

Geological, Geophysical & Geochemical Report  
on the

TL 4 CLAIM

Omineca Mining Division, B.C.

by: Gordon Maxwell & Lyndon Bradish

NORANDA EXPLORATION COMPANY, LIMITED  
(NO PERSONAL LIABILITY)

N.T.S. 93N/12W & N/5W

February 1986

14,781

85-1205-14781

Geological, Geophysical & Geochemical Report

on the

TL\_4\_CLAIM

Located at Coordinates: 55 deg. 29.5 min. N, 125 deg. 54 min. W

Omineca Mining Division, B.C.

FILMED

by: Gordon Maxwell & Lyndon Bradish

*Owner/Operator:* NORANDA EXPLORATION COMPANY, LIMITED  
(NO PERSONAL LIABILITY)

N.T.S. 93 N/12W & N/5W

February 1986

TABLE OF CONTENTS

	<u>Page</u>	
Summary . . . . .	1	
Introduction . . . . .	2	
Location and Access . . . . .	2	
Claim Statistics . . . . .	2	
Regional Geology . . . . .	2	
Local Geology . . . . .	2	
Previous Work . . . . .	3	
Grid . . . . .	3	
 Soil Geochemistry:		
Introduction . . . . .	3	
Observations . . . . .	3	
 Geophysics:		
Instrumentation . . . . .	4	
Discussion of Results . . . . .	4	
 Conclusions . . . . .		4
 Recommendations . . . . .		5
 References . . . . .		5

APPENDICES

APPENDIX I	--	STATEMENT OF COSTS
APPENDIX II	--	STATEMENT OF QUALIFICATIONS
APPENDIX III	--	GEOCHEMICAL ANALYTICAL METHODS DESCRIPTION

LIST OF FIGURES

Figure 1	Location Map	Scale 1:8,000,000
Figure 2	Claim Map	Scale 1:50,000
Figure 3	Regional Geology	Scale 1:500,000

LIST OF MAPS

Map 1	Geology	Scale 1:5,000
Map 2	SE-88 Survey	Scale 1:5,000
Map 3	Magnetometer Survey	Scale 1:5,000
Map 4	Cu-Zn Soil Geochem	Scale 1:5,000
Map 5	Ag Soil Geochem	Scale 1:5,000

**SUMMARY:**

The TL 4 claim is located along the Takla Landing access road approximately 4 kilometers east of Takla Landing. The property is underlain by favourable volcanic stratigraphy of the Sitlika Assemblage, which closely resembles the Kutcho Formation which hosts the Esso-Sumac Volcanogenic massive sulphide deposit in north central B.C.

During late September and early October of 1985, Noranda Exploration crews established 4.4 kilometers of grid line and collected 70 "B" horizon soil samples. Results of the sampling was generally disappointing. The geophysical surveys consisted of 2.05 kilometers of HLEM and 3.275 kilometers of magnetometer. These surveys outlined a 750 meter long highly conductive horizon in the center of the grid.

**INTRODUCTION:**

The TL 4 claim was staked in October of 1985 by Lorne Warner, an employee of Noranda Exploration, to cover a previously reported airborne EM anomaly. The work described within the report was carried out in late September and October of 1985. The work was performed under the supervision of G. Maxwell and R. Swire.

**LOCATION AND ACCESS:**

The property is situated approximately 4.0 kilometers northeast of the village of Takla Landing in central B.C. (Figure 1). The grid is directly accessible via the Takla Landing access road which runs across the claim (Figure 2).

**CLAIM STATISTICS:**

The claim consists of 20 units staked using the modified grid system and is found on map 93N/5 and 93N/12 in the Omineca Mining Division.

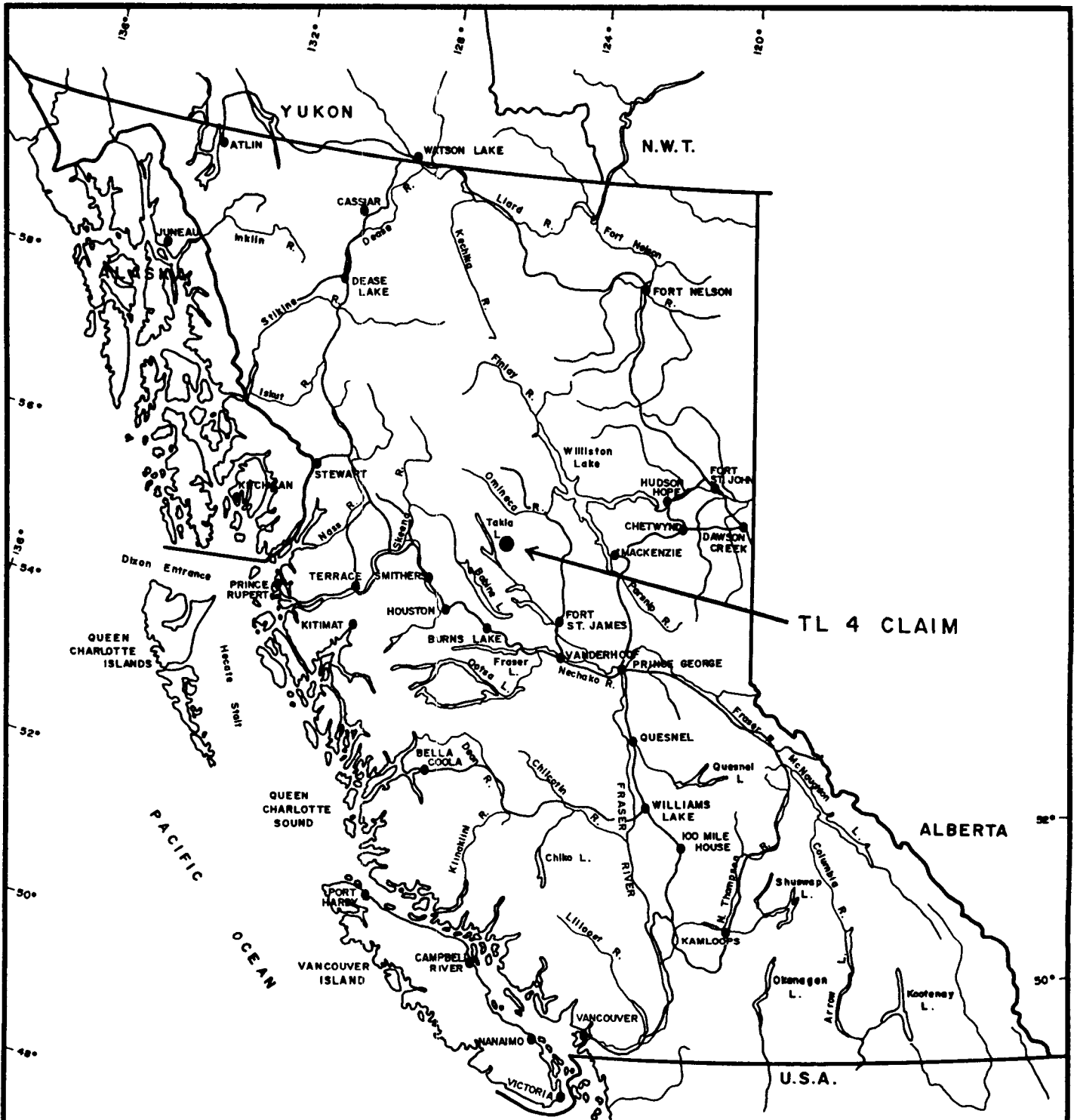
<u>Claim Name</u>	<u># Units</u>	<u>Record #</u>	<u>Record Date</u>
TL 4	20	7357	Oct. 9/85

**REGIONAL GEOLOGY:**

The area is underlain by Upper Triassic to Lower Jurassic volcanic and sedimentary rocks of the Sitlika Assemblage which have been regionally metamorphosed to greenschist facies (Paterson, 1974). This assemblage is composed mainly of well foliated andesitic to rhyolitic pyroclastics and flows with lesser amounts of greywacke, siltstone and phyllite. The Sitlika volcanics are characterized by local development of sericite, quartz-sericite and chlorite schists. The Takla Fault separates the Sitlika rocks from the Tertiary Sustat Group to the west. The Permian Cache Creek rocks to the east are separated from the Sitlika by the Vital Fault and a serpentinite melange. The Cache Creek Group is bounded to the east by the Pinchi Fault and the Jurassic Hogen Batholith (Figure 3).

**LOCAL GEOLOGY:**

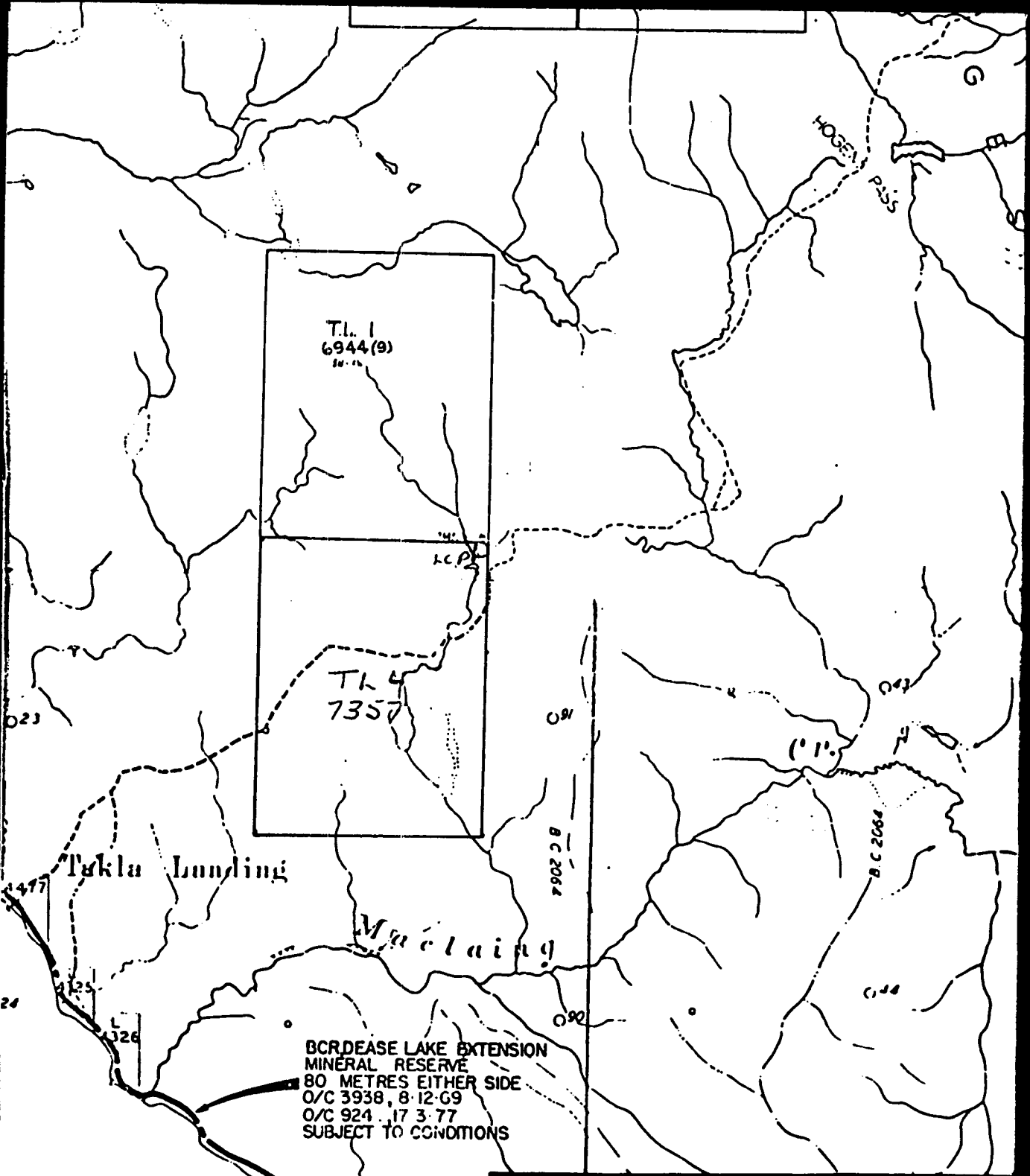
The property is underlain mainly by pale green chloritic schists and weakly schistose andesitic flows and tuffs. These rocks trend north/south and dip steeply to the east. The andesites consist of poorly preserved amygdaloidal flows and fine ash tuffs. The only other rock unit observed on the claim is a weakly graphitic, grey to black phyllite horizon. Much of the grid is underlain by low swampy areas where outcrop exposure is very poor. No explanation was observed for the conductive horizon outlined on the grid. The geology is plotted on a 1:5000 scale map in the back pocket.



0 100 200 KILOMETRES  
SCALE: 1:8,000,000

REVISED	TL 4 CLAIM	
	Location Map	
PROJ.No. 248	SURVEY BY: G.M.	DATE: Feb. 86
N.T.S. 93N/14	DRAWN BY: S.K.B.	SCALE: 1:8,000,000
DWG.No. 1	<b>NORANDA EXPLORATION</b>	
	OFFICE: PRINCE GEORGE, B.C.	

VANCAL 11927



REVISED	TL 4 CLAIM
	Location Map
	<i>Carson McPherson</i>
PROJ. No. 248	SURVEY BY: G.M. DATE: Feb. 86
N.T.S. 93N/5	DRAWN BY: G.M. SCALE: 1:50,000
DWG. No. 2	<b>NORANDA EXPLORATION</b> OFFICE: Prince George, B.C.





## PREVIOUS WORK:

The property had previously been covered by helicopter-borne electromagnetic and magnetic surveys contracted by McIntyre Mines in 1977. An airborne EM anomaly with an associated magnetic response was detected in the area of the TL 4 claim. One line of vertical loop EM was performed along the road using a McPhar Model SE 300, which located a conductor axis. No further work has been reported.

## GRID:

The grid was established to cover the previously detected ABEM response and consists of 3.5 kilometers of line controlled by 0.9 kilometers of baseline. The grid was flagged with stations marked at 25 meter intervals along winglines running at an azimuth of 090 degrees. The grid intersects the access road at several locations.

## SOIL GEOCHEMISTRY:

### Introduction

Soil samples were taken from the "B" horizon using a grub hoe from depths ranging from 25 to 38 cm. The samples were placed in Kraft wet strength paper bags, dried, then shipped to Noranda Labs in Vancouver, B.C. for analysis (for analytical procedure see Appendix III).

A total of 70 samples were taken and analyzed for Cu, Zn, and Ag. No samples (N.S.) were taken on several locations due to rock exposure or swampy conditions. The results are plotted on a 1:5,000 scale map (in back pockets).

### Observations

**COPPER** The copper values range from 4 ppm to 68 ppm. No anomalous trends were detected on the gridded area, although the higher Cu values seem to reflect better developed soil profiles rather than anomalous geochem.

**ZINC** The Zinc values range from 16 ppm to 130 ppm. None of these values are considered anomalous, but several above threshold values appear to form a weak trend associated with the HLEM conductor axis on lines 7850N to 8150N.

**SILVER** Silver values range from the detection limit of 0.2 ppm to 1.0 ppm. A weakly anomalous trend occurs on lines 8000N and 8150N about 200 meters east of the main conductor axis. These values should be field checked to determine their source

## GEOPHYSICS:

### INSTRUMENTATION

SE-88 EM System The SE-88 unit differs from the normal HLEM systems such as the MaxMin II above in that it measures without regard to phase, the ratio of signal amplitude between two frequencies which are transmitted and received simultaneously. A low frequency of 112 Hz is used as a reference frequency. The signal difference is integrated or averaged over a period of time in order to improve the signal to noise ratio.

The survey parameters employed on the follow-up programme are as follows:

Coil separation	: 100 meters
Frequencies	: 3037, 1012, 337 Hz
Reference frequency	: 112 Hz
Integration period	: 16 or 8 seconds
Reading interval	: 25 meters
Measurement	: ratio of amplitude between reference and signal frequencies (%).

MP-3 Magnetometer System Magnetometers manufactured by Scintrex Ltd. of Concord, Ontario were employed for these surveys. The MP-3 Total Field Magnetometer System consists of one or more field units and a base station. Diurnal and day to day variations are automatically corrected at the end of the survey by the built in microprocessor giving the data a usable accuracy of 1 gamma.

### DISCUSSION OF RESULTS

A wide zone of high conductivity extending beyond the limits of the grid was recorded by the SE-88 E.M. survey. The width is typically 50 metres and the conductivity reaches a maximum of 40 Siemens at the north end of the grid. A high magnetic susceptibility is recorded coincident with the conductor on Lines 7850N to 8150N and beyond these limits the magnetic anomaly migrates away from the conductor. The dip is assumed to be near vertical and the depth to the current axis is approximately 10 metres.

### CONCLUSIONS:

Geologic mapping has outlined favourable volcanic stratigraphy of the Sitlika Assemblage in the area of the TL 4 claim. This stratigraphy appears to be similar to that of the "Kutcho Formation" which hosts the Esso-Sumac deposit in north central B.C. The HLEM survey outlined a 750 meter long highly conductive horizon which extends beyond line 8300N. A high magnetic susceptibility is coincident with the conductor axis between lines 7850N and 8150N. The geologic environment and the results of the geophysical survey have outlined an attractive

target which should be tested by drilling or trenching. The results of the soil geochem survey are somewhat disappointing, but at over half of the stations to be surveyed a B horizon soil sample was not available due to very swampy conditions.

#### RECOMMENDATIONS:

1. Continuation of the HLEM and Magnetic surveys to determine the strike extent of the conductive horizon.
2. Further detailed geology of hand trenching in the area of the conductor axis to determine the source of the conductivity.
3. Possibly more extensive mechanical trenching or a shallow drill hole to test the conductor axis.

#### REFERENCES:

- Crosly, R.O. Airborne Geophysical Surveys, Ruth Mineral Claims, TAKLA LAKE Area, B.C., Assessment Report for McIntyre Mines Limited, 1977.
- Francoer, D. Geological, Geophysical and Geochemical Report on TAKLA Project for McIntyre Mines Limited, 1977.
- Monger, J.W.H. Lower Mesozoic Rocks in McConnell Creek Map Area, (94E), British Columbia. Geological Survey of Canada, Paper 76-1A.
- Paterson, I.A. Geology of Cache Creek Group and Mesozoic Rocks at the Northern end of the Stuart Lake Belt, Central B.C., Geol. Survey of Canada, Paper 74-1, Part B, 1974.

APPENDIX I  
STATEMENT OF COSTS

PROJECT: TL\_4\_CLAIM

REPORT TYPE: Geological, Geochemical and Geophysical

a) **WAGES:**

Geology - 1 manday @ \$150.00/day	\$ 150.00
Geophysics - 4 mandays @ \$125.00/day	\$ 500.00
Soil Geochem - 2 mandays @ \$110.00/day	\$ 220.00
Linecutting - 2 mandays @ \$110.00/day	\$ 220.00

b) **FOOD & ACCOMMODATION:**

9 mandays @ \$ 50.00/day	\$ 450.00
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c) **ANALYSIS:**

70 samples @ \$4.00/sample	\$ 280.00
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d) **COST OF PREPARATION OF REPORT:**

Author	\$ 130.00
Drafting	\$ 115.00
Typing	\$ 110.00

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**TOTAL: \$ 2175.00**

**Cost Breakdown:**

Geology	\$ 290.00
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Geophysics:

HLEM, 3.275 km's	\$ 615.00
Mag, 2.050 km's	\$ 265.00
Linecutting	\$ 320.00

Geochemistry	\$ 685.00
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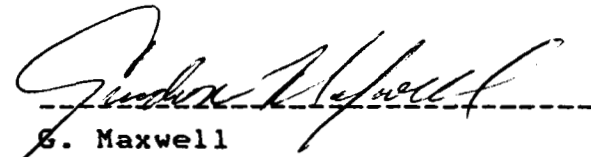
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**\$ 2175.00**

APPENDIX II

STATEMENT OF QUALIFICATIONS

I, Gordon Maxwell of Prince George, Province of British Columbia, do hereby certify that:

1. I am a Geologist residing at 6162 Caledonia Crescent, Prince George, British Columbia.
2. I am a graduate of the University of Manitoba with an Hons. B. Sc. (geology).
3. I am a member in good standing of the Canadian Institute of Mining and the Prospector's and Developer's Association.
4. I presently hold the position of Project Geologist with Noranda Exploration Company, Limited and have been in their employ since 1980.

  
-----  
G. Maxwell



### APPENDIX III

#### ANALYTICAL METHOD DESCRIPTIONS FOR GEOCHEMICAL ASSESSMENT REPORTS

The methods listed are presently applied to analyse geological materials by the Noranda Geochemical Laboratory at Vancouver.

##### Preparation of Samples

Sediments and soils are dried at approximately 80°C and sieved with a 80 mesh nylon screen. The -80 mesh (0.18 mm) fraction is used for geochemical analysis.

Rock specimens are pulverized to -120 mesh (0.13 mm). Heavy mineral fractions (panned samples \* from constant volume), are analysed in its entirety, when it is to be determined for gold without further sample preparation.

##### Analysis of Samples

Decomposition of a 0.200 g sample is done with concentrated perchloric and nitric acid (3:1), digested for 5 hours at reflux temperature. Pulps of rock or core are weighed out at 0.4 g and chemical quantities are doubled relative to the above noted method for digestion.

The concentrations of Ag, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, V and Zn can be determined directly from the digest (dissolution) with a conventional atomic absorption spectrometric procedure. A Varian-Techtron, Model AA-5 or Model AA-475 is used to measure elemental concentrations.

##### Elements Requiring Specific Decomposition Method:

**Antimony - Sb:** 0.2 g sample is attacked with 3.3 ml of 6% tartaric acid, 1.5 ml conc. hydrochloric acid and 0.5 ml of conc. nitric acid, then heated in a water bath for 3 hours at 95°C. Sb is determined directly from the dissolution with an AA-475 equipped with electrodeless discharge lamp (EDL).

**Arsenic - As:** 0.2 - 0.3 g sample is digested with 1.5 ml of perchloric 70% and 0.5 ml of conc. nitric acid. A Varian AA-475 equipped with an As-EDL is used to measure arsenic content in the digest.

**Barium - Ba:** 0.1 g sample digested overnight with conc. perchloric, nitric and hydrofluoric acid; Potassium chloride added to prevent ionization. Atomic absorption using a nitrous oxide-acetylene flame determines Ba from the aqueous solution.

**Bismuth - Bi:** 0.2 g - 0.3 g is digested with 2.0 ml of perchloric 70% and 1.0 ml of conc. nitric acid. Bismuth is determined directly from the digest with an AA-475 complete with EDL.

**Gold - Au:** 10.0 g sample is digested with aqua regia (1 part nitric and 3 parts hydrochloric acid). Gold is extracted with MIBK from the aqueous solution. AA is used to determine Au.

**Magnesium - Mg:** 0.05 - 0.10 g sample is digested with 4 ml perchloric/nitric acid (3:1). An aliquot is taken to reduce the concentration to within the

range of atomic absorption. The AA-475 with the use of a nitrous oxide flame determines Mg from the aqueous solution.

**Tungsten - W:** 1.0 g sample sintered with a carbonate flux and thereafter leached with water. The leachate is treated with potassium thiocyanate. The yellow tungsten thiocyanate is extracted into tri-n-butyl phosphate. This permits colourimetric comparison with standards to measure tungsten concentration.

**Uranium - U:** An aliquot from a perchloric-nitric decomposition, usually from the multi-element digestion, is buffered. The aqueous solution is exposed to laser light, and the luminescence of the uranyl ion is quantitatively measured on the UA-3 (Scintrex).

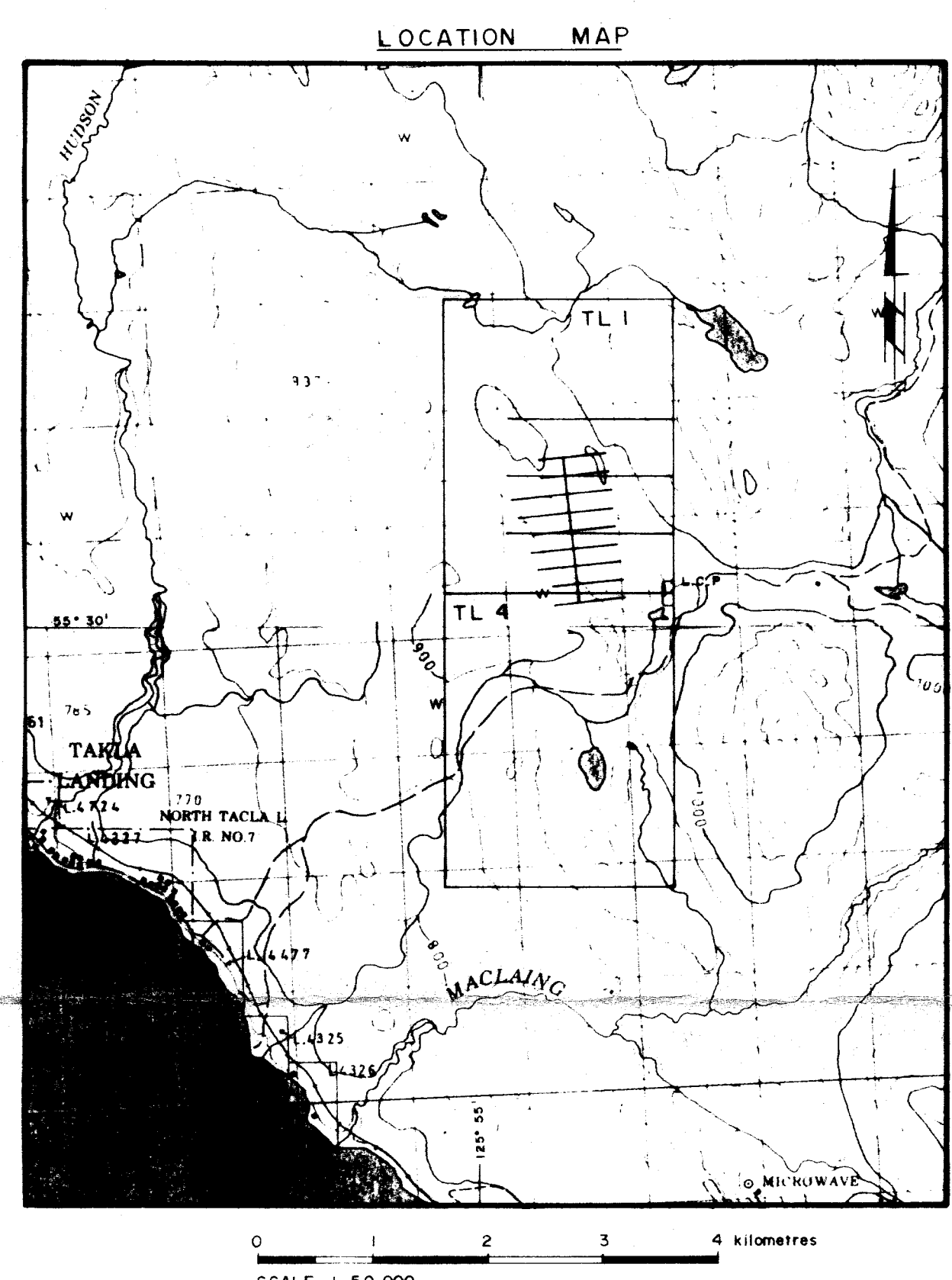
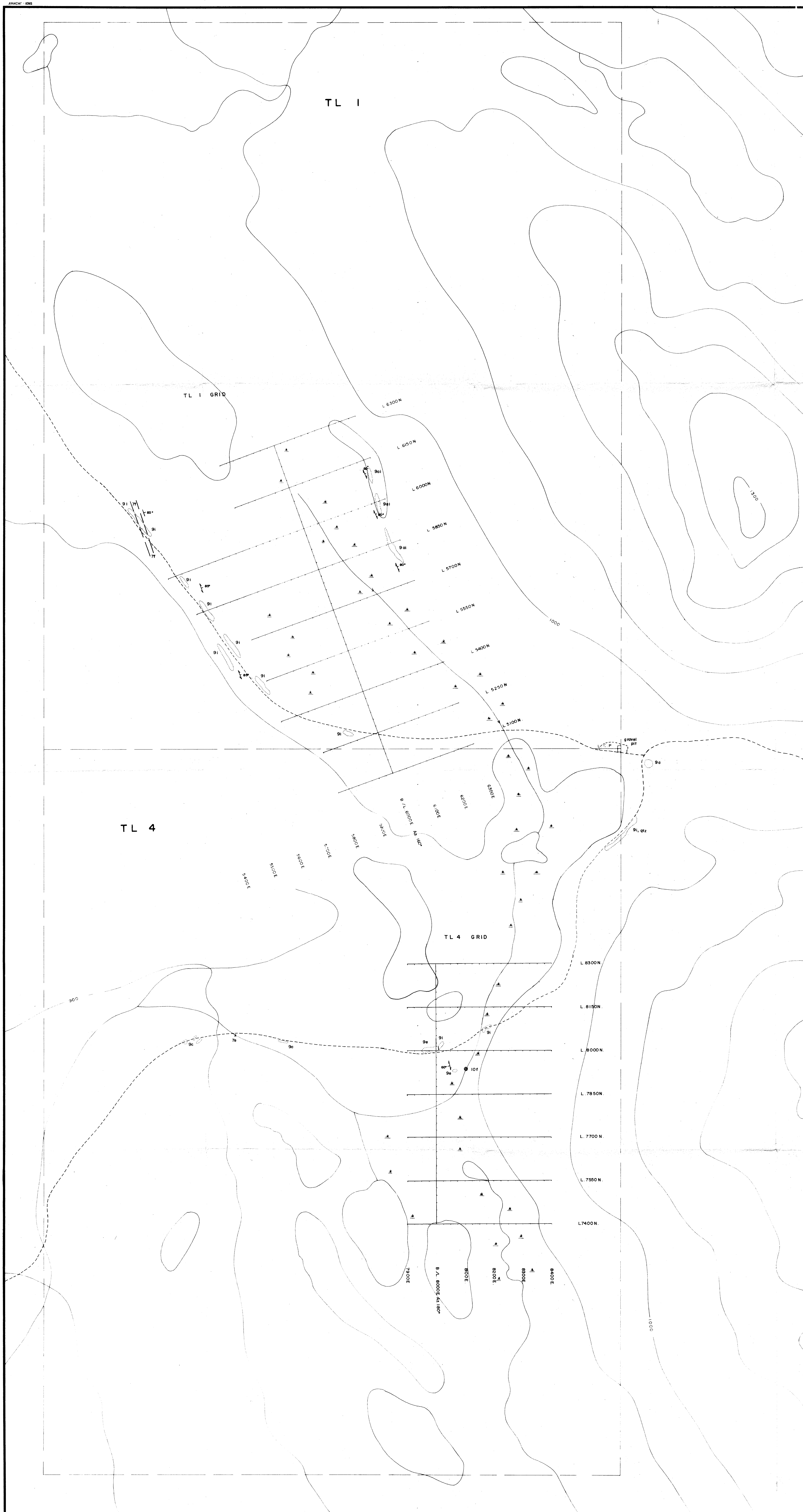
\* N.B. If additional elemental determinations are required on panned samples, state this at the time of sample submission. Requests after gold determinations would be futile.

#### LOWEST VALUES REPORTED IN PPM

Ag - 0.2	Mn - 20	Zn - 1	Au - 0.01
Cd - 0.2	Mo - 1	Sb - 1	W - 2
Co - 1	Ni - 1	As - 1	U - 0.1
Cu - 1	Pb - 1	Ba - 10	
Fe - 100	V - 10	Bi - 1	

EJvL/ie  
March 14, 1984





**LEGEND**

- UPPER CRETACEOUS AND LOWER TERTIARY**
- SUSTUT GROUP**
- 13 Sediments**  
 (a) conglomerate  
 (b) sandstone  
 (c) shale
- 12 Volcanics**  
 (a) rhyolite  
 (b) andesitic  
 (c) basalt
- EARLY JURASSIC**
- 11 Paleic Intrusives**  
 (a) granite  
 (b) granodiorite  
 (c) diorite
- UPPER TRIASSIC - LOWER JURASSIC**
- SITILKA GROUP**
- 10 Dacite or Rhyolite**  
 (a) massive  
 (b) porphyritic  
 (c) amygdaloidal or vesicular  
 (d) pillow  
 (e) tuff  
 (f) lapilli tuff  
 (g) tuff breccia  
 (h) agglomerate  
 (i) sericite schist
- 9 Andesite**  
 (a) massive  
 (b) porphyritic  
 (c) amygdaloidal or vesicular  
 (d) pillow  
 (e) tuff  
 (f) lapilli tuff  
 (g) tuff breccia  
 (h) agglomerate  
 (i) chlorite schist
- 8 Basalt**  
 (a) massive  
 (b) porphyritic  
 (c) amygdaloidal or vesicular  
 (d) pillowed
- 7 Clastic Sediments**  
 (a) conglomerate  
 (b) sandstone  
 (c) argillite  
 (d) silty phyllite  
 (e) phyllite  
 (f) graphitic phyllite
- 6 Chemical Sediments**  
 (a) iron formation  
 (b) ironstone  
 (c) chert  
 (d) chert breccia
- PERMIAN TO TRIASSIC**
- 5 Ultramafic Intrusives**  
 (a) serpentine  
 (b) gabbro
- PERMIAN**
- CACHE CREEK**
- 4 Basalt**  
 (a) massive flow  
 (b) pillowed flow  
 (c) chloritic schist
- 3 Chert**  
 (a) massive chert  
 (b) laminated chert  
 (c) chert breccia
- 2 Clastic Sediments**  
 (a) grey to black phyllite  
 (b) graphitic phyllite  
 (c) maroon siltstone  
 (d) greywacke/siltstone  
 (e) sandstone/arkose  
 (f) conglomerate
- 1 Limestone (marble)**
- Chalcocopyrite Cp**  
**Pyrrhotite Po**  
**Pyrite Py**  
**Malachite Mal**  
**Magnetite Mag**  
**Sphalerite Sph**  
**Graphite Gr**
- Gossan G**  
**Sphalerite sph**  
**Calcite cal**

- SYMBOLS:**
- LAKE
  - SWAMP
  - RIVER, STREAM
  - RAILWAY
  - ROAD (SECONDARY)
  - CLAIM BOUNDARY
  - HELICOPTER LANDING
  - 1985 NORANDA GRIDS
- GEOLOGICAL SYMBOLS:**
- AREA OF ROCK OUTCROP
  - ROCK OUTCROP
  - FLOAT
  - GEOLOGICAL BOUNDARY:
    - Defined
    - Assumed
  - SCHISTOSITY CLEAVAGE, FOLIATION
    - (Vertical, inclined, dip unknown)
  - FAULT
    - (Defined, approximate, assumed)
    - bedding

**GEOLOGICAL BRANCH  
 ASSESSMENT REPORT**

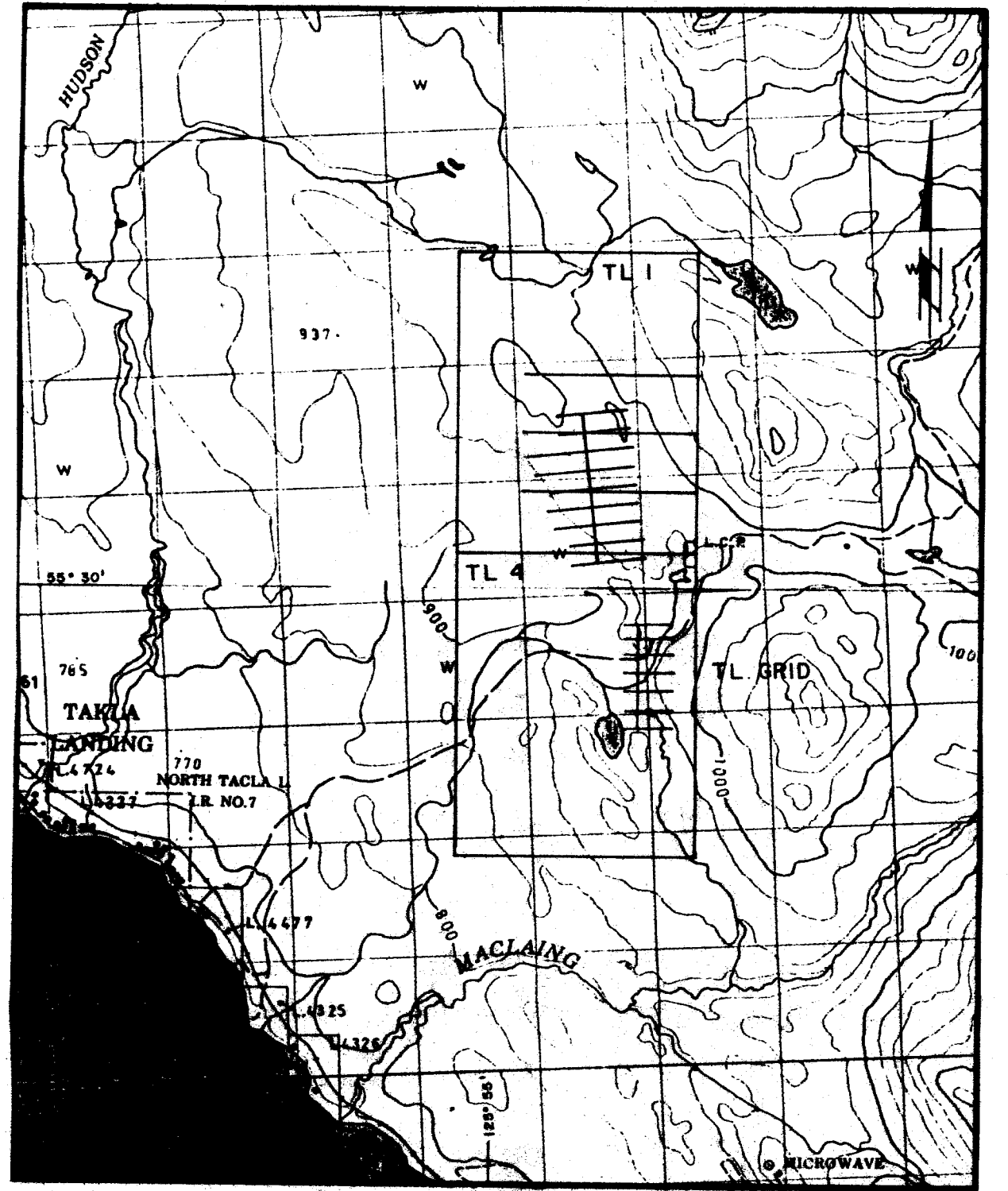
**14,781**

REVISED	TAKLA NAK	
	TL 1 & TL 4 CLAIM	
	GEOLOGY MAP	
PROJ. No. 548	SURVEY BY: G.M., L.W.	DATE: SEPT. 1985
NTS: 35N 75.12	DRAWN BY: S.K.B.	SCALE: 1:5000
DWG. No.	<b>NORANDA EXPLORATION</b>	
MAP I	OFFICE: PRINCE GEORGE, B.C.	

7500.0  
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7900.0  
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8700.0  
8900.0  
9100.0

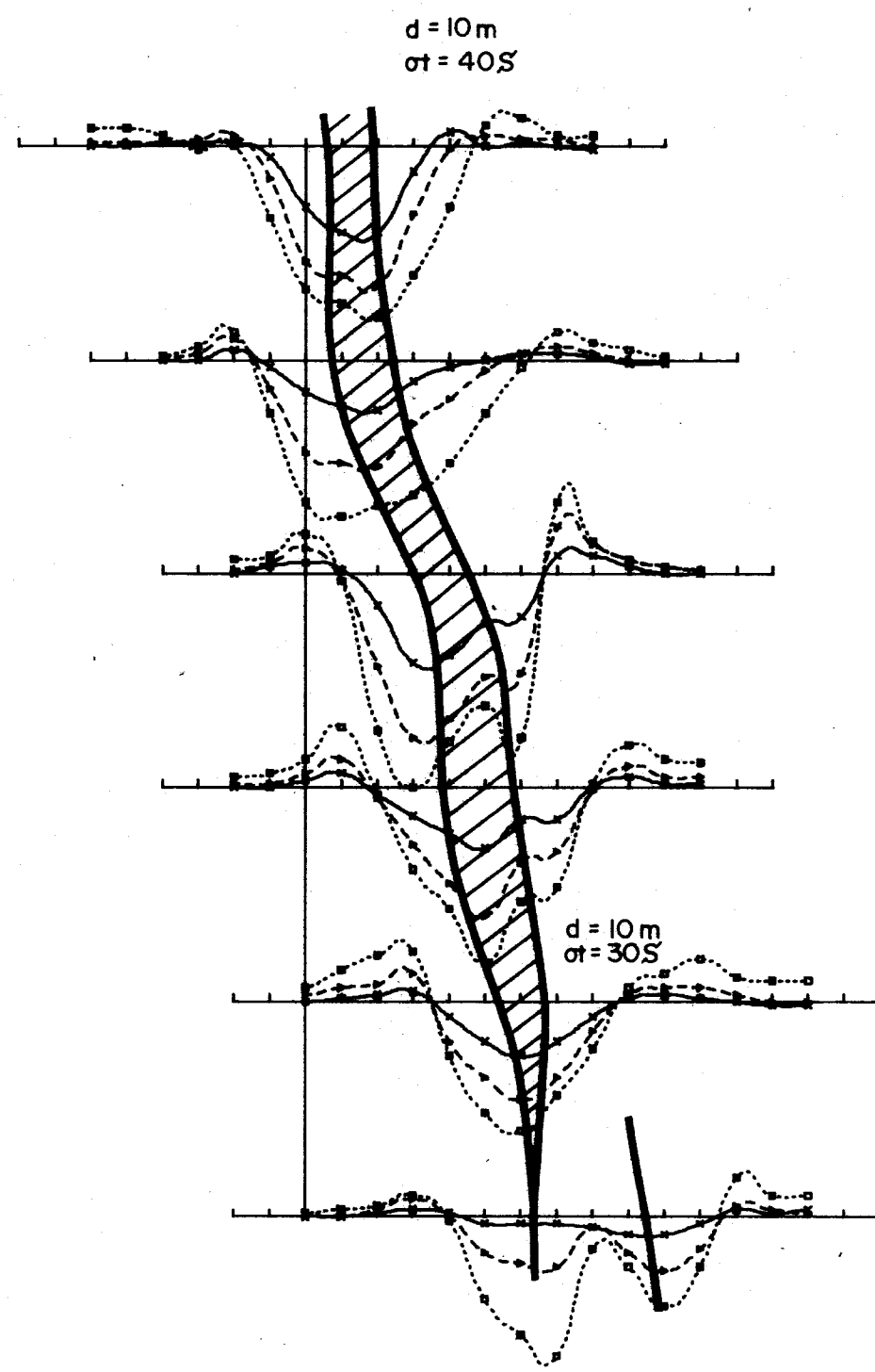
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7600.0N  
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6400.0N  
6200.0N

LOCATION MAP



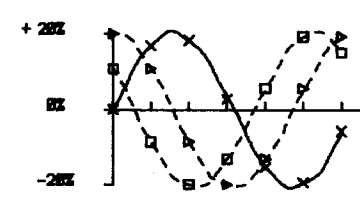
SCALE 1:50,000

BASELINE



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,781



Instrument : SE88  
Coil Spacing : 100m  
Ref. Frequency : 112 Hz  
Vertical Scale : 1 cm = 20%  
Conductor Axis :  
337 Hz ---x---  
1812 Hz ---o---  
3837 Hz ---g---

100m 50m 0m 100m 200m

TL4

SE-88 SURVEY

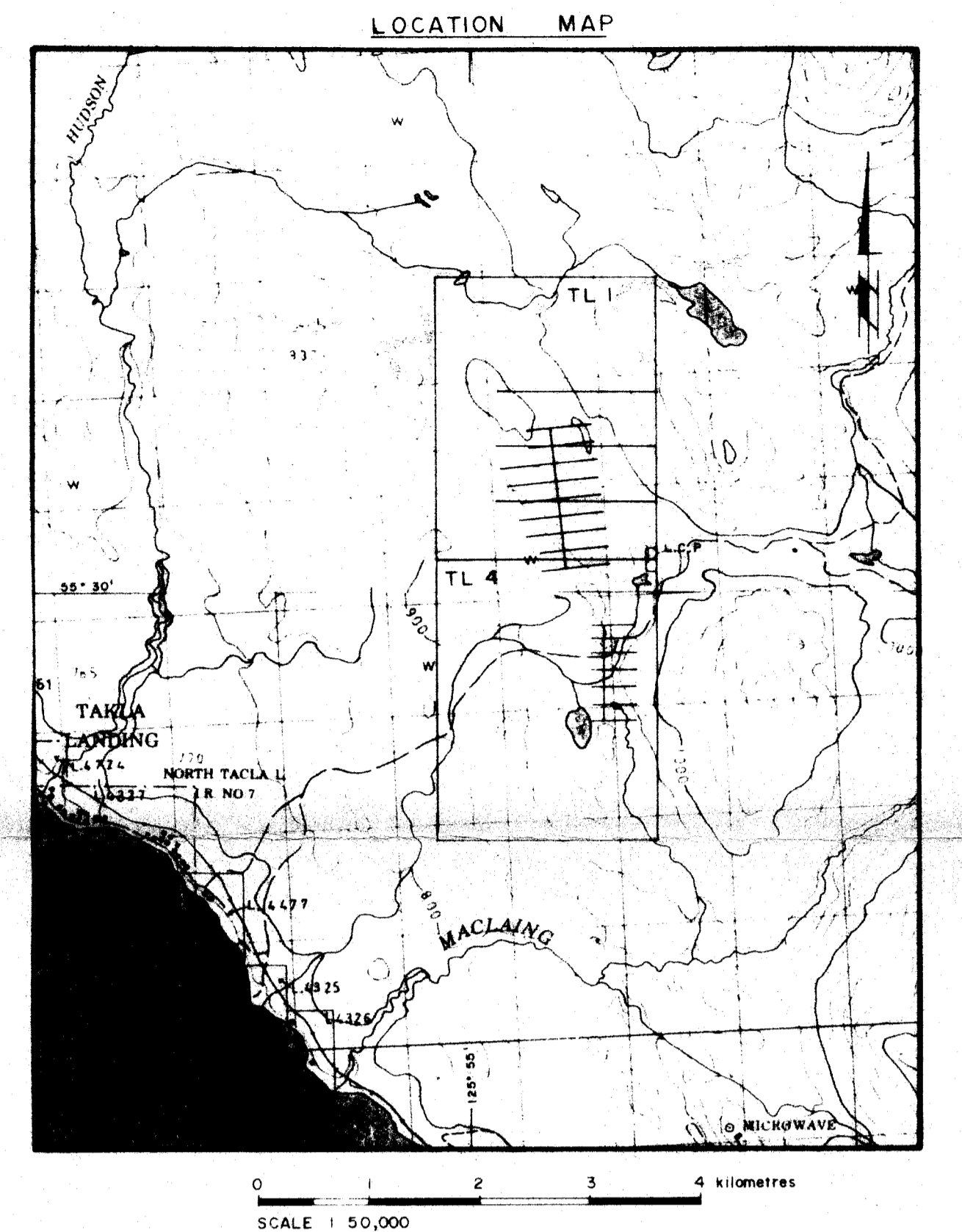
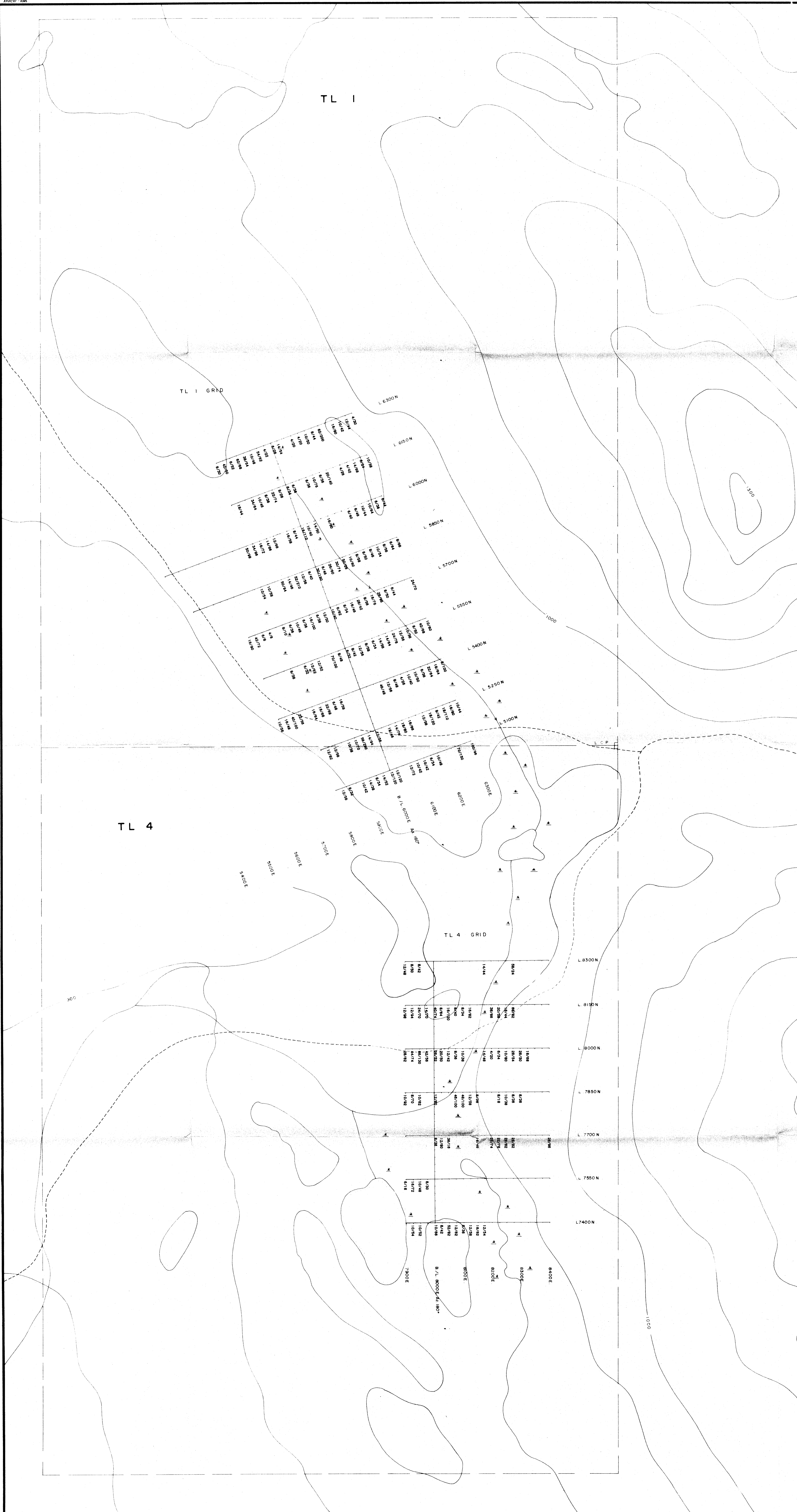
PROJECT: TAKLA-NAK PROJECT #: 248  
BASELINE AZIMUTH: 180 Deg.

SCALE = 1:5000 DATE: 9/10/85  
SURVEY BY: RS/KL/BG NTS: 93/N/5

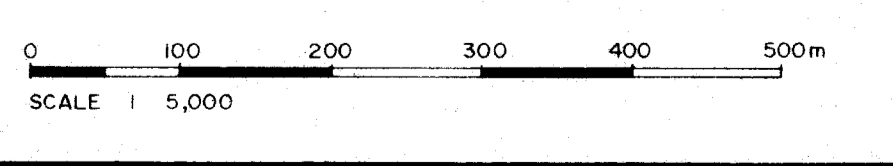
MAP 2 FILE: SM248TL4.Zet  
NORANDA EXPLORATION







**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**  
**14,781**



REVISED	TAKLA NAK	
	TL1 & TL4 CLAIM	
	CU, ZN IN PPM	
PROJ. No 548	SURVEY BY: S. K. B.	DATE: 11/10/88
N.T.S. 31M / 5.1R	DRAWN BY: S. K. B.	SCALE: 1:5,000
DWG No	<b>NORANDA EXPLORATION</b>	
MAP 4	OFFICE: PRINCE GEORGE, B.C.	

7500E 7700E 7900E 8100E 8300E 8500E 8700E 8900E 9100E

9200N

9000N

8800N

8600N

8400N

8200N

8000N

7800N

7600N

7400N

7200N

7000N

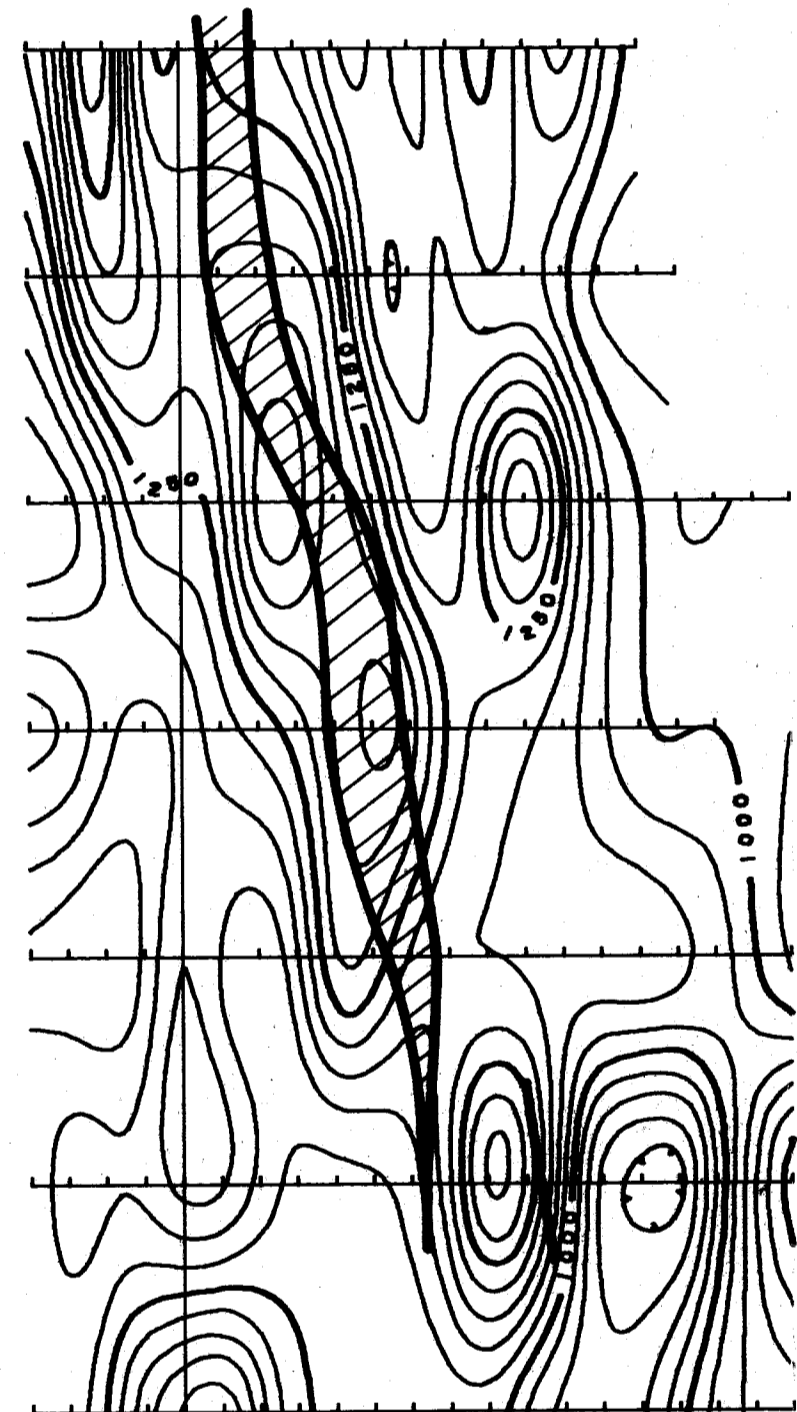
6800N

6600N

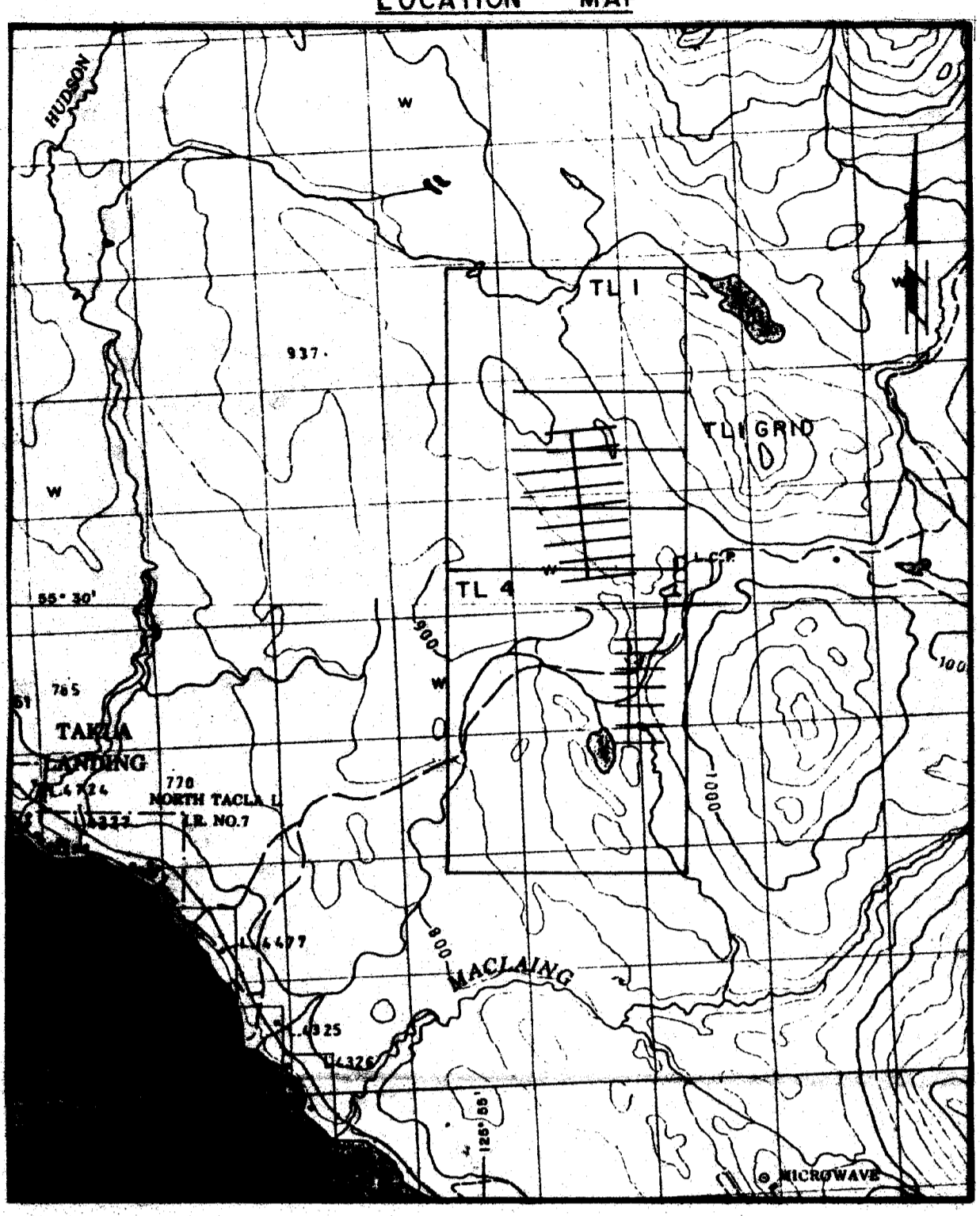
6400N

6200N

BASELINE



LOCATION MAP



SCALE 1:50,000



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,781

Instrument	MP-3
Detun	57000.0 nT
Contour Interval	50 nT (2 passes through a 9 pt. Hanning Filter.)
Conductor Axis	—
100m 50m 0m 100m 200m	

TL 4

**MAGNETOMETER SURVEY**  
( FILTERED CONTOUR PRESENTATION )

PROJECT: TAKLA-NAK PROJECT #: 248  
BASELINE AZIMUTH: 180 Deg.

SCALE = 1:5000 DATE: 9/17/85  
SURVEY BY: KL/SH NTS: 93N  
FILE: M248TL4.ZAT

MAP 3 NORANDA EXPLORATION