

83-#725 - 11771

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**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**11,771**

ASSESSMENT REPORT  
VLF ELECTROMAGNETIC SURVEY  
ON THE  
SOUTH FLORENCE CLAIM  
QUEEN CHARLOTTE ISLANDS, B.C.

SKEENA MINING DIVISION  
N. LAT. 53 DEGREES 34.5'      W. LONG. 132 DEGREES 15'

NTS 103F/9E,9W

FOR

R. CALABRIGO & ASSOCIATES  
VANCOUVER, BRITISH COLUMBIA

by

M.A. POND, B.Sc.

STRATO GEOLOGICAL ENGINEERING LTD.

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VANCOUVER, B. C.      V6C 1M9

December 1, 1983



SUMMARY

A recently completed reconnaissance VLF-electromagnetic (VLF-EM) survey and soil sampling program over the west portion of the South Florence claim has indicated a number of weak conductive zones. Soil samples taken were mostly off these zones and it is recommended that the grid be more closely sampled over VLF-EM anomalies.

Further work in the South Florence claim area is also warranted to the south and east over a series of magnetic lows flanking Florence Creek. This area should be investigated with a reconnaissance VLF-EM and soil surveys because coincident anomalous geochem values and weak conductive zones occur with low magnetics flanking Florence Creek, in the Hook and Kenny claims areas to the south.

Respectfully submitted,  
Strato Geological Engineering Ltd.

*M.A. Pond*

M.A. Pond, B.Sc.  
Geologist

December 1, 1983

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## INTRODUCTION

Pursuant to a request by Mr. R. Calabrigo, a reconnaissance VLF-Electromagnetic (VLF-EM) survey was carried out over the western portion of the South Florence claim during October, 1983. Also collected during this time were 24 soil samples taken along possible conductive zones.

The intent of the geophysical work was to delineate any geological structure, contacts and/or faults within the survey area. Specific interest was in the area of variable magnetics south and east of the LCP. The results of 9.7 kilometers of VLF-EM survey data over this area are presented in this report.

## LOCATION, ACCESS AND TOPOGRAPHY

The claim group is located in central Graham Island some 20 kilometers south-southwest of Port Clements and 13 kilometers south-southeast of Juskatla. Access is by MacMillan Bloedel logging roads, Branch No. 4 cutting through the westerly third of the claim.

The claims are primarily in a logged area and the ground is covered by ten year regrowth. The eastern areas are generally covered with virgin timber having heavy undergrowth of salal.

Florence Creek and its tributaries flow northerly, bisecting the claim roughly into thirds. Topography is quite rough in the southern portion of the claim, and elevations vary from 60 meters in the north central areas to over 200 meters in the southwest area of the claim (Figures 1 and 2).

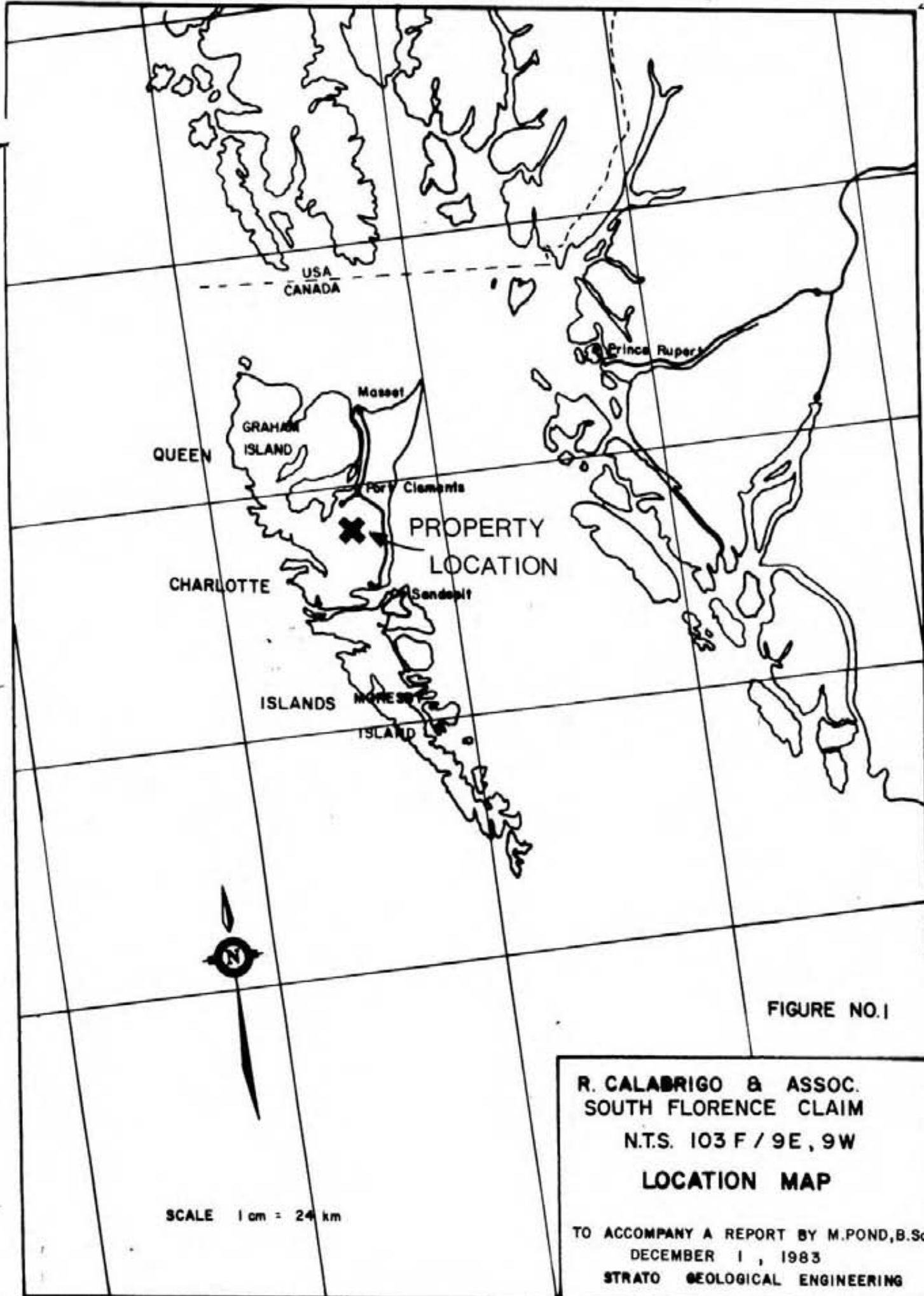


FIGURE NO.1

**R. CALABRIGO & ASSOC.**  
**SOUTH FLORENCE CLAIM**  
**N.T.S. 103 F / 9E, 9W**  
**LOCATION MAP**

TO ACCOMPANY A REPORT BY M.POND, B.Sc.  
DECEMBER 1, 1983  
STRATO GEOLOGICAL ENGINEERING

SCALE 1 cm = 24 km

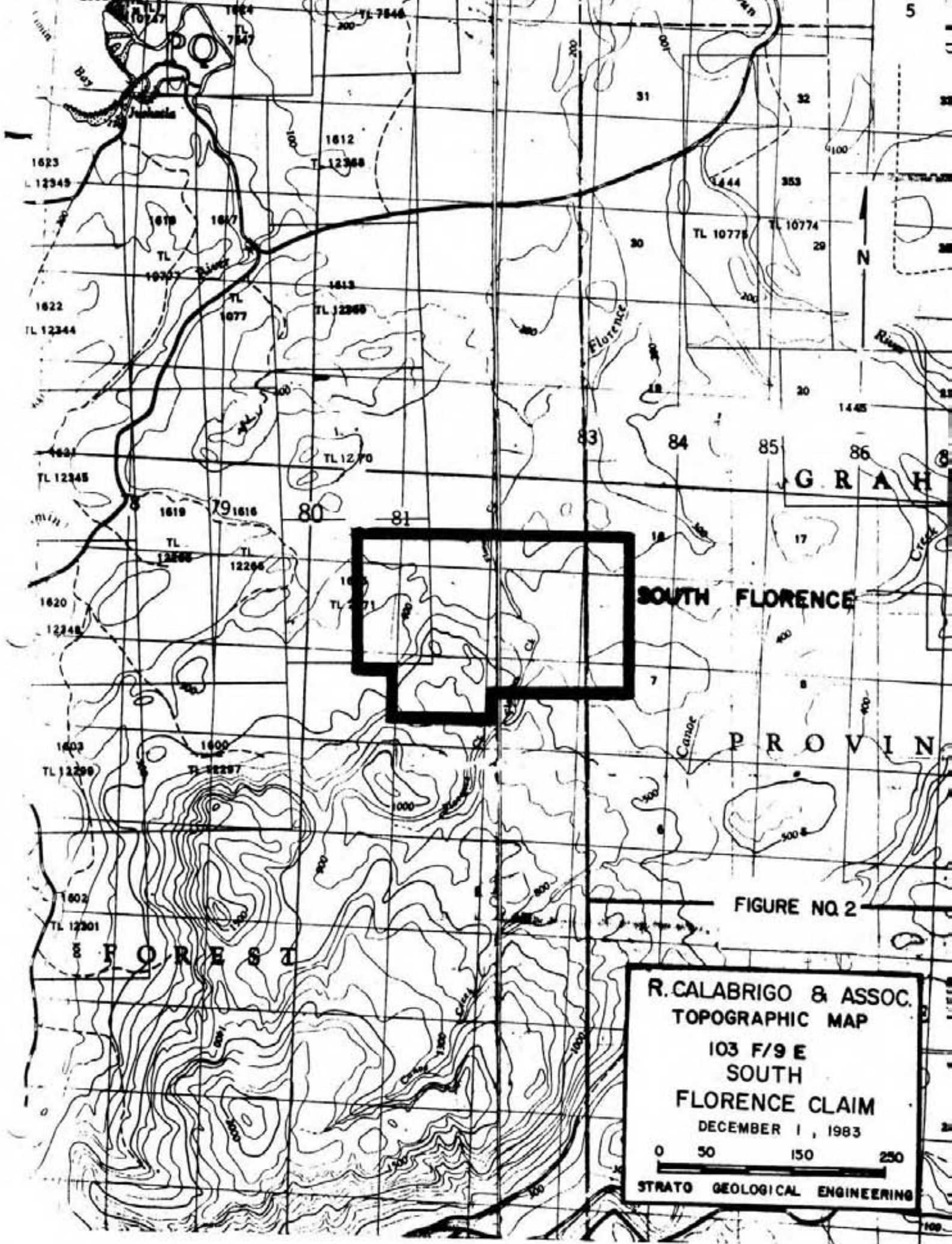


FIGURE NO. 2

R. CALABRIGO & ASSOC.  
TOPOGRAPHIC MAP  
103 F/9 E  
SOUTH  
FLORENCE CLAIM  
DECEMBER 1, 1983  
0 50 150 250  
STRATO GEOLOGICAL ENGINEERING

## CLAIM

The property comprises 20 contiguous mineral claim units in the Skeena Mining Division and is recorded as follows:

<u>Name</u>	<u>Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
South Florence	20	1729	October 16, 1983

Assessment work has been filed, this report being part of the work, to maintain the claims in good standing until October 1984. The claims are shown on B.C. Department of Mines and Petroleum Resources Mineral Titles Reference Map 103F/9E and 9W. The L.C.P. is located in accordance with the specifications of the Mining Act.

## GENERAL GEOLOGY

The southwestern half of the claim, as mapped by A. Sutherland Brown, Bulletin No. 54, is underlain by Paleocene Masset Formation consisting of subaerial basalt flows and breccias, rhyolite ash flows, and lesser dacite. No structure is mapped in the claim area.

A.F. Roberts, P.Eng., has previously noted basalt and rhyolite ash with pyrite in the area.

## PREVIOUS WORK

**Geochemistry:** A minor geochemistry program was carried out on the South Florence claim, by Team Mineral Services Inc. of Delta, B.C. in 1979. The grid was 500 meters by 100 meters on which 96 samples were taken. Five anomalous values for gold and five anomalous values for mercury were found near the center of the claim.

**Geophysics:** A reconnaissance VLF-EM survey was carried out



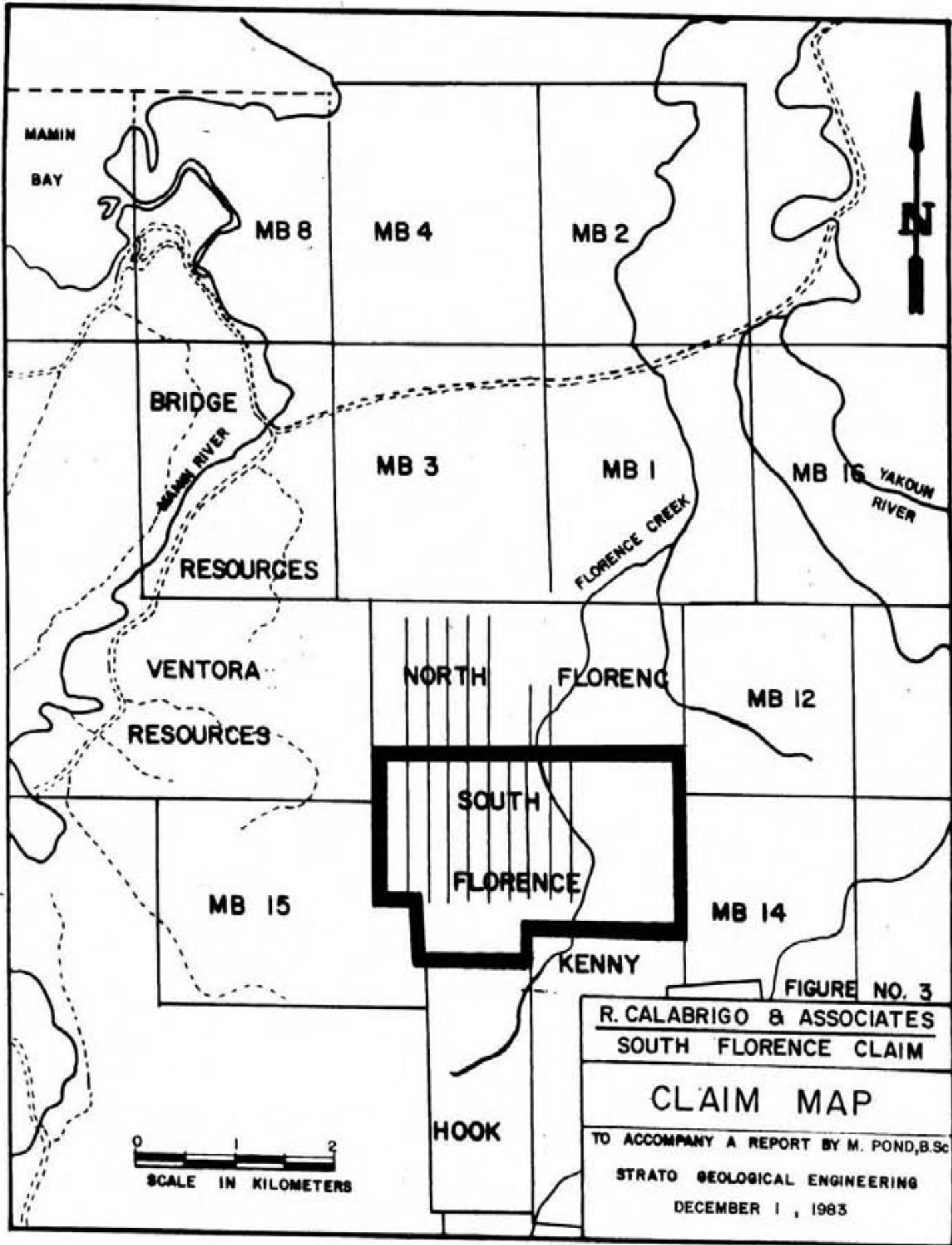


FIGURE NO. 3  
 R. CALABRIGO & ASSOCIATES  
 SOUTH FLORENCE CLAIM  
**CLAIM MAP**  
 TO ACCOMPANY A REPORT BY M. POND, B.Sc.  
 STRATO GEOLOGICAL ENGINEERING  
 DECEMBER 1, 1983



by Strato Geological Engineering Ltd. during August and September 1980. Two hundred meter line separations and 25 meter station intervals were used to make the grid. Weak trends were located but were interpreted to be controlled by the wide spacing and by the north-south direction of the lines. It was recommended that further work be done on a more closely spaced grid with east-west lines.

Strato Geological Engineering Ltd. also carried out a reconnaissance magnetometer survey and a reconnaissance Induced Polarization (IP) line over the South Florence claim during July 1981. The magnetic survey grid was made with north-south lines at 200 meter separation and 25 meter station intervals.

The magnetometer survey suggested a probable geological contact passing through the west central portion of the North and South Florence claim, although it was not confirmed by the resistivity contrast of the IP line. Recommendations were to continue the magnetometer survey on intermediate lines so as to clearly delineate any geological contact.

Also recommended was a reconnaissance geochemical soil sampling program with any resulting correlation between magnetic and geochemical data leading to selected areas of interest.

#### INSTRUMENTATION AND SURVEY PROCEDURES

The VLF electromagnetic survey grid was established from the North and South Florence LCP. East-west survey lines were chained and compassed at 100 meter intervals with 25 meter station intervals. A total of 9.75 kilometers of line were completed. The VLF survey was conducted with a Sabre Electronics Model 27, receiver. The Transmitter Station used was NPG, Jim Creek (Seattle), Washington, at a frequency of 24.8 kHz and a radiated power of 250 kilowatts. Both dip angle and horizontal field strength measurements were recorded; dip angle measurements were filtered using the Fraser Filter method to permit presentation of data in a contour map form: Figure 4. The method is well known and is fully described in literature.

Soil samples were collected in closely spaced groups of three to six samples over possible conductive zones, figures 5 and 6. A total of 24 samples were collected. All samples were analysed for silver, arsenic and antimony by the inductively coupled plasma method (ICP). The atomic absorption (AA) method was used for mercury.

Statistical analysis was performed using the graphical technique of Lepeltier (1969). Because only 24 samples were collected, interpretation is based on the combining of geochemical data from a survey done on the Hook and Kenny claims, giving a total statistical population of 96 samples. The Hook and Kenny work was also done by Strato Geological Engineering Ltd. in the time two weeks prior to the South Florence work. Both sets of samples have been treated in the same way.

Concentrations greater than the geometric mean (background) plus two standard deviations can be considered anomalous and those greater than background plus three standard deviations are considered highly anomalous. If the threshold for the anomalous population occurs at a lower value than background plus two deviations then threshold is considered anomalous,  $b + 2s$  as very anomalous and  $b + 3s$  as highly anomalous. Figures 5 and 6 in this report present the results of geochemical analysis of the 24 samples taken on the South Florence claim.

## DISCUSSION OF RESULTS

### VLF Electromagnetic Survey

This survey showed a number of weak to very weak conductive zones, possibly reflecting near surface features or ground water effects. No strongly conductive zones, i.e. faults, shears or sulfide zones, can be clearly interpreted from the results. The anomalies that are picked up generally have a short strike length (less than 200 meters) and trend north-south. Two anomalies have a strike length slightly greater than 500 meters and have Fraser Filter contour values up to 20 degrees. One small anomaly on line 5+00S, 0+50E has a 30 degree Fraser Filter value. Average width of all the conductive zones is 50 to 100 meters.

No correlation could be established between the VLF-EM anomalies and the previous magnetic results.

### Geochemical Analytical Results

<u>Element</u>	<u>b</u>	<u>b + s</u>	<u>*b + 2s</u>	<u>b + 3s</u>
Sb	2.8 ppm	3.5 ppm	7.2 ppm	15.5 ppm
	n = 96		*threshold = 7.2 ppm	

Two populations, a low and a high background can be graphically determined for antimony.

Element	b	b + s	*b + 2s	b + 3s
Hg	150 ppb	300 ppb	570 ppb	1150 ppb
	n = 96		*threshold = 400 ppb	

Three populations can be graphically determined for mercury. A low and a high background, and an anomalous population.

Element	b	b + s	*b + 2s	b + 3s
Ag	.18 ppm	.29 ppm	.43 ppm	.67 ppm
	n = 96		*threshold = .43 ppm	

Two populations, a low and a high background can be graphically determined for silver.

Element	b	b + s	*b + 2s	b + 3s
As	6.1 ppm	10.1 ppm	18 ppm	32 ppm
	n = 96		*threshold = 18 ppm	

Three populations, a low and a high background and an anomalous population can be graphically determined for arsenic.

No values over threshold for any of the four elements were found for the samples from the South Florence claim. Because of the limited exposure of outcrop on the claim it is difficult to interpret what rock types have led to the splits in geochemical populations.

## CONCLUSIONS

The VLF-EM survey has outline a number of weak conductive zones, most of which have not been adequately soil sampled. Those anomalies that have been sampled do not have associated with them any anomalous values for the elements tested. The VLF-EM anomalies do not appear to be coincident with any magnetic pattern in this area of the claim.

A program of electromagnetic survey work and geochemical soil sampling is recommended as follows:

1. Soil samples should be taken over the stronger VLF-EM anomalies to establish if any mineralization is associated with them.
2. The survey grid should be extended to the southeast to cover an area of magnetic lows which surrounds Florence Creek and continues south into the Hook and Kenny claims. Areas of magnetic lows in the Hook and Kenny claims are anomalous in mercury.
3. Work over the extension should include VLF-EM and soil sampling on 100 meter line separations and 25 meter station intervals.

Respectfully submitted,  
Strato Geological Engineering Ltd.

*M.A. Pond*

M.A. Pond, B.Sc.  
Geologist

December 1, 1983

*R.J. Englund*

R.J. Englund, B.Sc.  
Geophysicist

REFERENCES

Brown, A. Sutherland (1968)

B.C. Department of Mines and Petroleum Resources, Bulletin No. 54, Geology of the Queen Charlotte Islands.

Englund, R.J. (December 29, 1981)

Assessment Report Geophysical Survey on the North and South Florence Claims, Queen Charlotte Islands, B.C., Skeena Mining Division, for R. Calabrigo and Associates.

Pond, M. (November 23, 1983)

Assessment Report VLF-EM and Geochemical Soil Survey on the Hook and Kenny Claims, Queen Charlotte Islands, B.C., Skeena Mining Division, for R. Calabrigo and Associates.

Roberts, A.F. (February 6, 1981)

Report on the VLF-EM Survey, South Florence Claim (20 units), Queen Charlotte Islands, B.C., Skeena Mining Division for R. Calabrigo and Associates.

TIME-COST DISTRIBUTION

The claim group toward which work is being applied with this report consists of the South Florence (1792), Hill (798), and the River (797) mineral claims. Assessment work has been filed to keep the claims in good standing until October 1984.

This report describes the VLF-EM and geochemical soil survey data on the South Florence claim. The surveys were done by Strato Geological Engineering Ltd. during the period September 27 to October 14, 1983.

A listing of personnel and distribution of costs is as follows:

Personnel

J. Gibson	Field Supv., Geophysical Technician
G. Fjetland, B.Sc.	Geologist

Cost Distribution

Labour	\$ 4,225.00
Room and Board	1,300.00
Transportation (incl. gas, oil, etc.)	910.00
Instrument Rental	325.00
Field Supplies	273.00
Mob-Demobilization Cost (proportionate)	716.05
Map & Report - drafting, reproduction, copying, etc.	328.75
Report - data reduction and interpretation	1,100.00
TOTAL	\$ 9,177.80

Signed

  
Strato Geological Engineering Ltd.



CERTIFICATE

I, Michael A. Pond, of 312 - 1165 West 13th Avenue of the City of Vancouver, Province of British Columbia, do hereby certify as follows:

1. I am a graduate of the University of British Columbia where I obtained my Bachelor of Science Degree (Geology), in May, 1982.
2. I have been engaged in the study and practice of exploration geology since graduation and for two summer field seasons prior to graduation.
3. I have primarily worked in British Columbia with Utah Mines Ltd. and with Strato Geological Engineering Ltd.; and in the Henik Lakes region of the N.W.T. with Suncor Inc.
4. I have no direct, indirect or contingent interest, nor do I expect to receive any such interest in the properties of R. Calabrigo and Associates.

Dated at Vancouver, Province of British Columbia, this 1st day of December, 1983.

*Michael A. Pond*

Michael A. Pond, B.Sc.

CERTIFICATE

I, Ralph J. Englund, of 1112 Grover Ave., Coquitlam, British Columbia, do hereby certify as follows:

1. I am a Consulting Geophysicist with offices at 103 - 709 Dunsmuir Street, Vancouver, B. C. V6C 1M9
2. I graduated in 1971 from the University of British Columbia, with a degree of Bachelor of Science.
3. I have been engaged in the study, teaching, and practice of exploration geophysics continuously for a period of 11 years. I have worked as a geophysical consultant on numerous projects in Western North America since 1972.
4. I am a member in good standing of the British Columbia Geophysical Society.
5. The field work and the interpretation of results in this report were done under my direct supervision.
6. I have no direct, indirect, or contingent interest in the properties of R. Calabrigo and Associates, nor do I expect to receive any such interest.

Dated at Vancouver, Province of British Columbia, this 1 st day of December, 1983.



R.J. Englund, B.Sc.

A P P E N D I X    A

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PH: 253-3158 TELEX: 04-53124

DATE RECEIVED OCT 18 1983

DATE REPORTS MAILED *Oct 24/83*

### ICP GEOCHEMICAL ANALYSIS

A .500 GRAM SAMPLE IS DIGESTED WITH 3 ML OF 3:1:3 HCL TO HNO3 TO H2O AT 90 DEG.C. FOR 1 HOUR.  
THE SAMPLE IS DILUTED TO 10 MLS WITH WATER.

THIS LEACH IS PARTIAL FOR: Ca, P, Mg, Al, Ti, La, Na, K, W, Ba, Si, Sr, Cr AND B. Au DETECTION 3 ppm.

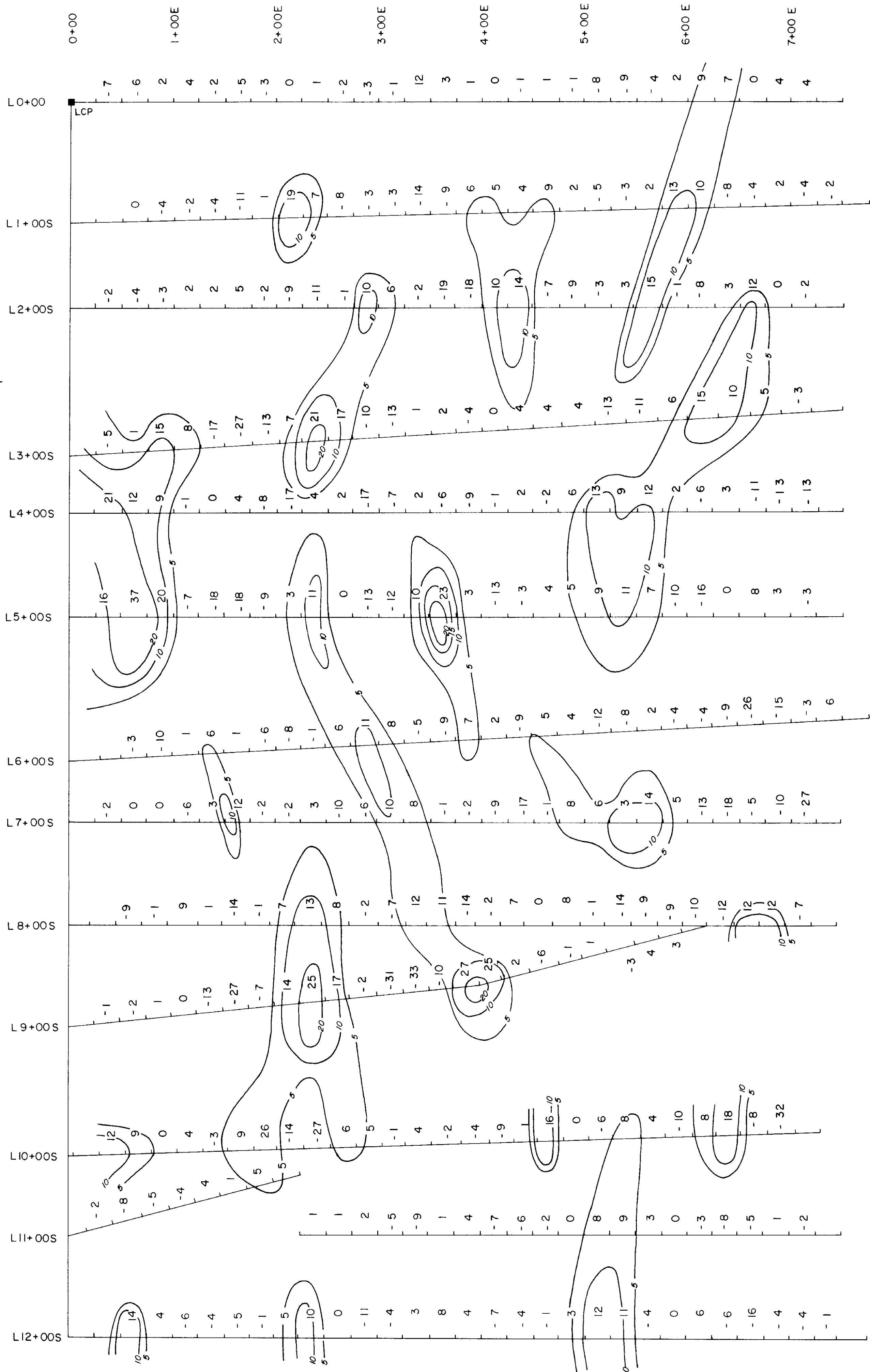
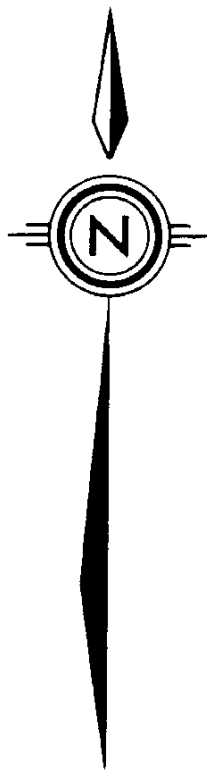
Hg# ANALYSIS BY FLAMELESS AA FROM .500 GRAM SAMPLE.

SAMPLE TYPE - SOIL

ASSAYER *Al Toye* DEAN TOYE, CERTIFIED B.C. ASSAYER

STRATO GEOLOGICAL PROJECT # A585(FLOR) FILE # 83-2614 PAGE# 1

SAMPLE	AG ppm	AS ppm	SB ppm	Hg# ppb
0S 6+25E	.3	7	2	140
2S 6E	.1	7	2	150
2S 6+50E	.1	7	2	220
2S 7E	.2	9	2	140
4S 5E	.1	7	2	120
4S 5+50E	.3	4	2	200
4S 6E	.2	6	2	100
4S 6+50E	.3	7	2	120
4S 7E	.3	11	2	230
7S 4+50E	.2	15	2	210
7S 5E	.2	2	2	90
7S 5+50E	.2	3	2	100
7S 6+50E	.2	15	2	100
7S 7E	.1	9	3	90
7S 7+50E	.1	8	2	110
9S 0+75E	.1	7	2	60
9S 1E	.2	2	2	210
9S 1+25E	.2	2	2	90
11S 2+75E	.1	5	2	140
11S 3E	.1	5	2	80
11S 3+25E	.1	7	2	160
12S 2+75E	.2	2	2	80
12S 3E	.1	7	2	160
12S 3+25E	.2	2	2	200
STD A-1	.3	9	2	50



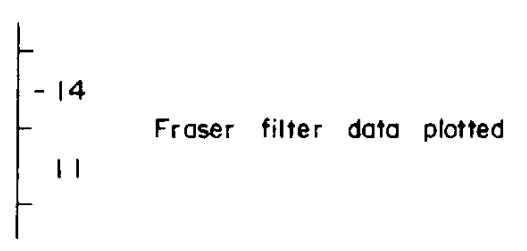
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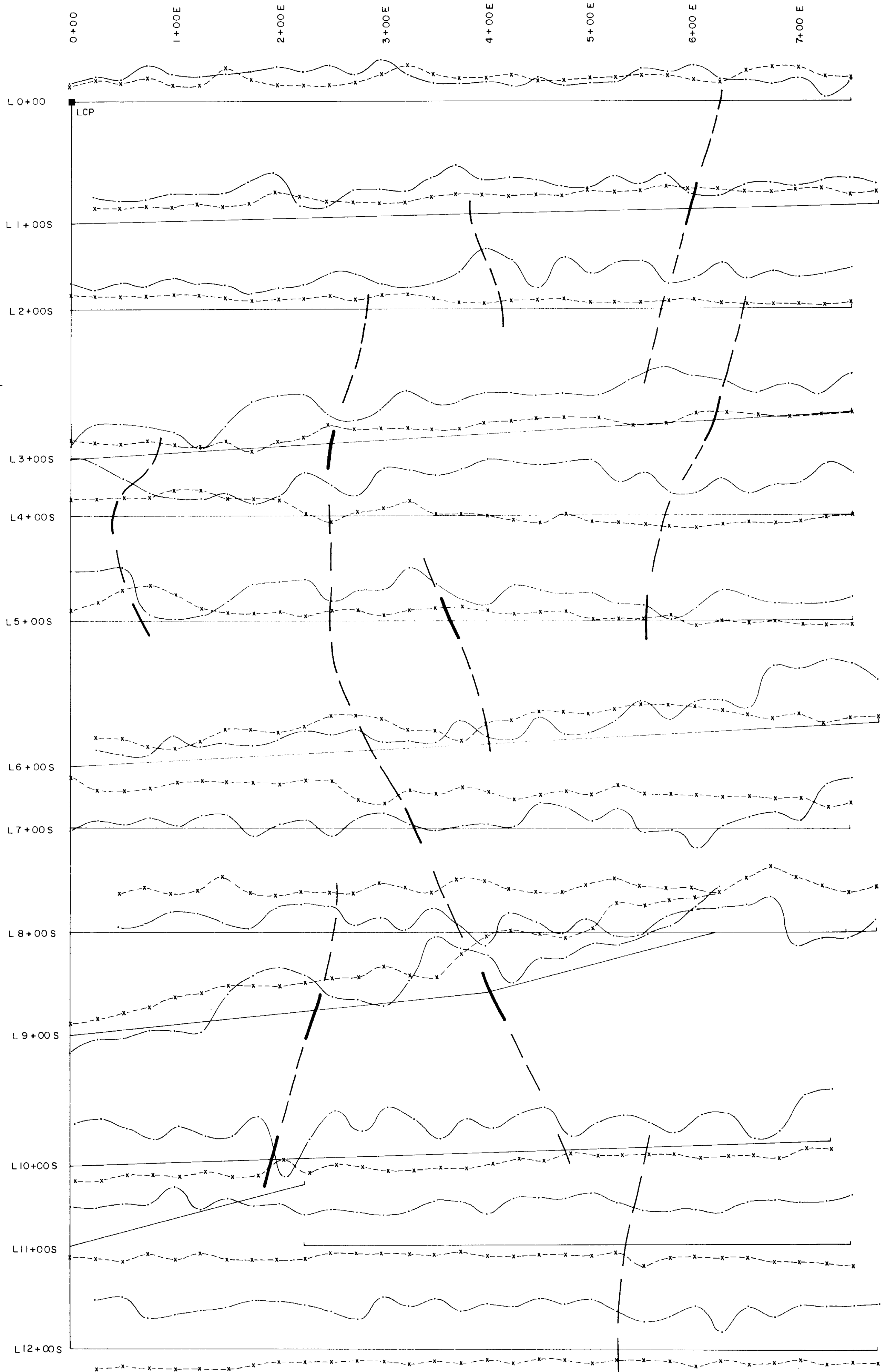
**FIGURE 4**

**LEGEND**

- NOTES :**
- Instrument : Sabre Electronics Model 27 Receiver
  - Transmitter : NPG Seattle; frequency 24.8 KHz
  - Contour interval at 5 , 10 , 20



<b>R. CALABRIGO &amp; ASSOCIATES</b>	
SOUTH FLORENCE CLAIM SKEENA M.D. N.T.S. 103 F / 9E	
<b>VLF - EM SURVEY FRASER FILTER CONTOUR MAP</b>	
50 0 50 100 150 m	
To accompany a report by M. POND, B. Sc. STRATO GEOLOGICAL ENGINEERING LTD.	
DRAWN BY : MP / SG	DATED : DEC. 1, 1983



**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**11,771**

FIGURE 5


**LEGEND**

NOTES:  
 - Instrument : Sabre Electronics Model 27 Receiver  
 - Transmitter : NPG Seattle : frequency 24.8 KHz

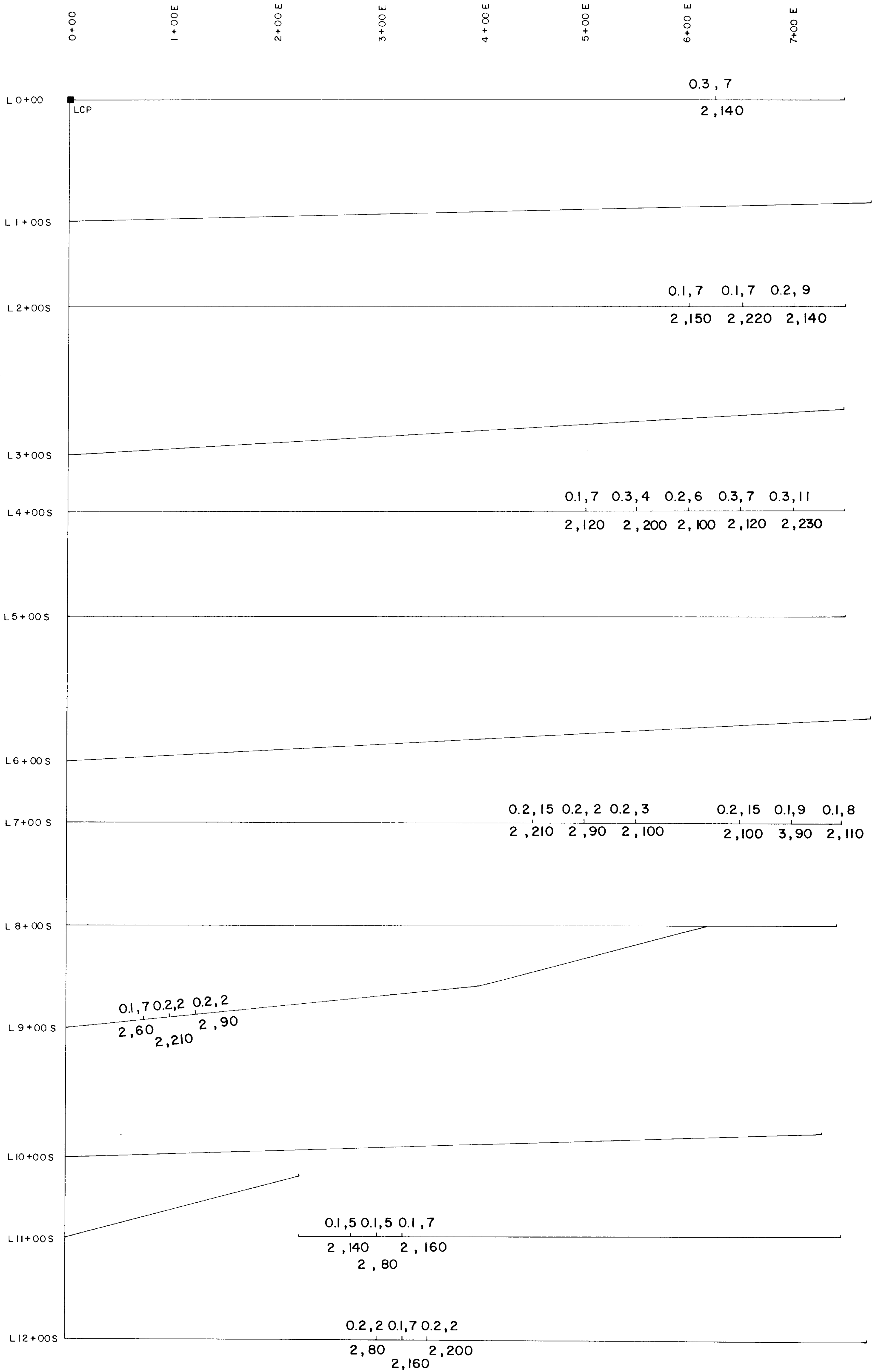
— — — — — Strong conductor trend  
 - - - - - Moderate conductor trend  
 . . . . . Weak conductor trend

DIP - ANGLE SCALE  
 +10°  
 Line  
 -10°

FIELD - STRENGTH SCALE  
 60%  
 Line  
 20%

<b>R. CALABRIGO &amp; ASSOCIATES</b>	
SOUTH FLORENCE CLAIM SKEENA M.D. N.T.S. 103 F / 9E	
<b>VLF-EM SURVEY (PROFILE PLOT PLAN)</b>	
50 0 50 100 150 m	
To accompany a report by M. POND, B.Sc. STRATO GEOLOGICAL ENGINEERING LTD.	
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**LEGEND**

- ≥ 0.6 ppm **Ag**
- \* ≥ 0.4 ppm < 0.6 ppm
- △ ≥ 15 ppm **Sb**
- △\* ≥ 7 ppm < 15 ppm
- \* Threshold
- ≥ 32 ppm **As**
- \* ≥ 18 ppm < 32 ppm
- ⬡ ≥ 1150 ppb **Hg**
- ⬡\* ≥ 570 ppb < 1150 ppb
- ⬡\* ≥ 400 ppb < 570 ppb

0.1, 7 : ppm Ag, ppm As  
2, 60 : ppm Sb, ppb Hg

Soil sample locations

**GEOLOGICAL BRANCH ASSESSMENT REPORT**

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FIGURE 6

**R. CALABRIGO & ASSOCIATES**

SOUTH FLORENCE CLAIM  
SKEENA M.D. N.T.S. 103 F / 9E

**SOIL GEOCHEMISTRY**  
(Ag, Sb, As, Hg)

50 0 50 100 150 m

To accompany a report by M. POND, B.Sc.  
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