ASSESSMENT REPORT
ON GEOLOGICAL, GEOCHEMICAL, AND GEOPHYSICAL SURVEY AND DIAMOND DRILLING
DRIFTPILE CREEK PROPERTY

JANUARY 30, 1979

R.C. Carne R.J. Cathro

PART 2 OF 2
ON OVERSIZE
SHELF

ASSESSMENT REPORT
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ON

GEOLOGICAL, GEOCHEMICAL, AND GEOPHYSICAL SURVEY

AND

DIAMOND DRILLING

Group	Claims	Record No.	Total	NTS	Mining District
1	P22	71775	2	94K/4W (see 94F/13W 94L/1E)	Liard
	P24	71777		"	"
2	P20	71773	6	"	"
	P37	71790		"	"
	P39	71792		"	"
	P41	71794		"	"
	Goof 1	71862		"	"
	Goof 4	71865		"	"
3	D2	71809	3	"	"
	D19	71826		"	"
	D21	71828		"	"
4	P19	71772	5	"	"
	P21	71774		"	"
	P23	71776		"	"
	Goof 2	71863		"	"
	D39	71846		"	"
5	D20	71827	3	"	"
	D22	71829		"	"
	D24	71831		"	"
6	D41	71848	1	"	"

Location - 58°04'N Latitude; 125°55'W Longitude

Claims owned by Placer Development Ltd.
Survey operated by Welcome North Mines Ltd. (NPL)
for Gataga Joint Venture (optionee)

Survey performed from August 12 to September 12, 1978 by Archer, Cathro & Associates Ltd.
Report by R.C. Carne, B.Sc. and R.J. Cathro, B.A.Sc., P. Eng.
January 30, 1979

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GATAGA JOINT VENTURE

Driftpile Creek Program, 1978

Itemized Cost Statement #2

During 1978, Gataga Joint Venture performed work on its optioned Driftpile Creek property consisting of a drill program and detailed geological, geochemistry and geophysical surveys.

The amount of work performed prior to August 12, 1977, the anniversary of the claims concerned, is estimated at $144,000. At the time of filing assessment, this expense was represented by an initial cost statement of $29,743.42 (accompanying a preliminary report on the geology and geochemistry by R.C. Carne and R.J. Cathro dated August 12, 1978) and by an initial portion of the drilling program (represented in this report).

This cost statement itemizes the balance of 1978 expenditures apart from those already presented in Cost Statement #1. No expenses have been duplicated in either statement.

This cost statement totals $266,021.93 of which $114,256.58 has already been applied to work performed prior to August 12, 1978 and filed for assessment. The balance of $151,765.35 is applied to assessment for work after August 12, 1978 and the relevent Statements of Exploration and Development are attached.

Itemized Cost Statement

A. Wages		Days		
M.P. Phillips (Geologist)	July 18-31 August 1-10,14(1/2 day)	(14) (10-1/2)	$200/day	$ 4,900.00
R.C. Carne (Geologist)	July 1-31 August 1-31 September 1-14 October 1-31 November 1-30 December 1-31	(31) (31) (14) (31) (30) (31)	$2700/month	14,568.00*
C.A. Main (Geologist)	March (1/3 month) April (1/4 month) July 1-5 September 19	(5) (8) (5) (1)	$2700/month	2,100.00
C. Chalmers (Field Assistant)	July 1-12 September 3-8 October (3 days)	(12) (6) (3)	$1350/month	1,182.00*
J. Ogilvey (Field Assistant)	July 1-31 August 1-31 September 1-2	(31) (31) (2)	$1050/month	2,335.50*
S. Veerman (Field Assistant)	July 8-31 August 1-31	(24) (31)	$1200/month	2,211.00*
F. Gish (Field Assistant)	July 14-31 August 1-31 September 1-13, 27-30 October 8-31 November 1-30 December 1-31	(16) (31) (17) (24) (30) (31)	$1500/month	7,383.00*
D. Wickham (Field Assistant)	July 27-31 August 1-31 September 1-7	(4) (31) (7)	$1425/month	1,989.00*
D. Smail (Field Assistant)	August 1-31 September 1-6	(31) (6)	$1125/month	1,395.00*
C. Romaniuk (First Aid Man)	August 9-31 September 1-11	(23) (11)	$450/week	3,732.00
C. Newsome (Casual Labour)	August (3-1/4 days)	(3-1/4)	$53/day	172.25
				$40,392.75

* includes cooking and/or clothing bonus

B. Food and Accommodation

Whitehorse - Archer, Cathro Staff House ($30/day)

R. Carne: July 21-23(3); August 1-2(2); September 11-14(4)
F. Gish: July 14-15(2); September 11-13,27,28(5)
C. Chalmers: July 11(1); September 3(1)
C. Main: July 27-31(4)
D. Wickham: July 27-29(3); August 31(1); September 1-2(2)
S. Veerman: August 23-24(2)
D. Smail: August 1-2,31(3); September 1-2(2)
C. Newsome: August 29-31(3)

38 days @ $30 — $1,140.00

Whitehorse - Management Meetings

R.J. Cathro: September 10
J. Brock: July 25

308.68

Watson Lake - Belvedene and Sportsman Motels

J. Brock: August 9
R. Dennett: August 23
R. Cathro: August 29
R. Carne: September 10
F. Gish: July 21, September 10
S. Veerman: July 8, 9

321.90

Muncho Lake - J & H Wilderness Lodge

Drill Crew: August 21, July 11-16 — 741.56

$2,512.14

Field Accommodation (Driftpile Creek Camp, maximum 16 man camp)

July:	303 mandays
August:	367 mandays
September:	10 mandays
	710 mandays

Groceries	6,109.01
Field office supplies, stationary, airphoto surveys	700.24
Field hardware, camp supplies (including rental), field clothing and lumber	6,518.47
	$13,327.72

C. Transportation

1. C.P. Air

R. Cathro	- Whse-Watson L-Whse	June 20	$ 92.00
	- Whse-Van-Watson L-Whse	July 7	257.00
	- Whse-Van-Whse (1/2)	July 20	126.00
	- Whse-Watson L-Whse	August 1	90.70
	- Whse-Ft.St.John-Van-Whse	August 5	249.00
	- Whse-Watson L-Whse	August 17	90.70
	- Whse-Van-Whse	August 18	252.00
	- Whse-Van	September 14	130.00
J. Ogilvy	- Whse-Watson L	July 27	45.35
	- Watson L-Whse	August 23	43.20
H. Krueger	- Whse-Watson L	July 12	45.35
	- Watson L-Whse	August 27	45.35
F. Gish	- Whse-Watson L	July 12	45.35
	- MacPass-Whse	July 12	84.00
	- Whse-Van	September 25	130.00
R. Carne	- Watson-Whse-Van	July 20	172.00
	- Whse-Watson	August 1	45.35
M. Phillips	- Whse-Watson	July 20	45.35
	- Ft.St.John-Whse	August 13	99.35
D. Smail	- Whse-Watson	August 1	45.35
	- Watson-Whse-Van	August 17	172.00
D. Wickham	- Whse-Watson	July 30	45.35
	- Watson-Whse-Van	August 17	170.00
J. Brock	- Ft.St.John-Whse	August 3	128.50
R. Dennett	- Whse-Watson	August 31	45.35
	- Watson-Whse	August 27	45.35
S. Veerman	- Watson-Whse-Van	August 18	170.00
C. Romaniak	- Watson-Edmonton	August 17	114.00
	- Edmonton-Watson	August 10	114.00
			$3,137.95

2. Cessna 185 (B.C. Yukon Air Services)

August 23-24	Watson-Mayfield-Watson	356 miles	$ 391.60
	(Watson Lake Flying Service)		
July 31	Watson-Mayfield-Watson	350 miles	385.00
			$ 776.60

3. <u>Beaver (B.C. Yukon Air Services)</u>

July 16	Watson-Mayfield-Watson	356 miles	$ 498.40
18	" " "	"	498.40
27	" " "	"	498.40
August 31	" " "	"	498.40
	(Watson Lake Flying Service)		
August 9	Watson-Mayfield-Watson	350 miles	490.00
			$2,483.60

4. <u>Otter (B.C. Yukon Air Services)</u>

July 3	Watson-Mayfield-Watson	356 miles	$ 640.80
21	" " "	"	640.80
July 18	Watson-Mayfield-Muncho-Mayfield-Watson-Mayfield-Muncho-Mayfield-Watson	2504 miles	4,057.20
July 9	Watson-Mayfield-Watson	356 miles	
11	" " "	"	640.80
August 7 & 8	Watson-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Watson	1252 miles	1,958.60
August 11	Watson-Mayfield-Watson	356 miles	640.80
12	Watson-Mayfield	178 miles	320.40
15	Watson-Mayfield-Watson	356 miles	640.80
19	" " "	" "	640.80
16 & 17	Watson-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Muncho-Mayfield-Watson	1022 miles	1,659.60
August 23	Watson-Mayfield-Watson	356 miles	640.80
September 10	Watson-Mayfield-Muncho-Watson	382 miles	687.60
July 26	Watson-Mayfield-Watson	356 miles	640.80
August 2	Watson-Mayfield-Watson	" "	640.80
3	" " "	" "	640.80
4	" " "	" "	640.80
5	" " "	" "	640.80
(Watson Lake Flying Service)			
July 29	Watson-Mayfield-Watson	350 miles	630.00
			$17,643.80

5. <u>Helicopter - Bell 47G3B2 (Trans North Turbo Air)</u>
(Ferry to/from Driftpile Creek and local work)

Date	Hours	
July 14	1.8 @ $175/hour	$ 315.00
15	10.3	1,802.50
16	9.8	1,715.00
17	10.1	1,767.50
18	6.0	1,050.00
19	2.2	385.00
20	3.1	542.00
21	5.6	980.00
22	3.6	630.00
23	3.6	630.00
24	1.2	210.00
25	3.2	560.00
26	4.6	805.00
		$11,392.50

Date	Hours	
July 27	2.7	$ 472.50
28	3.5	612.50
29	3.1	542.50
30	2.5	437.50
31	3.7	647.50
August 1	.6	105.00
2	3.0	525.00
3	9.6	1,680.00
4	4.7	822.50
5	3.0	525.00
6	7.1	1,242.50
7	8.0	1,400.00
8	5.2	910.00
9	3.7	647.50
10	5.0	875.00
11	6.1	1,067.50
12	4.8	840.00
13	3.6	630.00
14	1.8	315.00
		$14,297.50

Date	Hours	
August 15	1.9	$ 332.50
16	8.7	1,522.50
17	2.5	437.50
18	2.7	472.50
19	0.4	70.00
20	2.6	455.00
21	3.3	577.50
22	3.3	577.50
23	7.3	1,277.50
		$ 5,722.50

6. Helicopter - Bell 206B (Trans North Turbo Air) (Local work)

August 31	0.5 @ $350/hour	$ 175.00

7. Helicopter - Bell 206B (Frontier Helicopter) (Local work)

September 3	3.6 @ $330/hour + fuel	$ 1,224.00
10	3.6	1,224.00
		$ 2,448.00

8. Helicopter - Bell 206B (Okanogan Helicopter) (Local work)

July 2	1.4 @ $290/hour + fuel	$ 407.26
3	1.6	465.44
9	1.7	494.53
11	4.0	1,200.60
		$ 2,567.83

9. Helicopter - Bell 212 (Associated Helicopters) (Management Tour)

August 9	4.5 @ $770/hour + fuel	$ 3,715.00

10. All fuel, aviation, regular or diesel, is listed under diamond drill expense.

11. Rented Trucks/Cars

Archer, Cathro truck (1 ton) rent of July plus repairs and gas	$ 233.54
Tilden, 5 ton - September 14	553.40
Tilden, car, Watson Lake - August 24	50.84
Tilden, car, Watson Lake - August 10	108.24
	$ 946.02

D. Instrument Rental

SBX 11 Single sideboard radio transceiver @ 250/month	July	$ 250.00
	August	250.00
	September 1-10	83.00
		$ 583.00

E(1) Geochemical Survey

1.	Soil samples - 5935 samples analyzed for Cu, Pb, Zn (plus preparation) @ $2.44/each	$14,481.40
2.	Rock samples	
	171 samples assayed for Pb,Zn @ $8.40	$ 1,436.40
	38 samples assayed for Pb,Zn @ $11.29 (overtime)	429.02
	302 samples assayed for Cu,Ag @ $1.68	507.36
	31 samples assayed for Ba @ $7.60	235.60
	189 samples prepared for composite analysis @ .40¢	75.60
	393 samples assayed for Cu,Pb,Zn @ $14.95	1,390.35
	1 sample assayed for Au,Ag @ $6.40	6.40
	8 samples assayed for Pb,Zn,Ba @ $16.00	128.00
	6 samples assayed for Cu,Pb,Zn,Ba,Ag @ $23.60	141.60
	1 sample assayed spectrographically @ $20.00	20.00
		$ 4,370.33
3.	Air freight of samples to Vancouver (includes some freight of sundry camp equipment)	$ 1,940.36

E(2) Geophysical Survey ("Max-Min" EM Survey)

1.	Direct wages, J. Betz, Geophysicist September 1-12, December 4-19 - 15.5 days @ $250/day	$ 3,875.00
2.	Room and accommodation, Watson Lake, September 1,2,12	128.00
3.	Transport (Whitehorse-Watson Lake)	45.35
4.	Rental of Equipment 10 days @ $30/day	300.00
5.	Shipment of equipment	124.00
6.	Drafting, report preparation	172.00
		$ 4,644.35

E(3) Direct Drilling Costs (July 12-August 17)

1.	Direct Wages @ $17/hour (J. Schussler, R. Gibson, O. Probst, W. Thibodeau, M. McDonald)	
	(a) Mobilization/demobilization - 433 hours	$ 7,531.00
	(b) Move time - 342 hours	5,814.00
2.	Casing @ $19.00/foot - 218 feet	4,142.00
3.	Core drilling (NQ) @ $16/foot - 1114 feet	17,824.00
4.	Core drilling (BQ) @ $15/foot - 2002 feet	30,030.00
5.	Acid tests @ $25.00 - 20	500.00
6.	Core boxes and freight - 206 boxes	1,399.20
7.	Standby time (drill) @ $45/hour - 14 hours	630.00
8.	Demobilization expense (flat rate)	1,500.00
9.	Fuel, grease, solvent, naptha (includes av gas since helicopter used for all drill moves)	7,004.52
10.	Contract building of core rocks at Driftpile Creek	350.00
11.	Rent - core splitter/diamond saw (three months)	90.00
		$76,814.72

F. Office Costs to support program (includes final report preparation)

1.	Management:	(a) Legal Expenses	$ 5,443.45
		(b) Administrative - Welcome North Ltd.	5,000.00
		(c) Management Fee - Archer, Cathro & Assoc. January-December, 1978	18,000.00
			$28,443.45
2.	Postage, Telephone, Petty Cash, Stationary		$ 1,710.68
3.	Drafting, Drafting equipment includes 198.5 hours @ $16/hr		$ 3,598.21
4.	Blueprinting (Archer, Cathro & Superior Reproduction)		$ 1,661.86
5.	Expediting:		
	Archer, Cathro @ $700/month	- June	$ 700.00
		- July	700.00
		- August	700.00
		- September 1-10	233.00
			$ 2,333.00
	Shelly Dalziel (Watson Lake) @ $22/hour		
		July - 26.5 hours	$ 583.00
		August - 36.5 hours	726.00
		September - 7.5 hours	165.00
		September (Sundry)	27.66
			$ 1,501.66
6.	Accounting - Archer, Cathro @ $200/month January-December, 1978		$ 2,400.00
		Grand Total - All Expenditures	$266,021.93

INTRODUCTION

In 1970, Geophoto Surveys conducted a reconnaissance stream sediment survey in the Driftpile Creek area on behalf of a syndicate. In 1973, three members of the syndicate, Pembina Pipeline Ltd., Sun Oil (Delaware) Ltd. and General Crude Oil Co. Northern Ltd., entered a joint venture with Canex Placer Ltd. (now Placer Development Ltd.) to investigate some of the anomalies. Initial prospecting resulted in the discovery of mineralized float on Driftpile Creek in July, 1974. This was staked as 168 "two-post" mineral claims and explored with geochemical and geophysical surveys, mapping and hand trenching in 1974 and 1975. Sixty-seven claims now remain in good standing.

Gataga Joint Venture (GJV) was formed in April, 1977 by Aquitaine Company of Canada Ltd., Chevron Canada Limited, Getty Mining Pacific Ltd., Welcome North Mines Ltd. and Castlemaine Exploration Ltd. to investigate the significance of geochemical anomalies in the Driftpile Creek area. During this program, additional mineral claims were staked adjacent to the Canex-Placer Driftpile Creek property.

Early in 1978, GJV negotiated an agreement to option the Driftpile Creek property from the Placer Syndicate and field management was contracted to Archer, Cathro and Associates Ltd. Field investigation during the 1978 season consisted of detailed geochemical surveys on the existing grid, detailed mapping, an orientation geophysical survey and diamond drilling. Each of the these investigations is only partially complete at this time and this report is designed to be a synopsis of 1978 work rather than a final report on geology and economic potential of the property.

LOCATION AND ACCESS

The property, located at 58°04'N and 125°55'E, straddles Driftpile Creek about 22 km from its confluence with the Kechika River (Figure 1). Elevations locally range from 1100 m to over 2000 m above sea level. Access is by float-equipped fixed-wing aircraft from Watson Lake, Yukon Territory, about 29 km to the northwest, to Mayfield Lake about 20 km east of the property, and by helicopter from Mayfield Lake to the property. Much of the fuel and camp supplies needed for the 1978 program were trucked about 300 km from Watson Lake to Muncho Lake (Km 747 on the Alaska Highway) and ferried 90 km by fixed-wing aircraft to Mayfield Lake. The nearest large town is Fort Nelson, 210 km ENE, which does not have a float plane base.

CLAIM STATUS

The property optioned from Placer Development consists of 67 contiguous, full or fractional, mineral claims staked under the "two-post" system and recorded in the Liard Mining District as follows:

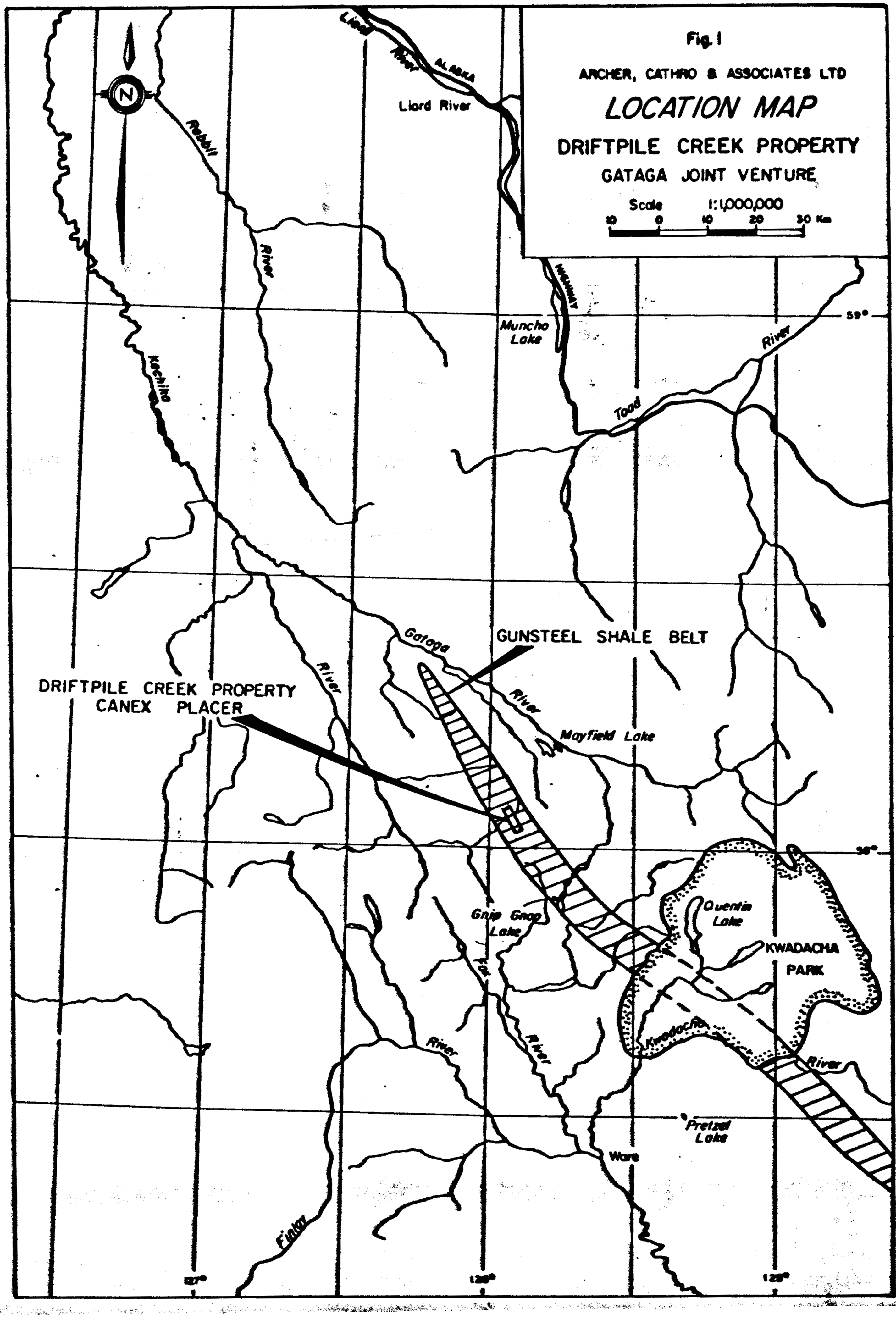


Fig. 1
ARCHER, CATHRO & ASSOCIATES LTD
LOCATION MAP
DRIFTPILE CREEK PROPERTY
GATAGA JOINT VENTURE
Scale 1:1,000,000
10 0 10 20 30 Km
Liard River
ALASKA
HIGHWAY
Liard River
Rabbit River
Muncho Lake
Toad River
Kechika
GUNSTEEL SHALE BELT
Gataga River
DRIFTPILE CREEK PROPERTY
CANEX PLACER
Mayfield Lake
Gnip Gnop Lake
Quentin Lake
KWADACHA PARK
Fox River
Kwadacha River
Pretzel Lake
Ware
Finlay
59°
58°
127°
126°
125°

TABLE I

GJV CLAIM STATUS AS OF DECEMBER 1, 1978

CLAIM NAME	NO. OF UNITS	GRANT NUMBER	EXPIRY DATE
LIARD MINING DISTRICT			
(A) Placer et al Option			
D2		71809	12 August, 1982
4		71811	"
6		71813	"
8		71815	"
10		71817	"
12		71819	"
14		71821	"
16		71823	"
19-34		71826-71841	"
37-48		71844-71855	"
P2		71755	"
4		71757	"
6		71759	"
8		71761	"
19-20		71772	12 August, 1981
21-32		71774-71785	12 August, 1982
34		71787	"
37		71790	12 August, 1981
39		71792	"
41		71794	"
43		71796	"
45		71798	"
47		71800	"
49		71802	"
51		71804	"
Goof 1F		71862	6 September, 1981
2F		71863	6 September, 1982
4F		71865	6 September, 1981
5F		71992	6 September, 1982
Total	67 - two post claims		
(B) 100% GJV Owned (claims periferal to the optioned property)			
Saint 2 (1-20)	20	284	28 April, 1985
Saint 4 (1-4;13-16)	8	286	"
Saint 5 (1-20)	20	287	" 1984
Bob 1 (1-12)	12	289	" 1985
Bob 7 (1-6)	6	295	"
Knot 2 (1-20)	20	370	14 June, 1984
Gneiss 2 (1-20)	20	372	"
Hole 1 (1-6)	6	418	11 July, 1984
Hole 2 (1-4)	4	419	" 1983
Hole 3 (1-12)	12	420	" 1985
	128 - total units		

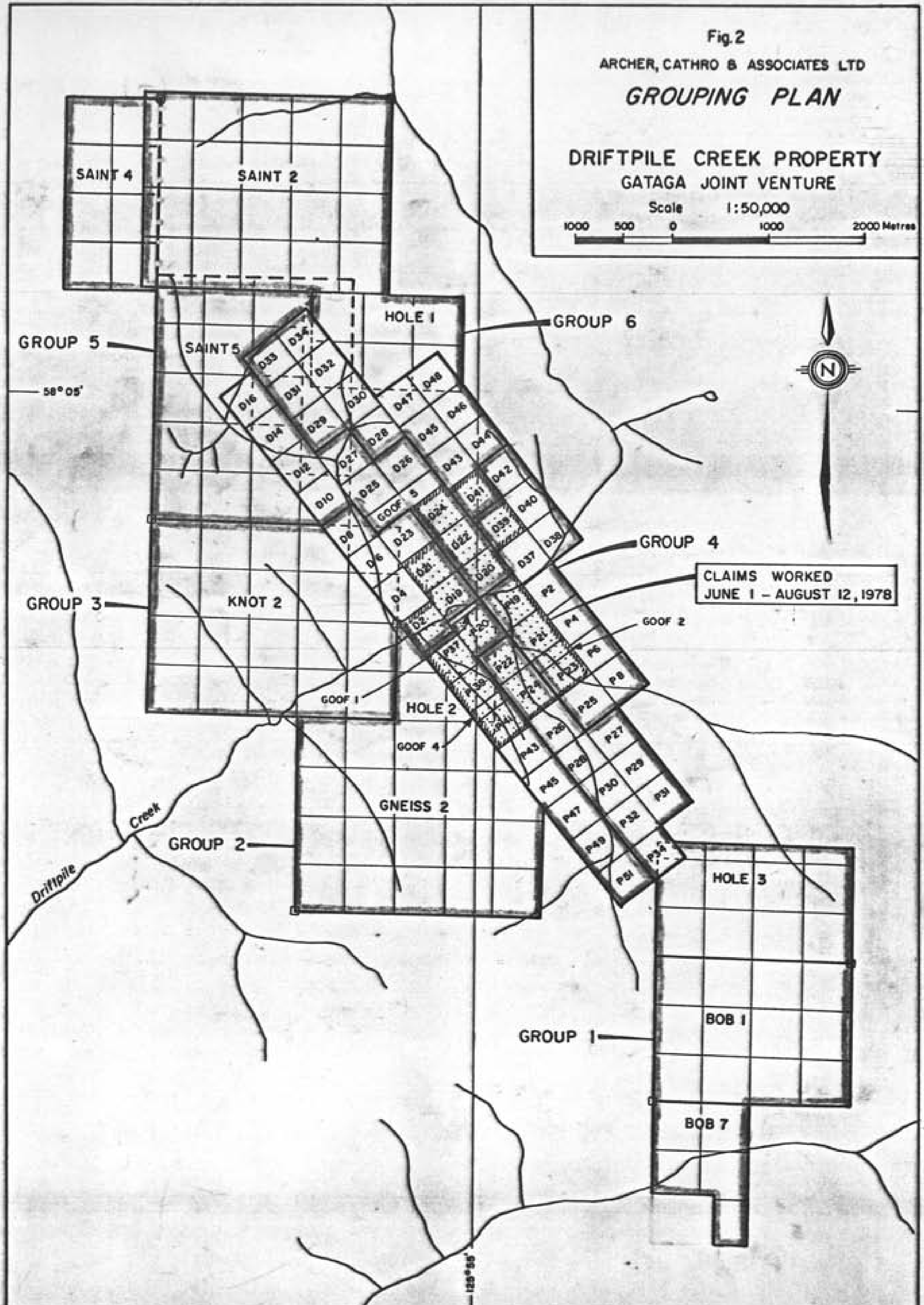


Fig. 2
ARCHER, CATHRO & ASSOCIATES LTD
GROUPING PLAN
DRIFTPILE CREEK PROPERTY
GATAGA JOINT VENTURE
Scale 1:50,000
1000 500 0 1000 2000 Metres
SAINT 4
SAINT 2
SAINT 5
HOLE 1
GROUP 5
GROUP 6
GROUP 4
GROUP 3
GROUP 2
GROUP 1
KNOT 2
HOLE 2
GNEISS 2
HOLE 3
BOB 1
BOB 7
CLAIMS WORKED
JUNE 1 – AUGUST 12, 1978
GOOF 1
GOOF 2
GOOF 4
GOOF 5
58° 05'
Driftpile
Creek

SUMMARY OF PREVIOUS WORK

Much of the Driftpile Creek property was geologically mapped at 1:4800 scale by Canex Placer geologists during 1974 and 1975. Results of this survey were inconclusive however, due to the poor quality of bedrock exposure on the property and insufficient knowledge of regional stratigraphic and structural styles.

A geochemical sampling program was initiated during the 1974 field season and completed the following year (see previous Placer Assessment Reports). Soil sampling was conducted on a grid with 400 foot (122 m) line spacing and station intervals of 100 feet (30.5 m). Soil samples were analyzed for zinc, lead, silver and barium. Both zinc and lead plots showed the presence of strong broad anomalies but sample spacing was not dense enough to sufficiently delineate mineralized zones or drill tragets.

A vertical loop "shootback" (Ronka) electromagnetic (EM) survey was conducted over much of the grid in 1975. Results were interpreted under the assumptions that upright open folds were the dominant structural style, that faulting was confined to a few major northeast and northwest trending zones, and that pyritic sulphide horizons on the property were less than 3 m thick. Results of this survey suggested the mineralization was confined to two discrete stratigraphic horizons. GJV work in 1978 has tentatively confirmed this conclusion but the structural picture suggested by the EM survey has proven to be erroneous due to the much greater fault density than that which was assumed by Placer geologists.

An ambitious hand trenching program that was carried out on the property during the 1974 and 1975 seasons was only partially successful. Extreme oxidation of mineralization in places to depths of greater than 5 m inhibited surface sampling of mineralization.

1978 PROGRAM

Prompted by the similarities between the geological setting at Driftpile Creek and the Macmillan Pass area of the Selwyn Basin and the Castlemaine silt survey, which showed unstaked lead anomalies along strike, GJV carried out an extensive regional sampling and mapping program in the Driftpile Creek area (see GJV Report, 1977, filed for assessment). Although this program did not discover any new areas of significant mineralization, economic potential of the Driftpile Creek prospect was confirmed. Accordingly, GJV negotiated an agreement to option the Driftpile Creek property from the Placer Syndicate early in 1978.

The 1978 program consisted of detailed geological mapping, detailed soil geochemical sampling, compass and chain surveys to obtain mapping and topographic control on the previously established grid, limited hand trenching and diamond drilling. The program was led by Rob Carne, who was relieved on holidays by Mike Phillips. Able assistance, mainly during camp construction, was provided by Cam Chalmers. During the latter part of the summer, soil sampling, surveying and core splitting was supervised by senior assistant Frank Gish and conducted by junior assistants Dave Wickham, Dave Smail, John Ogilvie and Steve Veerman.

The program was initially supported by an Okanagan Helicopter Bell 206B based at the Cyprus Anvil camp on Pretzel Lake, some 72 km southeast of the Driftpile Creek camp. The drilling program was supported by a Bell 47G3/B2 helicopter chartered from Trans North Turbo Air Ltd., Whitehorse and crewed by pilot Ron Dennett and engineer Harold Kreuger. This helicopter was based at the GJV camp.

Diamond drilling was contracted to D.J. Drilling of Vancouver. The drill crew consisted of two 2-man crews and a cook. In compliance with Workers' Compensation Board requirements, an industrial first aid attendant was hired for duration of the drill program. At completion of drilling, the first aid attendant, Charles Romaniuk, stayed on at reduced salary to cook and perform camp chores.

A permanent tent frame camp was constructed at the 1974-75 campsite on Driftpile Creek, consisting of four tents for crew quarters, a cook tent and a supply tent. All but the supply tent have plywood floors. A large log core rack was also built at the camp. Facilities were winterized and left intact at the close of the program so that they can be reoccupied with little effort.

Attempts at obtaining accurate survey control on the property were hampered by locally high relief around the main creeks and almost complete vegetation cover. Existing government airphoto coverage, flown in 1948, is not of sufficient quality to provide mapping control at the scale required for property work. Fifty cotton aerial photography targets were installed on the property when it was learned that a photo plane was in the district. However, a forest fire in Kwadacha Park in early August prevented the survey being flown before the weather turned poor and the photography had to be deferred until 1979.

An orientation Maximum II - type EM survey was performed by contractor Jack Betz at the end of the season. Approximately 11,800 feet (3600 m) of lines were surveyed near the drill holes with a 400 foot (122 m) coil separation on the 222 and 3555 Hz channels following a test line with coil separations of both 200 and 400 feet and three frequencies (222 Hz, 888 Hz and 3555 Hz). This technique outlined strong conductive zones but could not reliably distinguish between sulphide zones and graphitic shale nor predict the dip of the zone. Betz's report will be submitted separately when it is received.

Summary of 1978 Program

(a) Geochemical survey

5935 soil samples analyzed for Cu, Pb and Zn

840 rock samples assayed for Au, Ag, Pb, Zn, Cu or Ba

(b) Geophysical Survey

3.6 km surveyd by Maximum II-type EM

(c) Drilling

1016.2 m of diamond drilling of which 295.4 m were in 3 NQ size holes and 720.8 m were in 6 BQ size holes

(d) Geology Survey

2.24 sq. km mapped for geology and geomorphology @ 1:1000

(e) Lines established (all chained, none cut)

(i) baselines - 6.8 km

(ii) crosslines - 86.0 km

Claims upon which work was actually performed:

(a) D2, 19-22, 24, 39, 41; P19-24, 37, 39, 41

(b) D2, 19, 22, 24, 41; P19, 20, 22, 24, 37, 39; Goof(F) 1, 2

(c) Hole

78-1	P22
78-2	P22
78-3	P22
78-4	P19, P20
78-5	P19, P20
78-6	P19
78-7	D41, D42
78-8	D41, D42
78-9	P21

(d) D2, 19-22, 24, 39, 41; P19-24, 37, 39, 41

(e) D2, 19-22, 24, 39, 41; P19-24, 37, 39, 41

GEOLOGICAL SURVEY

Physiography and Geomorphology

The Driftpile Creek property lies within the Muskwa Range of northern Rocky Mountains, flanked on the southwest by the Kechika River in Rocky Mountain Trench and on the northeast by the broad Gataga River valley. Within the property area, physiography is typified by long, low ridges and valleys which trend NW-SE, paralleling structural strike of underlying sedimentary rocks. These ridges and valleys are cut by the southwest trending valley of Driftpile Creek, which exhibits a U-shaped glaciated profile in its upper part and a rejuvenated V-shaped fluviatile profile in its lower 150-250 m.

Tributaries of Driftpile Creek flow in northwest or southeast trending valleys, resulting in a trellised drainage pattern. Tributary streams are immature with waterfalls and deeply incised, narrow, steep-walled canyons common through their length. In contrast, major southwest-flowing creeks meander through valleys bottomed by alluvium.

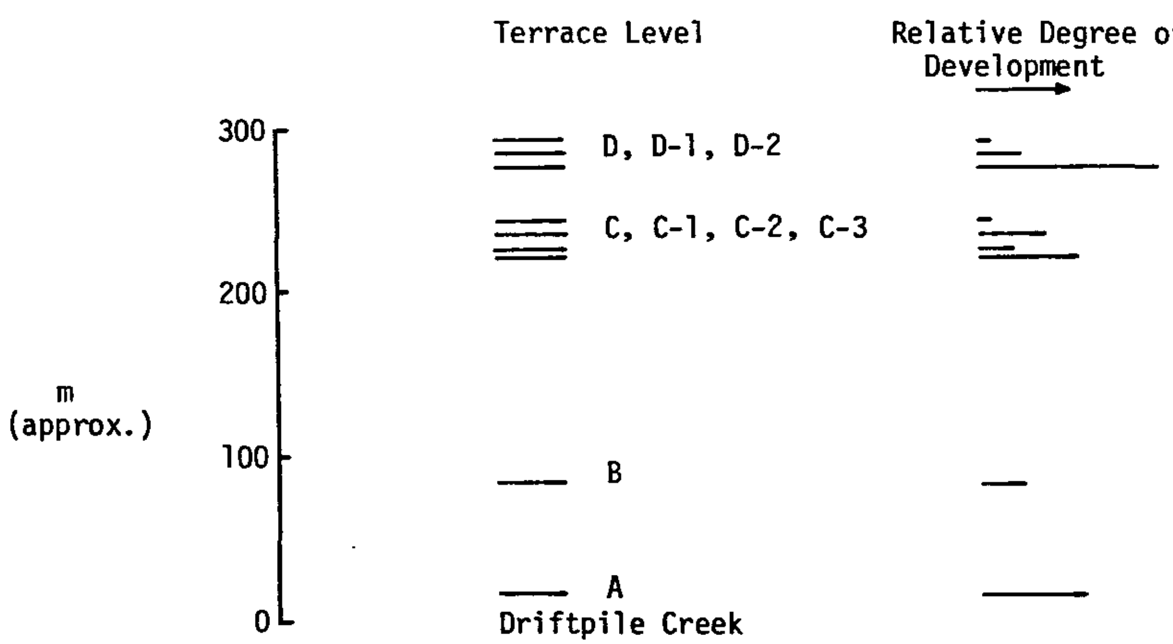
Although elevations regionally range from 1100 m to over 2000 m, relief is locally subdued in areas underlain by shales and clastic sedimentary rocks. Resistant, older carbonate rocks which flank the area on the southwest and northeast form prominent cliffs.

Treeline is at approximately the 1500 m elevation on south facing slopes. Vegetation in valleys is predominately composed of arctic black birch and willows with minor black spruce in swampy areas and juniper, poplar and pine on dry slopes.

The region has been subjected to valley and/or ice sheet glaciation but the lack of abundant glacial till or erratics suggests that this glaciation was older than late Pleistocene. The most recent Pleistocene glaciation consisted mainly of alpine and cirque glaciers to the east and west. The main geomorphological effect of the last glaciation was the modification and scouring of the main valleys, local disruption of the drainage pattern and formation of several ice-dammed lakes, downcutting of tributary streams to form rock-walled canyons, and deposition of scattered, localized gravel and debris deposits. Detailed distribution of glacial and post-glacial deposits is shown on Figures 3,4,5 and 6 (in pocket) and summarized on Figure 7 (in pocket).

Ice and/or morainal damming of Driftpile Creek some 4 km downstream from the property in late Pleistocene time resulted in flooding of much of the area for extended periods. Gradual, but somewhat erratic, lowering of the lake level accompanied down-cutting of the outlet creating several generations of strand-lines or wave-cut terraces (Plates A and B). Approximate vertical distribution of these features is tabulated in Table II.

TABLE II: APPROXIMATE VERTICAL DISTRIBUTION OF WAVE-CUT TERRACES AT DRIFTPILE CREEK, B.C.



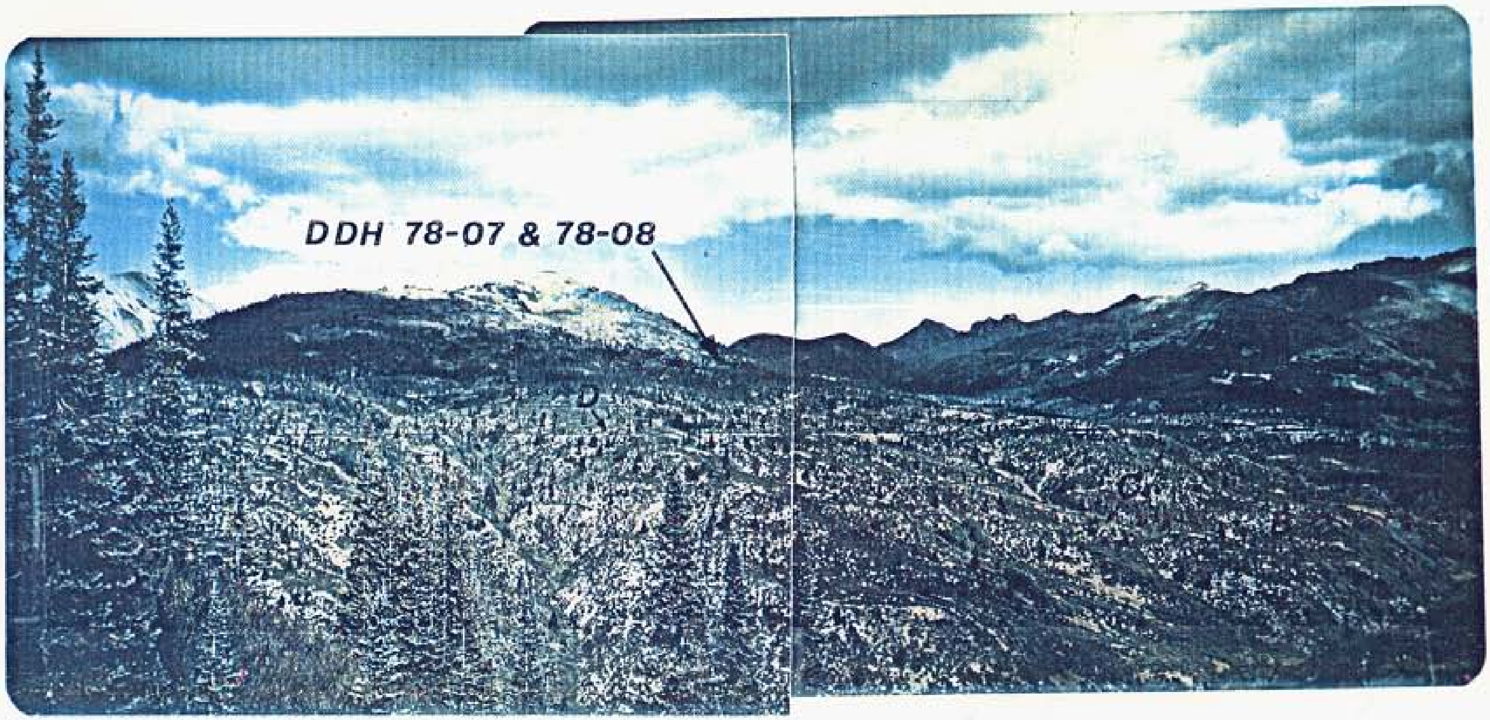


Plate A: View looking north from the south-central area of the property showing wave-cut terraces B, C and D.

Plate B: View looking east from the south-central area of the property showing wave-cut terraces D and D-1.

Shale fragments along beach terraces are sub-rounded. Where disturbance by animals and vegetation is minimal, relict implication of pebbles is preserved.

Two distinct types of glacial erratics are found in the Driftpile Creek area. Well rounded cobbles and large boulders of resistant Lower Paleozoic quartzite and quartzite pebble conglomerate derived from the east are present at all elevations. This type of erratic appears to be the only remaining evidence of the early Pleistocene sheet ice glaciation. Well preserved lateral and terminal moraines are related to the last alpine glaciation. Angular erratics of upper Paleozoic chert pebble conglomerate have a probable source area in a steep cliff face about 15 km northwest of the property. Erratics of this type have been observed to excced 6 m in maximum dimension. Chert pebble conglomerate boulders are scattered across the floor and sides of Driftpile Creek valley but are not found above the highest lake level (Plate C). Their very angular nature, contrary direction of transport (for early sheet glaciation) and distribution suggest that they were ice-rafted. Indeed, their source area overlooks the north arm of the post-glacial lake.

Exposures of pyritic mineralization which lie below the upper lake level are leached and oxidized in excess of 5 m depth (Plate D). In contrast, relatively fresh exposures of sulphide mineralization above highest lake level occur within 20 cm of the surface. Infusion of cold, oxygenated lake waters under an increased hydraulic gradient and consequent depression of reduced phreatic groundwaters beneath the lake may be responsible for the deep levels of oxidation observed.

Plate C: View looking west from the south-central area of the property. The large chert pebble conglomerate (Besa River Fm) glacial erratic is situated immediately below terrace level D.

Plate D: Large rusty kill zone at confluence of Driftpile and Geophoto Creeks. Trench 78-01 encountered up to 3.5 m of highly ozidized pyritic mineralization.

Regional Stratigraphy:

The Driftpile Creek property lies within Kechika Trough, a southwesterly continuation of the much larger Selwyn Basin. Sedimentary rocks exposed in the area range in age from Cambrian to lower Mississippian. Stratigraphy and facies relationships are summarized in Figure 8. Only the upper Devonian Gunsteel Formation is exposed on the Placer Sydnicate option.

Regional stratigraphy has been discussed in detail in the GJV 1977 final report and is only briefly summarized here. The reader will note that terminology of the upper Devonian to Mississippian(?) "Black Clastic" assemblage has been changed for the 1978 GJV assessment report to conform with proposed GSC nomenclature. Both Cyprus Anvil and Riocanex are now using GSC terminology and it is felt that conformity by GJV will more readily facilitate future discussion of the area and its mineral potential. Briefly, the "Gunsteel Formation" of 1977 has been subdivided into Besa River Formation (formerly the lower member of the "Gunsteel Formation") and overlying Gunsteel Formation. Gnip Gnop Formation (1977) will be referred to as Warneford Formation in future.

In the Driftpile Creek area, base of the exposed section consists of shallow water clastic and carbonate reefoid accumulations of lower Cambrian Atan Group. Fore and back reef assemblages of the upper member form an ideal environment for Mississippi Valley type lead-zinc deposits although none have yet been discovered here to the writers knowledge.

Cambro-Ordovician silty dolomites and dolomitic siltstones of Kechika Group overlie Atan Group rocks with apparent conformity. Reduced thickness of Kechika sediments overlying stratabound base metal showings on Texasgulf properties north of the Driftpile Creek area in conjunction with corroborating structural evidence leads to the supposition that this mineralization was emplaced along a thrust fault between Atan and Kechika Groups.

Platform to basinal facies of the, here, dominately pelitic Ordovician to middle Devonian Road River Formation conformably overly older Kechika Group clastic rocks. In Selwyn Basin, correlative Road River sediments host a number of significant sedimentary and volcano-sedimentary zinc-lead deposits. Cursory exploration in Road River lithologies by GJV in 1977 revealed the presence of scattered zinc-rich shales although no zinc sulphide deposits have yet been found.

Coarse clastic rocks of middle to upper Devonian Besa River Formation mark the abrupt change from lower Paleozoic miogeosynclinal environments along a relatively stable epicontinental trough to middle Paleozoic eugeosynclinal sedimentation which predominated along the western margin of the northern Cordillera. Easterly fining of these clastic rocks in the region reflects an, as yet, undiscovered source terrane to the west of the Driftpile Creek area. Besa River rocks may have been derived from uplift and subsequent erosion of basinal Road River cherts. A mildly angular unconformity which exists between Besa River and older rocks was probably caused by erosion during deposition of the clastic rocks.

Pyritic and siliceous, fine grained black shale of upper Devonian Gunsteel Formation conformably overlie coarser grained, although similarily appearing, rocks of Besa River Formation. Unlike Besa River lithologies, however, Gunsteel shales exhibit marked thickness changes along the length of the Gataga shale belt. It is presently unknown whether this effect is a result of different rates of quiet deposition in individual sub-basins, or whether it reflects erosinal relief beneath the lower Mississippian unconformity. In any case, the greatest observed thickness of Gunsteel shales occurs at Driftpile Creek. An important feature of lower Gunsteel

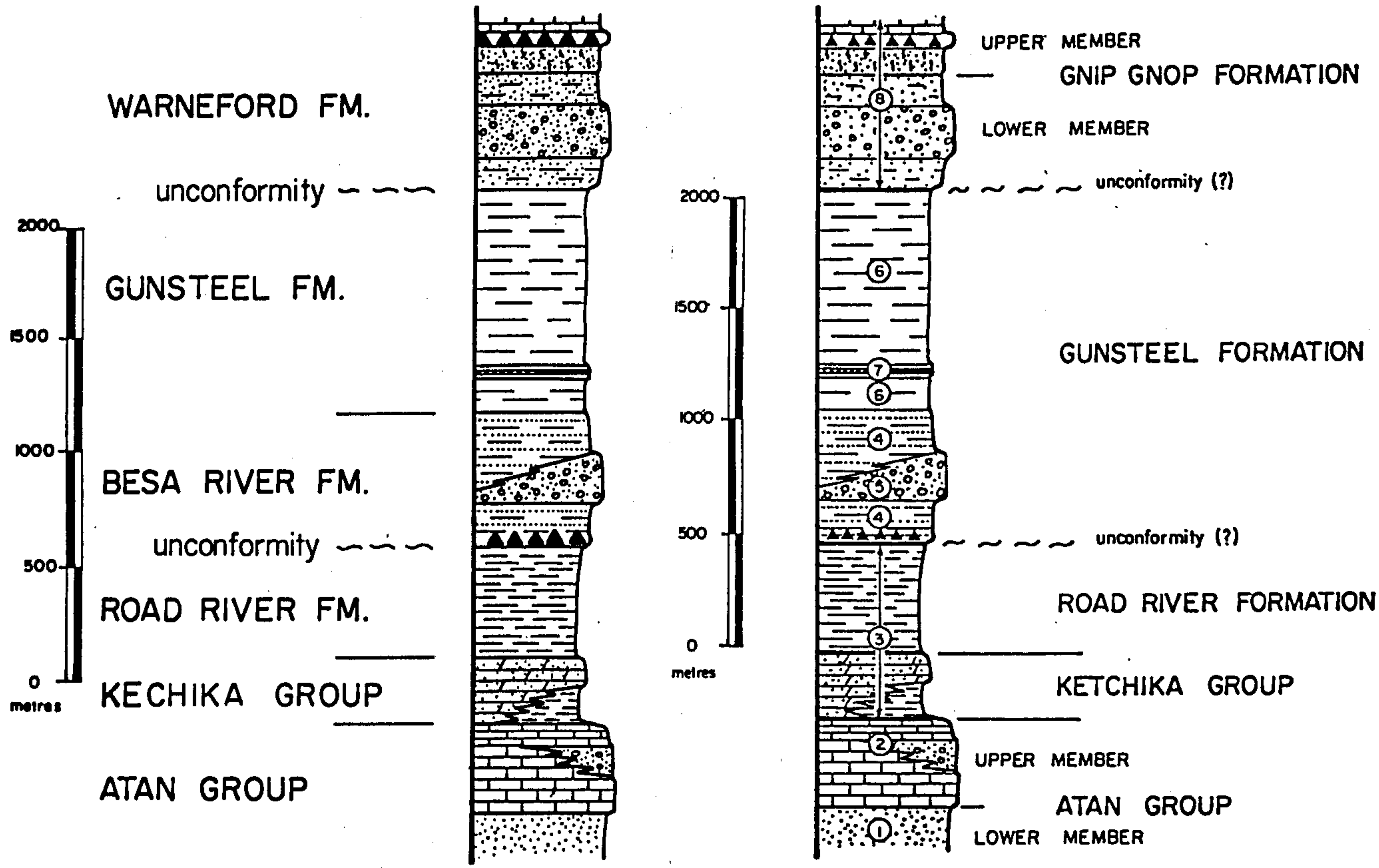


Figure 8. 1978 (left) and 1977 (right) stratigraphic columns, Driftpile Creek area, B.C. Note changes in nomenclature for 1978.

Formation is a horizon of very pyritic shale, chert and barite which is typically anomalous in base metals, silver and barium. These chemical sediments are interpreted by GJV to reflect a regional geothermal-exhalative event.

Westerly derived clastic sediments form the basal member of the Warneford Formation. Coarse, polymictic conglomerate deposited as turbidite fan assemblages characterize the package at Driftpile Creek. Erosional remnants composed of interbedded cherts and calcareous sediments cap the succession.

Driftpile Creek Stratigraphy

The geology of that part of the property mapped to date is shown at 1:1000 scale on Figures 9 through 12 and at 1:2000 scale on Figure 13. The only unit identified on the property is Gunsteel Formation. Although exposure is less than one per cent, compilation of diamond drill logs leads to a reliably consistent picture of the stratigraphy. The generalized stratigraphic section shown on Figure 14 is fairly representative although exact structural relationships between various bedrock exposures and diamond drill holes have yet to be resolved.

At this early stage, very little attempt has been made at facies analysis and extrapolation of lithological contacts beyond their known extents. Detailed stratigraphic sections compiled from diamond drill holes and measured sections on the property will be submitted later in a separate report with accompanying petrographic analyses.

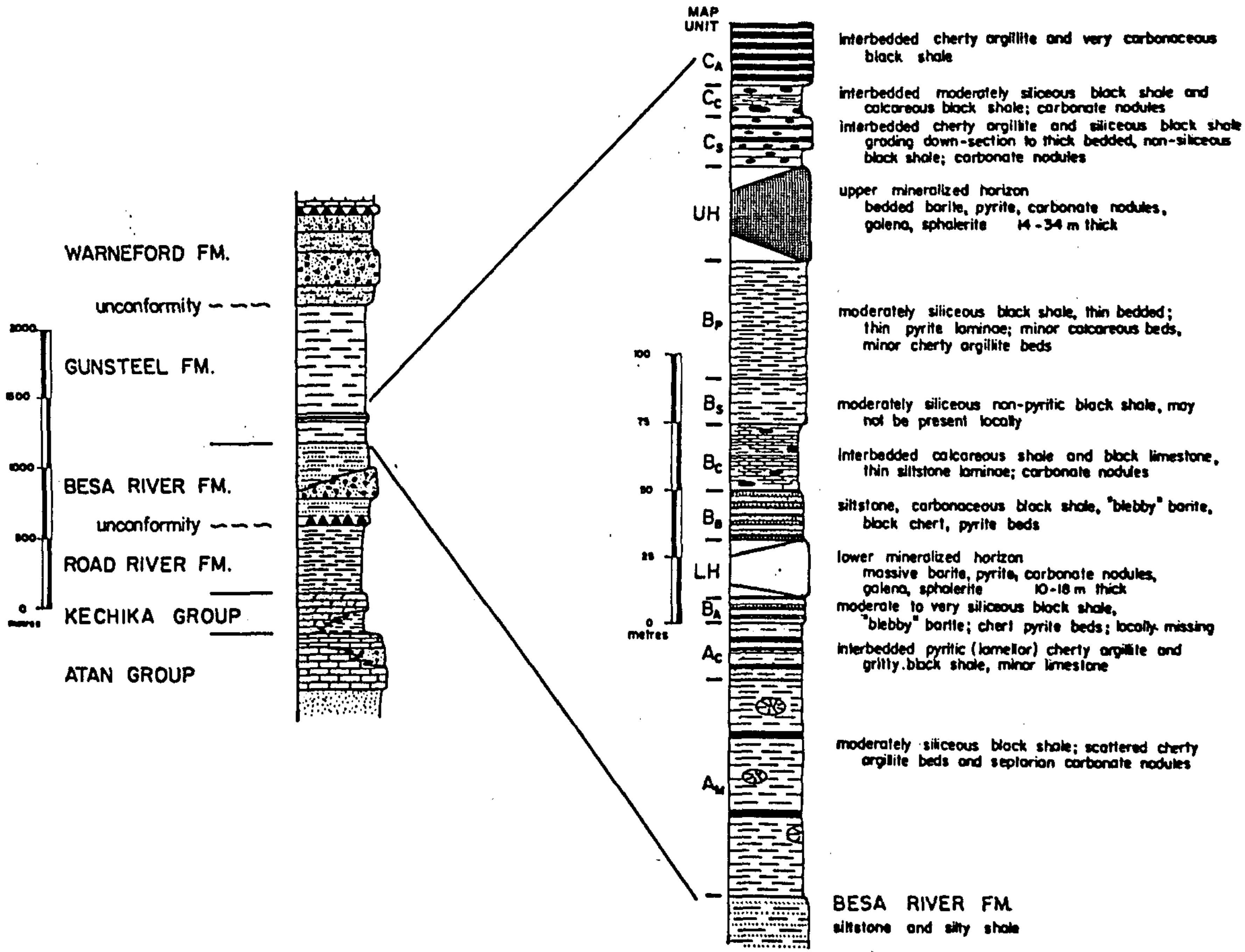


Figure 14. Detailed stratigraphic column, Driftpile Creek property.

Structural Geology

Rocks of the Gunsteel Formation within the Driftpile Creek area form a four to six km wide, linear belt that strikes northwest. Although they are essentially unmetamorphosed, these rocks are structurally complex. On a gross regional scale, they occupy a broad synclinorium compressed against an anticlinorium of more resistant older carbonate rocks to the east.

In many areas on the property, bedding is difficult to distinguish from axial plane cleavage due to the uniformly featureless nature of most lithologies, especially on weathered surfaces. Where bedding is distinguishable, the absence of geopetal features in the shales makes distinction between overturned and upright bedding almost impossible. Problems with structural interpretation are further complicated by the generally recessive nature of the rocks coupled with abrupt and perhaps diachronous facies changes.

Tectonic shortening in carbonate rocks is regionally reflected in normal faults and large-scale, broad open folds while more incompetent shales are often isoclinally folded, accompanied by thrust faulting. On the Driftpile property, tectonic shortening appears to have been taken up in broad, open and upright folds which are cut by NW-SE trending, steeply dipping faults. In detail (see diamond drill sections, Figures 15 to 19), these fault zones consist of several conjugate sets of diverging and converging fault and shear zones. Overall displacement seems to invariably be west side up. Cleavage surfaces, which vary from 120° to 145° in strike direction, are nearly always coated with graphite. Sense of slip along cleavage planes, like the major faults, appears to be west side up.

Cleavage-bedding relationships indicate that most megascopic structures plunge at low angles (10° to 20°) although the direction of plunge (northwest or southeast) does not appear to be consistent from fold to fold. Adjacent to fault systems, megascopic fold limbs are modified by the presence of smaller, isoclinal folds.

TABLE III: ASSAY VALUES FOR SURFACE GRAB SAMPLES, DRIFTPILE CREEK PROPERTY 1978

Sample No.	Cu(%)	Pb(%)	Zn(%)	Ba(%)	Ag (oz/ton)	Type of Mineralization	Location	Type of Sample
12551	0.01	0.01	0.71	46.6	0.01	Barite	4+25S,4+50E	float
12552	0.01	0.02	1.66	36.4	0.01	Barite	5+20S,2+50E	outcrop
12553	0.01	0.76	3.42	46.2	0.01	Barite	5+20S,2+50E	outcrop
12554	0.01	0.25	3.91	0.07	0.01	Pyrite	15+70S,1+80E	float
12555	0.01	8.52	3.26	0.05	0.01	Pyrite	15+50S,1+80E	float
12556	0.01	0.19	1.09	0.06	0.01	Pyrite	21+90S,1+00W	outcrop
12557	0.01	3.59	1.98	0.09	0.01	Pyrite	15+50S,1+80E	float
12558	0.01	16.70	0.02	0.05	0.01	Pyrite	16+00S,2+20E	float
12559	0.01	0.44	2.70	0.05	0.01	Pyrite	15+50S,1+80E	float
12560	0.01	0.10	3.00	3.93	0.01	Pyrite	20+40S,0+85E	outcrop
12561	0.01	11.20	0.11	0.07	0.01	Pyrite	18+10S,1+50E	float
12562	0.01	22.10	11.84	0.06	0.02	Pyrite	24+00S,6+60E	float
12563	0.01	0.06	3.38	25.05	0.01	Barite	Trench 78-01	outcrop
12564	0.01	7.34	2.13	0.08	0.01	Pyrite	15+50S,1+80E	float
12566	0.01	56.90	0.07	0.34	0.14	Galena	2+00N,12+00W	float

Mineralization

Cross-sections and diagrammatic representations of mineralized intersections for diamond drill holes 78-01 to 78-09 are shown on Figure 15 to 19 (in pocket). Diagrammatic representations of mineralization are designed to display all pertinent data available from detailed logging in conjunction with lead and zinc assays of drill core in a format which is amenable to rapid interpretation of the data. These drill logs show actual and true widths of drill intersections; relative composition and type of mineralization; lead, zinc and combined lead-zinc values; and ratios of lead to combined lead-zinc for each mineralized intersection. Weighted diamond drill core assays are tabulated on the following page (Table IV). Summaries of detailed logging and assay values for true widths of mineralized intersections are shown on Table V following Table IV.

Based on diamond drill logs and detailed mapping of much of the property, a good argument can be made for the hypothesis that at least two distinct mineralized horizons are present at Driftpile Creek. Unfortunately, conclusive proof of this theory will have to await diamond drilling of an unfaulted section. Definition of the two horizons and metal zoning within each, both laterally and vertically, will not be attempted at this time. It is hoped that at the conclusion of the proposed 1979 program sufficient data will be available for this type of study.

Both mineralized horizons are similar in nature, consisting mainly of finely interlaminated pyrite, carbonate minerals and black shale with variable amounts of barite. The two horizons are separated by a minimum of 100 m of barren pelitic sedimentary rocks and are differentiated mainly on the basis of distinct local stratigraphic and mineralogic variations that are too abrupt to be accounted for by facies change or metal zoning.

TABLE IV: SUMMARY OF ASSAYS FROM DIAMOND DRILL HOLES, DRIFTPILE CREEK PROPERTY, 1978

HOLE	From (ft)	(m)	To (ft)	(m)	ASSAYS Length (ft)	(m)	% Pb	% Zn	%Pb + Zn
78-01	271.0	82.6	323.5	96.6	52.5	16.0	0.29	1.77	2.06
78-02	128.5	39.2	162.8	49.6	34.3	10.4	0.16	1.74	1.90
78-03	252.5	77.0	278.0	84.8	25.5	7.8	0.27	1.40	1.67
	207.5	63.2	298.5	90.9	91.0	27.7	0.18	1.04	1.22
78-04	53.5	16.3	138.0	42.1	84.5	25.8	0.36	2.49	2.85
	155.0	47.2	176.0	53.6	21.0	6.4	0.59	1.55	2.14
	53.5	16.3	186.8	56.9	133.3	40.6	0.35	1.87	2.22
78-05	106.0	32.3	136.0	41.5	30.0	9.2	0.39	2.91	3.30
	185.5	56.5	210.0	64.0	24.5	7.5	0.61	1.78	2.39
	214.0	65.2	221.0	67.4	7.0	2.2	0.47	2.47	2.94
	227.0	69.2	237.5	72.4	10.5	3.2	0.11	2.49	2.60
	70.5	21.5	237.5	72.4	167.0	50.9	0.30	1.87	2.17
78-06	33.5	10.2	116.0	35.3	82.5	25.1	0.35	1.53	1.88
	20.0	6.1	144.0	43.9	124.0	37.8	0.39	1.24	1.63
78-07	235.0	71.6	261.7	79.7	26.7	8.1	9.05	3.53	12.58
	261.7	79.7	285.0	86.8	23.3	7.1	0.34	1.24	1.58
	235.0	71.6	285.0	86.8	50.0	15.2	4.99	2.46	7.45
78-08	420.2	128.1	444.3	135.4	24.1	7.3	4.01	3.11	7.12
	444.3	135.4	487.5	148.6	43.2	13.2	0.70	2.22	2.92
78-09	80.0	24.4	102.2	31.2	22.2	6.8	0.63	3.87	4.50
	106.2	32.4	110.8	33.8	4.6	1.4	1.83	6.04	7.87
	51.0	15.5	110.8	33.8	59.8	18.3	0.53	2.94	3.47
	127.0	38.7	137.0	41.8	10.0	3.1	0.87	3.60	4.47
	463.5	141.3	488.0	148.7	24.5	7.4	0.22	4.14	4.36
	508.0	154.8	523.0	159.4	15.0	4.6	0.21	3.21	3.42
	463.5	141.3	523.0	159.4	59.5	18.1	0.18	2.98	3.16

TABLE V: SUMMARY OF DIAMOND DRILL INTERSECTIONS

DIAMOND DRILL HOLE	GRID COORDINATES	MINERALIZED HORIZON	TRUE THICKNESS (Ft)	(m)	OVERALL GRADE (Pb+Zn%)	OVERALL METAL RATIOS (Pb/PB+Zn)
78-01	2000S, 180W	Upper	50.6	16.4	2.06	0.14
78-02	1600S, 90W	"	45.1	14.6	1.90	0.08
78-03	1600S, 90W	"	50.1	16.2	1.22	0.15
78-04	477S, 00E	"	111.8	36.3	2.22	0.16
78-05	477S, 00E	"	108.4	35.1	2.17	0.14
78-06	400S, 300E	"	*123.0	39.9	1.63	0.24
78-09	2400S, 200E	"	*77.4	25.1	3.47	0.15
78-07	4160N, 1840E	Lower	36.2	11.7	7.45	0.67
78-08	4160N, 1840E	"	36.1	11.7	4.90	0.38
78-09	2400S, 200E	"	52.2	16.9	3.16	0.06

*Collared in mineralization, true thickness is estimated.

The upper horizon was intersected in diamond drill holes 78-01 to 78-06 inclusive, and in the top of drill hole 78-09. Although structural complications do not permit extrapolation between all of these drilled intersections (Figure 13), some tentative conclusions can be made for this west-dipping belt of mineralization along a strike length of about 2000 feet (650 m). Here, the upper horizon consists principally of finely laminated pyrite, carbonate minerals and shale intervals which are separated vertically by barren shale beds averaging about 1.5 feet (0.5 m) in thickness. Carbonate minerals in the upper part of the zone gradually give way to barite in a northerly direction towards Driftpile Creek. Both galena and sphalerite are contained with monomineralic laminae in the pyrite or as fine-grained accumulations interstitial to pyrite. Recrystallized carbonate gangue is generally barren except for traces of galena and sphalerite along cleavage and relict bedding planes. Barite is generally white in colour, thin to moderately thick-bedded and devoid of sulphide minerals.

True thickness of the upper horizon in the southern part of its known extent (DDH 78-01 to 78-03) averages about 48 feet (15.5 m) while its thickness near Driftpile Creek (DDH 78-04 to 78-06) averages about 114 feet (37 m). Metal grades range between 1.22 and 3.47 per cent combined lead-zinc. Metal ratios (Pb/Pn+Zn) vary from 0.08 to 0.24 and average 0.18. Copper content of the upper mineralized horizon ranges from 10 to 60 ppm, averaging about 25 ppm. Silver values range from trace amounts to 5 ppm and average about 2 ppm.

The immediate hanging wall of the upper horizon consists of very carbonaceous black shale interbedded with cherty argillite (map units C_S and C_C). Large, flattened carbonate nodules in non-siliceous horizons probably results from strain-induced recrystallization of basinal limestone beds in the section. This assemblage is overlain by radiolarian, cherty, non-pyritic, black argillite rhythmically interbedded with soft, black shale (map unit C_A). The footwall sequence consists of variably siliceous, black, carbonaceous shale with distinctive fine pyrite laminae repeated at millimetre wide intervals (map unit B_P).

The lower mineralized horizon is interpreted to include the "Upper Trench Zone", intersected in drill holes 78-07 and 78-08, outcroppings in Driftpile Creek and Geophoto Creek (Figure 13) and the lower intersection of drill hole 78-09. In holes 78-07 and 78-08, this zone consists of interlaminated pyrite, carbonate gangue and shale very similar to upper horizon mineralization. Barite, encountered near the top of the intersection in hole 78-07, is massive, grey in colour and distinctly granular in nature. Galena and sphalerite within this barite consists of lamellar concentrations of interstitial disseminations. No pyrite is present in the barite. True thickness of lower horizon mineralization in the North Trench Zone is 36.2 feet (11.7 m). Grade over this width in hole 78-07 was 7.45 per cent combined lead-zinc with a Pb/Pb+Zn ratio of 0.67. Grade encountered in hole 78-08, approximately 320 feet (104 m) down dip from the hole 78-07 intersection, was 4.90 per cent combined lead-zinc with a Pb/Pb+Zn ratio of 0.38.

In diamond drill hole 78-09, collared about 6000 feet (1560 m) south of holes 78-07 and 78-08, the lower mineralized horizon consists of finely laminated pyrite, carbonate minerals and black shale with discrete laminae of galena and sphalerite contained in scattered massive pyrite sections. No barite is present here. The 52.2 foot (16.9 m) true thickness averages 3.16 per cent combined lead-zinc with with an average Pb/Pb+Zn ratio of 0.06. Copper content of the lower horizon ranges from 5 to 40 ppm, averaging about 25 ppm. Silver values range from trace amounts to 4 ppm and average about 2 ppm.

Unlike the upper horizon, footwall and hanging wall rocks of the lower horizon are weakly mineralized (less than 0.2 per cent Pb and 1.0 per cent Zn). Fine-grained sphalerite occurs interstitial to pyrite within a sequence of interbedded discrete pyrite laminae, cherty black argillite, carbonate minerals and blebby barite. The footwall rocks are mapped as unit B_A while hanging wall rocks are mapped as unit B_B (Figure 13). Footwall and hanging wall assemblages are together interpreted as being correlative with a regionally occurring barite-pyrite-chert horizon (map unit 7, GJV 1977). The hanging wall sequence is in turn overlain by silty shale interbedded with calcareous shale and limestone (unit B_C, Figure 13).

Based on the little information available at present, upper horizon mineralization bears strong similarity to shale-hosted sedimentary-exhalative deposits at Howard Pass, Yukon Territory and MacArthur River, Australia. This type of mineralization is commonly pyritic, zinc-rich (with respect to lead), copper and silver deficient, contains abundant shale inter-calcations and interbeds, and is very poorly zoned both laterally and vertically. These deposits are theorized to have formed from relatively low temperature geothermal brines. The lower mineralized horizon has strong affinities with deposits which have been theorized to form from moderate temperature exhalative fluids. Probable examples of this type are the Tom-Jason deposits at Macmillan Pass, Yukon Territory; Sullivan Mine, B.C. and Meggen Mine, West Germany. This type of deposit is usually moderately well zoned, with overall Pb:Zn ratios of 1:1. In addition, copper and silver values are generally significantly higher than in the former type.

GEOCHEMICAL SURVEY

Introduction

Most of the Driftpile Creek property was sampled by Placer in 1974 and 1975 at roughly 100 foot (30.5 m) intervals on east-west lines spaced approximately 400 feet (122 m) apart. The 1978 GJV sampling program increased sampling density on the property to 50 foot (15.2 m) intervals on east-west lines spaced 100 feet (30.5 m) apart to provide more detail on the size and continuity of anomalous trends. A few areas with geomorphological complications required line spacing of 50 feet (15.2 m). The 1978 soil survey represents an area approximately 10,000 feet (3060 m) long and 6000 feet (1830 m) wide and comprised about 6,400 samples.

Field and Laboratory Technique

Samples were collected in kraft paper bags which were numbered in the field with their individual grid designation. The sample locations were established by hip chain and compass survey and marked with 1 m lath pickets. All samples were shipped air freight to Chemex Labs Ltd., North Vancouver, B.C. where they were dried, screened to a minus 80 mesh fraction and analyzed routinely for copper, lead and zinc using a nitric-perchloric acid extraction and atomic absorption spectrometry. Samples which contained a high barium content required redigestion due to barium interference with lead analysis. A portion of the minus 80 mesh fraction from each sample was stored at the lab. Samples from the 1974 and 1975 surveys had undergone the same analytical procedure at Placer's Research Lab in Vancouver for lead, zinc, silver and barium.

Results

Copper, lead and zinc soil geochemical values are plotted on Figures 20 to 22, respectively. Due to time constraints, rigorous statistical treatment of geochemical data from the 1974, 1975 and 1978 programs was not performed but lognormal plots of sample population vs metal content have been prepared for samples in Map Area Two and are plotted on Figures 23 to 25 on the following pages.

Copper soil values are erratic but their ranges reflect lognormal background distributions (Figure 23) indicating that copper is derived from rock backgrounds and that no copper is associated with the zinc-lead mineralization on the property. Indeed, surface and subsurface mineralization assayed to date shows only trace amounts of copper.

Lead soil assays have proven invaluable for locating and interpreting mineralization, even in areas with overburden complications. The lead plot (Figure 24) is of significance because the respective distributions are different even though the same extraction and analytical techniques were used for both the 1974-75 and 1978 surveys. The background population for the 1974-75 lead survey has a significantly narrower distribution and a higher mean value than the 1978 survey over the same area. Correspondingly, mean value for the anomalous population resulting from the earlier survey has a lower value than that of the GJV survey. Threshold values for both distributions are about 750 ppm lead. Variance is probably due to minor differences in analytical techniques between the two labs. To facilitate ease of comparison and full utilization of both surveys, Placer soil lead values, especially those which occur near the mean of the

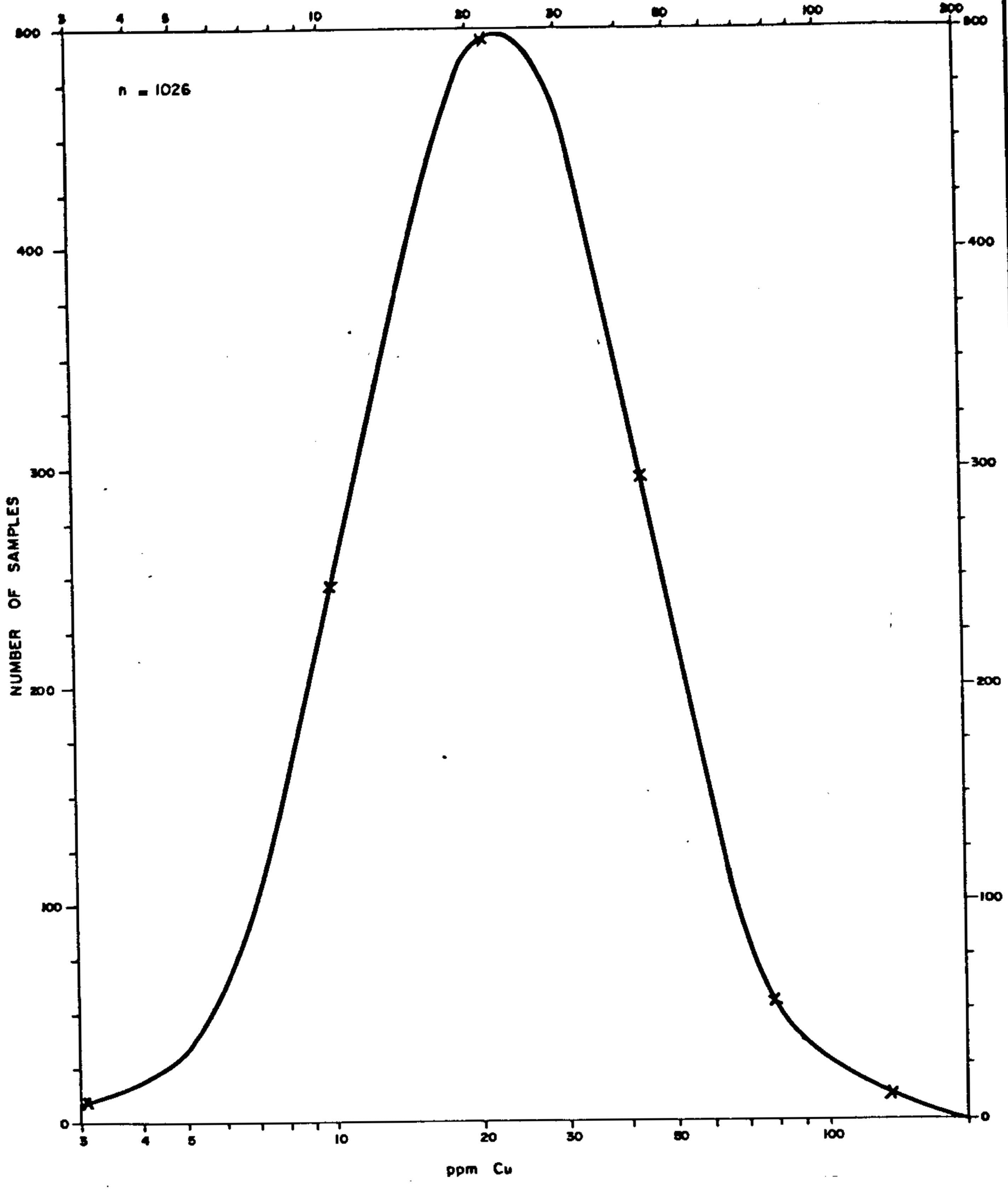


Figure 23: Lognormal plots for copper, 1978 soil survey (Map Area Two); number of samples vs copper values.

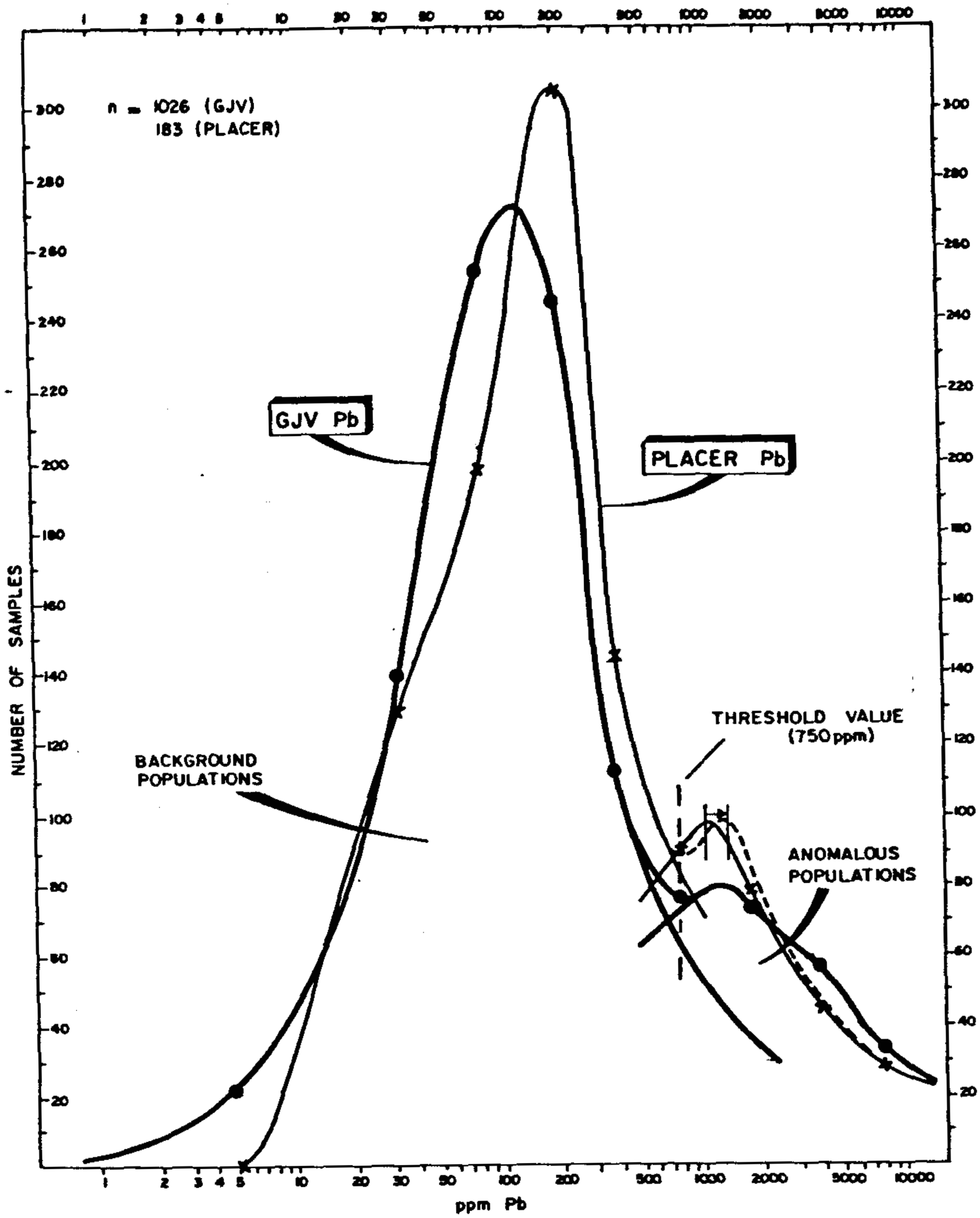


Figure 24: Lognormal plots for lead, 1974-75 and 1978 soil surveys (Map Area Two); number of samples vs lead values. Lower number of Placer samples is normalized to GJV sample population size. Note that the mean value indicated for the 1974-75 (Placer) background is higher than that for the 1978 (GJV) results. Also note that the mean value of the 1974-75 anomalous population is lower than that for the 1978 sampling program.

lognormal distribution, were logarithmically adjusted before they were plotted on Figure 21. The narrow and roughly elongate nature of the contoured anomalies indicates that little hydromorphic or glaciomorphic dispersion is present. Background and threshold values for lead in soils on the Driftpile Creek property are unusually high for both the district and the northern Cordillera. Background on the property averages approximately 125 ppm lead with a threshold value of about 750 ppm. In contrast, a regional threshold value of about 75 ppm lead in soils was established for Gunsteel Formation shales by GJV in 1977. Whole rock geochemical assays of the 1978 drill core suggests that anomalous lead haloes in hanging wall rocks of both the lower and upper mineralized horizons may be the cause. Despite this problem, spurious anomalous trends appear to be absent or; at worst, weakly developed.

Lognormal plots of sample population vs zinc content, shown on Figure 25, indicate that respective distributions of the 1974-75 Placer and 1978 GJV surveys differ. Background populations for both distributions are symetrical with identical means although zinc background values from the earlier survey have a slightly greater range. While anomalous population curves display nearly identical shapes and ranges in both surveys, mean value of the 1978 GJV zinc values is somewhat lower than that of the 1974-75 results. A threshold value of 500 ppm zinc is indicated for the GJV zinc data while the Placer zinc population yields a threshold value of about 600 ppm. Placer's zinc values, especially those which occur in the lower half of the anomalous population, were logarithmically adjusted to conform with the GJV data before they were plotted on Figure 22. Although contoured zinc anomalies are well defined by abrupt margins, they display a more erratic distribtuion in comparison with lead anomalies. As previously

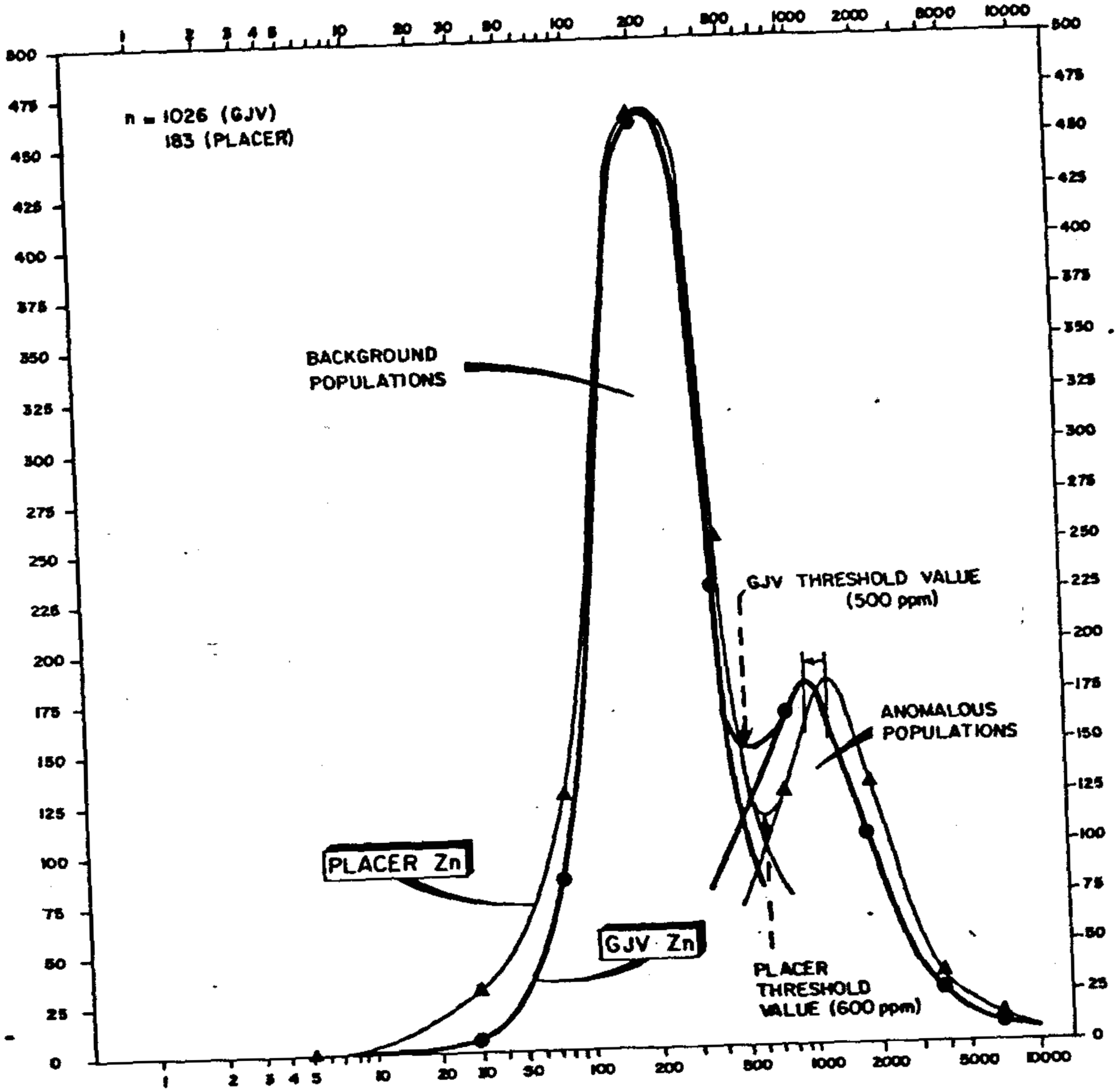


Figure 25: Lognormal plots for zinc, 1974-75 and 1978 soil surveys (Map Area Two); number of samples vs zinc values. Lower number of Placer samples is normalized to GJV sample population size. Note that mean value for the anomalous population indicated by the 1974-75 (Placer) program is higher than mean value of the 1978 (GJV) results.

mentioned, most lead anomalies appear to correlate well with known distribution patterns of underlying mineralization. Many well-defined zinc anomalies do not. This type of zinc anomaly typically occupies elongate wet depressions, seep zones or swamps along topographic lineaments that have been interpreted as possible fault or shear zones (see Figure 13). The 1977 GJV program showed a similar greater mobility of zinc with respect to lead in groundwater in the Driftpile Creek region, especially along zones of high intrastratal porosity such as fault and shear systems. It is conceivable that some of the zinc anomalies could be related to mineralization which is cut by faults at depth.

Barium soil analyses carried out as part of the 1974-75 survey displayed a threshold value of about 1 per cent Ba and range between upper and lower detection limits of 10 and 0.1 per cent respectively.. Scattered anomalous zones are concentrated on the north-east half of the sampled area (Map Areas Four and Five and north half of Map Area Two) but are rare on the southwest half (Map Area One and south half of Map Area Two). This trend possibly reflects primary mineralogical zoning in underlying base metal deposits. This observation is supported by data from the 1978 diamond drilling and mapping program since no barite occurrences were found in Map Area One or the south half of Map Area Two.

Silver background from the 1974-75 soil survey ranges from one to two ppm. Strongly anomalous values (4 ppm to greater than 10 ppm) are restricted to the western part of the property where they correlate well with lead values suggesting the possibility of primary mineral zoning. Silver content of mineralization underlying these anomalies has not yet been tested. Known mineralization on the east half of the property containsvery little silver. Corresponding silver values in soils from that portion of the property are only background or weakly anomalous.

In conclusion, results of detailed soil sampling carried out on the property by GJV in 1978 have greatly clarified a previously rather poorly defined target. Elongate, well defined lead anomalies appear to relate directly to underlying mineralization. Zinc soil geochemistry, in part, confirms the lead data however some zinc anomalies appear to relate to fault zones which cut mineralization at depth. Combination of results from the 1974-75 and 1978 soil sampling programs suggests an overall zoning pattern for mineralization where strongest lead and silver values occur in the southwest of the property, giving way to relative zinc and barium enrichment to the northeast.

DIAMOND DRILLING

The drilling was conducted by D.J. Drilling Ltd. of Vancouver and was supervised by John Schussler. A Boyles 17A model drill equipped with hydraulic feed, wireline and a diesel engine was used. Most of the equipment was trucked from Watson Lake to Muncho Lake and flown from there to Mayfield Lake, where a good dock was constructed. The heaviest pieces were flown direct to Mayfield from Watson Lake because the existing docks at Muncho were inadequate for loading a float plane.

A total of 3334 feet (1016.2 m) were drilled in 9 holes between July 18 and August 16. The first three holes were drilled NQ size but the program was converted to BQ when the drilling proved easier than expected. Core recovery was 99 per cent and only dropped in fault zones. A summary of the drilling follows:

HOLE	LOCATION	DIP	AZIMUTH	SIZE	LENGTH FEET	LENGTH METRES
78-01	2000S/170W	-55	055	NQ	450	137.2
78-02	1600S/90W	-55	055	NQ	198	60.4
78-03	1600S/90W	-90	-	NQ	321	97.8
78-04	470S/00E	-45	055	BQ	225	68.6
78-05	470S/00E	-85	235	BQ	256	78.0
78-06	470S/300E	-45	055	BQ	465	141.7
78-07	4100N/1650E	-50	093	BQ	361	110.0
78-08	4100N/1650E	-85	093	BQ	500	152.4
78-09	2400S/200E	-50	055	BQ	558	170.1
					3334	1016.2

Sampling the drill core with a conventional core splitter proved to be very difficult and slow because of shattering along cleavage planes. This destroyed its value for subsequent logging and future study. The problem was solved by cutting the core longitudinally with a gas-powered diamond saw.

D.J. Drilling's crew, equipment and performance were entirely satisfactory during the 1978 program and equipment failures and down-time were almost negligible.

GEOPHYSICAL SURVEY

The following is a report on a contracted survey conducted from September 3 to September 10, 1978

John Betz Limited

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REPORT ON THE ELECTROMAGNETIC TESTS
GATAGA JOINT VENTURE
DRIFTPILE CREEK PROPERTY
LIARD MINING DIVISION, B.C.
LAT 58°04'N LONG 125°50'W N.T.S. 94 K/4W

December 1978
Toronto, Ontario

John E. Betz
John Betz Limited

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REPORT ON THE ELECTROMAGNETIC TEST SURVEY
GATAGA JOINT VENTURE
DRIFTPILE CREEK PROPERTY
LIARD MINING DIVISION
LAT 58°04'N, LONG 125°50'W, N.T.S. 94-K-4(W)

INTRODUCTION

The objective of this program was to determine if electromagnetic methods could serve as a guide to diamond drilling in this area. With this in mind, test lines were chosen around some of the drill holes of the 1978 drilling program. These lines can be broken into three groups, which are:

Group A--44N, 40N, and 36N from 26+00E to 14+00E; to test the response of the mineralization intersected by DDH 78-07.

Group B--4S from 13+00E to 22+00W; to test the mineralization intersected by DDH's 78-04, 05, & 06, and to test areas of rusty talus to the west of these drill holes.

--12N from 8+00W to 27+00W; to test the possibility of conductive horizons crossing the valley from the area of line 4S.

Group C--20S from 4+00E to 20+00W and 24S from 10+00E to 4+00W; to test the mineralization in DDH's 78-01 and 78-09, and to test the area of rusty talus around 13+00W on L-20S.

By way of getting a preconceived idea of what to expect from the known mineralization, ohmmeter tests were made on several specimens of sulphide mineralization and graphite. In no instance was highly conductive material encountered; however, the specimens of bedded fine-grained pyrite, massive galena and soft fault-zone graphite were all sufficiently conductive to predicate their response to a ground EM system of appropriate sensitivity. The next step was an in situ look at this conductive material.

The EM system used on this project was the MaxMin II, made by Apex Parametrics Ltd of Markham, Ontario. The specifications for, and methods of, operating this system are amply described in the operations manual provided by the manufacturer. They will not be repeated here.

For this project, the MaxMin II was used in a maximum coupled coplanar mode with the turns of the transmitting and receiving coils held parallel to the mean slope, along the traverse line, of the terrain between the coils. On flat ground, this mode of operation is the well known horizontal loop mode.

In rough terrain such as on the Gataga grid, it is of paramount importance to control the spacing and the tilt of the coils in order to get 'clean' in-phase data and to reap the fullest possible interpretation. One method of controlling the coils is to pre secant-chain* the grid, recording contingent slope information in the process. Another method is to use a fixed length of reference cable and an inclinometer during the course of the survey. The fixed length of cable is draped over the topography and an inclinometer is used to observe the station-to-station slopes. The latter slopes are recorded in the notebook as a separate column of information. The mean slope between the coils is readily derived in the field from the station-to-station slope information, thus insuring coplanarity at all times. The slope information is also used in conjunction with a programmable calculator(following the field work) to derive the straight line distance between the coils and thence a correction for the in-phase reading. The latter method results in a somewhat larger noise envelope than the secant chaining method, e.g. 5% vs. 2% of primary field strength, thus making more difficult the recognition of small in-phase anomalies such as would be obtained from very deep, highly conductive zones. However, the secant chaining method has the disadvantage of requiring a pre chaining technique which is beyond the capability of most line cutters to do well. This means that the EM crew has to prechain the grid before surveying it, adding perceptibly to the cost of the survey, i.e. by about 75%.

In the name of saving time, the method involving the contemporaneous use of an inclinometer was used during the current project, except on L-4S where a couple of very sharp gulleys would have introduced errors to this method well beyond the pre-stated 5% noise envelope. L-4S was secant chained prior to running the MaxMin II system.

A coil spacing of 400 ft and frequencies of 222 and 3555 Hz were used throughout the MaxMin tests. The reasons for this choice of coil spacing and frequency are:

a) A coil spacing of 400 ft is a compromise value to get moderately good resolution of near-surface conductors and moderately good search depth for deep conductors. It is always possible to use another coil spacing for follow-up work.

* The method of secant chaining and subsequent data reduction is described in the MaxMin II operations manual. It will not be repeated here.

b) Two widely-spaced frequencies lead to a fairly accurate conductivity-thickness estimate for conductive zones, as well as helping to interpret the shape and attitude of non-simplistic conductive zones. A very high frequency will detect very "poor" conductors which are scarcely visible to a very low frequency.* A very low frequency will make "good" conductors stand out in the presence of "poor" conductors--something that a very high frequency cannot do.*
c) The results at one frequency serve to monitor the inevitable reading and/or recording error at the other frequency.

In addition to the coil spacing of 400 ft, a coil spacing of 200 ft was used on L-4S only. This was done primarily to determine the degree of added resolving power of the shorter coil spacing.

The MaxMin II receiver was operated by me throughout the survey. The transmitter was operated by personnel provided by Archer, Cathro & Associates Ltd.

The claims touched on by these tests are D2,D19,D22,D24,D41, P19,P20,P21,P22,P24,P37,P39,GOOF1, and GOOF2.

Location and access maps will be given in other reports composed by Archer Cathro personnel. They will not be repeated here beyond stating the latitude, longitude, and N.T.S. number in the title and on the plans.

PRESENTATION OF RESULTS

The MaxMin II results are shown in profile form on special plot sheets. On the same sheets are topo profiles derived from the inclinometer work, and an interpreted conductor section. Reduced-scale copies of these sheets, of which there are eight, are included just before the pocket at the end of the report.

A conductor interpretation is also shown in plan for each of the three test areas. This plan is in the pocket at the end of the report.

DISCUSSION OF RESULTS

A few depth, dip and σ.t (conductivity-thickness) determinations are shown on the plan, where it was felt they could be made with reasonable accuracy. Generally however, the mutual interference of the many conductors made it impossible to make accurate determinations.

* There is an example of this in the results to be discussed.

It is worthy of note that the depth figures shown on the plan are not necessarily the depths of the bedrock, but rather the depths to the conductive material of the σ.t values indicated. Where there is appreciable weathering, the depth shown on the plan could be somewhat greater than the depth to bedrock. Also, the interpreted depth can be greater than the true depth, if the traverse lines are not well in from the ends of the conductive zone. There's no way of knowing this with the limited size of these test grids.

For single simplistic bodies, it is possible to interpret dip from the profile shape. However, in this area the mutual interference effects of closely spaced conductive zones makes this virtually impossible. It is conceivable that some insight into regional dip could be obtained by running sufficiently long traverses to reach neutral ground on opposite sides of a wide conductive unit. The profile shape on each side could well indicate an overall dip for the unit. Unfortunately, there were no clear-cut cases like this during these tests. For this reason, the dips in the interpreted conductor sections on the profile sheets are generally shown as vertical--except for conductors C_1, C_2, and D on L's 20S and 24S for which the dips were derived from the drilling results.

Although an attempt has been made to classify the conductive zones in terms of their σ.t values, the full significance of this exercise is not yet known as far as finding economically viable ore bodies is concerned. The following table shows some of the possibilities for the different σ.t classifications. The possibilities for the stated resistivity values are also given in the table.

Category	σ.t (mhos)	Nature of Conductor
1a	>1000	Zone of extremely well-developed graphite (probably with some massive coarse-grained sulphides); or zone of massive coarse anhedral-grained sulphides. (Most of the Archean massive sulphide bodies containing coarse-grained chalcopyrite and/or pyrrhotite and/or pyrite are in this category.)
1b	100 to 1000	Zone of well-developed graphite; or thick zone of massive fine-grained pyrite with some silicification; or thin zone (e.g. <1 meter) of massive coarse anhedral-grained sulphides.
1	20 to 100	Zone of massive fine-grained pyrite with some silicification; or zone of moderately-developed graphite; or zone of extremely thin laminae of coarse-grained massive sulphides.
2	2 to 20	Zone of massive fine-grained pyrite with appreciable silicification; or zone of poorly to moderately developed graphite.

Category	σ.t (mhos)	Nature of Conductor
3	0.5 to 2	Zone of shearing or fracturing with or without disseminated mineralization; or zone of massive fine-grained pyrite with large amount of silicification; or zone of poorly-developed graphite.
	20 to 40 ohmmeters	Varved clays; or carbonaceous sediments, containing zones of marginally developed graphite; or porous or fractured rock containing salt water.
4	0.05 to 0.5	Zone of shearing or fracturing, with or without disseminated mineralization.
	40 to 400 ohmmeters	Varved clays to dry tills; or carbonaceous sediments; or porous fractured rock containing ionic water.

Of course, sphalerite or $BaCO_3$ (both non-conductors) can be present in any or all of the preceding categories. Depending upon their mode of occurrence, their presence will either decrease, or will not affect, the σ.t values.

The largest σ.t value encountered on these grids is about 100 mhos, thus excluding conductors in categories 1a & 1b from being the cause of any of the observed anomalies.

Now for the specific interpretation of the MaxMin II results on a group basis.

Group A (L's 36N, 40N, and 44N)

As shown on the plan, there is a clear-cut 20 to 25 mho conductive zone crossing this line group. The zone lies in a weakly conductive (20 ohmmeter) host medium, as indicated by the background levels of the in-phase and out-of-phase readings, and by the reverse out-of-phase anomaly from the 20 to 25 mho zone at the high frequency.

Without being more familiar with the geology in this area, it is difficult to speculate on the nature of the weakly conductive host medium. There are a couple of valid suggestions in category (3) in the preceding table. However, there is no doubt that the 'stronger' conductor crossing the grid is the mineralized horizon intersected by drill hole 78-07. It would appear from this that there is sufficient massive galena in this zone to create some measure of electrical continuity over an appreciable length and depth.

Group B (L's 4S and 12N)

The gap between L's 4S and 12N is somewhat large for making a firm correlation between the results on each line. Nonetheless, a comparison of the profiles on the two lines points to an almost certain correlation between conductive assemblage A on the western part of L-4S and assemblage A' on L-12N. In fact, the similarity in overall profile shape was the criterion for indicating a strike direction for these conductive assemblages and for all of the component parts within them. Unfortunately, L-12N did not extend far enough toward the east to verify the presence of a conductive assemblage analogous to assemblage B on the eastern part of L-4S. So, there's no basis for assigning a strike direction to the component parts of assemblage B, other than making them run parallel to the component parts of assemblage A.

There is a point of difference between the conductive picture within A on L-4S and that within A' on L-12N. The latter is based on results with a 400 ft coil spacing, and the former on results with a 200 ft coil spacing. The higher resolving power of the 200 ft coil spacing led to a more detailed breakdown of the conductive components on L-4S. This point can be better appreciated by comparing the interpreted sections on the profile sheets for L-4S, for both the 200 ft and the 400 ft coil spacings.

Although mutual interference effects make dips near impossible to determine, there is a hint in the '200 ft' results of a westward dip for conductive zones A_1 and A_4, and an overall eastward dip for conductive assemblage B. Should this dip interpretation be true, then conductive assemblages A and B could lie on opposite limbs of an anticline. Longer profiles might resolve this issue better.

DDH's 78-04, 05, and 06 have in effect sampled conductive unit B_2-B_3-B_4. It is interpreted that this unit is a mix of at least three poorly to moderately conductive zones separated by more poorly conductive material. There is only a suggestion of multiple zones in the '400 ft' results, but a definite indication thereof in the '200 ft' results. Even then, the conductor system is not totally resolved by the '200 ft' results.

Although I'm writing without the benefit of the specific drill logs, my notes indicate that 'interesting' mineralization was encountered across most of unit B_2-B_3-B_4, which would imply that the mineralization is associated by and large with the more poorly conductive components within the unit. The more strongly conductive components would then be due to either stringers of massive fine-grained sulphides (sphalerite excluded), or to zones of graphite. The answer no doubt lies in the drill core.

Group C (L's 20S and 24S)

The interpretation for this system suffers from an insufficient overlap of the two lines. Nonetheless, there is sufficient overlap to establish a strike trend for the area around the base line. Rightly or wrongly, the same strike trend has been used beyond the area of overlap.

The soft graphite intersected near the collar of DDH 78-01 is the probable cause of conductor B_2. Had the hole been collared a little further to the west, it would have got a full cut of conductor B_2.

Conductor C_1 correlates quite well with the surface projection of the massive pyrite and $BaCO_3$ intersected in the upper part of DDH 78-09. A little more poetic licence is required to project the massive pyrite and $BaCO_3$ intersected in the lower part of DDH 78-01 to be coincident with conductor C_1 on surface. A tentative geological interpretation on the job site had the zone intersected deep in DDH 78-01 subcropping in the valley around the base line, simultaneous with being faulted eastward, eventually outcropping coincident with conductor C_1. Based on the geophysical evidence, there is no subcropping conductive zone around the base line; so, it is surmised that there is no faulting of the pyrite-$BaCO_3$ zone, but rather there is a flexure in its dip causing it to surface at conductor C_1.

The several graphitic zones intersected by DDH 78-09 project rather neatly into conductor C_2.

As accurately as the massive pyrite-$BaCO_3$ intersection can be projected to surface from depth in DDH 78-09, it coincides rather well with conductor D. Also, conductor D lies just up-slope to the west of the pyrite boulders found in the valley around 9+00E on L-24S, adding strongly to the possibility of this conductor being the source of these boulders.

It is worthy of note that the most 'interesting' material economically does not have the largest $\sigma.t$ value--just the opposite. In fact, it is primarily through the out-of-phase component at the high frequency, that zones C_1 and D have been detected.

There is no drilling in the area of conductors A_1, A_2, A_3, and A_4. However, it is of interest to note that the zone of rusty talus around 13+00W on L-20S coincides fairly well with the eastern half of conductor A_3. Assuming that the rusty talus is locally derived, then it would appear that the example of conductors C_1 & D is being followed again, wherein the most interesting mineralization from an economical point of view is not necessarily the most highly conductive.

CONCLUDING REMARKS AND RECOMMENDATIONS

As can be seen in the discussion, the mineralization 'of interest' goes from being the primary conductor in group A to being a secondary conductor in groups B and C. It is even conceivable that, in and around groups B and C, the mineralization of interest might become non-conductive if the amount of sphalerite and $BaCO_3$ was to increase and the amount of pyrite to decrease. But, in both cases the 'interesting' mineralization closely flanks more strongly conductive material (graphite?), which can serve as a marker horizon. However, with the myriad of conductors in the Driftpile Cr. area, and the absence of a firm relationship between $\sigma.t$ and mineral content, it will require tools like geochemical soil sampling and geological mapping to get the drill into the right area. Once 'interesting' mineralization is proven to exist in a given area, there is little doubt, based on the present examples, that an EM system like the MaxMin II will be able to guide a drill along strike.

It is worthy of recollection that the out-of-phase component, in particular at the high frequency, has been a useful tool in delimiting poorly conductive flanks on moderately conductive zones, e.g. conductor C_1 against C_2 in group C. An essentially in-phase system like the vertical loop, or the shootback would not be capable of this. This is one good reason for using a system like the MaxMin II for continued coverage of the grid. At the same time, the MaxMin II when used as recommended can give a more precise in-phase reading (or equivalent) than either the vertical loop or shootback systems.

There is some room for latitude in choosing line, coil and station spacings. As evidenced on L-4S, the smaller of the two coil spacings used (200 ft) gives a better resolution of the conductive picture. However to reap the full resolving capability of a 200 ft coil spacing, the station spacing should not exceed 50 ft. Such a station spacing would increase the overall survey time some 75% over a 100 ft station spacing. On the other hand, given that the localizing of at least one edge of a conductive horizon sufficiently well to guide a drill--and not the extra-fine resolution of conductive components--is the major issue, it appears that a 400 ft coil, and a 100 ft station spacing would be generally adequate. Nonetheless, some refinement could be added in places to the results from the latter combination, by using a smaller coil and station spacing.

Bearing in mind the variables of survey time, resolving power and depth of penetration, a good compromise combination of coil and station spacing would be 300 ft and 75 ft, respectively, on lines 300 ft apart. If the latter station spacing is judged awkward, the alternative is to go metric with a 100 meter coil and 25 meter station spacing on lines 100 meters apart.

The next point of decision is whether or not to use the simultaneous inclinometer technique, or the secant chaining technique for controlling the coils. Certainly the former technique is more rapid and would be generally adequate for the problem at hand. For a pure reconnaissance type project the simultaneous inclinometer technique would be recommended. However, in view of the state of progress of this project, a fall-out of secant chaining should be considered. This is a very accurate grid map in terms of station and line location, and of station elevations along the lines. When combined with a contour plan derived from orthophotos, it would be possible to make a plan of the lines, stations and topo contours, which would stand the test of a surveyor's transit, at least as far as could be distinguished at a scale of say, 1:2500. For this reason, it is recommended that a set of grid lines be cut by a competent line cutting crew, after which they should be secant chained by a competent employee of Archer Cathro, such as Frank Gish. Should this recommendation be accepted, I will send a set of secant chaining instructions separately.

It is deserving of comment at this point that grid lines do not have to be super clean or super straight to do effective MaxMin II work. However, they should be clean enough and/or well marked enough to be readily followed, and they should not contain any sharp kinks or bends.

In closing, some information is given to help work out a cost figure for any future MaxMin II coverage of the property. Someone like Gish should be able to get 2½ line miles per day, while secant chaining. He will require one helper for this. Also, there will be two to three days required for data reduction. This will go more quickly with fewer errors if a helper is used. I will be able to cover 2½ line miles per day with one helper on the transmitter, and 3 line miles per day with a second helper to pull the cable and take notes. However, with appreciable walking distances from camp and wet working conditions , all of the above line mileage figures could drop by ½ mile per day. There could easily be as much as 12 to 14 days of travelling, data reduction, interpretation, presentation planning, and report writing in view of the anticipated complexity of the conductor picture. My charge will be $275. per day next year, and the equipment cost will be $30. per day. There will be travelling, equipment shipping, drafting, typing, and reproduction costs, which can be estimated from the invoice for the current project.

WRITER'S DECLARATION

Neither I, not John Betz Limited, have any financial interest in any of the properties of Archer, Cathro & Associates Ltd. or any of its joint venture partners.

I hold BA (1952) and MA (1953) degrees in geophysics from the University of Toronto. I have worked full time in mining exploration geophysics since 1953, and two summer seasons prior to 1953.

All statements made in the report are correct to the best of my knowledge.

REGISTERED PROFESSIONAL ENGINEER
J. E. BETZ
PROVINCE OF ONTARIO

December 1978
Toronto, Ontario

John E. Betz
John Betz Limited

PROFILE INDEX

MaxMin II & Topo Profiles with Interpreted Conductor Picture for Lines:

Note: Four different categories of conductor are indicated on the profile sheets. These are:

1 $\sigma.t$ = 20 to 100 mhos

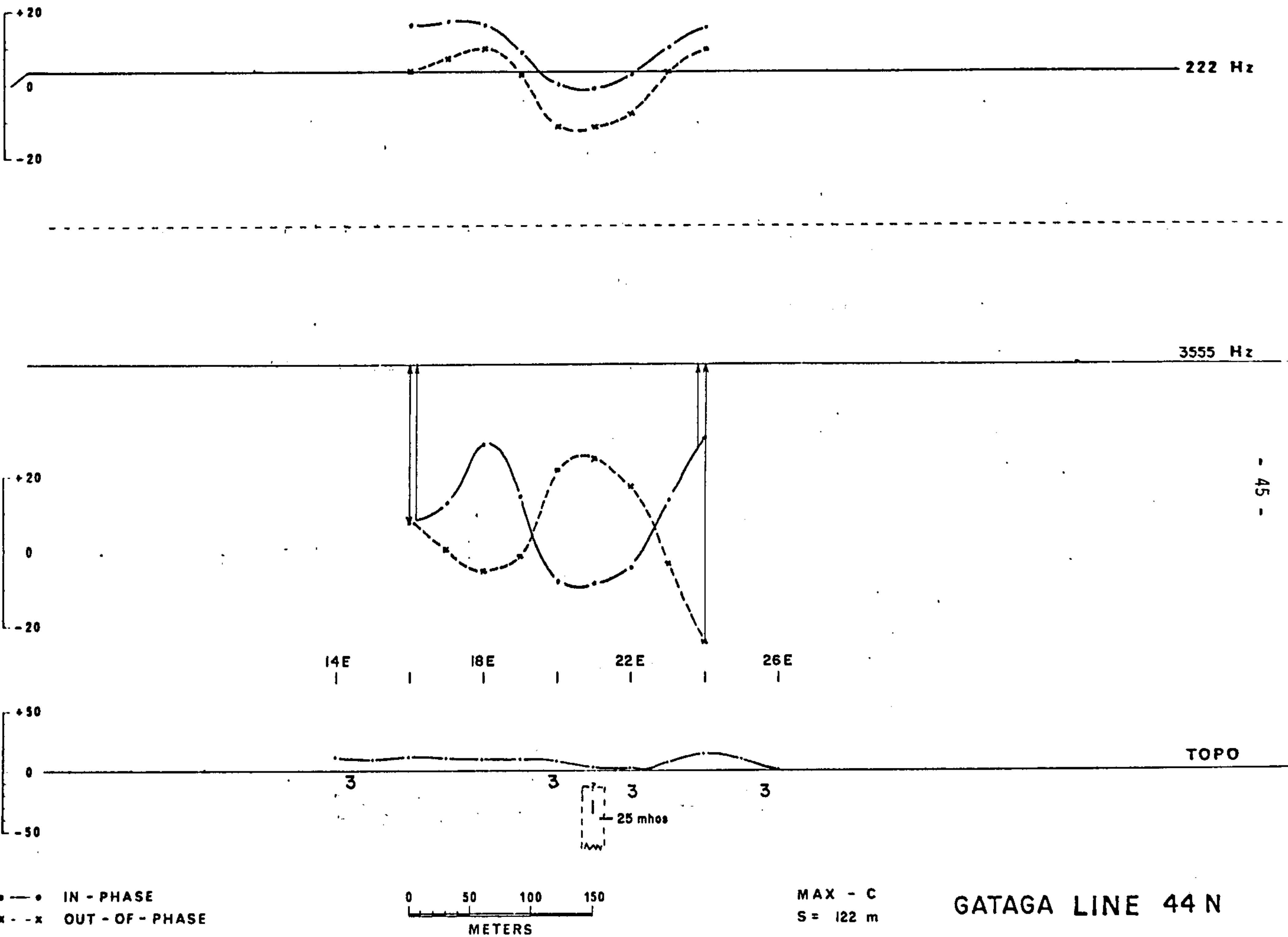
2 $\sigma.t$ = 2 to 20 mhos

3 $\sigma.t$ = 0.5 to 2 mhos, or ρ = 20 to 40 ohmmeters

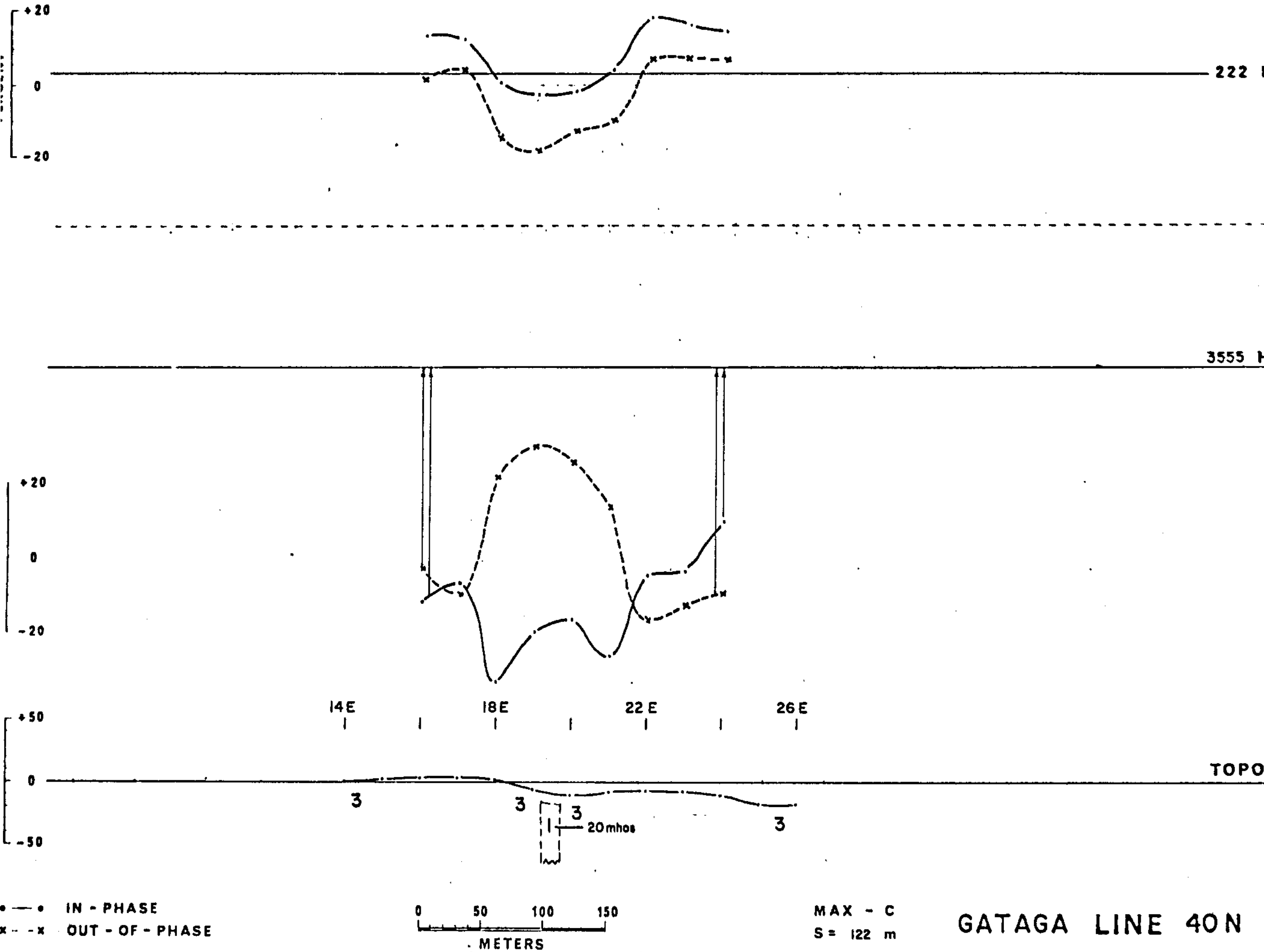
4 $\sigma.t$ = 0.05 to 0.5 mhos, or ρ = 40 to 400 ohmmeters

The category number is written on the conductive zones, and their letter designation is written above.

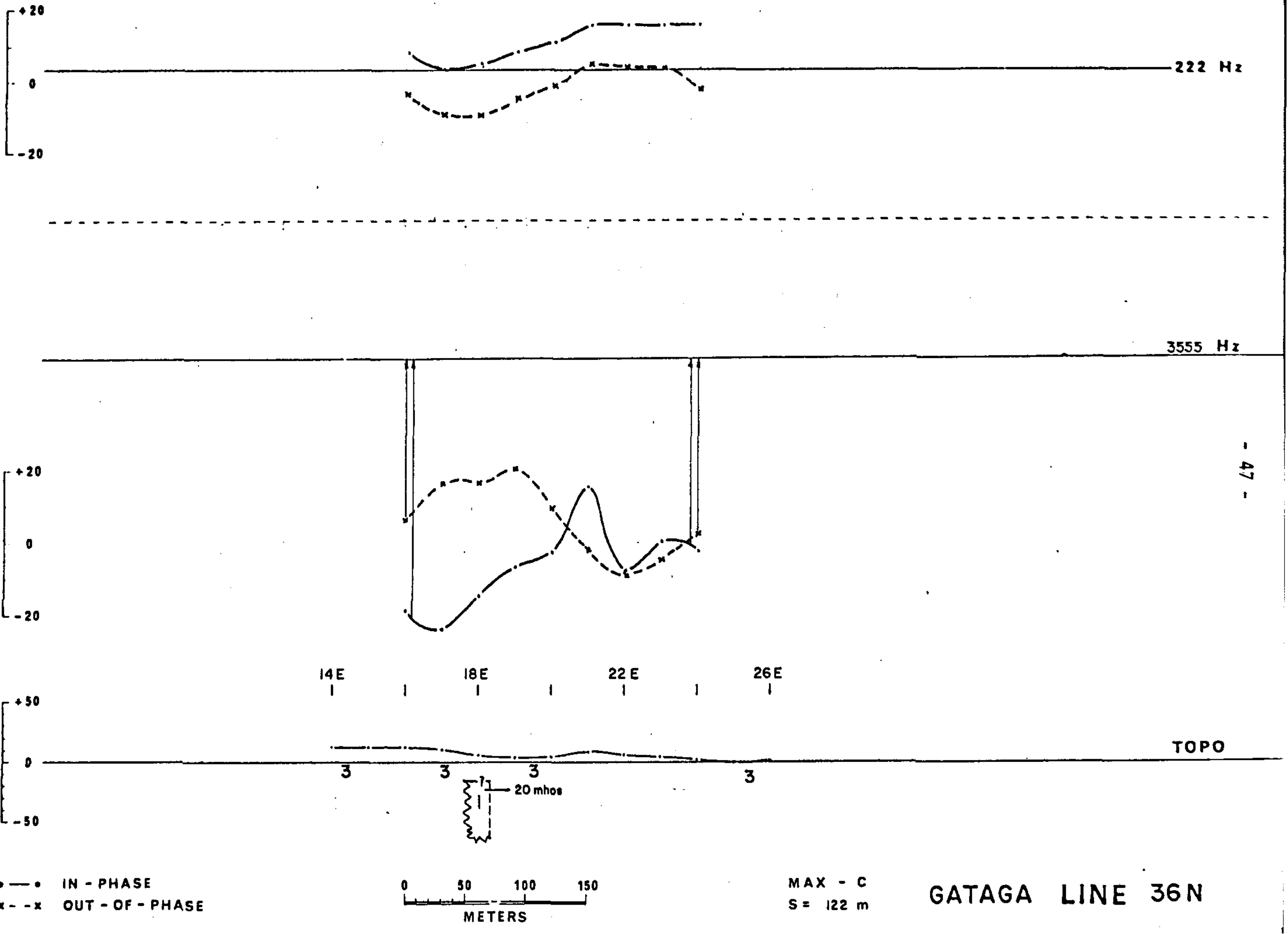
Note: See the table on pages 4 and 5 for a better appreciation of the significance of these $\sigma.t$ and ρ values.



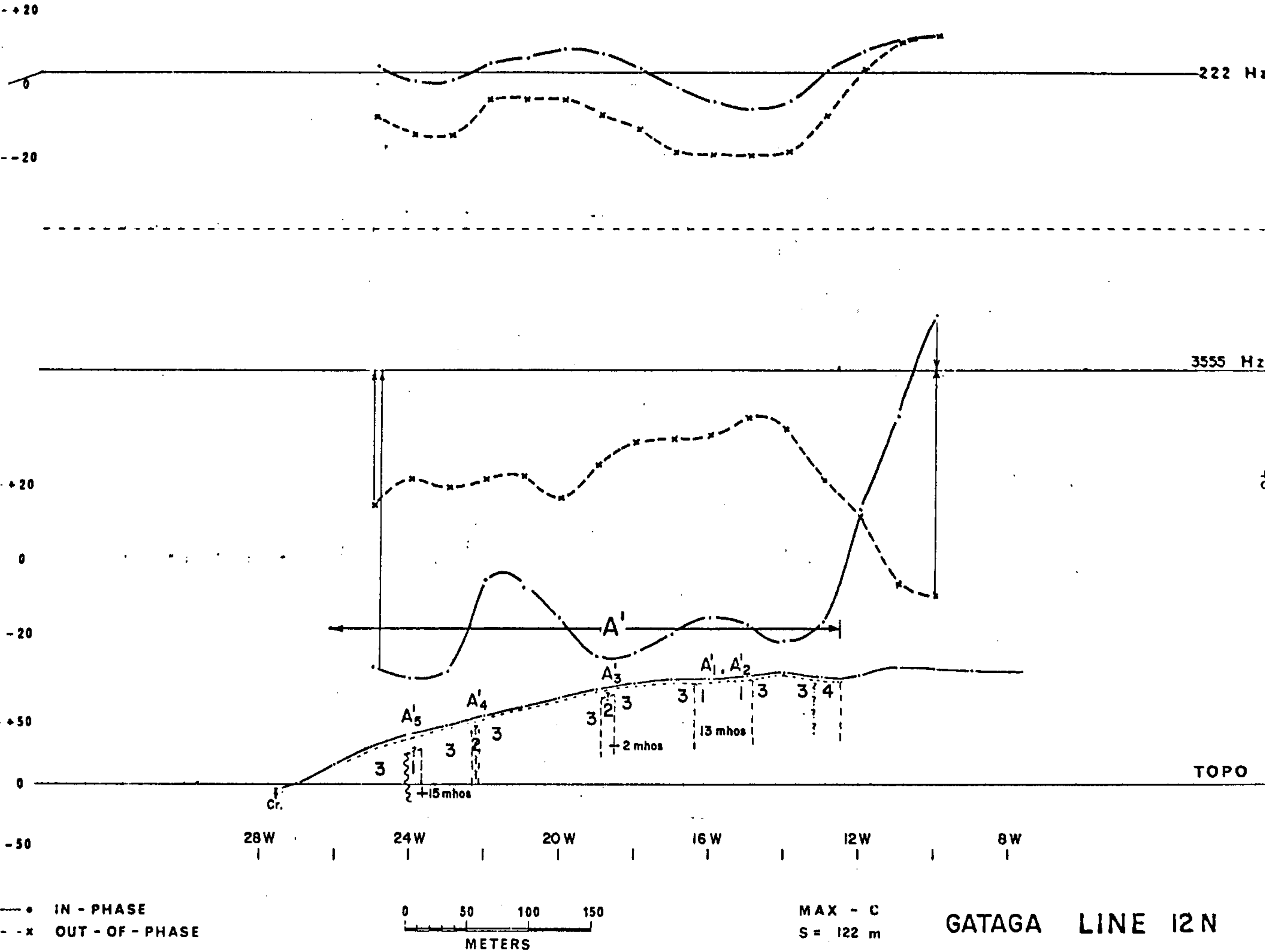
GATAGA LINE 44 N

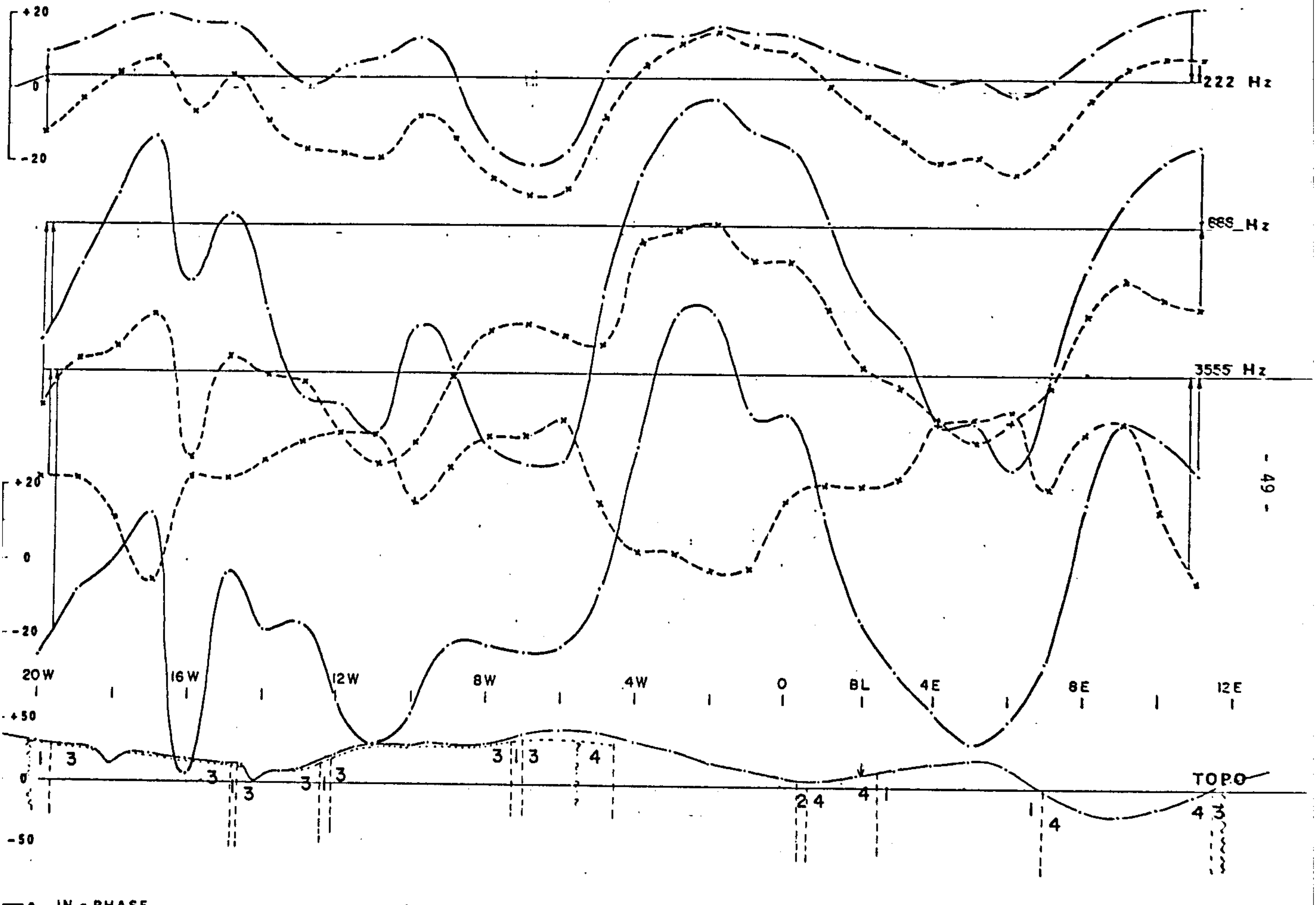


GATAGA LINE 40N



GATAGA LINE 36N


+20
0
-20
222 Hz
3555 Hz
+20
0
-20
A'
A'3
A'1, A'2
A'4
A'5
+50
0
-50
TOPO
Cr.
3
1
2
4
+15 mhos
+2 mhos
13 mhos
28W
24W
20W
16W
12W
8W
IN - PHASE
OUT - OF - PHASE
0
50
100
150
METERS
MAX - C
S = 122 m
GATAGA LINE 12N



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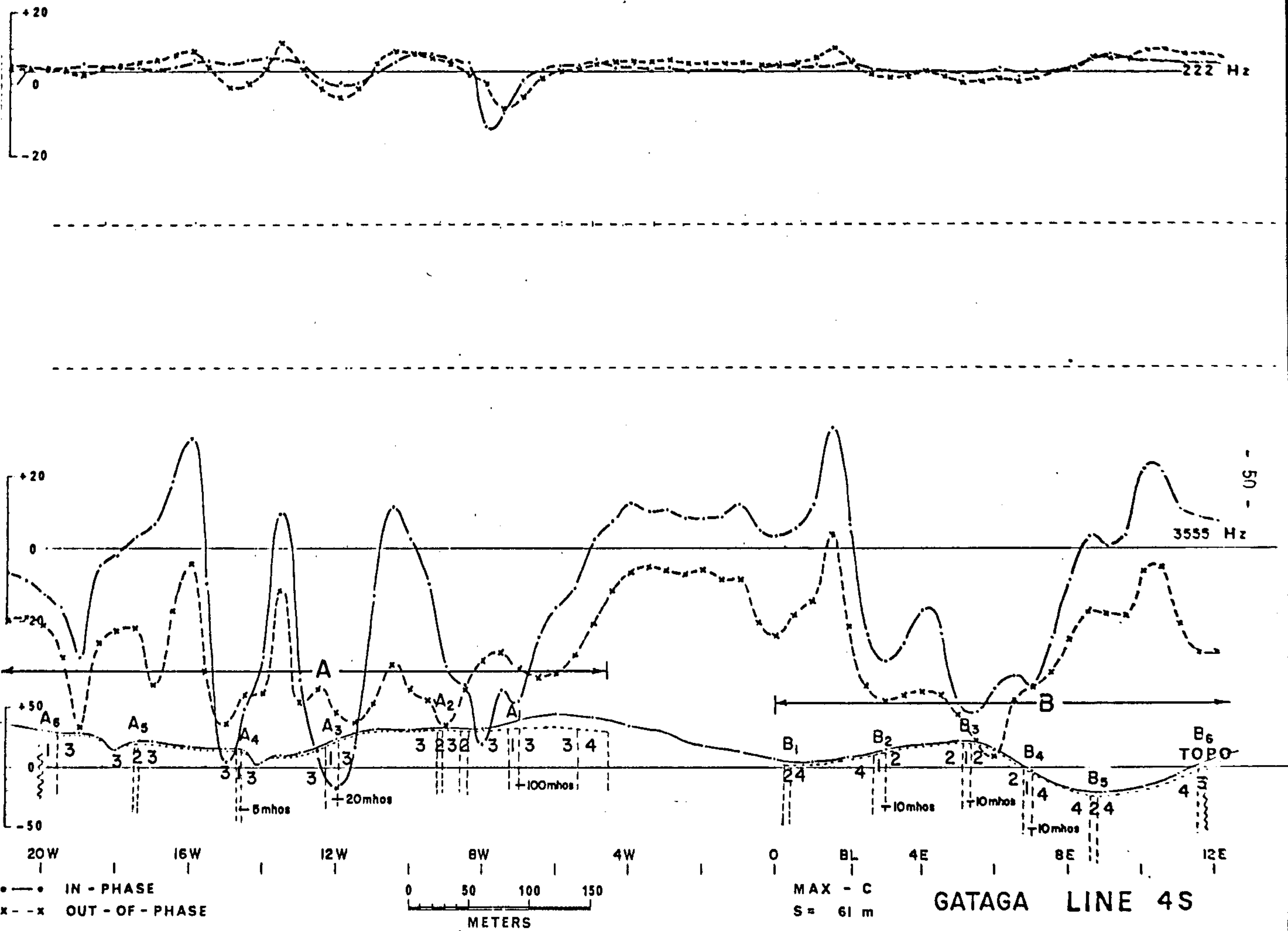
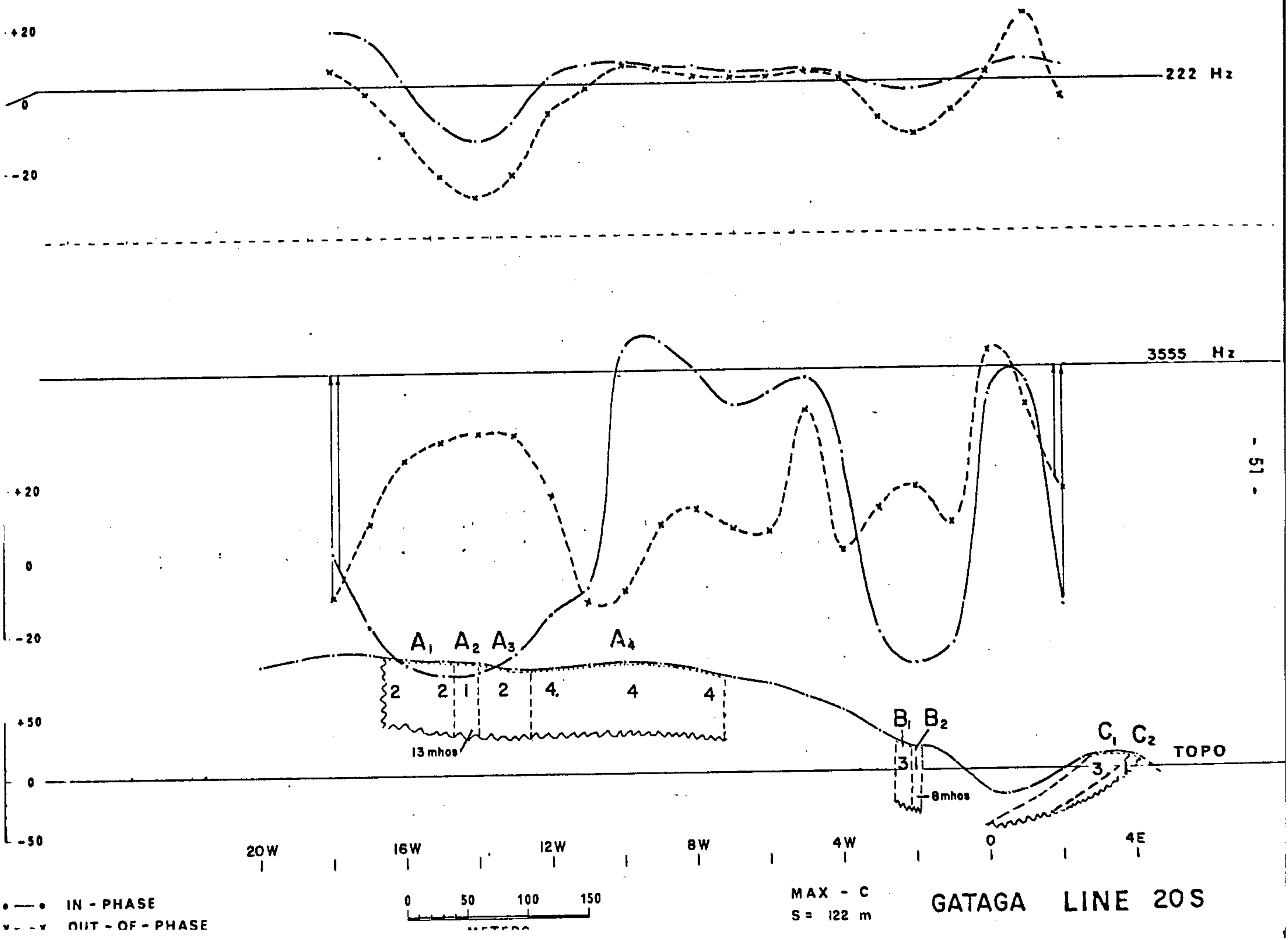
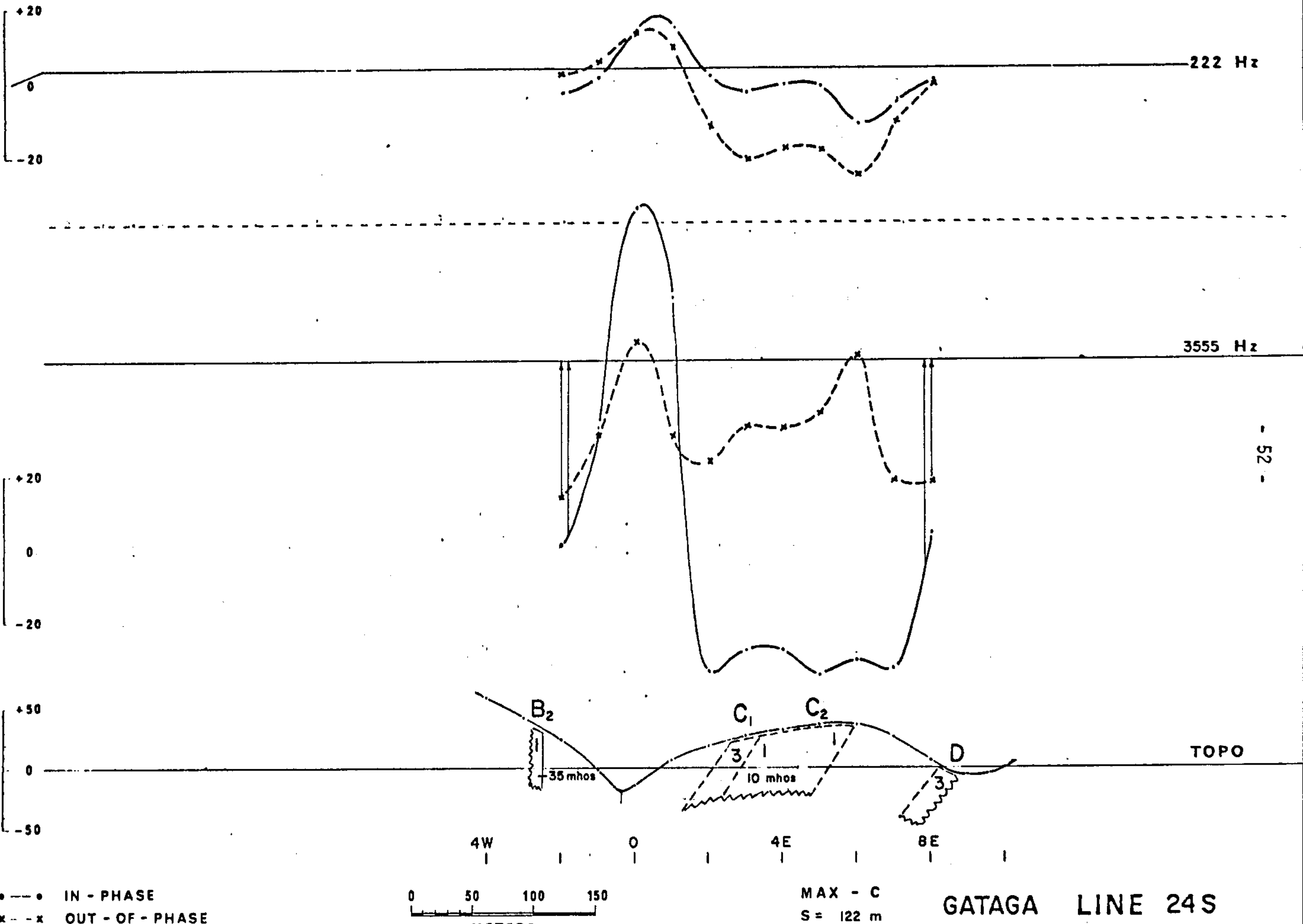


GATAGA LINE 4S



GATAGA LINE 20S



GATAGA LINE 24S

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1016 STANDARD BUILDING
510 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 1L8

October 11, 1978.

STATEMENT OF QUALIFICATIONS

I, Robert C. Carne, residing at 5665 Toronto Road, Vancouver, British Columbia, state that:

1. I have graduated from the University of British Columbia with a B.Sc. degree in Geological Sciences in 1974.

2. I have been employed by Archer, Cathro & Associates Ltd. as a geologist since 1977 and that I have been engaged in mineral exploration in British Columbia, Yukon Territory and Northwest Territories since 1970.

3. I am a member of the Geological Association of Canada.

4. I am a member of the Geological Society of America.

5. I am a member of the Society of Economic Paleontologists and Mineralogists.

6. I personally supervised the exploration program at the Driftpile property during 1978 and logged all drill core.

Respectfully submitted,

Robert C. Carne, B.Sc.

RCC:jm

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AND ASSOCIATES LTD.
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Post Office Box 4127
Whitehorse, Yukon
Y1A 3S9

CERTIFICATE

I, Robert J. Cathro, with business addresses in Whitehorse, Yukon Territory, and Vancouver, British Columbia, and residential address in West Vancouver, British Columbia, do hereby declare that:

1. I am a 1959 graduate of the University of British Columbia in geological engineering.
2. I am registered as a professional engineer in both British Columbia and Yukon Territory.
3. I have been engaged in mineral exploration and evaluation since 1959 and have been a partner in Archer, Cathro & Associates Ltd. since 1966.
4. I have had full access to previous data on the Driftpile Property.
5. I have supervised the field program conducted by R.C. Carne.

Respectfully submitted,

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — R. J. CATHRO

R.J. Cathro, B.A.Sc., P. Eng.