COMINCO LTD.

EXPLORATION WESTERN DISTRICT

NTS: 82-F/1

HORIZONTAL LOOP EM AND MAGNETIC SURVEYS ON SHA CLAIMS 1, 2, 7 and 8

- ASSESSMENT REPORT -

NELSON AND FORT STEELE MINING DIVISIONS, B.C.

	Latitude	Longitude
SHA 1 and 2	49°9'N	116°17'W
SHA 7 and 8	49°4'N	116°15'W

CLAIM OWNER AND OPERATOR : COMINCO LTD.

APRIL 1983

J.J. LAJOIE, Ph.D., P.Eng
COMINCO LTD.

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EXPLORATION WESTERN DISTRICT

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HORIZONTAL LOOP EM AND MAGNETIC SURVEYS ON SHA CLAIMS 1, 2, 7 and 8

INTRODUCTION

The SHA claim group was staked in the spring of 1982 to cover ground underlain by Aldridge stratigraphy which is known to host the Sullivan orebody in Kimberley, B.C. Plate 239-82-1a is a general location map of the SHA claim group. Two areas within this claim group, Birch Creek and Little Moyie River, were chosen for geophysics work and these are shown outlined in the more detailed location map in Plate 239-82-1b.

Six kilometres of horizontal loop EM and magnetometer surveying were completed on the Birch Creek grid on six lines, 300 metres apart. Fifteen kilometres of horizontal loop EM and magnetometer surveying were completed on the Little Moyie River grid on eight lines, 400 metres apart. Nominal station spacing on both grids was 25 metres with more closely spaced stations in the magnetometer survey, where warranted.

FIELD WORK

The horizontal loop (MaxMin) and proton magnetometer (Geometrics G-836) work were completed completed between October 4 and 15, 1982 by J.J. Lajoie, S.J. Visser, B. Price and D. Keith. Access to the Birch Creek grid starts from the small village of Kitchener, about 15 kilometres east of Creston, on Hwy. 3, then easterly on a dirt road on the south side of the CP rail line to the power line right of way near Birch Creek, then up the power line road a short distance. Access to the Little Moyie River grid is via the Carroll Creek gravel road which starts on Hwy. 3 about 6 kilometres northwest of the

junction with Hwy. 95, south to a point about 6 kilometres from Hwy. 3 where a second gravel road branches off to the southeast to follow the Little Moyie River drainage.

The power line on the Birch Creek grid presented noise problems. For the horizontal loop work, this was minimized by exchanging transmitter and receiver positions when passing underneath it so that the receiver was always further from the power line than the transmitter. Readings were sometimes difficult to estimate near the line, especially at 888 Hz. The magnetometer would simply not function for a distance of about 50 metres on either side of the line.

The lines were slope chained. The chainage notes consisting of distance and slope information were supplied by the linecutters. Distance corrections were computed on a programmable hand calculator so that the coil separation of the MaxMin system horizontal loop EM system was always at the nominal 100 metres. However, errors in the chainage data caused some delays and problems.

The magnetometer data were based shifted and drift corrected in the normal manner.

DATA PRESENTATION

The maps and results are presented as follows:-

Plate 239-82-1a (in text)	SHA Claims Location Map scale 1:250,000
Plate 239-82-1b (in text)	Outline of SHA Claims, Birch Creek Grid and Little Moyie River Grid scale 1:50,000
Plate 239-82-2 (in envelope)	Birch Creek Horizontal Loop EM c.s. = 100 m; F = 444 Hz scale 1:5,000; 1 cm = 10%
Plate 239-82-3 (in envelope)	Birch Creek Horizontal Loop EM c.s. = 100 m; F = 888 Hz scale 1:5,000; 1 cm = 10%

Plate 239-82-4 (in envelope)	Birch Creek Horizontal Loop EM c.s. = 100 m; F = 1777 Hz scale 1:5,000; 1 cm = 10%
Plate 239-82-5 (in envelope)	Birch Creek Horizontal Loop EM c.s. = 100 m; F = IP : 1777 - 444 Hz; OP : 1777 Hz scale 1:5,000; 1 cm = 10%
Plate 239-82-6 (in envelope)	Birch Creek Magnetometer Data scale 1:5,000; 1 cm = 200 gammas
Plate 239-82-7 (in envelope)	Little Moyie River Horizontal Loop EM c.s. = 100 m; F = 444 Hz scale 1:5,000; 1 cm = 10%
Plate 239-82-8 (in envelope)	Little Moyie River Horizontal Loop EM c.s. = 100 m; F = 888 Hz scale 1:5,000; 1 cm = 10%
Plate 239-82-9 (in envelope)	Little Moyie River Horizontal Loop EM c.s. = 100 m; F = 1777 Hz scale 1:5,000; 1 cm = 10%
Plate 239-82-10 (in envelope)	Little Moyie River Horizontal Loop EM c.s. = 100 m; F = IP : 1777 - 444 Hz; OP : 1777 Hz scale 1:5,000; 1 cm = 10%
Plate 239-82-11 (in envelope)	Little Moyie River Horizontal Loop EM scale 1:5,000; 1 cm = 100 gammas

INTERPRETATION

1. Birch Creek Grid

The horizontal loop data at frequencies 444, 888, and 1777 Hz are shown in Plates 239-82-2 to 4 respectively. In places, the in-phase data are very noisy, undoubtedly due to poor chainage. This can be verified by subtracting the 444 Hz in-phase from the 1777 Hz in-phase (Plate 239-82-5), resulting in most of the in-phase noise disappearing except in the vicinity of the noisy power line, as can be expected.

There appears to be a very weak conductor at 400E on Line 300N, characterized by a weak out-of-phase response at 888 Hz and 1777 Hz. The in-phase response, if any, is within the noise level and so the conductance must be less than about 0.5 mhos. The conductor is likely due to some weak sulphides.

The magnetic data (Plate 239-82-6) show strong activity west of the baseline. There are no EM responses coinciding with the magnetic responses. The latter may, therefore, be due to an intrusive body on the west side of the baseline.

2. Little Moyie River Grid

The horizontal loop data at the three frequencies of 444 Hz, 888 Hz, and 1777 Hz, are presented in Plates 239-82-7 to 9, respectively. Plate 239-82-10 is a 1777 Hz plot with the 444 Hz in-phase data subtracted in order to help identify those in-phase anomalies resulting from chainage errors. The latter are marked with 'f' in Plate 239-82-8 to indicate false anomalies. The in-phase anomalies at the west end of Lines 1600N and 2400N are also interpreted as false anomalies. Interpretation of conductance and depth to top was made on well-defined anomalies at all three frequencies using standard half plane nomograms. The results are shown above each conductor as conductance in mhos and depth to top in metres. The interpreted parameters are reasonably consistent from frequency to frequency. A dip interpretation made by measuring the relative shoulder amplitudes of the isolated, well-defined anomaly at 150E on Line 400N (Plate 239-82-8), produces a dip of 45^{o}E. The interpreted conductive zones are compiled on the 888 Hz plot (Plate 239-82-8).

Conductor A is the best conductor and is continuous across the whole grid. The conductance is best at the north and south ends, being 25 mhos and 16 mhos respectively. Depth is less than 10 metres, indicating a subcropping source. Conductor B is a lower conductivity zone ($\approx$ 10 mhos) which is narrow at the south end of the grid and appears to widen to the north. Conductor C, D and E are weaker conductors ($\approx$ 10 mhos). Conductor F on Line 27N is a 12 mho conductor which was given a separate designation because it does not appear to line up with either of Conductors B or C on Line 24N.

The 45°E interpreted dip and the elevation difference between Lines 27N and 24N are not enough to account for the offset between Conductors B and F.

The magnetic data for the Little Moyie River grid is presented in Plate 239-82-11. Conductor A has a varied magnetic response along most of its length with a maximum of 290 gammas on Line 2000N. The remaining conductors on the grid have no significant magnetic expression. A strong 600 gamma anomaly occurs at the east end of Line 400N. From its very sharp anomaly shape, it is likely caused by a shallow magnetic source.

The conductors on the Little Moyie River grid are likely caused by stratiform pyrite mineralization with the greatest concentration of pyrite in Conductor A which probably also contains some pyrrhotite to account for the coincident magnetic response.

CONCLUSIONS

On the Birch Creek grid, no significant HLEM responses were found and therefore no further work is warranted.

On the Little Moyie River grid, zones of weak to moderate conductance were found. The highest conductances, up to 25 mhos, occurred in westernmost zone 'A' extending across the whole grid. These conductances, however, are much too low to be due to Sullivan-type mineralization.

Submitted by:

Jules J. Lajoie, Ph.D., P.Eng.
Research Geophysicist
Cominco Ltd.

Endorsed by:

G. Harden, Ph.D., P.Eng.
Manager, Exploration
Western District
Cominco Ltd.

JJL/jel

Approved for Release by:

J. M. Hamilton, P.Eng.
Chief Geologist, Kimberley

DISTRIBUTION:

Mining Recorder	(3)
Cranbrook Office	(1)
Western District	(1)
Technical Support	(1)

IN THE MATTER OF THE B.C. MINERAL ACT

AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME

CARRIED OUT ON THE SHA CLAIMS 1, 2, 7 AND 8

LOCATED 15 KM EAST OF CRESTON, B.C.,

IN THE NELSON AND FORT STEELE MINING DIVISIONS OF THE

PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY

N.T.S. : 82-F/1

S T A T E M E N T

I. Jules J. Lajoie of the City of West Vancouver in the Province of British Columbia, make oath and say:

1. THAT I am employed as geophysicist by Cominco Ltd. and, as such have a personal knowledge of the facts to which I hereinafter depose;

2. THAT annexed hereto and marked as "Exhibit A", to this statement is a true copy of expenditures incurred on geophysical survey on the SHA mineral claims;

3. THAT the said expenditures were incurred between October 4th and October 15, 1982, for the purpose of mineral exploration of the above-noted claims.

Jules J. Lajoie, Ph.D., P.Eng.
Geophysicist, Cominco Ltd.

APRIL 1983

EXHIBIT 'A'

STATEMENT OF GEOPHYSICAL EXPENDITURES (1982)

SHA 1, 2, 7, AND 8 CLAIMS

1.	SALARIES		
	Senior Geophysicist (J.J. Lajoie) 9 days @ $ 245/day	$ 2,205.00	
	Geophysicist (S.J. Visser) 8 days @ $ 175/day	1,400.00	
	Assistants		
	a) B. Price 9 days @ $ 85/day	765.00	
	b) D. Keith 9 days @ $ 71/day	639.00	$ 5,009.00
2.	EQUIPMENT RENTAL		
	a) MaxMin Horizontal Loop System 10 days @ $ 45/day	450.00	
	b) Geometrics G-836 Proton Mag 10 days @ $ 10/day	100.00	550.00
3.	OPERATING DAY CHARGE(1) (HLEM & MAG)		
	13 days @ $ 250/day		3,250.00
4.	EXPENSE ACCOUNTS		
	Jules J. Lajoie	970.00	
	S. J. Visser	944.00	
	B. Price	599.00	
	D. Keith	250.00	2,763.00
5.	MISCELLANEOUS		
	a) Truck Rental	464.00	
	b) Freight (MaxMin)	60.00	524.00
	TOTAL		$ 12,096.00

I certify this to be a true statement of expenditures for the geophysical survey on the SHA 1, 2, 7, and 8 Claims in 1982.

Jules J. Lajoie

Jules J. Lajoie, Ph.D., P.Eng.
Geophysicist, COMINCO LTD.

(1) Operating Day Charge: for those field days on which useful data is acquired to cover costs of drafting, computer processing, interpretation and report writing.

CERTIFICATION

I, Jules J. Lajoie, of 5655 Keith Road, in the City of West Vancouver, in the Province of British Columbia, do hereby certify that:-

1. I graduated from the University of Ottawa in 1968 with an Honours B.Sc. in Physics, from the University of British Columbia in 1970 with a M.Sc. in Geophysicis, and from the University of Toronto in 1973 with a Ph.D. in Geophysics.

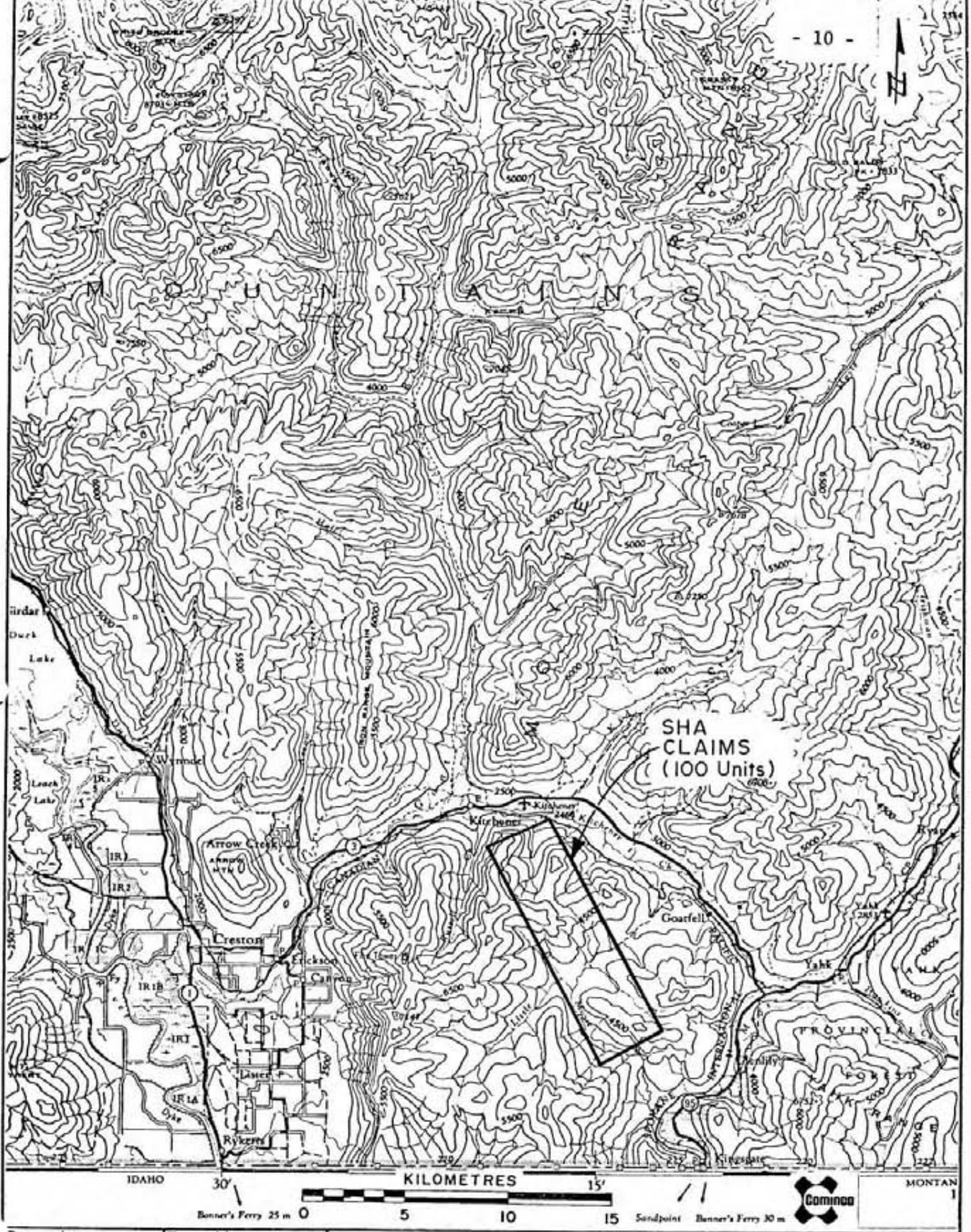
2. I am a registered member of the Association of Professional Engineers of the Province of British Columbia, the Society of Exploration Geophysicists, and the British Columbia Geophysical Society.

3. I have been practicing my profession for the past nine years.

Jules J. Lajoie

Jules J. Lajoie, Ph.D., P.Eng.
Research Geophysicist

APRIL 1983



Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

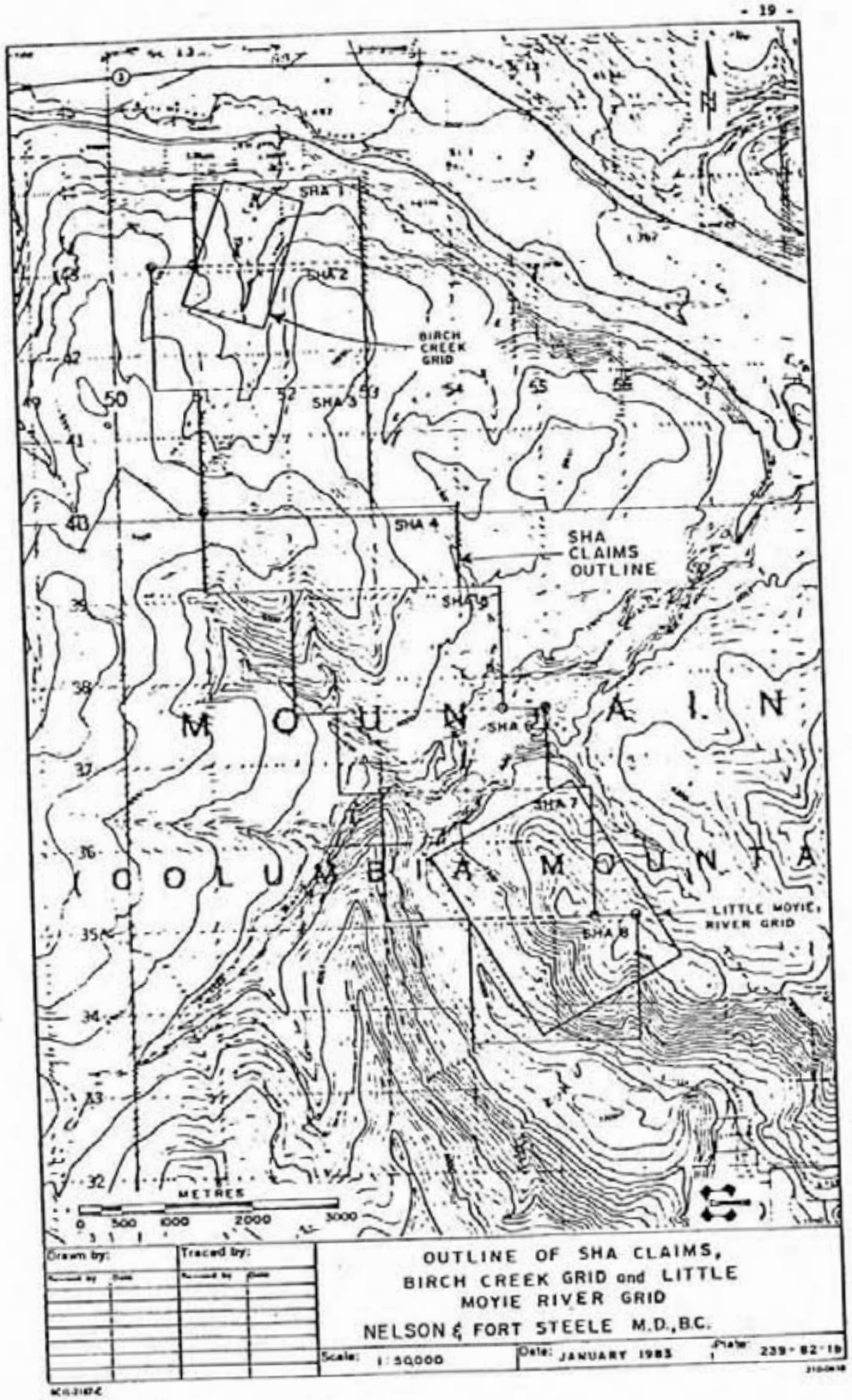
SHA CLAIMS
LOCATION MAP
NELSON and FORT STEELE M.D., B.C.

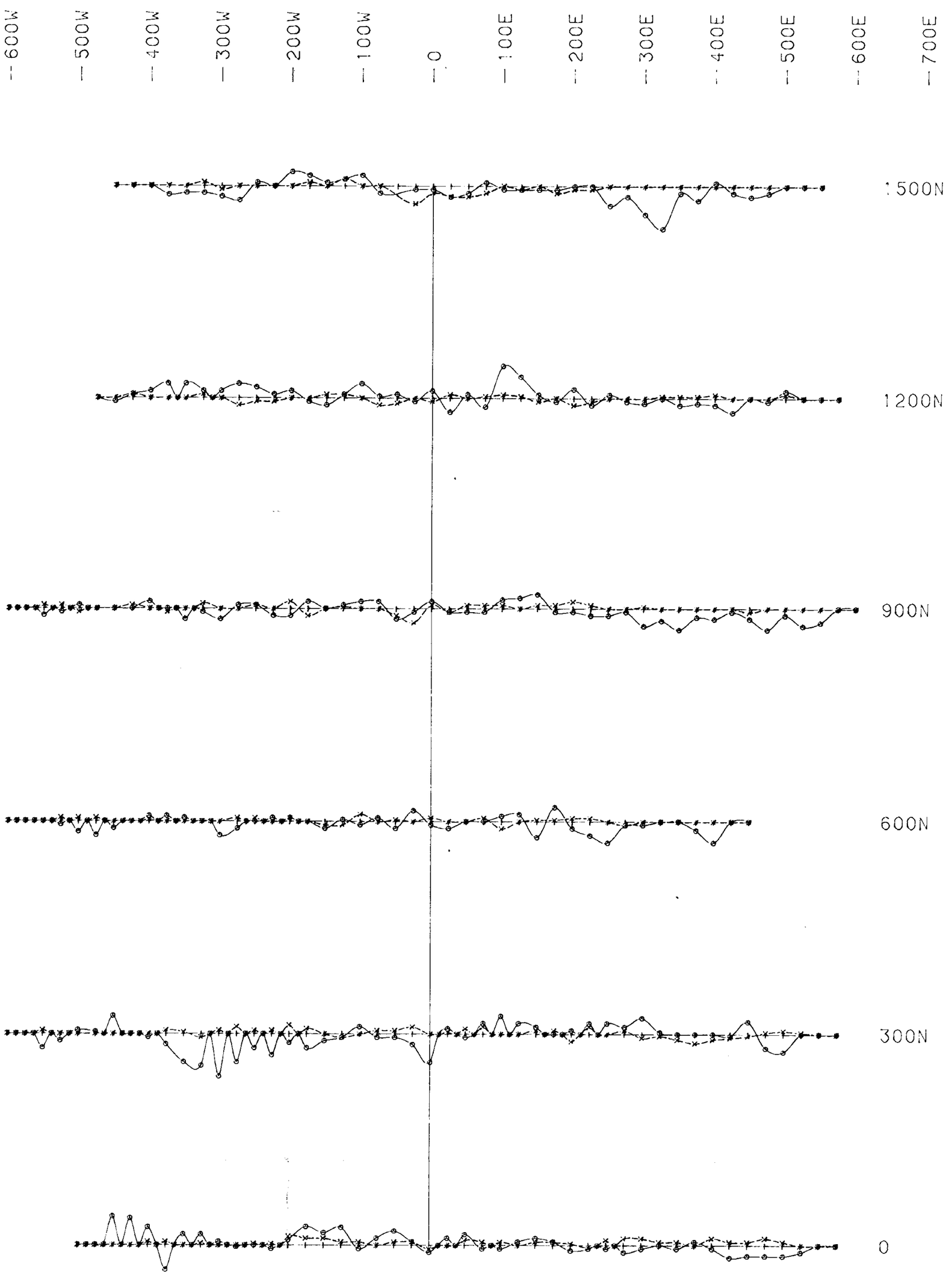
Scale: 1: 250,000

Date: JANUARY 1983

Plate: 239-82-1a

- 19 -


SHA 1
SHA 2
BIRCH CREEK GRID
SHA 3
SHA 4
SHA CLAIMS OUTLINE
SHA 5
SHA 6
SHA 7
SHA 8
LITTLE MOYIE RIVER GRID
METRES
0 500 1000 2000 3000
Drawn by:
Traced by:
OUTLINE OF SHA CLAIMS, BIRCH CREEK GRID and LITTLE MOYIE RIVER GRID
NELSON & FORT STEELE M.D., B.C.
Scale: 1:50000
Date: JANUARY 1983
Plate 1
239-82-1b



GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,210

PART 1 OF 2

METRES
50 0 100 250

TO ACCOMPANY A REPORT BY J. LAJOIE

SHA PROPERTY

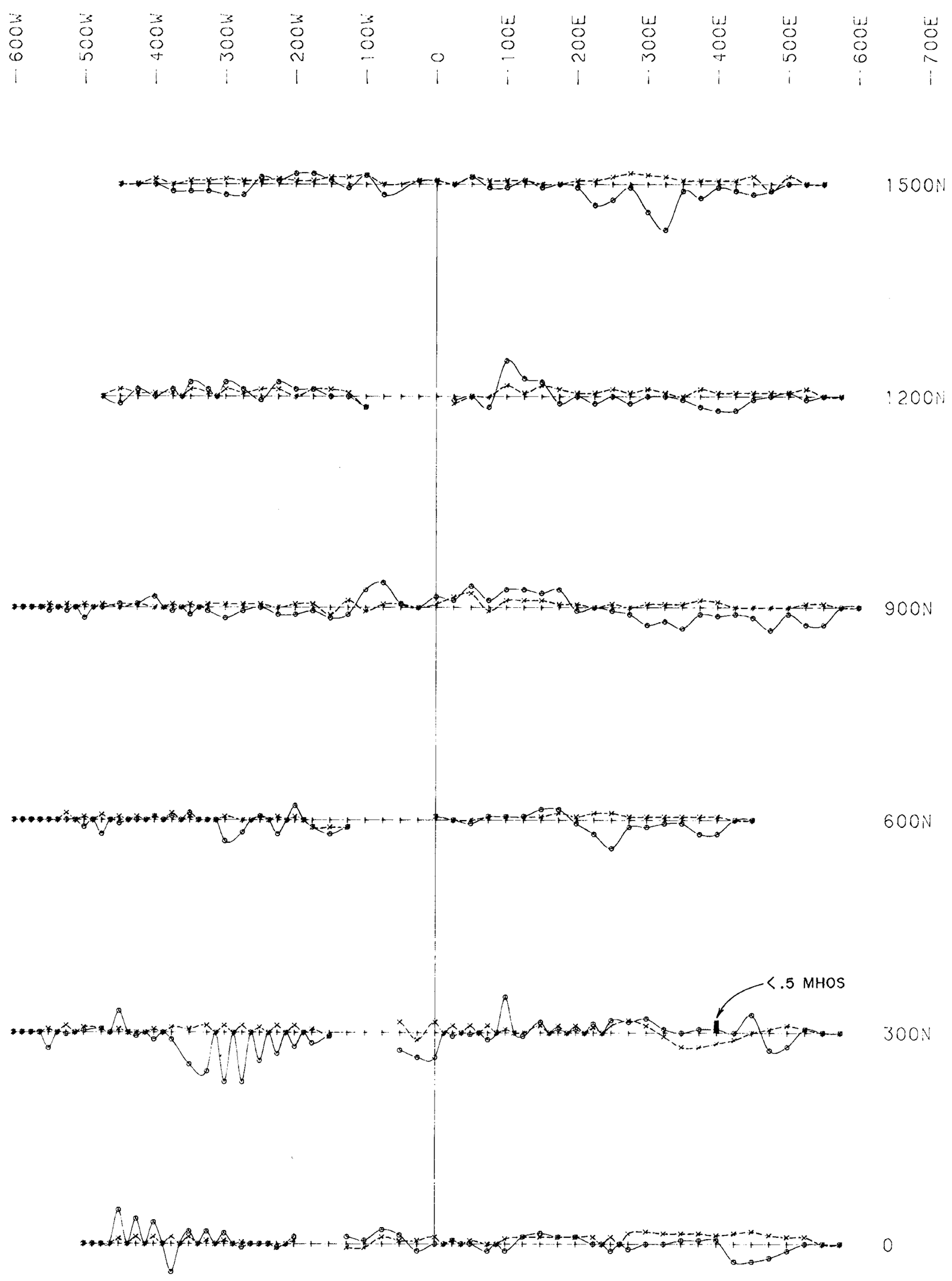
N.T.S. 82 F/1

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

BIRCH CREEK HORIZONTAL LOOP EM
Coil Seperation = 100m
Frequency = 444Hz
FORT STEELE M.D., B.C.

Scale: 1:5000 | Date: FEBRUARY 1983 | Plate: 239-82-2

FORM 210 0670



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ASSESSMENT REPORT

11,210

PART 1 OF 2

METRES
50 0 100 250

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SHA PROPERTY

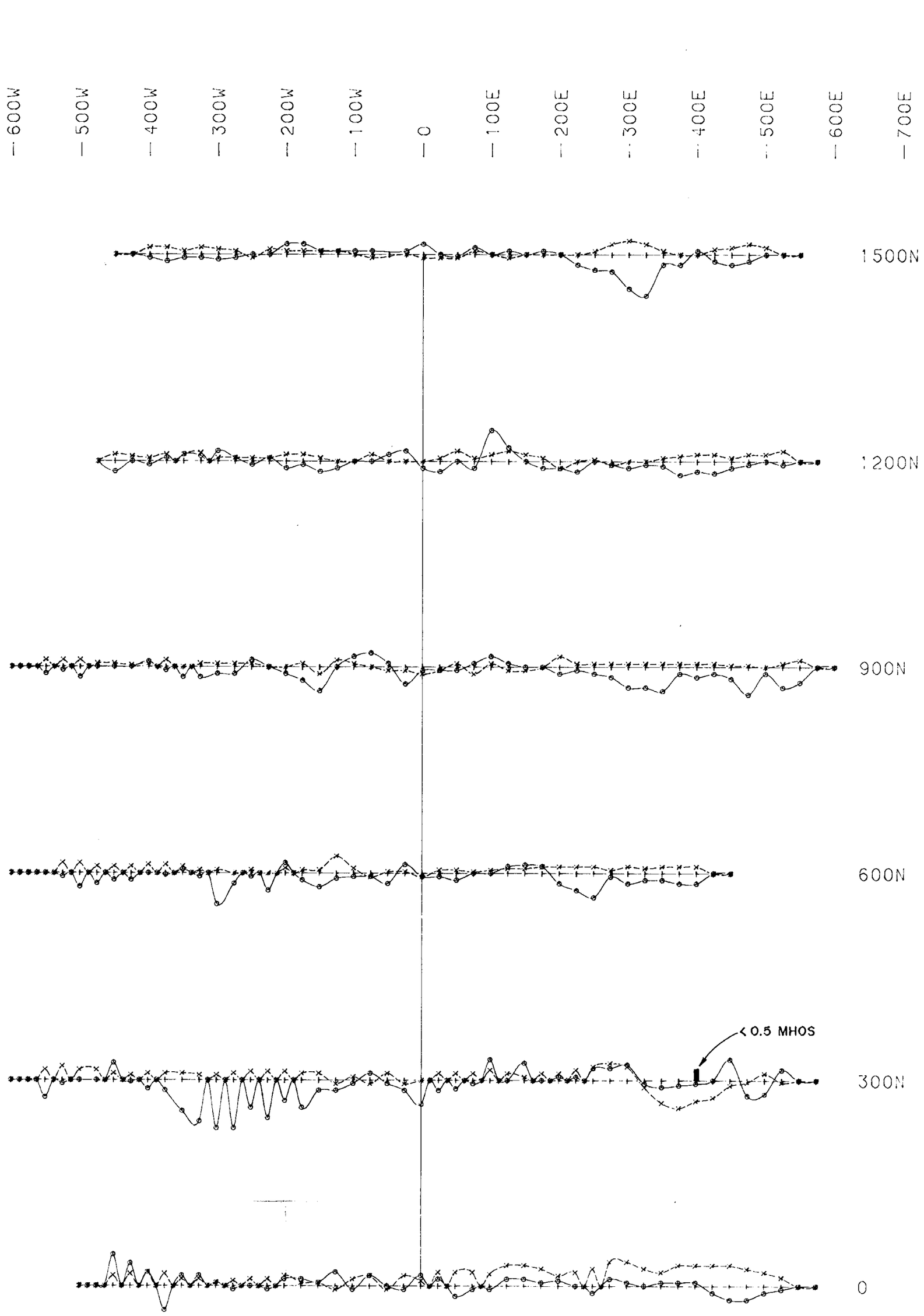
N.T.S. 82 F/1

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

BIRCH CREEK HORIZONTAL LOOP EM
Coil Seperation = 100m
Frequency = 888Hz
FORT STEELE M.D., B.C.

Scale: 1:5000 | Date: FEBRUARY 1983 | Plate: 239-82-3

FORM 210 0870



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PART 1 OF 2

METRES
50 0 100 250

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Jules Lajoie

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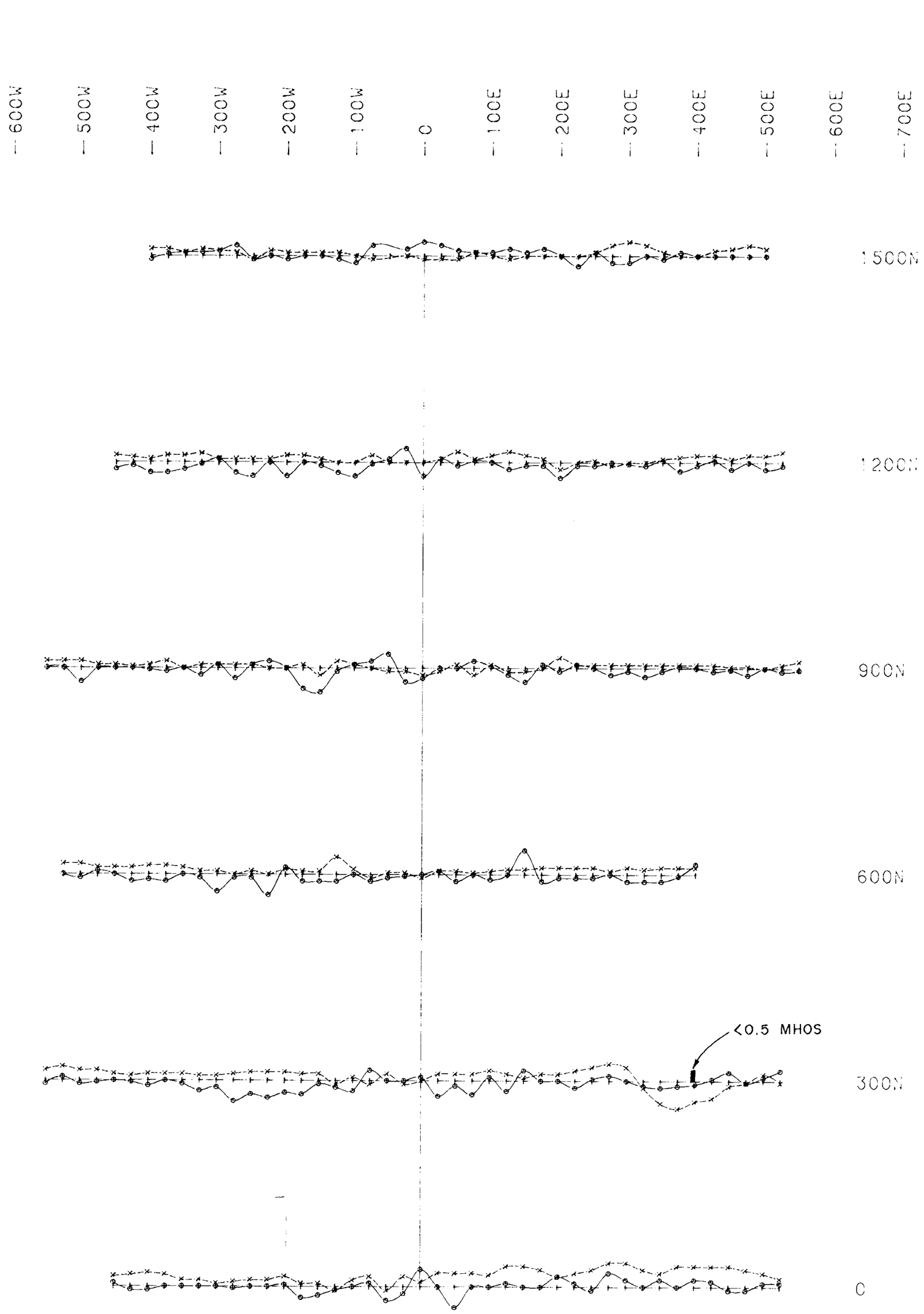
Revised by	Date	Revised by	Date

BIRCH CREEK HORIZONTAL LOOP EM
Coil Seperation = 100m
Frequency = 1777Hz
FORT STEELE M.D., B.C.

Scale:	Date:	Plate:
1:5000	FEBRUARY 1983	239-82-4

FORM 210 0479



C

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,210

PART 1 OF 2

METRES
50 0 100 250

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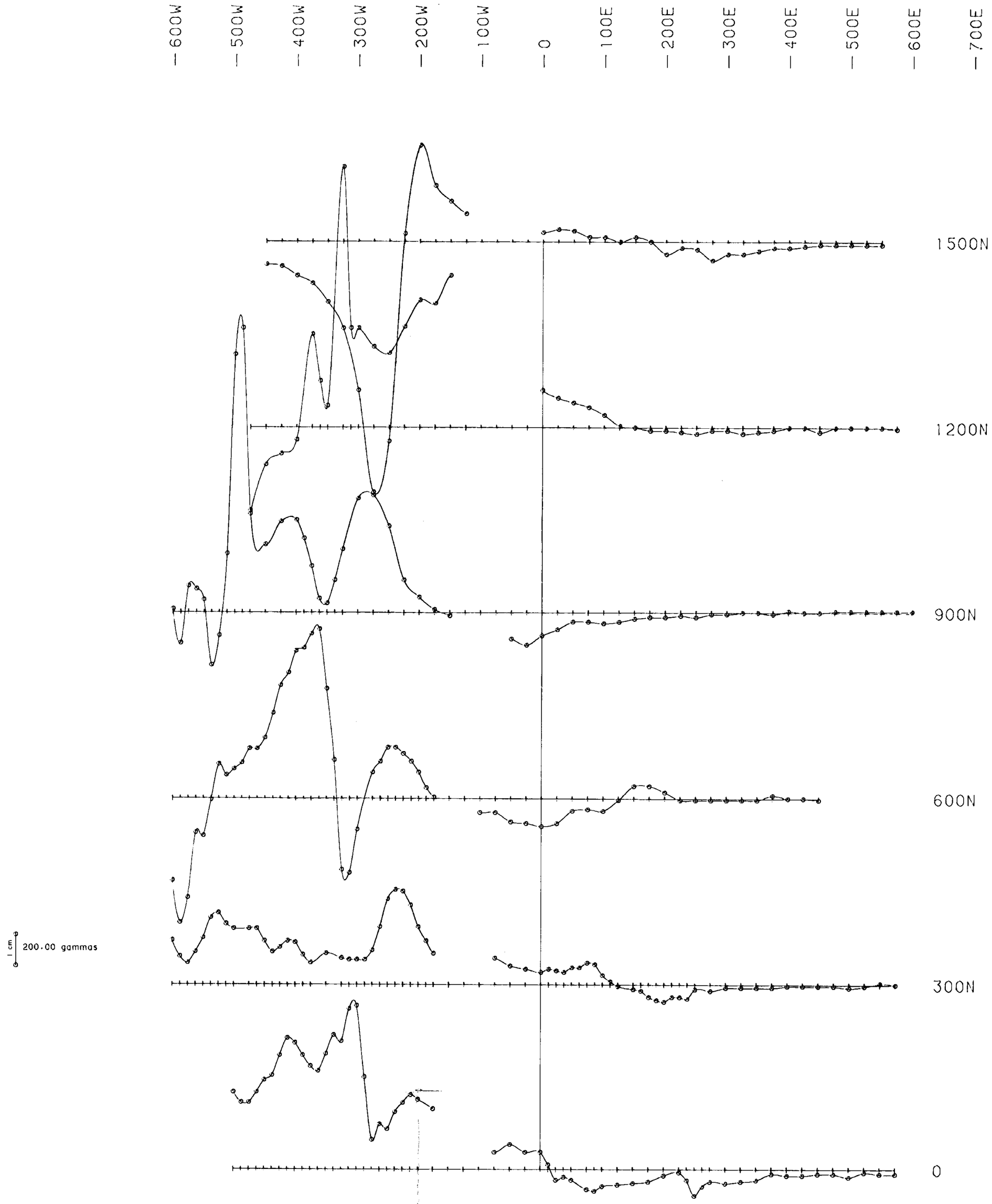
N.T.S. 82 F/1

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

BIRCH CREEK HORIZONTAL LOOP EM
Coil Seperation = 100m
Frequency = I.P. 1777-444Hz, O.P. 1777Hz
FORT STEELE M.D., B.C.

Scale:	Date:	Plate:
1: 5000	FEBRUARY 1983	239-82-5

FORM 210 0870



GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,210

PART 1 OF 2

METRES
50 0 100 250

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N.T.S. 82 F/1

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Revised by	Date	Revised by	Date

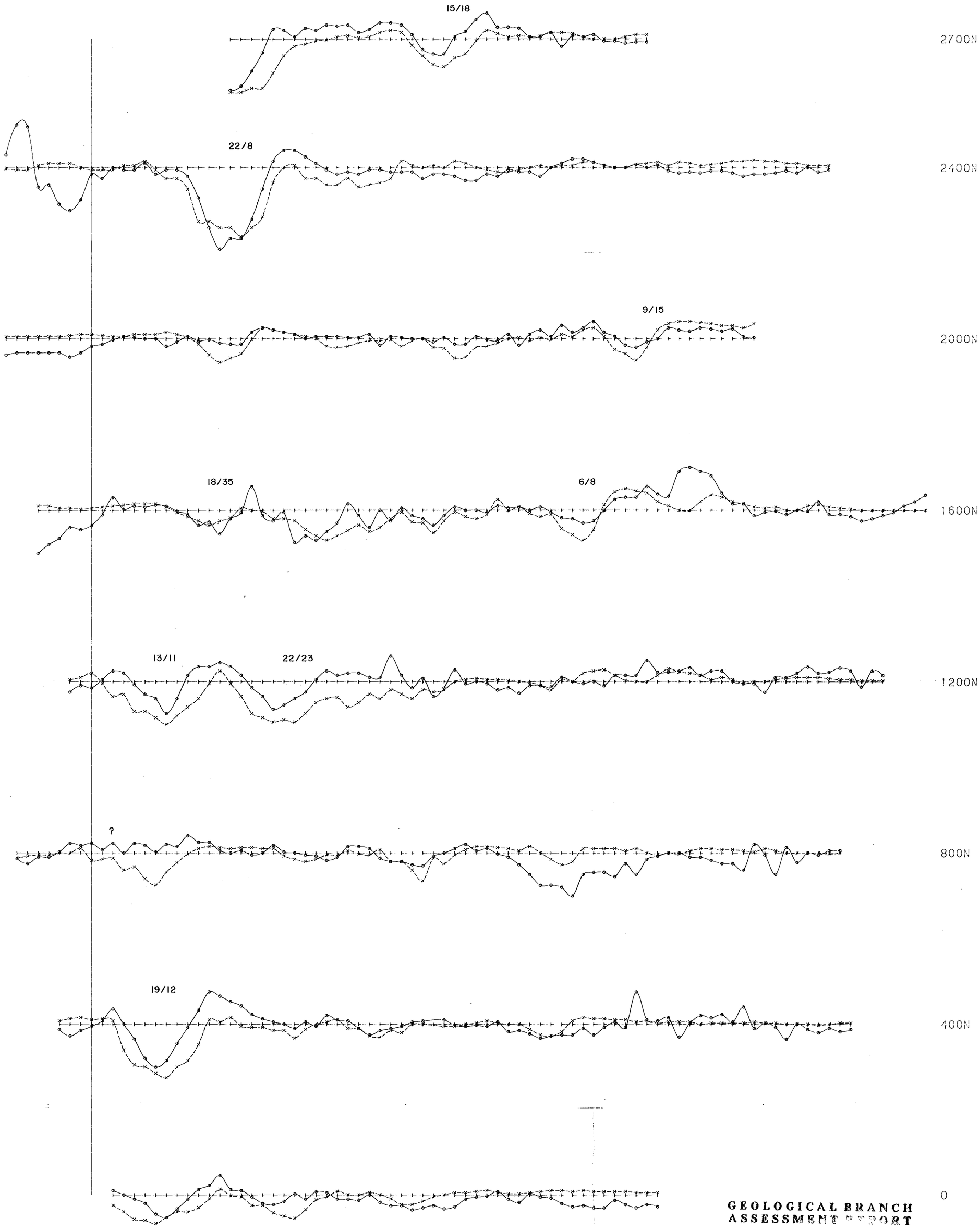
BIRCH CREEK
PROTON MAGNETOMETER DATA

FORT STEELE M.D., B.C.

Scale: 1:5000 Date: FEBRUARY 1983 Plate: 239-82-6

FORM 210 0870

200W 100W 0 100E 200E 300E 400E 500E 600E 700E 800E 900E 1000E 1100E 1200E 1300E 1400E 1500E 1600E 1700E 1800E 1900E 2000E



CONDUCTANCE / DEPTH TO TOP
IN MHOS / IN METRES

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,210
PART 1 OF 2

METRES
50 0 100 250

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N.T.S. 82 F/1

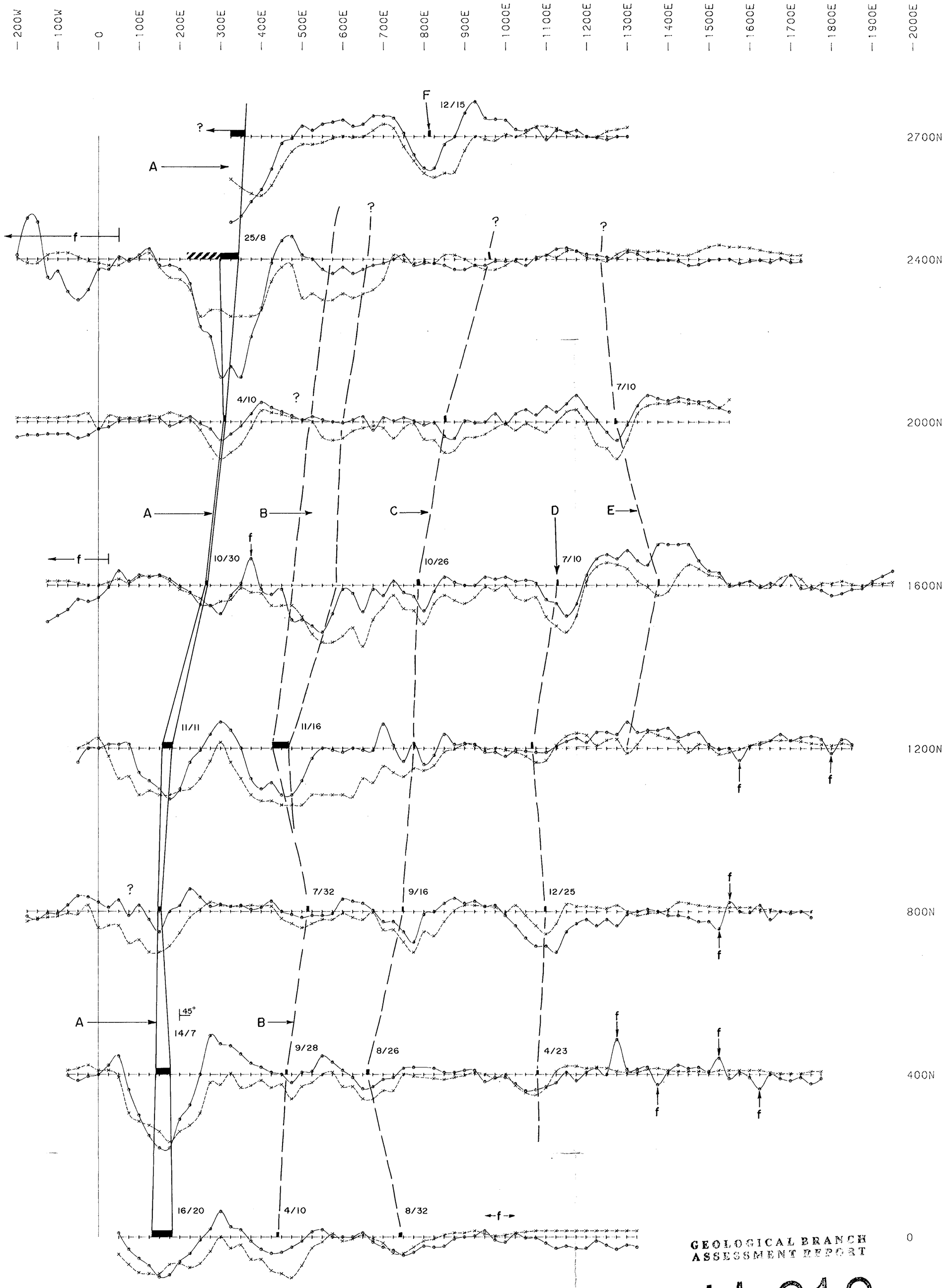
Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

LITTLE MOYIE RIVER HORIZONTAL LOOP EM
Coil Seperation=100m
Frequency=444 Hz

FORT STEELE M.D., B.C.

Scale: 1:5000 Date: FEBRUARY 1983 Plate 239-82-7

FORM 210 0670



CONDUCTANCE / DEPTH TO TOP
IN MHOS / IN METRES

f = FALSE ANOMALIES DUE TO POOR CHAINAGE

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,210
PART 1 OF 2

METRES
50 0 100 250

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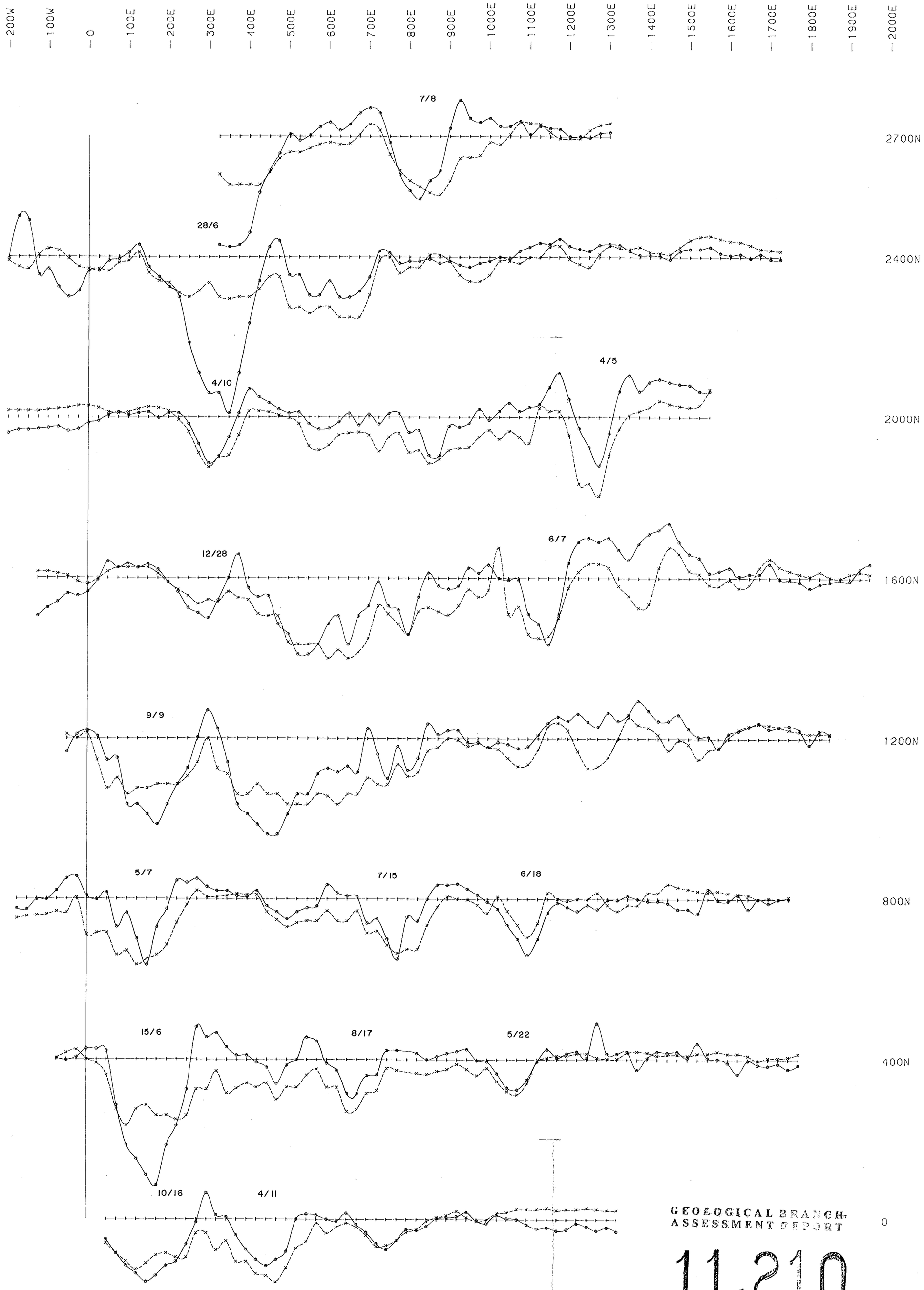
Revised By	Date	Revised by	Date

LITTLE MOYIE RIVER HORIZONTAL LOOP EM
Coil Seperation = 100m
Frequency = 888 Hz

FORT STEELE M.D., B.C.

Scale 1: 5000 | Date FEBRUARY 1983 | Plate 239-82-8



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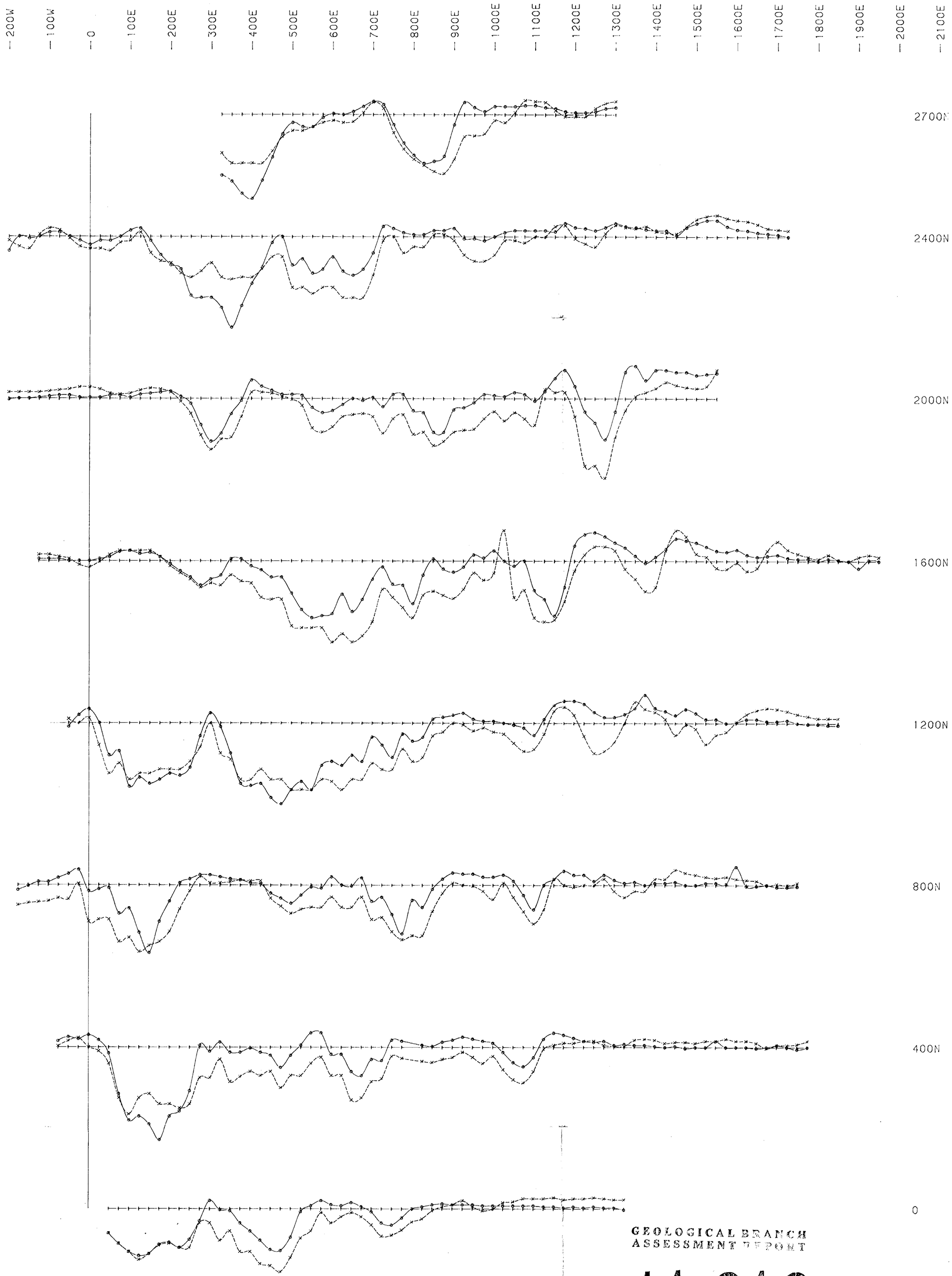
Revised by	Date	Revised by	Date

LITTLE MOYIE RIVER HORIZONTAL LOOP EM
Coil Seperation = 100 m
Frequency = 1777 Hz
FORT STEELE M.D., B.C.

Scale: 1:5000 | Date: FEBRUARY 1983 | Plate: 239-82-9

FORM 210 0870



GEOLOGICAL BRANCH
ASSESSMENT REPORT

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PART 1 OF 2

METRES
50 0 100 250

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SHA PROPERTY

N.T.S. 82 F/1

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Revised by	Date	Revised by	Date

LITTLE MOYIE RIVER HORIZONTAL LOOP EM
Coil Seperation = 100 m
Frequency = I.P 1777-444Hz, O.P. 1777Hz
FORT STEELE M.D., B.C.

Scale: 1:5000 Date: FEBRUARY 1993 Plate: 239-82-10.

FORM 219 0478

200W 100W 0 100E 200E 300E 400E 500E 600E 700E 800E 900E 1000E 1100E 1200E 1300E 1400E 1500E 1600E 1700E 1800E 1900E 2000E 2100E

2700N

2400N

2000N

1600N

1200N

800N

400N

0

1 cm 100.00 gammas

EM CONDUCTORS

METRES
50 0 100 250

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,210

PART 1 OF 2

TO ACCOMPANY A REPORT BY J. LAJOIE Jules Lajoie

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N.T.S. 82 F/1

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Revised by	Date	Revised by	Date

LITTLE MOYIE RIVER
PROTON MAGNETOMETER DATA
FORT STEELE M.D., B.C.

Scale: 1:5000 Date: FEBRUARY, 1983 Plate: 239-82-11

FORM 416 0/78