

1982 GEOPHYSICAL & SURVEYING REPORT  
ON THE MID CLAIM GROUP

Watson Lake Mining District, Y.T., NTS 105-B-1  
Latitude 60°02'N; Longitude 130°12'W



December, 1982

091418

YUKON ASSESSMENT

1 9 8 2

GEOPHYSICAL AND SURVEYING REPORT

ON THE

M I D C L A I M G R O U P

WATSON LAKE MINING DISTRICT, YUKON TERRITORY  
N.T.S. 105-B-1  
Latitude 60°02'N; Longitude 130°12'W

OWNER: AMAX OF CANADA LIMITED

OPERATOR: REGIONAL RESOURCES LTD.

BY

J. J. Hylands, P.Eng.

CORDILLERAN ENGINEERING  
1418-355 Burrard Street  
Vancouver, B.C. V6C 2G8

DECEMBER, 1982

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CLAIMS: Mid 1-128; Grant No's YA56975-YA57102  
Mid 129-160; Grant No's YA57155-YA57186  
Mid 161-225; Grant No's YA58936-YA59000  
Mid 226-240; Grant No's YA65801-YA65815

LOCATION: S. of Rancheria River, approximately 85 km  
west of Watson Lake, Yukon Territory.

WORK

PERIOD: June 1 to October 6, 1982

This report has been examined by  
the Geological Laboratory  
under Section 53 - Broken Quartz  
Dip 1/2 and is reported as  
reproduction work to the amount  
of \$ 37.700 -

*A. Watson*

*for* Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory

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### PLATE

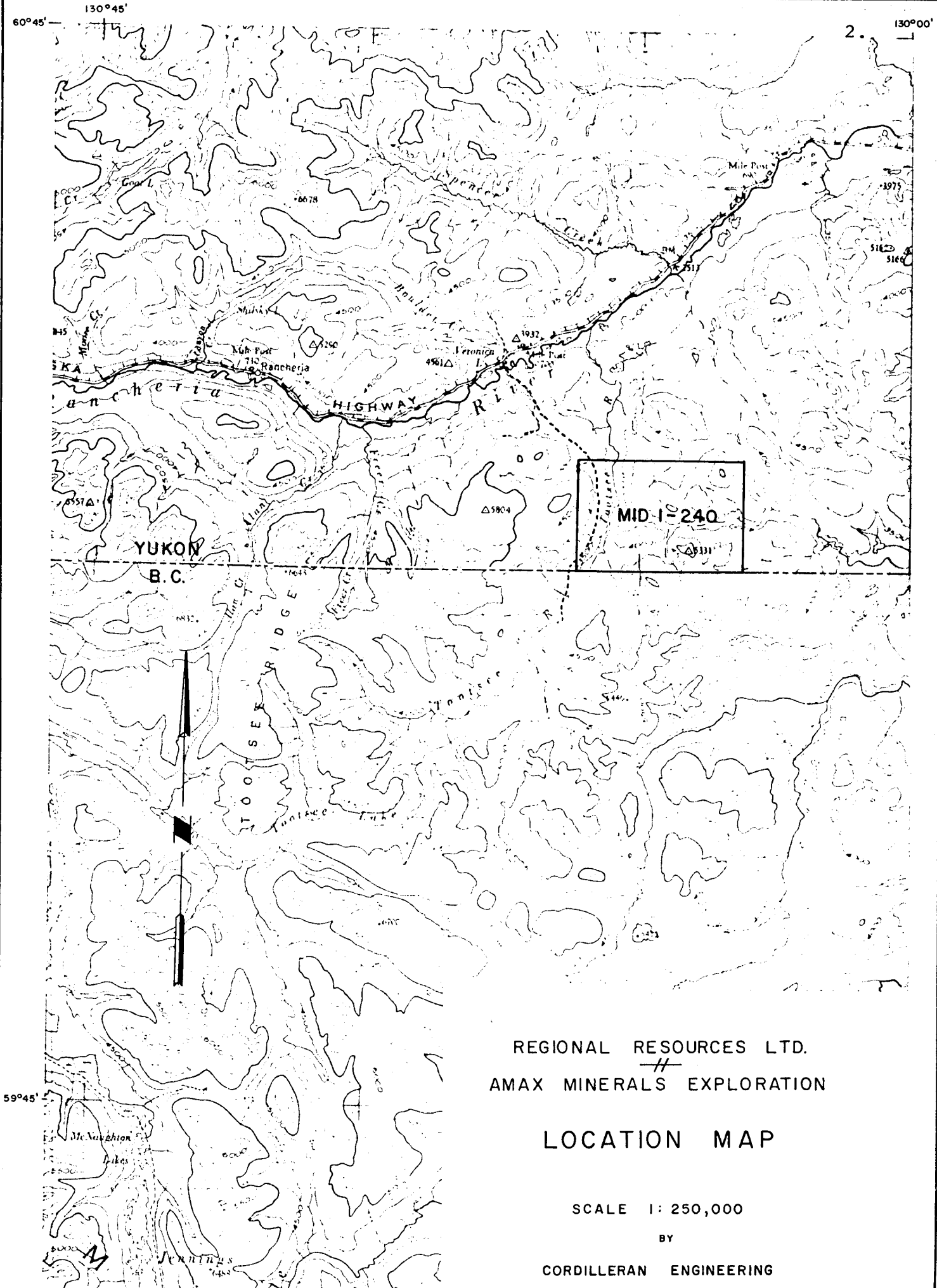
<u>PLATE 1</u>	Cut Line Grids, 1982 .....	in pocket
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## INTRODUCTION

The Mid Claim Group lies south of the Rancheria River approximately 85 km west of Watson Lake, Yukon Territory. Access to the camp is by helicopter or via a rough four-wheel drive road which runs 28 km south from the Alaska Highway at kilometre Post 1136 (Figure 1, Location Map). The Mid Claim Group consists of the Mid 1-240 two-post claims (Figure 2, Claim Map) staked in 1980 and 1981 by Cordilleran Engineering for Regional Resources Ltd. after a combined stream sediment sampling and prospecting program in 1980. A barite horizon was found immediately south of the Y.T.-B.C. border and traced north into the claim area. In February, 1981, Regional Resources Ltd. optioned the property to AMAX of Canada Limited and engaged Cordilleran Engineering to manage exploration of the Midway property, consisting of the Mid claims in Y.T., and the Way, Bull, Climax and Post claims in B.C.

During the 1981 field season the Mid claims were geologically mapped at 1:5000 scale, 10.5 km of cut baseline and 126.4 km of blazed and flagged cross- and tie-line were established, and 2546 soil samples collected. Three lines (3.9 km) of Pulse EM and gravity surveys were conducted over one geochemically anomalous area.

After assessing the 1981 data it was concluded that, because of extensive overburden cover, the next stage in the program should be expanded Pulse EM surveys over geochemically anomalous areas underlain by Lower Sylvester siltstone/argillite which hosts mineralization further south.



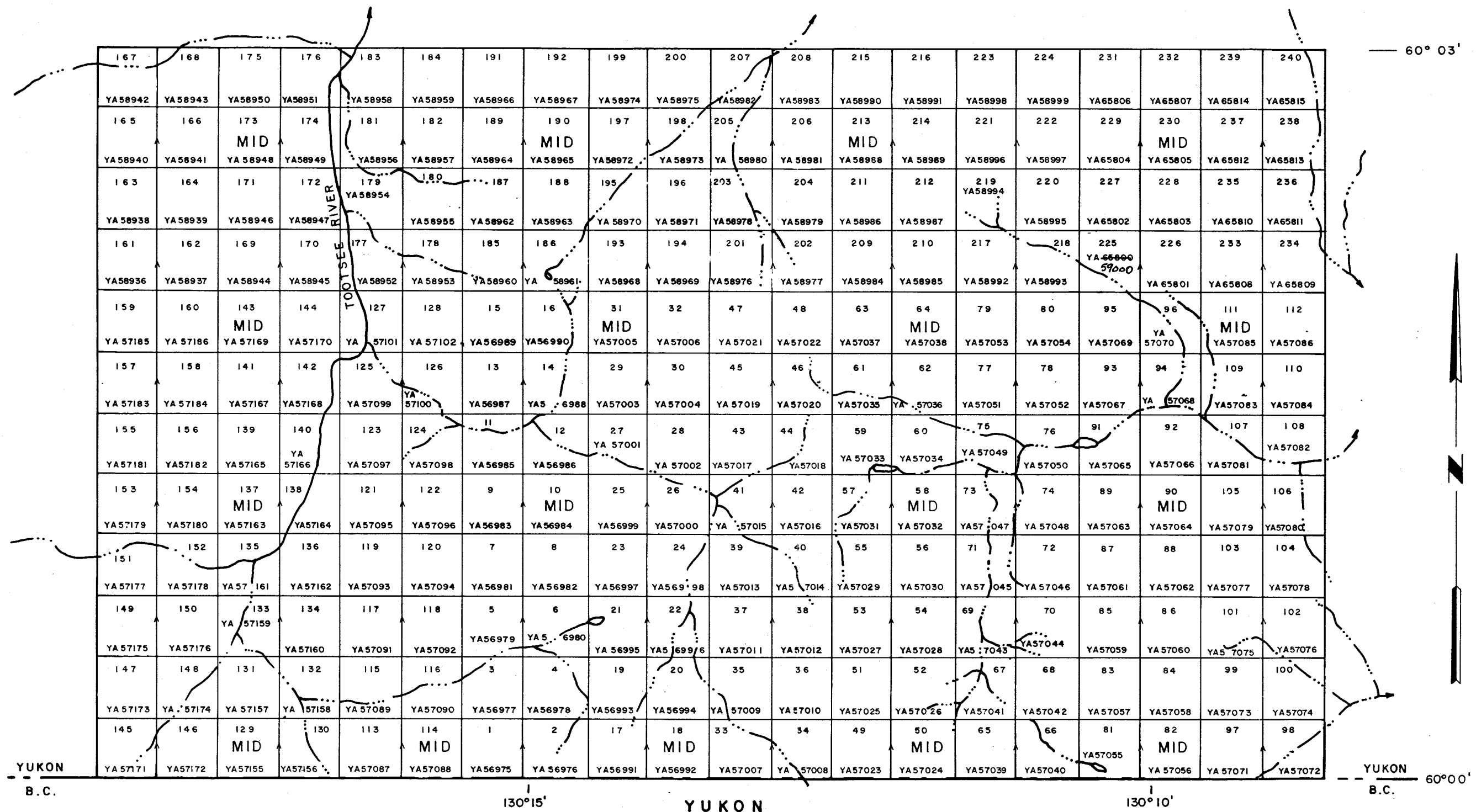
REGIONAL RESOURCES LTD.  
 //  
 AMAX MINERALS EXPLORATION

LOCATION MAP

SCALE 1:250,000

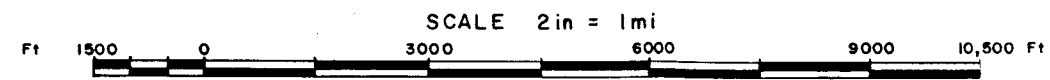
BY

CORDILLERAN ENGINEERING



YUKON B.C. 130°15' YUKON 130°10' YUKON B.C. 60°00'

REGIONAL RESOURCES LTD.  
 AMAX MINERALS EXPLORATION  
 MIDWAY PROPERTY  
 MID 1-240 CLAIM GROUP



NOVEMBER 1982

NTS 105 B 1

BY : CORDILLERAN ENGINEERING

FIGURE 2

## 2.0 1982 EXPLORATION PROGRAM

Following the 1981 program recommendations, an expanded grid was cut to control Pulse EM surveys. This grid was surveyed. As a precursor to producing topographic maps an aerial photographic survey was flown over the property.

### 2.1 GRID ESTABLISHMENT

Two cut line grids were established (Plate 1). In the Survey Creek area the 1981 grid was expanded to the south with 2.3 km of line. 11.8 km of line was cut from the 1981 baseline (12500E) west from Survey Mountain over Big Swamp.

### 2.2 GEOPHYSICS

2.8 km of Pulse EM survey were conducted over the Survey Creek grid, and 9.2 km over the Big Swamp grid. The work was done by Glen E. White Geophysical Consulting and Services Ltd., Vancouver. Their report, with maps and profiles, is attached.

### 2.3 AERIAL PHOTOGRAPHY

As a precursor to having orthophoto and contour maps produced, the Midway property was photographed on July 27, 1982, by Northwest Survey of Edmonton. None by nine inch photographs were produced at the following scales:

Midway property	1:40,000	black and white
Midway property	1:20,000	black and white, and colour
Discovery showing area	1:10,000	black and white

The contractor supplied a two-man crew which was on the property between July 13 and July 24, 1982, surveying 33 photo control stations to be used for later orthogonal mapping. In addition, Midway personnel targetted 110 points with 12m x 12m crosses. Forty targets were in the Yukon Territory. These points were claim location posts, Bench Marks and important grid line intersections. They were targetted so that co-ordinates could be obtained by aerial triangulation during the mapping phase. Final photo control station co-ordinates for the Y.T. stations are given in Table 1, and the Midway target descriptions in Table 2.

A description of survey techniques is given in the following letter from J. F. Welter, North West Survey Corporation International Ltd.

TABLE 1

PHOTO CONTROL STATION CO-ORDINATES, Y.T.

<u>Station</u>	<u>North</u>	<u>East</u>	<u>Elevation</u>
Square	6,652,991.958	432,737.061	1,625.100
Springs	6,659,981.071	422,442.934	1,769.260
PS-11	6,655,308.500	425,988.838	1,578.741
PS-12	6,656,677.921	434,551.886	1,452.983
PS-13	6,653,301.483	437,252.988	1,516.316
Lord Ecce	6,658,400.386	438,705.298	1,409.053

- Notes 1) Co-ordinates in Universal Transverse Mercator System, modified to T-t projections and scale corrections.  
2) elevations relative to mean sea level.

TABLE 2

MIDWAY AIRPHOTO TARGET DESCRIPTIONS, Y.T.

<u>Target No.</u>	<u>Description</u>
3	10.5m @ 314° to #1 Post Mid 193,194, #2 Post Mid 31,32
4	2.2m @ 090° to #1 Post Mid 201,202, #2 Post Mid, 47,48
5	5.2m @ 300° to #1 Post Mid 97,98
7	16.0m @ 280° to #1 Post Mid 81,82
8	11.7m @ 110° to 19800N,14500E
9	@ #1 Post Mid 65,66
10	@ Bench Mark #281
10	25.4m @ 270° to 19800N,13600E
12	12.7m @ 260° to #1 Post Mid 49,50
13	16.2m @ 090° to Bench Mark #280
14	59.5m @ 270° to #1 Post Mid 33,34
15	54.0m @ 090° to #1 Post Mid 17,18
16	50.5m @ 260° to #1 Post Mid 17,18
18	12.5m @ 356° to Bench Mark #279
19	17.0m @ 270° to #1 Post Mid 1,2
20	@ Bench Mark #278
21	@ Bench Mark #277
21	37.7m @ 270° to #1 Post Mid 113,114
23	7.0m @ 310° to #1 Post Mid 129,130
24	2.8m @ 080° to Bench Mark #276
25	9.0m @ 310° to #1 Post Mid 145,146
26	3.5m @ 160° to #1 Post Mid 185,186, #2 Post Mid 15,16
27	3.0m @ 110° to #1 Post Mid 209,210, #2 Post Mid 63,64
28	2.5m @ 040° to #1 Post Mid 217,218, #2 Post Mid 79,80
29	14.0m @ 360° to #1 Post Mid 225,226, #2 Post Mid 95,96
30	18.7m @ 150° to #1 Post Mid 233,234, #2 Post Mid 111,112
31	12.3m @ 290° to #2 Post Mid 239,240
32	2.0m @ 340° to #2 Post Mid 231,232
33	2.5m @ 270° to #2 Post Mid 223,224
34	28.0m @ 110° to #2 Post Mid 215,216
35	18.0m @ 250° to #2 Post Mid 207,208
40	13.0m @ 355° to #1 Post Mid 169,170, #2 Post Mid 143,144
41	2.0m @ 080° to #2 Post Mid 191,192
42	17.0m @ 350° to #2 Post Mid 183,184
43	23.0m @ 330° to #1 Post Mid 177,178, #2 Post Mid 127,128
69	30.0m @ 306° to #2 Post Mid 199,200
70	@ 24964N,12500E
72	@ 19800N,12500E
87	38.9m @ 180° to #1 Post Mid 161,162, #2 Post Mid 159,160
88	35.0m @ 50° to #2 Post Mid 167,168
89	16.0m @ 200° to #2 Post Mid 175,176
93	3.0m @ 270° to Bench Mark #275



# NORTH WEST SURVEY CORPORATION INTERNATIONAL LTD.

7.

Aerial and Photogrammetric Surveyors

AREA CODE 403  
TELEPHONE 483-8033  
TELEX 037-3039

DEVILLE BUILDING  
17203 - 103 AVE.  
EDMONTON, ALTA. T5S 1J4

November 12th, 1982

Cordilleran Engineering,  
1418 Marine Building,  
355 Burrard St.,  
Vancouver, B.C.  
V6C 2G8

Attention: J. M. Hylands

Dear Sir;

Re: Horizontal and Vertical Control Survey  
Midway Project - Map Sheet 1040/16, B.C.

In previous discussions you were advised of the considerable distortion found between existing Federal-Provincial survey control in the Midway area. This has now been reviewed and confirmed by the Geodetic Computations Section, Ministry of Environment, as per their letter of October 1, 1982. Our information will be incorporated into the NAD '83 readjustment, but the existing published information will not be changed. A statement of field procedures and data adjustment follows.

### Field Procedures

The 1982 Control Survey program was designed to provide a photogrammetric data base and survey framework for the Midway exploration area. Existing stations available in the area were from the Geodetic Survey of Canada first order triangulation network (1948) or British Columbia third order topographic control traversing (1971). Our firm had established two control stations in late 1981 while performing an engineering and claim post location survey.

The area to be controlled was approximately 40 kms square within which two first order (Geodetic Survey of Canada) - Springs and Square; one second order (D.N.D.) - Lakehill and six third order (B.C. topo) stations existed. 22 stations were established being PS 1 to 20, an eccentricity station adjacent to Control 1-81 and unclassified topo station Lord. Monumentation consisted

.../2

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Cordilleran Engineering  
November 12th, 1982

of a 0.75 m x 1.5 cm iron bar driven to within 8 cm of ground level over which was erected a 10 cm x 10 cm x 1.2 m red wooden post. Aerial photography targets were placed at all stations with the exception of Control 1-81. Control 2, established in 1981, was lowered to stabilize the iron bar.

Reduced visibility due to forest fires dictated the stations be traversed between rather than rayed from a prominent point. Second order field procedures were followed with horizontal angles observed in four sets with Wilde T'2 Theodolites and distances measured with an AGA 78 Laser Geodimeter. Elevation differences were computed from simultaneous trigonometric levelling procedures. Vertical ties using this method were also completed between Geodetic Station Springs and Geodetic Bench Marks 267-F and 268-F along the Alaska Highway providing an elevation of 1769.26 at Springs.

#### Data Reduction and Adjustment

Raw field data was reduced in preparation for the adjustment, i.e. horizontal and vertical angles were meaned and distances were corrected for meteorological conditions, observed slopes and reduced to sea level. Preliminary closures in the field indicated internal angular accuracies of 3" to 5" and horizontal closures of 1:300,000. A least squares plane coordinate adjustment was performed on the data using estimated standard deviations on the observed angles and distances. Unconstrained adjustments indicated excellent results. Attempts to hold to the published NAD'27 values of first, second and third order control indicated some considerable distortion between and within the various sources. The next readjustment is planned for 1983 in B.C. on the May '76 datum. Therefore, we have held fixed the published NAD'27 coordinates of first order stations Springs and Square and have disregarded published values of other stations. This provides the best relative and absolute horizontal coordinates for the 1982 survey without distortion by constraining to published values for the third order stations.

A least squares elevation adjustment was completed using computed elevation differences and weighted by the interstation distance. Published elevations of the second and third order control stations and station Springs at 1769.26 were held.

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Cordilleran Engineering  
November 12th, 1982

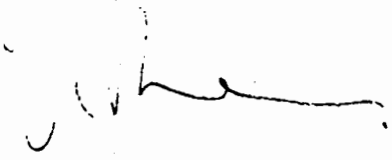
Analysis of Results

The horizontal adjustment indicates relative interstation accuracy that is generally second order. The adjusted station elevations have standard deviations of 0.30 metres.

We will transform and rotate the 1981 survey data file containing claim posts, drill holes, etc., to the 1982 values; the elevations will not change.

Yours very truly,

NORTH WEST SURVEY CORPORATION INTERNATIONAL LTD.



J. F. Welter, A.L.S., C.L.S.

#### 2.4 CONTROL SURVEY

Between August 4 and September 17, 1982, Midway personnel surveyed 456 points (baselines, claim location posts, diamond drill holes, roads, etc.) on the Midway property using a rented Hewlett Packard EDM System, model HP 3810. This unit gave a digital read out of slope distance, horizontal distance, vertical distance and vertical angle. For slope distances to 500m a triple-prism was used on the rod, with double triple-prisms used for longer shots. The limit of the EDM was found to be 2000m.

Forty-seven control points, consisting of  $\frac{1}{2}$ " x  $1\frac{1}{2}$ " lath painted fluorescent orange, were surveyed using photo control stations established by North West Survey as control. Preliminary co-ordinates were supplied by North West Survey in August for photo control stations, which were used for the Midway survey calculations. Final co-ordinates, received in mid November, varied by  $\pm 2.0$  metres from the preliminary co-ordinates. The co-ordinates for the 456 Midway points have not yet been recalculated using the final photo control station co-ordinates.

Control points, diamond drill hole collars and claim location posts were surveyed by tripling the horizontal angle, and reading each of horizontal distance, vertical distance, slope distance and vertical angle three times. Ray shots from control points to other points of interest were made using a single determination of angles and distances. A number of points previously surveyed were re-surveyed during the program as a check on accuracy. The indicated accuracy is 1:6000 horizontally, 0.3m vertically.

Co-ordinates and descriptions of the Y.T. points surveyed are given in Table 3; the points are plotted on Plate 1.

TABLE 3

CONTROL SURVEY, CO-ORDINATES OF POINTS, Y.T.

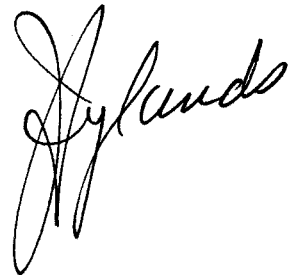
<u>Shot No.</u>	<u>Description</u>	<u>Northing</u>	<u>Easting</u>	<u>Elevation</u>
192	Control Point 31	6,653,013.54	432,448.93	1599.30
193	Control Point 32	6,653,013.66	432,699.09	1618.45
194	Control Point 33	6,652,961.60	432,543.41	1600.57
269	210N, 125E	6,652,932.99	432,631.22	1598.69
270	208N, 125E	6,652,725.81	432,632.34	1519.10
271	206N, 125E	6,652,520.02	432,633.16	1446.17
272	204N, 125E	6,652,320.17	432,633.55	1380.69
273	202N, 125E	6,652,116.54	432,634.32	1326.68
274	200N, 125E	6,651,914.35	432,636.28	1308.66
275	198N, 125E	6,651,708.89	432,637.69	1298.43
276	Bench Mark #280	6,651,712.76	432,405.93	1286.01
277	59.5m E of Post #1, Mid 33,34	6,651,715.21	432,242.25	1289.64
278	200N, 119E	6,651,925.29	432,033.29	1270.84
279	Control Point 34	6,653,024.37	432,402.38	1589.66
280	208N, 114E	6,652,736.20	431,544.10	1192.46
281	206N, 11422.2E	6,652,554.56	431,566.28	1198.56
282	204N, 11392.8E	6,652,362.70	431,533.29	1228.85
283	212N, 125E	6,653,136.27	432,637.60	1544.38
284	214N, 125E	6,653,339.26	432,646.17	1424.75
285	Control Point 37	6,652,235.62	433,086.92	1507.40
286	Control Point 38	6,652,793.39	434,480.57	1516.92
287	209N, 13550E	6,652,797.87	433,673.75	1274.47
288	208N, 13550E	6,652,698.52	433,671.27	1283.16
289	20850N, 135E	6,652,748.49	433,622.98	1285.94
290	210N, 135E	6,652,899.03	433,627.09	1273.30
291	212N, 135E	6,653,100.60	433,625.65	1262.08
292	214N, 13475E	6,653,303.69	433,600.01	1263.86
293	214N, 13650E	6,653,300.13	433,774.71	1234.12
294	212N, 13550E (Hel.pad)	6,653,101.47	433,675.68	1248.25

## 3.0

## SUMMARY &amp; CONCLUSIONS

The Pulse EM surveys resulted in the definition of a number of strong conductors in areas of zero outcrop, particularly in the Big Swamp grid area. In as much as bedding exposed on Survey Mountain, between the two grids, strikes northwest, the orientation of the conductors as interpreted by G.E.White may have to be revised. Soil geochemical anomalies which resulted from the 1981 soil sampling program in the Survey Creek area had no well defined trend, whereas in the Big Swamp area the anomalies paralleled the regional structure.

The soil geochemical anomalies combined with the results of the expanded Pulse EM surveys define tragets for future trenching and diamond drilling.

A handwritten signature in cursive script, appearing to read "J. Hylands". The signature is written in black ink and is located in the lower right quadrant of the page.

## 4.0

## COST STATEMENT

The British Columbia-Yukon Territory border was not a factor in deciding where, when or how work was done in 1982. The bulk of the exploration money was spent in British Columbia. The cost per man day of camp and fees, per hour for the helicopter, per km for geophysical surveys, per claim for aerial photography, and per station for surveying have been calculated on the basis of the total amount spent for each on the Midway property.

4.1 MANAGEMENT FEE AND PROFESSIONAL SERVICES, B.C. & Y.T.

Management Fee	.....	\$ 61,160.00	
Professional Services	.....	<u>96,562.50</u>	
		<u>\$157,722.50</u>	
 <u>Applicable man days</u>			
Project Geologist	.....	582 man days	
Juniors	.....	738 man days	
Cooking Staff	.....	253 man days	
Linecutters	.....	278 man days	
Pilot & Mechanic	.....	<u>238 man days</u>	
		<u>2,089 man days</u>	(2044 in BC)

$$\text{FEE COST/Man day} = \frac{\$157,722.50}{2089} = \underline{\underline{\$75.50/\text{man day}}}$$

4.2 CAMP OPERATING, CONSTRUCTION AND MAINTENANCE COSTS (B.C. & Y.T.)

Camp supplies (non durable)	.....	\$ 30,742.10
Camp equipment (durable)	.....	20,227.37
Camp construction	.....	7,289.05
Food	.....	39,571.82
Stove oil, gasoline	.....	5,915.43
Propane	.....	2,391.03
Vehicle repairs	.....	596.85
Drum charges	.....	2,305.00
Insurance	.....	3,452.17
Drafting, office supplies, printing	.....	10,327.26
Telephone, postage	.....	6,105.00
Maps	.....	1,484.37
Equipment repairs	.....	913.37
		<u>\$131,320.82</u>

Camp man days (B.C. & Y.T. )

Project Manager	.....	128 man days
Project Geologist	.....	582 man days
Juniors & maintenance	.....	738 man days
Cooks	.....	253 man days
Northern Mountain crew	.....	246 man days
Glen E. White crew	.....	113 man days
Agar, Berretta & Ellis crew	.....	72 man days
North West Surveys crew	.....	24 man days
D.J.Drilling	.....	6 man days
Linecutters	.....	154 man days (+124 mandays in fly camp)
Visitors	.....	<u>114 man days</u>
		<u>2,430 man days</u>

$$\text{FOOD COST/Man day, B.C. \& Y.T.} = \frac{\$39,571.82}{2,554} = \underline{\underline{\$15.49/\text{man day}}}$$

1) <u>Camp Operating Costs:</u>		\$131,320.82
<u>Less:</u> -camp supplies (non durable)	\$30,742.10	
-camp supplies (durable)	20,227.37	
-camp construction (lumber)	7,505.32	
-Vehicle repairs	596.85	
-equipment repairs	913.37	59,985.01
		<u>71,335.81</u>
<u>Plus:</u> -Transportation of personnel, including room & meals	\$15,664.37	
-Helicopter, shuttle service 41.7 hr x \$515.75/hr	21,506.78	
-Rentals: radios, camp equipment	14,115.63	
trucks	16,080.63	67,367.41
		<u>67,367.41</u>
Sub Total Forward		\$138,703.22

4.2 (CAMP OPERATING, CONSTRUCTION & MAINTENANCE COSTS: BC & YT Cont'd)

1) Camp Operating Costs Forward	.....	\$138,703.22
Plus:-cook salaries		
Palfreyman; 112 d x \$80/d	\$ 8,960.00	
Tindle; 29 d x \$85/d	2,465.00	
Wardlaw; 72 d x \$65/d	4,680.00	
<u>213 days</u>		16,105.00
Management Fee; 213 d x \$75.50/d	.....	16,081.50
	Sub Total	<u>\$170,889.72</u>

Camp man days = 2430

Base cost/man day =  $\frac{\$170,889.92}{2430} = \$70.32$

Cooks support = 213 days x \$70.32/day = 14,978.16

TOTAL CAMP OPERATING COST = \$185,867.88

CAMP OPERATIONS COST/Man day =  $\frac{\$185,867.88}{2430} = \underline{\underline{\$76.50/\text{man day}}}$

2) Camp Construction & Maintenance Costs:

Camp supplies (non durable)	\$30,742.10	
Camp supplies (durable)	20,227.37	
Camp construction (lumber)	7,505.32	
Vehicle repairs	596.85	
Equipment repairs	913.37	\$ 59,985.01

<u>Less:-construction materials &amp;</u>		
equipment charged to drilling	\$15,898.52	
-cost of airphoto target		
material	<u>2,385.80</u>	<u>18,284.32</u>
		41,700.69

Helicopter, camp support  
41.5 hr x \$515.75/hr ..... 21,403.62

Salaries, camp mobilization & demobilization:

Palfreyman; 8 d x \$ 80/d	\$ 640.00	
Wardlaw; 8 d x \$ 65/d	520.00	
Hylands; 6 d x \$160/d	960.00	
Rowe; 4 d x \$145/d	580.00	
Hall; 4 d x \$140/d	560.00	
Jakubowski; 4 d x \$110/d	440.00	
Gorzynski; 4 d x \$135/d	540.00	
Balon; 7 d x \$100/d	700.00	
Unden; 8 d x \$ 65/d	520.00	
Bodin; 9 d x \$ 50/d	450.00	
Ferrier 7 d x \$ 60/d	420.00	
Flint; 14 d x \$130/d	1,820.00	
Simard; 7 d x \$ 60/d	420.00	
Tindle; 7 d x \$ 85/d	595.00	<u>9,165.00</u>

Sub Total Forward \$72,269.31

4.2 (CAMP OPERATING, CONSTRUCTION & MAINTENANCE COSTS: BC & YT Cont'd)

2) Camp Construction & Maintenance Costs Forward \$ 72,269.31

Camp construction, maintenance, salaries

Flint;	62 d x \$130/d	\$ 8,060.00	
Young;	71 d x \$ 80/d	5,680.00	
Ferrier;	4 d x \$60/d	240.00	
Simard;	14 d x \$ 60/d	840.00	
Unden;	2 d x \$ 65/d	130.00	
Sax;	2 d x \$ 65/d	130.00	
	<u>155 days</u>		15,080.00

Camp operating cost; 252 d x \$76.50/d 19,278.00

Manangement Fee, 252 d x \$75.50/d 19,026.00 38,304.00

TOTAL CAMP CONSTRUCTION = \$125,653.31

CAMP CONSTRUCTION & MAINTENANCE COST/Man day =  $\frac{\$125,653.31}{2430} = \underline{\underline{\$51.71/\text{man day}}}$

TOTAL CAMP SUPPORT COST = \$311,521.19

CAMP SUPPORT COST/Man day =  $\frac{\$311,521.19}{2430} = \underline{\underline{\$128.20/\text{man day}}}$

4.3 HELICOPTER COSTS (B.C. & Y.T.)

Total hours flown, Midway Project = 323.5 hours.

Helicopter lease, 323.5 hr x \$405/hr	\$131,017.50	
Aviation Fuel	<u>17,255.37</u>	\$148,272.87

Pilot and Mechanic in camp = 246 man days

Management Fee; 246 md x \$75.50/md		<u>18,573.00</u>
	Total base cost	\$166,845.87

Base cost/hr, without camp support  
for pilot, mechanic =  $\frac{\$166,845.87}{323.5} = \$515.75/\text{hr}$

Camp support, helicopter crew = 246 md x \$128.20/md	<u>31,537.20</u>
--	------------------

TOTAL COST OF OPERATING HELICOPTER \$198,383.07

HELICOPTER COST/HOUR, BC & YT =  $\frac{\$198,383.07}{323.5} = \$613.24/\text{hr}$

4.3 (Helicopter costs cont'd)

<u>Category</u>	<u>Hours Flown</u>		<u>Notes</u>
	<u>B.C.</u>	<u>Y.T.</u>	
Camp support	41.5	-	mobilization, demobilization, food trips
Shuttle service	41.7	-	camp to Watson Lake and return with personnel
Linecutting	31.9	3.2	moving linecutters, fly camps
Geophysics	13.7	1.7	EM Crew
	1.7	-	Gravity crew
Geology	41.1		
Surveying	40.0	4.5	Midway personnel
	24.4	-	North West Survey personnel
	18.6	-	Placing airphoto targets
Drilling	9.5	-	
Sampling	44.6	-	
	<u>308.7</u>	<u>9.4 hrs</u>	
	<u>318.1 hrs</u>		+ 5.4 hrs staking = 323.5 hrs

4.4 LINECUTTING COSTS (Y.T.)

Line cut = 11.8 km bush + 3.2 km alpine = 15.0 km total

Man days = 26 days in flycamp

Contract cost = bush \$315/km; alpine \$175/km

Management fees; 26 md x \$75.50/md	\$1,963.00	
Camp support, food; 26 md x \$15.49/d	402.74	
Helicopter support; 3.2 hrs x \$613.24/hr	<u>1,962.37</u>	<u>\$4,328.11</u>
Total Support & Supervision Cost		<u>\$4,328.11</u>

$$\text{Support \& Supervision Cost/km} = \frac{\$4,328.11}{15.0} = \$288.54/\text{km}$$

Linecutting Cost

Bush: \$315 + \$288.54 = \$603.54/km x 11.8km =	\$7,121.77
Apline: \$175 + \$288.54 = \$463.04/km x 3.2km =	<u>1,483.33</u>

**TOTAL LINECUTTING COST** \$8,605.10

4.4 (Linecutting Costs: Y.T. Cont'd)

TABLE 4  
Km OF LINE CUT AND CLAIMS INVOLVED

<u>Area</u>	<u>Line</u>	<u>From</u>	<u>To</u>	<u>Km Cut</u>	<u>Mid Claims</u>	
Big Swamp	200N	116E	-	125E	0.9	33,34
	202N	114E	-	125E	1.1	18,33,34
	204N	108E	-	125E	1.7	19,20,35,36
	206N	110E	-	125E	1.5	19,20,35,36
	208N	111E	-	125E	1.4	21,22,37,38
	210N	111E	-	125E	1.4	21,22,37,38
	212N	112E	-	125E	1.3	24,39,40
	214N	112E	-	125E	1.3	24,39,40
	114E	202N	-	214N	1.2	18,20,22,24
	Bush = 10.0km, alpine = 1.8km				11.8 km	
	Survey Creek	208N	135E	-	145E	1.0
209N		135E	-	145E	1.0	69,70,85
211N		135E	-	145E	1.0	69,70,85
135E		208N	-	210N	0.2	69
Bush = 1.9km, alpine = 1.3km				3.2 km		

CLAIMS COVERED = 17

$$\text{COST/CLAIM} = \frac{\$8,605.10}{17} = \$506.18/\text{claim}$$

4.5 GEOPHYSICAL SURVEY COSTS (Y.T.)Ground EM Survey

Crew man days, Y.T. = 12 days	B.C. & Y.T. = 87	
Km surveyed, Y.T. = 12 km	B.C. & Y.T. = 62	
Total invoice cost .....	\$34,180.70	
Y.T. Portion = $\frac{12}{62} \times \$34,180.70$	=	\$6,615.62
Camp support; 12 md x \$128.20/md	\$1,538.40	
Helicopter support, 1.7 hrs x \$613.24/hr	1,042.51	2,580.91
<b>TOTAL GROUND EM SURVEY COST</b>		<b><u>\$9,196.53</u></b>

$$\text{GROUND EM SURVEY COST/km} = \frac{\$9,196.53}{12} = \$766.38/\text{km}$$

4.5 (GEOPHYSICAL SURVEY COSTS Y.T. cont'd)

TABLE 5

LINE Km OF GEOLOGICAL SURVEY AND CLAIMS INVOLVED

<u>Area</u>	<u>Line</u>	<u>From</u>	<u>To</u>	<u>Km Surveyed</u>	<u>Mid Claims</u>
Big Swamp	198N	11675E	- 12500E	0.825	33,34
	200N	11600E	- 12500E	0.900	33,34
	202N	11400E	- 12500E	1.100	18,33,34
	204N	10800E	- 12450E	1.650	19,20,35
	206N	11000E	- 12050E	1.050	19,20,35
	208N	11100E	- 12025E	.925	21,22,37
	210N	11100E	- 12050E	.950	21,22,37
	212N	11200E	- 12050E	.850	24,39
	214N	11200E	- 12150E	.950	24,39,40
			<u>9.200</u>		
Survey Creek	208N	13450E	- 14500E	1.15	69,70,85
	209N	13450E	- 14100E	.65	69,70
	211N	13500E	- 14500E	<u>1.00</u>	69,70,85
			<u>2.80</u>		

CLAIMS SURVEYED = 15

$$\text{GROUND EM SURVEY COST/CLAIM} = \frac{\$9,196.53}{15} = \$613.10/\text{claim}$$

4.6 COST OF AERIAL PHOTOGRAPHY (B.C. & Y.T.)

North West Survey - invoices		\$23,606.57
North West Survey personnel:		
Establishing control, 2 surveyors in camp, for total of 24 man days		
Camp support; 24 md x \$128.20/md	\$ 3,076.80	
Helicopter support; 24.4 hr x \$613.24/md	<u>14,963.06</u>	\$18,039.86
Midway personnel:		
Placing additional airphoto targets		
Labour: Rowe; 1 d x \$145/d	\$ 145.00	
Young; 18 d x \$ 80/d	1,440.00	
Ferrier; 3 d x \$ 60/d	180.00	
Bodin; 10 d x \$ 50/d	500.00	
Sax; 14 d x \$ 65/d	910.00	
Uden; 13 d x \$ 65/d	<u>845.00</u>	4,020.00
balance forward		<u>\$45,666.43</u>

4.6 (COST OF AERIAL PHOTOGRAPHY: B.C. & Y.T. Cont'd)

<u>Balance Forward</u>			\$45,666.43
Camp support,	59 md x \$128.20/md	\$ 7,563.80	
Management Fee;	59 md x \$75.50/md	4,454.50	
Helicopter support;	18.6 hr x \$613.24/hr	11,406.26	
Target material		<u>2,385.80</u>	<u>25,810.36</u>
<b>TOTAL AERIAL PHOTOGRAPHY COST</b>			<b><u>\$71,476.79</u></b>

CLAIMS AND UNITS COVERED = 1399

$$\text{COST OF AERIAL PHOTOGRAPHY/UNIT} = \frac{\$71,476.79}{1399} = \$51.09/\text{unit}$$

4.7 COST OF CONTROL SURVEY (B.C. & Y.T.)

Instrument rental			\$ 2,998.00
Labour, salaries			
Hylands	34 d x \$160/d	\$ 5,440.00	
Slack	12 d x \$ 60/d	720.00	
Bodin	31 d x \$ 50/d	1,550.00	
Palfreyman	8 d x \$ 80/d	640.00	
Young	6 d x \$ 80/d	480.00	
Uden	5 d x \$ 65/d	325.00	
Sax	4 d x \$ 65/d	260.00	
Tindle	1 d x \$ 85/d	85.00	
Rowe	2 d x \$145/d	290.00	
Gorzynski	1 d x \$135/d	135.00	
Ewen	28 d x \$90/d	<u>2,520.00</u>	
	<u>132 d</u>		12,445.00
Management Fee;	132 d x \$75.50/d	\$ 9,966.00	
Camp support	132 d x \$128.20/d	16,922.40	
Helicopter support	44.5hr x \$613.24/hr	<u>27,289.18</u>	<u>54,177.58</u>
<b>TOTAL CONTROL SUVEY COST</b>			<b><u>\$69,620.58</u></b>

NUMBER OF POINTS SURVEYED (B.C. &amp; Y.T.) = 456

$$\text{COST/POINT SURVEYED} = \frac{\$69,620.58}{456} = \$152.68/\text{point}$$

4.7 (COST OF CONTROL SURVEY: B.C. & Y.T. Cont'd)

TABLE 6  
POINTS SURVEYED BY CLAIM

<u>Mid Claim</u>	<u>No. of Points</u>	<u>Point Numbers</u>
20	2	281,282
22	1	280
33	1	278
34	5	273,274,275,276,277
36	2	271,272
38	5	269,270,CP-31,CP-33,CP-34
40	2	283,284
52	1	CP-37
69	4	287,288,289,290
71	4	291,292,293,294
85	1	CP-38
53	1	CP-2

4.8 REPORT PREPARATION COST

## Salaries

J.J.Hylands,P.Eng.,Geol.	7 d x \$160/d	\$1,120.00	
H.E.Ewen,Draughtsman	7 d x \$ 90/d	<u>630.00</u>	\$1,750.00
Management Fee	Dec.2-10, 9/31 x 2/5 x \$8575	995.81	
Professional Serv.	Dec.2-10, 9/31 x 2/5 x \$8000	<u>929.03</u>	1,924.84
Office supplies,printing; est			<u>401.00</u>
<b>TOTAL REPORT PREPARATION COST</b>			<b><u>\$4,075.84</u></b>

Two of five Midway employees worked on report.

Linecutting, geophysical surveys and control survey affected 20 claims.

$$\text{COST OF REPORT/CLAIM} = \frac{\$4,075.84}{20} = \$203.79/\text{claim}$$

4.9 NAMES AND ADDRESSES OF PERSONNEL EMPLOYED

<u>Name</u>	<u>Address</u>	<u>Days in Y.T.</u>
O.S.Hairsine, P.Eng. Project Manager	1418-355 Burrard St. Vancouver, B.C. V6C 2G8	2
J.J.Hylands, P.Eng. Surveyor	1418-355 Burrard St. Vancouver, B.C. V6C 2G8	2
P.A.Unden Surveyors helper	948 Hartford Place N.Vancouver, B.C.	5
K.Sax Surveyors helper	11303-58 Ave. Edmonton, Alta. T6H 1C3	4
N.J.Bodin Surveyors helper	469 8 Ave. Kimberley, B.C. V1A 2X6	4
J.P.Young Surveyors helper	Box 2109 Princeton, B.C. V0X 1W0	4

## 5.0 ALLOCATION OF ASSESSMENT CREDITS

Physical work in the Yukon Territory in 1982 was, with the exception of aerial photography, done on 20 Mid claims. These claims have not been surveyed so it is assumed that they are as plotted on Plate 1.

In Table 7 is calculated the assessment credit for each claim worked on. The 1982 grouping is listed in Table 8, and shown on Figure 3. The application of credits to individual claims is given in Table 9.

TABLE 7  
CALCULATION OF ASSESSMENT CREDIT PER CLAIM

MID CLAIM	AERIAL PHOTOS @ \$51.09	REPORT COST @ \$203.79	(costs per claim)		CONTROL SURVEY		TOTALS
			LINE CUTTING @ \$506.18	GROUND EM @ \$613.10	#Points	@ \$152.68	
18	51.09	203.79	506.18	613.10	-	-	1,374.16
19	51.09	203.79	506.18	613.10	-	-	1,374.16
20	51.09	203.79	506.18	613.10	2	305.36	1,679.52
21	51.09	203.79	506.18	613.10	-	-	1,374.16
22	51.09	203.79	506.18	613.10	1	152.68	1,526.84
24	51.09	203.79	506.18	613.10	-	-	1,374.16
33	51.09	203.79	506.18	613.10	1	152.68	1,526.84
34	51.09	203.79	506.18	613.10	5	763.40	2,137.56
35	51.09	203.79	506.18	613.10	-	-	1,374.16
36	51.09	203.79	506.18	-	2	305.36	1,066.42
37	51.09	203.79	506.18	613.10	-	-	1,374.16
38	51.09	203.79	506.18	-	5	763.40	1,524.46
39	51.09	203.79	506.18	613.10	-	-	1,374.16
40	51.09	203.79	506.18	613.10	2	305.36	1,679.52
52	51.09	203.79	-	-	1	152.68	407.56
53	51.09	203.79	-	-	1	152.68	407.56
69	51.09	203.79	506.18	613.10	4	610.72	1,984.88
70	51.09	203.79	506.18	613.10	-	-	1,374.16
71	51.09	203.79	-	-	4	610.72	865.60
85	51.09	203.79	506.18	613.10	1	152.68	1,526.84
20	<u>\$1021.80</u>	<u>4075.80</u>	<u>8605.06</u>	<u>9196.50</u>	<u>29</u>	<u>4427.72</u>	<u>27,326.88</u>

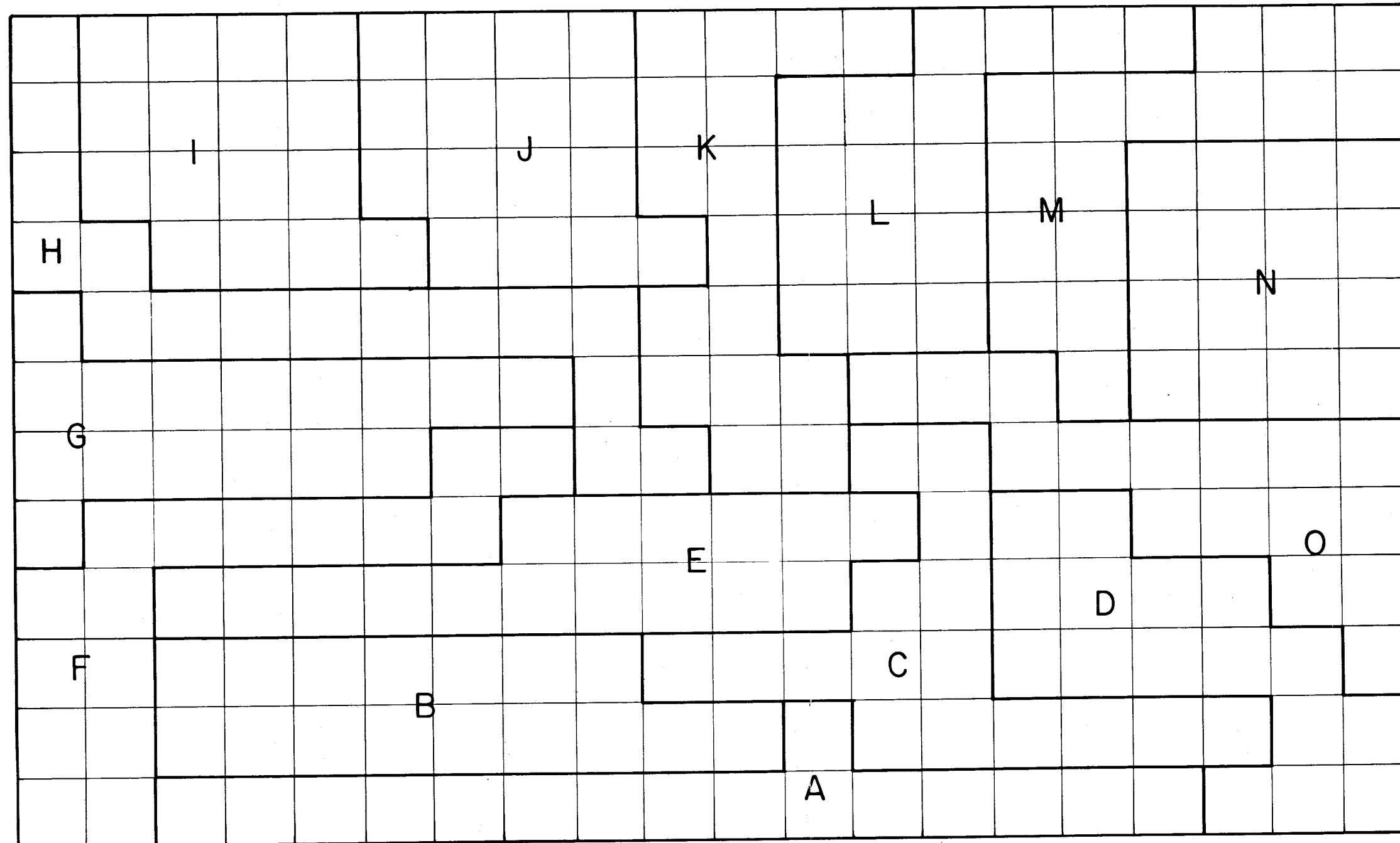
Remainder of claims = 220 x \$51.09 = 11,239.80

*Sylands*  
\$38,566.68

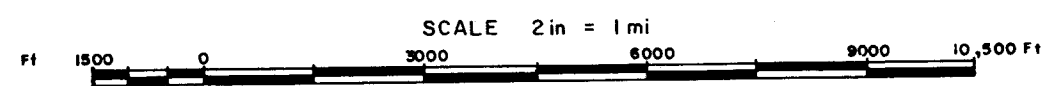
5.0 (ALLOCATION OF ASSESSMENT CREDITS Cont'd)

**TABLE 8**  
**GROUPING OF Y.T. CLAIMS**

<u>Group</u>	<u>Claims</u>	<u>Assessment Value</u>
A	Mid 1,2,17,18,33,34,36,49,50,65,66,81,113,114,129,130	\$6,718.06
B	Mid 3-6,19-21,35,115-118,131-134	6,415.08
C	Mid 22,37,38,51-56,58-60,67,68,83,84	5,802.57
D	Mid 69-74,82,85-88,97-101	6,364.56
E	Mid 7,8,10,23-26,39-42,57,119,120,135,136	5,092.01
F	Mid 9,11,12,121,122,137,138,145-152,154	817.44
G	Mid 13,14,123-126,139-142,153,155-159	817.44
H	Mid 15,16,27-29,31,127,128,143,144,160-163,165,167	817.44
I	Mid 164,166,168-179,181,183	817.44
J	Mid 180,182,184-195,197,199	817.44
K	Mid 30,32,43-47,196,198,200,201,203,205,207,208,215	817.44
L	Mid 48,63,64,202,204,206,209-214,216,223,224,231	817.44
M	Mid 78-80,217-222,229,230,232,237-240	817.44
N	Mid 93-96,109-112,225-228,233-236	817.44
O	Mid 61,62,75-77,89-92,102-108	<u>817.44</u>
		<b>\$38,566.68</b>



REGIONAL RESOURCES LTD.  
 #  
 AMAX MINERALS EXPLORATION  
 MIDWAY PROPERTY  
 GROUPING MAP



NTS 105 B 1

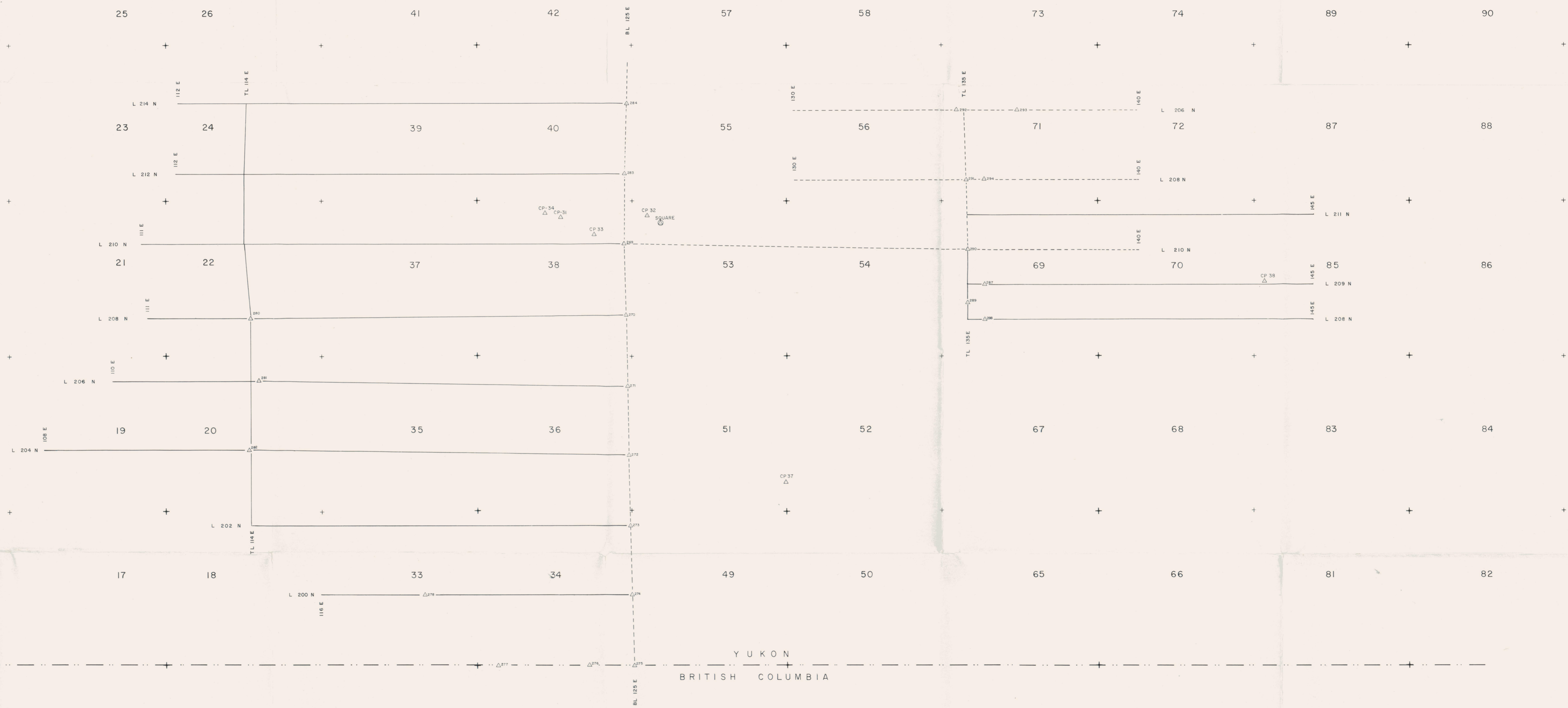
BY: CORDILLERAN ENGINEERING

NOVEMBER 1982

FIGURE 3

BIG SWAMP GRID

SURVEY CREEK GRID



L E G E N D

- 1982 CUT LINE
- - - 1981 CUT LINE
- + + CLAIM POST, CLAIM CORNER
- △ SURVEYED POINT

REGIONAL RESOURCES LTD.  
 AMAX MINERALS EXPLORATION  
 MIDWAY PROPERTY  
 CUT LINE GRID  
 MID CLAIMS

WATSON LAKE MINING DISTRICT, Y.T.  
 NTS 105 B/1  
 1 : 5,000  
 SCALE IN METRES  
 BY  
 CORDILLERAN ENGINEERING  
 416 - 355 BURNARD STREET  
 VANCOUVER, B.C. V6C 2G8

*J. J. [Signature]*

5.0 (ALLOCATION OF ASSESSMENT CREDITS Cont'd)

TABLE 9

APPLICATION OF ASSESSMENT CREDITS, Y.T.

Apply 1 year to each of Mid 119, 120	\$ 200
Apply 2 years to each of Mid 102,104,106,108,110,112,145,147,149,151, 153,155,157,159,161,163,165,167,168,175, 176,183,184,191,192,199,200,207,208,215, 216,223,224,231,232,234,236,238,239,240	8,000
Apply 3 years to Mid 101	300
Apply 4 years to each of Mid 1,2,3,4,5,6,7,8,10,17,18,19,20,21,22, 23,24,25,26,33,34,35,36,37,38,39,40, 41,42,49,50,51,52,53,54,55,56,57,58, 65,66,67,68,69,70,71,72,73,74,81,82, 83,84,85,86,87,88,97,98,99,100,113,114, 115,116,117,118,129,130,131,132,133,134	<u>29,200</u>
	\$37,700

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**CORDILLERAN ENGINEERING**

---

1418 MARINE BUILDING, 355 BURRARD STREET, VANCOUVER, BRITISH COLUMBIA V6C 2G8 TEL: (604) 681-8381

## 6.0 STATEMENT OF QUALIFICATIONS

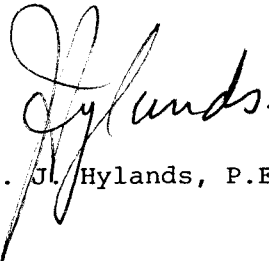
I, J. J. Hylands, with a business address at 1418-355 Burrard Street, Vancouver, British Columbia, V6C 2G8, do hereby certify that I have supervised or carried out the field work and have assessed and interpreted that data from this geophysical and control survey program on the Mid claims.

I also certify that:

1. I am a graduate of the University of British Columbia, Vancouver (B.A.Sc. Geological Engineering, Option 1, 1966).
2. I have engaged in the study and practice of mineral exploration since graduation, in Canada, the United States and the Phillipines.
3. I am a Professional Engineer registered in the Province of British Columbia.

Respectfully submitted

CORDILLERAN ENGINEERING



J. J. Hylands, P.Eng.

JJH/z  
December, 1982  
Vancouver, B.C.

C O N T E N T S

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ILLUSTRATIONS

- Figure 1 - Location and Claims Map
- Figure 2A - Composite Data Profile Map - Survey Creek Grid
- Figure 2B - Composite Data Profile Map - Big Swamp Grid
- Figures 3-5, Data Profiles - Survey Creek Grid
- Figures 6-14, Data Profiles - Big Swamp Grid

CORDILLERAN ENGINEERING LTD.  
GEOPHYSICAL REPORT  
ON A  
HORIZONTAL LOOP PULSE  
ELECTROMAGNETOMETER SURVEY

Survey Creek Grid, Big Swamp Grid, Watson  
Lake Mining Division, N.T.S. 105 B/1

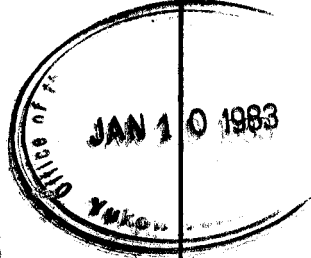
Latitude 60°00'N Longitude 130°12'W

AUTHORS: E. Trent Pezzot, B.Sc.  
Geophysicist **091418**

Glen E. White, B.Sc., P. Eng.  
Consulting Geophysicist

DATE OF WORK: July 26-27, August 1-3, 1982

DATE OF REPORT: September 22, 1982



## INTRODUCTION

During July and August 1982, Glen E. White Geophysical Consulting & Services Ltd. conducted a horizontal loop pulse electromagnetometer survey across the Cordilleran Engineering Ltd. Midway Project. The large claim group has been divided into a number of smaller areas with separate survey grids. The Survey Grid and Big Swamp Grid together required some 14 line kilometres of survey.

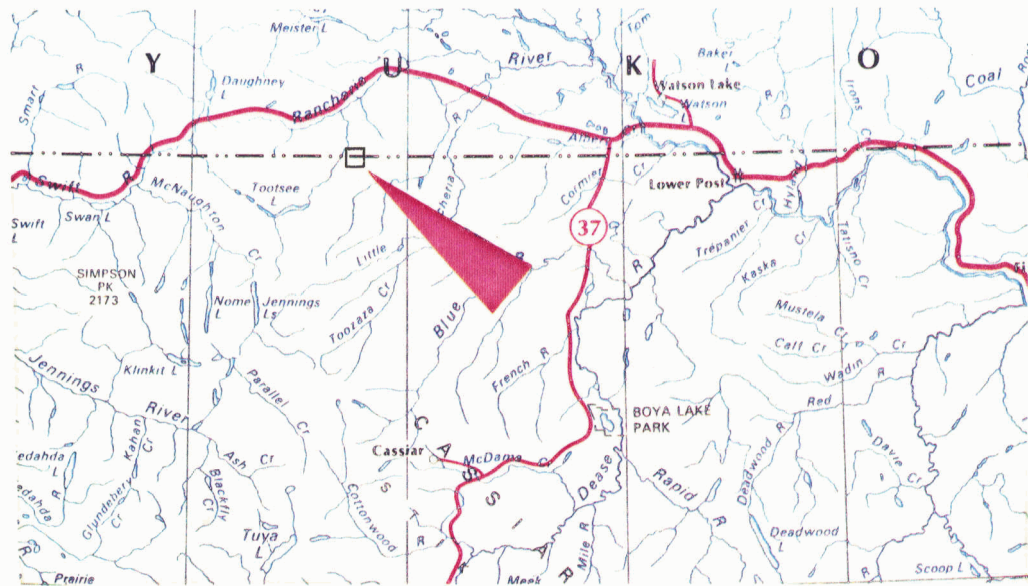
## PROPERTY

The Survey Creek Grid and Big Swamp Grid are located in the northernmost portion of the Midway area, on the northern side of the B. C. - Yukon border. The exact location of the grid is unknown by the authors but they appear to cover portions of the claims listed below and illustrated on Figure 1.

<u>Claim Name</u>	<u>Record Number</u>
MID 18	YA 56992
MID 20	YA 56994
MID 22	YA 56996
MID 33 - 38	YA 57007 - YA 57012
MID 49 - 54	YA 57023 - YA 57028
MID 67 - 70	YA 57041 - YA 57044
MID 83	YA 57057
MID 85	YA 57059

## LOCATION AND ACCESS

The Midway Project property is located approximately 90 km west of Watson Lake, Yukon Territories, and straddles the B.C. - Yukon border. The Survey Creek and Big Swamp Grids are within the Yukon Territories in NTS 105/B1. Approximate geographical co-ordinates are Latitude 60°00'N, and Longitude 130°12'N.



	31 MID YA57005	32 YA57006	47 YA57021	48 YA57022	63 YA57037	64 MID YA57038	79 YA57053	80 YA57054	95 YA57069	96 YA57070
18	29 YA57003	30 YA57004	45 YA57019	46 YA57020	61 YA57035	62 YA57036	77 YA57051	78 YA57052	93 YA57067	94 YA57068
	27 YA57001	28 YA57002	43 YA57017	44 YA57018	59 YA57033	60 YA57034	75 YA57049	76 YA57050	91 YA57065	92 YA57066
	25 YA56999	26 YA57000	41 YA57015	42 YA57016	57 YA57031	58 MID YA57032	73 YA57047	74 YA57048	89 YA57063	90 MID YA57064
	23 YA56997	24 YA56998	39 YA57013	40 YA57014	55 YA57029	56 YA57030	71 YA57045	72 YA57046	87 YA57061	88 YA57062
10	21 YA56995	22 YA56996	37 YA57011	38 YA57012	53 YA57027	54 YA57028	69 YA57043	70 YA57044	85 YA57059	86 YA57060
	19 YA56993	20 YA56994	35 YA57009	36 YA57010	51 YA57025	52 YA57026	67 YA57041	68 YA57042	83 YA57057	84 YA57058
	17 YA56991	18 MID YA56992	33 YA57007	34 YA57008	49 YA57023	50 MID YA57024	65 YA57039	66 YA57040	81 YA57055	82 MID YA57056

**CORDILLERAN ENGINEERING LTD.**  
 —BIG SWAMP AND SURVEY CREEK GRIDS—  
**LOCATION AND CLAIMS MAP**

*Glen C. White*  
 geographical consulting  
 services Ltd.

Access to the property is via unimproved roads south from the Alaska Highway near Mile 706, across the Rancheria River.

#### GENERAL GEOLOGY

The Midway Project property is underlain by Mississippian argillites, sandstones and coarse clastics of the Lower Sylvester Formation, which lie stratigraphically between McDame Formation carbonates and Upper Sylvester Formation volcanic rocks. Siliceous, pyritic and baritic exhalites, thought to be distal equivalents to Pb-Zn-Ag-Ba mineralization occur within the argillites. One stratiform galena-sphalerite-pyrite showing has been identified on the Bull 3 claim (B.C.).

The Lower Sylvester Formation rocks strike northwest and occupy the central part of a broad northwesterly trending syncline. Stratigraphy dips at  $10^{\circ}$  to  $30^{\circ}$  northeast and southwest toward the center of the structure. Numerous high angle faults cut stratigraphy, with vertical displacements up to several hundred metres.

## VECTOR PULSE ELECTROMAGNETOMETER SURVEY

The Crone pulse electromagnetometer system is a time domain E.M. system which can be used in the standard horizontal loop mode, fixed source mode or in a downhole mode.

The primary field for the standard horizontal loop method is produced by a portable transmitter loop of 6, 10, or 50 metres diameter. A depth of search of approximately 75% of separation is obtainable due to the high sensitivity of the receiver system. As measurements of the time derivative of the secondary field occur during primary field off time the method is relatively free from geometrical restrictions. Interpretation is accomplished with the aid of Slingram horizontal loop curves.

The primary field for the 2000 watt fixed source system is provided by a 500 by 1000 metre transmitter loop. A 150 by 150 metre loop is utilized with the 500 watt system. The time derivative of the secondary field resulting from the presence of a conductor is sampled at eight windows on the decay curve, during primary field off time. These eight channels of secondary field information are equivalent to a wide spectrum of frequencies from approximately 2 KHz to 16 Hz thus allowing conductor character and strength determination. The vertical and horizontal components are obtained at each station on the traverse, using the convention of vertical component positive upwards and horizontal component positive away from the transmitter loop. In areas of high surficial conductivity the primary field on time of 10.8 ms, and the receiver delay times may be doubled in order to obtain late time information. Time synchronization between transmitter and receiver is by radio or cable link.

The apparent primary field information is recorded at each occupied station. Normalization of the data with respect to instrument gain produces a constant gain plot. In this format a vertical plate-like conductor anomaly would be symmetric. Normalization with respect to the apparent primary field at each station provides a constant primary field plot that is useful in recognizing conductors present in the far primary field and in correlating anomaly amplitudes from line to line. The anomalies lose symmetry in this format but the condition of anomaly amplitude dependence on distance from the loop is relaxed. In the case of stacked profiles on plan maps it is practical to use the advantages of both of these methods and plot a constant gain profile normalized to the apparent primary field at a station near the conductor axis. This facilitates the correlation of conductors from line to line at varying distance in coverage from several transmitter loops.

The vector focus method of data display is useful in some line source conductor conditions. A resultant vector can be obtained by the vector addition of the vertical and horizontal components of the primary field. A perpendicular to this resultant indicates the apparent eddy current position.

## DISCUSSION OF RESULTS

The pulse electromagnetometer system was used in the standard horizontal loop mode utilizing a 6 metre transmitter loop and 75 metre transmitter-receiver separation. Readings were taken at 25 metre station intervals.

Composite data profile maps, illustrating the relative position and amplitudes of the EM anomalies are presented as Figures 2A (Survey Creek Grid) and 2B (Big Swamp Grid) of this report. Individual line profiles are presented as Figures 3 through 14. The data is plotted with positive values downward so as to be in a form compatible with Slingram anomaly type curves. Therefore, a downward trending anomaly will reflect a conductor axis. It should be noted that due to extremely strong responses observed on the Survey Creek Grid that Figure 2A is drawn at one-half the vertical scale of the Big Swamp Grid map.

### Survey Creek Grid

Three lines on the Survey Creek Grid were surveyed, totalling some 2.9 line kilometres. The abrupt change from a low amplitude, consistent response east of station 13900E to high amplitude, variable responses to the west is interpreted as lithological contact. This contact strikes north-south and separates a low conductivity - electrically homogeneous unit to the east from a heterogeneous, layered unit to the west. The contact itself illustrates weak conductivity on Lines 20900N and 21000N.

The responses to the west of the above mentioned contact are very high in amplitude and evident through all eight data channels. This indicates near-surface highly conductive sources. The most definitive response occurs on Line 20900N which indicates two closely spaced conductors at 13575E and 13640E and a third at 13760E. Anomalies on the lines to the north and south appear to align as illustrated on Figure 2A. The conductors are interpreted as narrowly spaced dyke-like zones. In this type of environment, the EM responses from each conductor are interfered with by the responses from adjacent zones and type curve comparisons become very limited. The zones appear to dip to grid west, however the interference effects reduce the reliability of this interpretation.

#### Big Swamp Grid

Nine lines totalling some 11.25 km were surveyed across the Big Swamp Grid. The majority of the lines exhibit a negative bias in the EM response which is indicative of a layer of high conductivity material at the surface. The transition to near zero values on the eastern ends of lines 21000N, 21200N and 21400N is interpreted as the edge to this feature. Superimposed over this negative bias, downward-trending peaks can be interpreted as either buried dyke-like conductors, or edge effects to a horizontal conductor (such as windows through a conductive overburden). Since most of the responses are asymmetrical and exhibit a similar westerly dip, they are interpreted as buried conductive units.

The response on Lines 20200N through 20600N between stations 11400E and 12000E are extremely complex and difficult to identify. It appears as if a large number of narrowly spaced conductors are present and the complex interference patterns established make line to line correlation, and probably even determination, of the conductor axes unreliable. To both the north and south the responses are more uniform and appear to reflect isolated conductive units. Amplitudes and channel responses are however similar which indicates common source materials. Quite possibly the area from 20200N to 20600N is one of extensive structural deformation.

A conductive unit is interpreted on the western ends of Lines 20400N through 20800N as illustrated on Figure 2B. Another zone is well defined on Line 20800N at station 11400E and extends to the north-northeast. A reverse polarity anomaly is observed along the strike of this zone on Line 21400N. It is possible that the dyke-like conductor observed on Line 20800N has broadened out or been rotated in such a manner as to appear as a flat-lying body. Reverse polarity anomalies are often present off the ends of linear conductors so it is also possible that the response observed on Line 21400N originates from another strong conductive body to the north of the grid.

SUMMARY AND RECOMMENDATIONS

From July 26-27 and August 1-3, 1982, Glen E. White Geophysical Consulting & Services Ltd. conducted some 14 line kilometres of horizontal loop PEM survey across the Survey Creek and Big Swamp Grids on Cordilleran Engineering Ltd.'s Midway area.

On the Survey Creek Grid, the PEM data delineates a north-south trending contact between an area of low conductivity, electrically homogeneous material and an area of westerly dipping, near surface, highly conductive dyke-like zones. The amplitudes of the anomalies to the west are very strong and interpreted as reflections of graphitic horizons. The weaker conductivity response observed at the contact on Line 21000N is much more similar to the response observed across the sulphide zones on the Discovery Grid.

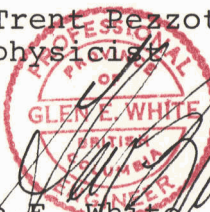
The Big Swamp Grid exhibits a much more complex geological environment. The area is for a large extent overlain by a conductive unit, which tends to mask and distort the responses from deeper conductors. The central portion of the grid appears to be underlain by numerous conductive bodies of variable attitude and size. This area is quite likely one of significant structural deformation. A relatively well defined conductor is present on the west ends of Lines 20800N through 20400N and considered open to the southwest. A dyke-like conductor located at 11400E on Line 20800N extends to the north-northeast. This anomaly reverses polarity on Line 21400N which indicates either a rotation to a more horizontal orientation or the presence of a major conductor immediately to the north.

The PEM responses observed across this grid are very similar to those observed across the sulphide mineralization on the Discovery Grid in both background and anomaly amplitudes. Based on these results, this area warrants followup exploration. It is known by the authors that soil sampling and surface prospecting has been conducted in the area. This information should be correlated to the PEM anomalies before assigning priorities to individual anomalies or trends.

Respectfully submitted,

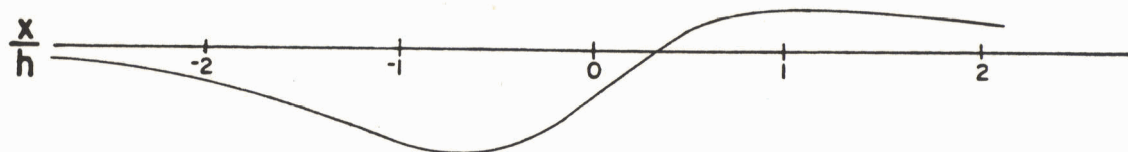


E. Trent Pezzot, B.Sc.  
Geophysicist

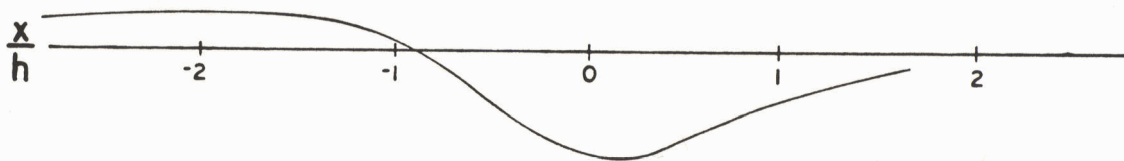


Glen E. White, B.Sc., P. Eng.  
Consulting Geophysicist

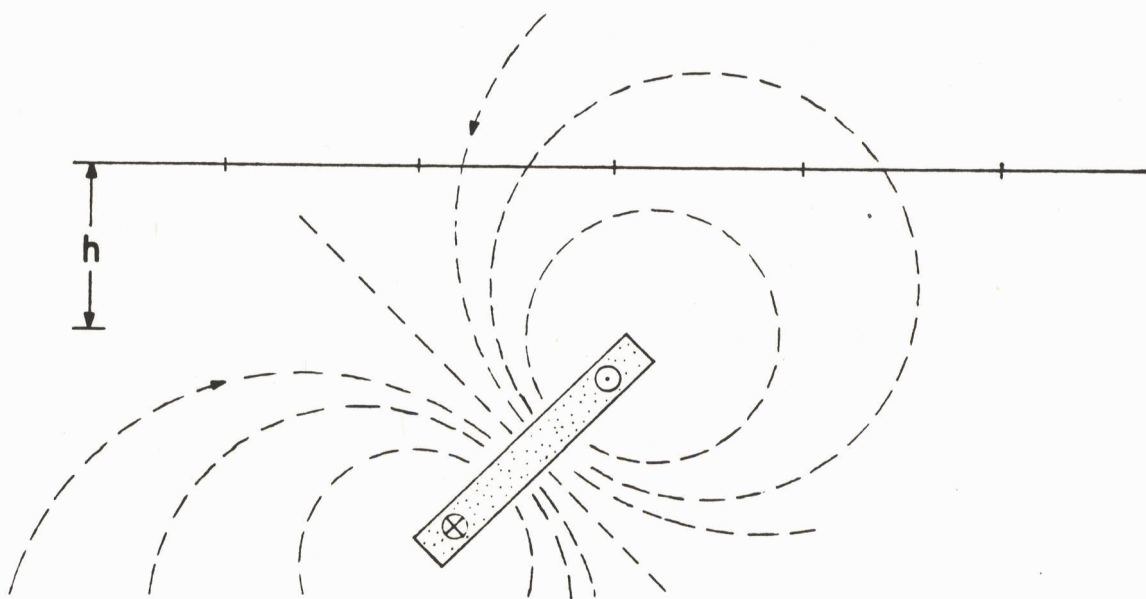
### VERTICAL COMPONENT



### HORIZONTAL COMPONENT

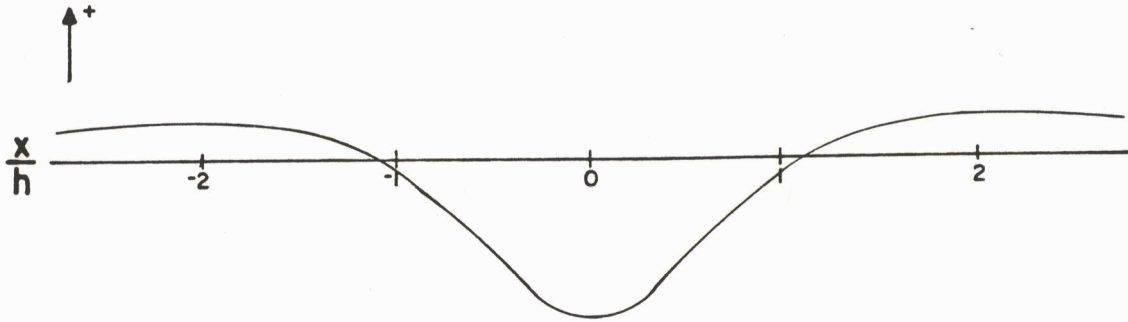


### VPEM ANOMALY SHAPE

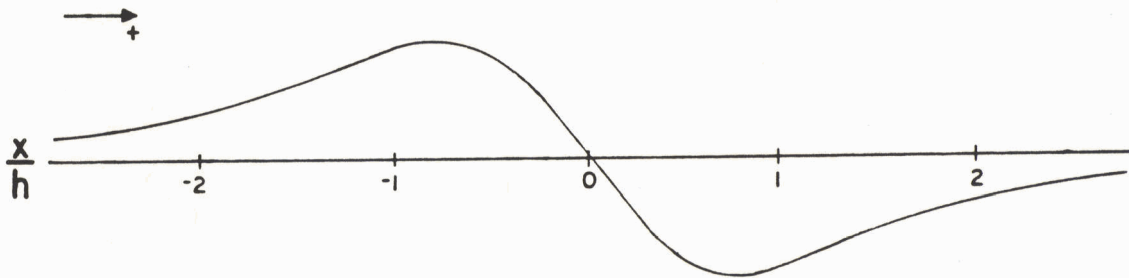


### INCLINED TABULAR BODY

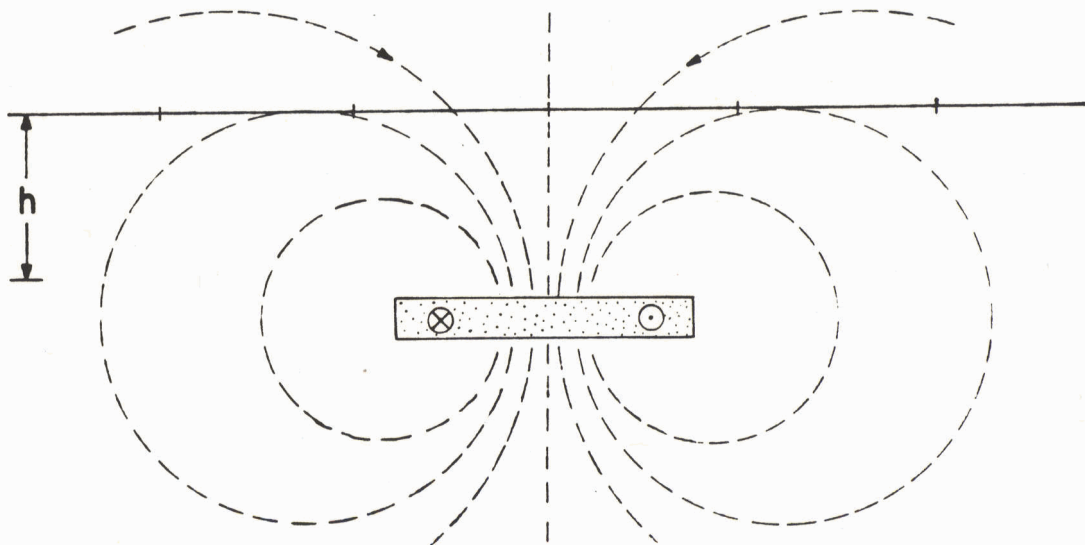
### VERTICAL COMPONENT



### HORIZONTAL COMPONENT

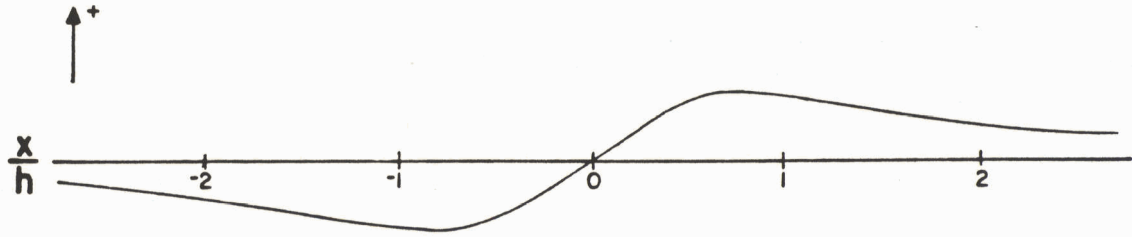


### VPEM ANOMALY SHAPE

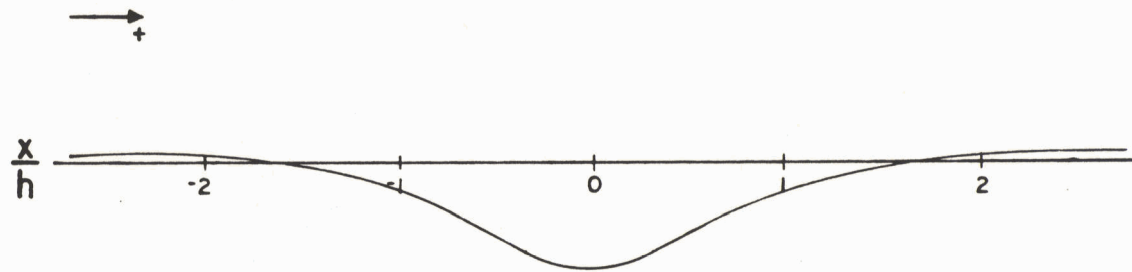


FLAT LYING TABULAR BODY

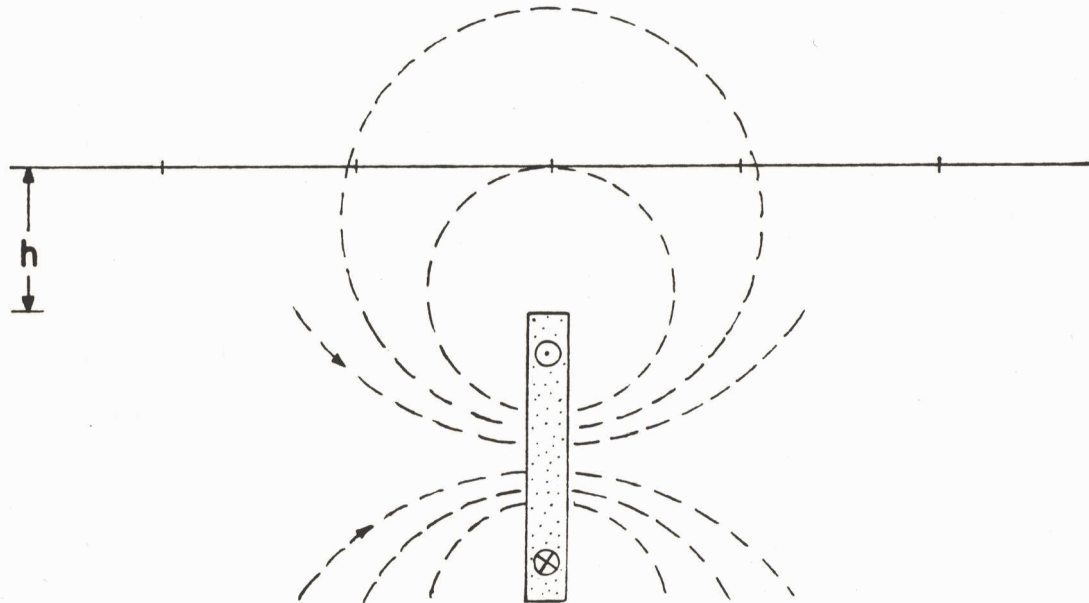
VERTICAL COMPONENT



HORIZONTAL COMPONENT



VPEM ANOMALY SHAPE



STEEPLY DIPPING TABULAR BODY

STATEMENT OF QUALIFICATIONS

NAME: PEZZOT, E. Trent

PROFESSION: Geophysicist - Geologist

EDUCATION: University of British Columbia -  
B.Sc. - Honors Geophysics and Geology

PROFESSIONAL  
ASSOCIATIONS: Society of Exploration Geophysicist

EXPERIENCE: Three years undergraduate work in  
geology - Geological Survey of Canada,  
consultants.

Three years Petroleum Geophysicist,  
Senior Grade, Amoco Canada Petroleum  
Co. Ltd.

Two years consulting geophysicist,  
Consulting geologist - B.C., Alberta,  
Saskatchewan, N.W.T., Yukon, western  
U.S.A.

Four years geophysicist with Glen E.  
White Geophysical Consulting & Services  
Ltd.

STATEMENT OF QUALIFICATIONS

NAME: WHITE, Glen E., P.Eng.

PROFESSION: Geophysicist

EDUCATION: B.Sc. Geophysicist - Geology  
University of British Columbia.

PROFESSIONAL ASSOCIATIONS: Registered Professional Engineer,  
Province of British Columbia.  
Associate member of Society of Exploration Geophysicists.  
Past President of B.C. Society of Mining Geophysicists.

EXPERIENCE: Pre-Graduate experience in Geology -  
Geochemistry - Geophysics with Anaconda  
American Brass.  
Two years Mining Geophysicist with  
Sulmac Exploration Ltd. and Airborne  
Geophysics with Spartan Air Services  
Ltd.  
One year Mining Geophysicist and Technical  
Sales Manager in the Pacific  
north-west for W.P. McGill and Associates.  
Two years Mining Geophysicist and  
supervisor Airborne and Ground Geophysical  
Divisions with Geo-X Surveys  
Ltd.  
Two years Chief Geophysicist Tri-Con  
Exploration Surveys Ltd.  
Twelve years Consulting Geophysicist.  
Active experience in all Geologic provinces  
of Canada.

COST BREAKDOWN

Production: July 26-30, 5 days @ \$725.....	\$3,625.00
Mobilization: (pro-rated @ 18% of total survey costs).....	174.60
Airfares: (pro-rated @ 18% of total survey costs).....	226.26
Airfreight: (pro-rated @ 18% of total survey costs).....	95.99
Related mob./demob. costs: (pro-rated @ 18% of total survey costs).....	5.62
	<hr/>
Sub total.....	\$4,127.47
Computer processing: 12 lines @ \$15/line.....	180.00
46 feet @ \$4/foot.....	184.00
Composite profile map (2)/digitizing.....	950.00
Drafting and binding: 10 hrs @ \$25/hr.....	250.00
Reproduction and materials.....	371.14
Interpretation and report.....	950.00
Shipping.....	20.00
	<hr/>
Sub total.....	\$2,905.14
TOTAL.....	\$7,032.61

Vector Pulse Electromagnetometer Data Listing

CORDILLERAN ENGINEERING LTD. - BIG SWAMP GRID & SURVEY CREEK GRID

Listing explanation:

Heading:

Line, Transmitter-Receiver Separation and Survey date

Table:

STATION: Plotting station

V1-V8: Secondary field vertical component, positive upwards

Channel 1-8 sample times: .15, .45, .85, 1.45, 2.45, 3.75, 5.85, 8.85  
milliseconds

ELV: Relative Elevation in Metres

GLEN E. WHITE Geophysical Consulting & Services Ltd.

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
---------	----	----	----	----	----	----	----	----	-----

Line 21100N, Separation 75 metres, Survey date 26/7/82

13538E	375	375	375	375	270	170	85	35	0
13563E	481	481	519	500	354	223	131	81	-2
13588E	333	333	214	107	17	-33	-33	-31	-2
13613E	195	102	-19	-107	-143	-138	-102	-71	0
13638E	29	-50	-117	-143	-140	-110	-71	-38	0
13663E	41	-54	-130	-157	-152	-111	-67	-35	3
13688E	-37	-130	-170	-169	-154	-122	-87	-50	7
13713E	42	-68	-130	-138	-132	-112	-88	-60	10
13738E	89	-21	-105	-126	-124	-108	-89	-61	15
13763E	-5	-67	-100	-105	-98	-85	-67	-48	18
13788E	-80	-89	-91	-87	-78	-65	-51	-33	22
13813E	-116	-111	-95	-80	-65	-55	-44	-27	26
13838E	-72	-70	-63	-55	-47	-39	-31	-22	31
13863E	0	-22	-34	-39	-39	-34	-25	-15	33
13888E	9	-13	-28	-31	-31	-27	-20	-11	34
13913E	-33	-34	-36	-34	-31	-25	-18	-12	36
13938E	-67	-62	-53	-42	-35	-27	-18	-13	40
13963E	-42	-42	-39	-32	-23	-23	-19	-16	44
13988E	-30	-28	-26	-21	-19	-17	-15	-11	48
14013E	-24	-22	-19	-14	-14	-14	-11	-5	51
14038E	-14	-12	-12	-10	-6	-6	-6	-2	54
14063E	-11	-9	-9	-8	-8	-6	-6	-2	56
14088E	-9	-7	-7	-6	-4	-4	-4	-1	57
14113E	-8	-7	-7	-6	-4	-4	-4	-2	57
14138E	-7	-6	-4	-4	-3	-3	-3	0	57
14163E	-5	-5	-5	-5	-5	-5	-5	-2	58
14188E	-8	-8	-8	-5	-5	-8	-8	-3	60
14213E	-8	-5	-5	-3	-3	-5	-5	-3	63
14238E	-7	-5	-5	-2	-2	-2	-2	2	67
14263E	-6	-6	-6	-3	-3	-6	-3	0	71
14288E	-4	-4	-4	-4	-2	-4	-4	-2	75
14313E	-3	-3	-3	-3	-3	-3	-2	0	80
14338E	-3	-3	-3	-3	-2	-2	-3	-2	85
14363E	-3	-2	-3	0	0	0	0	2	90
14388E	-2	-2	-2	-1	-1	-1	-1	0	92
14413E	-3	-3	-3	-1	0	0	1	1	94
14438E	-3	-3	-1	-1	0	0	0	1	94
14463E	-3	-3	-3	-3	-1	-1	-1	0	94

Line 20900N, Separation 75 metres, Survey date 26/7/82

13513E	232	128	-4	-80	-88	-64	-24	-4	0
13538E	264	122	-64	-161	-169	-128	-69	-31	-2
13563E	344	300	213	125	56	-16	-44	-28	-4
13588E	358	354	338	292	208	58	-38	-58	-4
13613E	250	270	287	283	237	97	-13	-37	-4
13638E	382	536	500	500	491	345	155	27	-3
13663E	325	320	270	200	135	70	20	5	0
13688E	175	146	82	-4	-82	-125	-111	-71	2
13713E	241	196	107	11	-74	-133	-130	-89	5
13738E	323	274	152	48	-32	-87	-97	-74	8
13763E	343	309	204	104	17	-48	-65	-43	12
13788E	267	222	129	36	-24	-56	-53	-33	14
13813E	96	11	-61	-88	-88	-72	-44	-21	17

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
13838E	-5	-71	-98	-96	-82	-58	-35	-15	19
13863E	-30	-40	-42	-42	-36	-28	-19	-9	22
13888E	-14	-19	-21	-21	-19	-17	-14	-10	26
13913E	-35	-35	-35	-28	-23	-20	-13	-5	30
13938E	-32	-32	-31	-28	-22	-21	-15	-7	33
13963E	-29	-29	-25	-21	-19	-17	-13	-4	36
14013E	-23	-21	-19	-17	-13	-10	-8	-4	40
14038E	-17	-13	-13	-13	-9	-9	-9	0	44
14063E	-11	-11	-11	-7	-7	-7	-7	0	47

Line 20800N, Separation 75 metres, Survey date 26/7/82

13488E	306	264	131	8	-83	-128	-111	-56	-84
13513E	308	308	181	60	-58	-137	-135	-83	-85
13538E	250	182	79	-14	-86	-136	-136	-93	-87
13563E	116	16	-72	-100	-124	-136	-128	-84	-88
13588E	76	21	-15	-42	-61	-79	-88	-73	-90
13613E	203	183	143	103	51	-17	-57	-54	-92
13638E	274	274	257	217	157	70	4	-22	-92
13663E	224	219	190	157	95	24	-24	-33	-89
13688E	81	63	37	7	-28	-67	-70	-60	-85
13713E	76	61	36	12	-9	-39	-45	-42	-81
13738E	67	40	7	-20	-40	-53	-50	-27	-80
13763E	111	85	37	4	-15	-30	-30	-19	-78
13788E	226	222	191	157	117	65	22	-4	-76
13813E	178	148	115	93	48	15	0	-4	-74
13838E	152	122	74	33	7	-7	-15	-7	-68
13863E	69	56	34	22	13	0	-3	-3	-64
13888E	0	0	-6	-6	-6	-11	-11	-11	-61
13913E	-22	-22	-22	-17	-13	-9	-9	-4	-54
13938E	-28	-28	-28	-22	-17	-17	-17	-6	-42
13963E	-12	-12	-9	-9	-9	-9	-6	-3	-34
13988E	-13	-13	-13	-13	-9	-9	-9	-4	-29
14013E	-7	-7	-7	-4	-4	-4	-4	-2	-27
14038E	-6	-6	-6	-6	-6	-3	-3	-3	-28
14063E	-8	-6	-6	-4	-4	-4	-2	0	-28
14088E	-3	-3	-3	-3	-3	-6	-3	0	-28
14113E	-4	-2	-4	-2	-2	-2	-2	0	-26
14138E	-4	-4	-2	-2	-2	-2	-2	0	-23
14163E	-4	-4	-2	-2	-2	-2	-2	0	-20
14188E	-4	-2	-2	-2	0	0	0	2	-17
14213E	-4	-2	-2	0	2	2	0	0	-14
14238E	-2	-2	-2	-2	-2	0	-2	-2	-11
14263E	-3	-2	-2	-2	-2	-2	-3	0	-10
14288E	-4	-2	-4	-4	-4	-4	-2	-2	-8
14313E	-3	-2	-2	-2	-2	-2	-2	0	-4
14338E	-4	-3	-3	-3	-1	-1	-1	-1	-2
14363E	-2	-1	-1	-1	0	-1	-1	0	-2
14388E	-2	-2	-2	-1	-1	-1	-1	0	0
14413E	-2	-1	-1	-1	0	-2	-2	0	2
14438E	-4	-3	-3	-1	-1	-1	-1	0	2
14463E	-3	-1	-1	0	-1	-1	-1	0	0

Line 21400N, Separation 75 metres, Survey date 27/7/82

11238E	-5	-9	-12	-7	-5	-5	-5	-2	0
11263E	-47	-35	-20	-12	-4	-4	-4	-2	3

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
11288E	-80	-45	-27	-13	-7	-5	-2	2	2
11313E	-56	-40	-28	-12	-8	-8	-8	-4	0
11338E	-48	-33	-18	-8	-5	-5	-3	3	2
11363E	-56	-36	-18	-9	-7	-7	-4	-2	0
11388E	-32	-36	-32	-16	-8	-8	-8	0	3
11413E	-64	-50	-32	-18	-9	-9	-5	5	3
11438E	-42	-42	-30	-18	-6	-6	-6	0	8
11463E	-136	-96	-48	-20	-8	-8	-8	4	10
11488E	-197	-126	-57	-23	-9	-9	-6	-3	10
11513E	-406	-281	-131	-69	-25	-13	-13	6	18
11538E	-338	-219	-113	-44	-13	-13	-13	6	25
11563E	-250	-190	-90	-40	-20	-20	-10	10	32
11588E	-244	-200	-111	-56	-22	-22	-11	0	40
11613E	-231	-223	-177	-100	-62	-46	-23	-8	48
11638E	-152	-140	-124	-96	-64	-44	-24	-12	55
11663E	-143	-136	-129	-100	-71	-50	-29	-7	63
11688E	-118	-112	-100	-82	-59	-41	-18	0	71
11713E	-79	-73	-64	-48	-42	-27	-15	-3	78
11738E	-88	-76	-59	-41	-29	-24	-18	0	82
11763E	-90	-86	-71	-43	-33	-24	-14	-5	89
11788E	-186	-171	-129	-86	-43	-43	-29	-14	97
11813E	-72	-64	-52	-24	-16	-16	-8	4	107
11838E	-57	-46	-29	-14	-4	-4	-4	0	112
11863E	-46	-29	-21	-13	0	0	-4	4	112
11888E	-22	-13	-9	0	4	0	0	4	107
11913E	-23	-15	-8	-3	0	-3	-3	-3	109
11938E	-22	-13	-6	0	0	-3	-3	3	111
11963E	-12	-8	-4	0	4	0	0	4	113
11988E	-9	-3	-3	-3	-3	-3	-3	0	114
12013E	-7	-3	-3	0	0	0	0	3	114
12038E	-10	-6	-3	-3	0	-3	-3	0	111
12063E	-13	-7	-7	0	0	-7	-7	-7	110
12088E	-7	-4	-4	-4	-4	-4	-4	0	110
12113E	-12	-6	-6	0	0	-6	-6	0	111

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11238E	-63	-47	-29	-13	-8	-8	-5	3	163
11263E	-65	-50	-33	-18	-10	-10	-8	-5	163
11288E	-73	-51	-33	-16	-9	-7	-4	0	163
11313E	-71	-54	-36	-21	-7	-7	-4	0	163
11338E	-98	-63	-38	-18	-9	-5	-4	0	163
11363E	-120	-86	-51	-26	-17	-9	-6	-3	163
11388E	-31	-40	-38	-31	-19	-14	-10	-2	168
11413E	-52	-54	-48	-33	-17	-10	-6	0	168
11438E	-27	-80	-77	-57	-30	-20	-13	0	158
11463E	-50	-89	-83	-50	-33	-22	-11	-6	150
11488E	82	18	-27	-45	-36	-27	-18	0	140
11513E	103	57	10	-7	-13	-10	-7	3	130
11538E	53	33	3	-13	-13	-10	-3	7	120
11563E	-7	-7	-18	-21	-21	-18	-11	0	110
11588E	-45	-45	-50	-45	-40	-35	-20	0	100
11613E	-48	-48	-48	-44	-36	-32	-16	-4	90
11636E	-32	-29	-29	-29	-27	-22	-15	-7	81
11663E	-17	-15	-15	-15	-13	-11	-7	-3	75
11688E	-17	-16	-16	-16	-13	-10	-7	-1	70
11713E	-19	-19	-19	-16	-12	-9	-5	0	65
11738E	12	2	-16	-14	-12	-10	-6	2	60

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
11763E	-14	-13	-13	-12	-9	-6	-4	0	55
11788E	-19	-17	-17	-11	-9	-7	-4	0	50
11813E	-17	-14	-12	-8	-7	-7	-3	0	45
11838E	-13	-10	-8	-6	-3	-3	-3	0	41
11863E	-10	-6	-5	-3	-1	-3	-3	0	38
11888E	-8	-5	-3	-2	-2	-2	-2	0	34
11913E	-6	-3	-3	-1	-1	-1	-1	0	28
11938E	-6	-4	-2	-2	-2	-4	-4	-2	21
11963E	-5	-3	-2	-2	-2	-2	-2	0	14
11988E	-7	-5	2	-2	0	-2	-2	0	7
12013E	-8	-5	-3	0	0	0	0	0	0

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11138E	-65	-53	-37	-26	-14	-7	-5	-2	139
11163E	-74	-56	-39	-24	-15	-6	-3	-2	139
11188E	-88	-74	-53	-38	-21	-9	-3	-3	139
11213E	-100	-78	-54	-38	-22	-11	-5	-3	139
11238E	-115	-92	-62	-46	-27	-15	-8	-4	139
11263E	-117	-100	-73	-50	-27	-13	-10	0	139
11288E	-107	-82	-60	-44	-29	-13	-9	-2	139
11313E	-118	-100	-76	-53	-36	-18	-9	-4	139
11338E	-120	-113	-88	-63	-40	-20	-10	-5	139
11363E	-133	-116	-87	-64	-42	-20	-11	-4	139
11388E	-131	-105	-75	-54	-36	-16	-8	-3	139
11413E	-96	-85	-68	-49	-32	-17	-9	-4	139
11438E	-115	-100	-77	-54	-37	-15	-6	-3	139
11463E	-104	-104	-92	-66	-45	-26	-11	-6	141
11488E	-3	-53	-66	-61	-42	-24	-13	-8	140
11513E	-23	-71	-80	-74	-60	-37	-20	-11	138
11538E	-35	-68	-73	-68	-57	-41	-19	-8	135
11563E	-61	-85	-85	-73	-61	-42	-24	-15	130
11588E	-37	-57	-63	-60	-51	-40	-26	-14	125
11613E	-36	-47	-47	-47	-42	-31	-22	-11	121
11638E	-19	-28	-34	-31	-28	-25	-19	-9	116
11663E	-34	-38	-38	-34	-31	-22	-16	-6	110
11688E	-42	-42	-42	-40	-33	-27	-13	-4	102
11713E	-37	-40	-40	-37	-35	-30	-14	-2	94
11738E	-33	-33	-33	-30	-23	-14	-9	-5	86
11763E	-27	-29	-29	-27	-20	-11	-4	-2	78
11788E	-22	-29	-29	-29	-22	-14	-6	-4	72
11813E	-15	-21	-24	-21	-18	-12	-6	-3	65
11838E	-22	-26	-30	-26	-22	-17	-9	-4	57
11863E	-23	-23	-23	-22	-15	-7	-3	-2	49
11888E	-26	-28	-28	-26	-17	-11	-6	-2	42
11913E	-29	-31	-34	-29	-23	-11	-6	0	36
11938E	-22	-25	-25	-24	-16	-10	-6	-4	28
11963E	-20	-22	-24	-20	-16	-9	-4	-2	20
11988E	-22	-24	-22	-20	-13	-9	-4	-4	10
12013E	-28	-28	-26	-18	-14	-8	-4	-2	0

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11138E	-116	-88	-58	-42	-23	-12	-7	-5	0
11163E	-100	-97	-78	-54	-38	-16	-8	-5	0
11188E	-109	-109	-87	-61	-39	-22	-17	-4	-1
11213E	-59	-84	-81	-59	-44	-19	-9	-6	-3

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
11238E	-153	-153	-117	-70	-43	-20	-13	-10	-3
11263E	-157	-167	-133	-83	-50	-20	-10	-7	-3
11288E	-150	-166	-138	-88	-48	-20	-10	-4	-3
11313E	-171	-167	-122	-78	-41	-16	-6	-2	-1
11338E	-186	-179	-131	-83	-45	-14	-10	-3	-1
11363E	-140	-140	-111	-74	-41	-18	-7	-4	-1
11388E	-39	-77	-83	-67	-43	-22	-10	-5	-1
11413E	-8	-57	-73	-65	-45	-24	-10	-5	-1
11438E	-100	-100	-86	-66	-44	-24	-10	-4	-1
11463E	-202	-157	-110	-71	-45	-21	-10	-5	-1
11488E	-219	-168	-114	-76	-46	-22	-14	-5	-1
11513E	-226	-169	-111	-73	-48	-26	-11	-5	2
11538E	-223	-166	-105	-66	-41	-25	-13	-7	5
11563E	-229	-162	-103	-65	-41	-21	-12	-6	6
11588E	-140	-109	-72	-46	-32	-19	-11	-5	8
11613E	-100	-83	-58	-40	-28	-18	-12	-7	9
11638E	-88	-70	-54	-40	-30	-20	-12	-4	9
11663E	-129	-103	-74	-59	-44	-26	-15	-9	12
11688E	-160	-113	-80	-63	-48	-35	-15	-5	17
11713E	-115	-85	-67	-52	-42	-29	-13	-2	21
11738E	-92	-82	-64	-51	-41	-23	-13	-5	26
11763E	-85	-74	-64	-53	-40	-28	-13	-4	34
11788E	-111	-111	-106	-83	-61	-33	-17	-6	42
11813E	-79	-74	-65	-53	-40	-21	-9	-2	47
11838E	-75	-72	-63	-50	-31	-19	-9	-3	57
11863E	-69	-67	-56	-42	-25	-14	-8	-3	60
11888E	-64	-56	-44	-24	-16	-9	-7	-2	64
11913E	-65	-54	-38	-22	-11	-8	-5	-3	69
11938E	-46	-36	-24	-11	-6	-3	-3	-1	73
11963E	-53	-40	-26	-13	-8	-6	-4	0	77
11988E	-49	-39	-22	-12	-7	-5	-5	-2	82

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11038E	-168	-126	-79	-45	-21	-9	-2	0	-32
11063E	-153	-140	-100	-57	-33	-17	-7	-3	-33
11088E	-153	-138	-94	-63	-34	-19	-9	-3	-37
11113E	-211	-160	-103	-63	-40	-17	-9	-3	-37
11138E	-89	-94	-74	-47	-30	-19	-11	-4	-33
11163E	-99	-98	-66	-43	-28	-14	-6	-2	-34
11188E	-136	-136	-100	-64	-42	-19	-14	-8	-34
11213E	-174	-152	-105	-60	-36	-19	-12	-5	-35
11238E	-180	-156	-104	-67	-36	-22	-11	-4	-35
11263E	-189	-143	-96	-57	-33	-20	-11	-4	-35
11288E	-217	-168	-109	-68	-40	-21	-9	-2	-35
11313E	-219	-164	-108	-67	-38	-20	-8	-3	-35
11338E	-167	-160	-117	-75	-45	-25	-13	-5	-36
11363E	-182	-171	-118	-76	-44	-21	-12	-6	-36
11388E	-155	-152	-114	-76	-48	-24	-12	-5	-35
11413E	-150	-142	-104	-72	-46	-28	-10	-4	-35
11438E	-138	-141	-116	-88	-59	-28	-13	-6	-37
11463E	-50	-92	-92	-71	-48	-25	-10	-2	-37
11488E	-69	-121	-115	-90	-59	-28	-13	-5	-37
11513E	-96	-119	-102	-78	-50	-26	-9	-4	-37
11538E	-123	-136	-121	-90	-57	-26	-8	-3	-37
11563E	-68	-135	-133	-107	-74	-35	-14	-5	-37
11588E	-34	-102	-119	-109	-77	-40	-13	-6	-37
11613E	-36	-75	-97	-93	-71	-39	-16	-5	-37

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
11638E	-110	-109	-104	-86	-62	-32	-14	-4	-37
11663E	-93	-103	-97	-76	-52	-29	-12	-3	-35
11688E	-45	-102	-109	-89	-62	-34	-17	-9	-34
11713E	-8	-64	-69	-54	-33	-20	-8	-3	-34
11738E	-81	-125	-107	-69	-40	-22	-10	-5	-34
11763E	-196	-255	-173	-102	-53	-27	-13	-5	-32
11788E	-71	-125	-106	-67	-40	-19	-10	-4	-31
11813E	-25	-75	-67	-44	-28	-16	-7	-2	-31
11838E	27	-29	-44	-40	-31	-18	-11	-4	-29
11863E	30	-15	-38	-38	-30	-17	-9	-2	-27
11888E	9	-26	-44	-38	-26	-15	-9	-3	-24
11913E	-70	-70	-67	-50	-30	-17	-10	-3	-19
11938E	-63	-63	-58	-38	-25	-13	-13	-4	-12
11963E	-62	-58	-50	-31	-19	-15	-12	-8	-8
11988E	-38	-35	-25	-15	-11	-7	-5	-2	-4
12013E	-31	-25	-19	-13	-8	-6	-4	0	0

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10838E	-205	-185	-113	-60	-28	-13	-8	-3	0
10863E	-164	-160	-118	-72	-40	-18	-10	-6	2
10888E	-62	-90	-88	-60	-38	-19	-10	-7	4
10913E	26	-47	-76	-63	-42	-24	-13	-5	5
10938E	65	-39	-104	-96	-65	-30	-17	-9	4
10963E	-89	-127	-116	-84	-53	-29	-16	-9	-1
10988E	-76	-90	-73	-51	-35	-18	-12	-8	-1
11013E	-230	-187	-139	-91	-65	-30	-17	-9	-1
11038E	-148	-141	-111	-85	-56	-30	-19	-11	3
11063E	-119	-119	-105	-76	-57	-29	-19	-10	6
11088E	-100	-93	-78	-62	-47	-29	-16	-9	6
11113E	-80	-78	-65	-51	-36	-22	-13	-7	9
11138E	-100	-91	-71	-54	-34	-20	-14	-9	12
11163E	-113	-98	-76	-56	-38	-25	-13	-7	9
11188E	-103	-94	-77	-57	-37	-20	-14	-9	8
11213E	-83	-80	-68	-50	-33	-18	-13	-8	8
11238E	-111	-102	-79	-58	-38	-21	-11	-6	6
11263E	-105	-98	-75	-52	-34	-18	-14	-7	5
11288E	-118	-109	-88	-65	-44	-21	-15	-9	4
11313E	-84	-96	-92	-68	-56	-28	-16	-8	3
11338E	-40	-69	-64	-50	-36	-19	-12	-5	1
11363E	-59	-78	-74	-56	-37	-22	-11	-4	-1
11388E	-57	-80	-73	-55	-39	-23	-16	-7	1
11413E	-200	-198	-140	-93	-60	-31	-14	-7	3
11438E	-113	-150	-130	-93	-63	-35	-15	-10	2
11463E	-110	-133	-115	-83	-50	-25	-13	-8	-1
11488E	-60	-88	-83	-60	-40	-20	-10	-3	-1
11513E	-173	-150	-110	-75	-45	-23	-13	-8	-2
11538E	-120	-117	-94	-69	-43	-23	-14	-9	-1
11563E	-207	-185	-134	-93	-59	-32	-15	-5	-1
11588E	-83	-119	-105	-81	-57	-36	-17	-7	-1
11613E	-83	-117	-108	-88	-63	-35	-21	-10	-1
11638E	-16	-66	-76	-68	-55	-37	-16	-8	-2
11663E	-62	-106	-113	-104	-79	-45	-21	-9	-2
11688E	-30	-111	-137	-133	-104	-56	-22	-11	-2
11713E	-91	-163	-170	-147	-112	-60	-23	-9	-2
11738E	-185	-211	-204	-181	-141	-81	-30	-7	-1
11763E	-176	-176	-184	-180	-156	-100	-40	-16	-1
11788E	-58	-94	-131	-147	-144	-100	-50	-17	0

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
11813E	27	-21	-91	-118	-124	-109	-61	-21	1
11838E	-14	-57	-97	-116	-114	-89	-49	-16	1
11863E	-89	-125	-147	-150	-142	-100	-56	-19	2
11888E	-109	-131	-144	-147	-138	-94	-50	-19	2
11913E	-122	-144	-159	-163	-153	-109	-63	-16	3
11938E	-110	-140	-160	-167	-150	-97	-50	-17	6
11963E	-159	-185	-200	-196	-163	-96	-41	-11	8
11988E	-114	-146	-157	-154	-123	-69	-29	-9	10
12013E	-115	-139	-155	-148	-106	-55	-21	-6	11
12038E	-125	-147	-153	-138	-94	-47	-19	-9	12
12063E	-123	-130	-120	-93	-53	-23	-10	-7	13
12088E	-118	-118	-100	-68	-44	-18	-12	-3	15
12113E	-109	-94	-69	-44	-25	-13	-9	-6	15
12138E	-92	-80	-60	-36	-20	-16	-12	-8	16
12163E	-88	-71	-50	-38	-25	-17	-8	-4	17
12188E	-73	-54	-41	-30	-22	-14	-8	-5	20
12213E	-66	-50	-41	-25	-16	-9	-6	-3	22
12238E	-62	-49	-38	-24	-16	-11	-8	-5	23
12263E	-52	-42	-30	-21	-12	-9	-9	-6	24
12288E	-56	-41	-28	-22	-13	-6	-6	-6	26
12313E	-44	-38	-26	-18	-12	-6	-3	-3	28
12338E	-56	-40	-28	-20	-12	-8	-4	-4	29
12363E	-62	-43	-33	-19	-10	-10	-5	-5	32
12388E	-59	-48	-30	-19	-7	-7	-4	-4	37
12413E	-60	-45	-30	-20	-10	-5	-5	-5	41

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11438E	-103	-106	-97	-76	-58	-33	-21	-12	-4
11463E	-69	-100	-97	-83	-63	-43	-23	-9	-4
11488E	-85	-97	-97	-79	-55	-36	-18	-9	-5
11513E	-100	-97	-83	-60	-46	-23	-14	-9	-8
11538E	-143	-129	-100	-74	-54	-29	-14	-9	-4
11563E	-116	-109	-84	-67	-44	-27	-16	-9	-3
11588E	-82	-87	-76	-58	-42	-22	-13	-7	-3
11613E	-65	-71	-69	-55	-39	-20	-12	-6	-2
11638E	-84	-94	-84	-65	-45	-26	-13	-8	-2
11663E	-118	-118	-93	-67	-44	-22	-13	-7	-2
11688E	-164	-162	-120	-78	-53	-27	-13	-7	-3
11713E	-246	-215	-128	-78	-46	-29	-12	-6	-5
11738E	-221	-221	-172	-117	-76	-45	-17	-7	-8
11763E	-245	-236	-164	-108	-68	-36	-15	-8	-11
11788E	-171	-196	-179	-139	-100	-54	-21	-11	-12
11813E	-161	-183	-166	-129	-88	-44	-17	-10	-14
11838E	-73	-150	-170	-150	-103	-50	-17	-10	-15
11863E	-25	-130	-168	-158	-115	-55	-20	-10	-15
11888E	-20	-83	-105	-113	-95	-53	-23	-10	-14
11913E	-43	-58	-83	-100	-98	-63	-25	-10	-14
11938E	53	9	-53	-93	-98	-68	-30	-11	-14
11963E	60	5	-70	-103	-103	-73	-35	-13	-13
11988E	-14	-67	-104	-118	-106	-71	-35	-14	-13
12013E	-100	-116	-127	-124	-106	-69	-33	-12	-13
12038E	-65	-88	-104	-104	-94	-65	-33	-13	-12
12063E	-61	-85	-92	-90	-78	-53	-27	-10	-12
12088E	-71	-98	-107	-102	-89	-56	-27	-9	-11
12113E	-63	-85	-92	-90	-77	-50	-25	-8	-10
12138E	-80	-104	-116	-110	-92	-60	-28	-12	-10
12163E	-76	-91	-99	-89	-70	-43	-20	-7	-9

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
12188E	-48	-76	-92	-89	-73	-46	-22	-8	-9
12213E	-51	-79	-95	-94	-75	-43	-19	-8	-8
12238E	-76	-108	-122	-116	-88	-47	-20	-8	-7
12263E	-52	-85	-97	-89	-66	-34	-13	-6	-7
12288E	-64	-95	-100	-89	-62	-29	-13	-7	-7
12313E	-92	-108	-106	-88	-56	-29	-13	-6	-5
12338E	-106	-105	-91	-65	-38	-22	-9	-6	-4
12363E	-109	-100	-76	-50	-30	-13	-7	-6	-4
12388E	-85	-77	-56	-37	-24	-11	-8	-6	-3
12413E	-95	-76	-53	-33	-18	-11	-9	-5	-3
12438E	-89	-72	-51	-34	-19	-11	-6	-4	-1
12463E	-75	-53	-32	-21	-11	-6	-5	-2	0

Line 20000N, Separation 75 metres, Survey date 2/8/82

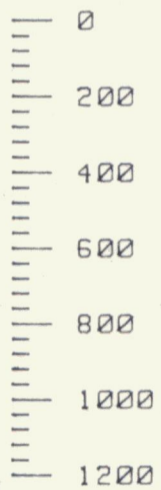
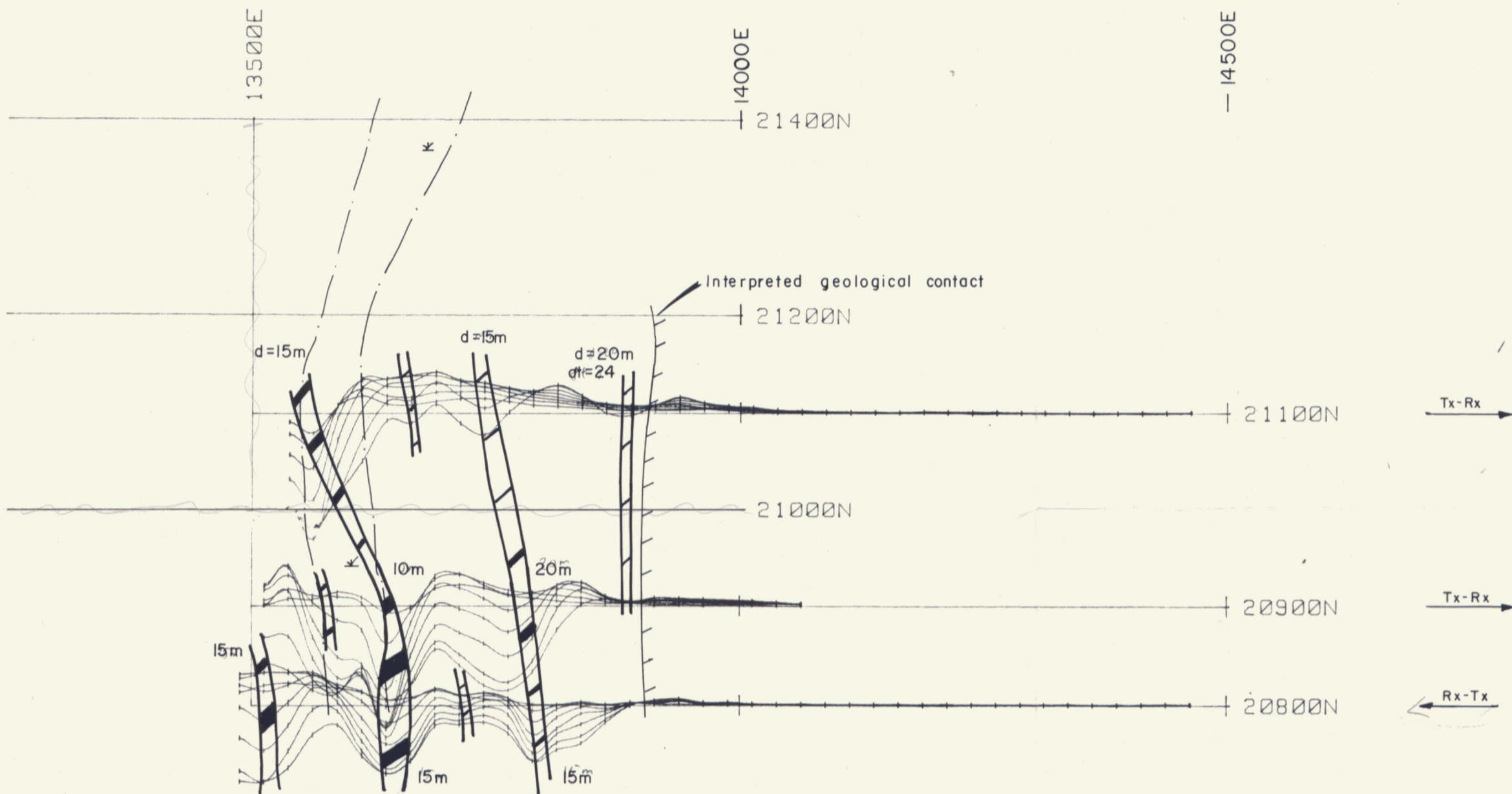
11638E	-103	-105	-85	-61	-40	-23	-13	-6	0
11663E	-96	-97	-81	-59	-38	-22	-12	-4	1
11688E	-55	-68	-63	-47	-32	-20	-9	-5	0
11713E	-107	-117	-93	-67	-42	-23	-12	-7	-1
11738E	-82	-104	-87	-63	-42	-23	-10	-5	-3
11763E	-112	-120	-95	-65	-44	-24	-11	-5	-4
11788E	-118	-129	-102	-68	-40	-22	-11	-6	-4
11813E	-119	-140	-115	-77	-48	-26	-13	-8	-5
11838E	-93	-123	-108	-73	-47	-26	-12	-7	-7
11863E	13	-43	-58	-48	-32	-18	-9	-4	-7
11888E	-69	-98	-91	-69	-46	-26	-11	-6	-7
11913E	-145	-161	-134	-92	-58	-26	-11	-5	-7
11938E	-126	-131	-117	-89	-57	-31	-17	-9	-6
11963E	-136	-132	-108	-81	-53	-27	-14	-8	-8
11988E	-104	-106	-93	-70	-46	-24	-12	-6	-8
12013E	-103	-105	-90	-68	-41	-24	-11	-6	-8
12038E	-100	-96	-79	-60	-38	-21	-11	-6	-8
12063E	-98	-98	-85	-63	-46	-24	-12	-7	-8
12088E	-90	-92	-85	-69	-51	-31	-14	-7	-8
12113E	-115	-118	-111	-91	-64	-38	-16	-7	-8
12138E	-108	-112	-110	-94	-71	-41	-20	-10	-8
12163E	-115	-119	-117	-102	-77	-47	-21	-11	-7
12188E	-108	-115	-115	-106	-85	-50	-27	-8	-7
12213E	-74	-93	-102	-98	-81	-51	-28	-12	-6
12238E	-93	-120	-133	-124	-111	-71	-38	-13	-6
12263E	-83	-112	-129	-129	-121	-83	-43	-12	-5
12288E	-102	-122	-140	-140	-129	-89	-44	-13	-5
12313E	-93	-125	-148	-153	-148	-105	-55	-15	-4
12338E	-46	-86	-114	-129	-126	-86	-43	-11	-4
12363E	-38	-79	-111	-119	-111	-65	-32	-8	-3
12388E	-41	-73	-105	-121	-117	-73	-32	-6	-3
12413E	-97	-109	-121	-121	-99	-55	-20	-4	-2
12438E	-122	-127	-125	-109	-76	-34	-10	-4	-1
12463E	-106	-111	-108	-86	-57	-26	-9	-5	0

Line 19800N, Separation 75 metres, Survey date 2/8/82

11713E	-126	-123	-96	-64	-40	-19	-11	-4	15
11738E	-113	-117	-102	-78	-54	-31	-17	-7	14
11763E	-104	-102	-89	-70	-50	-30	-13	-7	14
11788E	-152	-143	-112	-83	-57	-33	-17	-10	13
11813E	-118	-112	-93	-75	-53	-32	-14	-7	12

STATION	V1	V2	V3	V4	V5	V6	V7	V8	ELV
11838E	-107	-104	-88	-70	-53	-35	-16	-7	8
11863E	-124	-113	-91	-73	-51	-29	-13	-7	6
11888E	-117	-114	-98	-81	-60	-33	-14	-7	6
11913E	-128	-125	-105	-85	-60	-35	-15	-10	3
11938E	-104	-109	-98	-78	-55	-31	-15	-9	3
11963E	-97	-108	-92	-68	-50	-27	-13	-7	2
11988E	-92	-102	-88	-64	-40	-24	-12	-6	1
12013E	-108	-108	-84	-59	-39	-20	-9	-5	1
12038E	-121	-125	-104	-77	-50	-29	-13	-6	0
12063E	-128	-121	-91	-63	-42	-25	-11	-7	0
12088E	-173	-121	-80	-52	-31	-16	-8	-4	0
12113E	-180	-142	-96	-65	-42	-22	-11	-7	2
12138E	-126	-120	-96	-69	-44	-24	-11	-7	1
12163E	-47	-75	-72	-58	-39	-22	-11	-8	0
12188E	-46	-97	-100	-83	-57	-34	-17	-11	-1
12213E	-97	-127	-119	-95	-65	-38	-16	-8	-1
12238E	-138	-138	-122	-92	-59	-32	-14	-5	-1
12263E	-132	-130	-113	-85	-57	-32	-11	-6	-1
12288E	-104	-101	-87	-69	-48	-24	-10	-6	-1
12313E	-82	-88	-86	-70	-53	-26	-12	-5	-1
12338E	-75	-90	-92	-84	-64	-33	-11	-3	-1
12363E	-83	-100	-104	-94	-71	-33	-13	-6	-1
12388E	-83	-94	-94	-83	-59	-28	-9	-4	-1
12413E	-102	-104	-100	-80	-52	-26	-8	-6	-1
12438E	-84	-84	-79	-62	-40	-19	-8	-3	-1
12463E	-109	-104	-91	-69	-44	-16	-5	-2	0

A total of 450 stations were occupied, some 11.0 kilometres of line coverage on 12 lines.

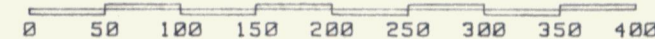


SCALE  
P.P.K.

KEY

- Conductor axis:
- Claim boundary:
- Claim post:
- Fault:
- Geological contact:

METRES



001119

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& SERVICES LTD.

INSTRUMENT: CRONE P.E.M.

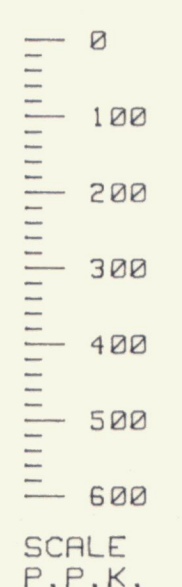
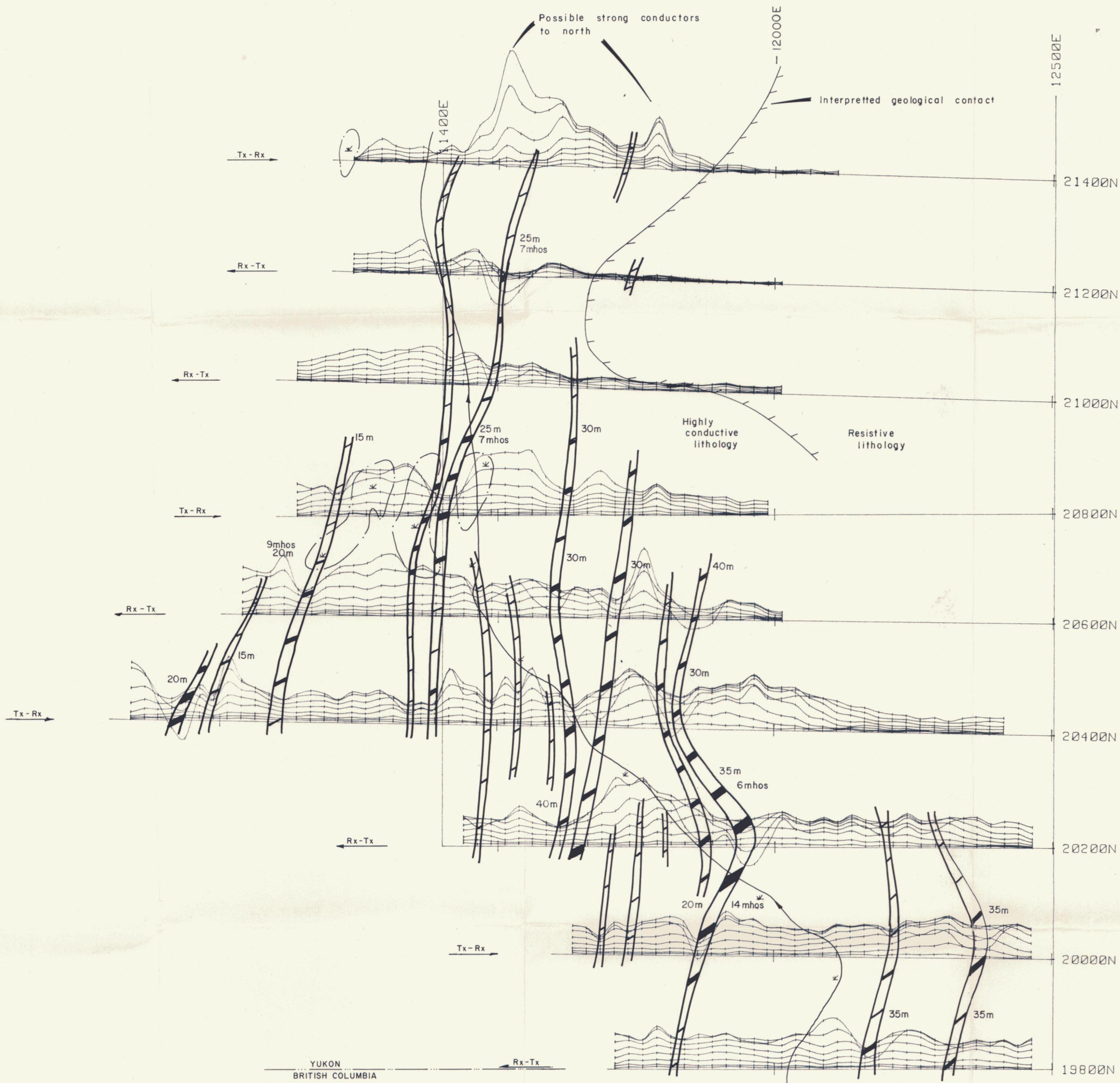


To accompany Geophysical Report on Survey Creek Grid

CORDILLERAN ENGINEERING  
SURVEY CREEK GRID  
HORIZONTAL LOOP SURVEY  
SEPARATION: 75 METRES

DATE: AUG/82

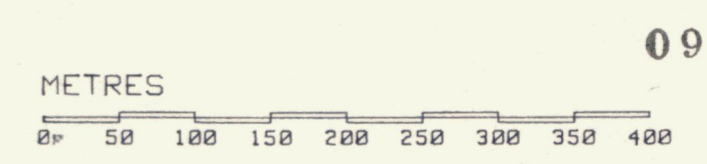
FIG.: 2A



SCALE  
P.P.K.

KEY

- Conductor axis:
- Claim boundary:
- Claim post:
- Fault:
- Geological contact:



091118

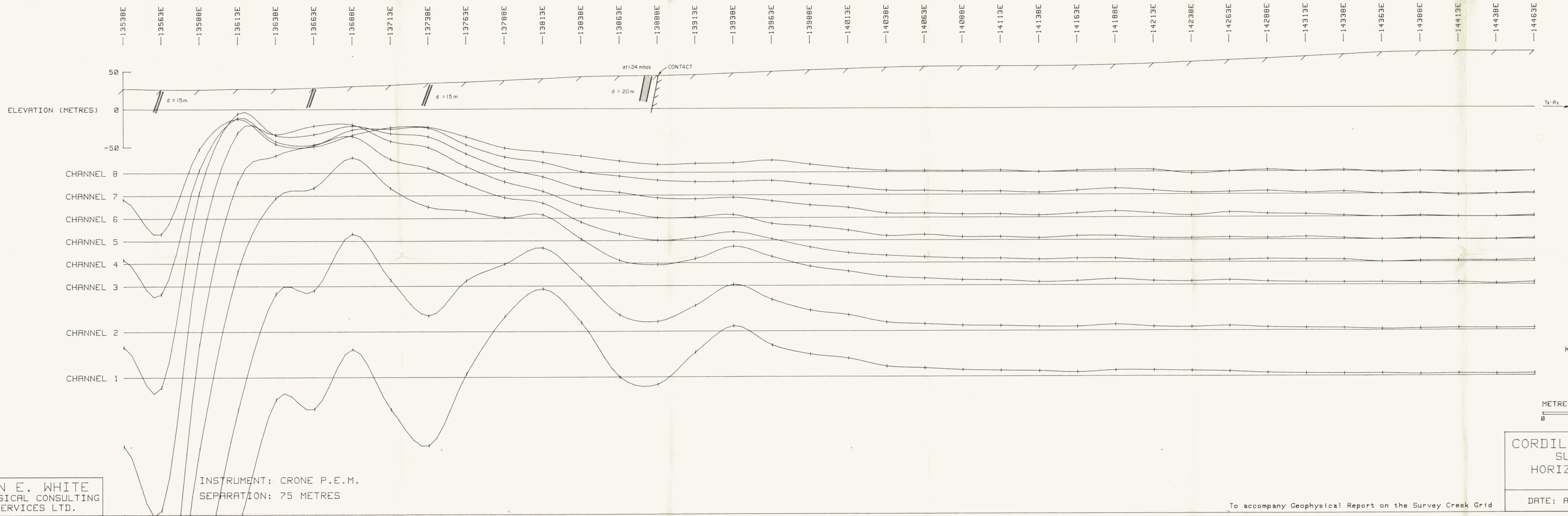


INSTRUMENT CRONE P.E.M.

CORDILLERAN ENGINEERING BIG SWAMP GRID HORIZONTAL LOOP SURVEY SEPARATION: 75 METRES	
DATE: AUG/82	FIG.: 2B

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& SERVICES LTD.

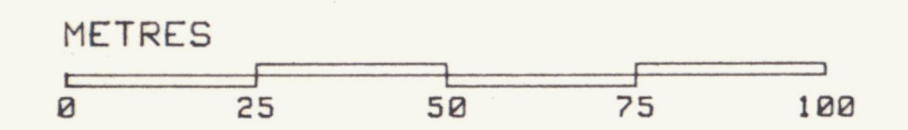
To accompany Geophysical Report on the Big Swamp Grid



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GEOPHYSICAL CONSULTING  
& SERVICES LTD.

INSTRUMENT: CRONE P.E.M.  
SEPARATION: 75 METRES

KEY  
Conductor axis: 



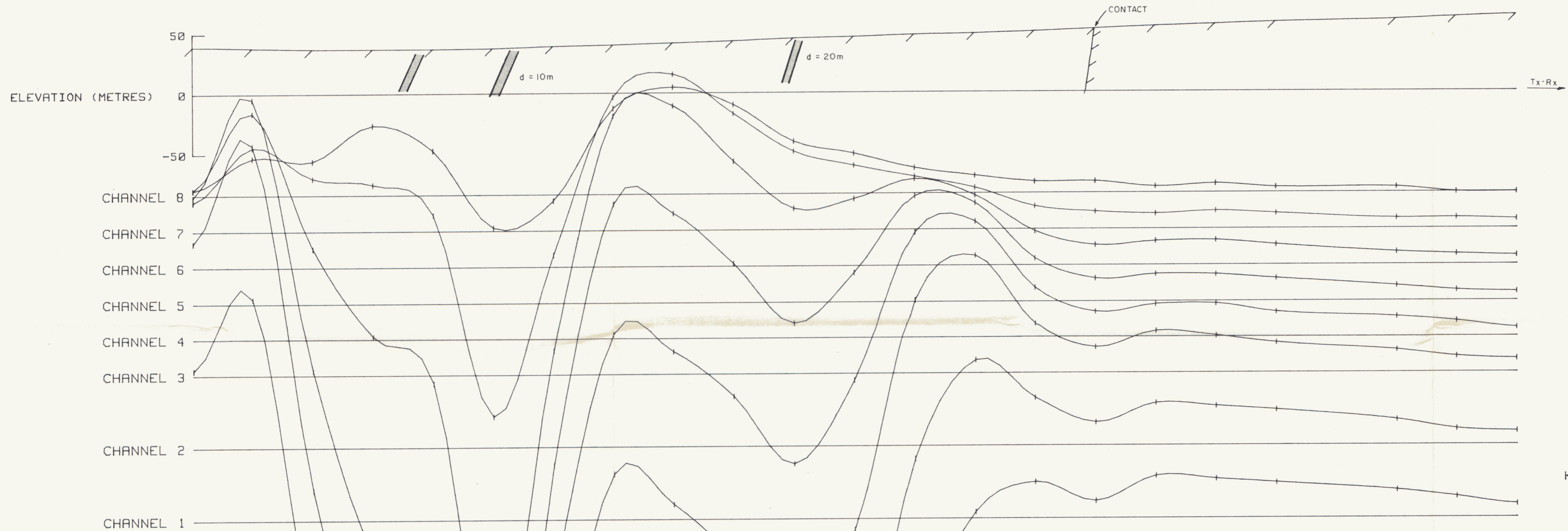
CORDILLERAN ENGINEERING  
SURVEY CREEK GRID  
HORIZONTAL LOOP SURVEY  
LINE 21100N

DATE: AUG/82

FIG.: 3

To accompany Geophysical Report on the Survey Creek Grid

—13513E —13538E —13563E —13588E —13613E —13638E —13663E —13688E —13713E —13738E —13763E —13788E —13813E —13838E —13863E —13888E —13913E —13938E —13963E —14013E —14038E —14063E



0  
20  
40  
60  
80  
100  
120  
SCALE  
P.P.K.

GLEN E. WHITE  
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& SERVICES LTD.

INSTRUMENT: CRONEY P.E.M.  
SEPARATION: 75 METRES

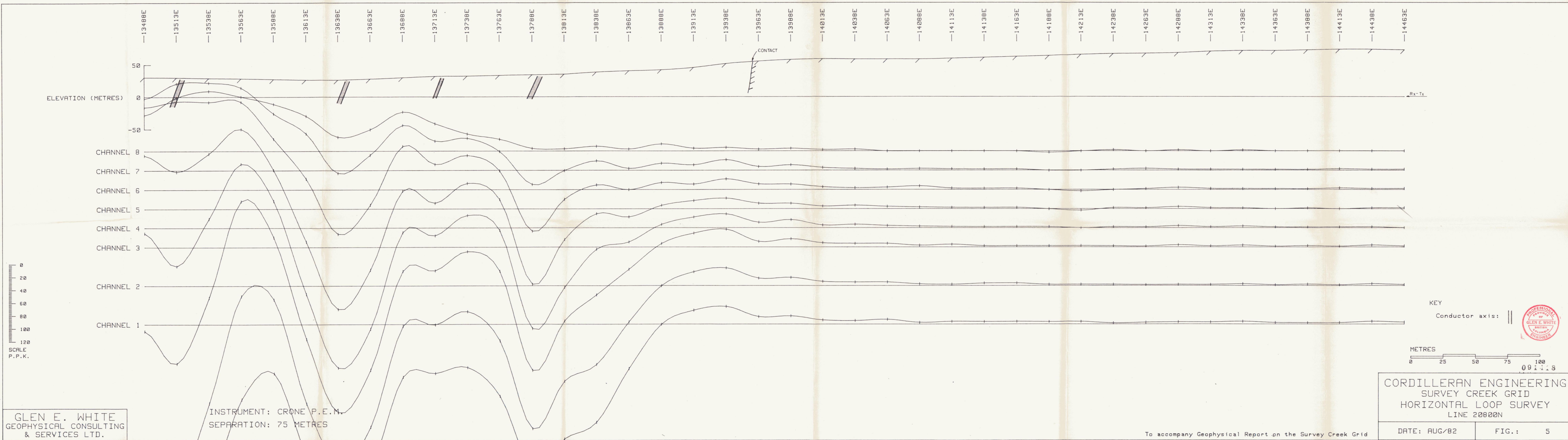
To accompany Geophysical Report on the Survey Creek Grid

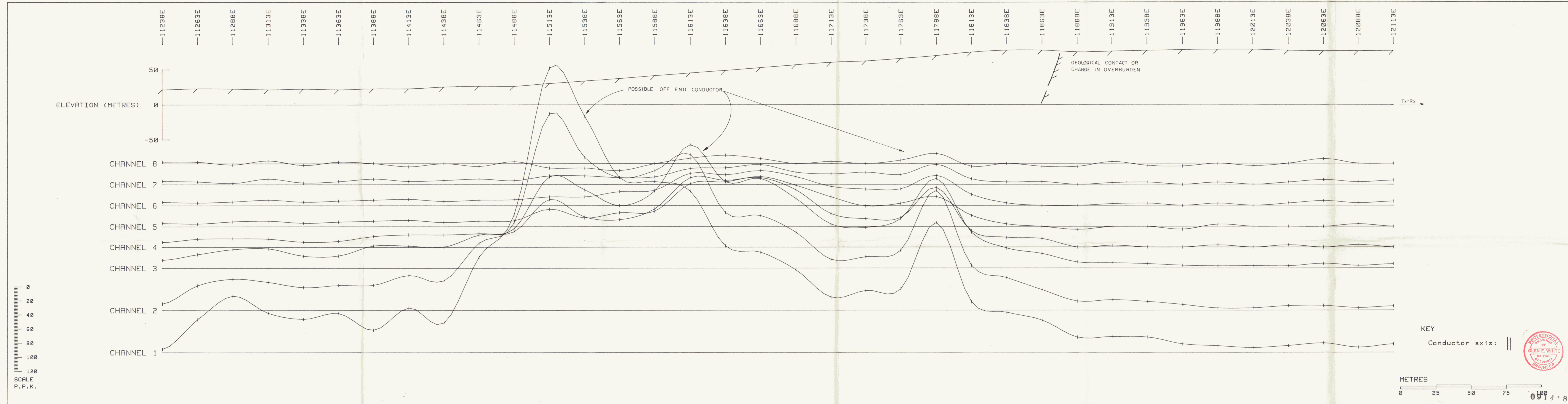
CORDILLERAN ENGINEERING  
SURVEY CREEK GRID  
HORIZONTAL LOOP SURVEY  
LINE 20900N

DATE: AUG/82

FIG.: 4







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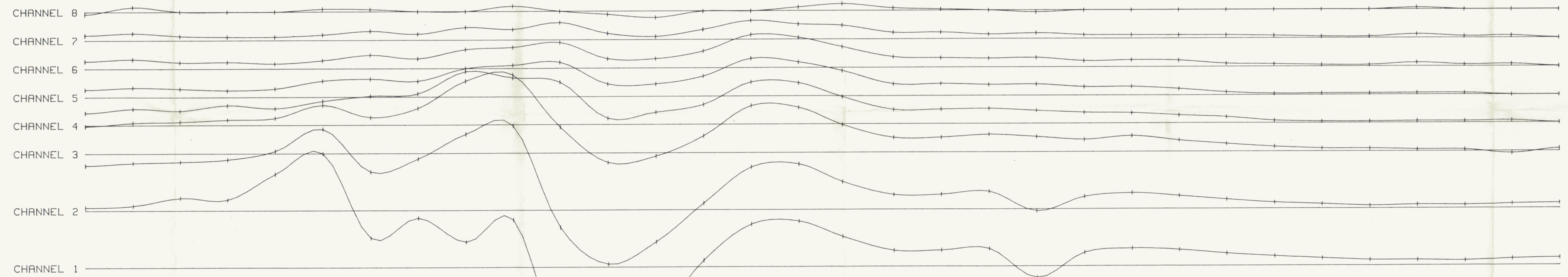
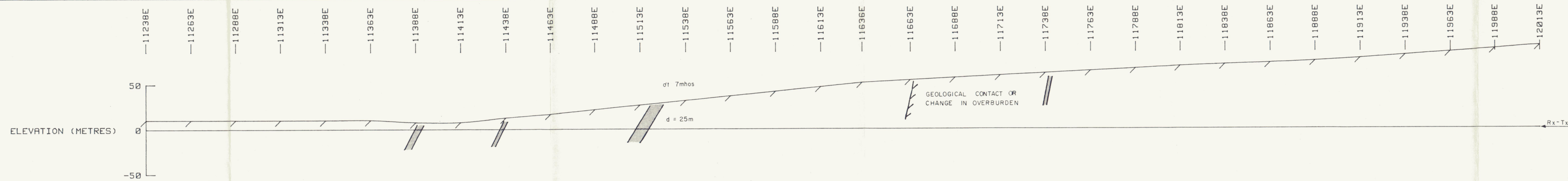
INSTRUMENT: CRONE P.E.M.  
 SEPARATION: 75 METRES

CORDILLERAN ENGINEERING  
 BIG SWAMP GRID  
 HORIZONTAL LOOP SURVEY  
 LINE 21400N

DATE: AUG/82      FIG.: 6

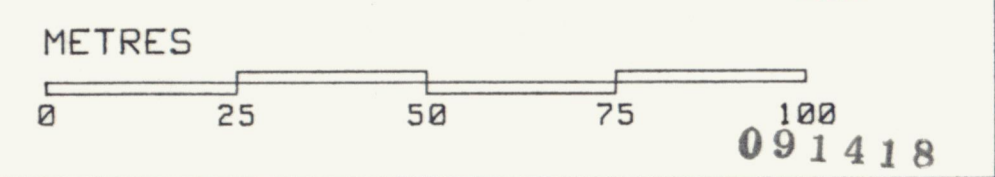
To accompany Geophysical Report on the Big Swamp Grid





0  
20  
40  
60  
80  
100  
120  
SCALE  
P.P.K.

KEY  
Conductor axis: ||



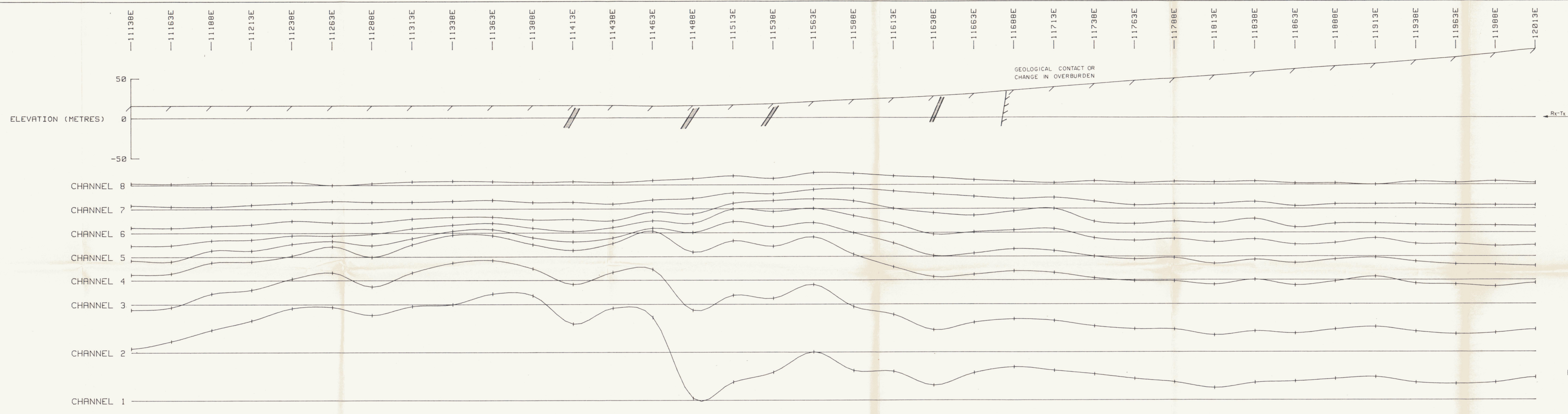
INSTRUMENT: CRONE P.E.M.  
SEPARATION: 75 METRES

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GEOPHYSICAL CONSULTING  
& SERVICES LTD.

CORDILLERAN ENGINEERING  
BIG SWAMP GRID  
HORIZONTAL LOOP SURVEY  
LINE 21200N

DATE: AUG/82      FIG.: 7

To accompany Geophysical Report on the Big Swamp Grid



0  
20  
40  
60  
80  
100  
120  
SCALE  
P.P.K.

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& SERVICES LTD.

INSTRUMENT: CRONE P.E.M.  
SEPARATION: 75 METRES

KEY  
Conductor axis: ||

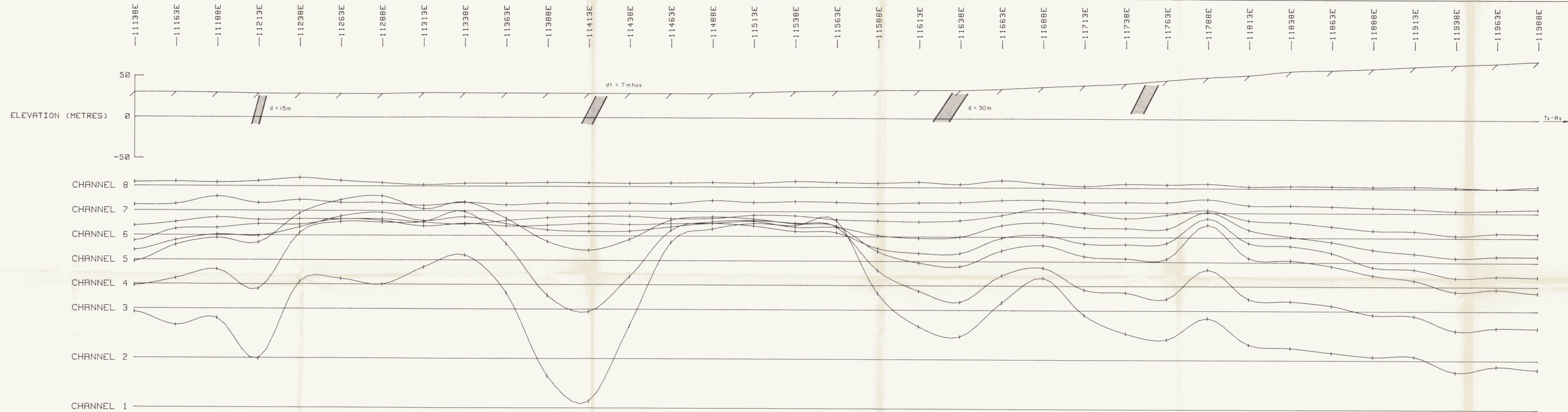


CORDILLERAN ENGINEERING  
BIG SWAMP GRID  
HORIZONTAL LOOP SURVEY  
LINE 21000N

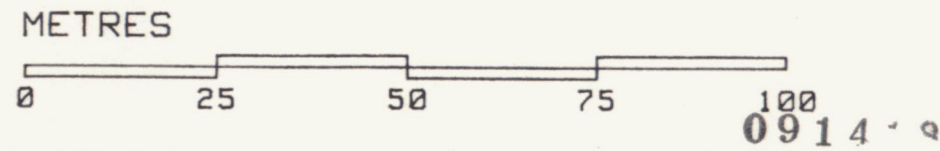
DATE: AUG/82

FIG.: 8

To accompany Geophysical Report on the Big Swamp Grid



KEY  
 Conductor axis: ||



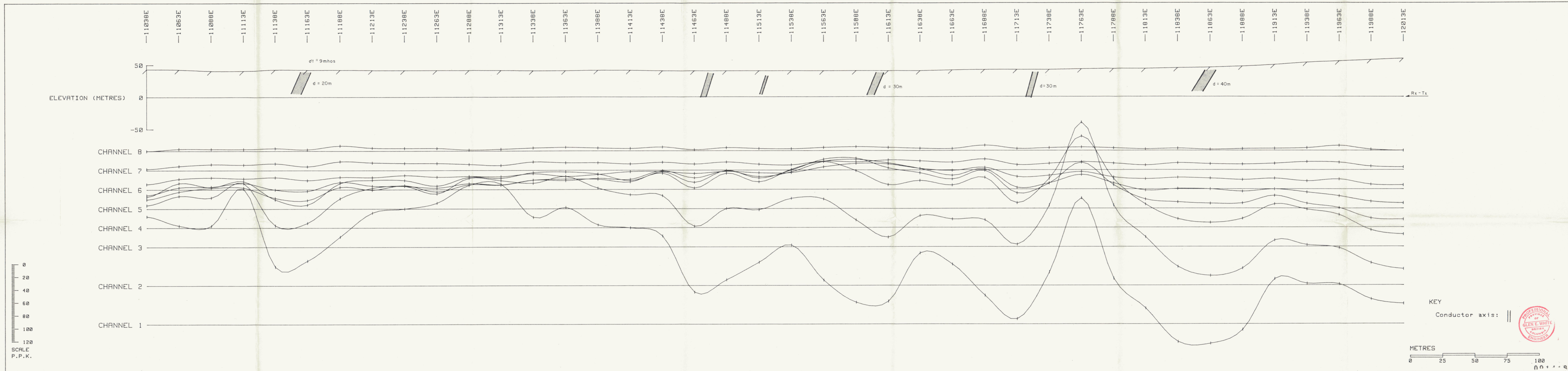
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INSTRUMENT: CRONE P.E.M.  
 SEPARATION: 75 METRES

CORDILLERAN ENGINEERING  
 BIG SWAMP GRID  
 HORIZONTAL LOOP SURVEY  
 LINE 20800N

DATE: AUG/82      FIG.: 9

To accompany Geophysical Report on the Big Swamp Grid



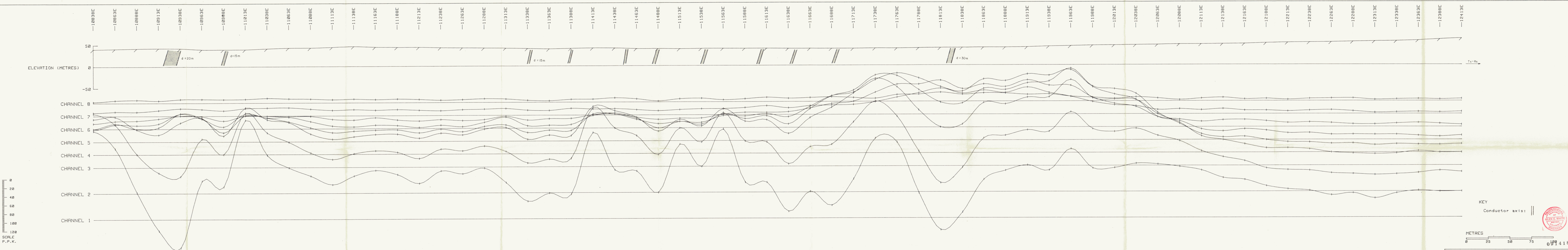
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INSTRUMENT: CRONE P.E.M.  
 SEPARATION: 75 METRES

To accompany Geophysical Report on the Big Swamp Grid

CORDILLERAN ENGINEERING BIG SWAMP GRID HORIZONTAL LOOP SURVEY LINE 20600N	
DATE: AUG/82	FIG.: 10





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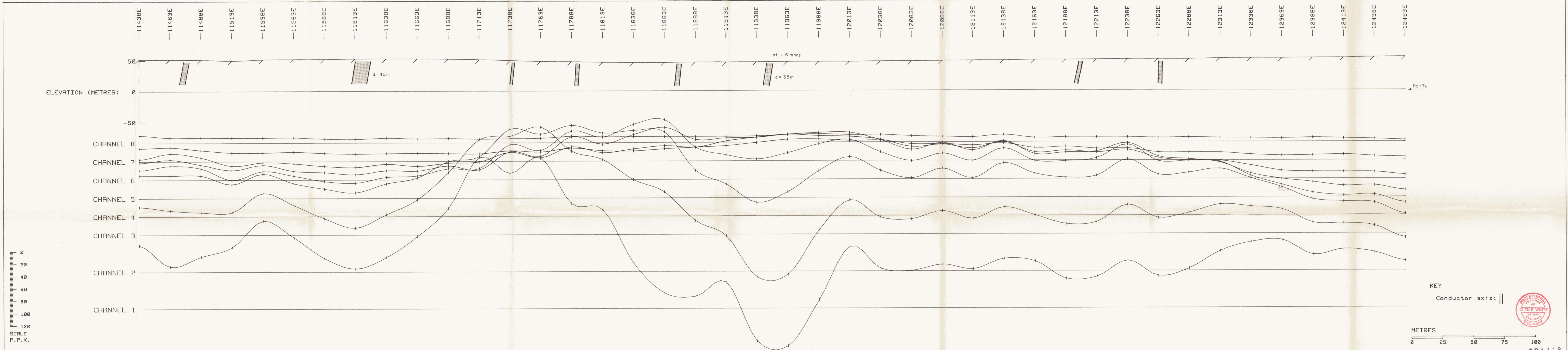
INSTRUMENT: CRONE P.E.M.  
SEPARATION: 75 METRES

To accompany Geophysical Report on the Big Swamp Grid

CORDILLERAN ENGINEERING  
BIG SWAMP GRID  
HORIZONTAL LOOP SURVEY  
LINE 20400N

DATE: AUG/82      FIG.: 11





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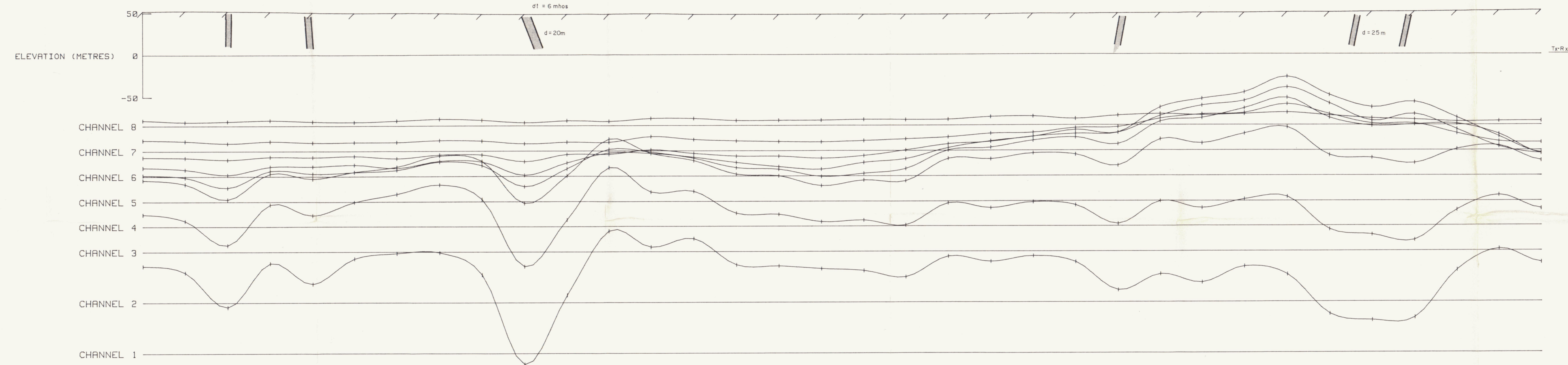
INSTRUMENT: CRONE P.E.M.  
 SEPARATION: 75 METRES

To accompany Geophysical Report on the Big Swamp Grid

CORDILLERAN ENGINEERING  
 BIG SWAMP GRID  
 HORIZONTAL LOOP SURVEY  
 LINE 20200N

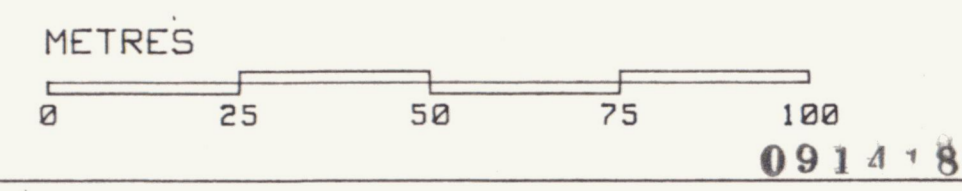
DATE: AUG/82      FIG.: 12

—11638E —11663E —11688E —11713E —11738E —11763E —11788E —11813E —11838E —11863E —11888E —11913E —11938E —11963E —11988E —12013E —12038E —12063E —12088E —12113E —12138E —12163E —12188E —12213E —12238E —12263E —12288E —12313E —12338E —12363E —12388E —12413E —12438E —12463E



0  
20  
40  
60  
80  
100  
120  
SCALE  
P.P.K.

KEY  
Conductor axis: ||



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GEOPHYSICAL CONSULTING  
& SERVICES LTD.

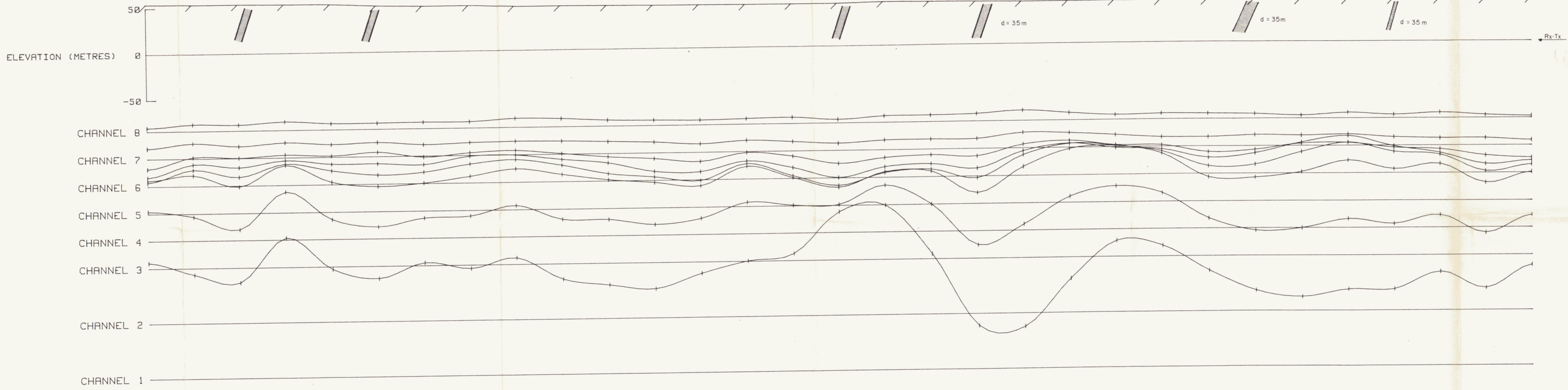
INSTRUMENT: CRONE P.E.M.  
SEPARATION: 75 METRES

CORDILLERAN ENGINEERING  
BIG SWAMP GRID  
HORIZONTAL LOOP SURVEY  
LINE 20000N

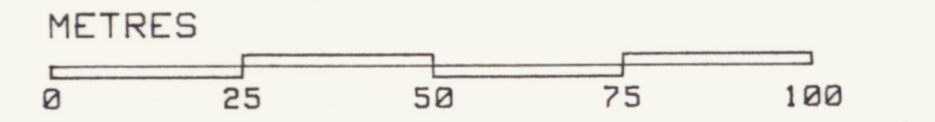
DATE: AUG/82 FIG.: 13

To accompany Geophysical Report on the Big Swamp Grid

—11713E —11738E —11763E —11788E —11813E —11838E —11863E —11888E —11913E —11938E —11963E —11988E —12013E —12038E —12063E —12088E —12113E —12138E —12163E —12188E —12213E —12238E —12263E —12288E —12313E —12338E —12363E —12388E —12413E —12438E —12463E



KEY  
Conductor axis: ||



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INSTRUMENT: CRONE P.E.M.  
SEPARATION: 75 METRES

To accompany Geophysical Report on the Big Swamp Grid

CORDILLERAN ENGINEERING  
BIG SWAMP GRID  
HORIZONTAL LOOP SURVEY  
LINE 19800N

DATE: AUG/82      FIG.: 14