HOMESTAKE MINING (CANADA) LTD.

GEOPHYSICAL REPORT ON A BOREHOLE PULSE EM SURVEY

TWIN PROJECT, BRITISH COLUMBIA

LATITUDE: 51°07'N
LONGITUDE: 119°56'W

AUTHOR: Dennis V. Woods, Ph.D., P.Eng.
Consulting Geophysicist

DATE OF WORK: 26 June - 31 July 1991
DATE OF REPORT: 20 August 1991

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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PART 2 OF 3

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ILLUSTRATIONS

INTRODUCTION:

During the period 26 June to 31 July 1991, a borehole pulse EM survey was carried out at the Twin Project in south-central British Columbia for Homestake Mining (Canada) Ltd. The survey was carried out in 4 drill holes with 1 to 3 separate passes in each hole using different positions of the transmitter loop. One drill hole (T91036) was re-surveyed using a smaller transmitter loop in six different positions. A Crone 2000 Watt Pulse EM system was used for all surveys.

The purpose of the borehole Pulse EM survey was to explore for economic mineral deposits in the vicinity of the holes and, in particular, to answer the following questions. 1) If no significant sulphide or graphitic mineralization is noted in the drill core, is there any indication of a conductor in the immediate vicinity of the hole and is it a worthwhile target for additional drilling? 2) If the drill hole intersected sulphide mineralization, is that mineralization representative of the main body of the conductive target or is there increased conductivity or thickness to one side of the hole? 3) If a conductive target is interpreted to one side of the drill hole, where is the conductor relative to the hole; i.e. where should the next hole be drilled?

The results of the survey are presented in this report along with a technical description of the borehole Pulse EM method, survey procedures, data presentation and interpretation procedures. The interpretation is based primarily on the borehole PEM results, augmented by drill core information where available.

SURVEY LOCATION AND ACCESS:

The Twin Project is located on the south side of Samatosum Mountain in the Adams Lake area about 70 kilometres north-northeast of Kamloops, B.C. (Figure 1). The property was accessed from Highway #5 at Barriere via the Agate Bay, Johnson Lake and Samatosum roads. Accommodation was obtained at the Johnson Lake Fishing Camp about 45 minutes from the property. (A recently constructed drill road behind Samatosum Mine provided more direct and shorter access to the drill sites across Minnova's property).

CRONE BOREHOLE PULSE EM SYSTEM:

The Crone borehole Pulse EM system is a time domain downhole EM instrument capable of detecting conductive mineralization intersected by the drill hole or lying off-hole. The borehole Pulse EM system utilizes a special downhole receiver coil, 600 or 1200 metre cable and winch in conjunction with a standard PEM transmitter and receiver normally employed in surface surveys.

The primary field is produced by a 150 by 150 metre square surface loop driven by the 500 watt PEM transmitter. Large loop surveys (i.e. up to 1000 metres) using the 2000 watt transmitter, and small loop surveys using the 10 metre diameter portable equipment, can be carried out depending on the depth and size of the expected conductive target.

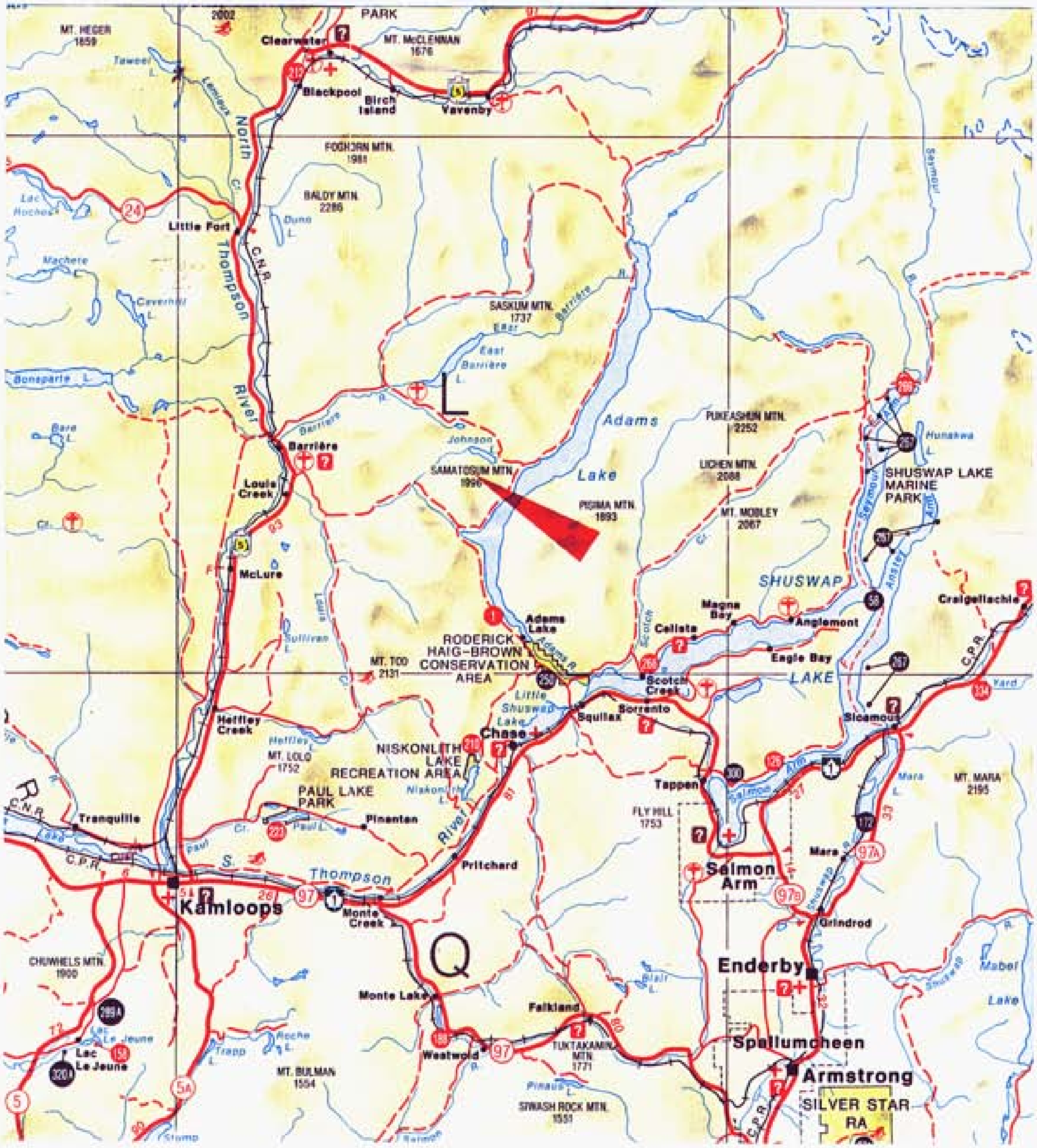


Figure 1.
Location Map - Twin Project
Homestake Mining (Canada) Ltd.

The time derivative of the secondary EM field is measured using an axial receiver coil lowered down the diamond drill hole. The minimum size of drill hole which can be accommodated is AQ (1.75" diameter). The receiver measures eight samples of the secondary field during the primary field off-time. Sample times range from 0.15 to 6.4 ms after primary field shut-off on a 10.8 ms transmitter time base.

Multiple transmitter loops may be used to provide various primary field to conductor coupling geometries in order to obtain conductor attitude and position information. A complete survey of a given drill hole may entail logging the hole from five transmitter loop setups. One of these loops would be approximately centred over the depth of interest with the remaining four loops away from and distributed around this central loop.

When an anomalous response is observed in a borehole log from a single transmitter loop, the nature of this anomaly allows the determination of the location of the conductive source relative to the drill hole. As shown by Woods and Crone (1980, Figs. 7 & 8), the response can indicate whether the borehole is intersecting the centre of the conductor, the margin of a conductor, with the bulk of conductive material away from the hole, or whether the conductor is entirely off-hole.

Model type curves for various conductor to borehole geometries from Woods (1975) and primary field vector diagrams from Macnae (1980) are employed in the interpretation. Quantitative analysis of the conductor's attitude, position and conductance is made using nomograms presented by Woods, et al. (1980). Computer plate modelling, using the routines developed by Dyck, et al (1980), can be used to confirm the interpretation.

In the case of a dike-like or tabular conductor, the magnitude of an anomaly varies with the angle that the primary field cuts the conductor. Thus, the change in coupling between the conductor and the primary field from different transmitter loop setups, will provide information on the attitude and position of the conductive mineralization.

If the conductor tends towards a more spheroidal shape, the shape as well as the magnitude of the anomaly will change as the primary field direction is altered. This occurs because the eddy currents are not constrained to flow within a single plane but rather tend to circulate perpendicular to the primary field direction. Thus, multiple transmitter loop coverage can also provide information about the shape of a conductive body.

In practice the responses observed in field situations are much more complex than those of simple models, but the results are sufficiently interpretable that the method has general acceptance and a number of discovery case histories exist.

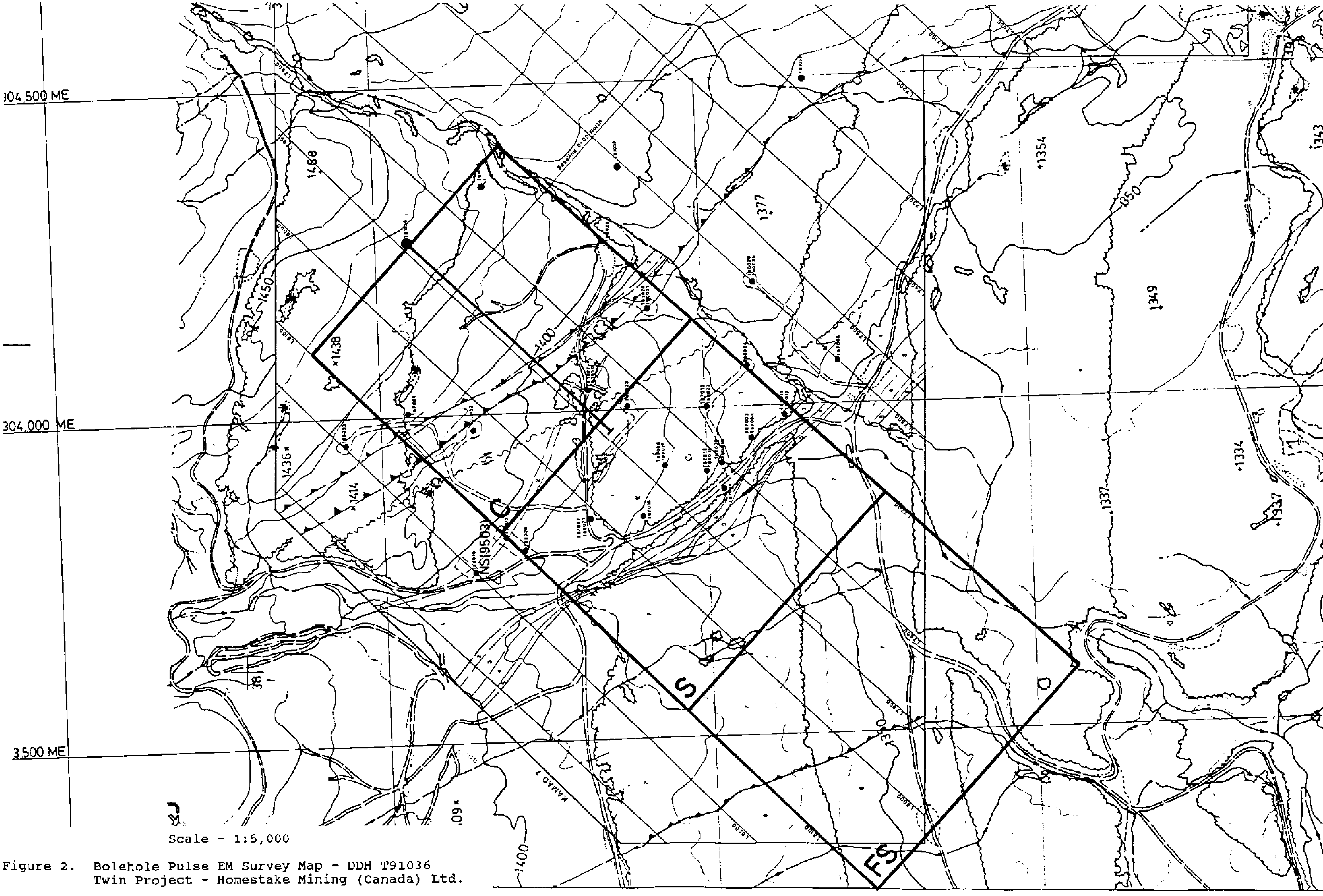
SURVEY PROCEDURE:

The borehole PEM surveys were carried out using a 2000 watt Crone PEM system. Deep holes (i.e. greater than 600 m) were surveyed using 400 m by 400 m transmitter loops while shallower surveys utilized 200 m square loops. The transmitter generated from 5 to 9 amps in the loops depending on the size of the transmitter loop and the grade of the loop wire. Loop locations for each separate drill hole are shown in Figures 2 to 6 and all surveys are listed below in Table 1.

Table 1 Borehole Pulse EM Survey

Hole	Location	Attitude	Depth (m)	Tx Loop	Survey (m)	Length (m)
T91036	-78+80E/-1+05N	225°/-89°(-45°)	1050	C	20 to 995	975
				S	20 to 995	975
				FS	20 to 996	976
T91036	-78+80E/-1+05N	225°/-89°(-45°)	1050	C	20 to 400	380
(Upper Section Only)				N	20 to 400	380
				S	60 to 400	340
				FS	60 to 400	340
				FSE	40 to 400	360
				FSW	40 to 400	360
T91037	-76+10E/-0+60S	225°/-80°(-57°)	865	C	20 to 269	249
T91038	-72+80E/-1+75S	225°/-80°(-42°)	1000	C	20 to 500	480
(Upper Section Only)				S	20 to 500	480
T91039	-77+50E/-0+75N	225°/-80°(-65°)	360	C	20 to 196	176
				total		6,471

Holes were surveyed from just below the casing at 5 to 10 m intervals depending on how rapidly the secondary response changed with depth. All holes were lined with plastic pipe as described by Woods (1990). T91036 was surveyed to the bottom of the hole using 400 m square loops. The upper section of this hole was then re-surveyed using 200



Scale - 1:5,000

Figure 2. Bolehole Pulse EM Survey Map - DDH T91036
Twin Project - Homestake Mining (Canada) Ltd.

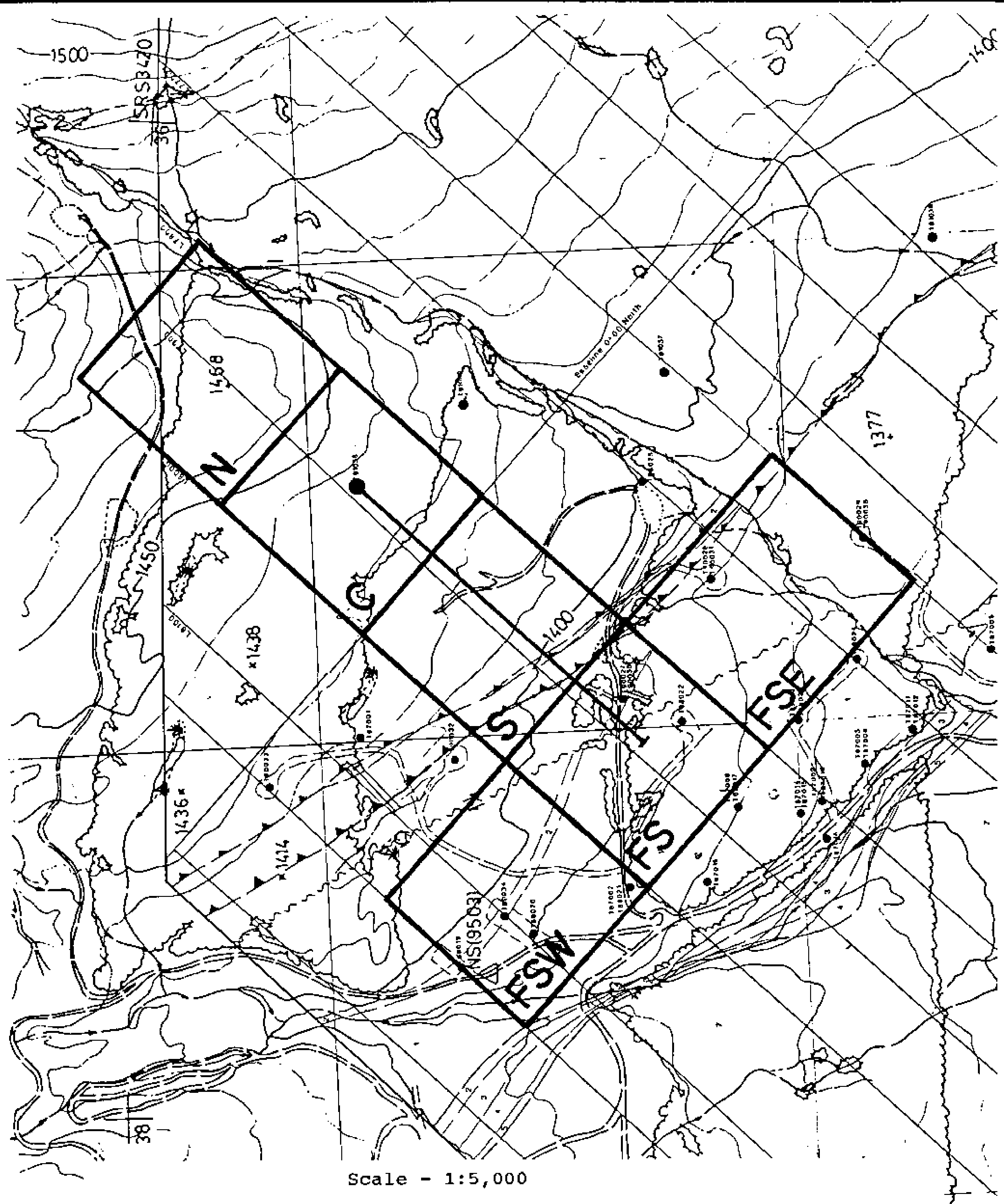


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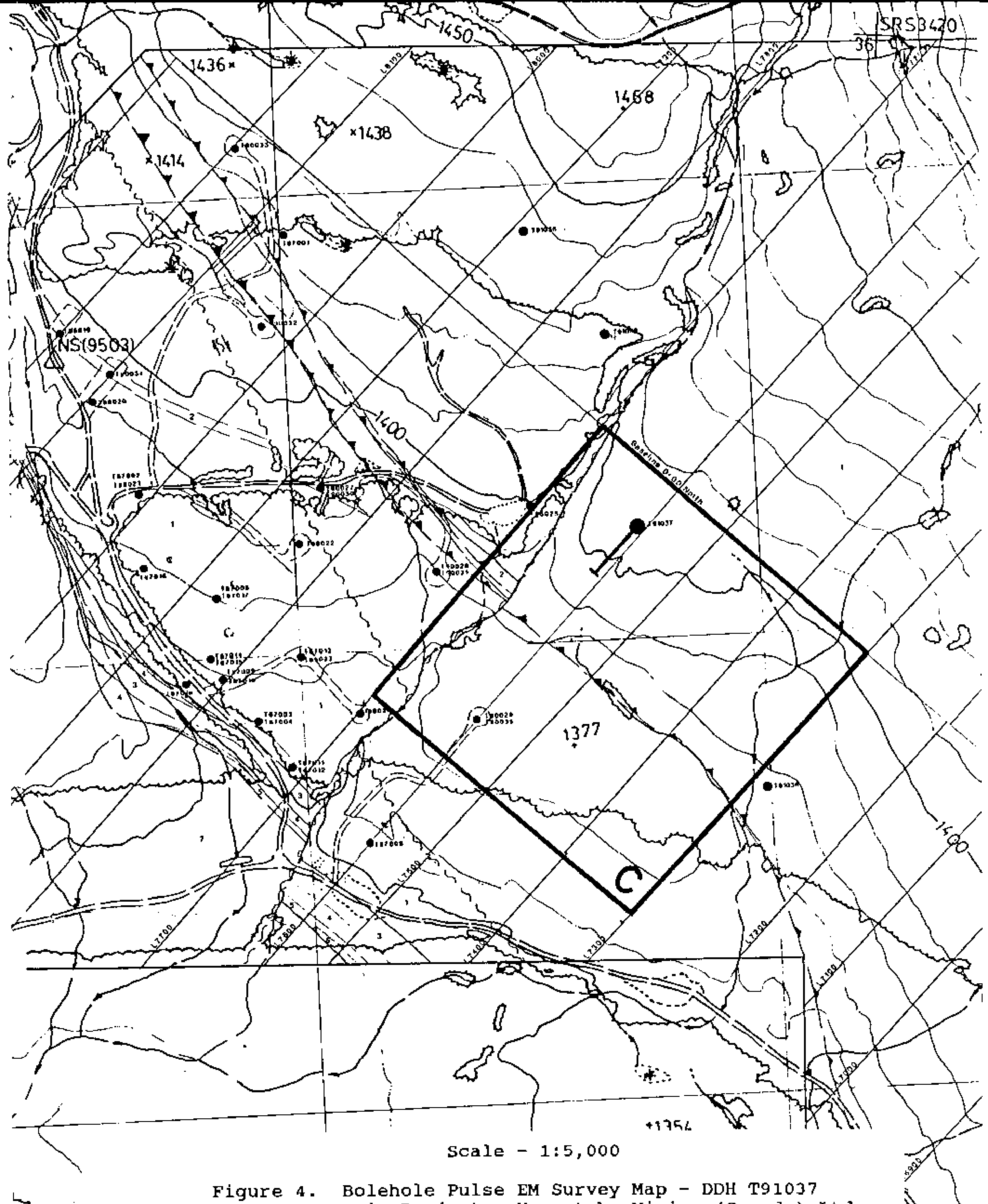
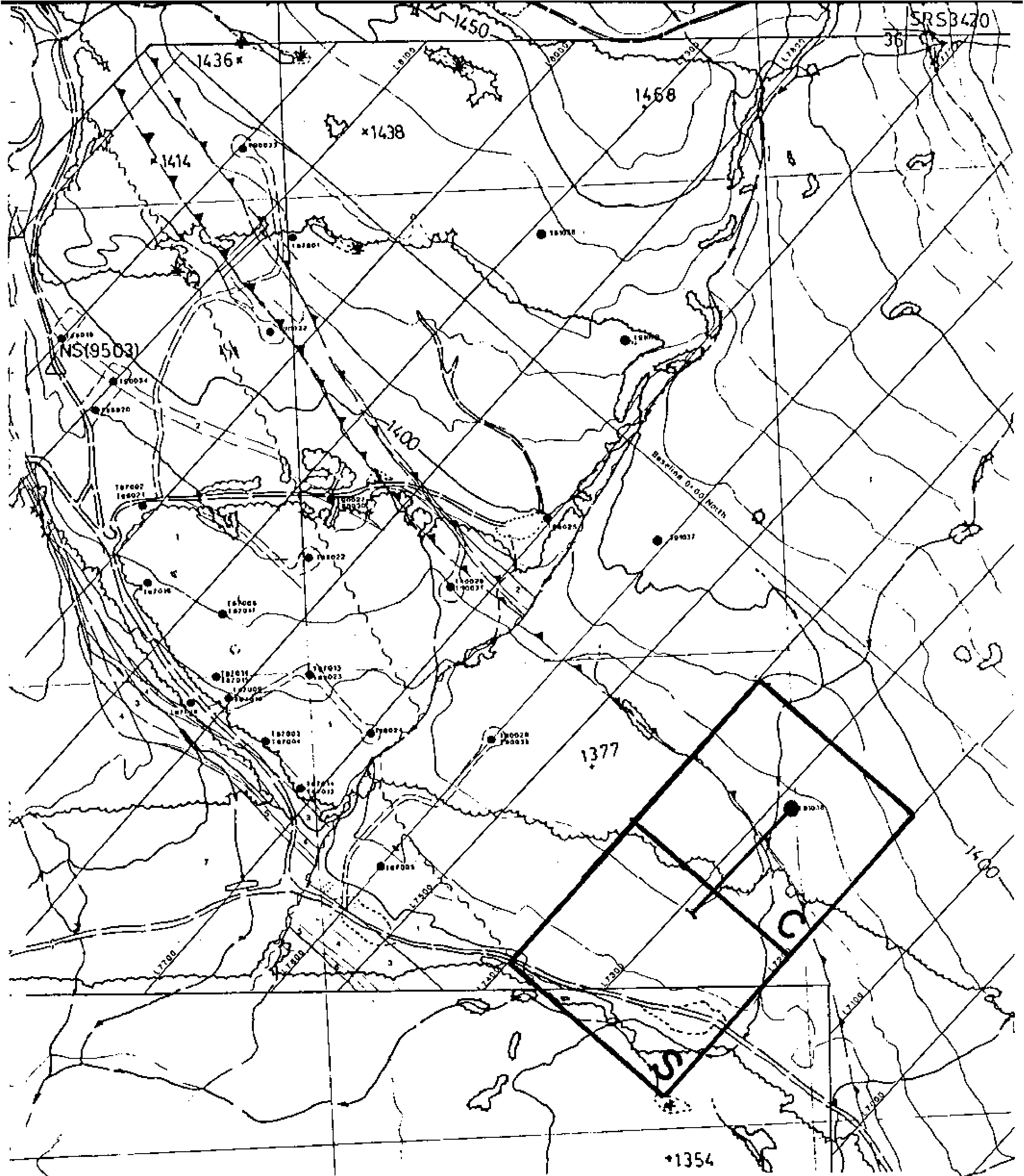
Figure 3. Bolehole Pulse EM Survey Map - DDH T91036 (Upper Section)
Twin Project - Homestake Mining (Canada) Ltd.



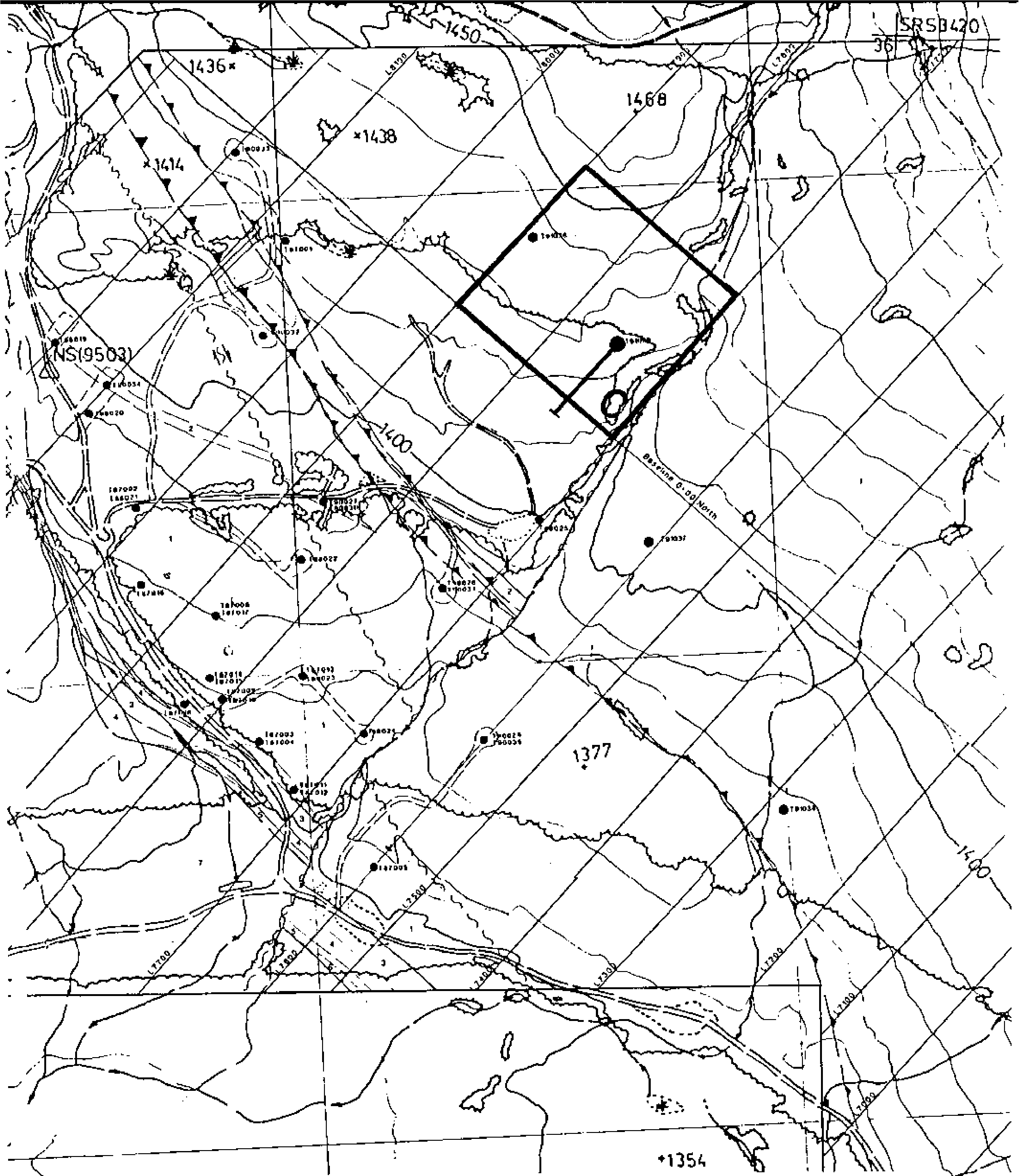
Scale - 1:5,000

Figure 4. Bolehole Pulse EM Survey Map - DDH T91037
Twin Project - Homestake Mining (Canada) Ltd.



Scale - 1:5,000

Figure 5. Bolehole Pulse EM Survey Map - DDH T91038
Twin Project - Homestake Mining (Canada) Ltd.



Scale - 1:5,000

Figure 6. Bolehole Pulse EM Survey Map - DDH T91039
Twin Project - Homestake Mining (Canada) Ltd.

m square loops. Only the upper 500 m of T91038 was surveyed using the 200 m square loops since there was less interest in the bottom portions of the hole. T91037 and T91039 were blocked at shallow depth due to breakage or jamming at the joins of the plastic pipe.

Secondary fields were measured with the receiver on maximum gain, except where the response was greater than 1000 units in which case the gain was decreased by one-half or one-quarter and the reading was then increased by the same factor. The Crone borehole Pulse EM system measures only the axial component in the drill hole. Time synchronization between transmitter and receiver was obtained using a direct cable link.

DATA PRESENTATION:

The borehole PEM survey results are shown in Profiles 1 to 13 at the back of the report. There is a separate plot for each drill hole and transmitter loop combination and each profile is plotted twice: a) linear amplitude scale, and b) logarithmic amplitude scale. The data are plotted as recorded on constant receiver gain.

The linear amplitude plots are arranged with the primary field strength across the top, the first four channels of secondary response combined on one amplitude axis in the centre, and the last four channels combined on a separate and expanded amplitude axis along the bottom. The amplitude axes are arbitrarily set to expand the data to maximum size to a limit of 4 PEM units per cm.

The logarithmic amplitude plots are in the standard format and size originally adopted by Woods (1975). This plotting procedure enhances resolution since small anomalies can be plotted on the same profile as large amplitude responses. It also facilitates direct comparison of anomalies from different transmitter loops, and to scale model type curves.

INTERPRETATION PROCEDURES:

The discussion of the borehole Pulse EM results is primarily a qualitative analysis of the profile plots based on past experience and aided by scale model studies (Woods, 1975) and primary field vector plots (Macnae, 1980). Quantitative interpretations are made using the nomograms from Woods, et al. (1980) and the conductance formulae given by Gallagher, et al. (1985).

DISCUSSION OF RESULTS:

T91036

T91036 was initially surveyed using three 400 m by 400 m transmitter loops. The results are shown in Profiles 1 to 3. In addition to a background response due to regional EM induction in the conductive formations in the general vicinity of the holes (Woods, 1991), there are two anomalies in the profiles: a 4-5 channel anomaly centred at a depth of 280-290 m, and an 8 channel anomaly centred at a depth of

910-920 m. The strong background response, which tends to parallel the primary field, partially distorts and obscures these anomalies, especially with the collar transmitter loop.

The deep anomaly can be seen to have the typical shape of that due to a large, off-hole conductor. The interpretation is shown graphically in Figure 7. The conductor is interpreted to be about 80 m from the hole and offset to the grid south, since the south loop produces the greatest response (see Figure 7b). It must be dipping at less than 40° to the north since it produces a weak, positive response with the far south loop (see Figure 7c). The conductor is probably greater than 250 m wide and has a conductivity-thickness product (i.e. conductance) of order 30 mhos.

The upper anomaly appears to have a more unusual form consisting of symmetric negative and positive peaks. This type of anomaly could be caused by variety of conductor geometries, but since it appears to maintain its shape regardless of primary field direction (except for the collar loop where the strong background response has almost entirely obscured the anomaly), it has been interpreted to be due to a small, plate-like conductor lying almost parallel to the hole (Figure 7). To more precisely define the shape and location of the conductor causing the anomaly in the upper section of T91036, the hole was re-surveyed using a set of 200 m square transmitter loops. The results from these surveys are shown in Profiles 4 to 9.

The anomaly from the 200 m loop surveys is a much lower amplitude, 2-3 channel response, than the 4-5 channel anomaly generated by the

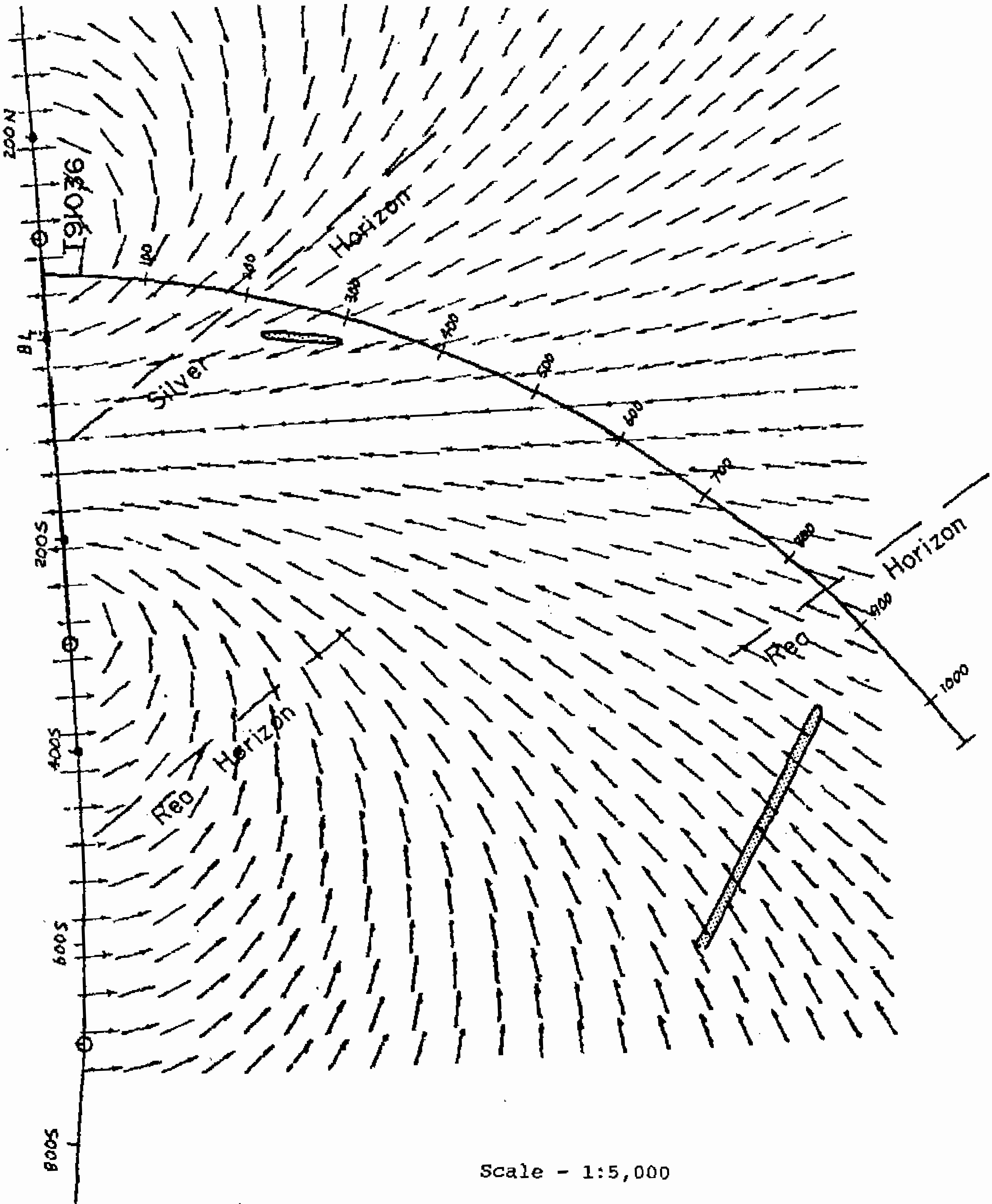


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Figure 7a. Interpretation Section
DDH T91036 - 400 m Collar Loop
Twin Project - Homestake Mining (Canada) Ltd.

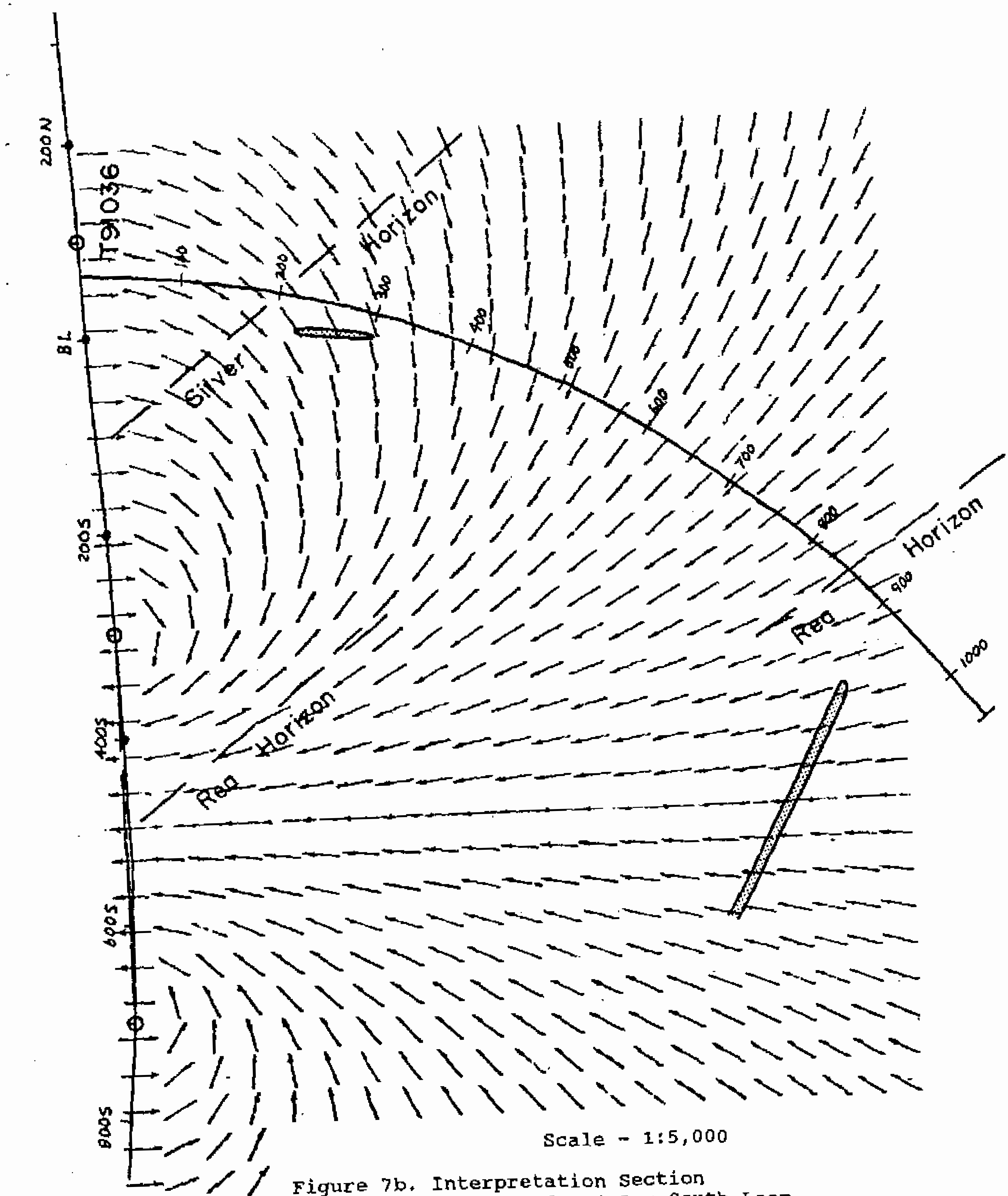

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Figure 7b. Interpretation Section
DDH T91036 - 400 m South Loop
Twin Project - Homestake Mining (Canada) Ltd.

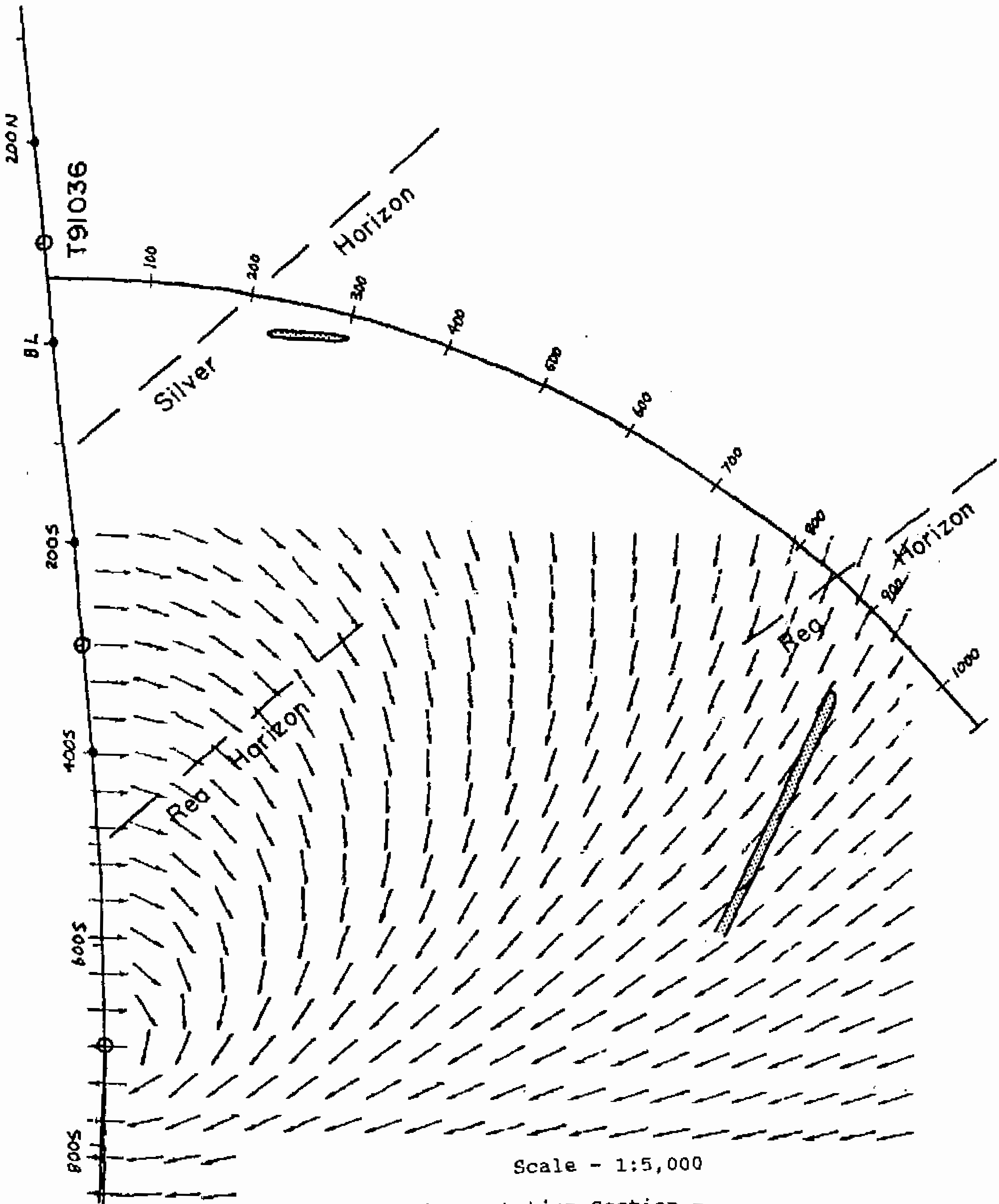

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Figure 7c. Interpretation Section -
DDH T91036 - 400 m Far South Loop
Twin Project - Homestake Mining (Canada) Ltd.

400 m transmitter loops. This is probably due to the weaker primary field of the 200 m transmitter loops. Although the anomaly has the same basic form as the 400 m loop surveys, it reverses polarity with the 200 m north loop and almost disappears with the 200 m collar loop. This information indicates that the anomaly is indeed due to a vertical to steeply dipping, plate-like conductor as depicted in the graphical interpretation shown in the Figure 8.

The conductor is interpreted to be only 80 to 100 m wide (i.e. depth extent), but to be at least 400 to 500 m long and extending both grid east and grid west of line -79+00E since the anomalies with the far southeast and far southwest loops are the same amplitude as the far south loop anomaly. The conductivity-thickness product of the conductor is estimated to be about 10-15 mhos.

T91037, T91038 and T91039

There are no significant anomalies in the results from the surveys of T91037, T91038 and T91039, only the background response mentioned earlier. A late channel anomalous response may be building toward the bottom of the survey portions of these hole, however either by design or circumstance, the surveys did not go deep enough to confirm this possibility.

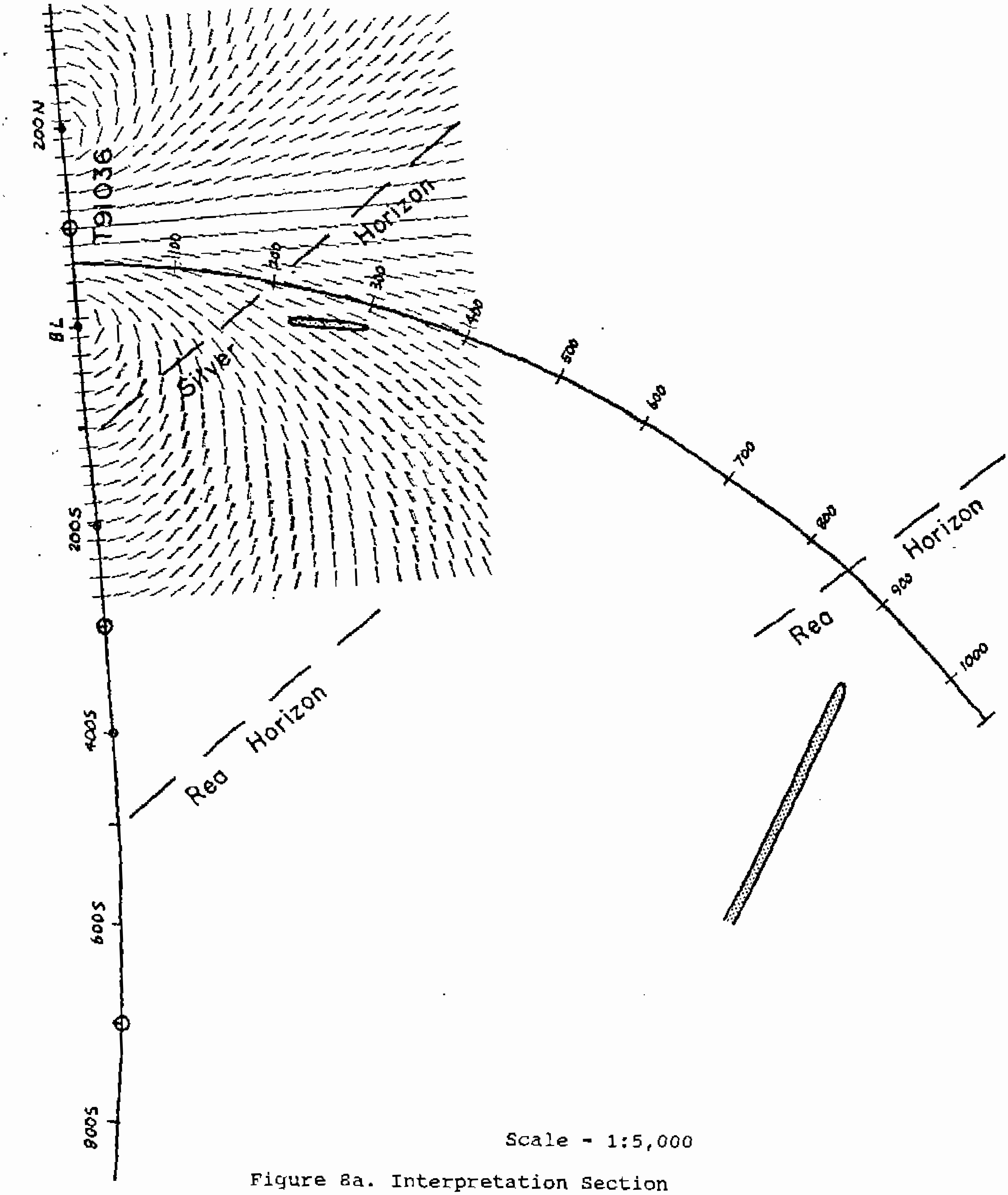

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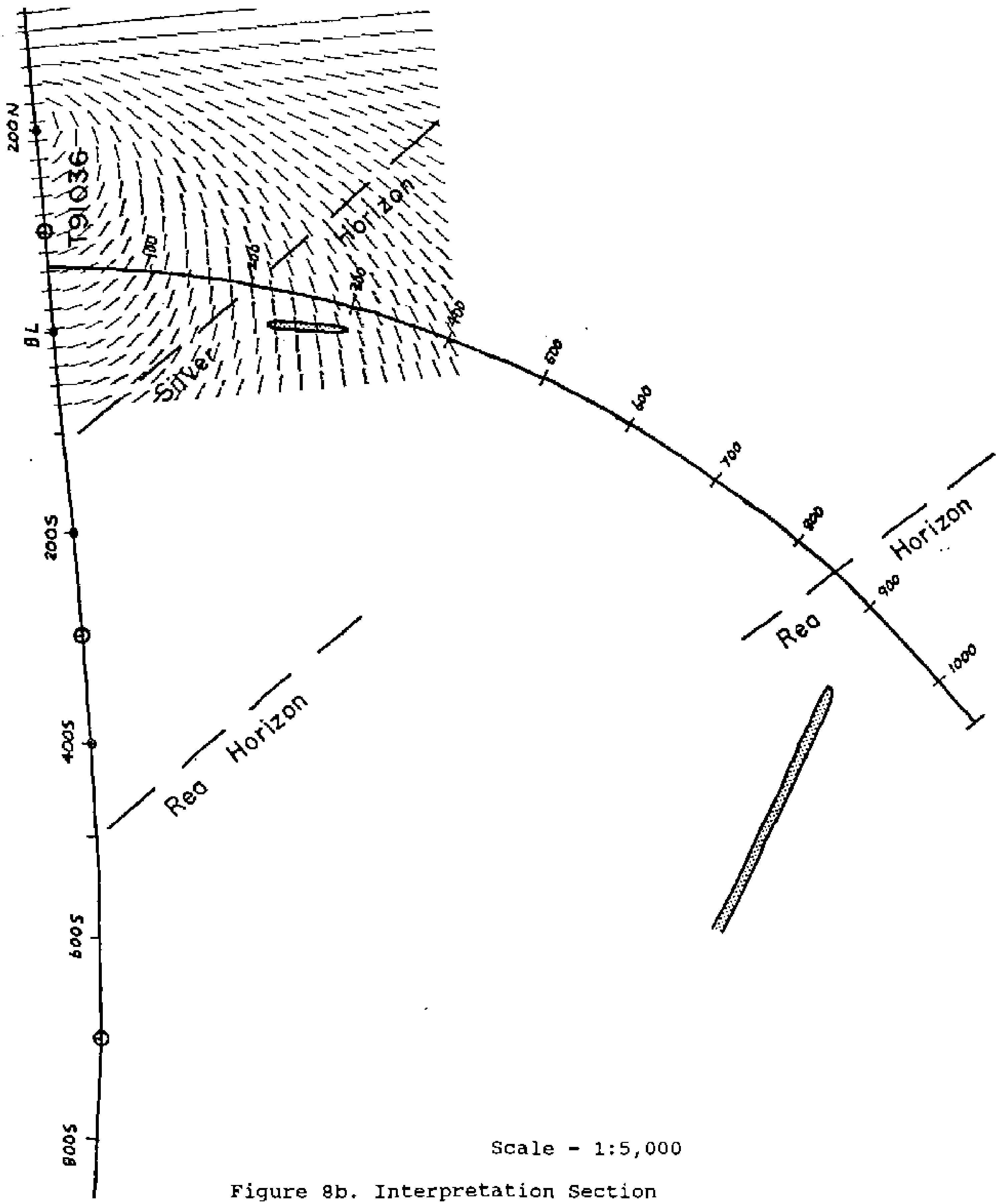
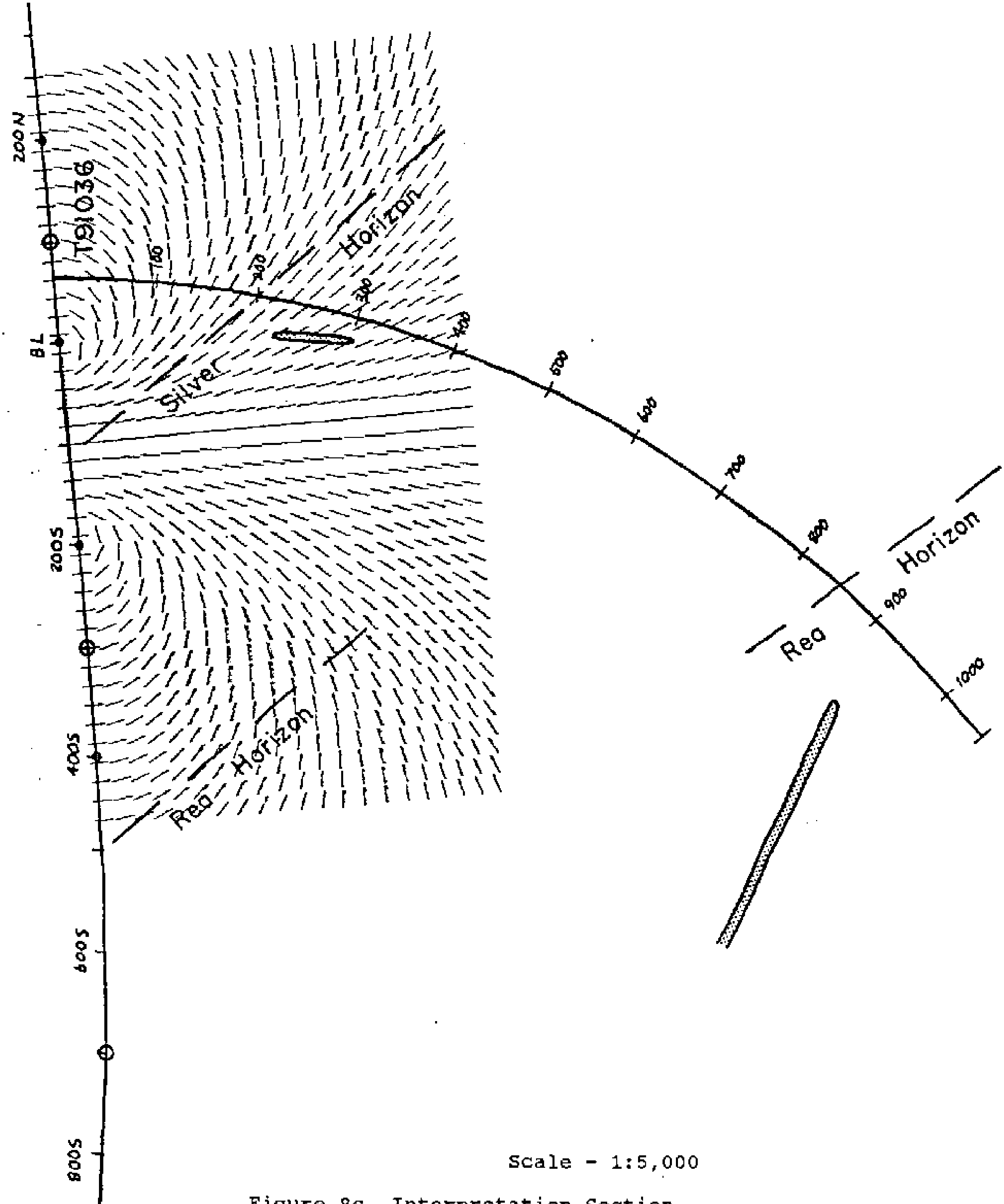
Figure 8a. Interpretation Section
DDH T91036 - 200 m Collar Loop
Twin Project - Homestake Mining (Canada) Ltd.



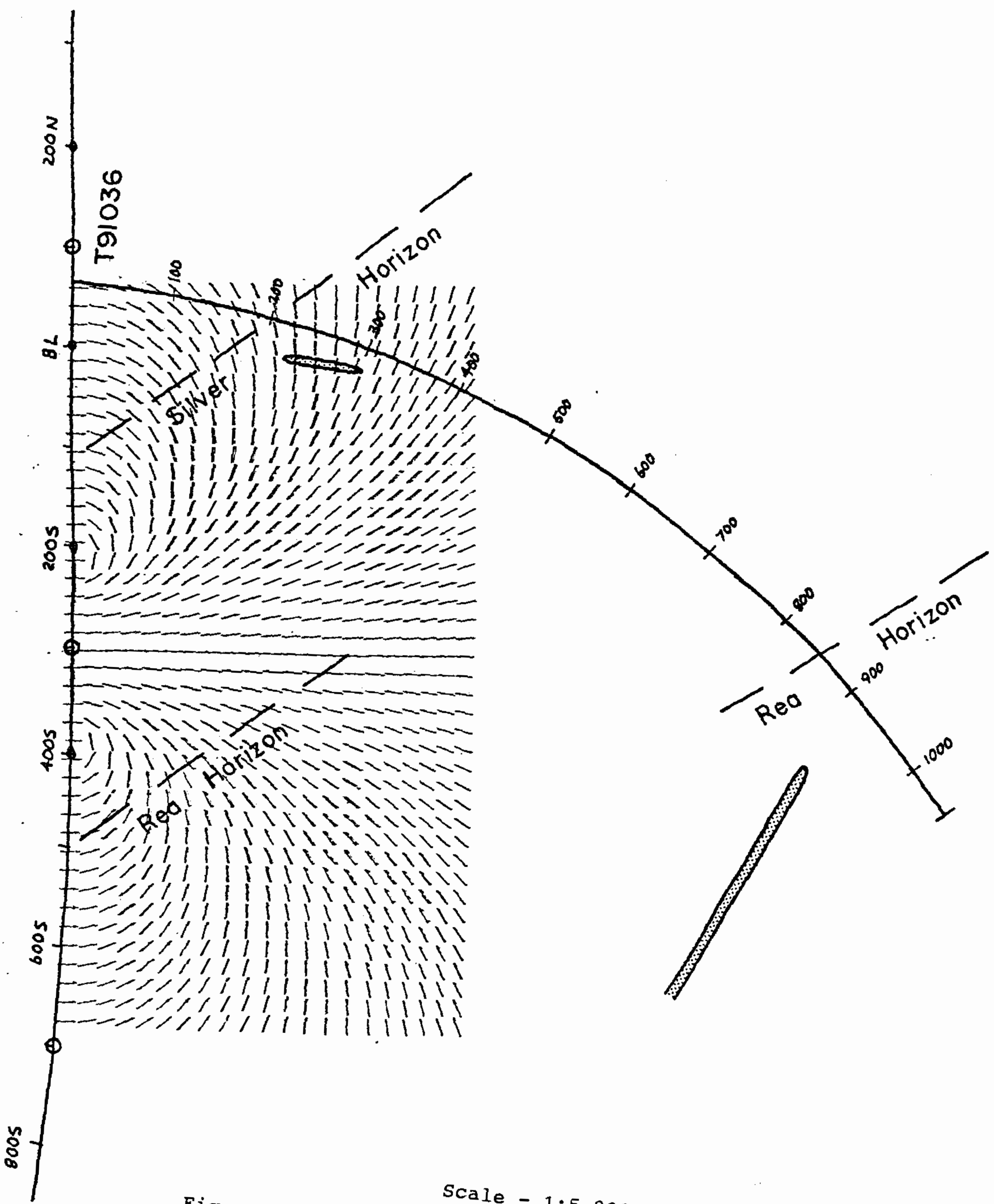
Scale - 1:5,000

Figure 8b. Interpretation Section
DDH T91036 - 200 m North Loop
Twin Project - Homestake Mining (Canada) Ltd.



Scale - 1:5,000

Figure 8c. Interpretation Section
DDH T91036 - 200 m South Loop
Twin Project - Homestake Mining (Canada) Ltd.



Scale - 1:5,000

Figure 8d. Interpretation Section
DDH T91036 - 200 m Far South Loop
Twin Project - Homestake Mining (Canada) Ltd.

CONCLUSION AND RECOMMENDATIONS:

The 8 channel anomaly in the lower portions of T91036 (and perhaps also the possible late channel build-ups in the other holes) is interpreted to be caused by a large conductor of relatively high conductance typical of the graphitic argillites on the Twin and Kamad properties. Although the interpreted conductor is close to where T91036 intersected the Rea horizon, it is probably due to graphitic argillites below this formation, possibly in the hanging wall of a fault just above the drill hole. Given this interpretation, no further drilling is recommended to test this conductor.

The upper conductor in close proximity to where T91036 intersected the Silver horizon, however the conductor does not conform to the stratigraphy in this area. Hence, it is unlikely to be a strataform or stratabound, massive sulphide ore body. However, the anomaly has similar size, amplitude and channel response as the Kamad ore body and hence represents a good follow-up drill target. The odd orientation of the conductor may be caused by faulting or folding.

Based solely on the borehole Pulse EM results and irrespective of the known geology, the optimal drill hole to intersect the interpreted conductor should be located at about -1+50S near line -79+00E and drilled at 045°/-60°, however such a hole would be parallel to with stratigraphy. Therefore, the recommended follow-up drill hole should be located behind T91036 at about -1+50N near line -79+00E and drilled at 225°/-70°.

It is also recommended that borehole Pulse EM surveying be continued on the Twin property since this is the best method for detecting massive sulphide mineralization missed by the drill holes. As these and other results in the area have demonstrated, it is possible to discriminate the Pulse EM response due to sulphide mineralization from graphitic argillite conductors.

Respectfully submitted,

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STATEMENT OF QUALIFICATIONS:

NAME: WOODS, Dennis V.

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EDUCATION:

B.Sc. Applied Geology,
Queen's University, 1973

M.Sc. Applied Geophysics,
Queen's University, 1975

Ph.D. Geophysics,
Australian National University, 1979

PROFESSIONAL ASSOCIATIONS:

Registered Professional Engineer, #15745
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Active Member,
Society of Exploration Geophysicist
Canadian Society of Exploration Geophysicist
Australian Society of Exploration Geophysicist

EXPERIENCE:

1971-79
- Field geologist with St. Joe Mineral Corp. and Selco Mining Corp. (summers)
- Research graduate student and teaching assistant at Queen's University and the Australian National University

1979-86
- Assistant Professor of Applied Geophysics at Queen's University
- Geophysical consultant with Paterson Grant & Watson Ltd., M.P.H. Consulting Ltd., James Neilson & Assoc. Ltd., and Foundex Geophysics Inc.
- Visiting research scientiet at Chervon Geosciences Ltd., Geological Survey of Canada, and the University of Washington

1986-89
- Project Geophysicist with Inverse Theory & Applications (ITA) Inc.
- Chief Geophysicist at White Geophysical Inc.
- Chief Geophysicist at Premier Geophysics Inc

1989-
- President of Woods Geophysical Consulting

SPECIFICATIONS – CRONE BOREHOLE PULSE EM EQUIPMENT

PROBE:
- Measures dB/dt of axial-component of borehole
- Ferrite cored antenna with preamplifier and self contained power supply (Ni.-Cd. rechargeable)
- 30 hours continuous operation
- Weight: 3.6 Kg.
- Length: 1.63 M.
- Diameter: 2.9cm (for "E" holes and larger)
- Pressure tested to 13.8 MPa (2000 PSI)

WINCH ASSEMBLY:
- 3 speed gear box, gear ratios 1:1, 2:1, 3:1
- Optional power winching for deep holes
- Borehole cable capacity of up to 2000 meters
- Portable

UNDERGROUND PUSHROD SYSTEM:
- For use in horizontal boreholes (< 45 degrees)
- Powered Pushrod assembly for holes > 500 meters

BATTERY SUPPLY:
±12 VDC, two internal, rechargeable, 12V gel type batteries

MEASURED QUANTITIES:
Primary shut-off voltage pulse (PP). Time derivative of the transient magnetic field by integrative sampling over eight, contiguous time gates (microseconds).

CH. NO.	WINDOW	WIDTH	MID PT.	REL. GAIN	WINDOW	WIDTH	MID PT.
PP	-100 to 0	100	-50	1.00	-200 to 0	200	-100
1	100 to 200	100	150	1.00	200 to 400	200	300
2	200 to 400	200	300	1.39	400 to 800	400	600
3	400 to 700	300	550	1.93	800 to 1400	600	1100
4	700 to 1100	400	900	2.68	1400 to 2200	800	1800
5	1100 to 1800	700	1450	3.73	2200 to 3600	1400	2900
6	1800 to 3000	1200	2400	5.18	3600 to 6000	2400	4800
7	3000 to 5000	2000	4000	7.20	6000 to 10K	4000	8000
8	5000 to 7800	2800	6400	10.00	10K to 15.6K	5600	12.8K
	10.8ms. Time Base				21.6ms. Time Base		

READOUT:
Readings are output on an analog meter (6V FSD), over three sensitivity ranges (X1, X10, X100). Data retrieval made by channel select switch.

TIMING:
A telemetry link ("sync.") is maintained by radio signal, or a back-up cable, between the transmitter and the receiver, and is meter monitored.

SENSITIVITY:
Adjustable through a ten turn, calibrated gain pot.

SAMPLING MODES:
"S & H" (Sample & Hold)
The receiver averages 512 (10.8 ms), or 256 (21.6ms), readings for all channels, and stores the results for display.
"CONT" (Continuous)
A running average for all channels is stored, enabling the operator to reject thunderstorm spikes and power line noise by visual inspection.

SPECIFICATIONS – PULSE EM TRANSMITTER EQUIPMENT

MOTOR GENERATOR:

4-1/2 H.P. Wisconsin, 4 cycle engine with belt drive to D.C. alternator; maximum output 120V, 30 amps; external gas tank; frame unit weight: 33 kg, shipping: 47 kg.

REGULATOR:

Controls and filters the alternator output; continuously variable between 24V and 120V D.C.; 20 amp maximum current; weight: 10 kg, shipping: 24 kg.

PEM WAVEFORM TRANSMITTER:

Controls bipolar, on-off waveform and linear current shut-off ramp time. Radio and cable time synchronization with housing for optional crystal clock sync system; on-off times for 60 Hz areas 8.33ms, 16.66ms, 33.33ms; for 50 Hz areas 10.0ms, 20.0ms, 40ms; for analog PEM operation 10.9ms, 21.8ms; linear controlled current shut-off ramp times of 0.5, 1.0 and 1.5ms; monitors for shut-off ramp operation, instrument temperature, Tx loop continuity, and overload output current; automatic shut-down for open Tx loop. Weight: 12.5 kg, shipping: 22 kg.

REMOTE RADIO, ANTENNA AND MAST:

Used for radio timing synchronization on large survey grids; range up to 2 km; radio has 12V rechargeable gell cell battery supply; antenna is fiberglass mounted on a 4 section aluminum mast each 2m long. Radio weight: 2.7 kg, shipping: 6.0 kg; mast and antenna shipped as bundle: 6.4 kg.

OPTIONAL CRYSTAL CLOCK TIMING LINK:

Installed in the Digital Rx and external box mounted to be plugged into PEM-Tx. Gel rechargeable power supply. Weight: 10 kg, shipping: 15 kg.

WIRE, SPOOLS AND WINDERS:

Transmitter wire is usually No. 10 or No. 12 AWG copper in 310m or 410m lengths, 1 length per spool; 2 spools in a shipping box; winder is mounted on a magnesium packframe.

MULTI-TURN MOVING COIL:

7 turn, 13.7 meter diameter Tx loop with plugs to break into 2 sections. Aluminum or copper wire and various coverings depending on area being used.

BATTERY POWER SUPPLY:

24V, 20 amp hour; rechargeable battery supply for use with PEM-Tx as power source rather than motor-generator-regulator. In aluminum case, with clamp connectors. Weight: 20.5 kg, shipping: 29 kg.

- Battery chargers supplied for all rechargeable battery units.
- All instruments and equipment operational from -40°C to +50°C.
- Shipping boxes are reusable plywood construction with closed cell foam shock protection.

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TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036 LOOP C
Scale 1: 1000.0

Date: July 1991	Survey: June 1991	Profile: 1a

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BOREHOLE PULSE EM SURVEY
HOLE T91036 LOOP C
Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 1b

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BOREHOLE PULSE EM SURVEY
HOLE T91036 LOOP S
Scale 1: 1000.0

Date: July 1991 | Survey: June 1991 | Profile: 2a

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BOREHOLE PULSE EM SURVEY
HOLE T91036 LOOP S

Scale 1: 1000.0

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BOREHOLE PULSE EM SURVEY
HOLE T91036 LOOP FS
Scale 1: 1000.0

Date: July 1991	Survey: June 1991	Profile: 3s

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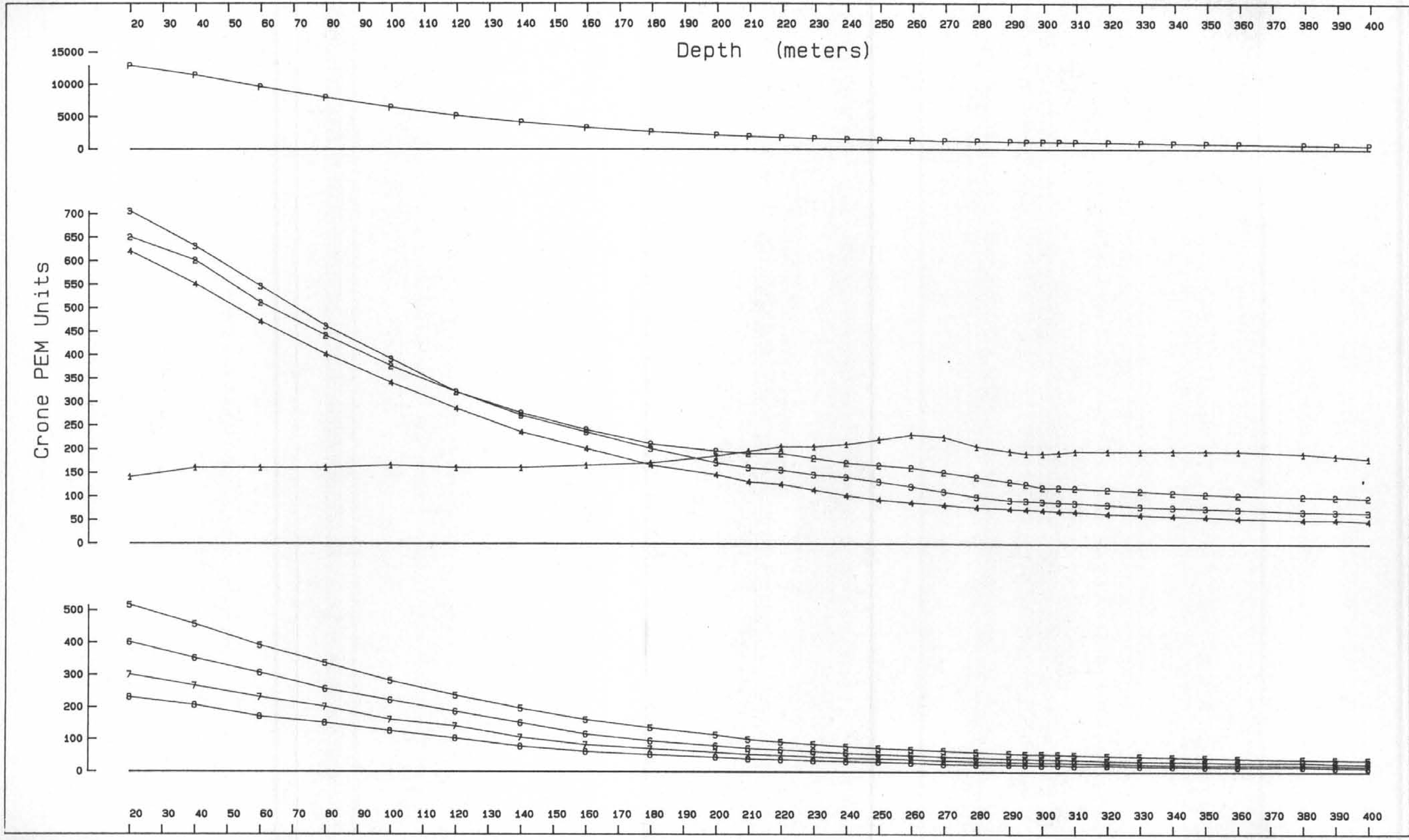
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036 LOOP FS
Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 3b

WOODS GEOPHYSICAL CONSULTING



HOMESTAKE MINING (CANADA) LTD.

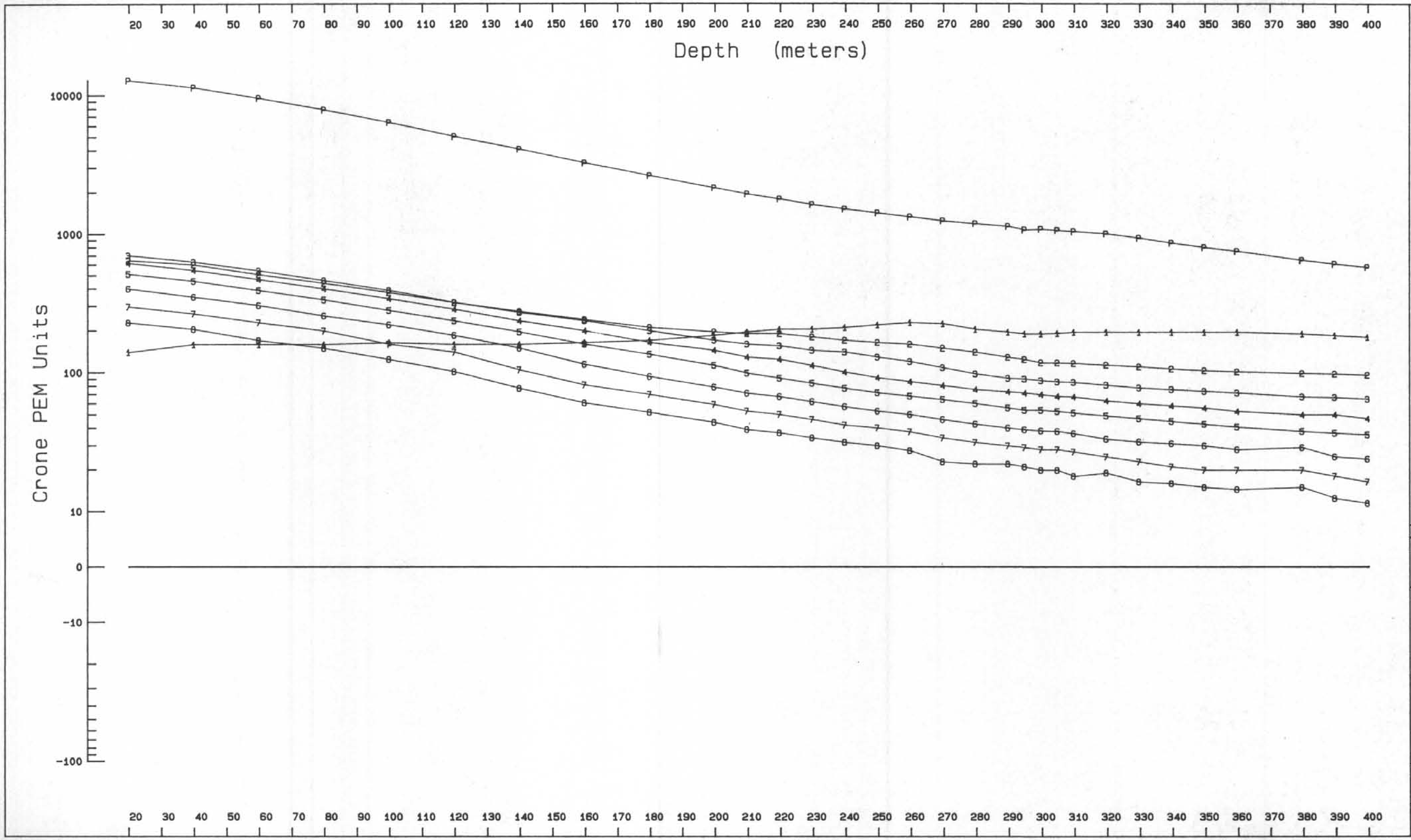
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 4a

WOODS GEOPHYSICAL CONSULTING



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PART 2 OF 3

HOMESTAKE MINING (CANADA) LTD.

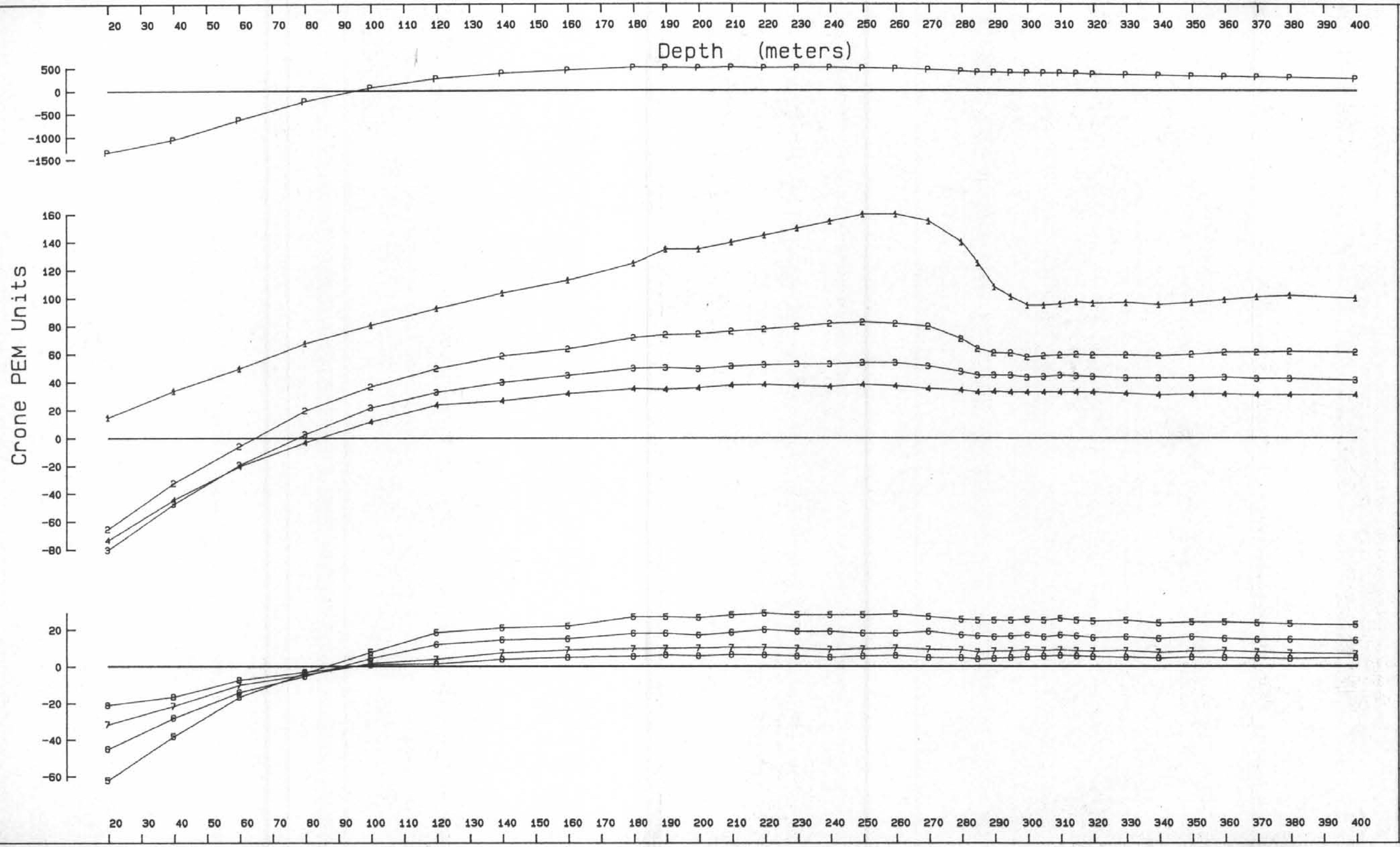
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 4b

WOODS GEOPHYSICAL CONSULTING



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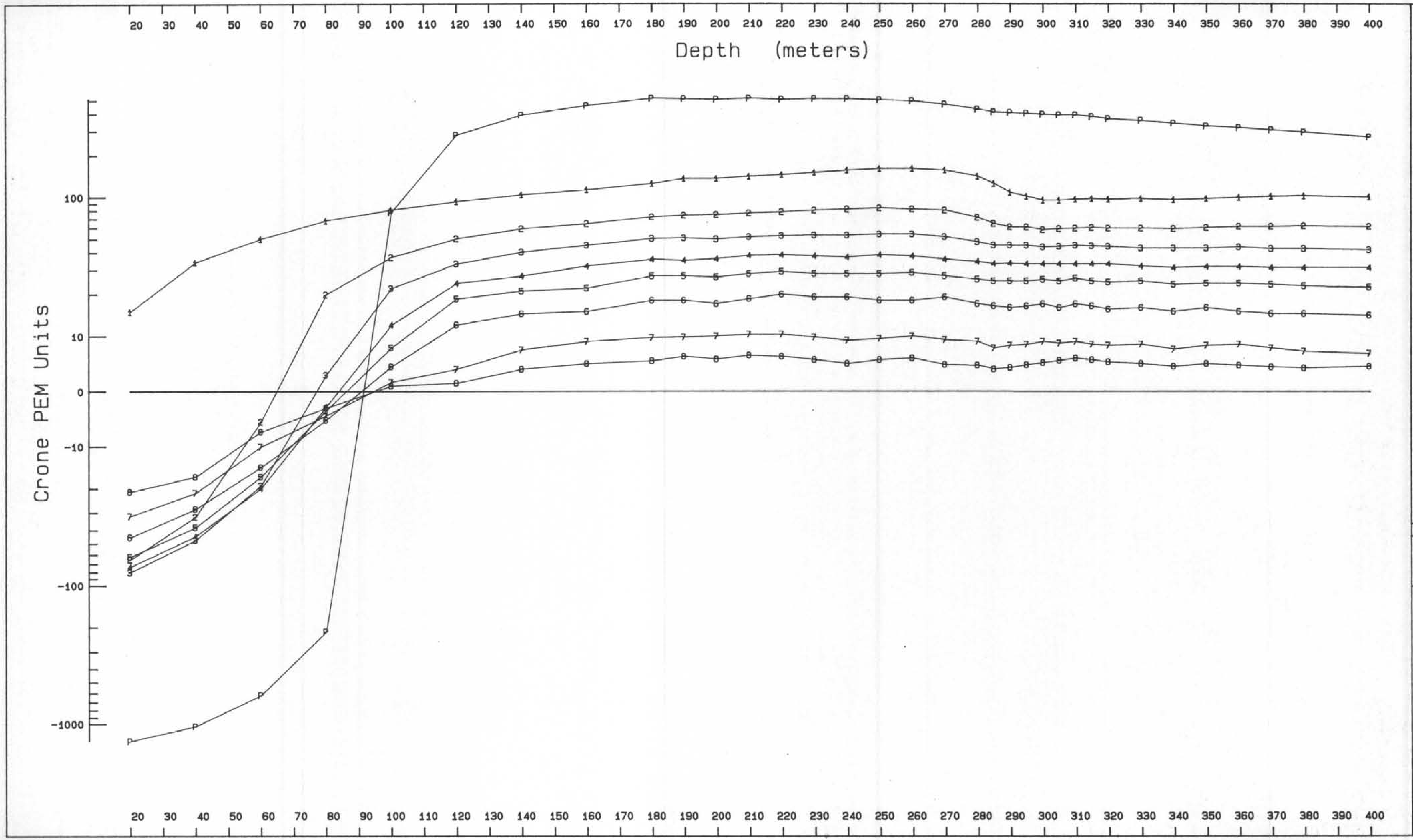
HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP N

Scale 1: 1000.0

Date: July 1991	Survey: June 1991	Profile: 5a

WOODS GEOPHYSICAL CONSULTING



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ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

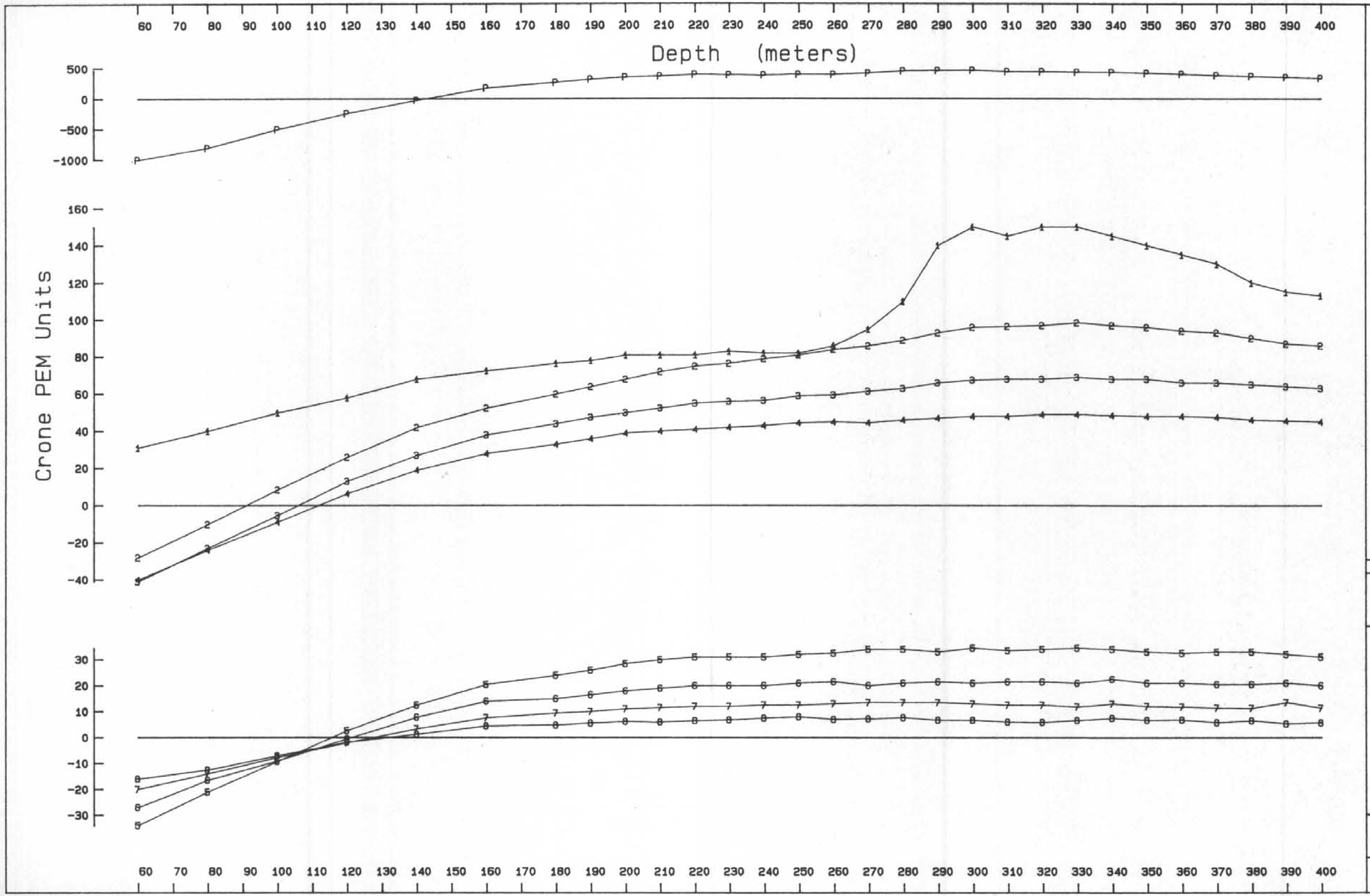
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP N

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 5b

WOODS GEOPHYSICAL CONSULTING



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HOMESTAKE MINING (CANADA) LTD.

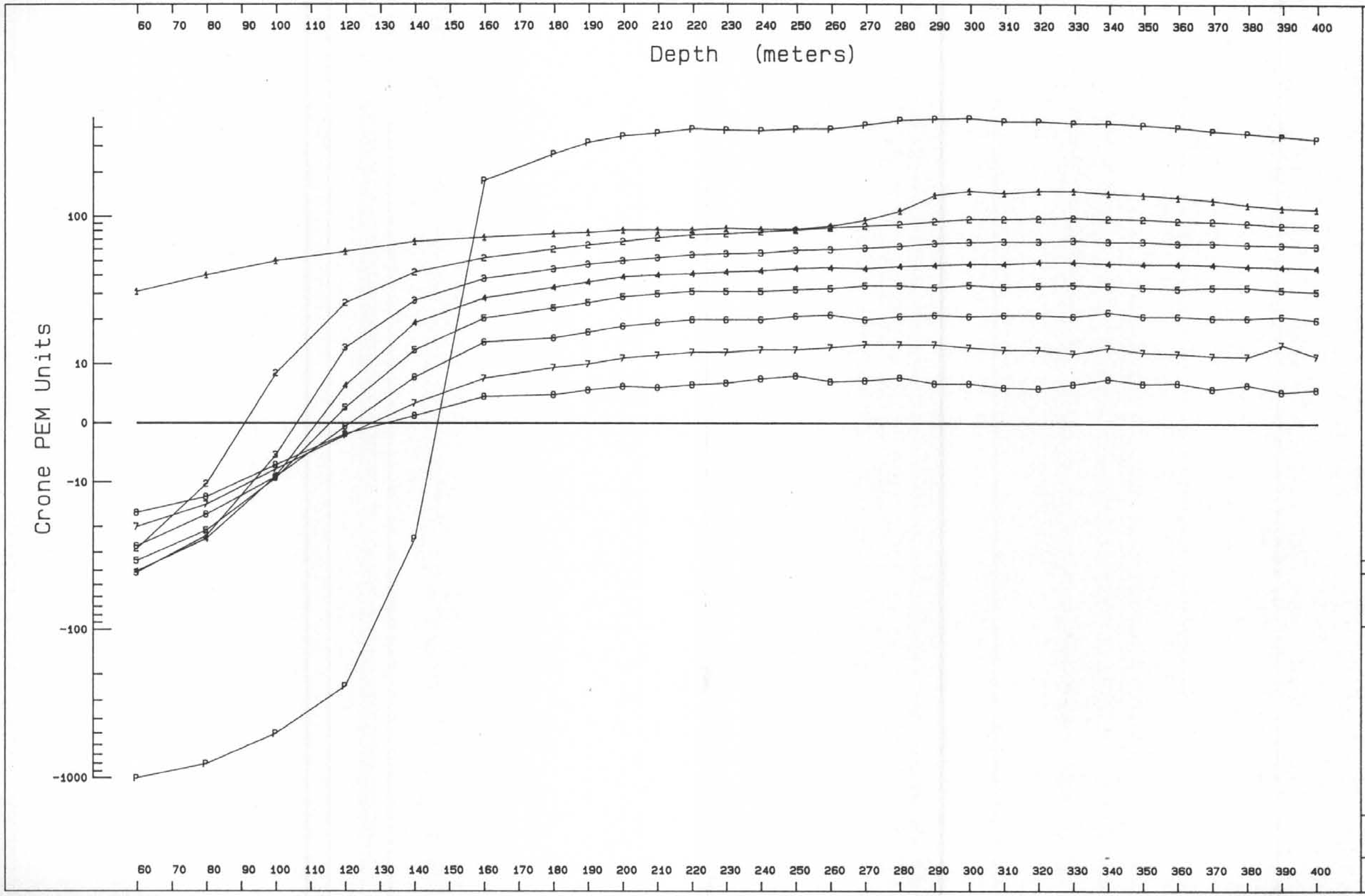
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP S

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 6a

WOODS GEOPHYSICAL CONSULTING



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ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

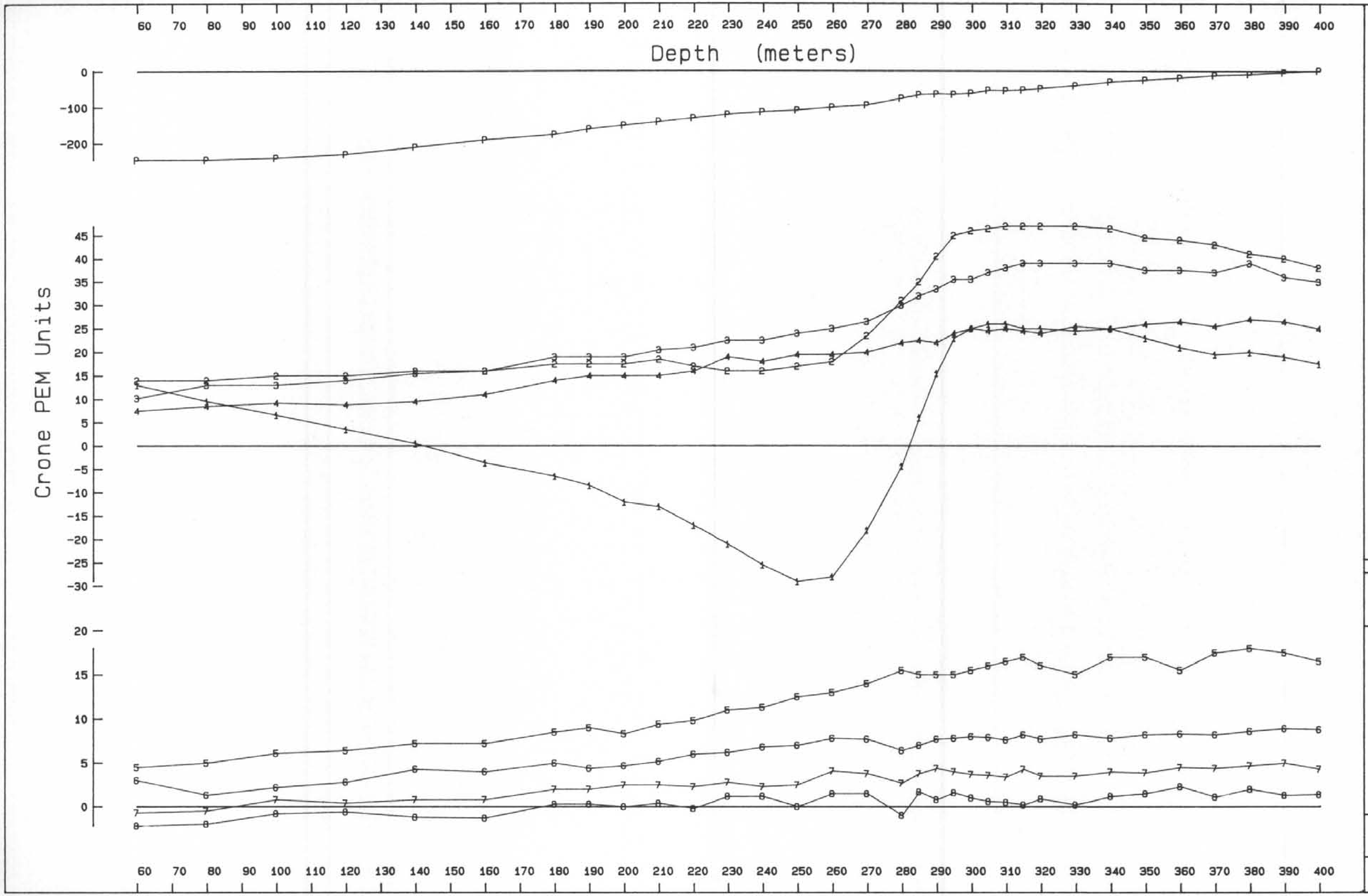
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP S

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 6b

WOODS GEOPHYSICAL CONSULTING



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HOMESTAKE MINING (CANADA) LTD.

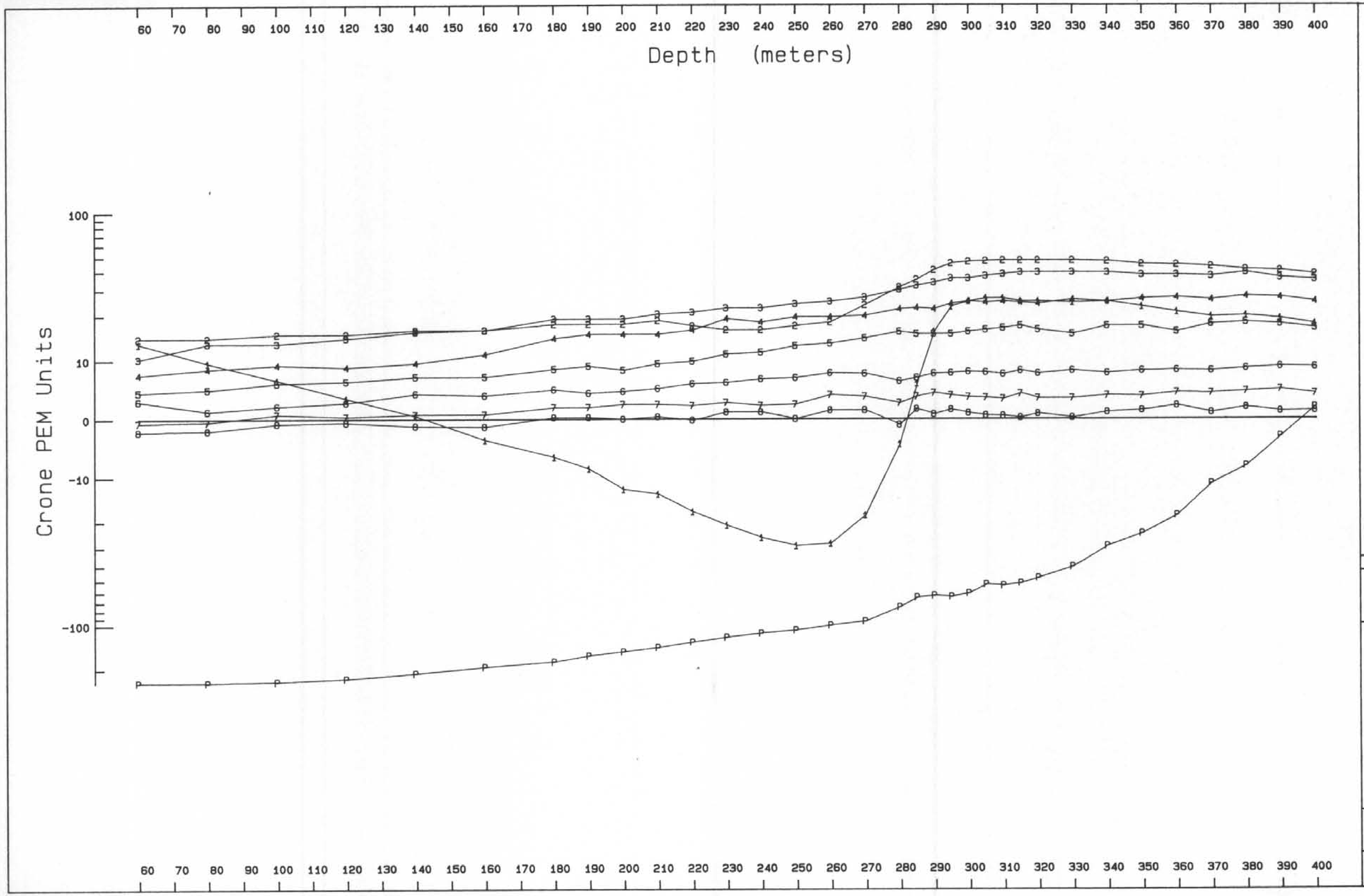
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP FS

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 7a

WOODS GEOPHYSICAL CONSULTING



GEOLOGICAL BRANCH
ASSESSMENT REPORT

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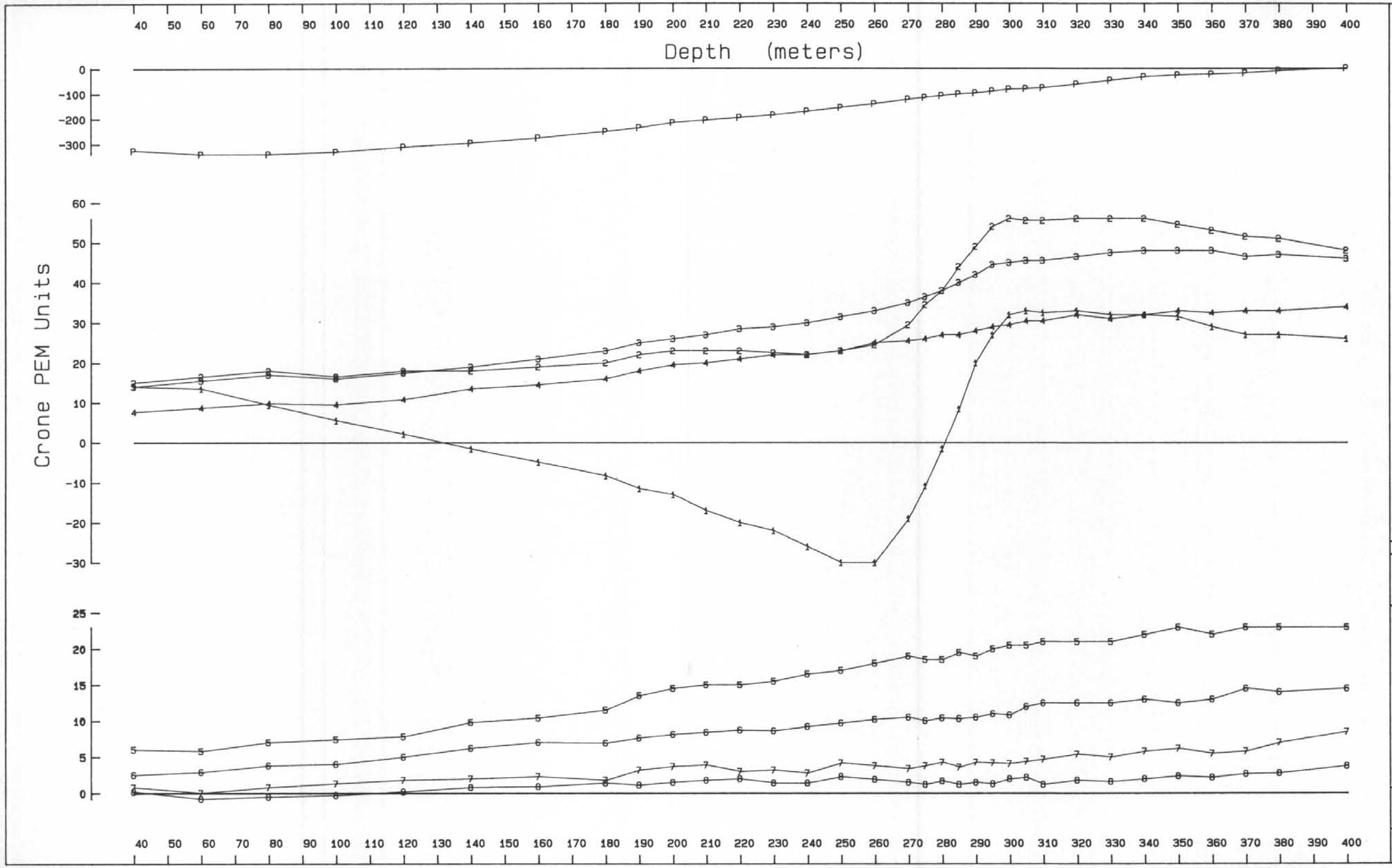
HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP FS
Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 7b

WOODS GEOPHYSICAL CONSULTING



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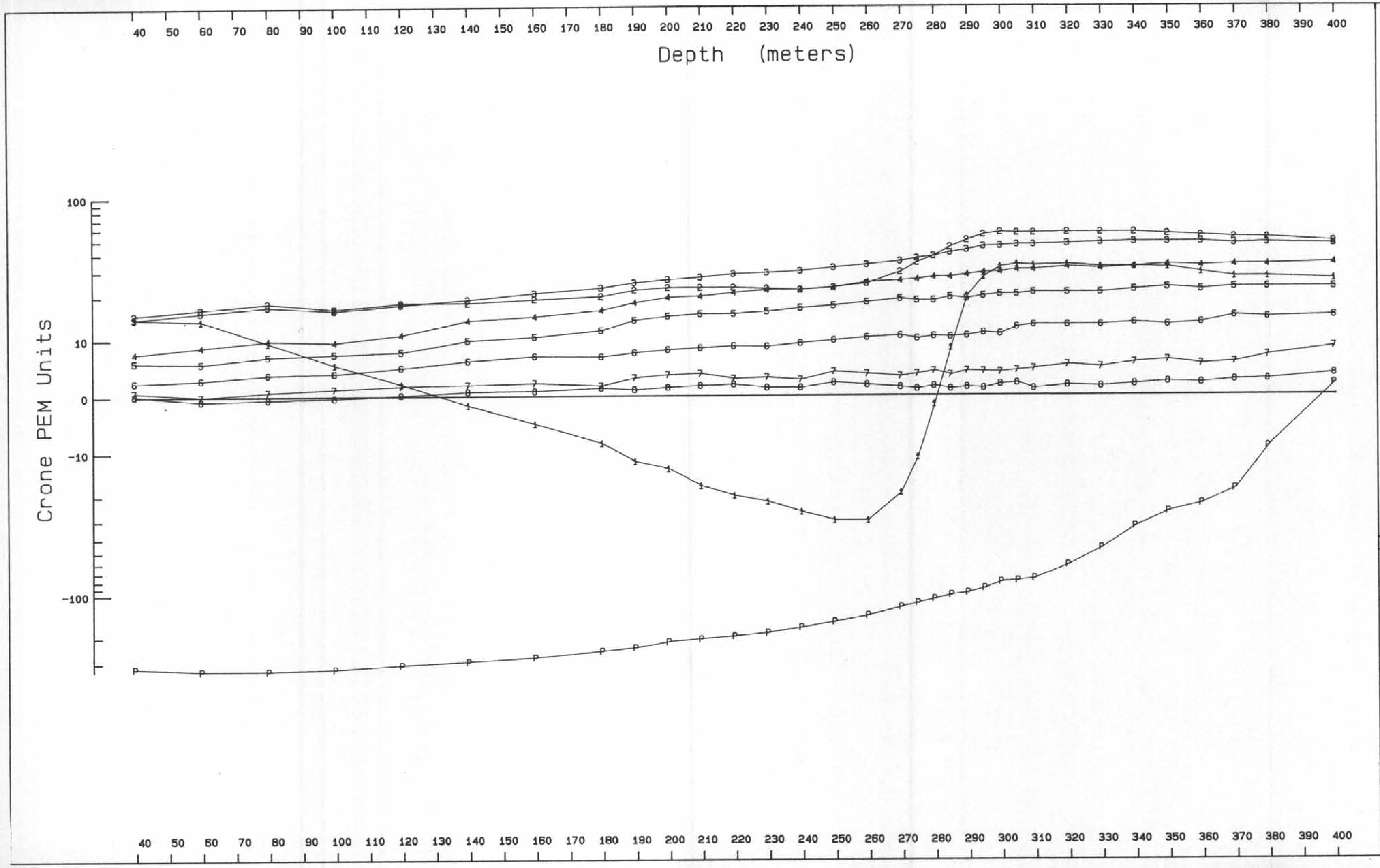
HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP FSE
Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 8a

WOODS GEOPHYSICAL CONSULTING



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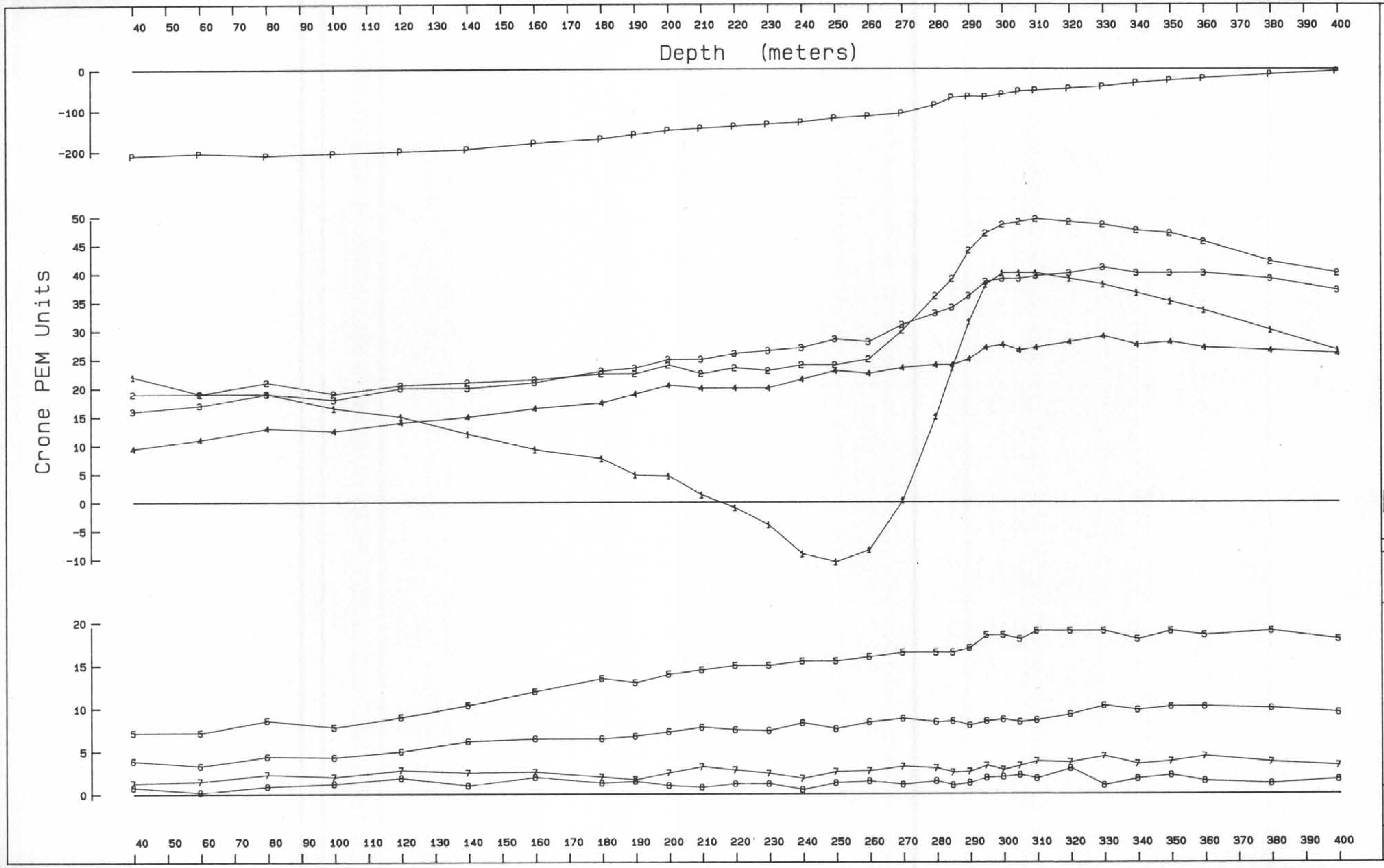
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP FSE

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991 | Survey: June 1991 | Profile: 8b

WOODS GEOPHYSICAL CONSULTING



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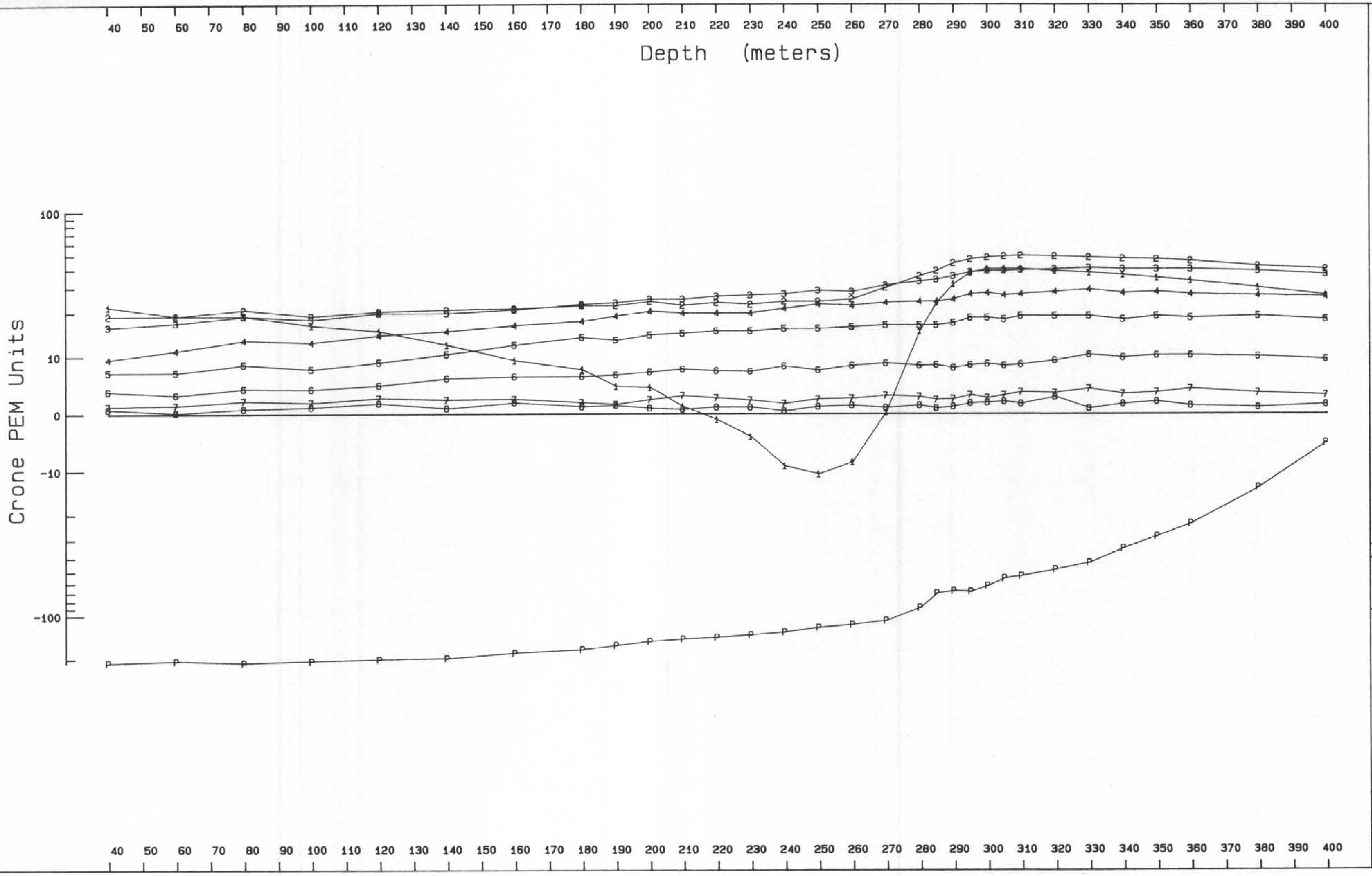
HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91036U LOOP FSW
Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 9a

WOODS GEOPHYSICAL CONSULTING



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ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT

BOREHOLE PULSE EM SURVEY

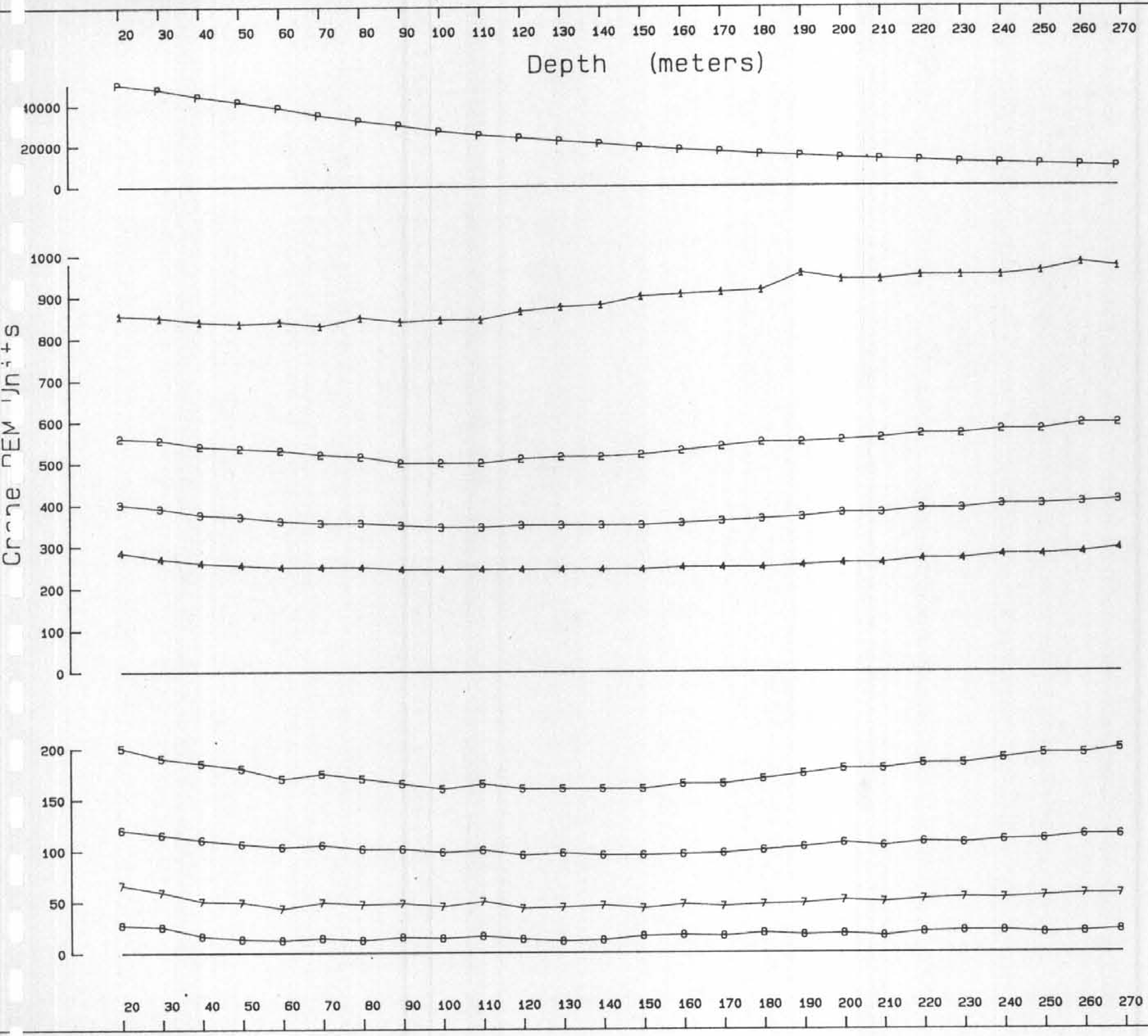
HOLE T91036U LOOP FSW

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 9b

WOODS GEOPHYSICAL CONSULTING



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ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

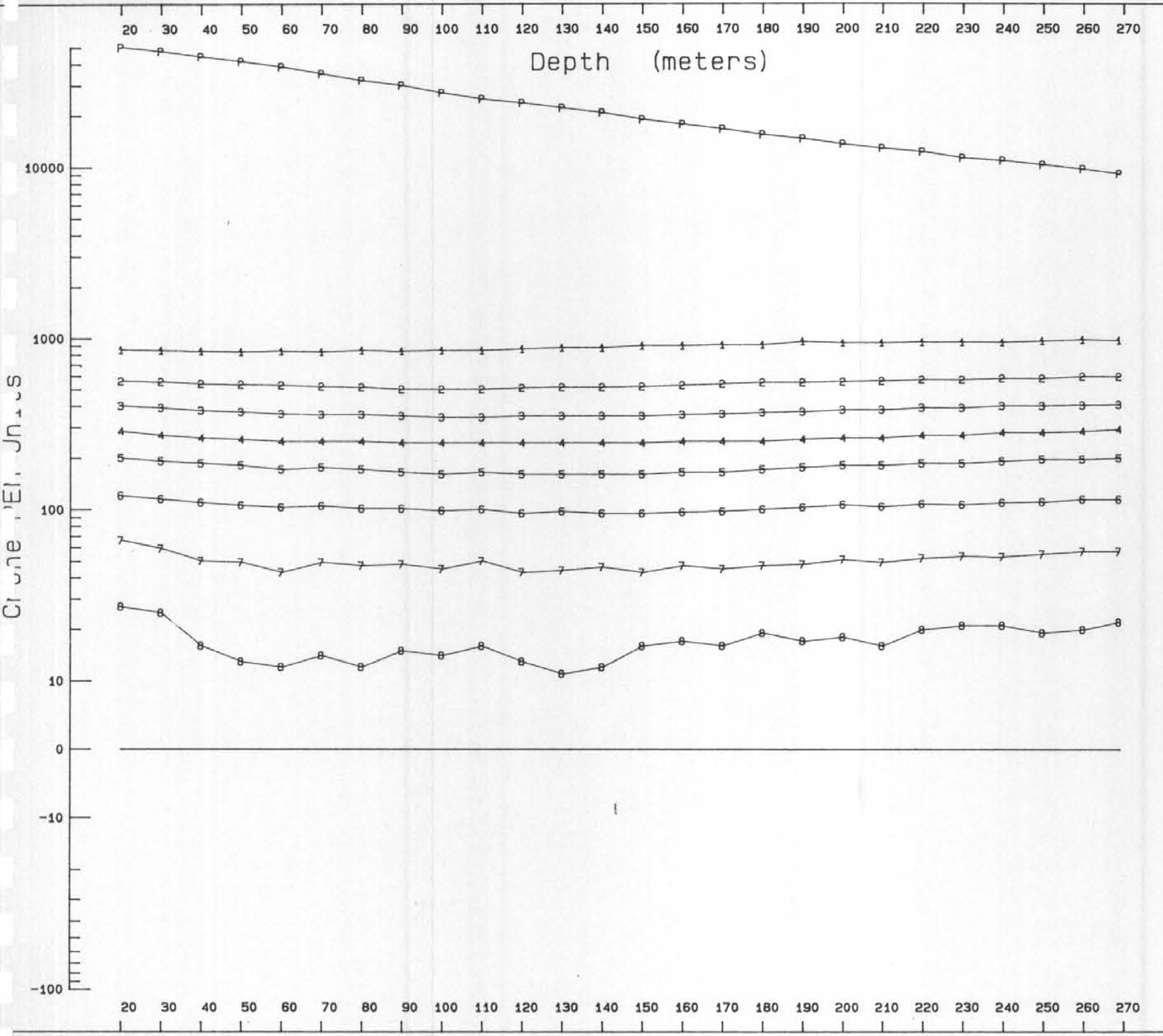
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91037 LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 10a

WOODS GEOPHYSICAL CONSULTING



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ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT

BOREHOLE PULSE EM SURVEY

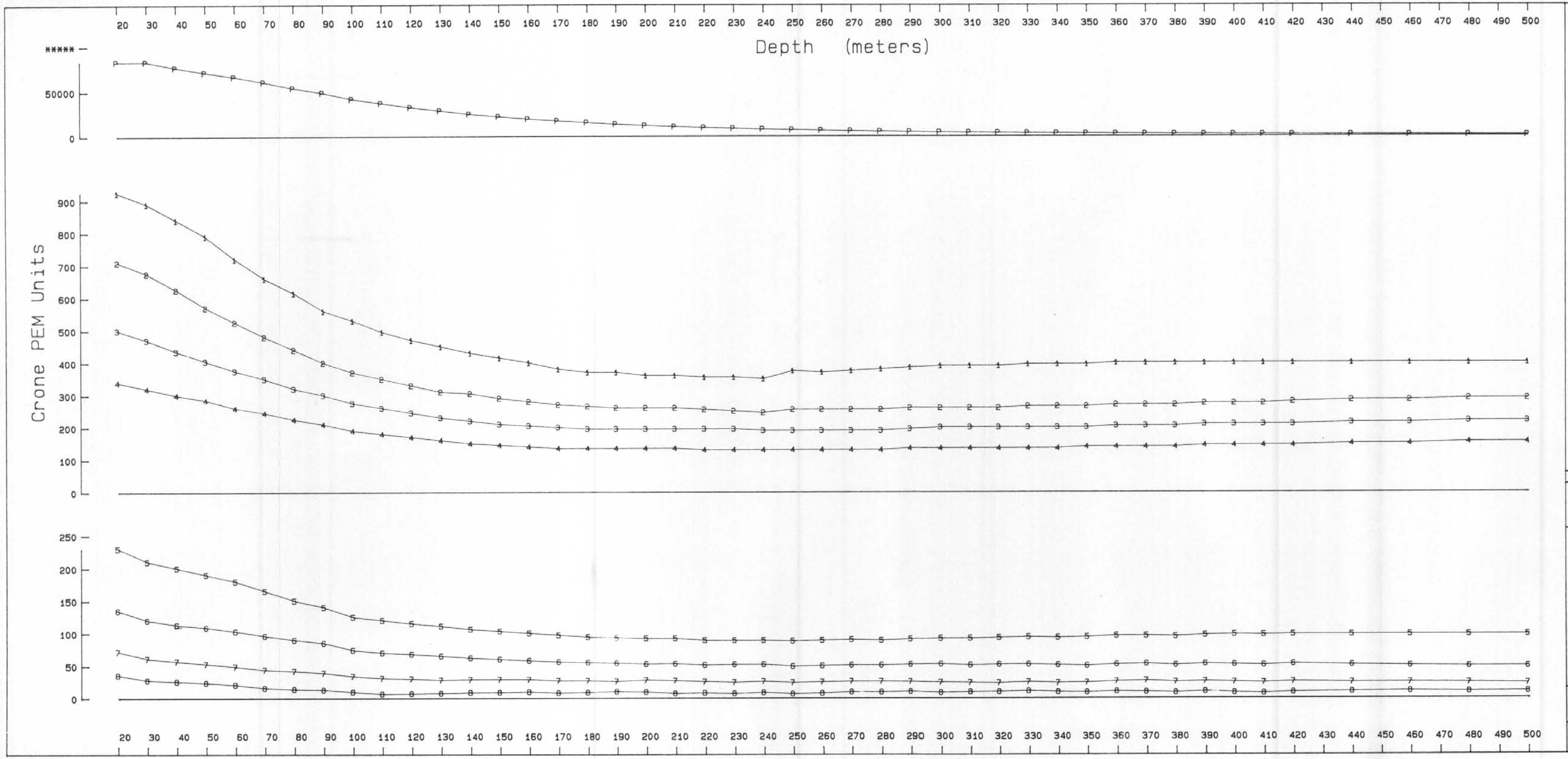
HOLE T91037 LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 10b

WOODS GEOPHYSICAL CONSULTING



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ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

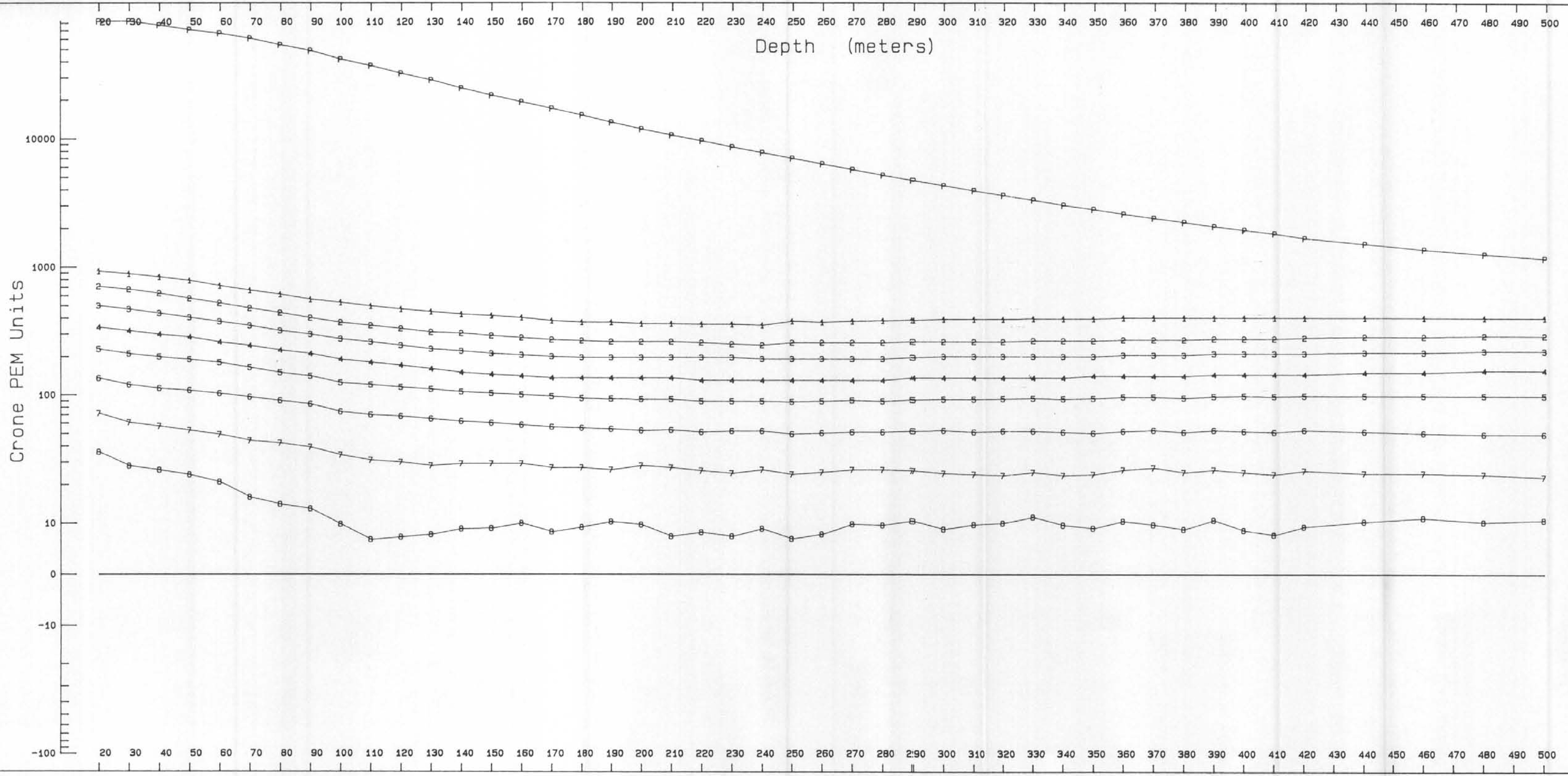
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91038 LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991 | Survey: June 1991 | Profile: 11a

WOODS GEOPHYSICAL CONSULTING



GEOLOGICAL BRANCH
ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

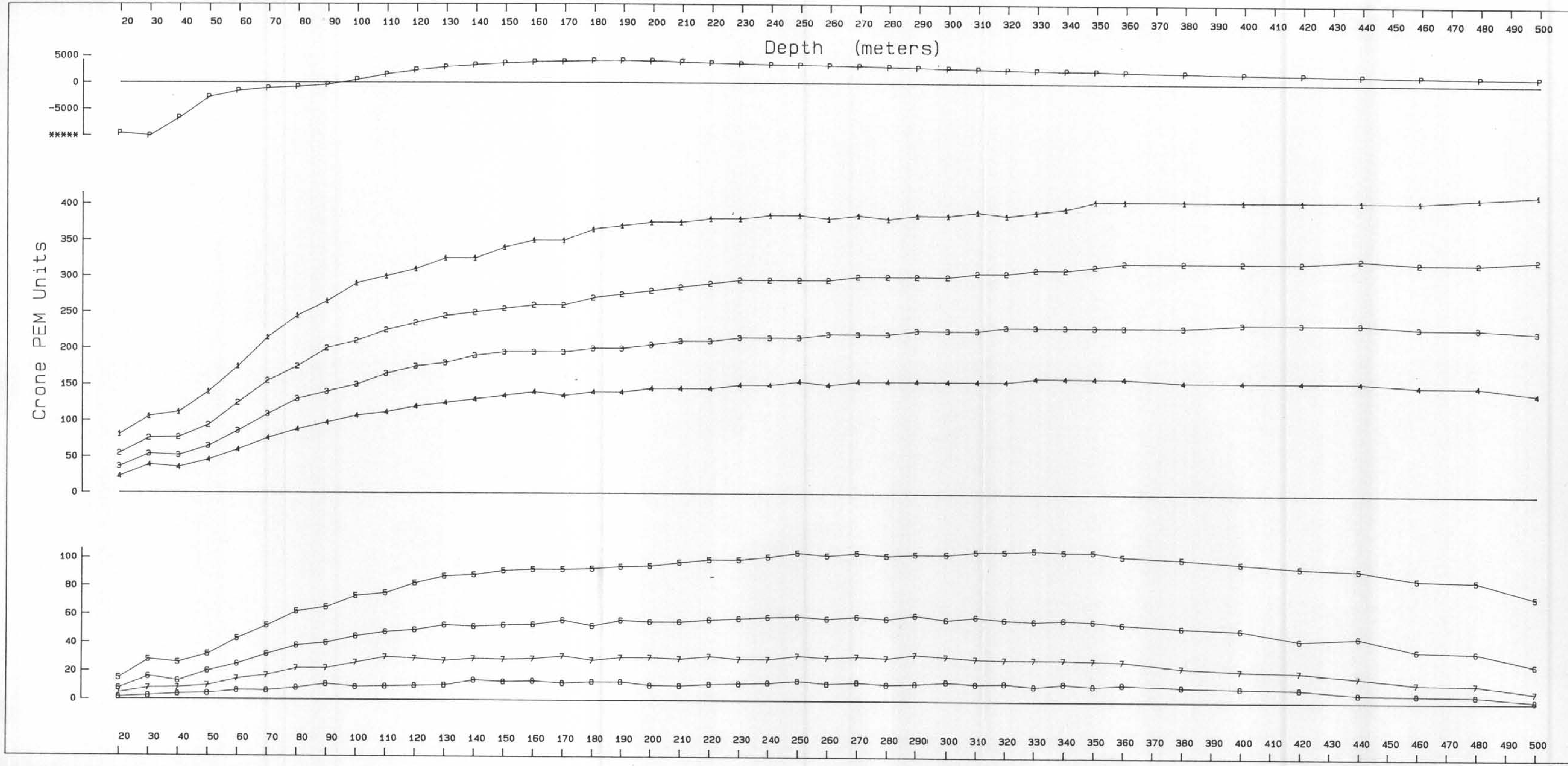
TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91038 LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 11b

WOODS GEOPHYSICAL CONSULTING



GEOLOGICAL BRANCH
ASSESSMENT REPORT

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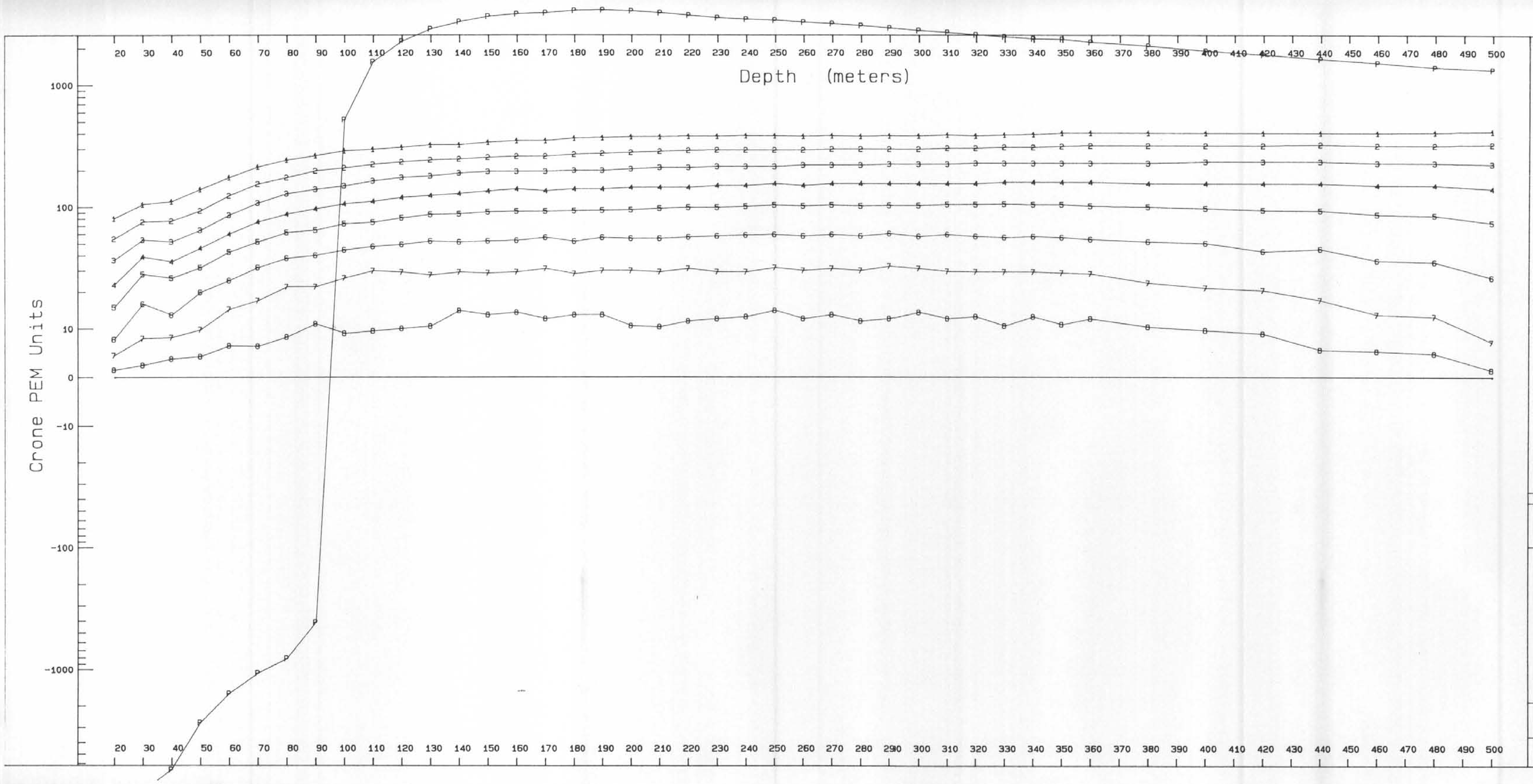
HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91038 LOOP S
Scale 1: 1000.0

Date: July 1991	Survey: June 1991	Profile: 12a

WOODS GEOPHYSICAL CONSULTING



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ASSESSMENT REPORT

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HOMESTAKE MINING (CANADA) LTD.

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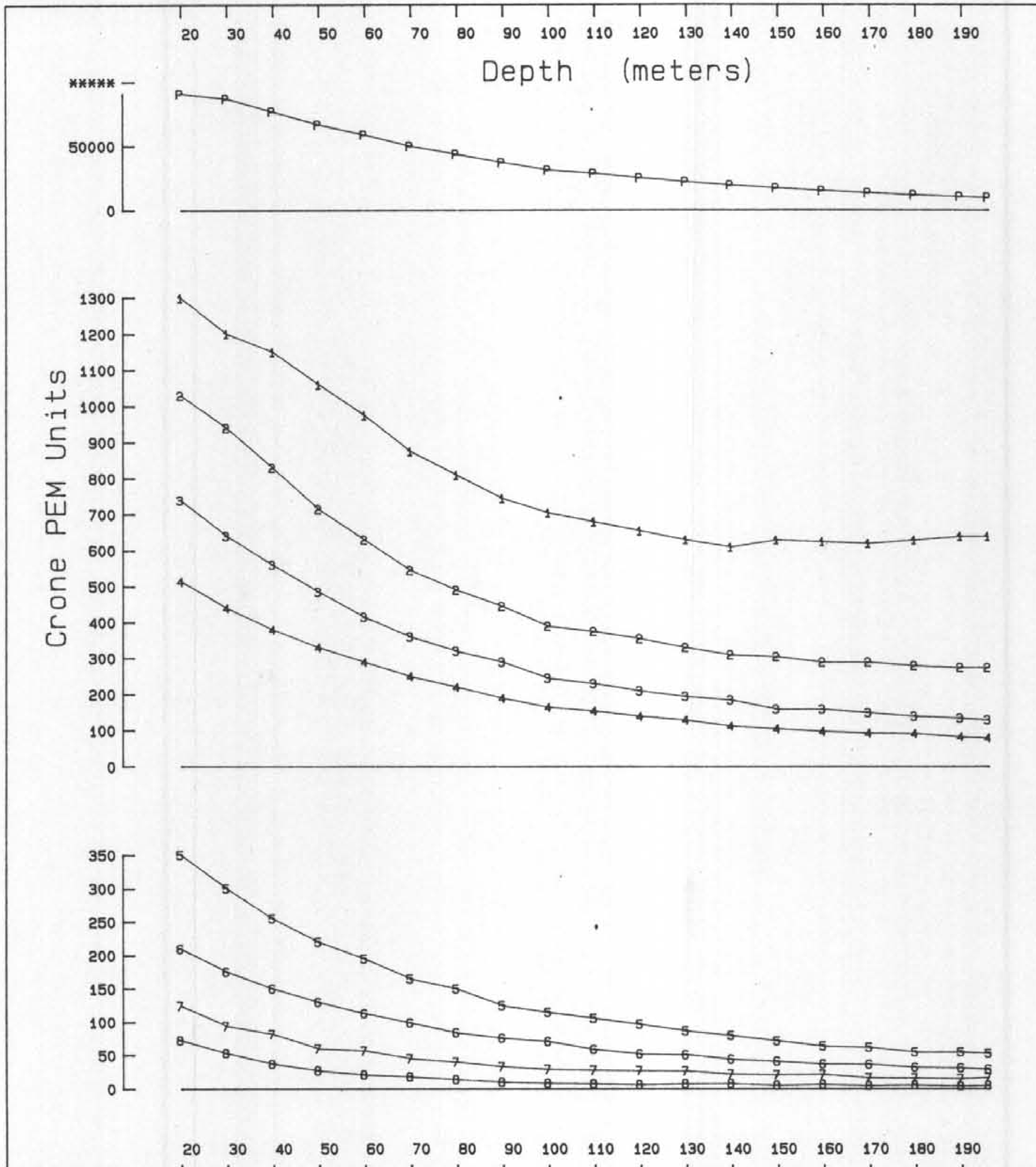
BOREHOLE PULSE EM SURVEY
HOLE T91038 LOOP S

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 12b

WOODS GEOPHYSICAL CONSULTING



HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT

BOREHOLE PULSE EM SURVEY

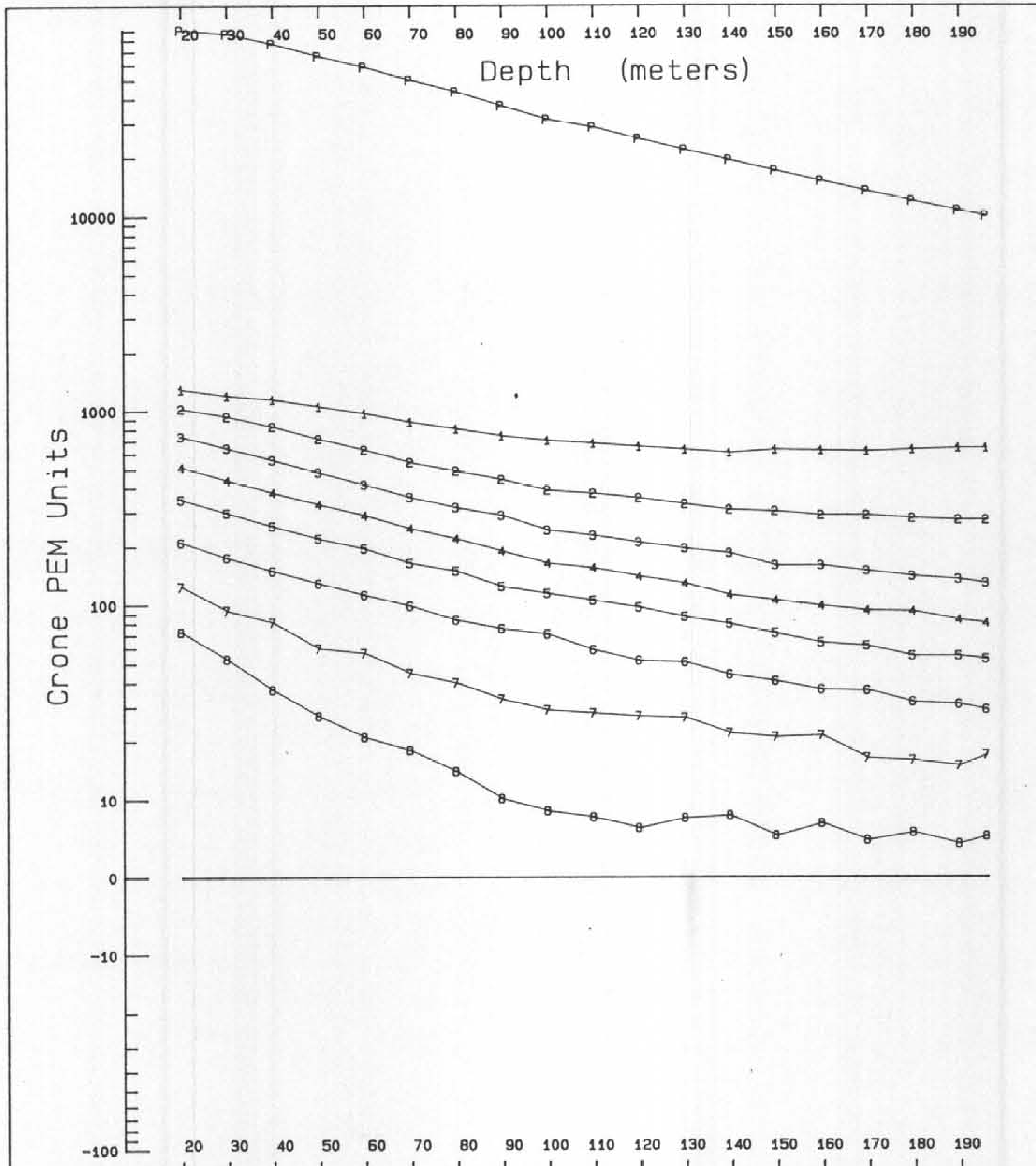
HOLE T91039 LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 13a

WOODS GEOPHYSICAL CONSULTING



GEOLOGICAL BRANCH
ASSESSMENT REPORT

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PART 2 OF 3

HOMESTAKE MINING (CANADA) LTD.

TWIN PROJECT
BOREHOLE PULSE EM SURVEY
HOLE T91039 LOOP C

Scale 1: 1000.0

0 20 40 60 80 100 M

Date: July 1991	Survey: June 1991	Profile: 13b

WOODS GEOPHYSICAL CONSULTING