COMINCO LTD.

EXPLORATION

WESTERN CANADA

NTS: 82F/9

CLAIR PROPERTY

FT. STEELE MINING DISTRICT

BRITISH COLUMBIA

RECEIVED
DEC 1 1 1992
Gold Commissioner's Office
VANCOUVER, B.C.

1992

ASSESSMENT REPORT ON A

UTEM SURVEY

LAT.49°38'

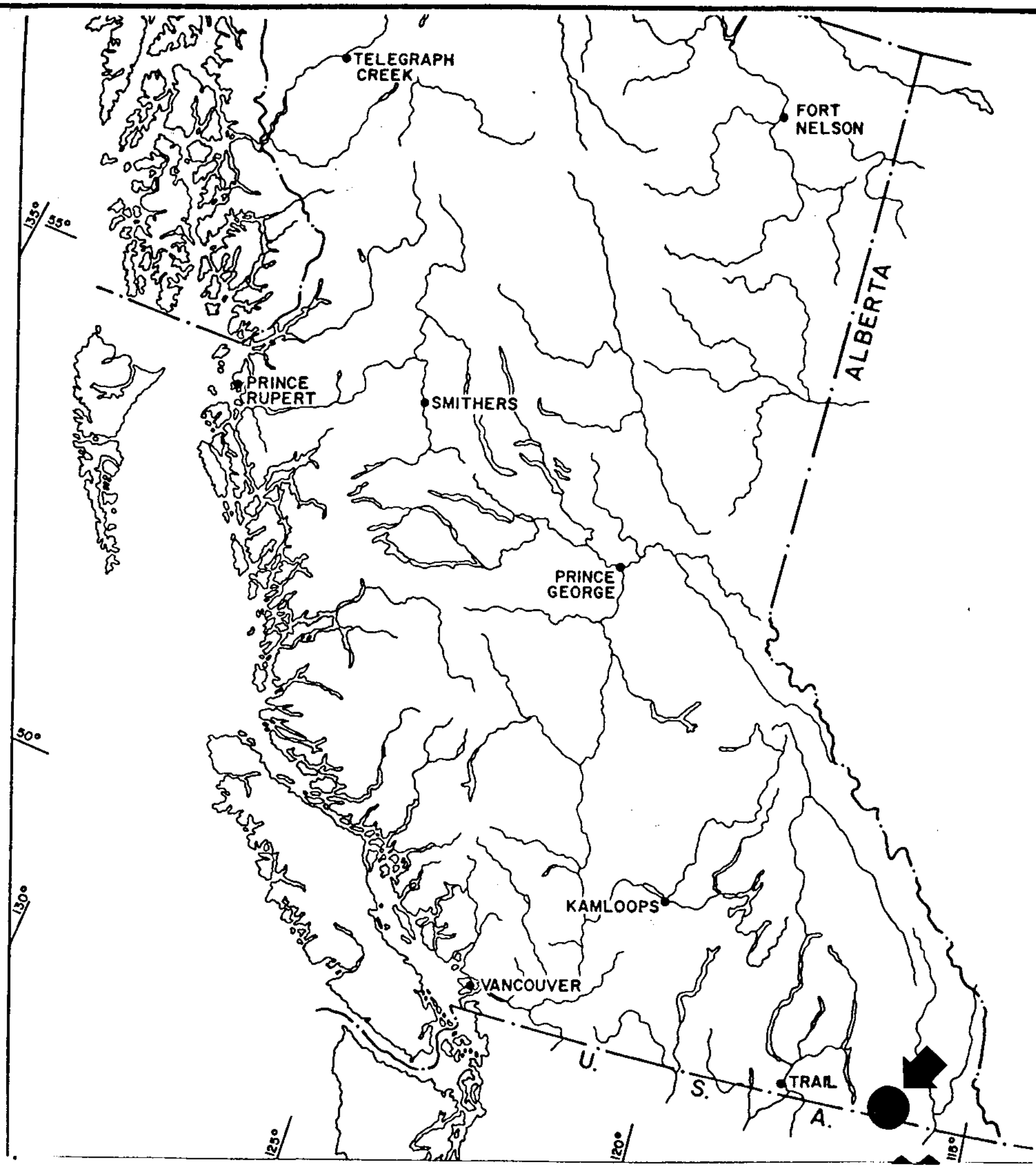
LONG.116°16'

WORK PERFORMED: AUGUST 18 - 31, SEPT 4, 1992

CLAIMS COVERED : CLAIR 3,5,6,7,14

DECEMBER 1992

I. JACKISCH



CLAIR PROPERTY

NTS 82F/9

Drawn by:		Traced by:		LOCATION MAP
Revised by	Date	Revised by	Date	
				Scale:

Date: December 1992

Plate 811-72-1

210-0620

3 - CL

TABLE OF CONTENTS

LIST OF PLATES

COMINCO LTD

EXPLORATION
NTS:82F/9

WESTERN CANADA

REPORT ON A
UTEM SURVEY
ON THE
CLAIR PROPERTY
FT. STEELE M.D., B.C.

- ASSESSMENT REPORT -

INTRODUCTION

From August 18 to 31, and Sept. 4, 1992, a University of Toronto Electromagnetic [UTEM] reconnaissance survey totalling 14 km was carried out by a Cominco Ltd. geophysical crew under the direction of geophysicist, R.W. Holroyd.

The purpose of the survey was to search for Pb/Zn Sullivan-type mineralization in Lower to Middle Aldridge host rocks. This exploration is part of a regional evaluation of the Aldridge Formation in the vicinity of the Sullivan Mine. The geological strike is generally N-S so an east-west line direction was chosen.

In the reconnaissance mode of UTEM surveying the loop and survey lines are not prepared prior to surveying, but are simply topofil traverses run through the bush, installed contemporaneous to the collection of UTEM data. The loop and survey station locations are later estimated from topography maps using compass, pacing, topofil, inclinometer, and altimeter [or any combination of these] data collected concurrent with the UTEM survey. This is a first pass approach and any significant conductors must be followed up with a controlled, cut and chained grid.

This report describes the operation of the UTEM system, the UTEM plotting format, and presents the results.

LOCATION AND ACCESS

The CLAIR Property is located about 15 kms west of Kimberley, B.C. in the Purcell Mountain Range. The survey took place 2 to 10 kms NW of St. Mary Lake. Access to this very mountainous area is via the St. Mary Road [shown on Plate 811-72-2]. Due to the steepness of the terrain, loop installation and survey line traverses were mainly helicopter assisted from this road.

HISTORY

The Clair claims date back to 1978, with additional staking on several occasions in subsequent years. The current claim block consists of 232 units in 23 claims. Geological mapping at 1:20,000 scale, contour soil geochem, several UTEM grids, and three drill holes have constituted exploration over the last 15 years.

GEOLOGY

The property is underlain by Helikian-age Aldridge Formation siliciclastic rocks. More particularly, middle Aldridge division turbidites underlie most of the claims with lower Aldridge on the east. Moyie intrusive sills and dykes of gabbroic composition are common. In general, the sediments dip west or northwest, and are cut by north-trending normal or thrust faults.

UTEM EQUIPMENT, PROCEDURES, AND DATA PRESENTATION

"UTEM" is an acronym for "University of Toronto Electromagnetometer". The system was developed by Dr. Y. Lamontagne while he was a graduate student at that University.

The field procedure consists of first laying out a large loop of single strand, enamel insulated wire in a roughly rectangular shape with sides one to two kms in length. This "loop" is energized by a few amperes of current from a transmitter powered by a 2 Kw motor generator. Survey lines are generally oriented perpendicular to one side of the loop and surveying is performed outside the loop.

The UTEM III transmitter energizes the loop with a precise triangular waveform at a carefully controlled frequency (30.974 Hz for this survey). The receiver system includes a sensor coil and backpack portable receiver which has solid state internal recording facilities. Time synchronization between transmitter and receiver is achieved though quartz crystal clocks in both units, which are accurate to within about one second in fifty years.

The receiver sensor coil typically measures the vertical component of the electromagnetic field and responds to its time derivative. [In some cases, the horizontal component is also recorded to provide additional information, but this was not the case for this survey]. Since the transmitter current waveform is triangular, the receiver coil will sense a perfect square wave in the absence of geological conductors. Deviations from the perfect square wave are caused by electrical conductors which may be geologic or cultural in origin. The receiver stacks any pre-set number of cycles in order to increase the signal to noise ratio.

The UTEM receiver gathers and records 10 channels of information at each station. The higher number channels (7,8,9,10) correspond to short time or high frequency while the lower number channels (1,2,3) correspond to long time or low frequency. Poor and/or small conductors will respond on channels 10,9, 8,7, and 6, while better conductors will produce anomalous responses on progressively lower number channels as well. For example, massive, highly conducting sulphide or graphite will produce a response on all ten channels.

processed, and plotted onto an 11" X 17" graphics plotter. These results are presented on a data section containing profiles of each of the ten channels, one section for each survey line. Several normalizing schemes may be utilized to present the results in data section, of which the continuously normalized plot and point normalized plot are used in this report.

1.] CONTINUOUSLY NORMALIZED PLOTS

This is the standard normalization scheme for general presentation.

a] For Channel 1: $\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - P}{P} \times 100\%$

where P is the primary field from the loop at the survey station
and Ch.1 is the observed amplitude for channel 1

b] The remaining channels [n = 2 to 10] are channel 1 reduced and channel 1 normalized:

$$\% \text{ Ch.n anomaly} = \frac{\text{Ch.n} - \text{Ch.1}}{\text{Ch.1}} \times 100\%$$

where Ch.n is the observed amplitude of Channel n [n = 2 to 10]

2.] POINT NORMALIZED PLOTS

These plots display an arrow at the top of the section indicating the station to which all data on the line are normalized. The purpose of point normalized plots is to display only the relative amplitude variation of the SECONDARY field along the survey line, that is, only that portion of the magnetic field resulting from electric currents induced in the ground.

a] For Channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - \text{Ppn}}{\text{Ppn}} \times 100\%$$

where Ppn is the Primary Field from the loop at the point norm station and Ch.1 is the observed amplitude for Channel 1.

b] The remaining channels [n=2 to 10] are channel 1 reduced and channel 1 normalized:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.n} - \text{Ch.1pn}}{\text{Ch.1pn}} \times 100\%$$

where Ch.n is the observed amplitude of Channel n and Ch.1pn is the observed channel 1 amplitude at the point norm station.

Point normalized plots are usually produced on data sections showing anomaly responses on the continuously normalized plots, in order to help interpretation by providing a different perspective to the data. The point norm station is usually chosen at a constant distance from the loop front for the whole grid, or, if there is an anomaly, at a station near the center of the anomalous response.

The above normalizing procedures result in any errors from miscalculations of the primary field, due to chainage errors, being displayed in Channel 1 only.

Channels 9 and 10 have not been plotted in this report because the short delay time corresponding to these channels result in the values becoming completely saturated a very short distance from the loop front. These channels do not, therefore, add any useful information and overwrite more important data from later channels.

INTERPRETATION

The Data Sections [D.S. 1 to 5] show numerous shallow, channel 3 to 8 crossover conductors of minor importance. Faults or geological contacts may be the cause of these features.

Line 1000N on Loop 2 lines shows some interference from the service power line along the St. Mary road. This line, which heads at a 45° angle with respect to the power line, shows unusually high values on Channels 4,5, and 6.

Plate 811-72-2 is a plan map of the area surveyed, showing a compilation of roads, creeks, topography, claim boundary, UTEM loops and lines, and UTEM conductors. The survey lines are, on average, 1 km apart. The weak, shallow conductors do not outline any continuous feature extending from line to line.

The westerly dip of the rocks on Loop 1, and easterly dip of the rocks for Loop 2 indicate a good coupling geometry between the loops and any possible stratiform mineralization. A large sulphide deposit of Sullivan size is not seen in the area surveyed.

CONCLUSIONS

14 kms of reconnaissance UTEM surveying detected 14 conductors which are generally of shallow source and weak conductance.

No strong conductors, or features which can be traced from line to line, or indication of sulphides were detected.

Report by : Ingo Jackisch
Geophysicist
Cominco Ltd.

Approved for Release : J.M. Hamilton
Manager, Exploration
Cominco Ltd.
Western Canada

Distribution:

Mining Recorder	[2]
Kootenay Exploration Office	[1]
Western District Files	[1]
Geophysics Files	[1]

6

8

REFERENCE

Lamontagne, Y., 1975 Applications of Wideband, Time Domain EM Measurements in Mineral Exploration: Doctoral Thesis, University of Toronto.

APPENDIX I

IN THE MATTER OF THE B.C. MINERAL ACT

AND THE MATTER OF A GEOPHYSICAL PROGRAMME

CARRIED OUT ON THE CLAIR PROPERTY

LOCATED 15 KMS WEST OF KIMBERLEY, B.C.

IN THE FORT STEELE MINING DIVISION OF THE

PROVINCE OF BRITISH COLUMBIA,

MORE PARTICULARLY

N.T.S. 82F/9

STATEMENT

I, Ingo Jackisch, of 424 Somerset Street, in the City of North Vancouver, in the Province of British Columbia, make oath and say:

1. THAT I am employed as a 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 a geophysical survey on the CLAIR Property;

3. THAT the said expenditures were incurred from August 18 to 31, and Sept. 4, 1992, for the purpose of mineral exploration on the above-noted property.

Ingo Jackisch
Ingo Jackisch
Geophysicist
Cominco Ltd.

Dated this 10 day of December, 1992
at Vancouver, B.C.

APPENDIX II

EXHIBIT "A" - STATEMENT OF EXPENDITURES

CLAIR PROPERTY - AUGUST 18-31, SEPT 4, 1992

1.] STAFF COSTS

a]	R.W. Holroyd, Geophysicist 14 days at $435/day	6090
b]	S. Tooley, Assistant 14 days at $145/day	2030
c]	A.Robulak, Assistant 14 days at $115/day	1610
d]	F.Dyment, Assistant 5 days at $110/day	550
e]	M. Welz, Geophysicist in Training 4 days at $125/day	500
f]	O. Korb, Assistant 3 days at $90/day	270
g]	L. Korb, Assistant 74.5 hours at $10/hour	745
h]	M. Jefferson, Assistant 108.5 hours at $10/hour	1085
i]	R. Grippisch, Assistant 82.5 hours at $10/hour	825
		$13,705.00

2.] EQUIPMENT RENTAL

a]	UTEM System	16 days at $250/day =	$4000
b]	Second UTEM Receiver	4 days at $150/day =	600
c]	UTEM Wire Rental	16 days at $15/day =	240
			$4840.00

3.] OPERATING DAY CHARGE [covers cost of data compilation, drafting, and report writing]

10 days at $445/day — $4450.00

4.] EXPENSE ACCOUNTS

R.W. Holroyd	1735.63
S. Tooley	333.66
A. Robulak	408.65
F. Dyment	163.73
	$2641.67

Balance Forward $25,636.67

APPENDIX II [Cont.]

STATEMENT OF EXPENDITURES

Balance Forward $25,636.67

5.] MISCELLANEOUS COSTS

a]	Freight [air and/or truck]	$357.12	
b]	Rental of 2 4X4 Trucks	1775.56	
c]	Accommodation	1925.00	
d]	Helicopter	4400.00	
			$8457.68

TOTAL EXPENSES $34,094.35

APPENDIX III

CERTIFICATION OF QUALIFICATIONS

I, INGO JACKISCH, of 424 Somerset Street, in the City of North Vancouver, in the Province of British Columbia, do hereby certify:

i. THAT I graduated with a B.Sc. in Geophysics from the University of British Columbia in 1975.

ii. THAT I am a member in good standing of the Association of Professional Engineers and Geoscientists of the Province of B.C.

iii. THAT I have been actively practising Geophysics from 1975 to 1993, and have been an employee of Cominco Ltd. from 1980 to 1993.

Ingo Jackisch
Ingo Jackisch, B.Sc. P.Geo.
Geophysicist, Cominco Ltd.

JUNE 1993

<u>**LEGEND**</u>

<u>**UTEM DATA SECTIONS**</u>

ORDINATE: Amplitude scale is given in %

ABSCISSA: Station or Picket Numbers in Hundreds of Meters

SYMBOL	CHANNEL	MEAN DELAY TIME [30 HZ]
|	1	12.8 ms
/	2	6.4
\	3	3.2
□	4	1.6
Σ	5	0.8
Δ	6	0.4
7	7	0.2
X	8	0.1
△	9	0.05
◇	10	0.025

<u>**DESCRIPTION OF INTERPRETATION SYMBOLS**</u>

Superscript indicates depth to top {S shallow 0-50m {M moderate 50-150m {D deep >150m

Superscript indicating latest anomalous channel

s 2

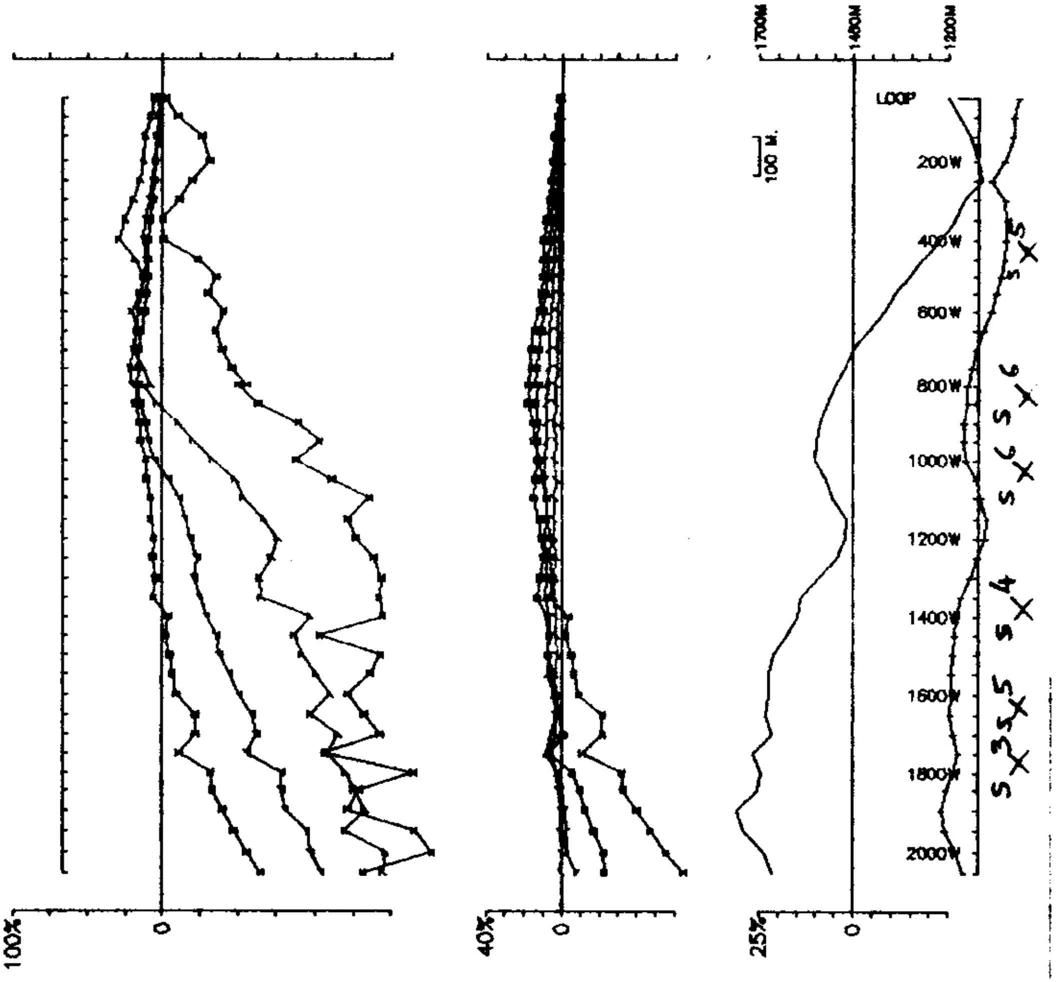
X — Axis of crossover conductor

A1

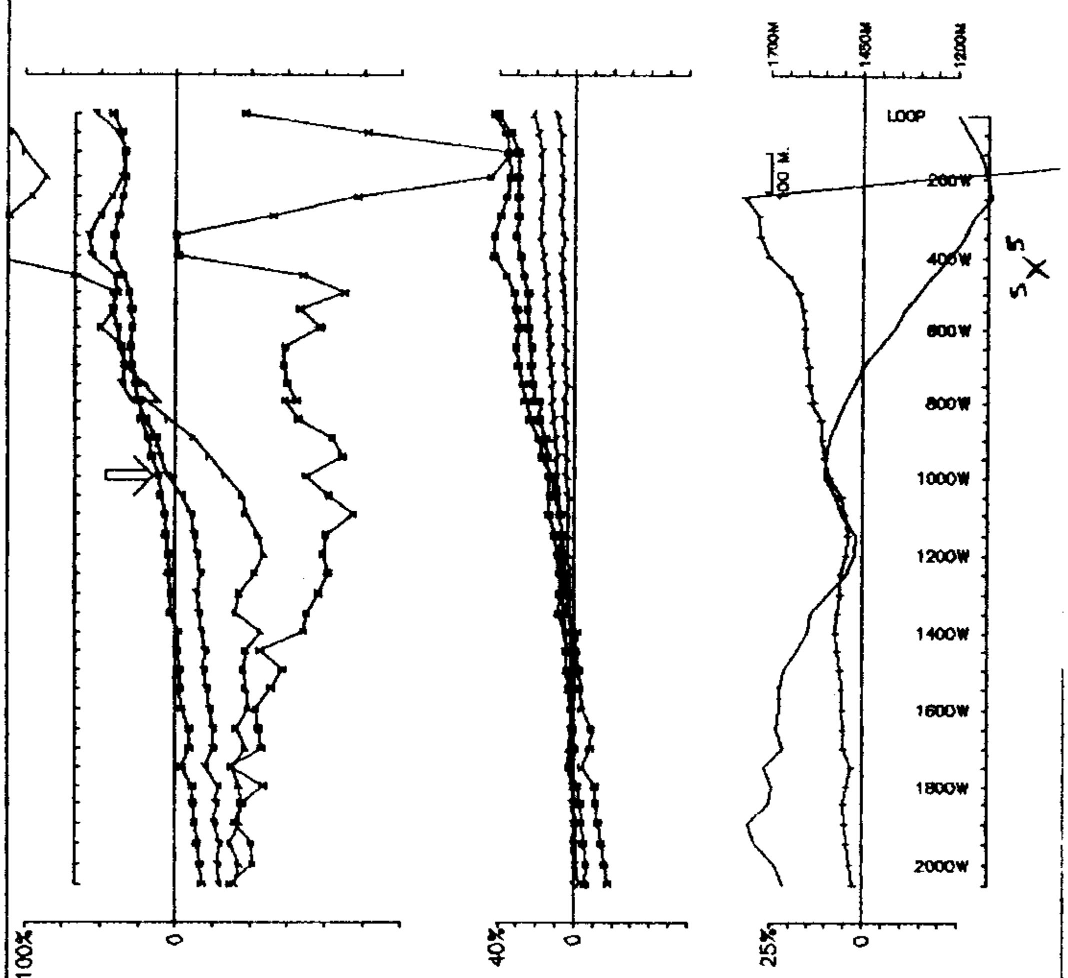
Conductor Name [for major features only]

—▷— Resistivity Contact [arrow points in direction of low resistivity zone]

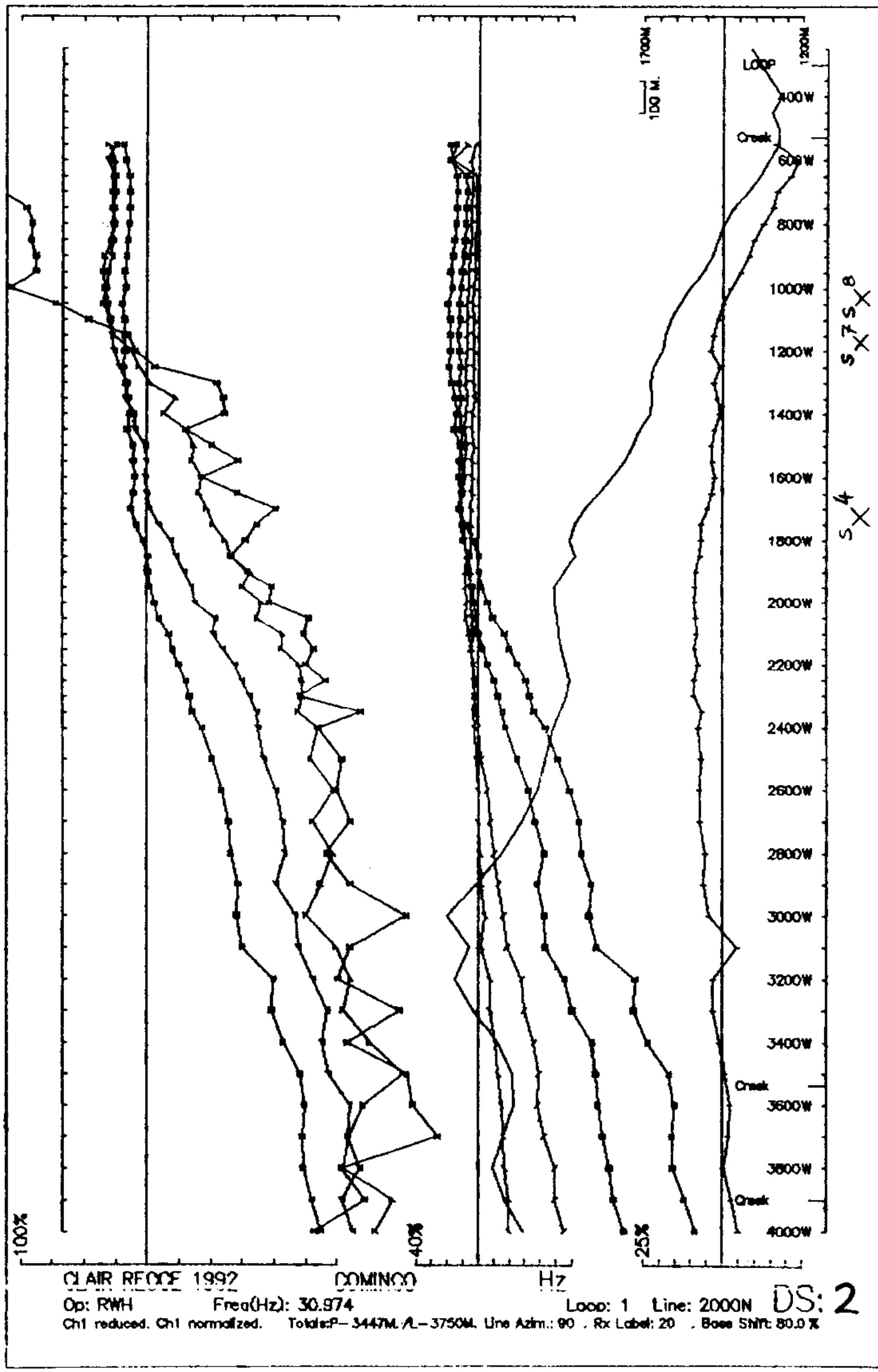
R Reverse crossover conductor

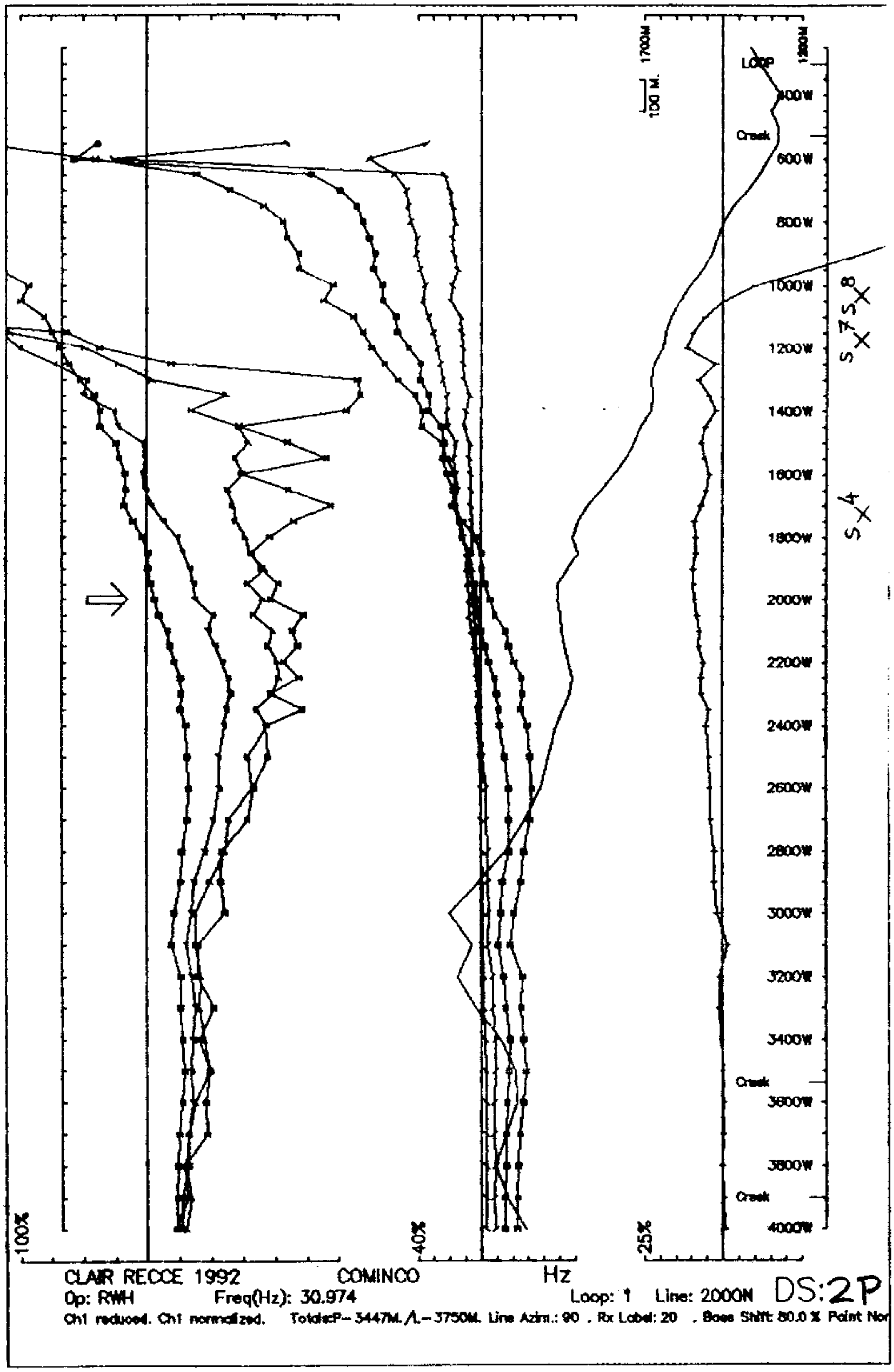


CLAIR RECCE 1992 COMINCO Hz
Op: RWH Freq(Hz): 30.974 Loop: 1 Line: 1000N DS: 1
Chi reduced. Chi normalized. Totals:P-2036M./L-2036M. Line Azim.: 90 . Rx Label: 10

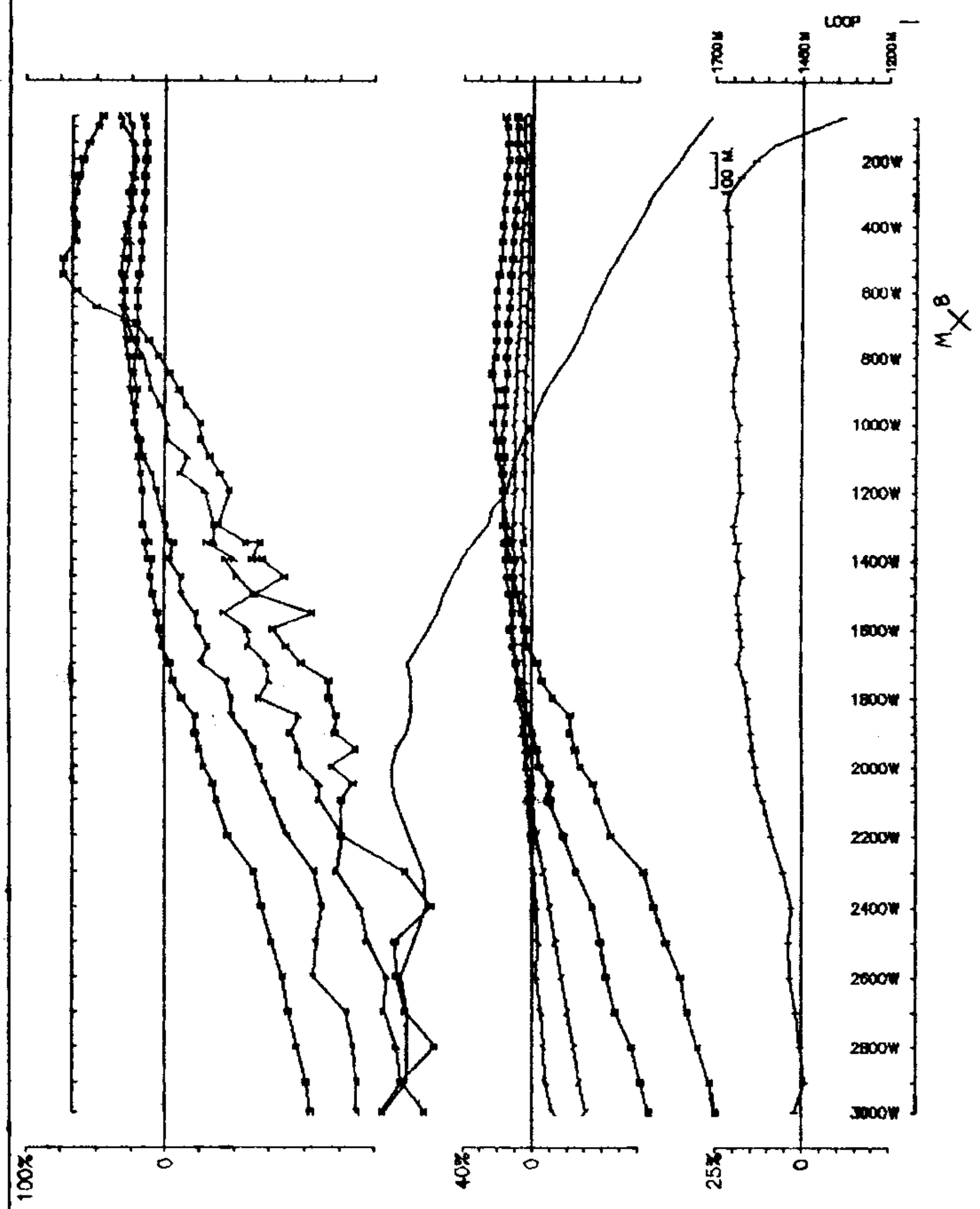


CLAIR RECCE 1992 COMINCO Hz
Op: RWH Freq(Hz): 30.974 Loop: 1 Line: 1000N DS: IP
Ch1 reduced. Ch1 normalized. Totals:P−2036M./L−2036M. Line Azim.: 90 . Rx Label: 10 . Base Shift: 80.0 % Polat: Nor

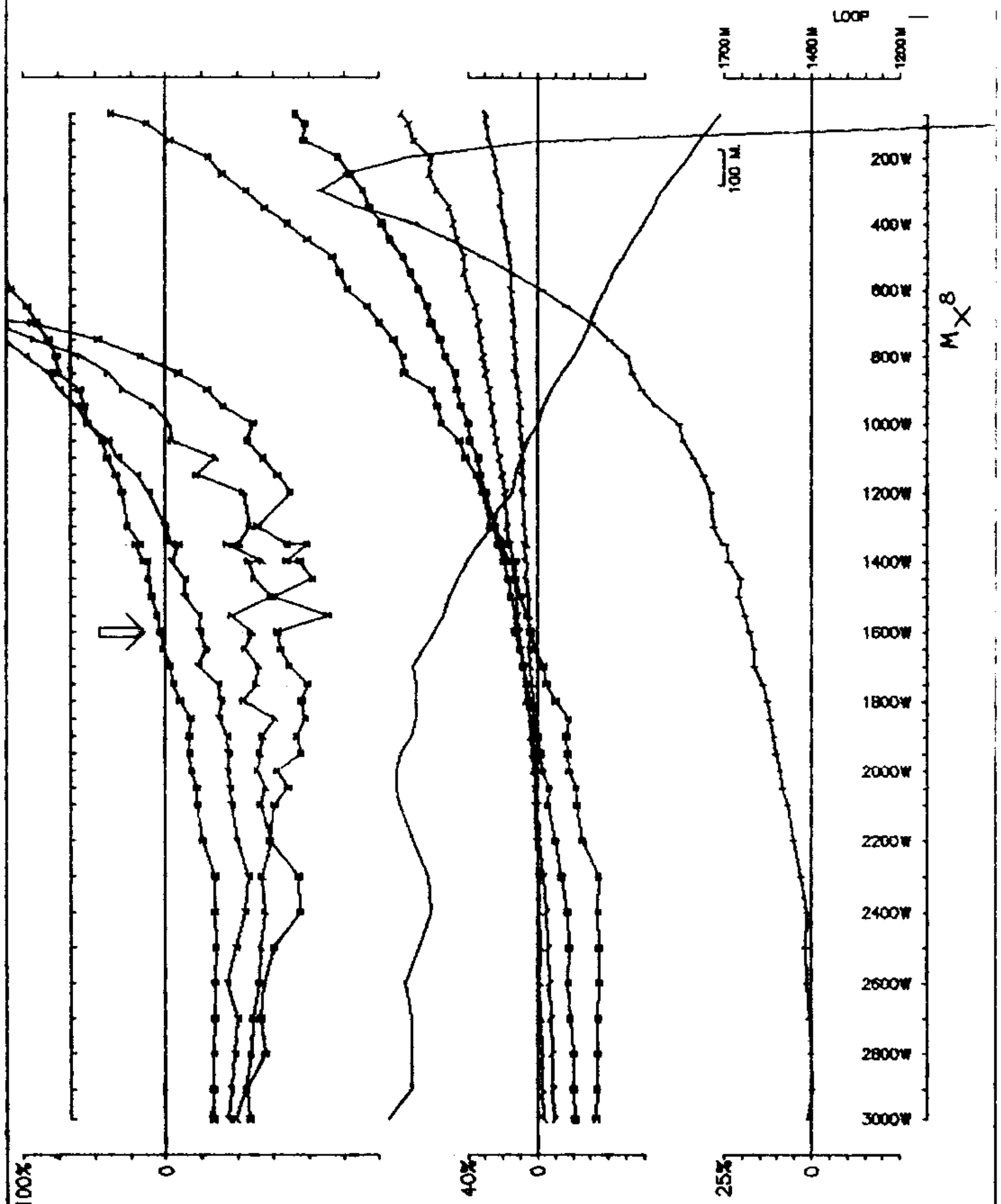

LOOP
Creek
400W
600W
800W
1000W
1200W
1400W
1600W
1800W
2000W
2200W
2400W
2600W
2800W
3000W
3200W
3400W
3600W
3800W
4000W
1700M
1200M
100 M.
S X 7 S X 8
S X 4
100%
40%
25%
CLAIR REOCE 1992
COMINCO
Hz
Op: RWH
Freq(Hz): 30.974
Loop: 1 Line: 2000N
DS: 2
Ch1 reduced. Ch1 normalized. Totals:P- 3447M./L- 3750M. Line Azim.: 90 , Rx Label: 20 , Base Shift: 80.0 %



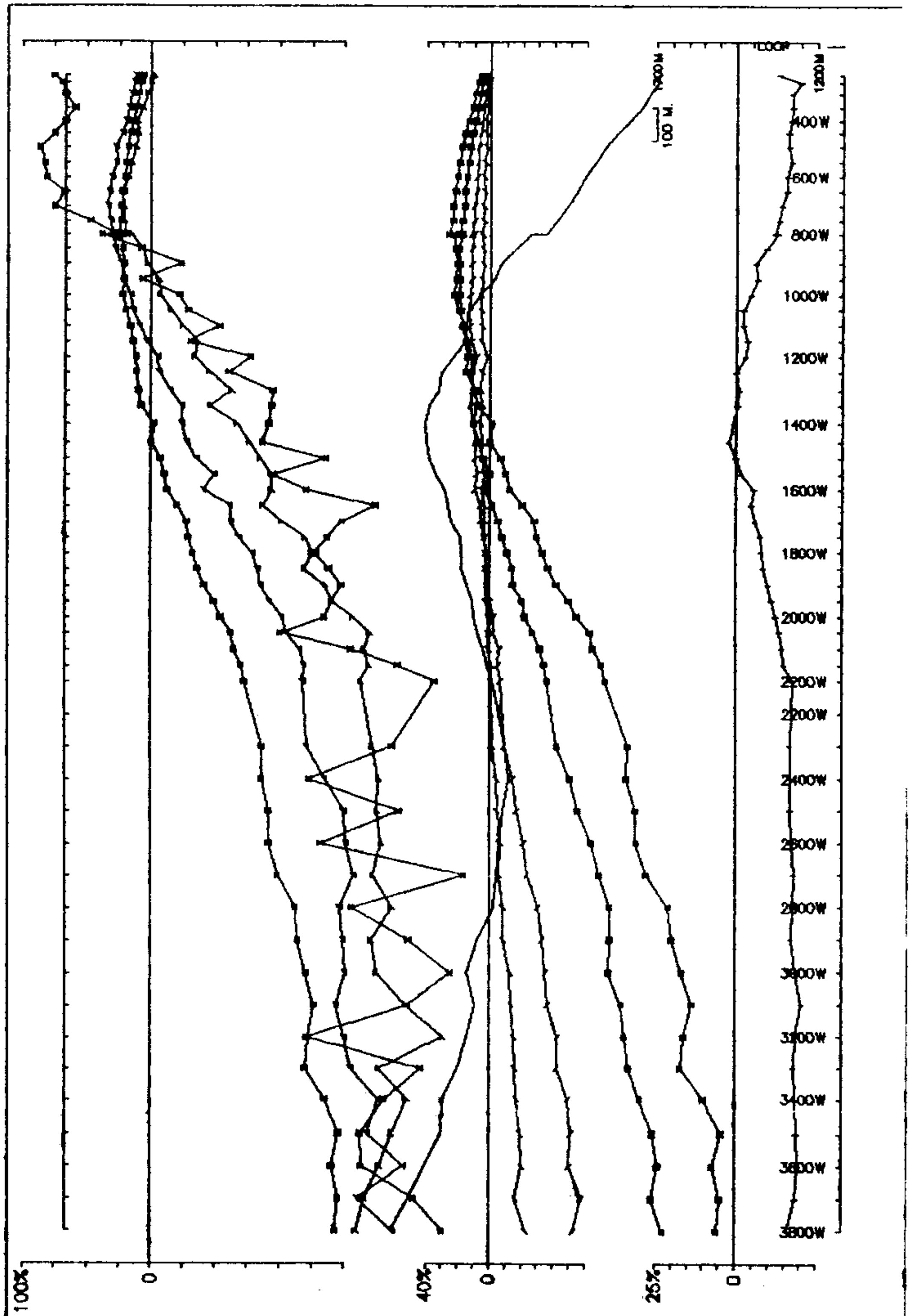
1700M
100 M.
1200M
LOOP
400W
Creek
600W
800W
1000W
1200W
1400W
1600W
1800W
2000W
2200W
2400W
2600W
2800W
3000W
3200W
3400W
Creek
3600W
3800W
Creek
4000W
100%
40%
25%
S X7 S X8
S X4
CLAIR RECCE 1992
COMINCO
Hz
Op: RWH
Freq(Hz): 30.974
Loop: 1
Line: 2000N
DS:2P
Ch1 reduced. Ch1 normalized.
Totals:P- 3447M./L- 3750M. Line Azim.: 90 . Rx Label: 20 . Base Shift 80.0 % Point Nor



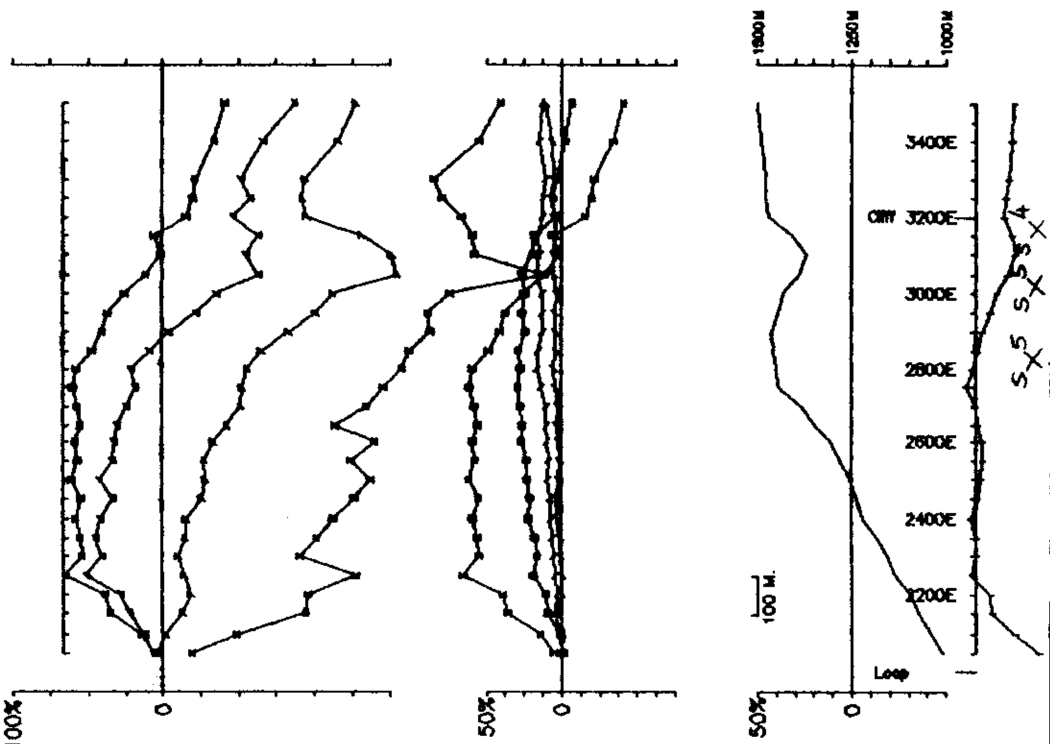
CLAIR RECCE 1992 COMINCO Hz
Op: RWH Freq(Hz): 30.974 Loop: 1 Line: 3000N DS: 3
Ch1 reduced. Ch9 normalized. Totals P—2850M /L—2930M. Line Azim.: 90 . Rx Label: 30



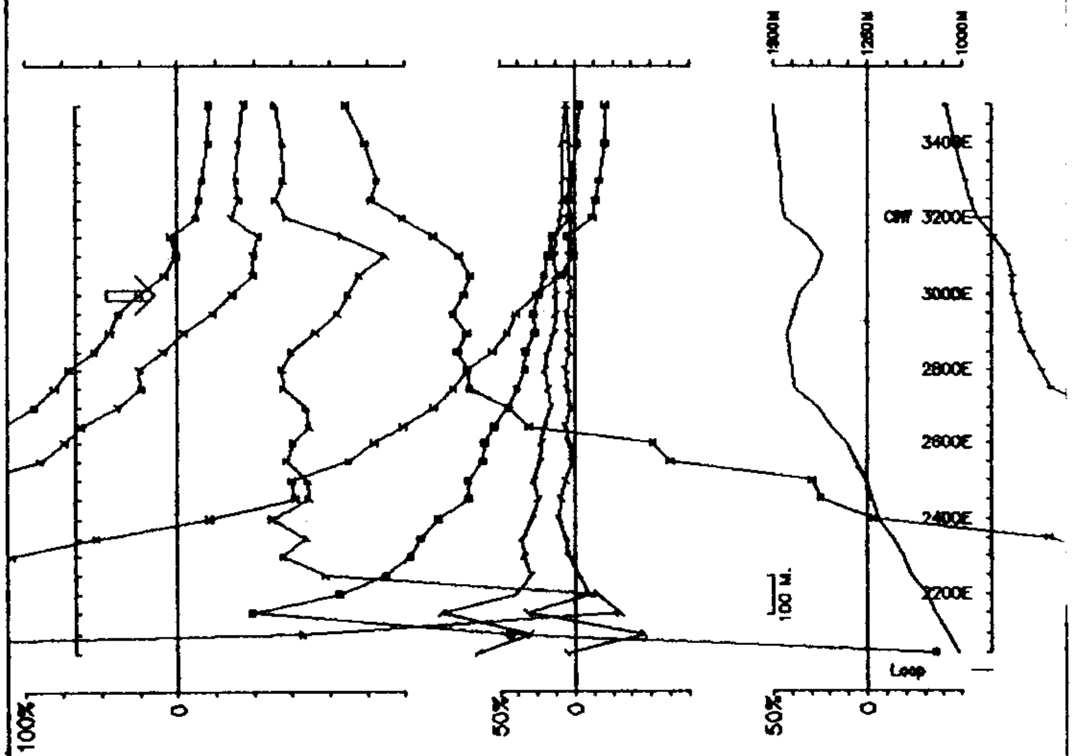
CLAIR RECCE 1992 COMINCO Hz
Dp: RWH Freq(Hz): 30.974 Loop: 1 Line: 3000N DS:3P
Ch1 reduced. Ch1 normalized. Totals:P-- 2838M. A-- 2930M. Line Azim.: 90 . Rx Label: 30 Point Normalized.



CLAIR RECCE 1992 COMINCO Hz
Op: RWH Freq(Hz): 30.974 Loop: 1 Line: 4000N DS: 4
Ch1 reduced. Ch1 normalized. Totals:P– 3590M. /L– 3718M. Line Azim.: 90 . Rx Label: 40



CLAIR RECCE 1992 COMINCO Hz
Op: RWH Freq(Hz): 30.974 Loop: 2 Line: 1000N DS: 5
Ch1 reduced. Ch1 normalized. TotalacP– 1445M. /L– 1445M. Line Azim.: 90 . Rx Label: 10



CLAIR RECCE 1992 COMINCO Hz
Op: RWH Freq(Hz): 30.974 Loop: 2 Line: 1000N DS:5P
Ch1 reduced. Ch1 normalized. TotdelP- 1445M /L- 1445M. Line Azim.: 90 . Rx Label: 10 Point Normalized.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

22,695

CLAIR PROPERTY FORT STEELE M.D., B.C.				NTS 82-F/9
Drawn by:	Traced by:	GRID, CLAIM and GEOPHYSICS COMPILATION MAP		
Revised by / Date	Revised by / Date			
		Scale: 1 : 20,000	Date: December 1992	Plate: 8