

REPORT ON
VLF ELECTROMAGNETIC SURVEY
ON THE
HAT CREEK PROPERTY
KAMLOOPS MINING DIVISION, B.C.

ON BEHALF OF
DOLMAGE CAMPBELL & ASSOCIATES

by

RICHARD O. CROSBY

October 5, 1976

Location -- About 18 miles west of Cache Creek,
B.C., about 2 miles south of Highway 12.

Dates -- August 26 - September 9, 1976

Richard O. Crosby & Associates

CONSULTING GEOPHYSICISTS

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INTRODUCTION

During the period August 26 to September 9, 1976 a VLF-EM survey was conducted over a portion of the Hat Creek No 1 Coal Deposit on behalf of Dolmage Campbell & Associates Ltd.

The area is located about 18 miles west of Cache Creek, B.C., and 2 miles south of Highway 12.

The purpose of the survey was to locate conductive zones which would assist in the structural interpretation of the area. Previous geophysical surveys including gravity, magnetic, induced polarization and electromagnetic have been conducted over portions of the property with varying degrees of success.

The survey was conducted employing the radiation from NPG, Jim Creek, Washington transmitter as the primary signal. Three profiles were also surveyed using the transmitter located at Cutler, Maine.

Signals from the Maine station were suppressed by the Seattle transmissions and after completion of the three profiles mentioned above, no further readings were attempted.

PRESENTATION OF RESULTS

The VLF-EM results are shown as profiles at a horizontal scale of 1" = 100 feet. Two profiles are shown on each sheet. The Cutler, Maine data are included after the Seattle profiles. The vertical scale is 40% per inch. Plate 1, at a scale of 1" = 400 feet shows the filtered data in contour form. The contour interval is 10%.

Plate 2, at a scale of 1" = 400 feet, shows the structural interpretation of the data.

A tabulation of the observed VLF-EM data is included as Appendix A to this report.

DISCUSSION OF RESULTS

Linear conductive zones and interpreted lineaments are shown on Plate 2. The conductive zones are reflected by measurements of vertical distortions of a horizontal magnetic field whose source, Seattle, Wa., is very nearly south so that the responses from conductors with that orientation are predominant.

The interpreted lineaments were selected on a basis of lateral movement on termination of conductive zones.

The frequency of the transmitted signal is relatively high (18.6 khz for Seattle) and E.M. 16 measurements are therefore sensitive to changes in conductivity in fault zones, flat lying surface conductors as well as mineralogical metallic targets. Penetration is usually no more than 200 feet subsurface.

Generally the map area, with respect to the EM-16 data is quite disturbed. Five major directions of faulting are inferred.

- (1) N - S : best shown along the west end of L82000 - L81250.
- (2) NE-SW : see interpreted lineaments in the centre of the northern half of the grid.

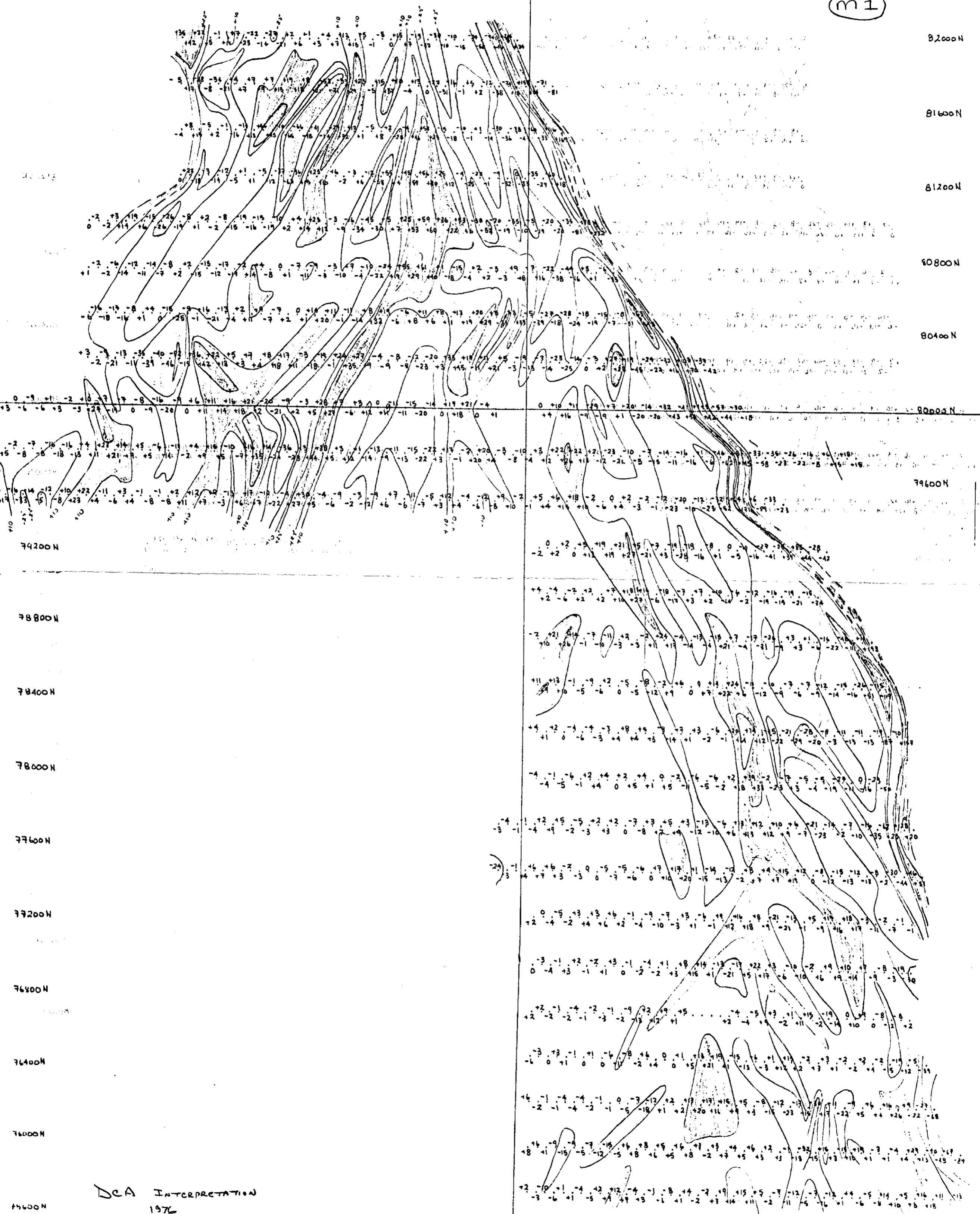
- (3) Approximately E - W : see interpreted faults in the northern part of the southern half of the grid.
- (4) NNE - SSW : see conductive zones around 20300E on lines L77500 - L77250.
- (5) NNW - SSE.

The area lying immediately west of the power line and extending northward along the eastern edge of the property is unique in that very few conductors were recorded. This is due to the fact that strong signals from the power line suppress any responses from near-by conductors. However, a small distortion of the power line response is noted on L800750 about station 20400E. The barbed wire fences on the property did not affect the EM-16 readings.

Because readings are attenuated with depth, an apparent increase in overburden thickness is indicated in the southern portion of the grid, where the conductors have amplitudes of less than 30% (one exception), while the anomalies in the northern part have a mean amplitude somewhat higher.

17.00 17600 18000 18400 18800 19200 19600 20000 20400 20800 21200 21600 22000 22400

m1



17 000

18 000

19 000

20 000

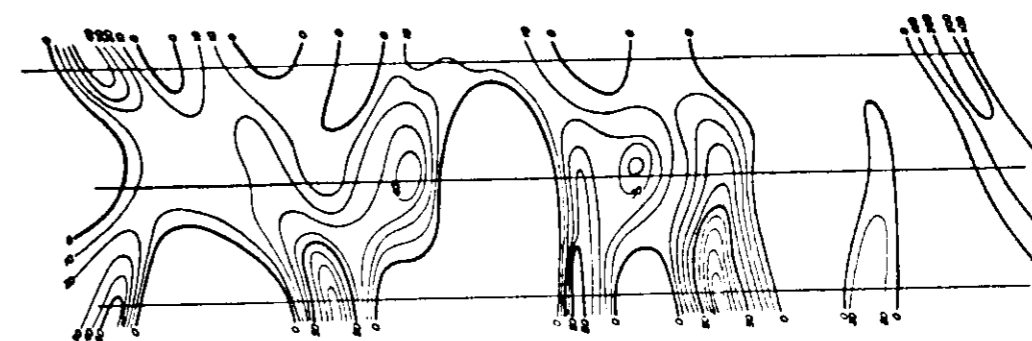
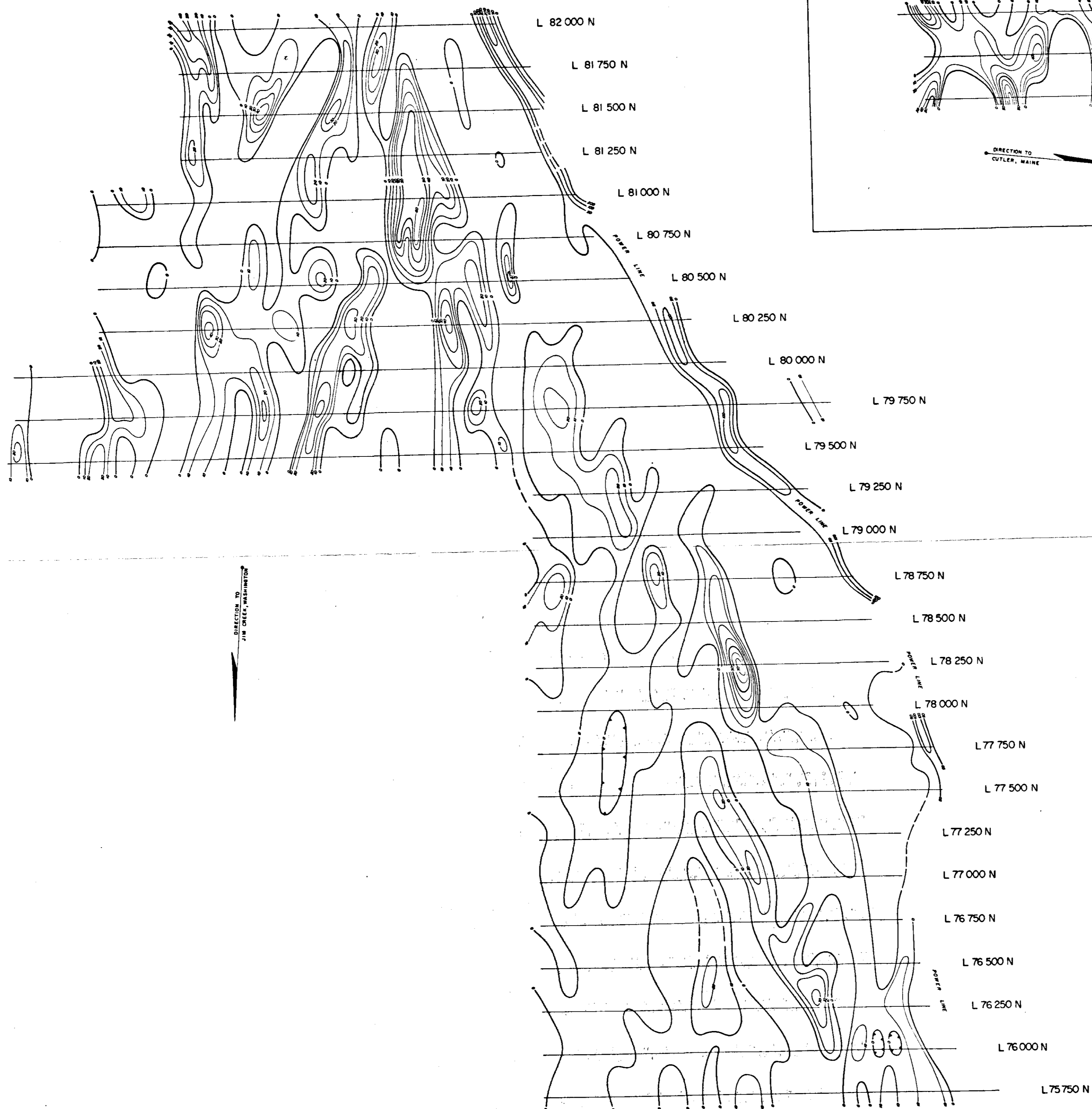
21 000

18 000

19 000

20 000

m2

FRASER FILTERED DATA
E.M. - 16ELECTROMAGNETIC DATA
CUTLER, MAINE 178 KHz

SCALE: 1" = 400'

FEET 0 250 500 750

PLATE I

 DOLMAGE, CAMPBELL
 &
 ASSOCIATES LIMITED

 HAT CREEK PROPERTY
 CACHE CREEK AREA, KAMLOOPS M.D. B.C.

CONTOUR PLAN

FILTERED

E.M. 16

ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:

1 inch = 400 feet

FEET 0 250 500 750 1000

DATE OCT. 5, 1976

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17 000

18 000

19 000

20 000

21 000

22 000

23 000

17000

18000

19000

20000

21000

18000

19000

20000

m3

L 82 000 N

L 81 750 N

L 81 500 N

L 81 250 N

L 81 000 N

L 80 750 N

L 80 500 N

L 80 250 N

L 80 000 N

L 79 750 N

L 79 500 N

L 79 250 N

L 79 000 N

L 78 750 N

L 78 500 N

L 78 250 N

L 78 000 N

L 77 750 N

L 77 500 N

L 77 250 N

L 77 000 N

L 76 750 N

L 76 500 N

L 76 250 N

L 76 000 N

L 75 750 N

L 82 000 N

L 81 750 N

L 81 500 N

STRUCTURAL INTERPRETATION

E.M. -16

ELECTROMAGNETIC DATA
CUTLER, MAINE 178 KHz

SCALE: 1" = 400'

FEET 0 250 500 750

DIRECTION TO
CUTLER, MAINE

INTERPRETATION LEGEND



FAULT



CONDUCTIVE ZONE

DIRECTION TO
JIM CREEK, WASHINGTON

PLATE 2

DOLMAGE, CAMPBELL
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ASSOCIATES LIMITEDHAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS B.C.

STRUCTURAL INTERPRETATION

E.M. 16

ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:

1 inch = 400 feet

FEET 0 250 500 750 1000

DATE OCT. 5, 1976

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17000

18000

19000

20000

21000

22000

23000

M4

DOLMAGE, CAMPBELL
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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 82 000 N
LINE No. - 81 750 N

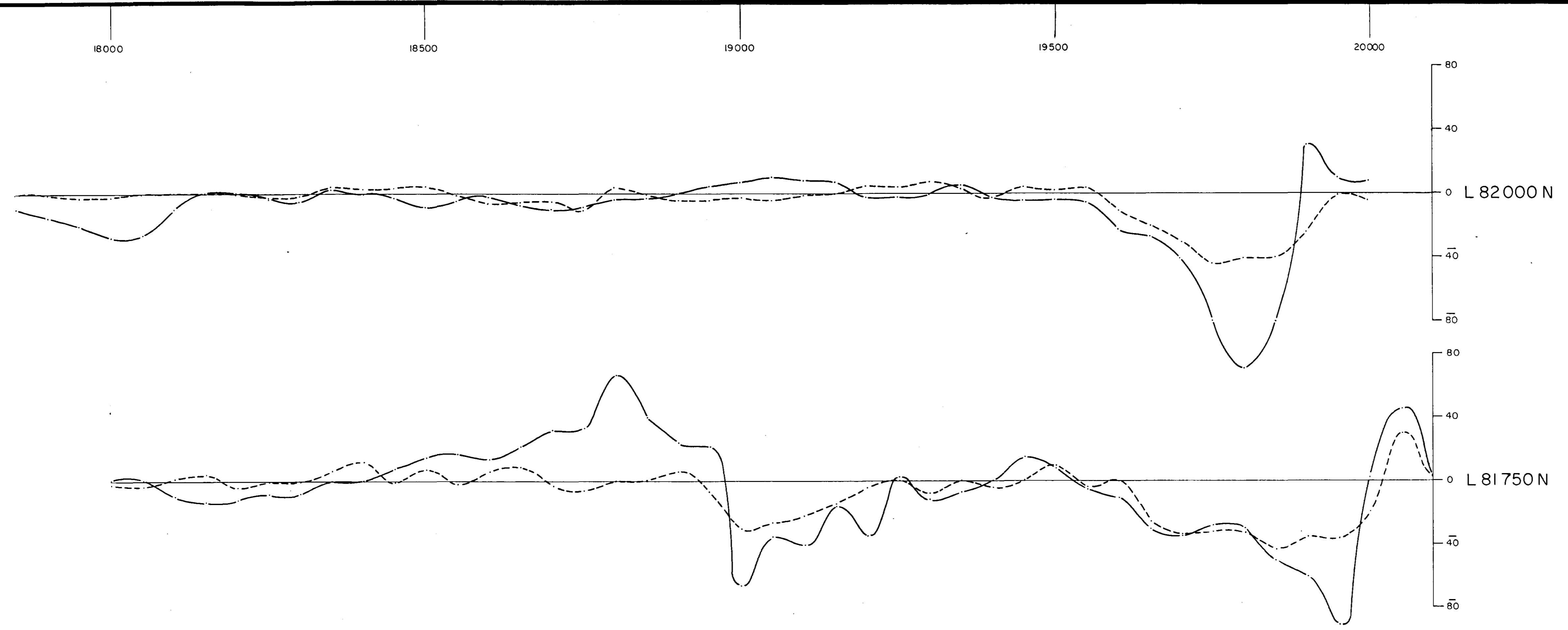
E.M. 16
ELECTRO MAGNETIC SURVEY
CUTLER MAINE 17.8 KHz

Scale:
1 inch = 100 feet

— · — · — IN PHASE %
- - - - - OUT OF PHASE %

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ms

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - L 81 500 N
LINE No. - L 81 250 N

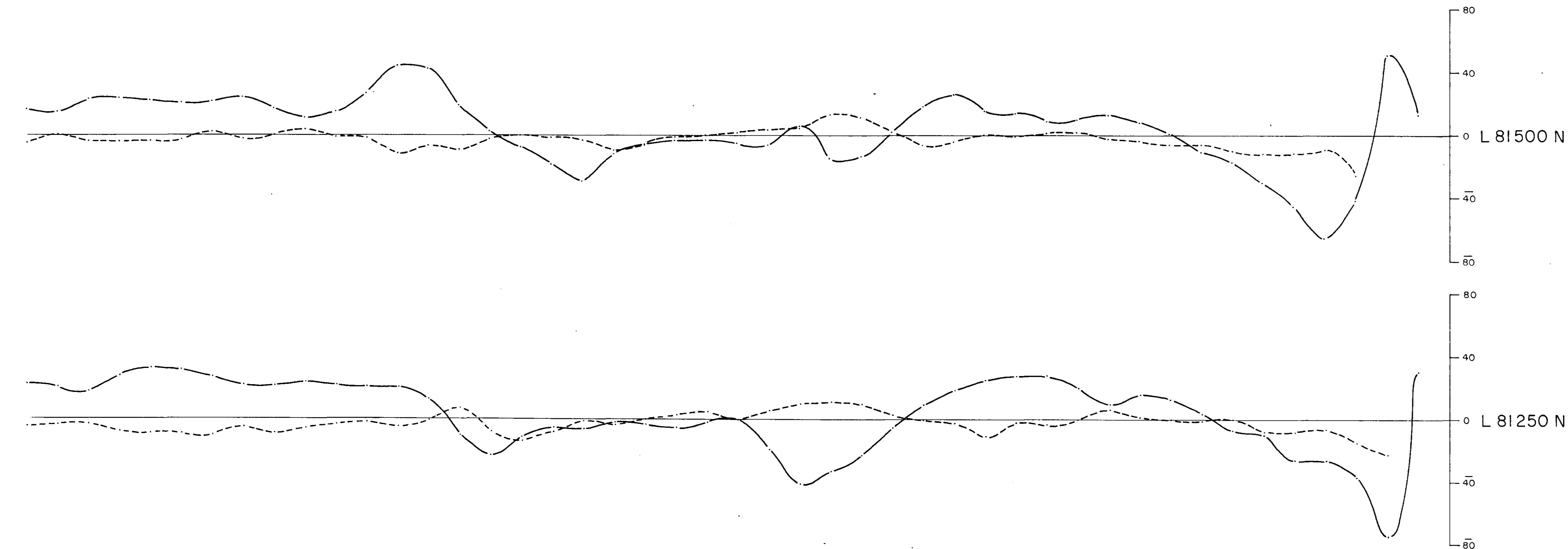
E.M. 16
ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

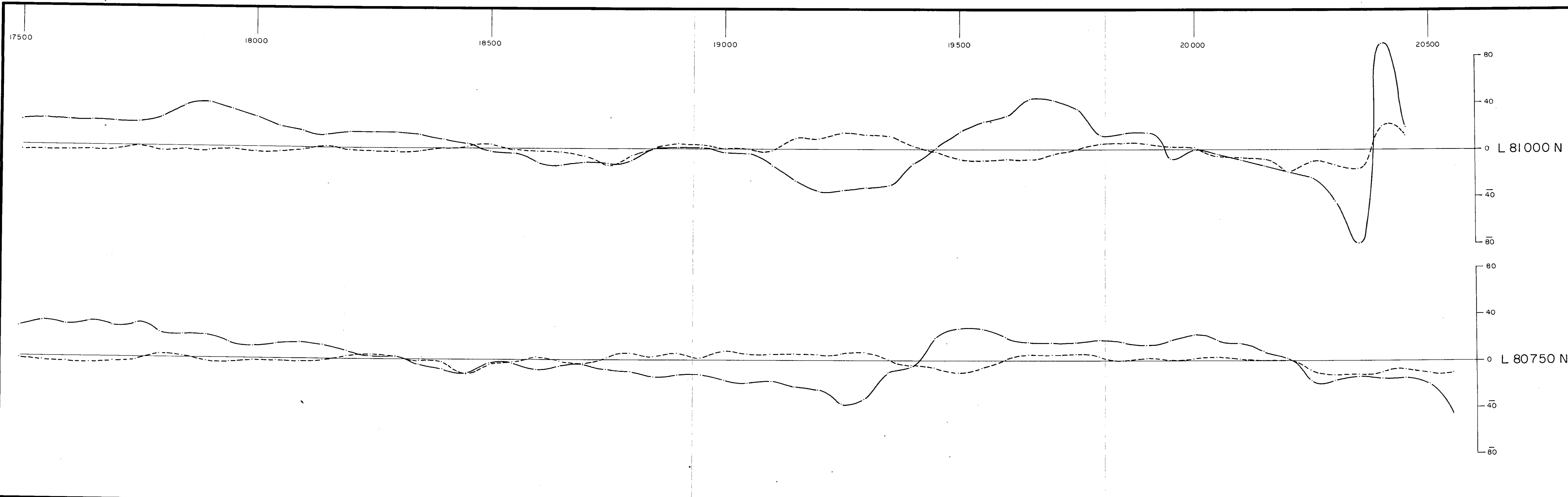
Scale:
1 inch = 100 feet

— · — · — IN PHASE %
- - - - - OUT OF PHASE %

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mb

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 81000 N

LINE No. - 80750 N

E.M. 16
ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:
1 inch = 100 feet

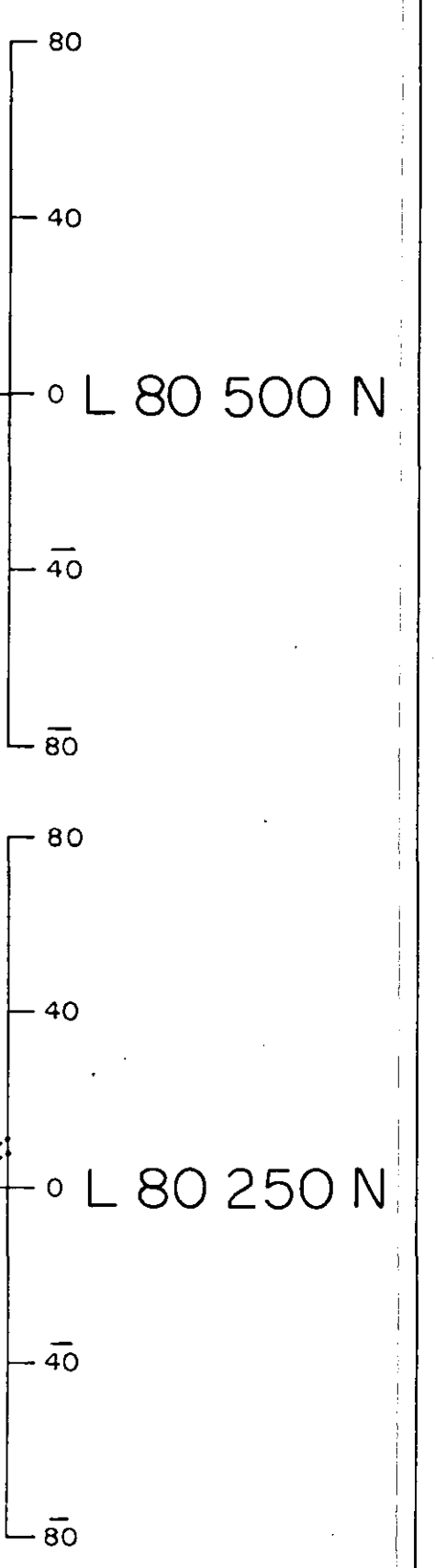
— IN PHASE %
- - - OUT OF PHASE %

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L 80 500 N

L 80 250 N



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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - L 80 500 N
LINE No. - L 80 250 N

E.M. 16
ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:
1 inch = 100 feet

— IN PHASE %
- - - OUT OF PHASE %

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AW

L 80 000 N

L 79 750 N

L 79 750N

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 80000 N
LINE No. - 79750 N

E.M. 16
ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

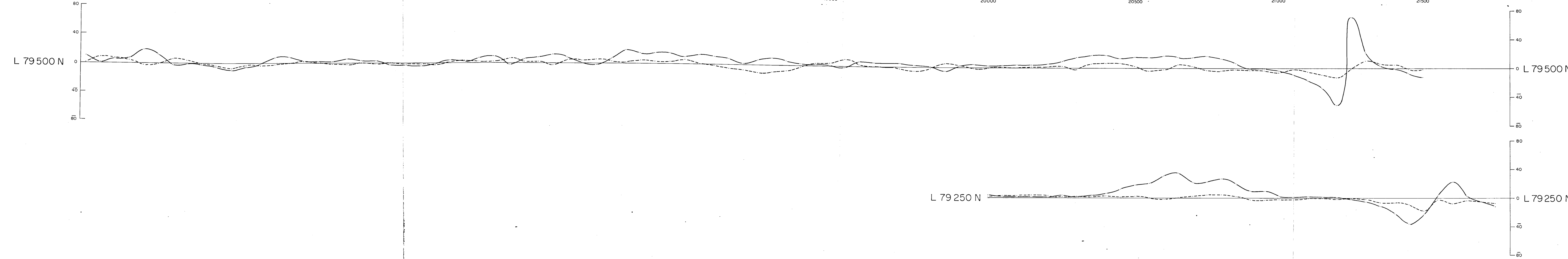
Scale:
1 inch = 100 feet

— IN PHASE %
- - - OUT OF PHASE %

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - L 79500 N
LINE No. - L 79250 N

E.M. 16
ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

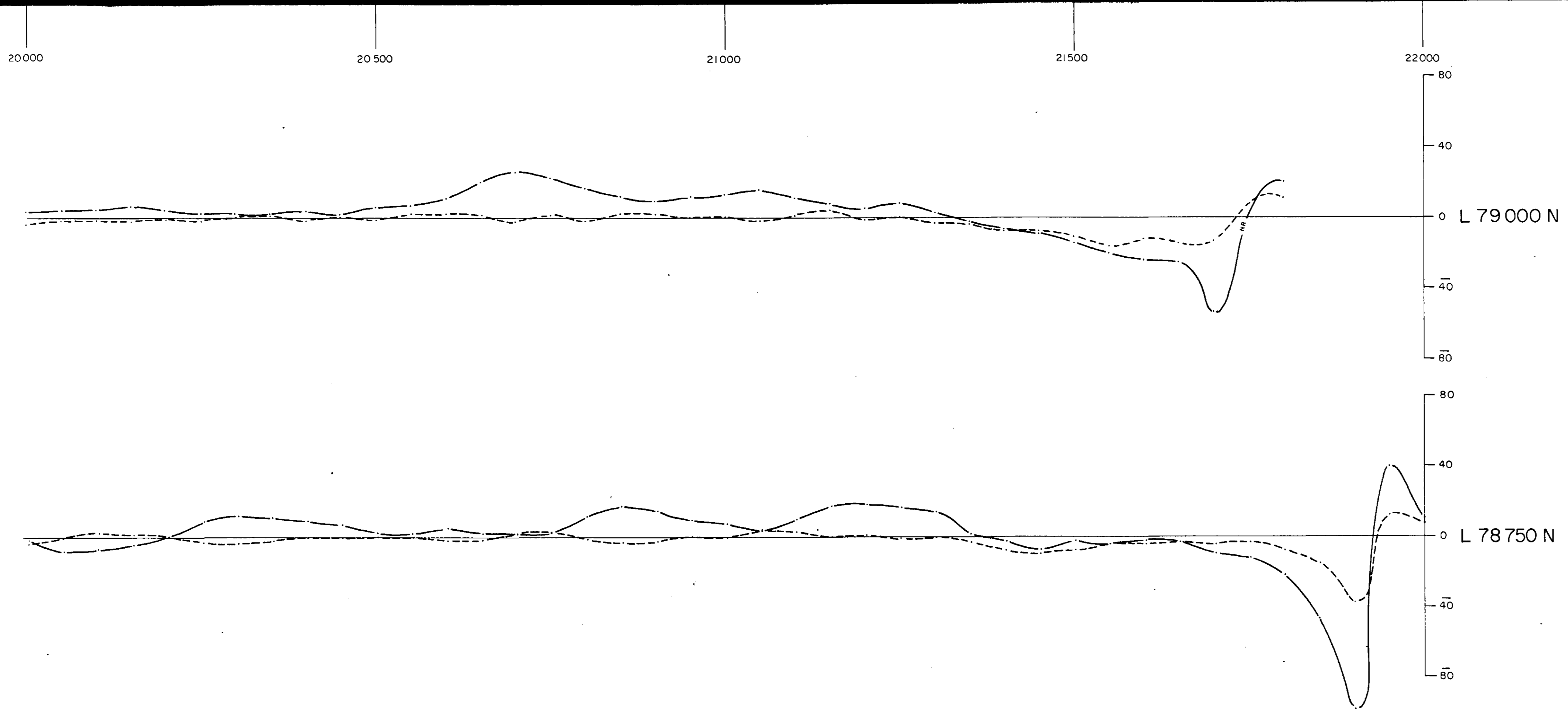
Scale:
1 inch = 100 feet

— IN PHASE %
- - - OUT OF PHASE %

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109



mid

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 79000 N
LINE No. - 78750 N

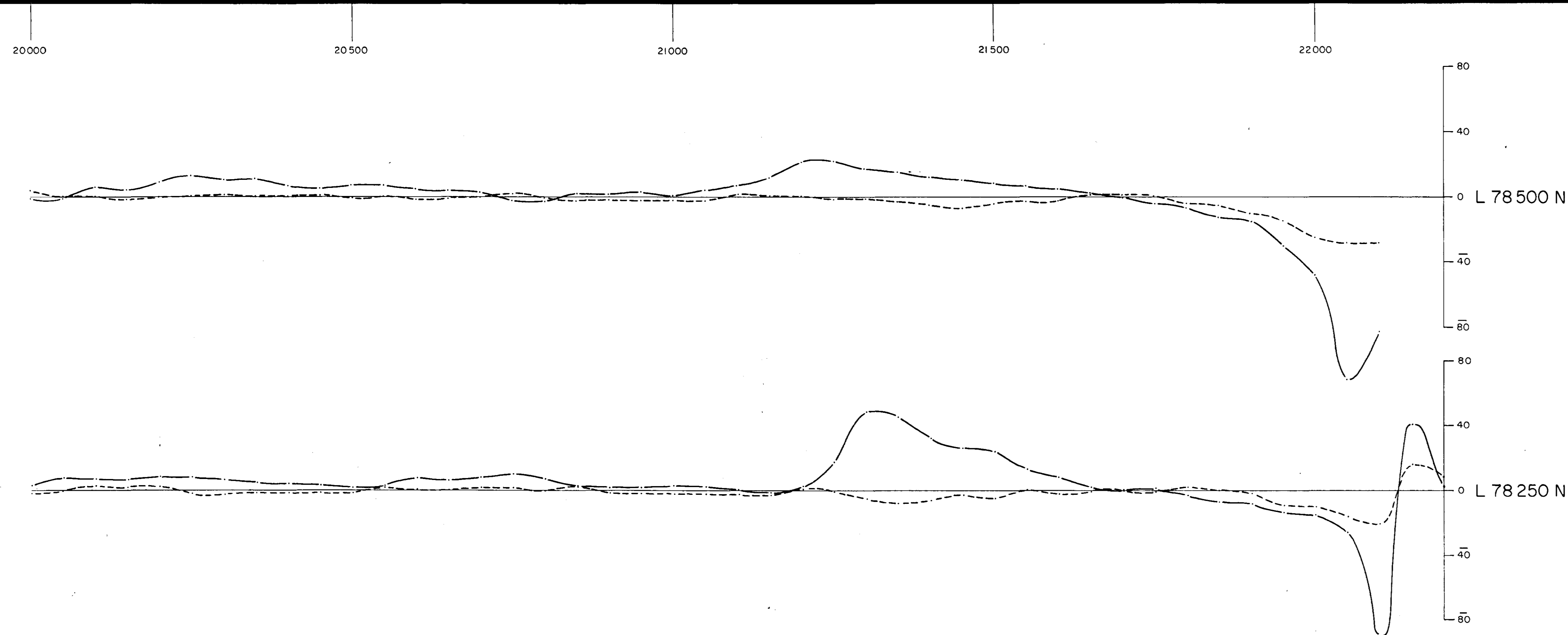
E.M. 16
ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:
1 inch = 100 feet

— · — · — · IN PHASE %
- - - - - OUT OF PHASE %

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 78500 N

LINE No. - 78250 N

E.M. 16

ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

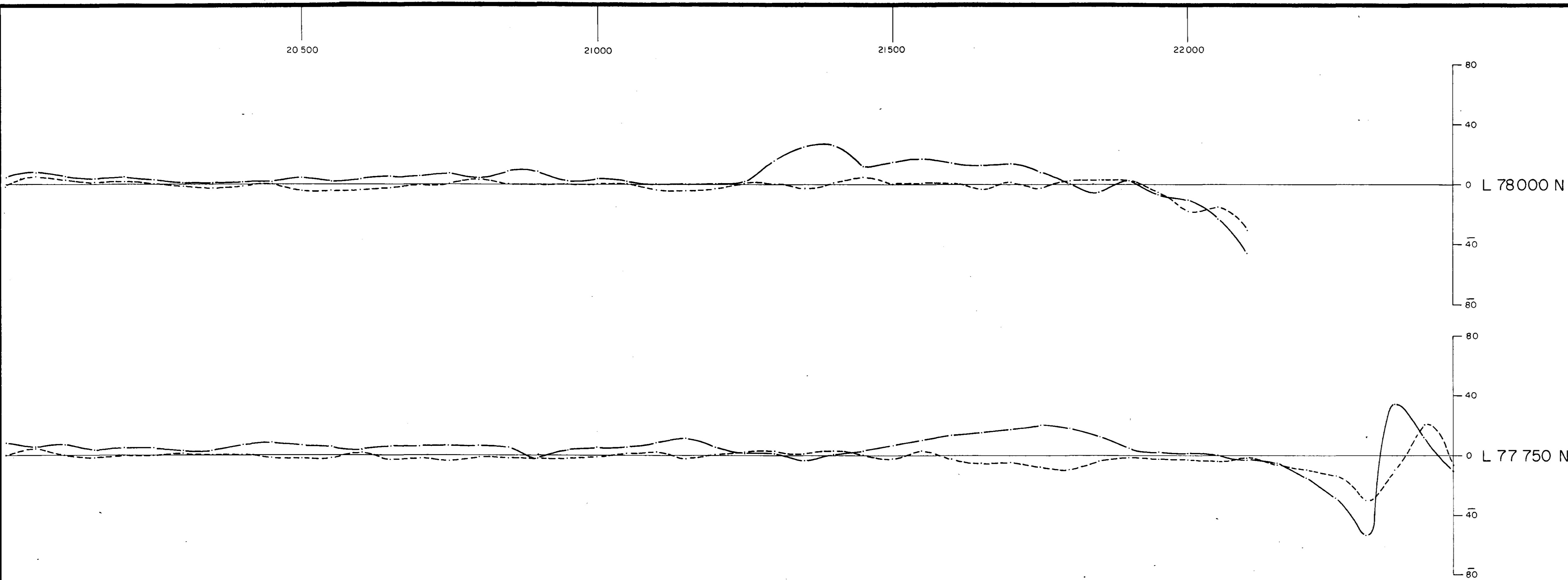
Scale:

1 inch = 100 feet

— · — · — IN PHASE %
- - - - - OUT OF PHASE %

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 78000 N

LINE No. - 77750 N

E.M. 16

ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

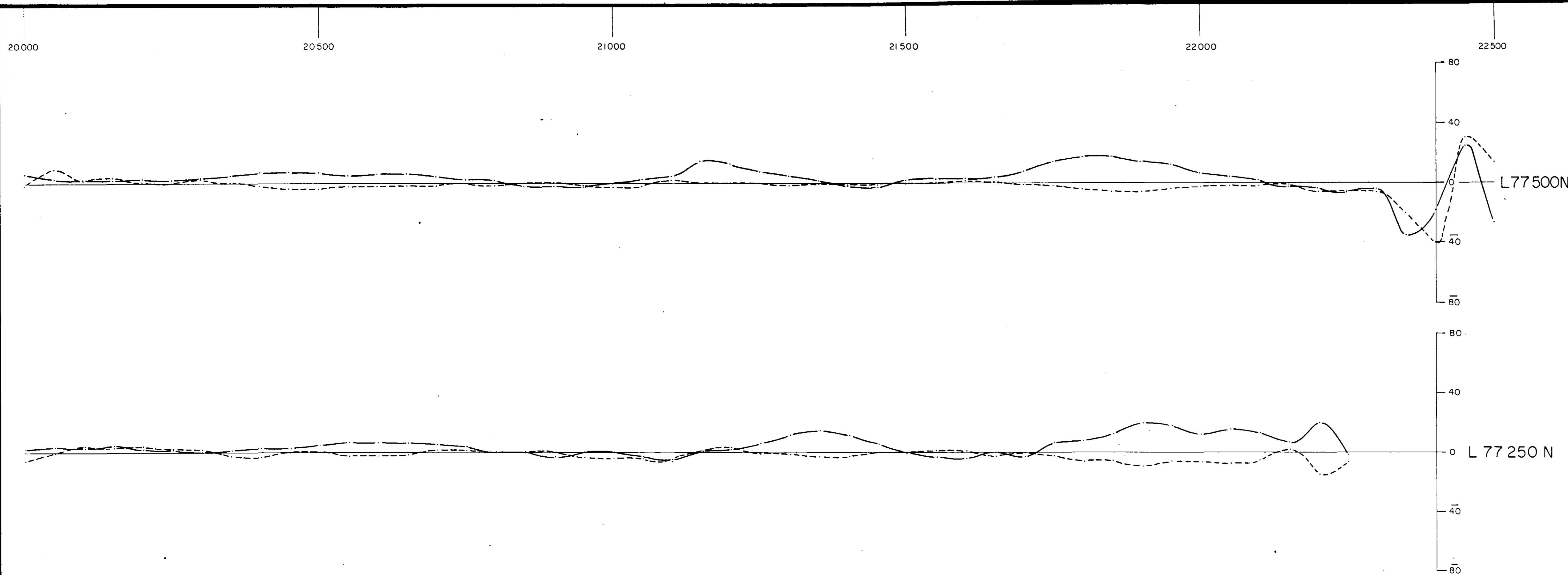
Scale:

1 inch = 100 feet

— · — · — · IN PHASE %
- - - - - OUT OF PHASE %

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 77500N

LINE No. - 77250N

E.M. 16
ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:
1 inch = 100 feet

— · — · — IN PHASE %
- - - - - OUT OF PHASE %

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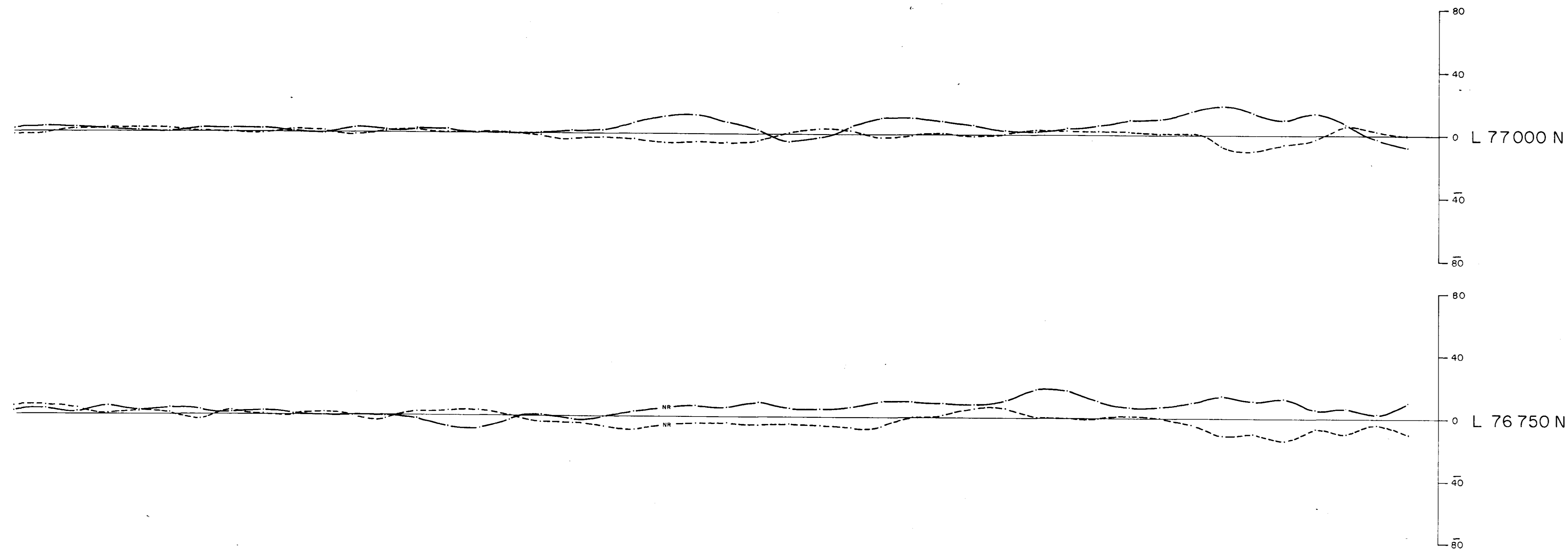
20 000

20 500

21 000

21 500

22 000



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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 77 000 N

LINE No. - 76 750 N

E.M. 16

ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

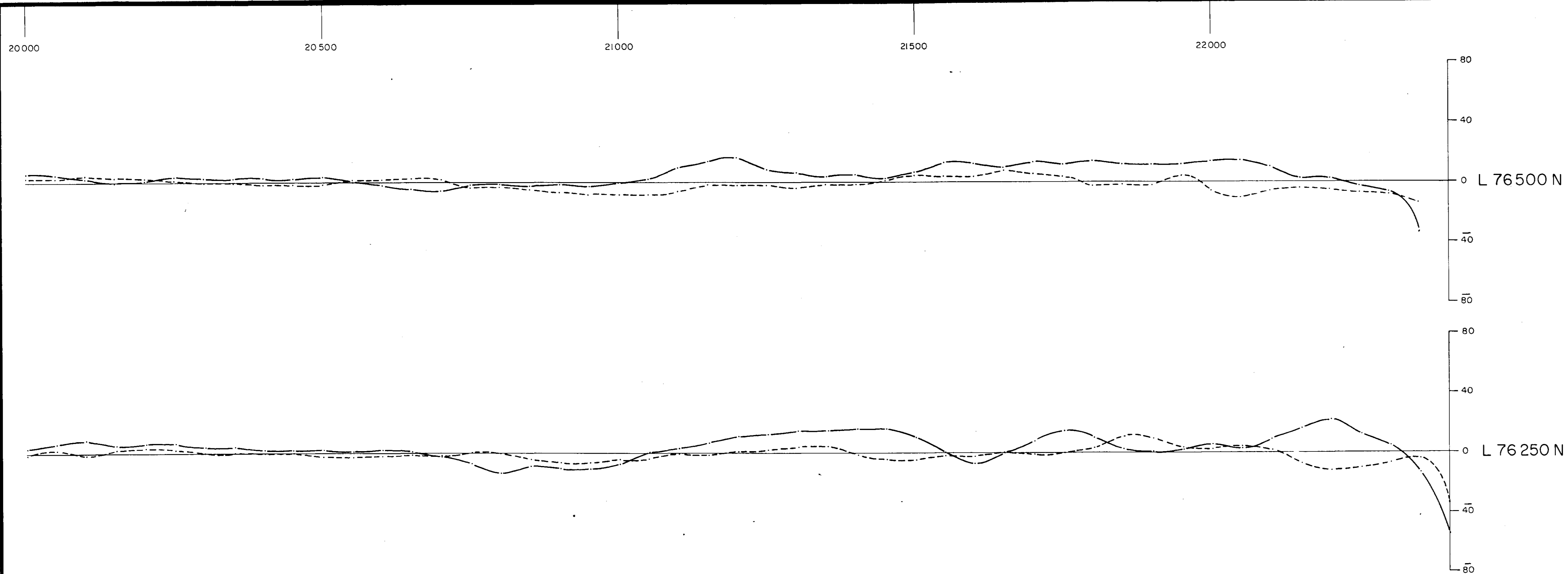
Scale:

1 inch = 100 feet

— · — · — IN PHASE %
- - - - - OUT OF PHASE %

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 76500 N

LINE No. - 76250 N

E.M. 16

ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:

1 inch = 100 feet

— · — · — IN PHASE %

- - - - - OUT OF PHASE %

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20000

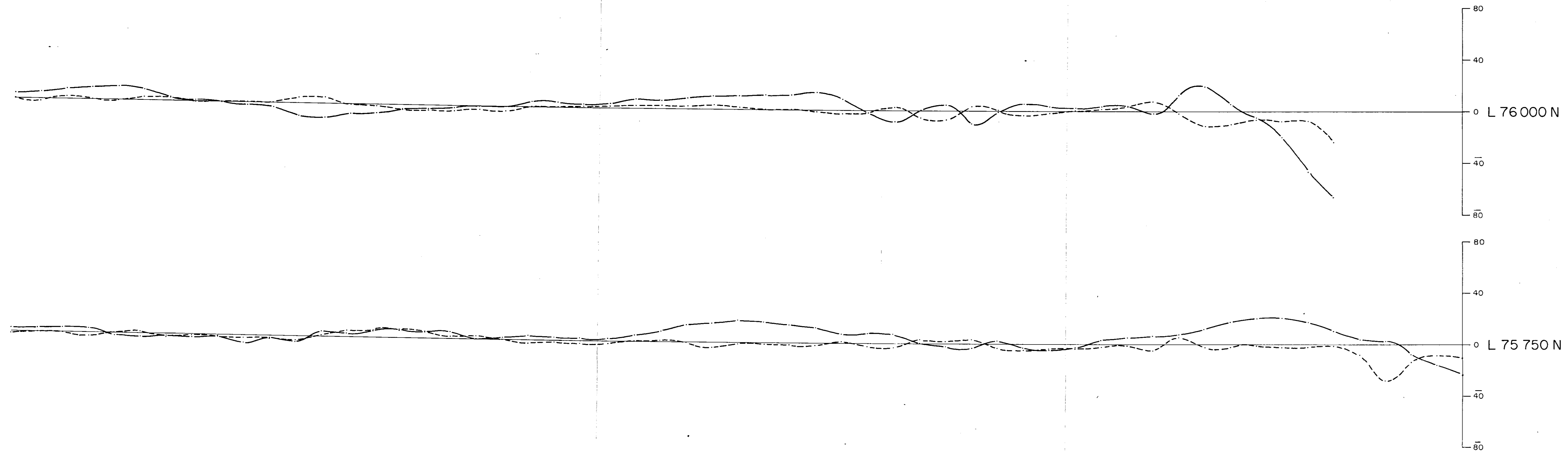
20500

21000

21500

22000

22500

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HAT CREEK PROPERTY
CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 76 000 N

LINE No. - 75 750 N

E.M. 16

ELECTRO MAGNETIC SURVEY
SEATTLE 18.6 KHz

Scale:

1 inch = 100 feet

— IN PHASE %
- - - OUT OF PHASE %

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18000

18500

19000

19500

20000

80

40

0

-40

-80

80

40

0

-40

-80

L 82 000 N

L 81750 N

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HAT CREEK PROPERTY
 CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - L 82000 N

LINE No. - L 81750 N

E.M. 16

ELECTRO MAGNETIC SURVEY
 SEATTLE 18.6 KHz

Scale:

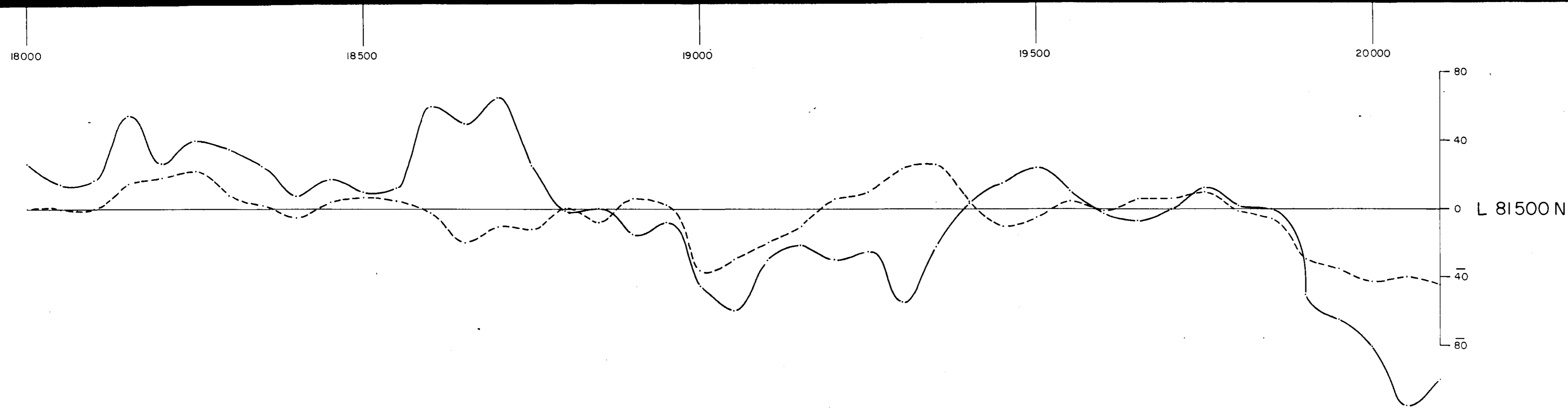
1 inch = 100 feet

— · — · — IN PHASE %

- - - - - OUT OF PHASE %

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HAT CREEK PROPERTY
 CACHE CREEK AREA, KAMLOOPS M.D. B.C.

LINE No. - 81500 N

LINE No. -

E.M. 16
 ELECTRO MAGNETIC SURVEY
 CUTLER MAINE 17.8 KHz

Scale:
 1 inch = 100 feet

— · — · — IN PHASE %
 - - - - - OUT OF PHASE %

DATE OCT. 5, 1976

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