4

ARIS SUMMARY SHEET

District Geologist, Nelson — Off Confidential: 94.10.25

ASSESSMENT REPORT 23134 — MINING DIVISION: Fort Steele

PROPERTY: Vine
LOCATION: LAT 49 26 00 LONG 115 52 00
UTM 11 5476027 582175
NTS 082G05W

CAMP: 001 Purcell Belt (Sullivan)

CLAIM(S): Vine 12,Vine 16,Vine 40,Vine 43,Vine 57-59,Vine 65
OPERATOR(S): Cominco
AUTHOR(S): Jackisch, I.
REPORT YEAR: 1993, 25 Pages
COMMODITIES
SEARCHED FOR: Lead,Zinc
KEYWORDS: Helikian,Aldridge Formation,Quartzites,Wakes
WORK
DONE: Geophysical,Physical
EMGR 23.2 km;UTEM
Map(s) - 1; Scale(s) - 1:20 000
LINE 23.2 km
RELATED
REPORTS: 16456,16697,16699,17886,17889,18407
MINFILE: 082GSW050,082GSW051

COMINCO LTD.

EXPLORATION

WESTERN CANADA

NTS: 82G/5

GEOPHYSICAL REPORT

ON

UTEM SURVEYS

ON THE VINE PROPERTY

FORT STEELE M.D., B.C.

- ASSESSMENT REPORT -

Latitude : 49°26'N

Longitude : 115°52'W

TIME PERIOD OF FIELD WORK : SEPT. 16 - 24, 1993

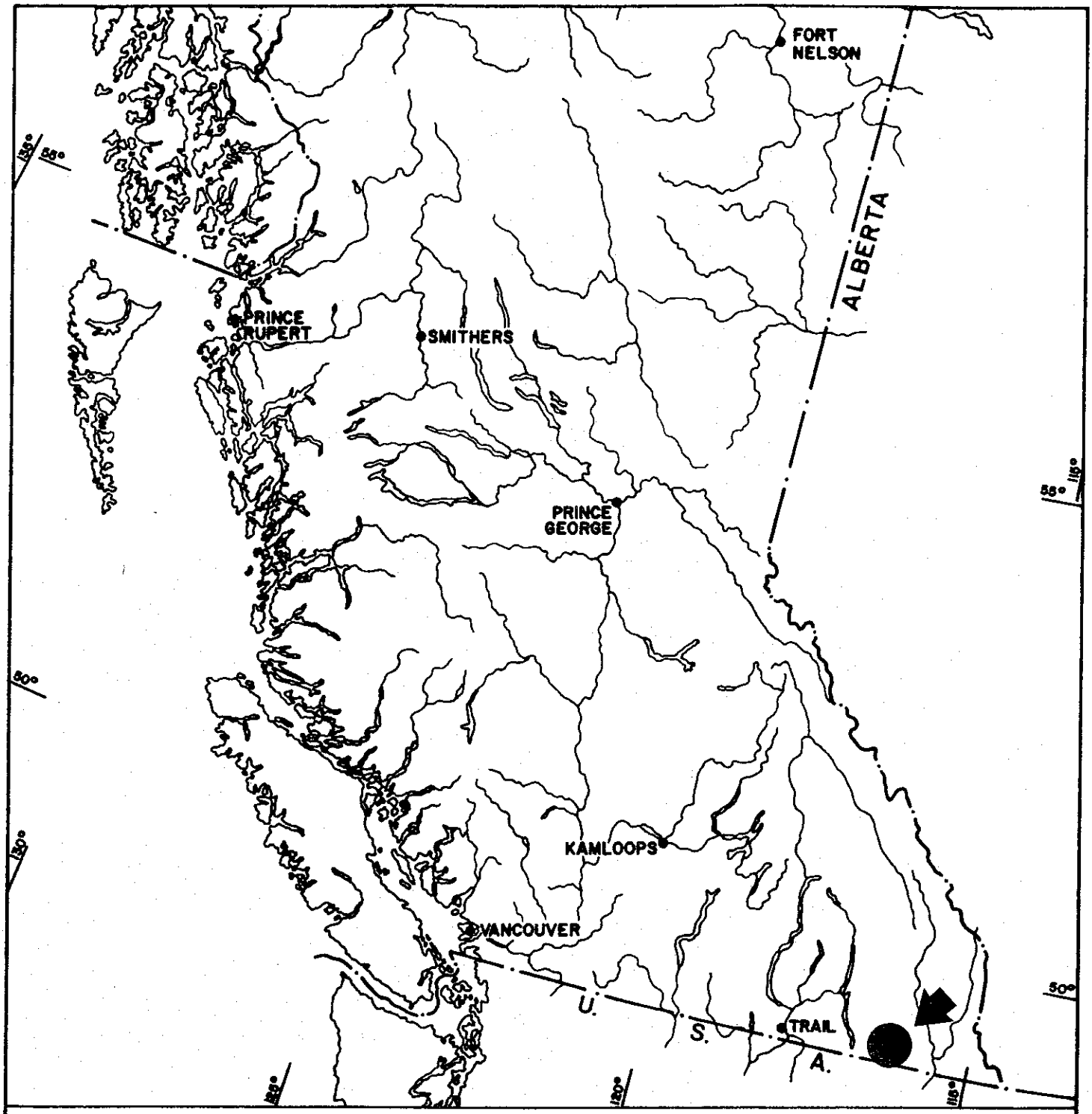
WORK PERFORMED BY : I.JACKISCH & D. HALL

CLAIMS COVERED : VINE 12, 16, 17, 39, 40, 43, 53, 55
VINE 57 - 61, 65, 2383, 2377, 2381

CLAIM OPERATOR : COMINCO LTD.

OCTOBER 1993

INGO JACKISCH



0 100 200 300 400 500 Km.

NTS 82G/5

Drawn by:		Traced by: a. m. e.	
Revised by	Date	Revised by	Date

VINE PROPERTY

LOCATION MAP

Scale: 1 : 6,370,000 | Date: NOV. 1991 | Plate: 811-71-01

NCI - 112A - CL

210-0610

TABLE OF CONTENTS

LEGEND FOR UTEM DATA SECTIONS

DATA SECTIONS

D.S. 1	LOOP 7	LINE	1000N
D.S. 2			2000N
D.S. 3	LOOP 6	LINE	3000E
D.S. 4			4000E
D.S. 5			5000E
D.S. 6	LOOP 8	LINE	6000N
D.S. 7	LOOP 10	LINE	1000S
D.S. 8			2000S
D.S. 9	LOOP 9	LINE	3000E
D.S. 10			4000E
D.S. 11			5000E
D.S. 12	LOOP 11	LINE	6000N
D.S. 13	12	LINE	7000E

COMINCO LTD.

EXPLORATION
NTS: 82G/5

WESTERN CANADA

GEOPHYSICAL REPORT ON A UTEM SURVEY ON THE VINE PROPERTY FORT STEELE M.D.,B.C.

- ASSESSMENT REPORT -

INTRODUCTION

During the time period June 16 - 24, 1993, 23.2 kms of UTEM surveying was carried out on the VINE Property by a COMINCO geophysical crew under the direction of geophysicists, I. Jackisch and D. Hall. The purpose of the UTEM survey was to search for Zn/Pb Sullivan-type deposits at depth.

This surveying was covered by two UTEM loops, each 1.5 km by 1 km in size. Most of the survey lines were reconnaissance lines, but 3 lines in thicker bush were cut and chained.

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

LOCATION AND ACCESS

This UTEM survey on the VINE Property is located 10 kms south of Cranbrook, B.C., and 11 kms northwest of the north end of Moyie Lake, B.C. Access is from Highway 3/95 [turnoff onto a gravel road heading east from Lumberton], from the Hidden Valley Road and 38th Ave. south of Cranbrook. The area of the grids is covered by numerous dirt roads which provide easy access to most of the survey area.

LIST OF CLAIMS SURVEYED

The following list of claims were covered by UTEM surveying:

VINE 12,16,17,39,40,43,53,55,57-61,65,2383,2377,2381

DESCRIPTION OF THE UTEM SYSTEM AND FIELD PROCEDURE

Utem is an acronym for "University of Toronto Electro-Magnetometer". Dr. Y. Lamontagne [1975] developed the system as part of his doctoral thesis at that university.

The field procedure consists of first laying out a large transmitter loop of single strand, enamel insulated copper wire. Survey lines are usually oriented perpendicular to one side of the loop and surveying can be performed both inside and outside the loop. The three power lines crossing through the survey grid

were expected to give a great deal of 60 Hz "noise". In an attempt to boost the signal, two strands of wire were laid out, thereby allowing more current to be tranmitted through the loop.

The UTEM III transmitter energizes the loop with a precise triangular waveform at a carefully controlled base frequency [30.974 Hz for this survey]. Power is supplied by a 2200W motor generator. The UTEM III receiver system includes a sensor coil and backpack portable receiver which has a digital recording facility on solid state memory and backup cassette magnetic tape. Time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units, accurate to about one second in 50 years.

The receiver sensor coil measures one or more components of the electromagnetic field and responds to its time derivative. In this survey, only the vertical component was measured. Since the transmitter current waveform is triangular, the coil will sense a perfect square wave in the absence of conductors. In the presence of electrical conductors, which may be geologic or cultural in origin, deviations from the perfect square wave are observed. The receiver stacks any pre-set number of cycles to increase the signal to noise ratio.

The UTEM receiver samples each half cycle of the waveform in ten channels or time windows. The delay time of each channel is equal to the width of the time window over which the signal is averaged. For a standard 30 Hz transmitted signal the delay times range from 16 microseconds for channel 10, to 8.33 milliseconds for channel 1. Therefore, the higher numbered channels [7-10] correspond to short time or high frequency while the lower numbered channels [1-4] correspond to late time or low frequency. Poor and/or small conductors will respond on channels 10, 9, 8, and 7. Better and/or larger conductors will give responses on progressively lower number channels as well. For example, large, massive, highly conducting sulphide or graphite bodies should produce a response on all ten channels.

At the end of the survey day, the data in the receiver is transferred to a personal computer and processed. It is then plotted on a printer using Cominco Ltd. proprietary software. In this report, the data is presented on Data Sections as profiles, with one profile for each of the ten channels.

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 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:

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

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

This normalizing procedure results in the errors from the miscalculations of the primary field, due to chainage errors, being displayed in Channel 1 only.

The channel 9 and 10 windows have such a small delay time that in most geological environments, it becomes completely saturated at a very short distance from the transmitter loop. In most cases, it provides no valuable information and overwrites other useful channels. Therefore, channels 9 and 10 have not been presented in this report.

INTERPRETATION

The claim boundaries, UTEM loops, lines, and conductor locations along with their accompanying labels are shown on Plate 811-71-3. The individual line profiles are included in Data Sections 1-13.

The high voltage power lines added significant 60 Hz noise to the UTEM readings. The two large power lines are approximately perpendicular to the survey lines on Data Sections 3,4,5,10, and 11. No data was collectable for 300-400 metres under and in the immediate vicinity of these power lines.

Data collected near the loop fronts and on survey lines located well away from the power lines are of good quality. Data near the power lines or towards the ends of survey lines that are close to the power lines is of lesser quality. Due to the poor signal to noise ratio this data took a long time to collect; some readings took 20 minutes for a single station. The transmitted signal was averaged over time until an acceptable signal to noise ratio was achieved, within reasonable time parameters.

Several shallow, channel 4 or 5 conductors were detected as shown on the map and data sections. Because of the large line spacing, the strike or connectability of these features cannot be interpreted.

The conductors detected on this survey have conductivities consistant with poorly-conducting causative bodies such as very

sparse metallic sulphides in bedrock and/or somewhat low resistivity overburden, gabbro flow contacts, geological contacts, or faults.

CONCLUSIONS

23.2 kms of UTEM surveying was carried out from Sept. 16-24, 1993. Several shallow, channel 4-6 conductors were detected.

Report by : Ingo Jackisch

Ingo Jackisch
Geophysicist
Cominco Ltd.

Approved for Release by : John Hamilton

J.M. Hamilton
Manager, Exploration
Western Canada
Cominco Ltd.

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):

The Vine claims cover NE+E dipping, Middle Aldridge sediments, Precambrian in age, composed predominantly of bedded quartzwackes quartzitic wackes and wackes intruded by gabbro sills + dykes. The area is bounded by 3 major faults, the E-W trending Cranbrook Fault on the N, the NW-SE trending Gold Creek Fault on the E and the NE-SW trending Moyie Fault on the SE. To date, no mineralization of economic significance has been found on the property.

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS (OVER)

Distribution:

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

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 VINE PROPERTY

LOCATED 10 KMS SOUTHWEST OF CRANBROOK, B.C.

IN THE FORT STEELE MINING DIVISION OF THE

PROVINCE OF BRITISH COLUMBIA,

MORE PARTICULARLY

N.T.S. 82G/5

S T A T E M E N T

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 VINE Property;

3. THAT the said expenditures were incurred from June 5-10, 1991, for the purpose of mineral exploration on the above-noted property.

Ingo Jackisch

Ingo Jackisch
Geophysicist, Cominco Ltd.

Dated this 29 day of October, 1991
at Vancouver, B.C.

APPENDIX II

EXHIBIT "A"

STATEMENT OF EXPENDITURES

VINE PROPERTY - SEPT 16-24, 1993

GEOPHYSICAL COSTS	$23,960.96
LINE CUTTING COSTS	4658.38
	$28,619.34

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 British Columbia.

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

October, 1993

LEGEND

UTEM DATA SECTIONS

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

DESCRIPTION OF INTERPRETATION SYMBOLS

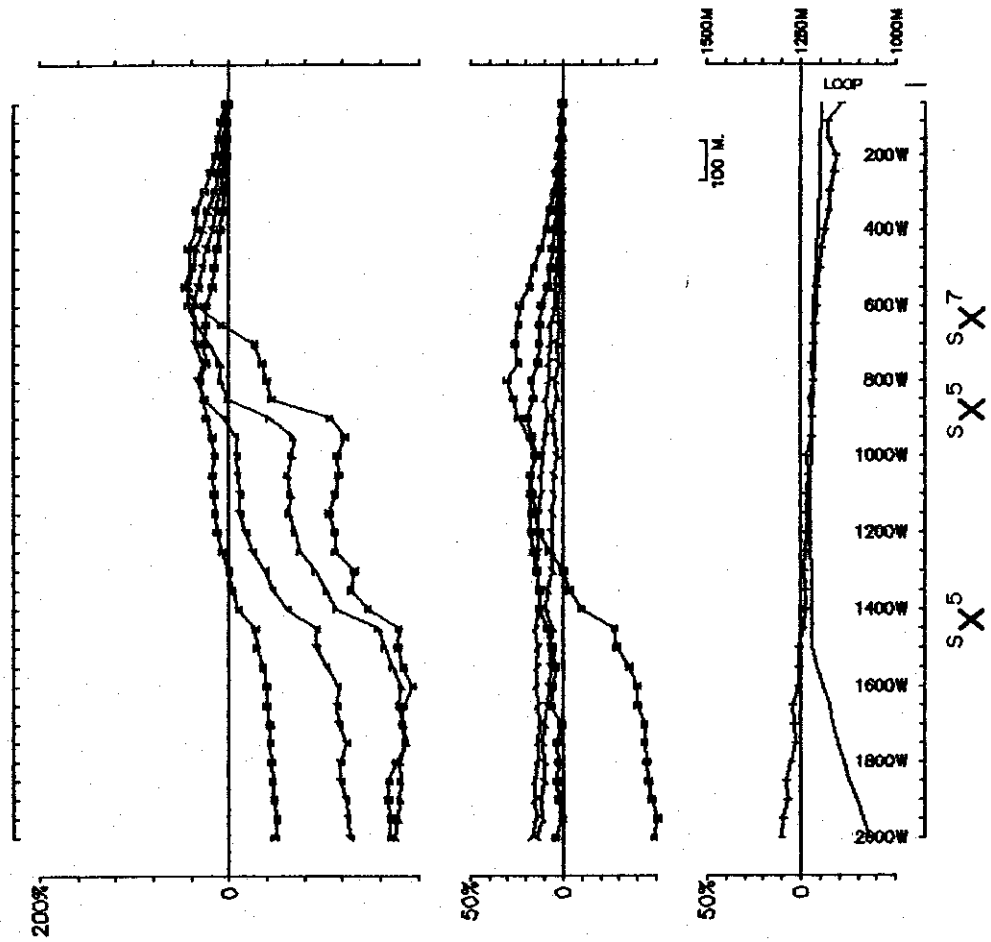
Superscript indicates depth to top {S shallow 0-50m {M moderate 50-150m {D deep >150m

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]

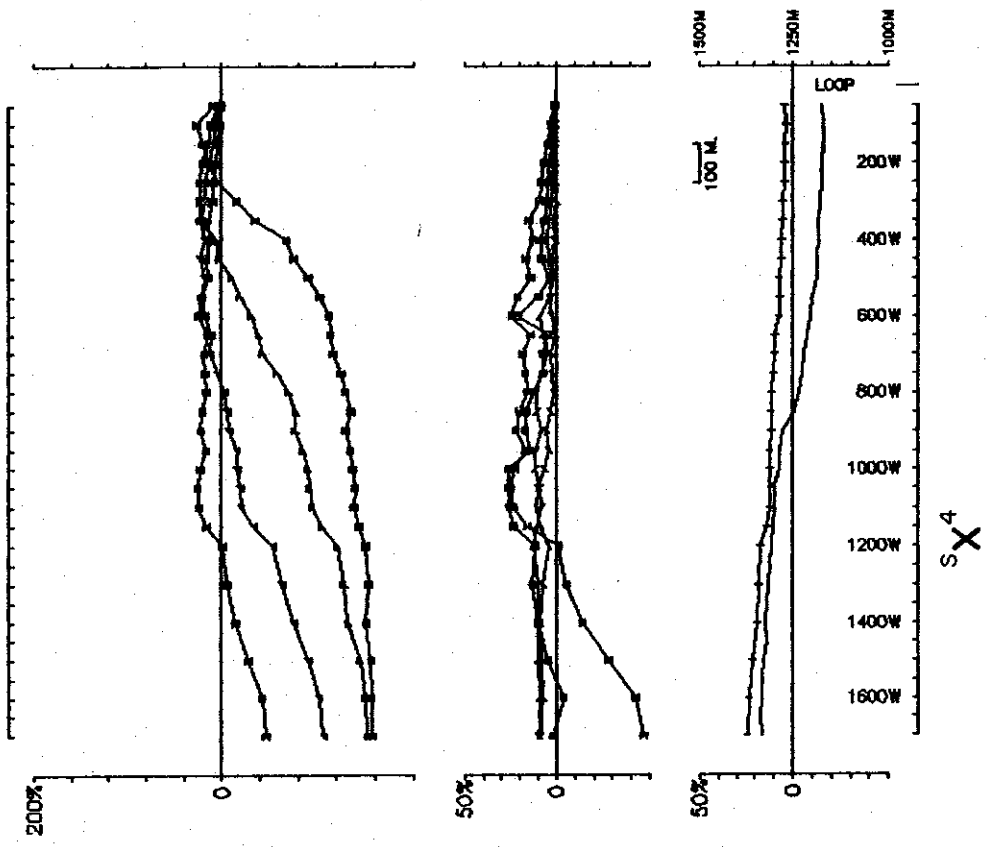
R Reverse crossover conductor



VINE PROPERTY COMINCO LTD Hz

Op: WJDH Freq(Hz): 30.974 #Stns: 40 Loop: 7 Line: 1000N DS: 1

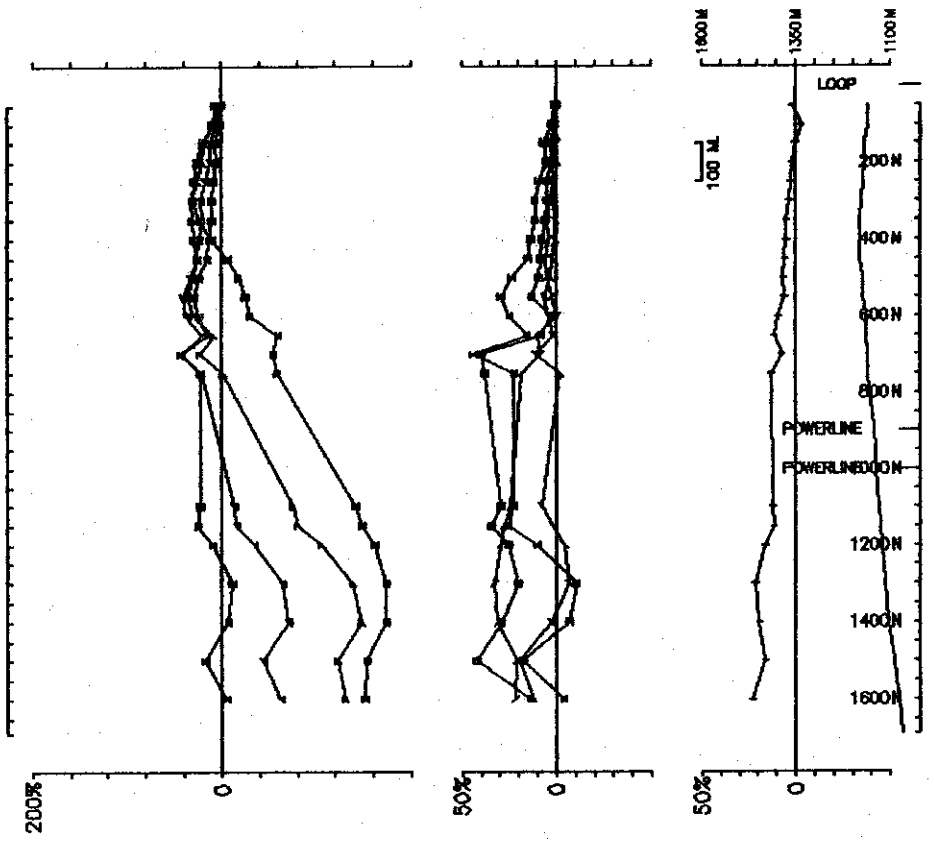
Ch1 reduced. Ch1 normalized. Totals:P-1924M./L-1949M. Line Azim.: 212 . Rx Label: 10



VINE PROPERTY COMINCO LTD Hz

Op: WJ,DH Freq(Hz): 30.974 #Stns: 29 Loop: 7 Line: 2000N DS: 2

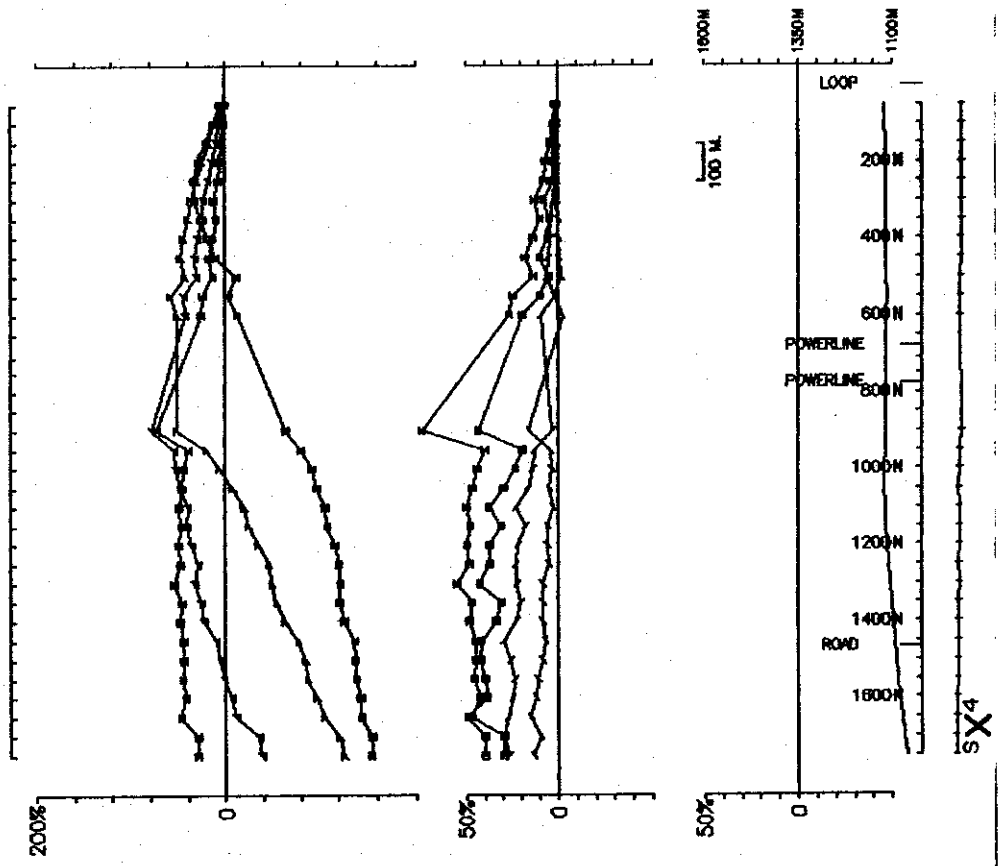
Ch1 reduced. Ch1 normalized. Totals:P-1652M./L-1652M. Line Azim.: 258 . Rx Label: 20



VINE PROPERTY COMINCO LTD Hz

Dp: M,DH Freq(Hz): 30.974 #Stns: 22 Loop: 6 Line: 3000E DS: 3

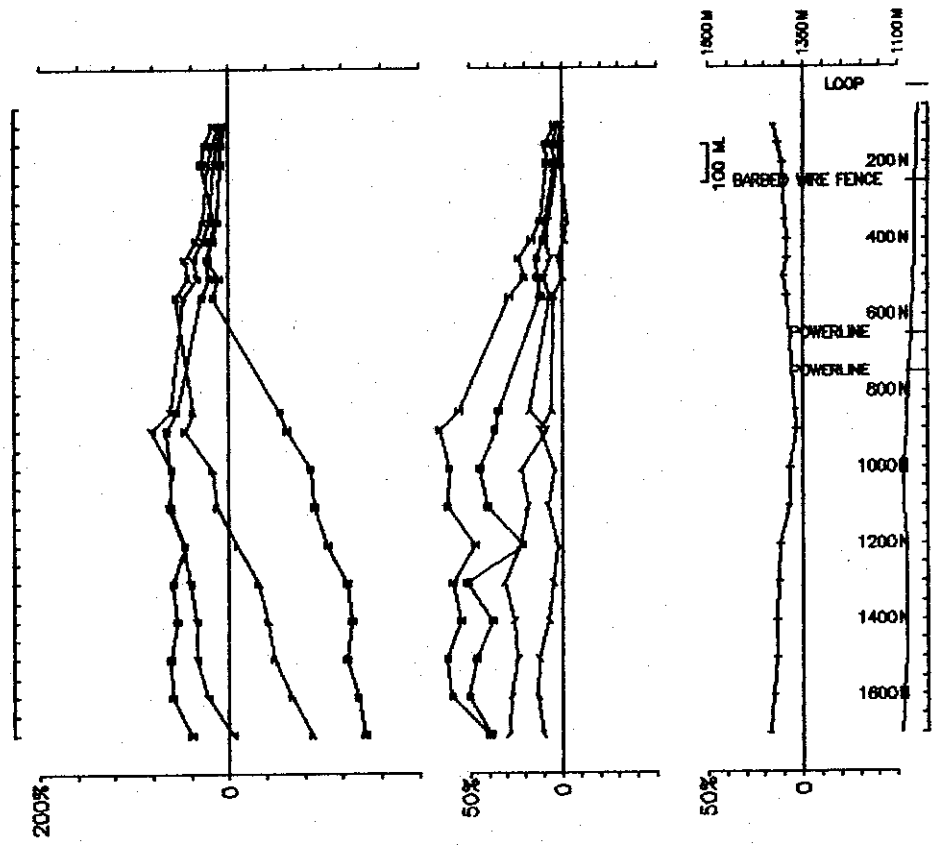
Ch1 reduced. Ch1 normalized. Totals:P- 1550M, /L- 1638M. Line Azim.: 314 . Rx Label:30



VINE PROPERTY COMINCO LTD Hz

Dp: M,DH Freq(Hz): 30.974 #Stns: 30 Loop: 6 Line: 4000E DS: 4

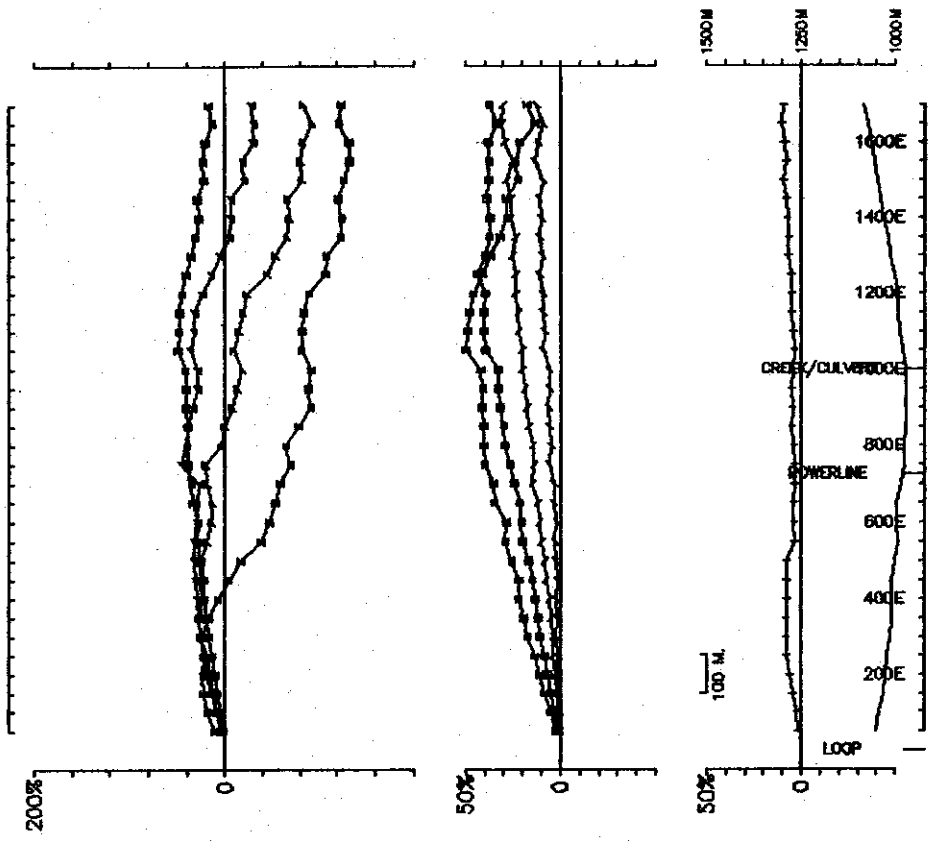
Ch1 reduced. Ch1 normalized. Totals:P--1701M./L--1701M. Line Azim.: 343 . Rx Label 40



VINE PROPERTY COMINCO LTD Hz

Op: MJ,DH Freq(Hz): 30.974 #Stns: 18 Loop: 6 Line: 5000E DS: 5

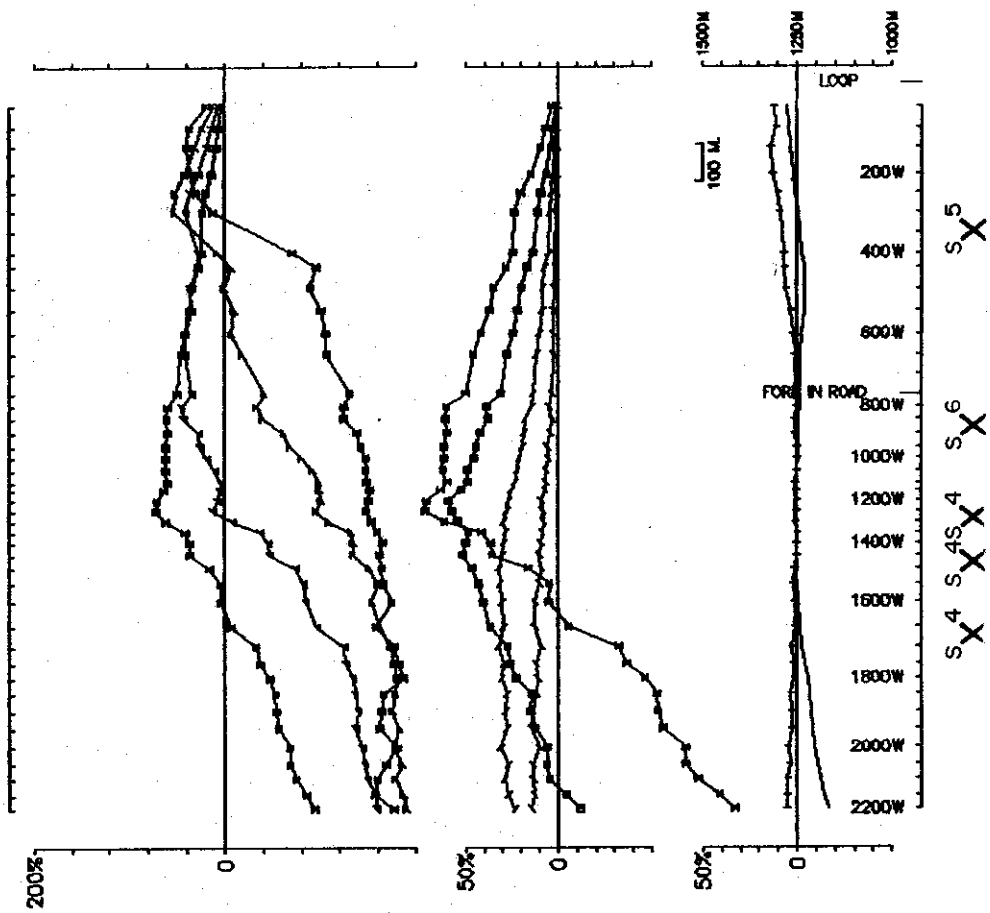
Ch1 reduced. Ch1 normalized. Totals:P-- 1599M. /L-- 1649M. Line Azim.: 5 . Rx Label: 50



VINE PROPERTY COMINCO LTD Hz

Op: M,DH Freq(Hz): 30.974 #Stns: 34 Loop: B Line: 6000N DS: 6

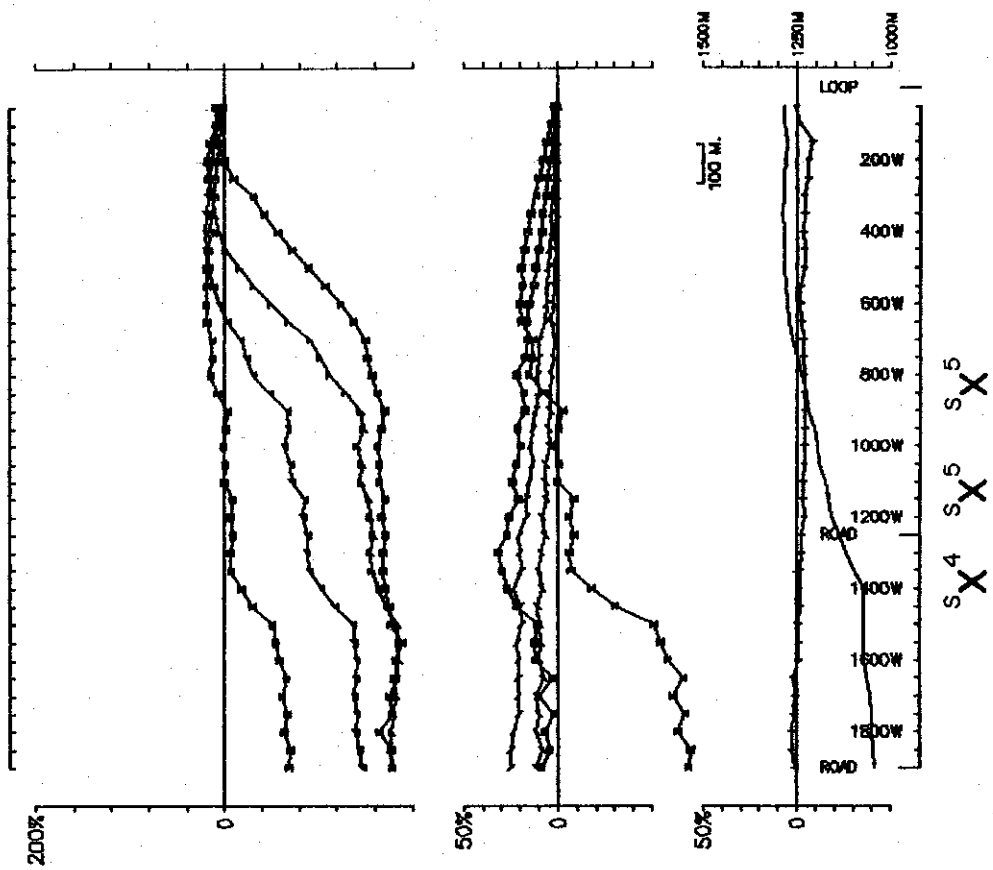
Ch1 reduced. Ch1 normalized. Totals:P- 1644M./L- 1644M. Line Azim.: 130 . Rx Label: 60



VINE PROPERTY COMINCO LTD Hz

Op: IJ,DH Freq(Hz): 30.974 #Stns: 42 Loop: 10 Line: 1000S DS: 7

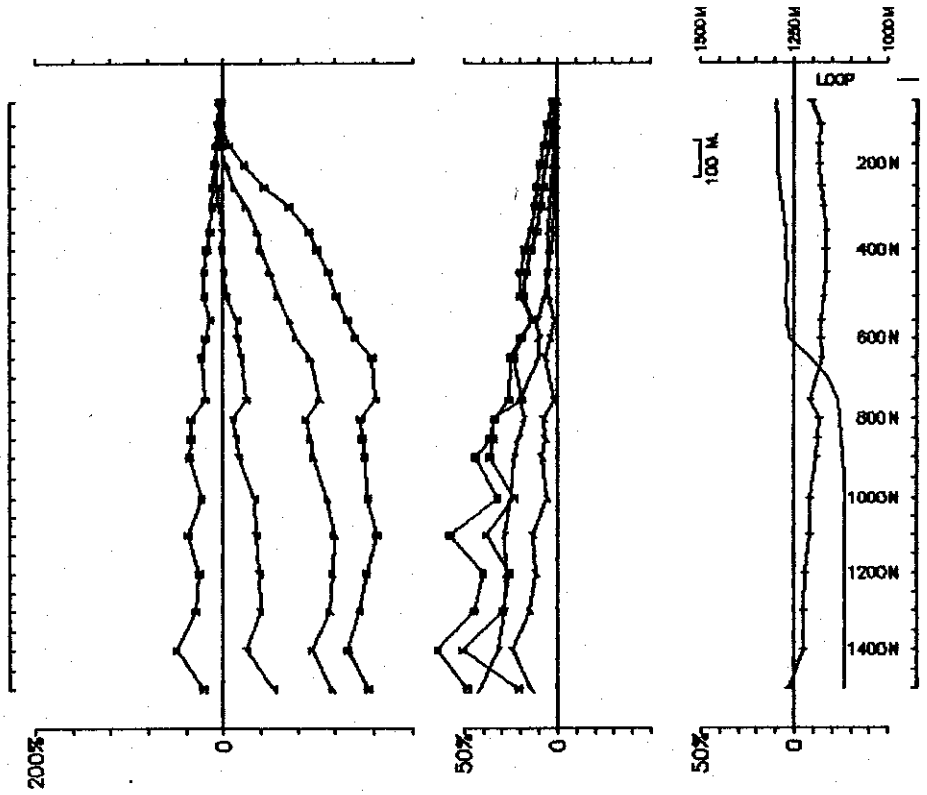
Ch1 reduced. Ch1 normalized. Totals:P-1842M./L-2322M. Line Azim.: 260 . Rx Label: 10



VINE PROPERTY COMINCO LTD Hz

Op: LJ,DH Freq(Hz): 30.974 #Stns: 38 Loop: 10 Line: 2000S DS: 8

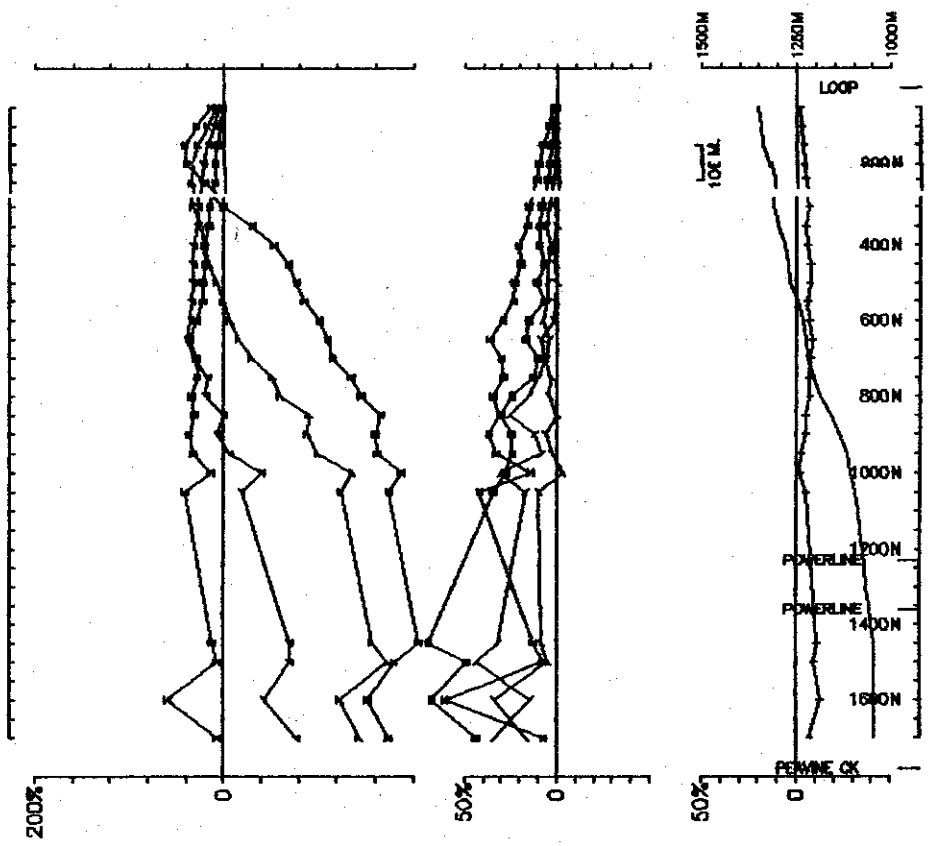
Ch1 reduced. Ch1 normalized. Totals:P-1737M,/L-1849M. Line Azim.: 240 . Rx Label: 20



VINE PROPERTY COMINCO LTD Hz

Op: W,DH Freq(Hz): 30.974 #Stns: 23 Loop: 9 Line: 3000E DS: 9

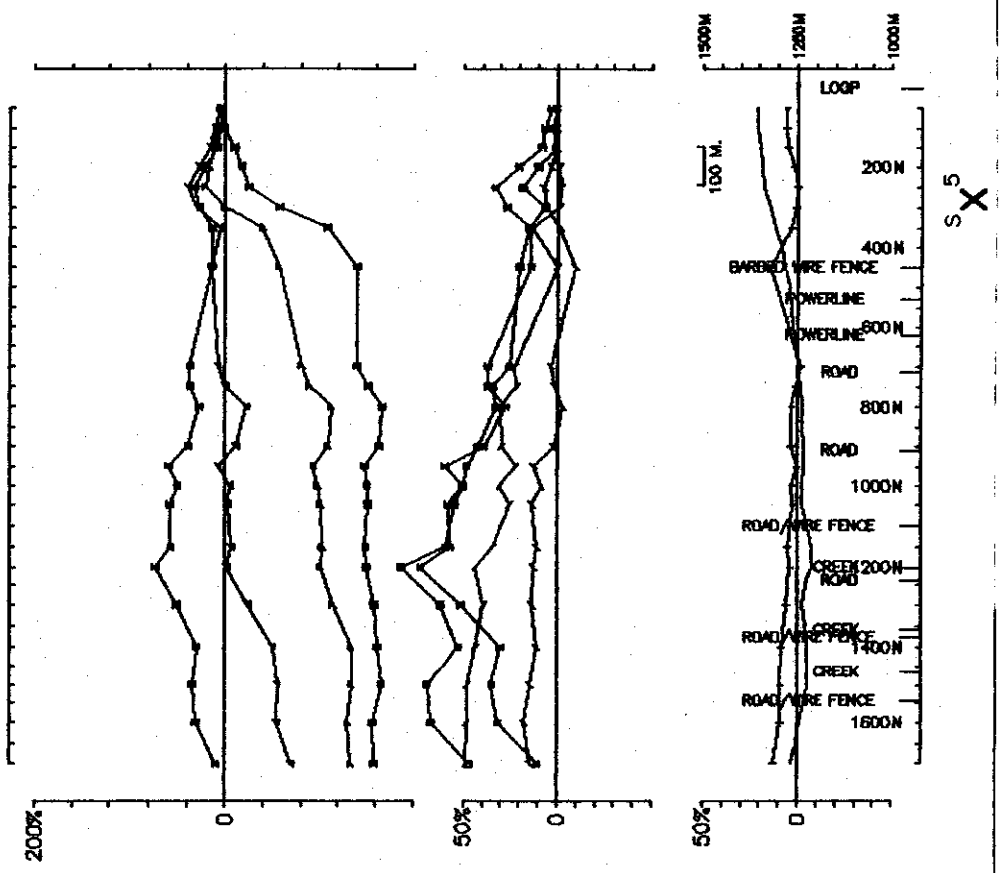
Ch1 reduced. Ch1 normalized. Totals:P-- 1549M. /L-- 1549M. Line Azim.: 215 . Rx Label: 30



VINE PROPERTY COMINCO LTD Hz

Op: WJ,DH Freq(Hz): 30.974 #Stns: 25 Loop: 9 Line: 4000E DS: 10

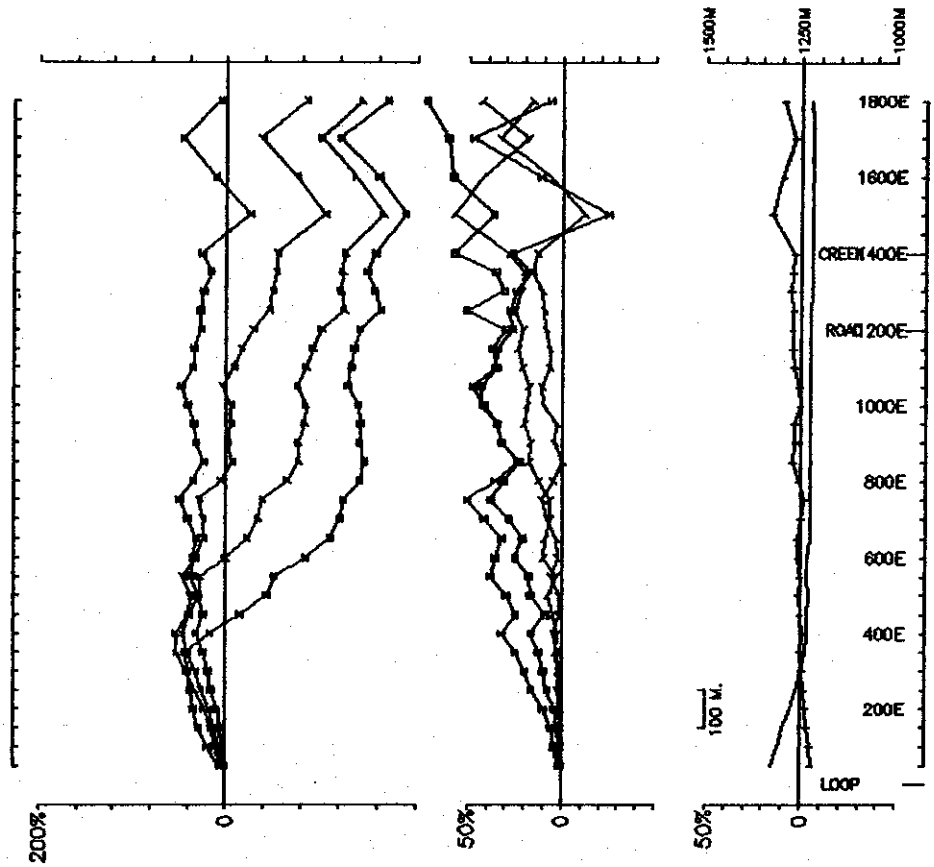
Chl reduced. Chl normalized. Totals:P- 1641M./L- 1641M. Line Azim.: 330 . Rx Label: 40



VINE PROPERTY COMINCO LTD Hz

Op: W,DH Freq(Hz): 30.974 #Stns: 22 Loop: 9 Line: 5000E DS: 11

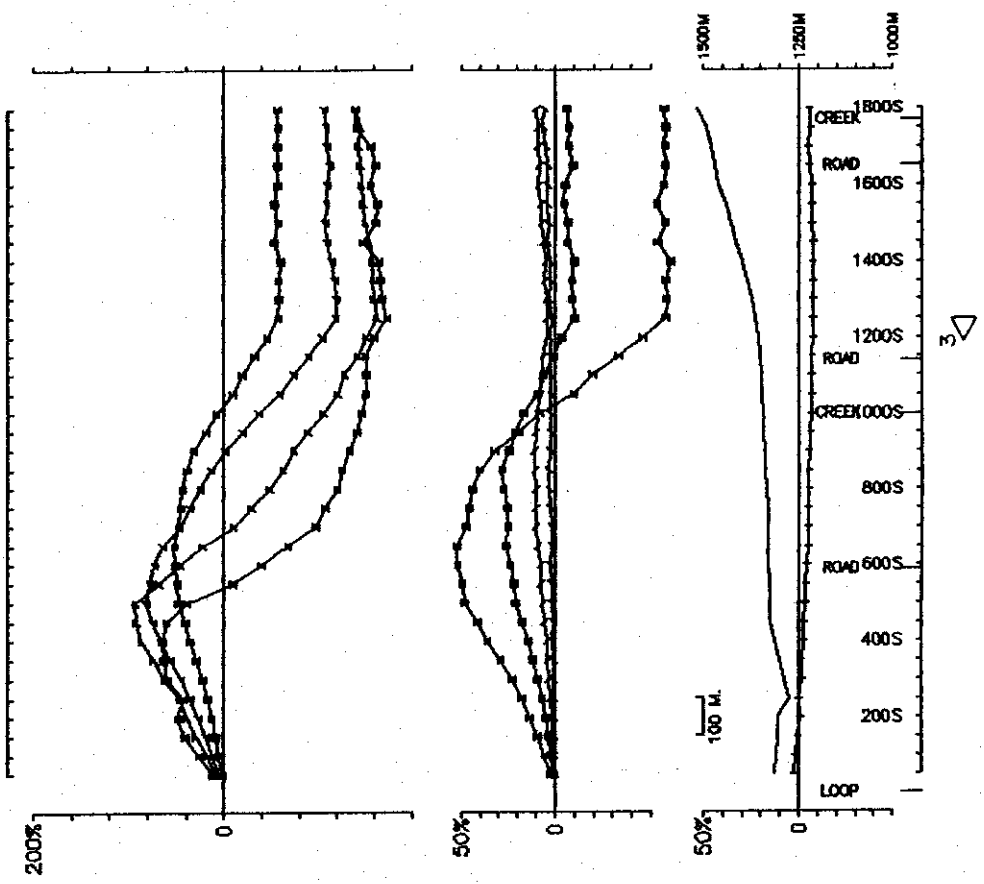
Ch1 reduced. Ch1 normalized. Totals:P-1731M./L-1731M. Line Azim.: 350 . Rx Label: 50



VINE PROPERTY COMINCO LTD Hz

Op: LJ,DH Freq(Hz): 30.974 #Stns: 32 Loop: 11 Line: 6000N DS: 12

Ch1 reduced. Ch1 normalized. Totals:P- 1740M. /L- 1740M. Line Azim.: 65 . Rx Label: 60



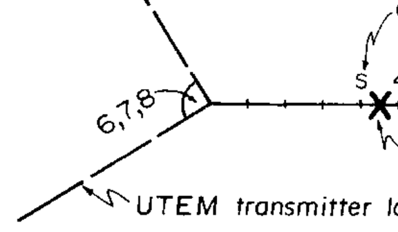
VINE PROPERTY COMINCO LTD Hz

Op: IJ,DH Freq(Hz): 30.974 #Stns: 36 Loop: 12 Line: 7000E DS: 13

Ch1 reduced. Ch1 normalized. Totals:P-1748M./L-1748M. Line Azim.: 142 . Rx Label: 70

N

0 0.5 1 1.5 2 kilometres



VINE PROPERTY

FORT STEELE M.D., B.C.

NTS 82·G/5

CLAIM, GRID and UTEM COMPILATION MAP

Drawn by	Traced by	Scale	Date	Plate
		1 : 20,000	October 1993	811·71·3

FORM 210 - 0670