVITY SURVEYS ON KETTLE  
6, 7, 8, 9, 11, 12, 14, 19, 21, 22, 23, 103, 104 & 105 M.C. BY L. BRADISH  
DATED SEPT 7, 1977

*L. Bradish*



REVISED	HYDRAULIC LAKE GRID	
	I.P. SURVEY	
	PERCENT FREQUENCY EFFECT	
	61 Q.3 B.S.O Hz.	
	10' 100m	
	Contour Interval: 3, 5, 7.5, 10	
PROJ. No.	SURVEY BY LCB, MV, GF	DATE OCT 1976, MAY 1977
N.T.S. 82 E	DRAWN BY LCB, JVV	SCALE 1:10000
DWG No.	NORANDA EXPLORATION	
1	OFFICE: VANCOUVER	



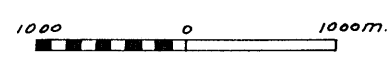
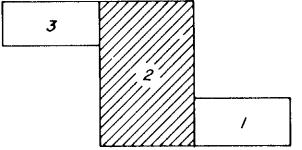
MINERAL RESOURCES BRANCH  
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 NO. **6418**

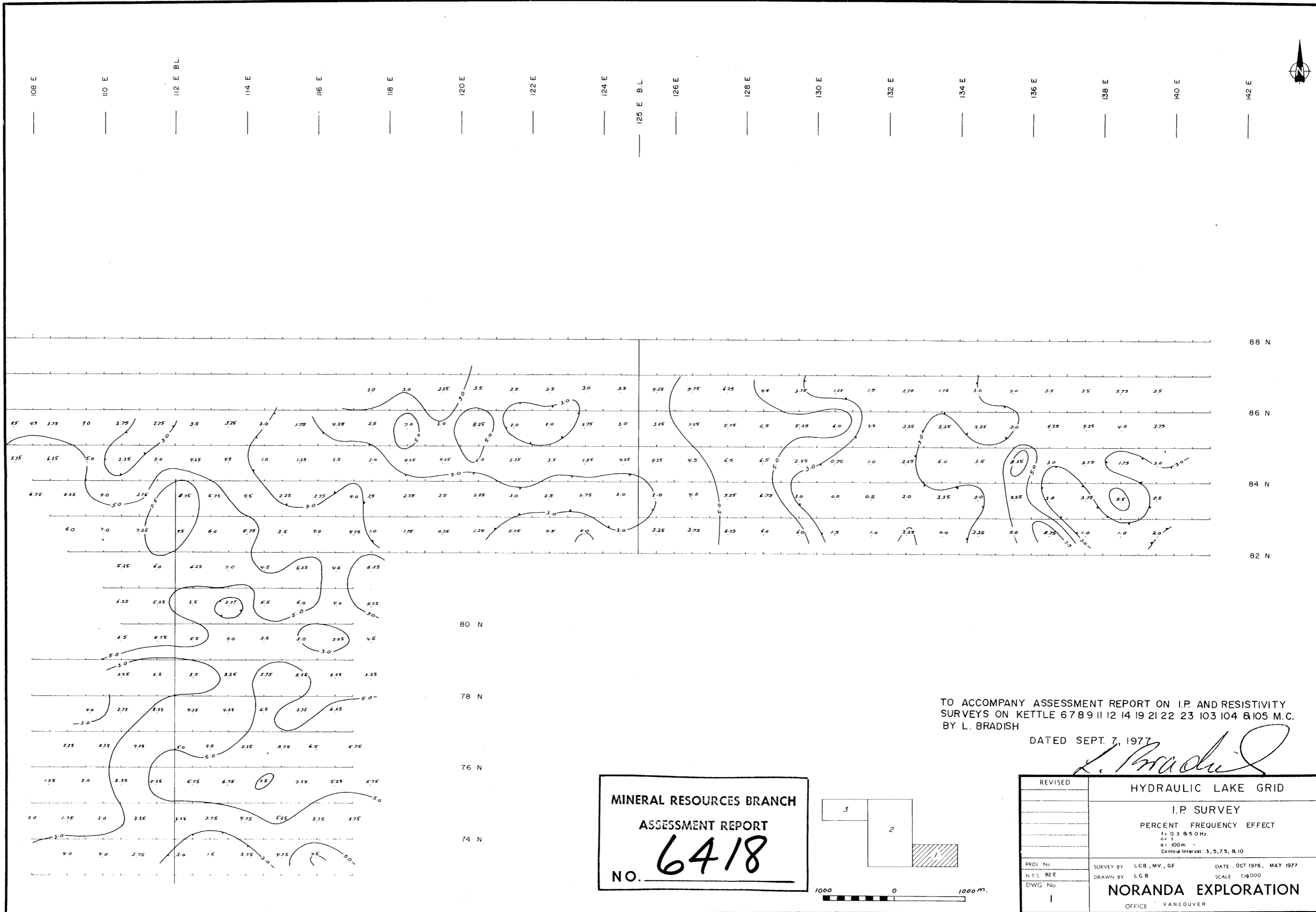
TO ACCOMPANY ASSESSMENT REPORT ON I.P. & RESISTIVITY SURVEYS ON KETTLE 6,7,8,9,11,12,14,19,21,22,23,103, 104 & 105 MINERAL CLAIMS BY L. BRADISH

DATED: SEPT. 7, 1977

*L. Bradish*

REVISED	HYDRAULIC LAKE GRID	
	I.P. SURVEY	
	RESISTIVITY $\rho_{sp}$ , $\Omega \cdot m$ .	
	f = 0.3 @ 50 Hz.	
	a = 100m	
	Contour Interval 10, 20, 50 $\Omega \cdot m$	
PROJ. No.	SURVEY BY LCB, M.V. & G.F.	DATE OCT 1976, MAY 1977
N.T.S. 82 E	DRAWN BY LCB, J.V.V.	SCALE 1:10000
DWG. No.	NORANDA EXPLORATION	
2	OFFICE: VANCOUVER	

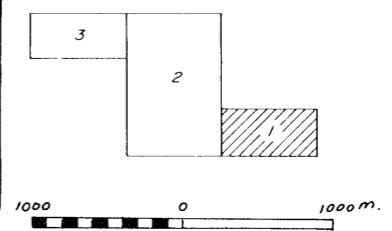




TO ACCOMPANY ASSESSMENT REPORT ON I.P. AND RESISTIVITY SURVEYS ON KETTLE 67891121419212223103104 & 105 M.C. BY L. BRADISH

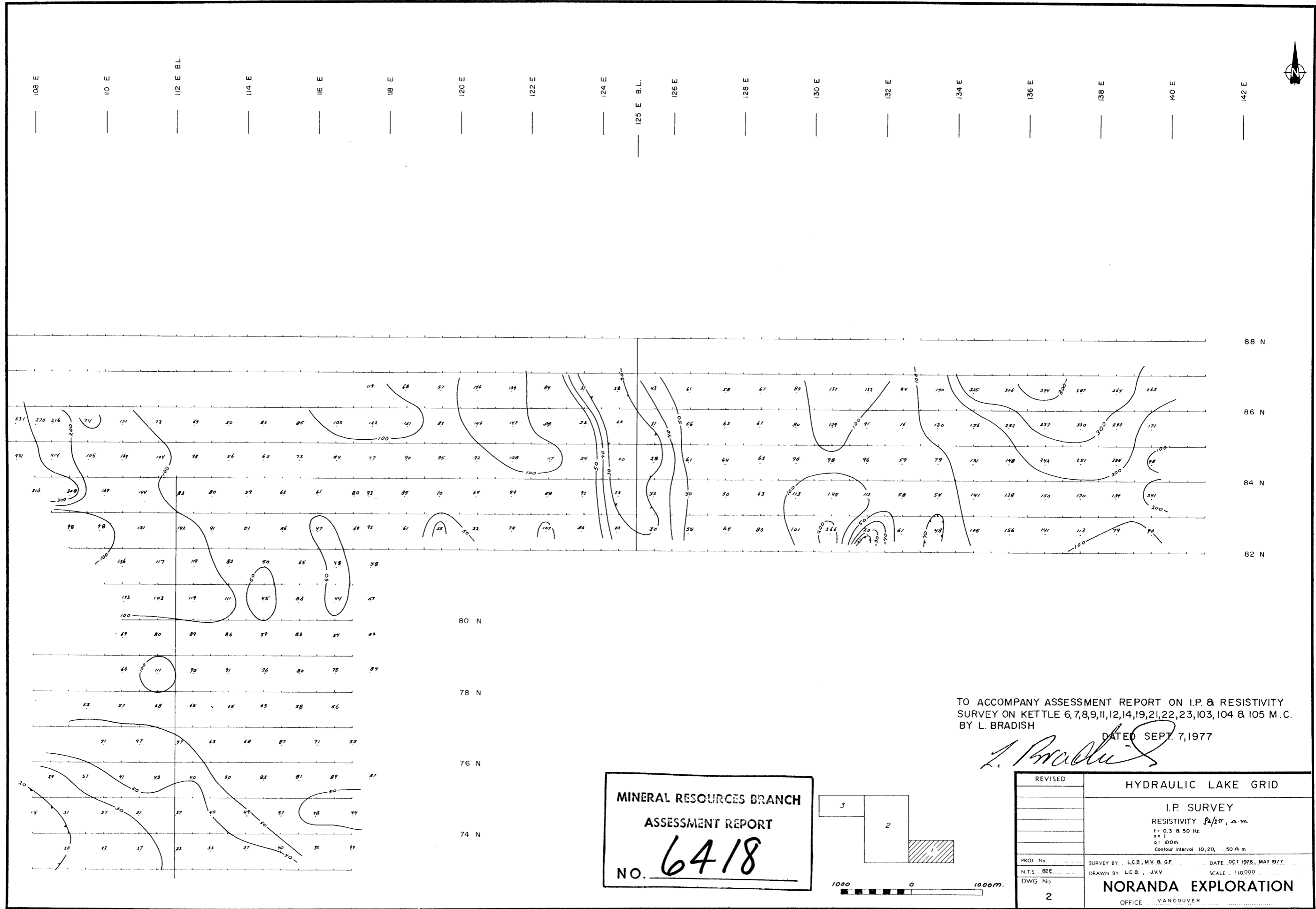
DATED SEPT. 7, 1977  
*L. Bradish*

MINERAL RESOURCES BRANCH  
 ASSESSMENT REPORT  
 NO. **6418**



REVISED	HYDRAULIC LAKE GRID	
	I.P. SURVEY	
	PERCENT FREQUENCY EFFECT	
	f = 0.3 & 5.0 Hz.	
	a = 100 m.	
	Contour Interval: 3, 5, 7.5, & 10	
PROJ. No.	SURVEY BY LCB, MV, GF	DATE OCT 1976, MAY 1977
NTS B2E	DRAWN BY LCB	SCALE 1:10000
DWG No.	<b>NORANDA EXPLORATION</b>	
1	OFFICE VANCOUVER	

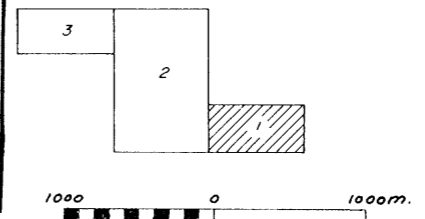




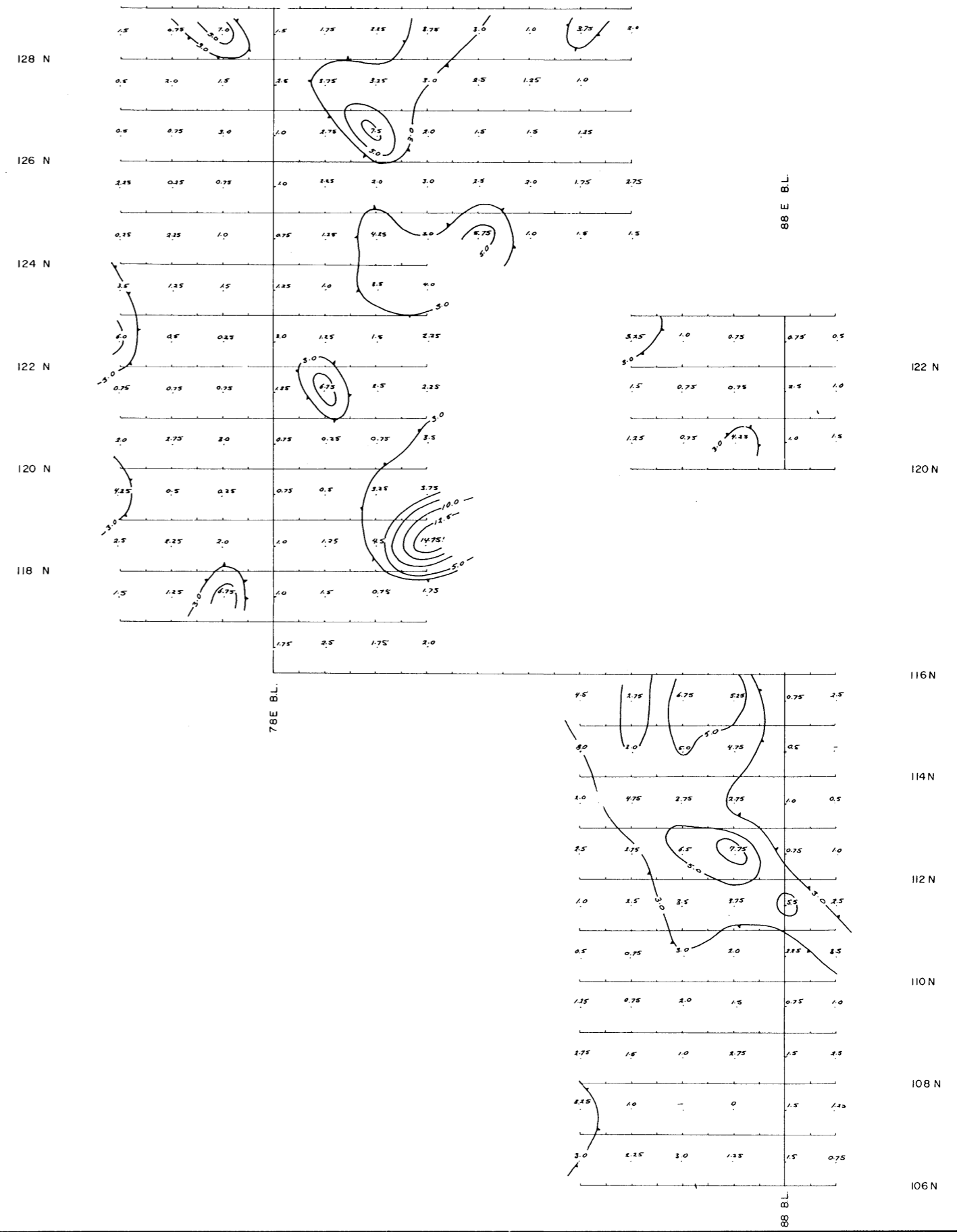
TO ACCOMPANY ASSESSMENT REPORT ON I.P. & RESISTIVITY SURVEY ON KETTLE 6,7,8,9,11,12,14,19,21,22,23,103,104 & 105 M.C. BY L. BRADISH DATED SEPT. 7, 1977

*L. Bradish*

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
NO. **6418**



REVISED	HYDRAULIC LAKE GRID	
	I.P. SURVEY	
	RESISTIVITY $\rho_a / 2\pi r, \Omega \cdot m$	
	f = 0.3 & 50 Hz	
	a = 100m	
	Contour Interval 10, 20, 50 $\Omega \cdot m$	
PROJ No.	SURVEY BY: L.C.B., M.V. & G.F.	DATE: OCT 1976, MAY 1977.
N.T.S. 82E	DRAWN BY: L.C.B., J.V.V.	SCALE: 1:10,000
DWG No.	<b>NORANDA EXPLORATION</b>	
2	OFFICE VANCOUVER	

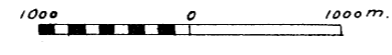
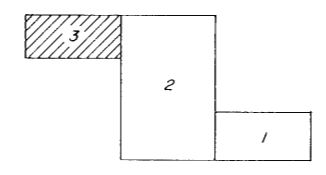


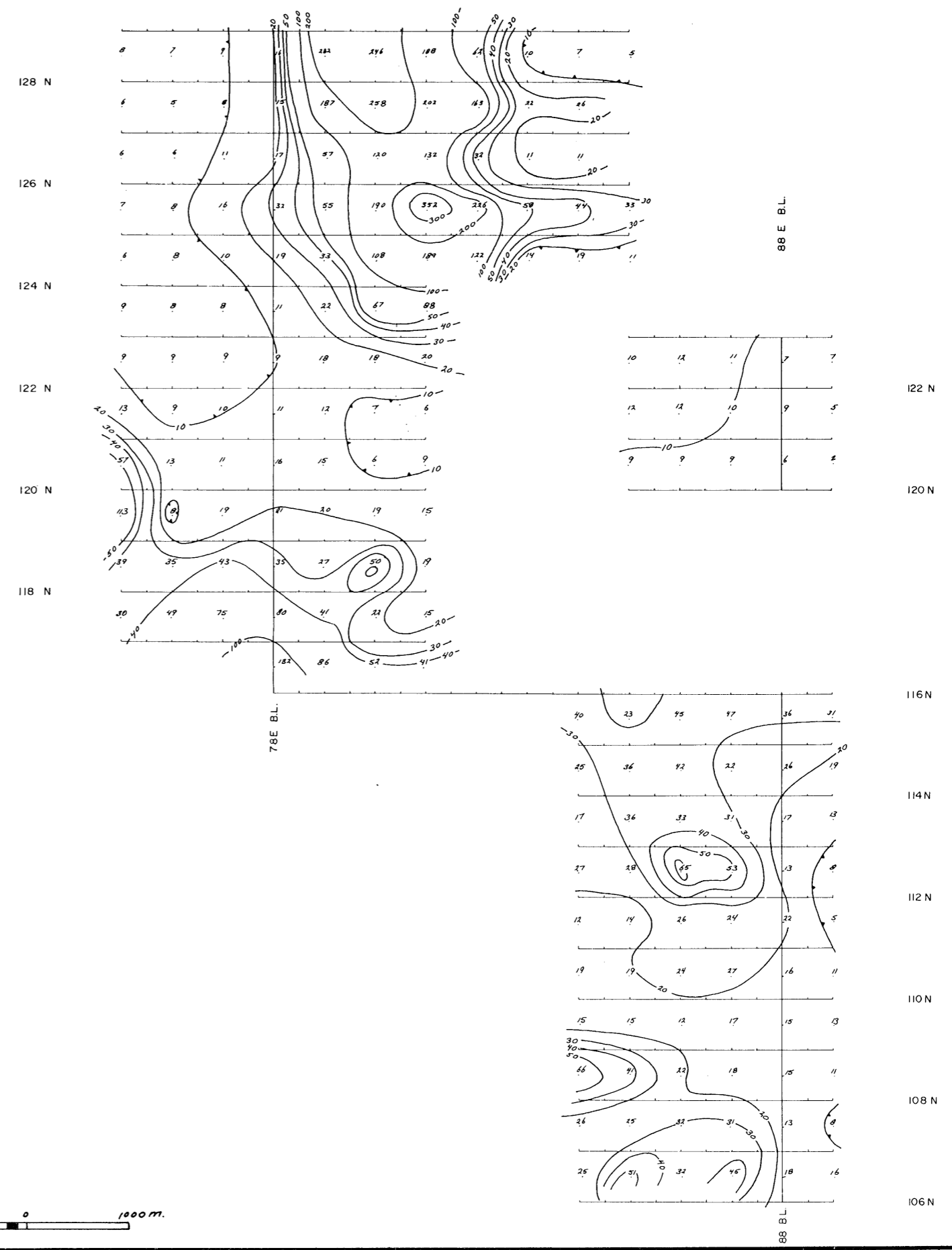
MINERAL RESOURCES BRANCH  
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 No. 6418

TO ACCOMPANY ASSESSMENT REPORT ON I.P. & RESISTIVITY SURVEYS  
 ON KETTLE 6 7 8 9 11 12 14 19 21 22 23 103 104 & 105 M.C. BY  
 L. BRADISH  
 DATED SEPT. 7, 1977

*L. Bradish*

REVISED	HYDRAULIC LAKE GRID	
	I.P. SURVEY	
	PERCENT FREQUENCY EFFECT	
	f: 0.3 & 5.0 Hz	
	n: 1	
	a: 100 m	
	Contour Interval: 3, 5, 7.5, & 10	
PROJ No	SURVEY BY LCB, M.V. GF	DATE OCT 1976, MAY 1977
N F S BZE	DRAWN BY LCB	SCALE 1:10000
DWG No	NORANDA EXPLORATION	
1	OFFICE: VANCOUVER	





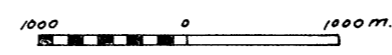
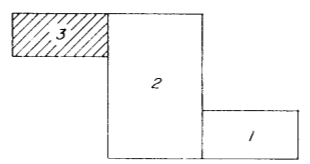
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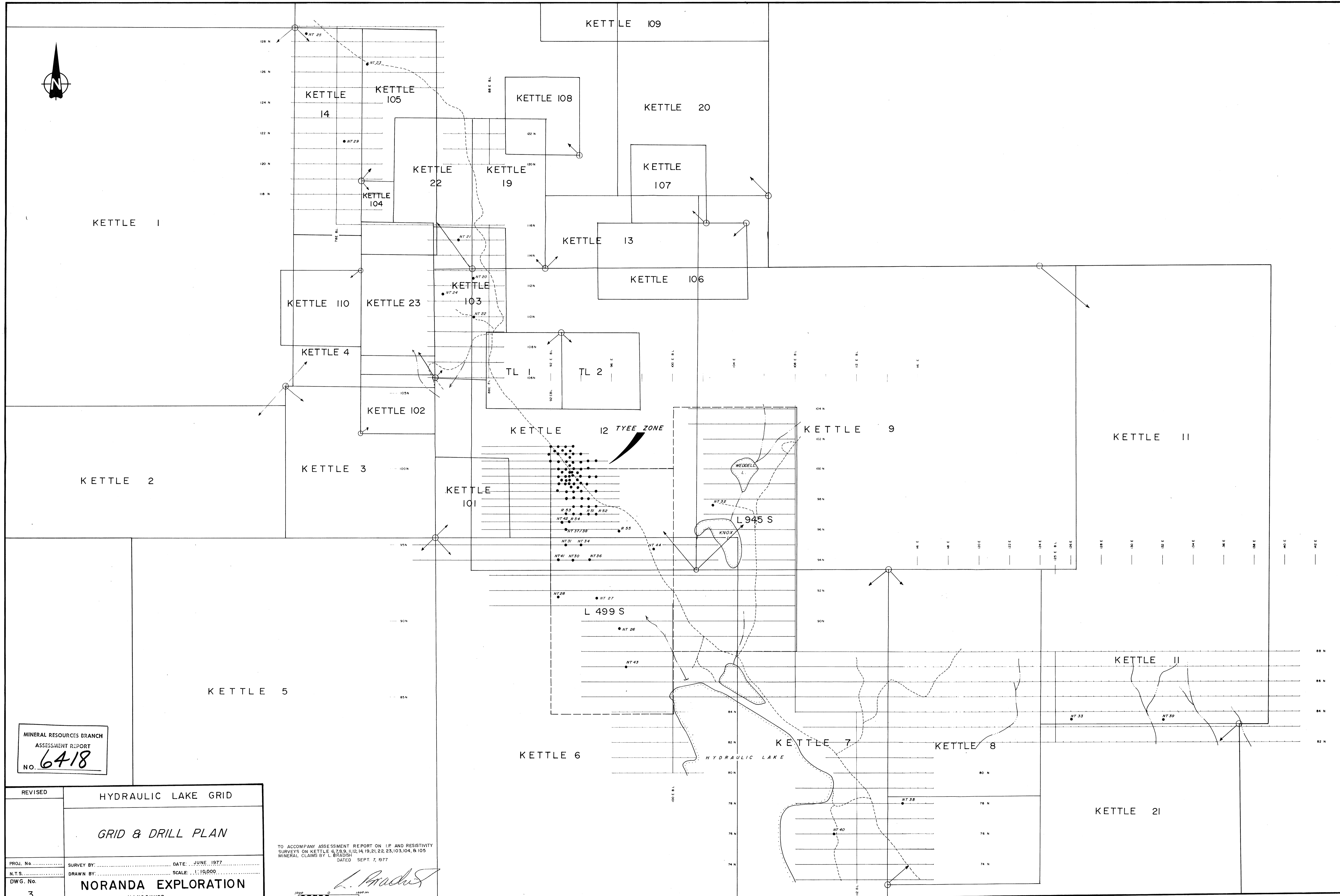
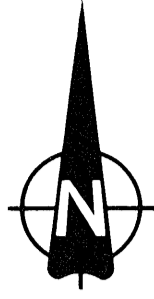
TO ACCOMPANY ASSESSMENT REPORT ON I.P. & RESISTIVITY SURVEYS  
 ON KETTLE 6789112 14 19 21 22 23 103 104 & 105 M.C. BY  
 L. BRADISH

DATED: SEPT. 7, 1977

*L. Bradish*

REVISED	HYDRAULIC LAKE GRID	
	I.P. SURVEY	
	RESISTIVITY $\rho_a / \pi r, \Omega \cdot m$	
	f: 0.3 & 50 Hz	
	n: 1	
	a: 100 m	
	Contour Interval 10, 20, 50 $\Omega \cdot m$	
PROJ. No	SURVEY BY LCB, MV & GF	DATE OCT 1976, MAY 1977
N 15 B2E	DRAWN BY LCB, JVV	SCALE 1:10000
DWG No	NORANDA EXPLORATION	
2	OFFICE VANCOUVER	





MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
No. **6418**

REVISED	HYDRAULIC LAKE GRID	
	GRID & DRILL PLAN	
PROJ. No. ....	SURVEY BY: .....	DATE: JUNE 1977
N.T.S. ....	DRAWN BY: .....	SCALE: 1:10,000
DWG. No. <b>3</b>	<b>NORANDA EXPLORATION</b>	
	OFFICE: VANCOUVER	

TO ACCOMPANY ASSESSMENT REPORT ON I.P. AND RESISTIVITY SURVEYS ON KETTLE 6, 7, 8, 9, 11, 12, 14, 19, 21, 22, 23, 103, 104, & 105 MINERAL CLAIMS BY L. BRADISH DATED SEPT. 7, 1977

*L. Bradish*

