1991

PRELIMINARY GEOSTATISTICAL STUDY

OF

FISH LAKE GOLD-COPPER DEPOSIT

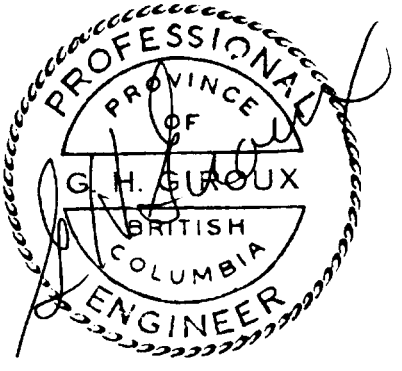
for

TASEKO MINES LIMITED

by

G.H. Giroux, P.Eng., MASc.
Montgomery Consultants Ltd.

April 24, 1991



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Suite 701, 675 West Hastings Street, Vancouver, BC V6B 1N2 (604) 684-6136 Fax: (604) 684-6270

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1.0 SUMMARY AND CONCLUSIONS

At the request of Mr. J. Franzen of Taseko Mines Ltd. the writer completed a preliminary semi-variogram analysis of the Fish Lake gold-copper deposit 130 km. southwest of the city of Williams Lake, B.C.

Discovered in the early 1930's, this deposit has been periodically explored by a number of major and junior mining companies including Phelps Dodge, Nittetsu, Quintana and Cominco.

Data for the study consisted of results from diamond and percussion holes drilled in the period from the late 1960's to present. For the purpose of this investigation samples were restricted to a window bounded by the coordinates 9400 E to 10800 E and 9475 N to 10650 N. Drill hole assay results were composited into 15 m. lengths between the elevations 1470 and 1140.

Results for copper indicated a geometric anisotropy with maximum continuity of 560 m. along the direction N55E and minimum continuity of 290 m. in a direction N145E.

Results for gold show close agreement with copper indicating a similar mineralization history. Gold semi-variograms showed a maximum continuity of 390 m. at N40E and a minimum continuity of 150 m. at N130E.

As a result the present drill hole spacing is more than adequate to predict copper grades. To predict gold grades, however, drill holes in the SE-NW direction should be no further than 150 m. apart.

2.0 INTRODUCTION

At the request of J. Franzen of Taseko Mines Ltd. the writer undertook a preliminary semi-variogram study on gold-copper data from the Fish Lake Deposit. The purpose of the exercise was to determine if any structural anisotropies existed and if so to quantify the ranges of these structures. This methodology would then provide information on optimum drill hole density and if one direction would require closer spaced holes than another.

3.0 DATA ANALYSIS

Data for the study consisted of all drill hole data within a window with south-west corner of 9400 E, 9475 N and north east corner of 10800 E, 10650 N. Drill hole data consisted of holes drilled from the late 1960's to the present. The location of the drill holes used in this study is shown on Figure 1.

There was no examination of duplicate data made for this study and as a result it is impossible to comment on sampling variability or accuracy of sample data.

In the coarse of preparing the data for a variogram analysis the following errors or discrepancies were found in the data base

- Drill Hole	Error
F89-12	From To 66.0 79.0 should be 66.0 69.0
F84-5	From To's 184.0 to 202.7 repeated twice
N70-1	From To's 8.7 to 61.0 repeated twice
N70-2	From To's 24.1 to 61.0 repeated twice
PH69-1	From To's 12.2 to 82.3 repeated twice
PH69-2	From To's 9.1 to 91.4 repeated twice
PH69-3	From To's 7.9 to 91.4 repeated twice
PH69-4	From To's 7.6 to 91.4 repeated twice
PH69-6	From To's 3.7 to 91.4 repeated twice
PH69-7	From To's 3.7 to 106.7 repeated twice
PH69-8	From To's 15.2 to 121.9 repeated twice
PC82-9	Two samples at end of hole no From To's

For the purpose of constructing semi-variograms 15 m. composites were calculated from each drill hole. Composites were formed starting at elevation 1470 down to elevation 1140. Composites were then sorted by vertical bench and relative semi-variograms were produced in four directions for each level. Values with zero grade were considered not assayed and dropped from the variogram analysis.

4.0 SEMI-VARIOGRAM ANALYSIS

4.1 Introduction

A semi-variogram is the fundamental autocorrelation tool of geostatistical procedures. It is defined as half of the mean squared difference of a variable for values separated by a distance h as given by the formula:

$$\gamma(h) = \frac{\sum_{i=1}^{n} (x_i - (x_{i+h}))^2}{2n}$$

where, $\gamma(h)$ is the semi-variogram
x_i is the value at location i
x_{i+h} is the value at a distance h from i
and n is the number of $x_i - (x_{i+h})$ pairs

Gamma (h) is a 3-dimensional function, commonly dependent on direction within a deposit which can also differ from one geological environment to another. An experimental semi-variogram is determined from a set of experimental data (e.g. assay values at known locations) and is shown graphically as a plot of gamma (h) versus h (lag or sample spacing). For practical applications a smooth mathematical model is fitted to the normally saw-toothed graph of an experimental semi-variogram. The most common form of mathematical model in general is the spherical or Matheron model (shown in Figure 3) and given by the formula:

$$\gamma(h) = C_o + C_1 \left(1.5\, h/a - .5\, h^3 / a^3\right) \quad \text{for } h \le a$$
$$= C_o + C_1 \quad \text{for } h > a$$

where C_o is the nugget effect
C_1 is the structural component
$C_o + C_1$ is the sill
a is the range (or influence of samples)
and h is the lag or sample spacing

In many cases where the value of $\gamma(h)$ increases systematically with grade it is convenient to determine a relative semi-variogram in which $\gamma(h)/m^2$ is plotted versus h, where m is the mean value of all samples used to determine an experimental semi-variogram. In this way two (or more) semi-variograms determined for different data sets (with different mean values) become more-or-less equivalent. An alternate approach is to transform (e.g. logarithmic or multigaussian) all the data and then produce normal semi-variograms or semi-variograms of transformed data such as precious metal values.

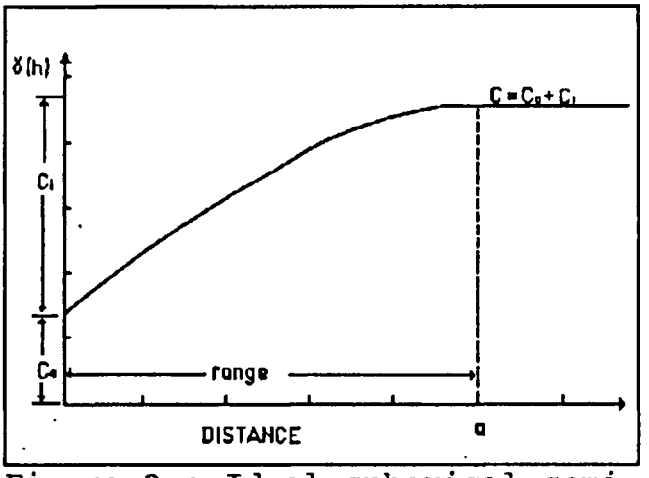


Figure 2 : Ideal spherical semi-variogram model, gamma(h) vs distance (sample spacing). Co is nugget effect, C is sill value and a is range over which samples are correlated.

For the Fish Lake Deposit relative semi-variograms were produced for both gold and copper in four horizontal directions on each bench and then averaged. The four directions were east-west, north-south, southwest-northeast and southeast-northwest.

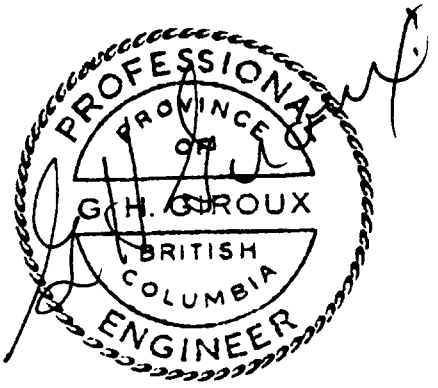
beyond 300 m. showing an increasing variation. This drift is a result of low grade to high grade zonation in this direction as shown by cross sections (Figures 6 and 7). Cross sections in the southwest -northeast directions (Figures 8 and 9) and in the east - west direction (Figure 10) show much less variability in gold grades and as a result produce longer ranges.

When a structural ellipse is constructed a direction of maximum continuity is N40E. Relative semi-variograms were then produced along this direction and the perpendicular to it (see Figures 11 and 12).

As a result ranges of 390 m. at N40E and 150 m. at N130E were indicated.

4.4 Discussion of Results

The present drill hole spacing seems adequate to predict copper grades. For gold, however, holes in the SE-NW direction should be spaced no further than 150 m. apart. The drift that is evident in both copper and gold in the SE-NW direction reflects the zonation from high grade in the centre to low grade on the NW perimeter. In the perpendicular direction grades are much more continuous.



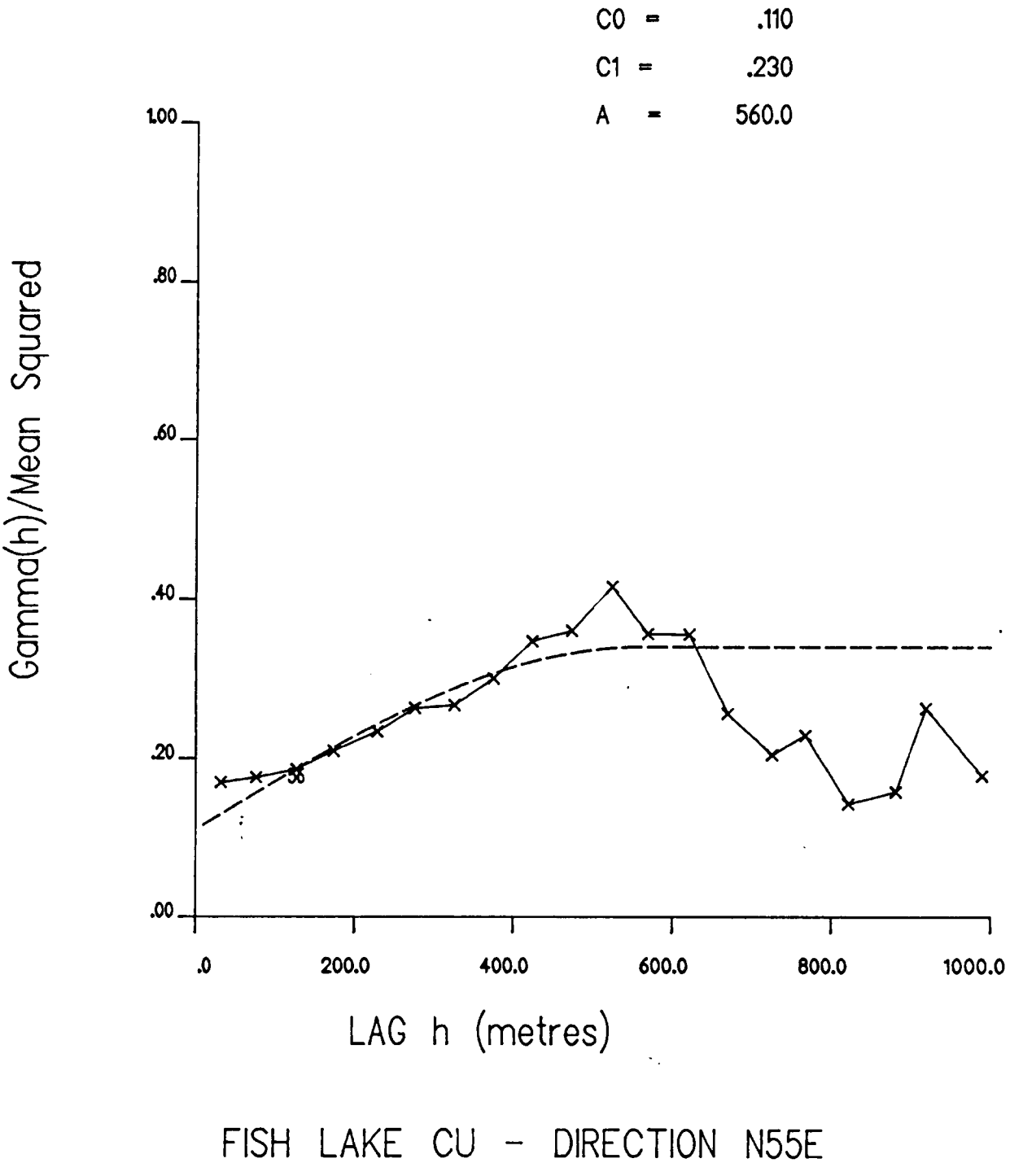


FIGURE 3 : Average Relative Semi-variogram for Copper in N55E Direction of Maximum Continuity

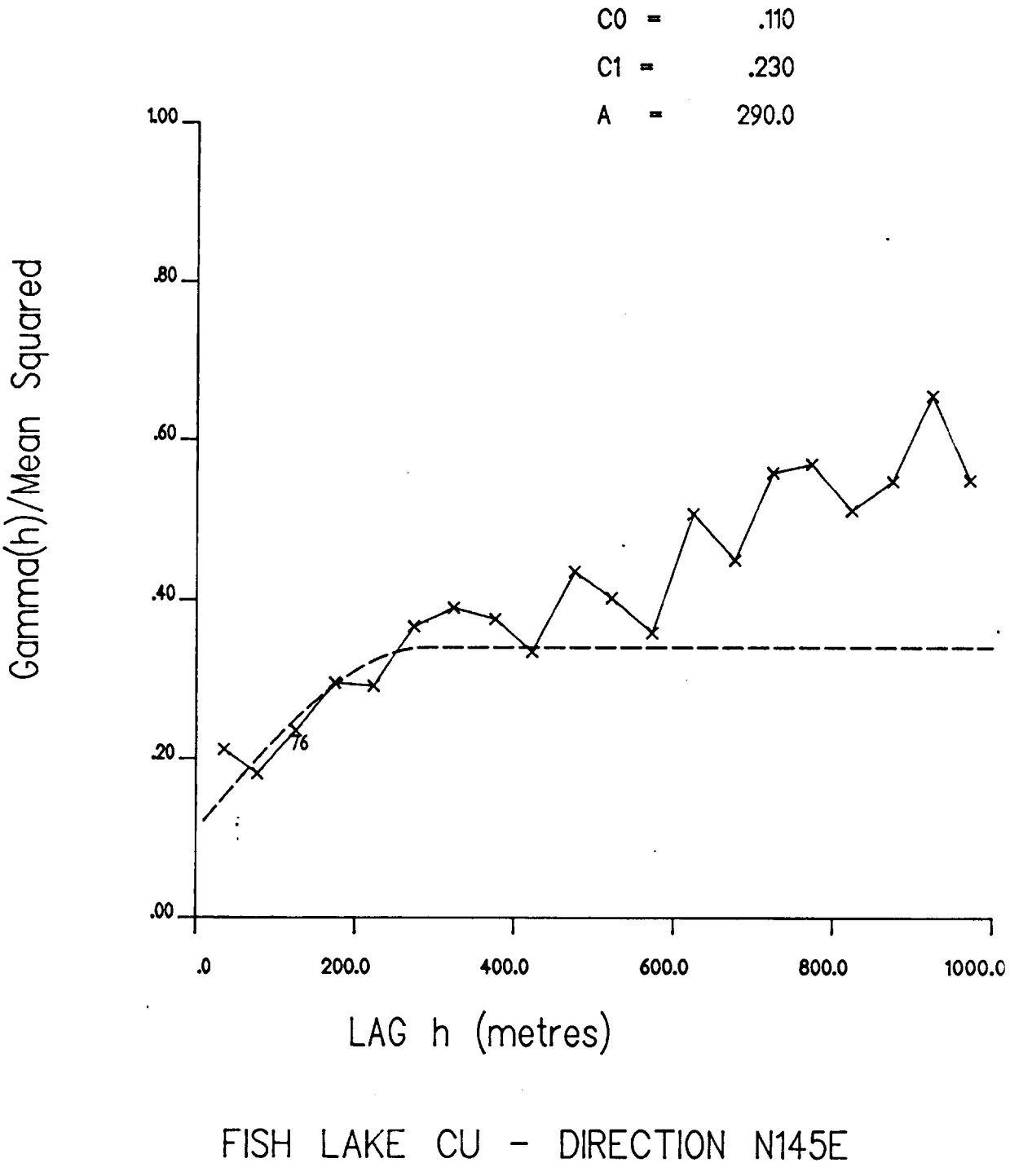


FIGURE 4 : Average Relative Semi-variogram for Copper in the N145E Direction of Minimum Continuity

REGRESSION SUMMARY

CU = .077 + .30 AU

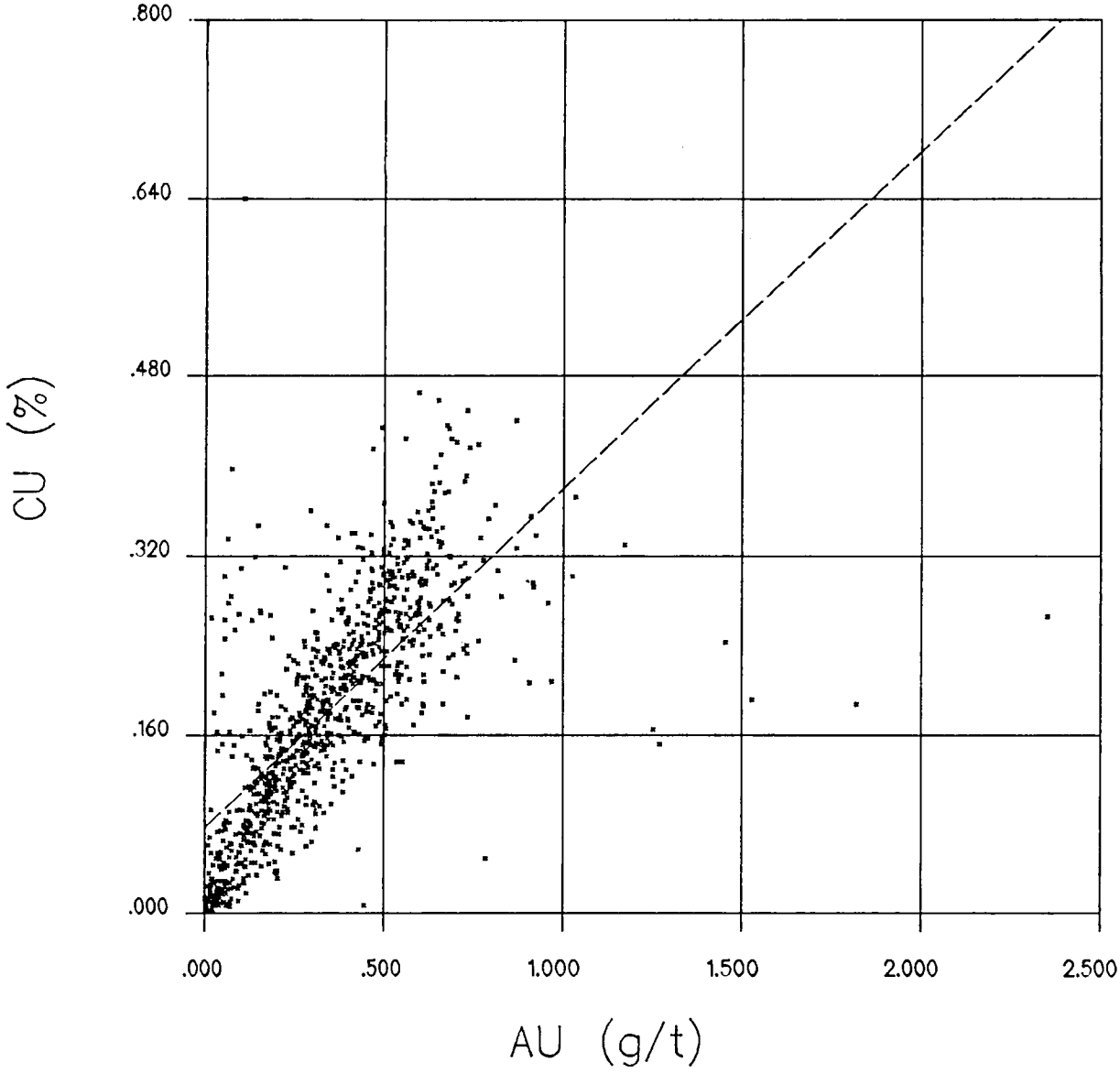
Standard Error on A = .41E-02

Standard Error on B = .99E-02

Standard Error on Y = .71E-01

Correlation Coefficient = .70391

N = 946



FISH LAKE 15M. COMPOSITES

FIGURE 5 : Scatter Plot for 15 m. Composites showing Gold versus Copper Grades

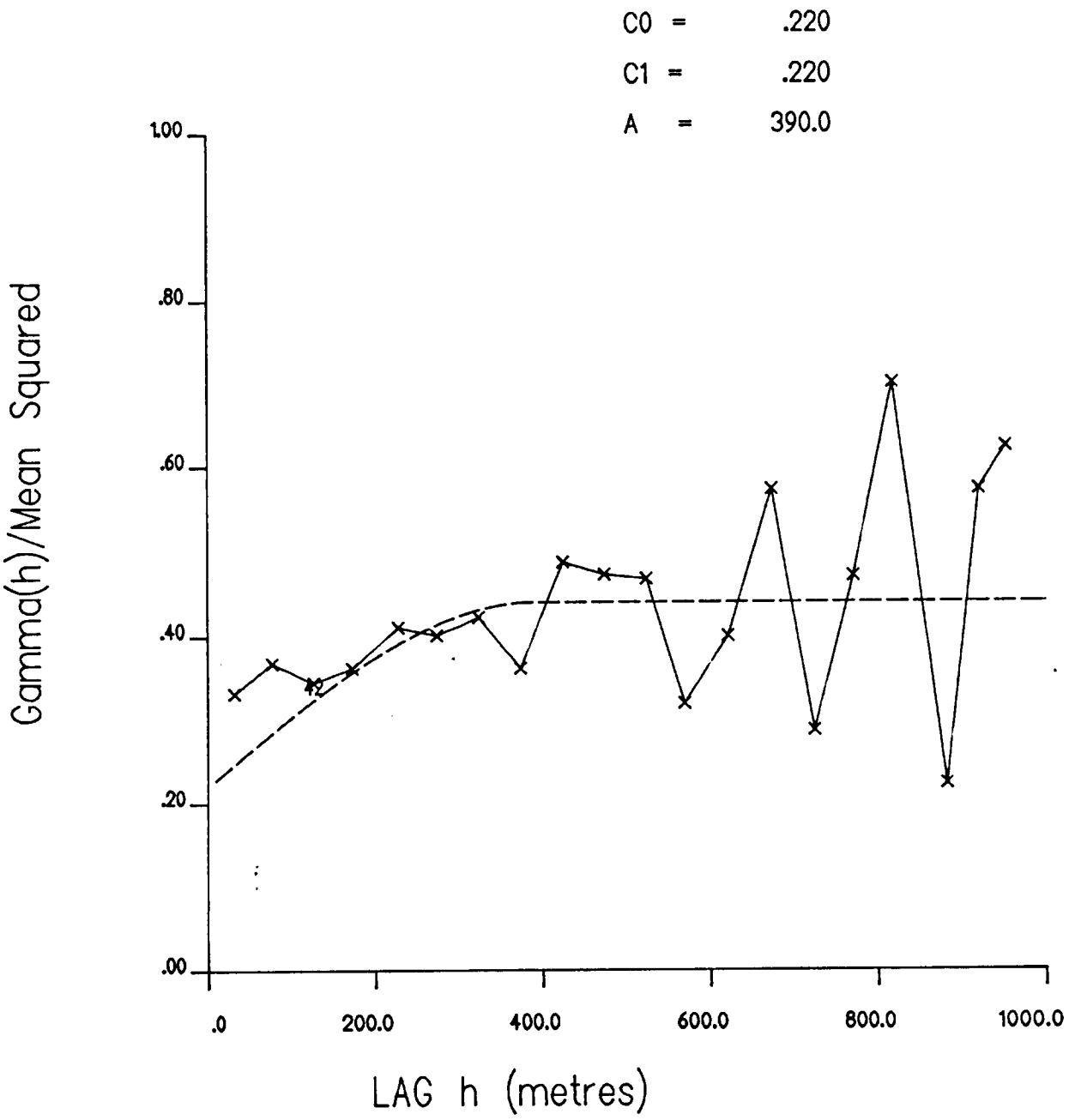


FIGURE 11 : Average Relative Semi-variogram for Gold in N40E Direction of Maximum Continuity

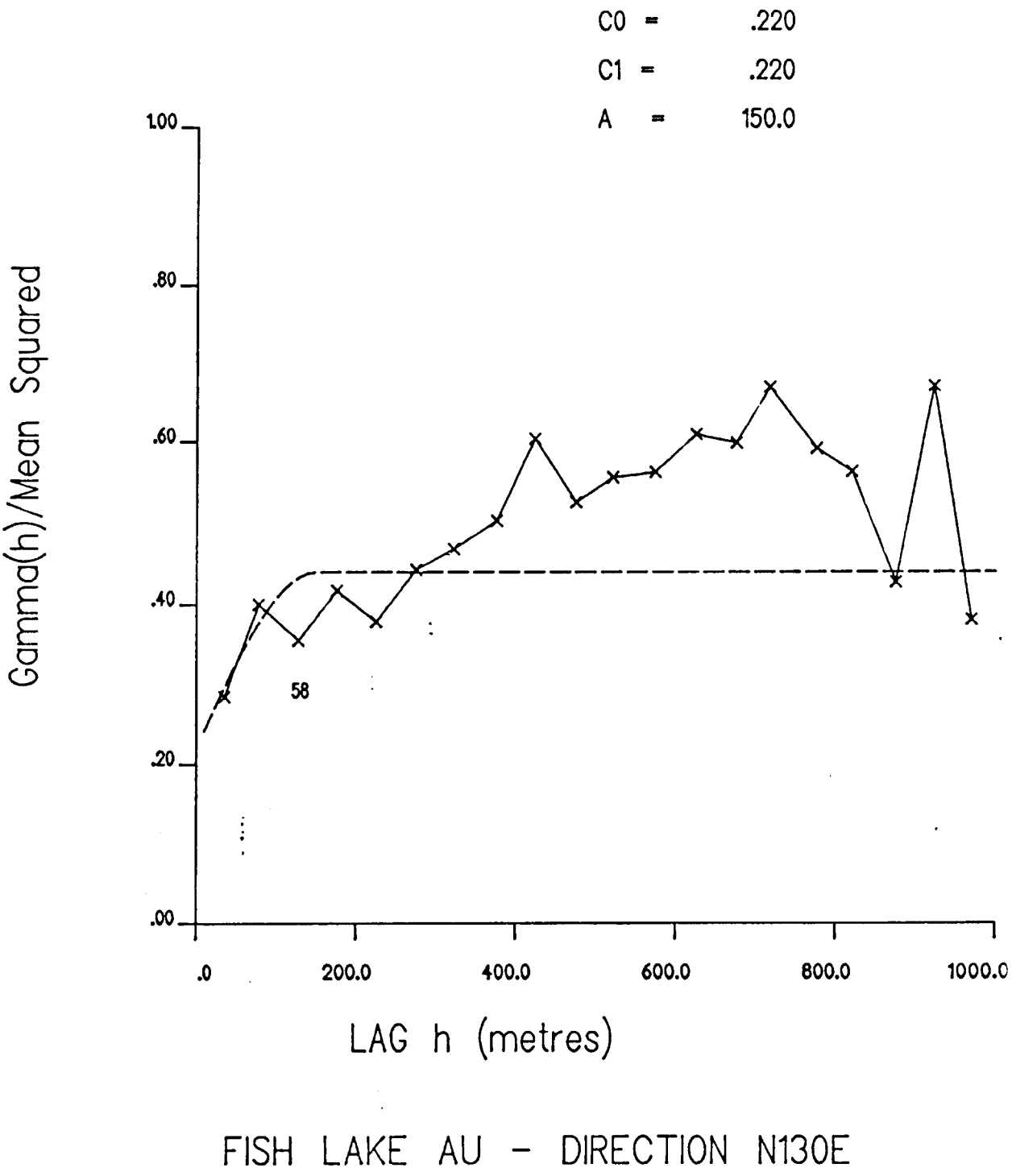


FIGURE 12 : Average Relative Semi-variogram for Gold in N130E Direction of Minimum Continuity

5.0 CERTIFICATE

I, G.H. Giroux, of 982 Broadview Drive, North Vancouver, British Columbia, do hereby certify that:

1. I am a consulting geological engineer with an office at #701 - 675 West Hastings Street, Vancouver, British Columbia.

2. I am a graduate of the University of British Columbia in 1970 with a B.A. Sc. and in 1984 with a M.A. Sc. both in Geological Engineering.

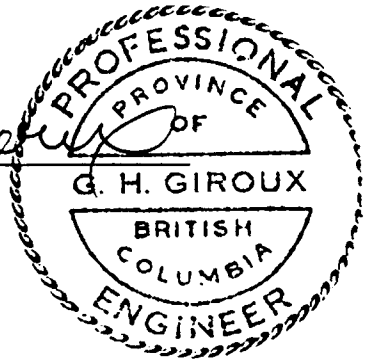
3. I have practised my profession continuously since 1970.

4. I am a member in good standing of the Association of Professional Engineers of the Province of British Columbia.

5. I have no interest, either direct or indirect in the properties or securities of Taseko Mines Limited, nor do I expect to receive any such interest.

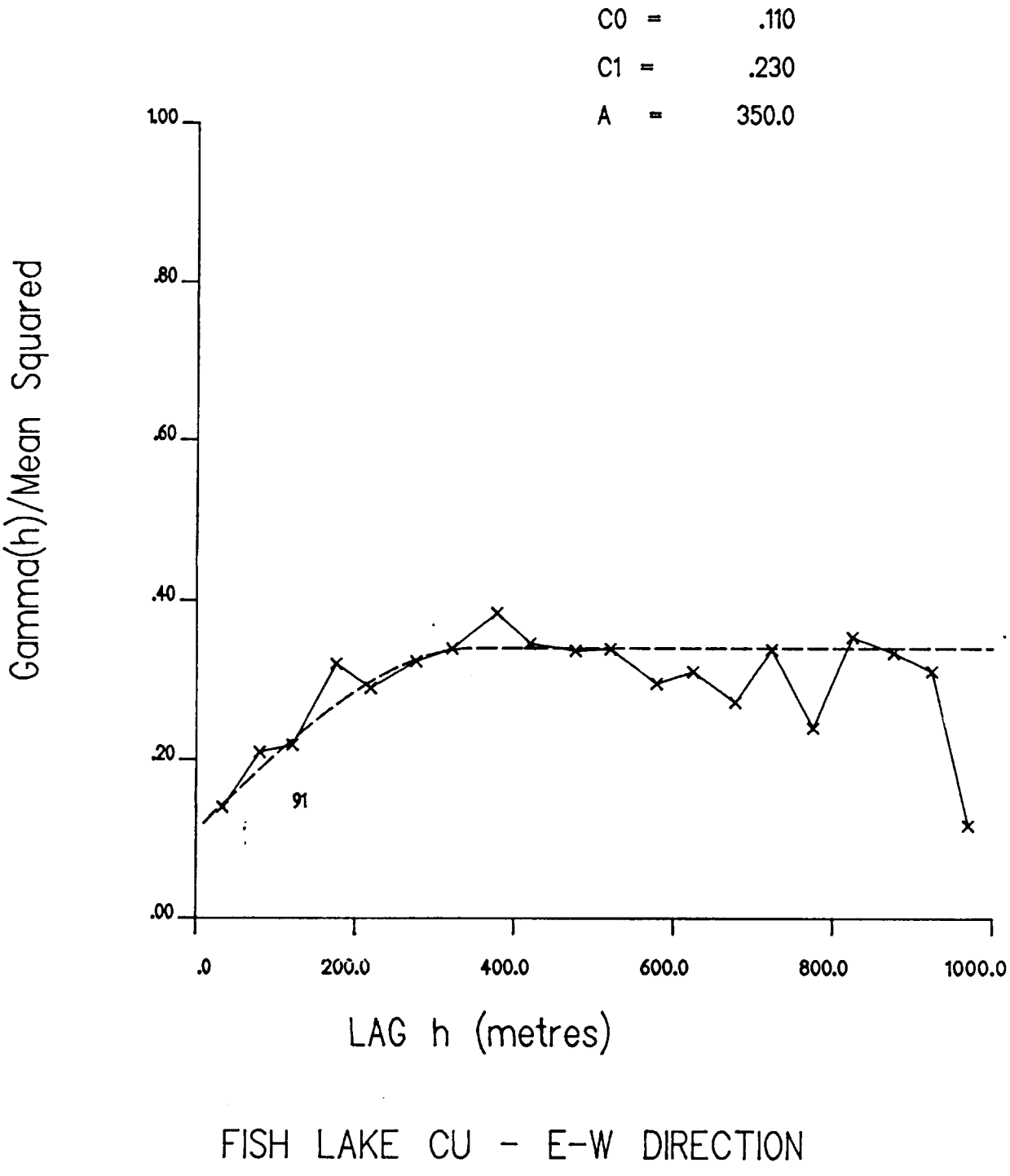
6. I consent to the use of this report by Taseko Mines Limited in submissions to the B.C. Superintendent of Brokers and the Vancouver Stock Exchange and to distribute all or parts of the report to shareholders or other parties, provided that the meaning is not altered by partial quotes.

G. H. Giroux
April 24, 1991

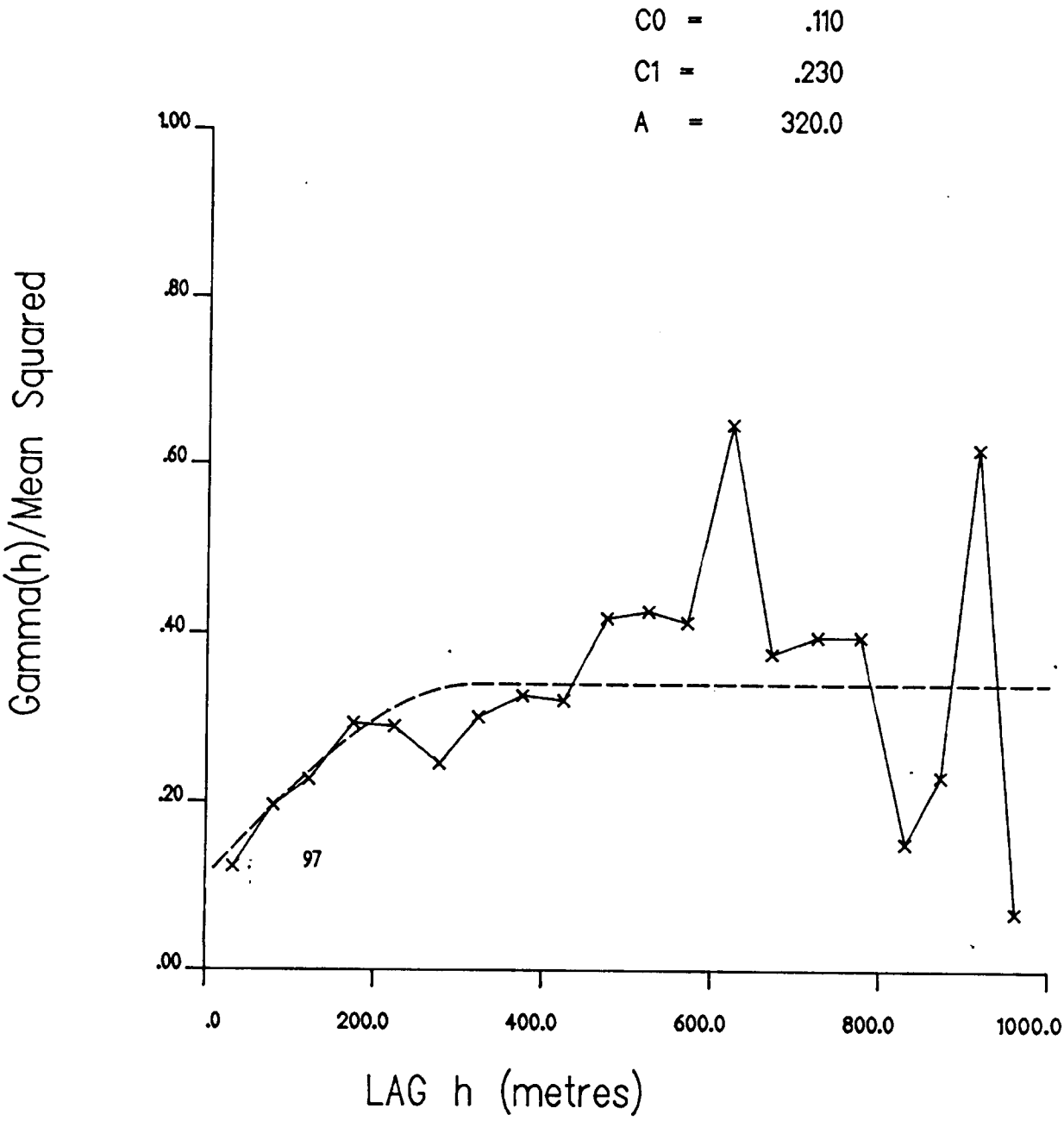


APPENDIX 1

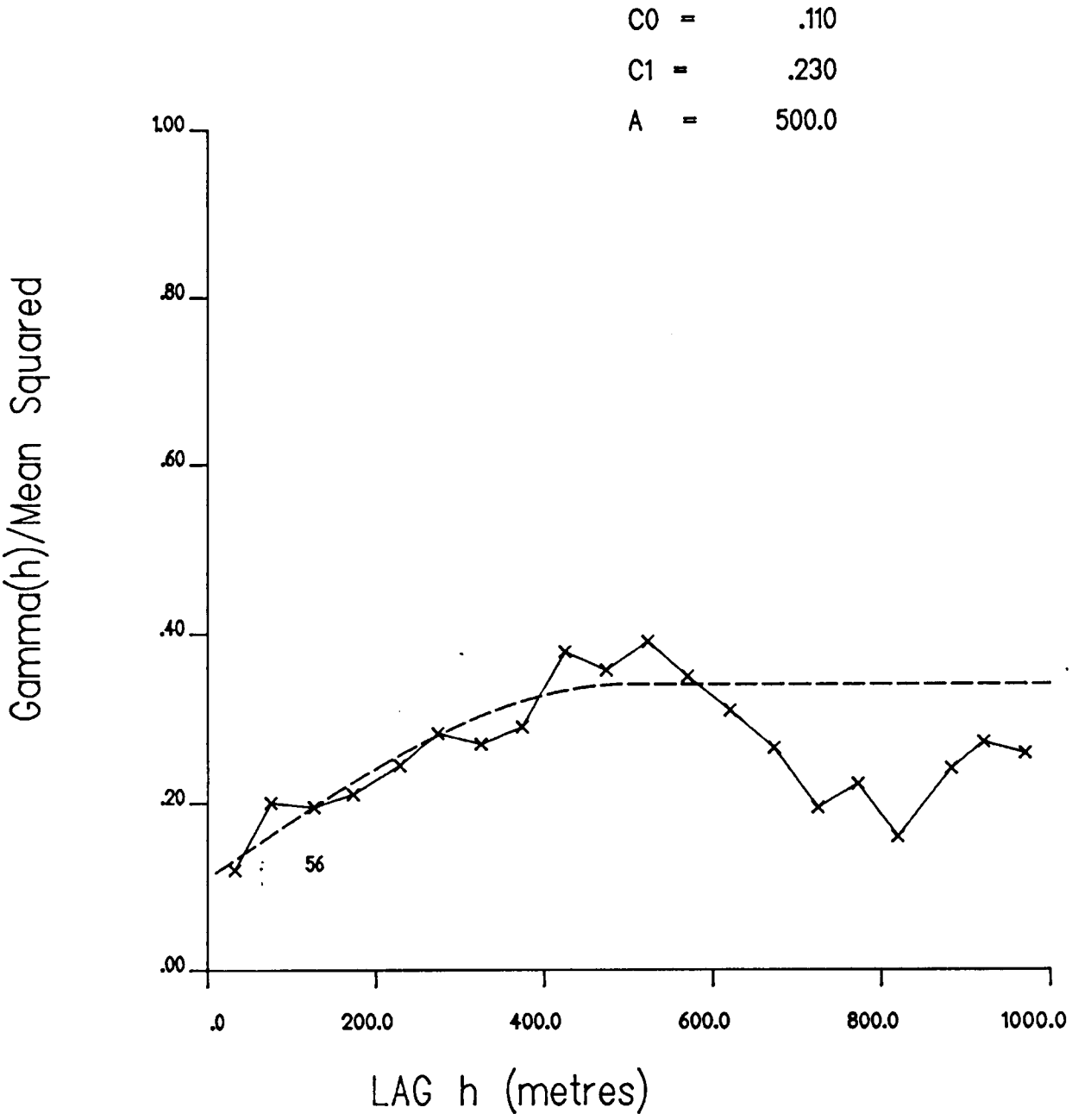
HORIZONTAL RELATIVE SEMI-VARIOGRAMS FOR COPPER



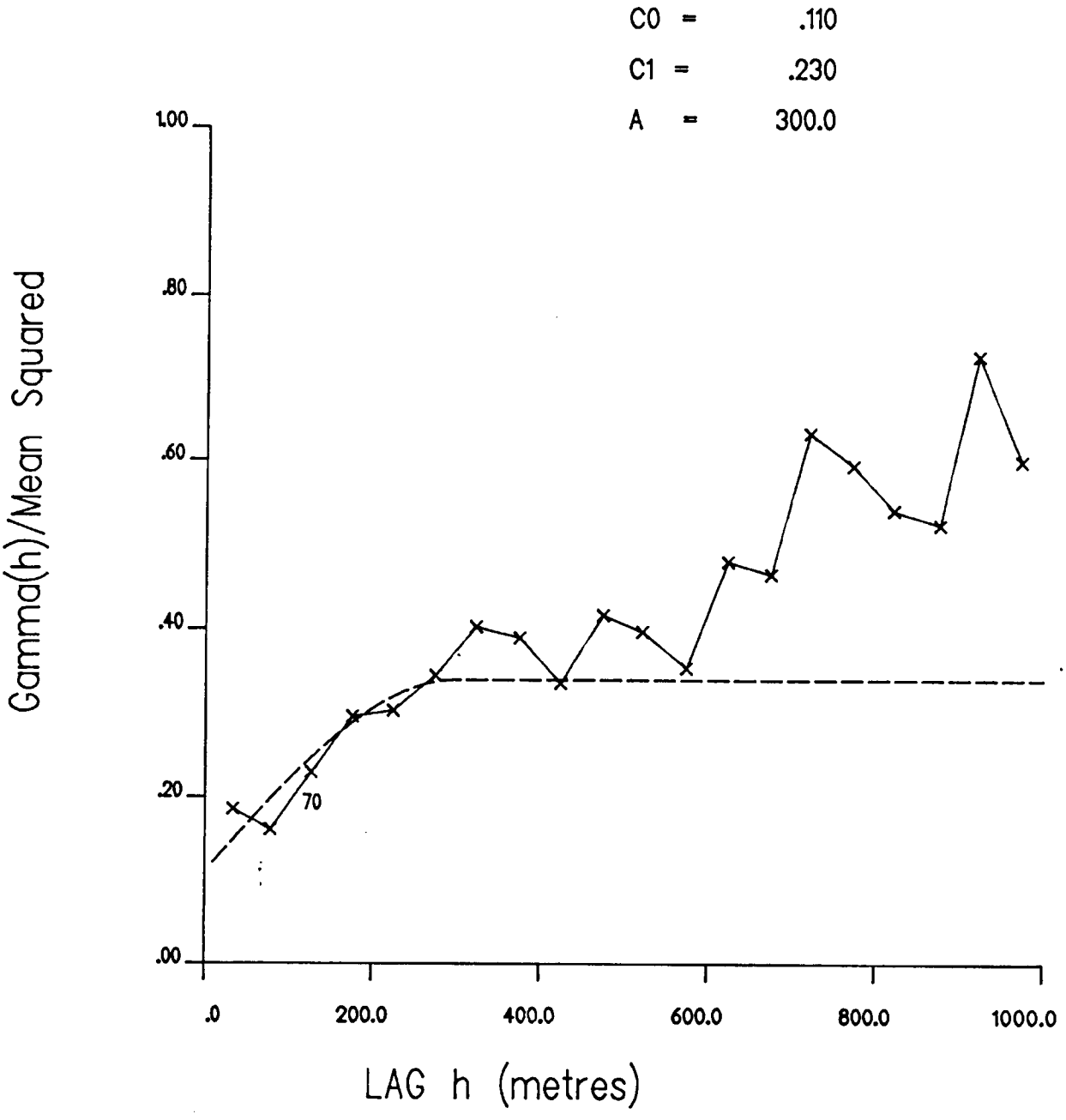
FISH LAKE CU - E-W DIRECTION



FISH LAKE CU - N-S DIRECTION



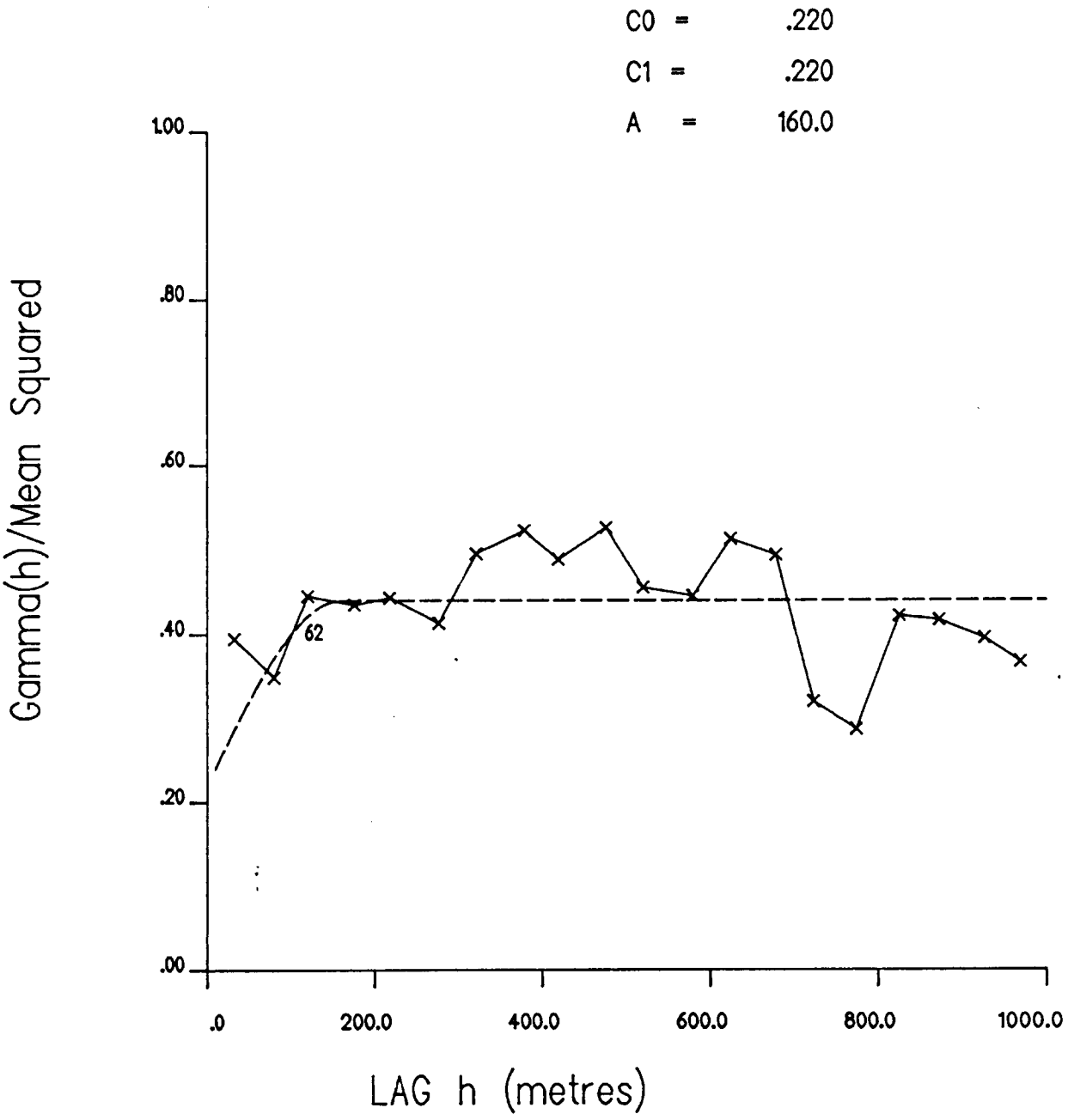
FISH LAKE CU - SW-NE DIRECTION



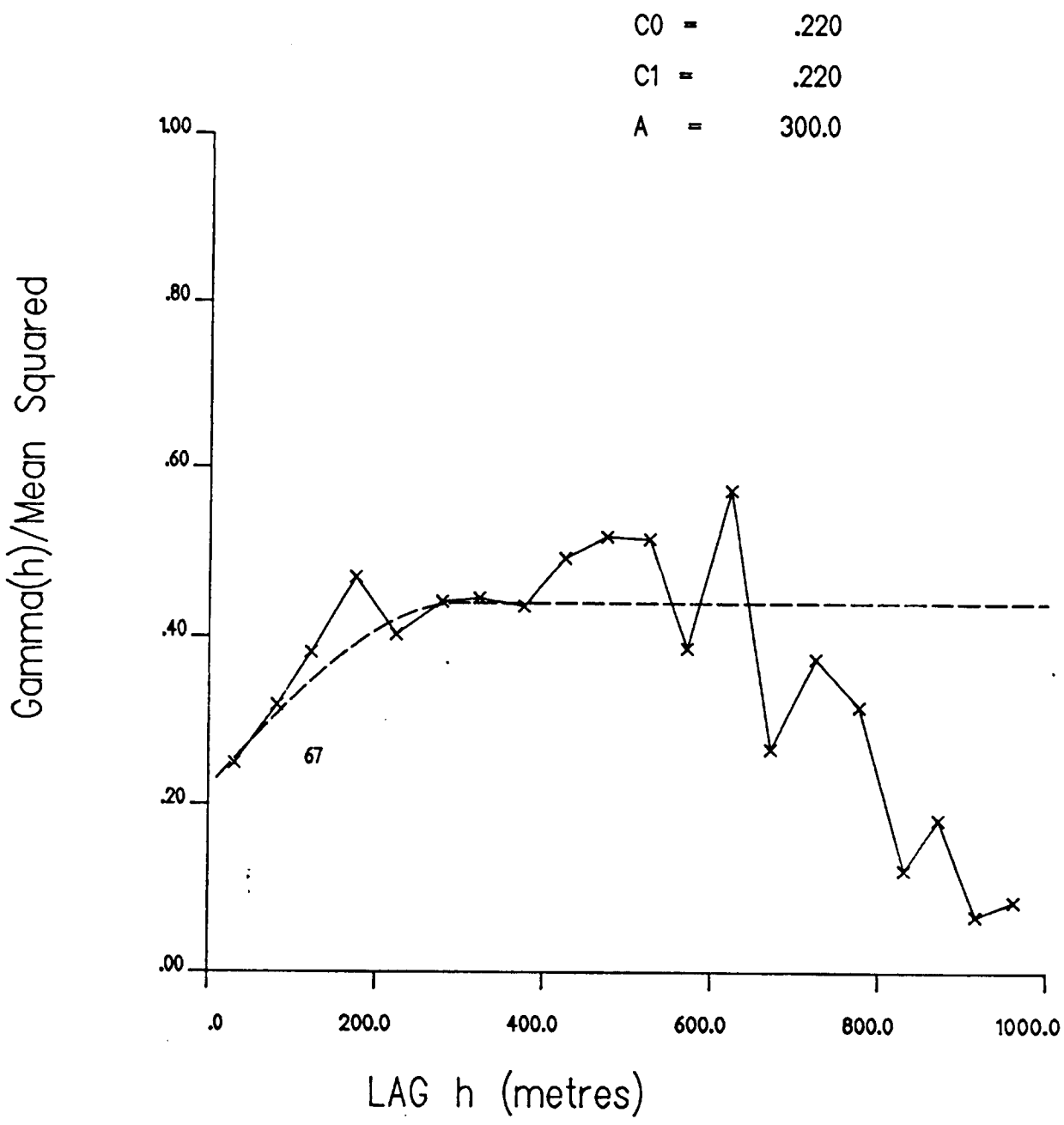
FISH LAKE CU - SE-NW DIRECTION

APPENDIX 2

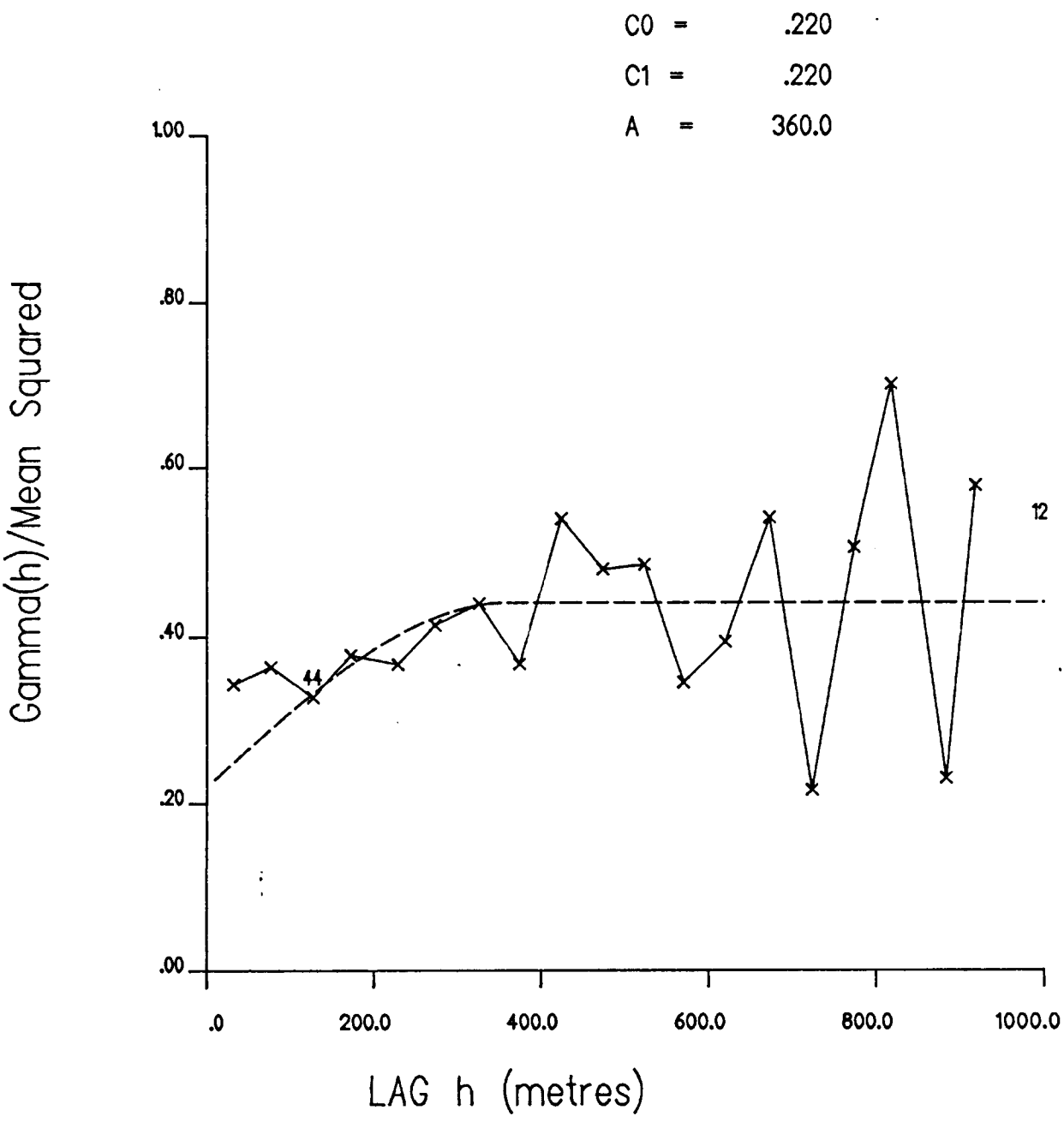
HORIZONTAL RELATIVE SEMI-VARIOGRAMS FOR COPPER



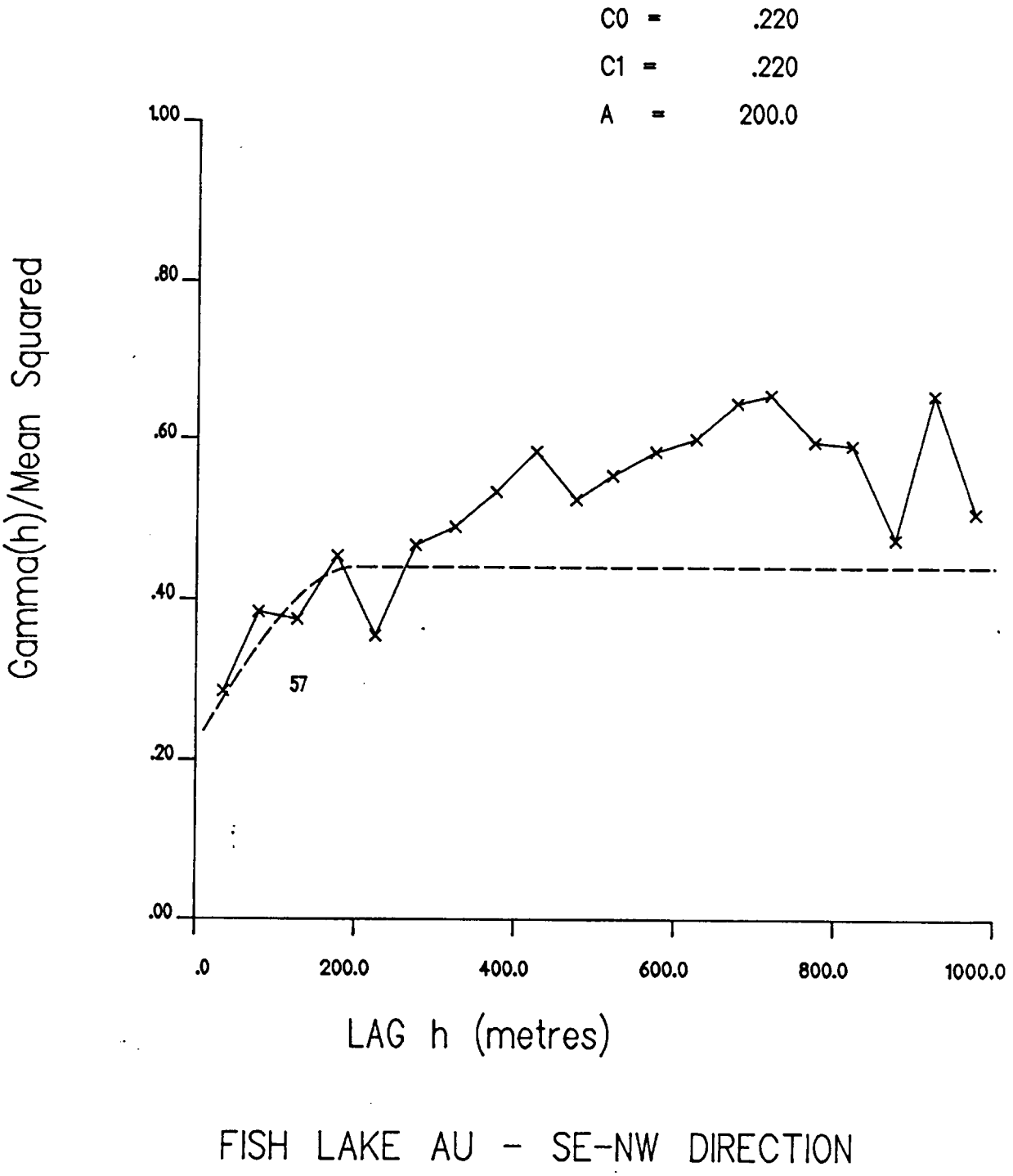
FISH LAKE AU - E-W DIRECTION



FISH LAKE AU - N-S DIRECTION



FISH LAKE AU - SW-NE DIRECTION



FISH LAKE AU - SE-NW DIRECTION

A

B

C

D

A'

B'

C'

D'

N

10,000 E

10600N

10500N

10400N

10300N

10200N

10100N

10000N

9900N

9800N

9700N

9600N

9400E

9500E

9600E

9700E

9800E

9900E

10000E

10100E

10200E

10300E

10400E

10500E

10600E

10700E

10800E

PC82-13 PC82-4 PC82-3 PC82-1 PC82-2 PC82-19

Q73-7 PH69-1 PH69-3 PH69-4 PH69-2

Q73-8 FL81-16 FL81-14

PC82-16 F89-1 Q73-9 Q74-5

Q93-13 FL81-6 F89-2 F89-3 FL81-11 FL81-31

N70-4 PH69-12

T72-3 Q73-2 FL81-19 PH69-11

N70-2 PH69-10

FL81-17 PH69-8 F89-8

Q73-3 PC82-15 Q74-3 FL81-13 FL81-1 Q74-7 PH69-9 F89-9

Q93-12 Q74-4

F84-5 Q73-11 F84-3 F89-10 F89-11 PH69-6 T69-3

T69-5 PH69-5 FL81-3

Q93-2 Q74-6 FL81-7

FL81-12 F89-12 FL81-5

FL81-10

Q73-4 T72-1 Q93-10

FL81-18 FL81-23 FL81-24

FL81-15 PH69-7

Q73-6

FL81-20

inches 0 1 2

centimetres 0 1 2 3 4 5

This reference scale bar was correct for the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

FIGURE 1

TASEKO MINES LIMITED

FISH LAKE PROJECT # 91FL1

PLAN VIEW SHOWING SECTIONS

0 40. 80. M.

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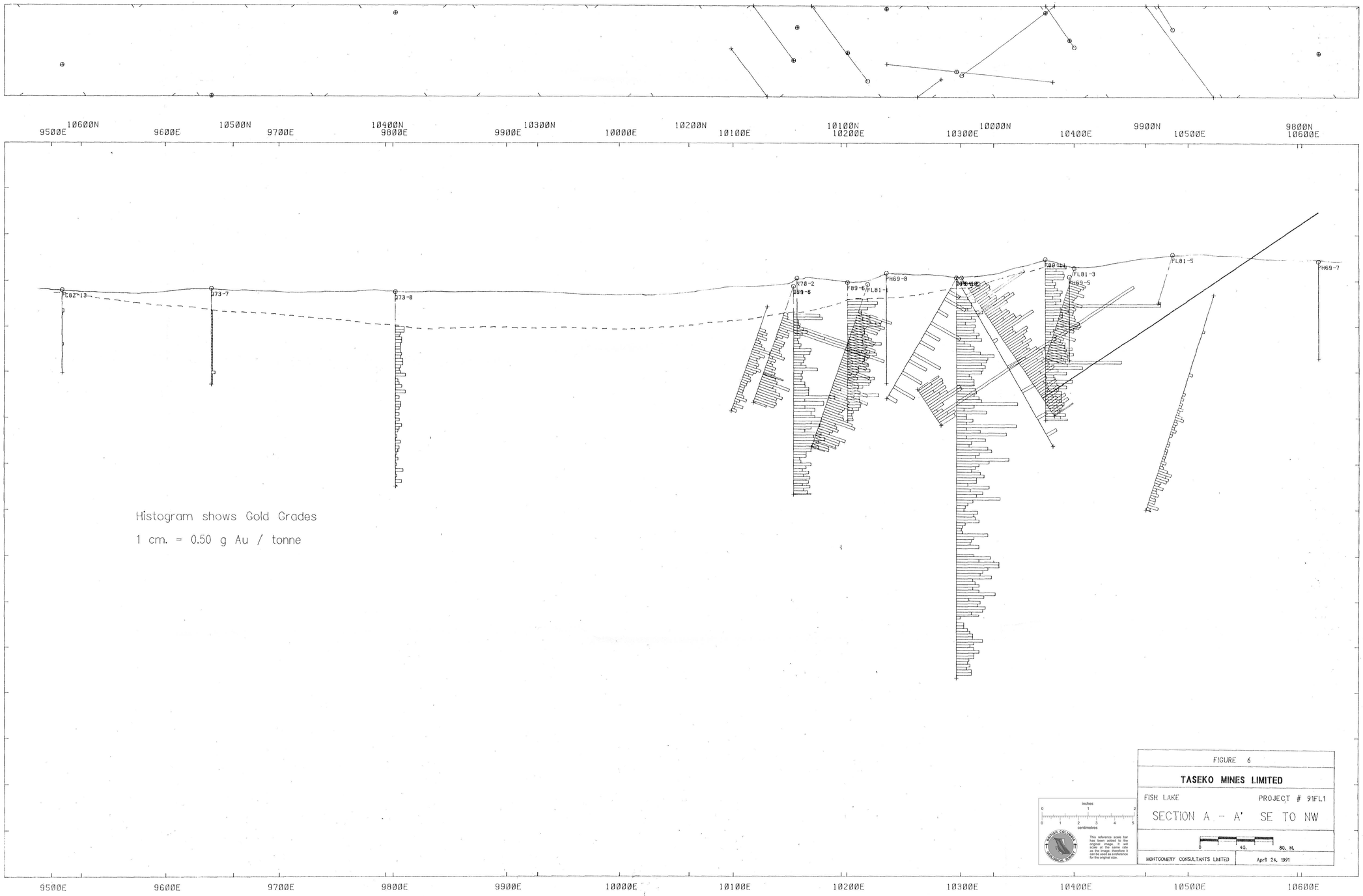
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9500E
9600E
10500N
9700E
10400N
9800E
9900E
10300N
10000E
10200N
10100E
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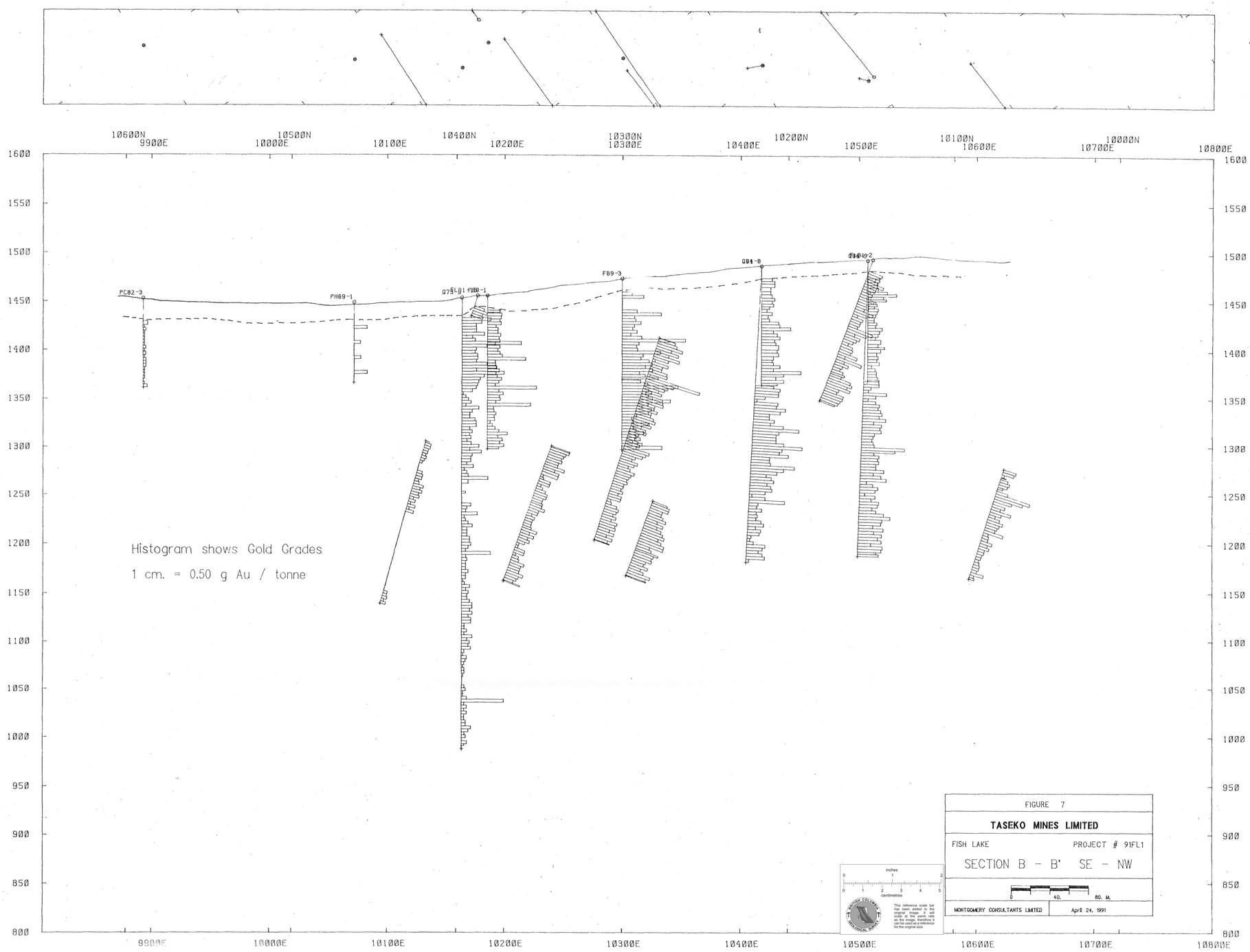
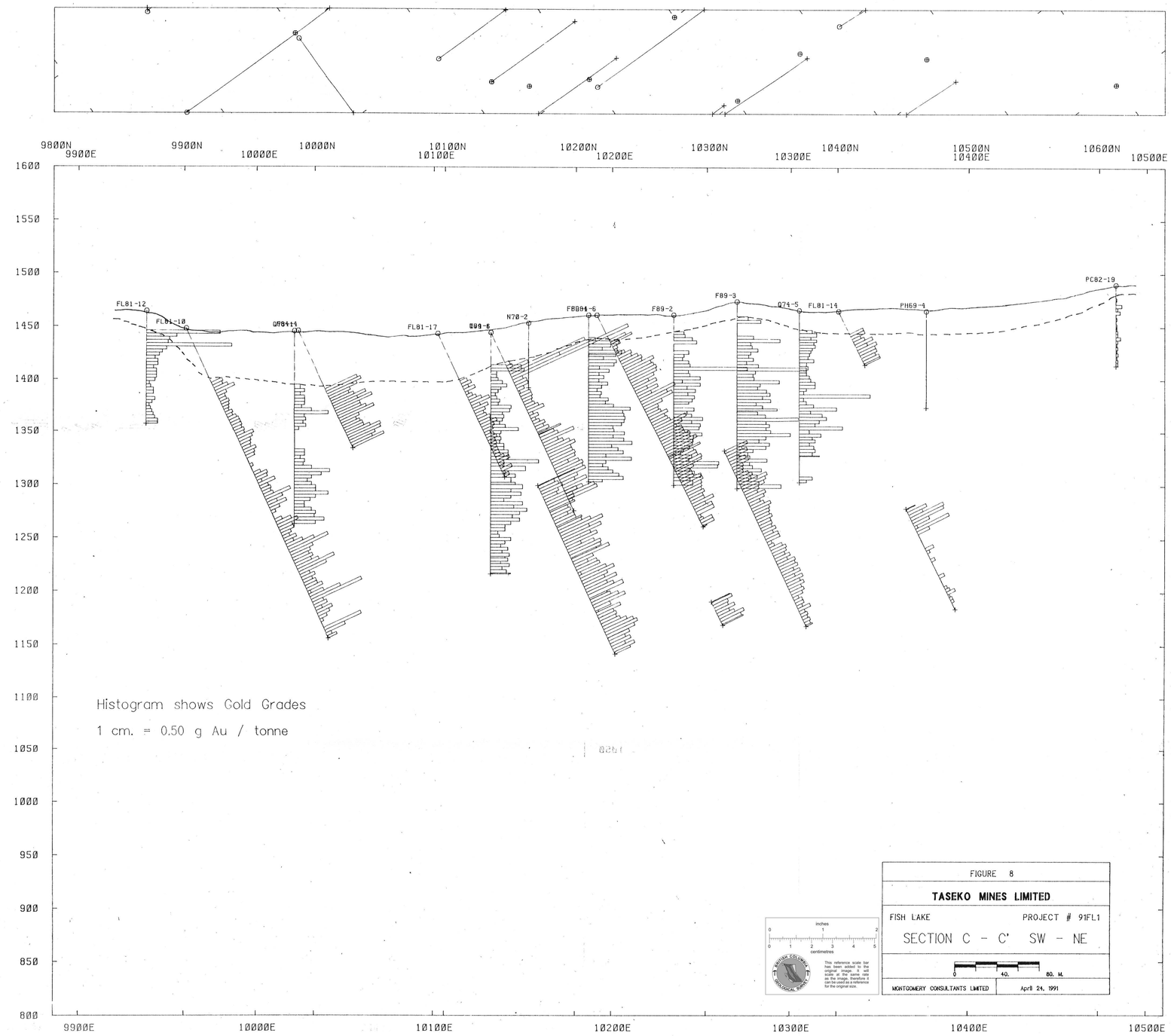
10200E
10000N
10300E
9900N
10400E
9800N
10500E
10600E
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
C82-13
D73-7
D73-8
D70-2
D89-6
F89-6/FL81-1
PH69-8
FL81-3
PH69-5
FL81-5
PH69-7
Histogram shows Gold Grades
1 cm. = 0.50 g Au / tonne
inches
centimetres
This reference scale bar has been added to the original image. It will not appear on any prints as the image, therefore it can be used as a reference for the original size.
FIGURE 6
TASEKO MINES LIMITED
FISH LAKE
PROJECT # 91FL1
SECTION A - A' SE TO NW
40.
80. M.
MONTGOMERY CONSULTANTS LIMITED
April 24, 1991


10600N
9900E
10500N
10000E
10100E
10400N
10200E
10300N
10300E
10400E
10200N
10500E
10100N
10600E
10000N
10700E
10800E
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
PC82-3
PH89-1
F89-3
Histogram shows Gold Grades
1 cm. = 0.50 g Au / tonne
FIGURE 7
TASEKO MINES LIMITED
FISH LAKE
PROJECT # 91FL1
SECTION B - B' SE - NW
0 40. 80. M.
MONTGOMERY CONSULTANTS LIMITED
April 24, 1991
inches
centimetres
This reference scale bar has been added to the original drawing. When the original is scanned at the same rate as the image, therefore it can be used as a reference for the original size.


9800N
9900E
9900N
10000E
10000N
10100N
10100E
10200N
10200E
10300N
10300E
10400N
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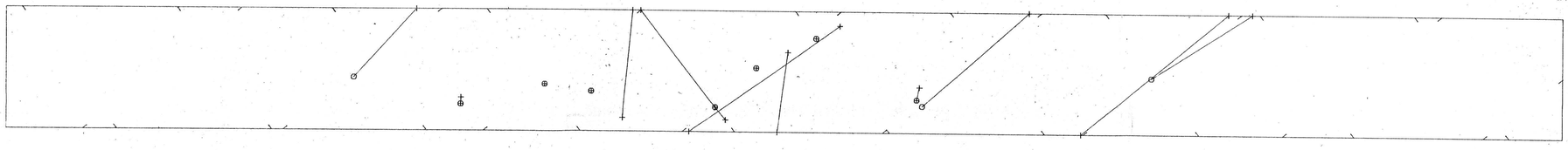
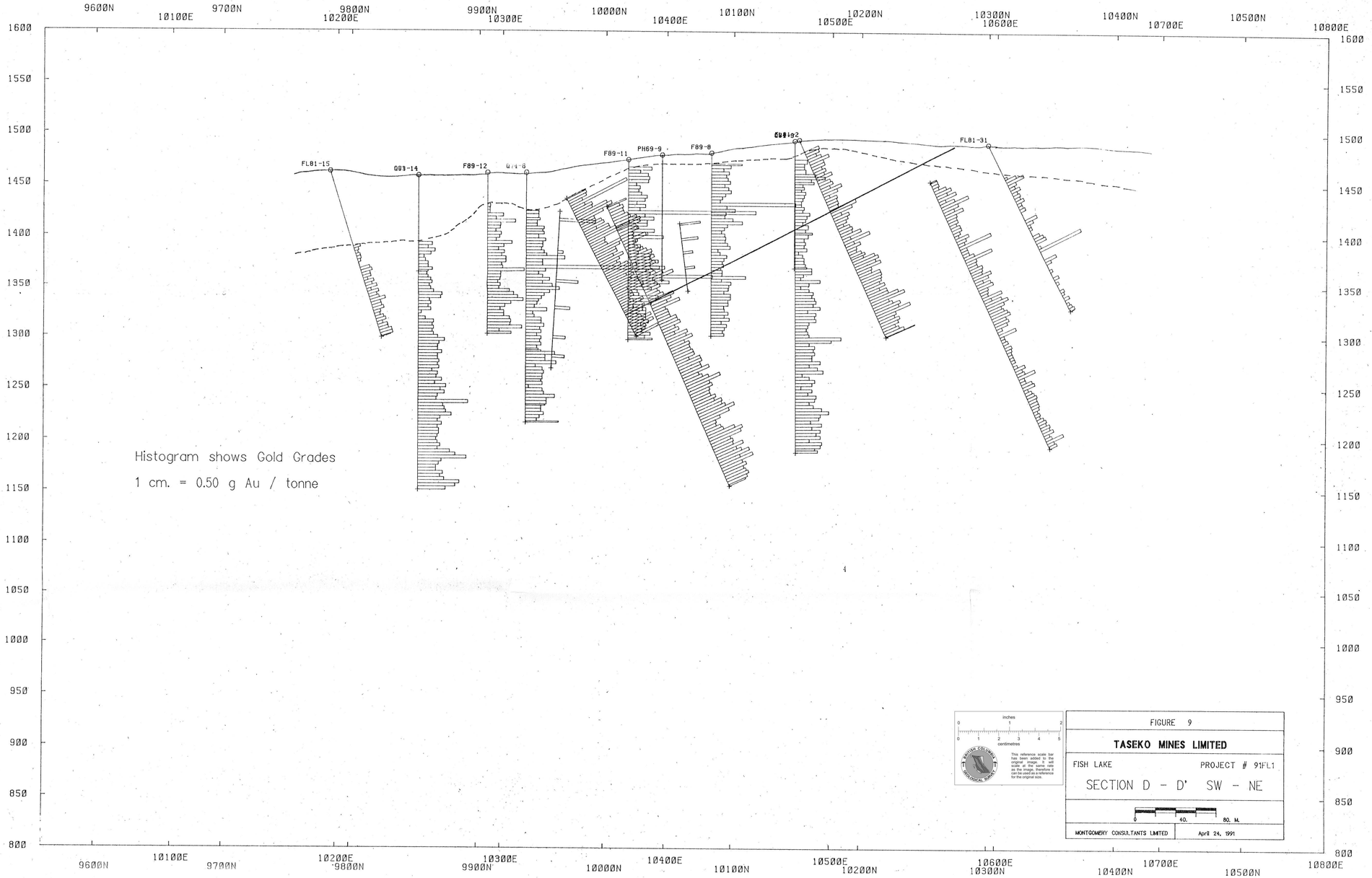
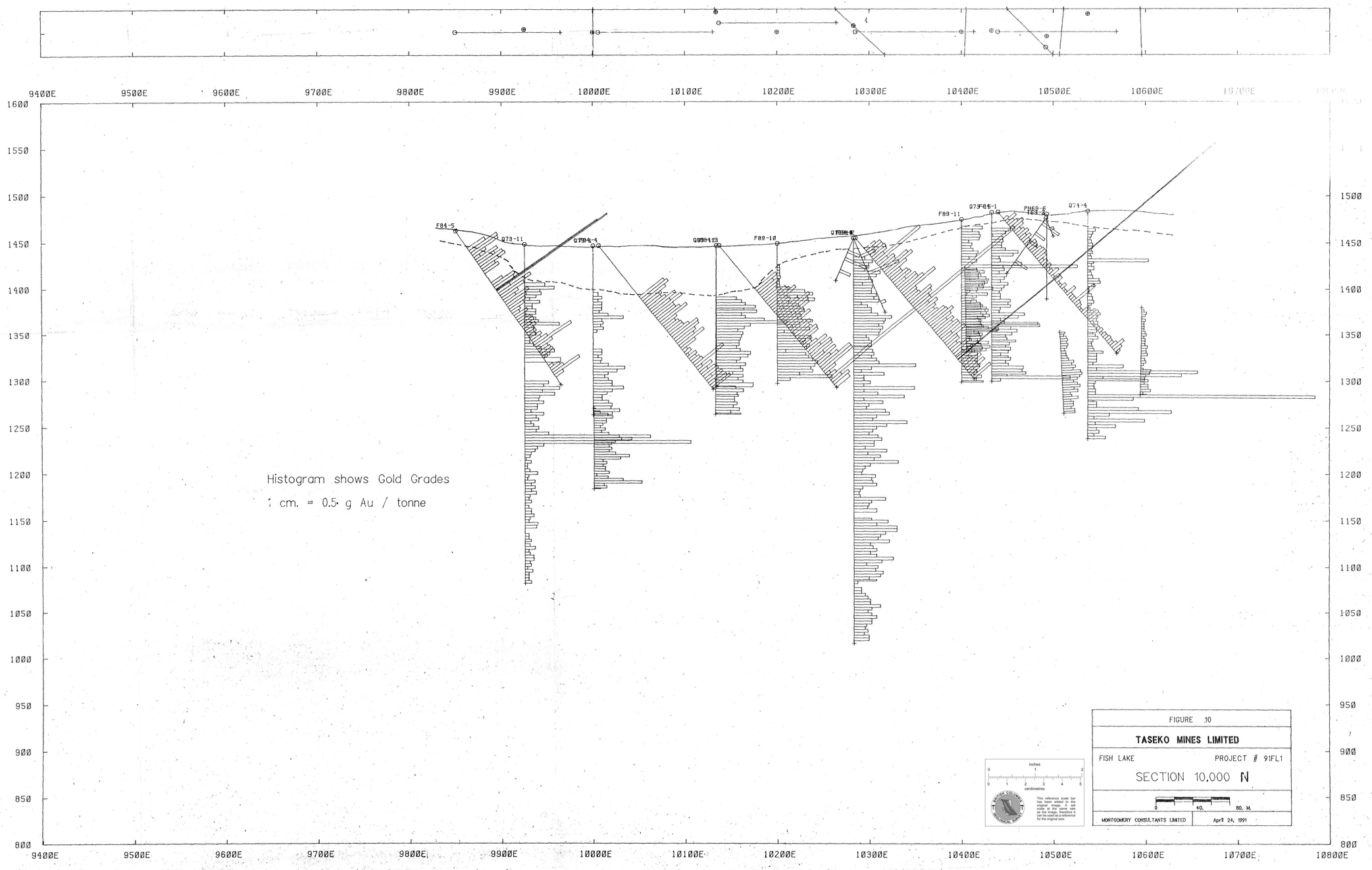
10400E
10600N
10500E
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
FL81-12
FL81-10
QP84-14
FL81-17
FB84-5
N70-2
FB84-6
F89-2
F89-3
Q74-5
FL81-14
PH69-4
PC82-19
Histogram shows Gold Grades
1 cm. = 0.50 g Au / tonne
FIGURE 8
TASEKO MINES LIMITED
FISH LAKE
PROJECT # 91FL1
SECTION C - C' SW - NE
0 40. 80. M.
MONTGOMERY CONSULTANTS LIMITED
April 24, 1991
inches
centimetres
This reference scale bar has been added to the original image. It will change if the image is resized as the image, therefore it can be used as a reference for the original size.




9600N
10100E
9700N
9800N
10200E
9900N
10300E
10000N
10400E
10100N
10200N
10500E
10300N
10600E
10400N
10700E
10500N
10800E
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
FL81-15
Q83-14
F89-12
Q84-6
F89-11
PH69-9
F89-8
Q84-2
FL81-31
Histogram shows Gold Grades
1 cm. = 0.50 g Au / tonne
inches
centimetres
This reference scale bar has been added to the original image. It will print to the same scale as the image, therefore it can be used as a reference for the original size.
FIGURE 9
TASEKO MINES LIMITED
FISH LAKE
PROJECT # 91FL1
SECTION D - D' SW - NE
0 40. 80. M.
MONTGOMERY CONSULTANTS LIMITED
April 24, 1991


9400E
9500E
9600E
9700E
9800E
9900E
10000E
10100E
10200E
10300E
10400E
10500E
10600E
10700E
10800E
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
F84-5
Q73-11
Q73F84-4
F89-10
F89-11
Q73F85-1
PH89-6
Q74-4
Histogram shows Gold Grades
1 cm. = 0.5 g Au / tonne
inches
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the original and can be used as a reference for the original size.
FIGURE 10
TASEKO MINES LIMITED
FISH LAKE
PROJECT # 91FL1
SECTION 10,000 N
0
40.
80. M
MONTGOMERY CONSULTANTS LIMITED
April 24, 1991