

Geophysical Survey Report
covering
Surface and Borehole Pulse EM Surveys
over the
West Timmins Project
for
Pacific North West Capital Corp.
during
November, 2005
by
CRONE GEOPHYSICS & EXPLORATION LTD.

Survey Area: West Timmins Project,
near Timmins, Ontario

Survey Type: Surface and Borehole Pulse EM Surveys

Survey Operator: Wayne Pearson

Survey Period: November 12th – 25th, 2005

Report By: Kevin Ralph

Report Date: February, 2006

Submitted To: Pacific North West Capital Corp.
Lively, Ontario

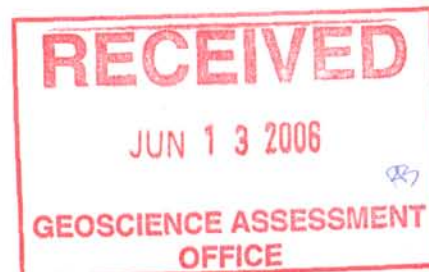


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1 INTRODUCTION

Crone Geophysics and Exploration Ltd. was contracted by Pacific North West Capital Corp. to conduct a Surface and Borehole Pulse Time Domain Electromagnetic (PEM) survey on its West Timmins Project, near Timmins, Ontario. The survey was conducted over the interval of November 12th – November 25th, 2005 during which time seven holes were surveyed. During this time period a brief surface survey was conducted on GRID 3 with two lines surveyed. This report outlines the geophysical work performed on this property. The appendices to this report contain page size profile plan maps, the PEM profiles, the linear profile plots, the step response profile plots and the Crone Instrument Specifications.

2 PROPERTY LOCATION AND ACCESS

The Property is located approximately 70 kilometers west of the city of Timmins, Ontario and lies within the townships of Belford, Griffin, Melrose, Montcalm, Nova, Strachan and Watson. The property is transacted by a park along the Groundhog River, which divides the claims into two separate groups.

Access to the West Timmins Property can be accomplished by travelling west from Timmins along Highway 101 for 5 km then northwest for 56 km along the Mallette logging road. A Tembec logging road from Kapuskasing provides access to the northwestern part of the property, this road connects with the Mallette road. A network of secondary logging roads provides additional access throughout the property.

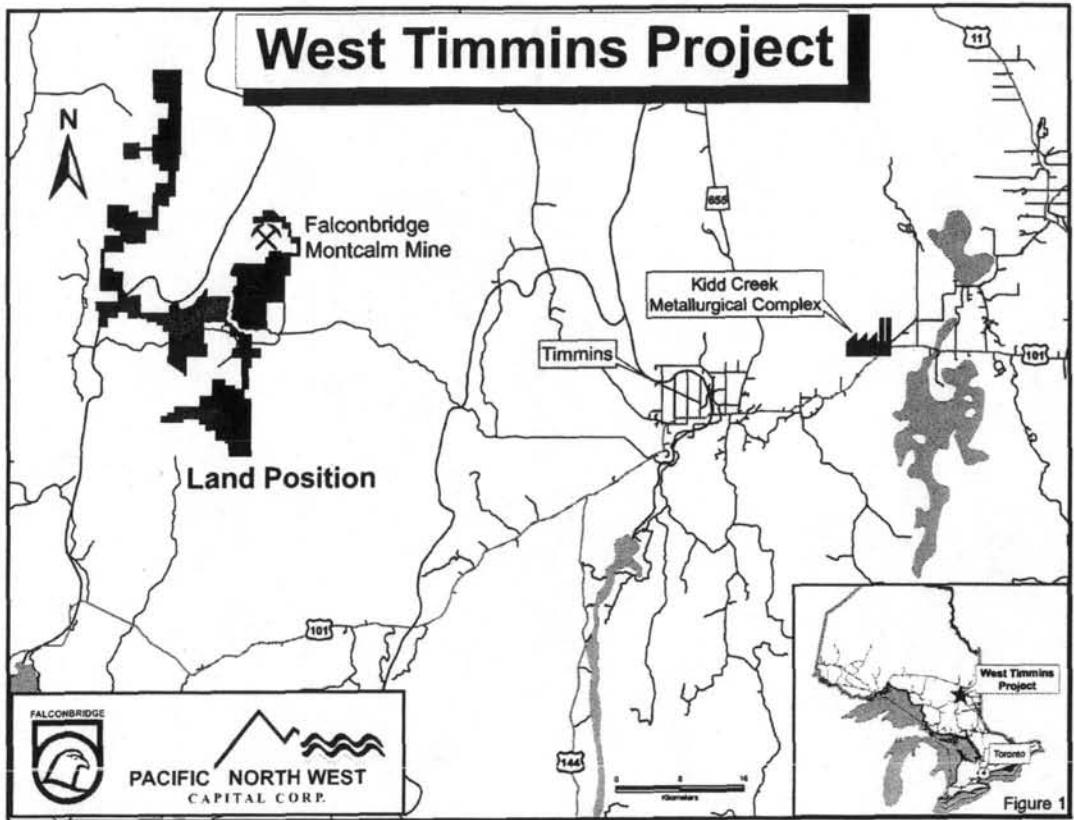


Figure 1: General Location Map – West Timmins Project

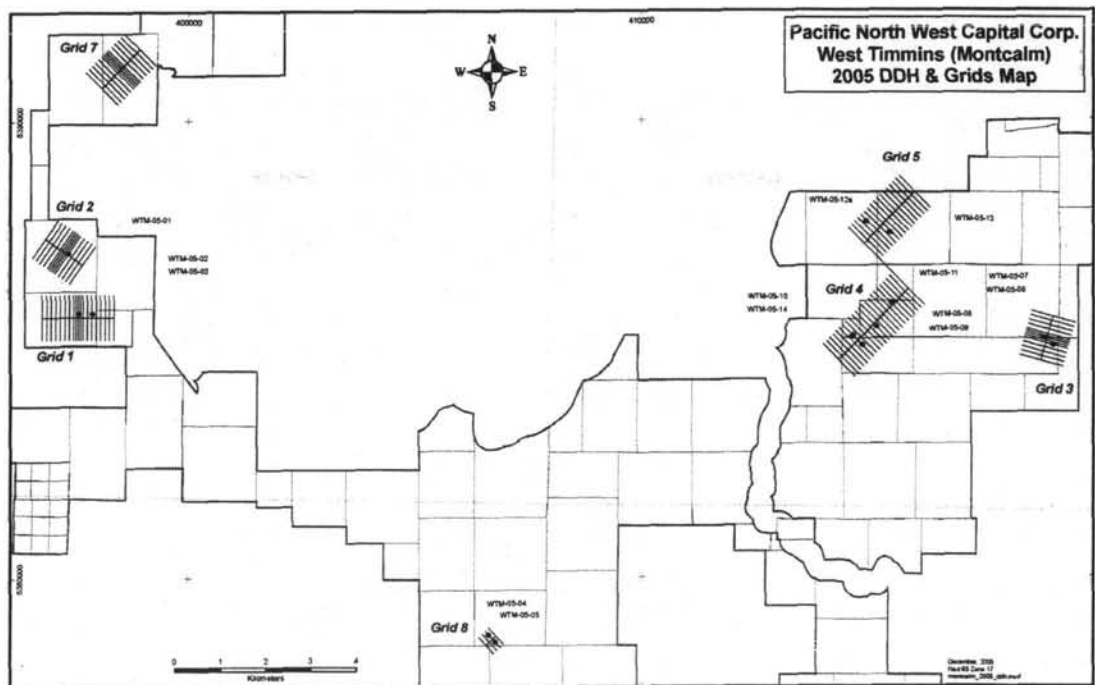


Figure 2: Grid Location Map – West Timmins Project

3 PERSONNEL

The following personnel were involved in the collection of the data and production of this report:

Survey Operators: Wayne Pearson
Report: Kevin Ralph

4 SURVEY METHOD & EQUIPMENT

Crone Pulse EM is a time domain electromagnetic method in which a precise pulse of current with a controlled linear shut off is transmitted through a large loop of wire on the ground and the rate of decay of the induced secondary field is measured across a series of time windows during the off-time. The EMF created by the shutting-off of the current induces eddy currents in nearby conductive material thus setting-up a secondary magnetic field. When the primary field is terminated, this magnetic field will decay with time. The amplitude of the secondary field and the decay rate are dependent on the quality and size of the conductor.

The equipment used was the Crone Pulse EM system. This includes a 2.4kW transmitter with a 120V voltage regulator powered by an 4.5 hp motor generator. The Crone Digital Receiver was used to collect the field data. The synchronization between the Transmitter and the Receiver was maintained by direct cable synchronization for the borehole surveys and by crystal clock for the surface surveys.

The 3D Borehole Pulse EM survey was conducted in which an axial component (Z) probe and a cross component (XY) probe was used to measure the three components of the induced secondary field. The first pass with the 'Z' probe detects any in-hole or off-hole anomalies and gives information on size, conductivity, and distances to the edge of conductors. The second pass with the 'XY' probe measures two orthogonal components of the EM field in a plane oriented at right angles to the borehole and the results give directional information to the center of the conductive body

The rotation of the XY probe was corrected through the use of an orientation tool, so that positive X points in the direction of the hole azimuth and positive Y is horizontal and points to the left of an observer looking down the hole.

The following table shows the various time gates, in ms, that constitute the channel configurations set up in the Crone PEM Receiver used in the surveys.

Table I: Channel Configuration, (16.66 ms time base)

Channel	Start	Finish	Channel	Start	Finish
1	4.800e-05	6.400e-05	2	6.400e-05	8.400e-05
3	8.400e-05	1.120e-04	4	1.120e-04	1.520e-04
5	1.520e-04	2.040e-04	6	2.040e-04	2.680e-04
7	2.680e-04	3.600e-04	8	3.600e-04	4.800e-04
9	4.800e-04	6.400e-04	10	6.400e-04	8.480e-04
11	8.480e-04	1.128e-03	12	1.128e-03	1.496e-03
13	1.496e-03	1.992e-03	14	1.992e-03	2.644e-03
15	2.644e-03	3.512e-03	16	3.512e-03	4.664e-03
17	4.664e-03	6.192e-03	18	6.192e-03	8.220e-03
19	8.220e-03	1.092e-02	20	1.092e-02	1.440e-02

Table II: Channel Configuration, (50 ms time base)

Channel	Start	Finish	Channel	Start	Finish
1	4.800e-05	6.400e-05	2	6.400e-05	8.400e-05
3	8.400e-05	1.120e-04	4	1.120e-04	1.520e-04
5	1.520e-04	2.040e-04	6	2.040e-04	2.680e-04
7	2.680e-04	3.600e-04	8	3.600e-04	4.800e-04
9	4.800e-04	6.400e-04	10	6.400e-04	8.480e-04
11	8.480e-04	1.128e-03	12	1.128e-03	1.496e-03
13	1.496e-03	1.992e-03	14	1.992e-03	2.644e-03
15	2.644e-03	3.512e-03	16	3.512e-03	4.664e-03
17	4.664e-03	6.192e-03	18	6.192e-03	8.220e-03
19	8.220e-03	1.092e-02	20	1.092e-02	1.440e-02
21	1.440e-02	1.770e-02	22	1.770e-02	2.770e-02
23	2.770e-02	3.770e-02	24	3.770e-02	4.770e-02

6 SURVEY PARAMETERS

Table III: Surface Survey Coverage

Line	Tx loop	Start	End	Length Read (m)	Component Measured
400N	05-07	325W	200E	525m	X, Z
450N	05-07	325W	175E	500m	X, Z

Table IV: Borehole Claims Information

Hole Number	Grid	Grid Location	Township	Claim #
WTM-05-05	8	Line 200N ST 75W	Nova	P3006238
WTM-05-06	3	Line 500N ST 100W	Montcalm	P3005311 & P3005315
WTM-05-07	3	Line 400N ST 75E	Montcalm	P3005311 & P3005315
WTM-05-08	4	Line 1100S ST 100E	Montcalm	P3010804
WTM-05-10	4	Line 1600S ST 100W	Montcalm	P3005321
WTM-05-12	5	Line 300N St 1600W	Montcalm	P30010025
WTM-05-12a	5	Line 300N St 1725W	Montcalm	P30010025
WTM-05-13	5	Line 500N St 1200W	Montcalm	P30010023

Table V: Borehole Survey Coverage

Hole	Tx loop	Collar Location	Dip at collar	Azimuth (grid)	Length Read (meters)	Component
WTM-05-05	05-05	406800 E - 5378581 N	44°	320°	20 - 230	X, Y, Z
WTM-05-06	05-06lp1 05-06lp2	418867 E - 5385209 N	51°	100°	50- 250	X, Y, Z
WTM-05-07	05-07	419112 E - 5385036 N	45°	295°	30-280	X, Y, Z
WTM-05-08	05-08	415172 E - 5385446 N	48°	318°	53-200	X, Y, Z
WTM-05-10	05-10	414653 E - 5385267 N	45°	321°	20-220	X, Y, Z
WTM-05-12	05-12	415031 E - 5387650 N	44°	318°	20-230	X, Y, Z
WTM-05-13	05-13	415469 E - 5387508 N	45°	315°	50-220	X, Y, Z

Table VI: Survey Parameters and Loop Location

Loop	Size	Location	Ramp Time	Current	Time Base
05-05	~300x 300	406803 E, 5378706 N 406627 E, 5378478 N 406858 E, 5378282 N 407043 E, 5378536 N	1.5 msec	18 amps	50 msec
05-06LP1	~300x 300	418666 E, 5385371 N 418527 E, 5385092 N 418886 E, 5384997 N 418936 E, 5385290 N	1.5 msec	18 amps	16.66 msec
05-06LP2	~300x 300	418936 E, 5385297 N 418875 E, 5385003 N 419193 E, 5384912 N 419220 E, 5385210 N	1.5 msec	18 amps	50 msec
05-07	~300x 300	419119 E, 5385239 N 418985 E, 5384970 N 419320 E, 5384890 N 419416 E, 5385158 N	1.5 msec	18 amps	50 msec
05-08	~300x 300	415261 E, 5385626 N 415057 E, 5385425 N 415264 E, 5385209 N 415467 E, 5385413 N	1.5 msec	18 amps	50 msec
05-10	~300x 300	414541 E, 5385236 N 414775 E, 5384992. N 414970 E, 5385219 N 414766 E, 5385433 N	1.5 msec	18 amps	50 msec
05-12	~250x200	414926 E, 5387618 N 415095 E, 5387442 N 415237 E, 5387573 N 415070 E, 5387747 N	1.5 msec	18 amps	50 msec
05-13	~300x 300	415277 E, 5387390 N 415483 E, 5387173 N 415709 E, 5387353 N 415500 E, 5387581 N	1.5 msec	18 amps	50 msec

7 PRODUCTION SUMMARY

Table VII: Production Summary

November 12 th , 2005	Mob to site, Dummied hole WTM05-06 and laid loop.
November 13 th , 2005	Surveyed hole WTM-05-06 and picked up the loop.
November 14 th , 2005	Drill not finished. Went out with PFN staff and located holes 5,8,10 and 11.
November 15 th , 2005	Hole WTM-05-12; laid loop and surveyed hole.
November 16 th , 2005	Picked up loop for hole 05-12, dummied hole WTM-05-08 and laid loop.
November 17 th , 2005	Surveyed hole WTM-05-08, and dummied hole WTM-05-10.
November 18 th , 2005	Surveyed hole WTM-05-10 and picked up the loopd.
November 19 th , 2005	Surveyed hole WTM-05-05.
November 20 th , 2005	Picked up loops 05-05 and 05-08.
November 21 st , 2005	Laid loop WTM-05-06LP2 and surveyed hole WTM-05-06.
November 22 nd , 2005	Dummied hole WTM-05-13 and laid loop.
November 23 rd , 2005	Surveyed hole WTM-05-13 and picked up the loop.
November 24 th , 2005	Surveyed hole WTM-05-07.
November 25 th , 2005	Surveyed lines 400N and 450N and picked up the loop.

8 SUMMARY COMMENTS

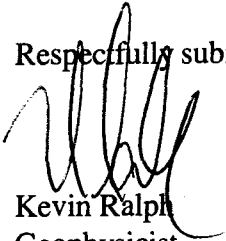
The following provides a brief summary of the results of the BH survey in Table format. The surface lines detected the same anomalous source as identified in holes 6 and 7 and have not been commented on in detail. The off-hole source identified here appears to remain untested and would rank as a high priority target.

Holes 5 and 8 should be analyzed closely after detailed geological logs are provided by the client. If the unit intersected here typically exhibits a moderate to good conductivity (example dunite, serpentized units etc.) the response may be well explained, however, more work is recommended with these two holes in particular.

The anomalous source(s) in hole 10 should be examined in a similar manner.

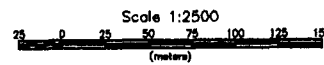
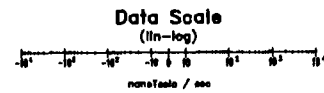
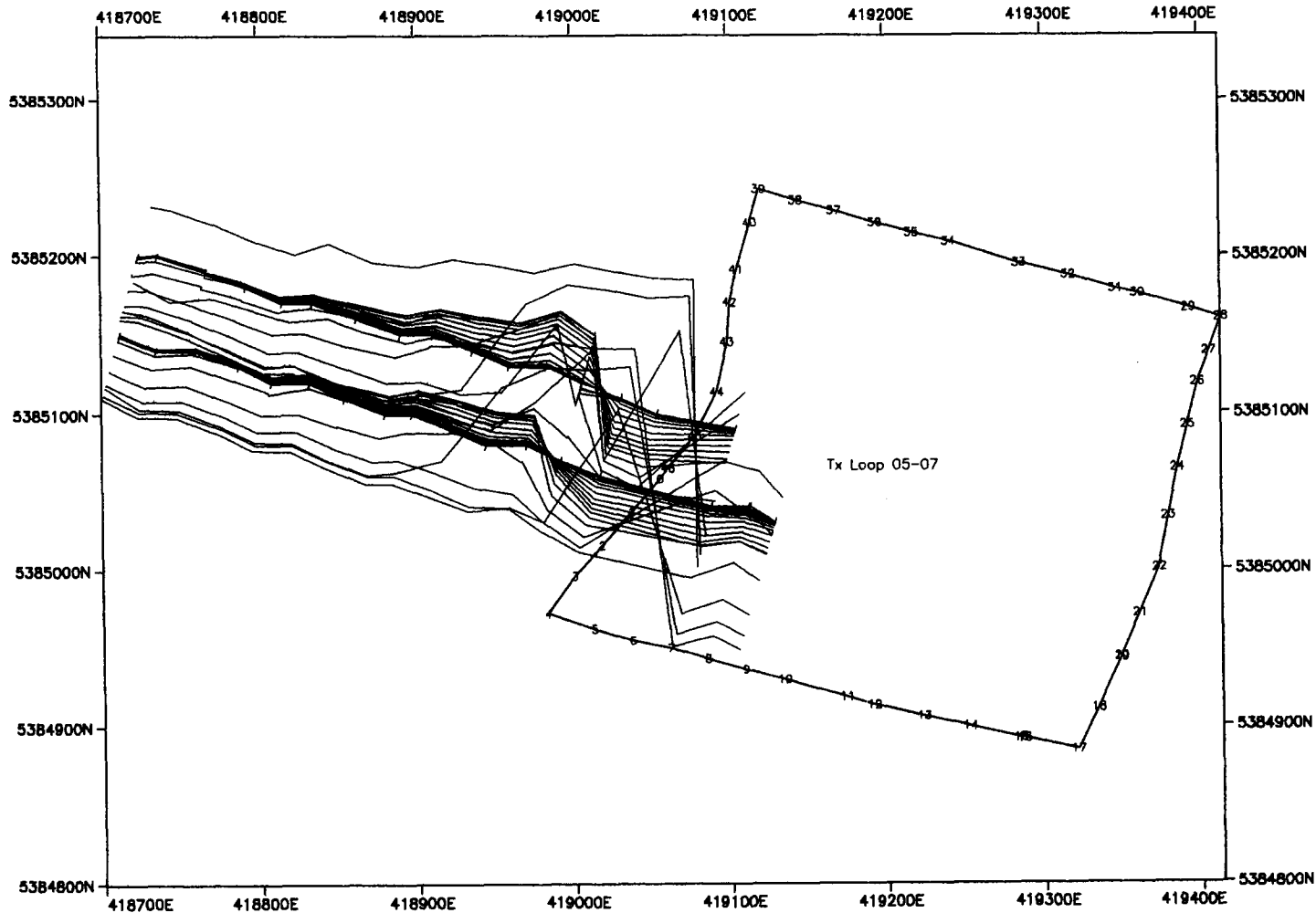
Hole	Survey depth	Anomaly depth	Type	Distance from hole	Direction	Comments
WTM-05-05	230m	~140m, ~170m	In-hole		Below and West	In-hole response. Source conductance: moderate- good. Late time eddy currents move away from hole but this could be bulk conductivity effect of a thick unit (i.e. May not be a higher conductance zone lying away from hole)
WTM-05-06	250m	~80m	Off-hole	~10-15m	Above and North	High conductance but very small source.
		~120m, ~125m	In-hole			Very high conductance but small sources.
		~200m	Off-hole	>50m	South	Long wavelength response due to a distant, high conductance source. Conductor located South of hole. Excellent Target.
WTM-05-07	280m	~225m	Off-hole	~25m	Above and South	Same conductor as seen from hole 6. Conductor is centered South of and above the hole. Source is high conductance and is an Excellent Target.
WTM-05-08	200m	~110m	Off-hole	<10m		Very small and weakly conductive source.
		~150m	In-hole		Below and North	In-hole response due to a small source exhibiting good conductance.
		~150m	Off-hole	>25m ?	Below and North	In-hole response is superimposed on a longer wavelength off-hole anomaly. This response might warrant closer investigation and will need to be closely analyzed in conjunction with geological /lithological input
WTM-05-10	220m	~70m	Off-hole	~25-30m	Above and South	Conductor located South of and centered above hole. Source is a good conductor and may warrant further investigation
		~110m	In-hole		Below and South	Small source.
		~120m	Off-hole	~20-30m?	Below	Source exhibits good conductance but may have limited depth extent? However, if mineralization intersected at 110m is of interest this may be a potential target.
WTM-05-12						No anomalous sources detected.
WTM-05-13						No anomalous sources detected.

Respectfully submitted,

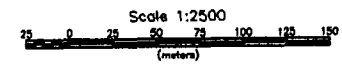
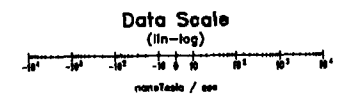
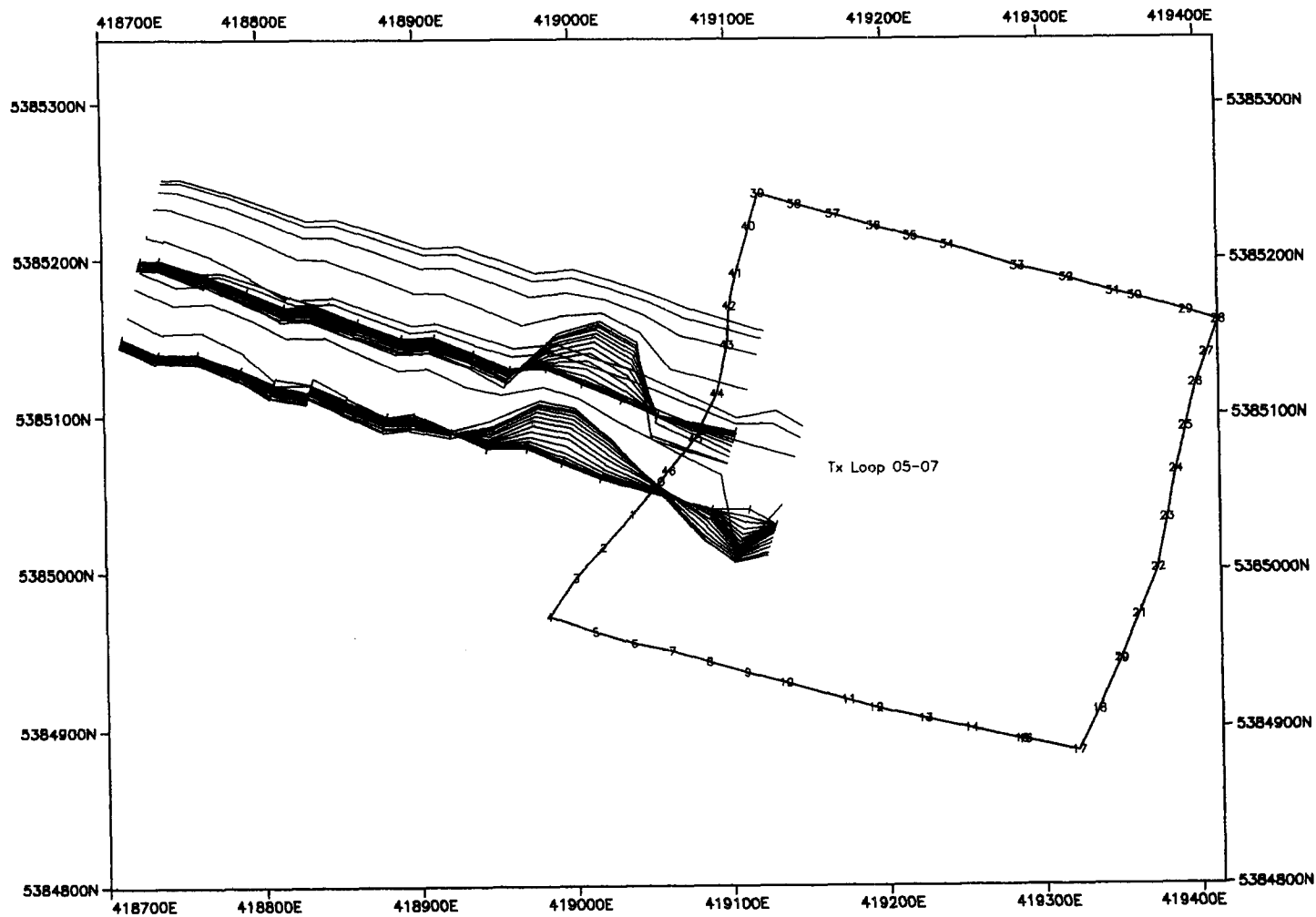


Kevin Ralph
Geophysicist
Crone Geophysics & Exploration Ltd.

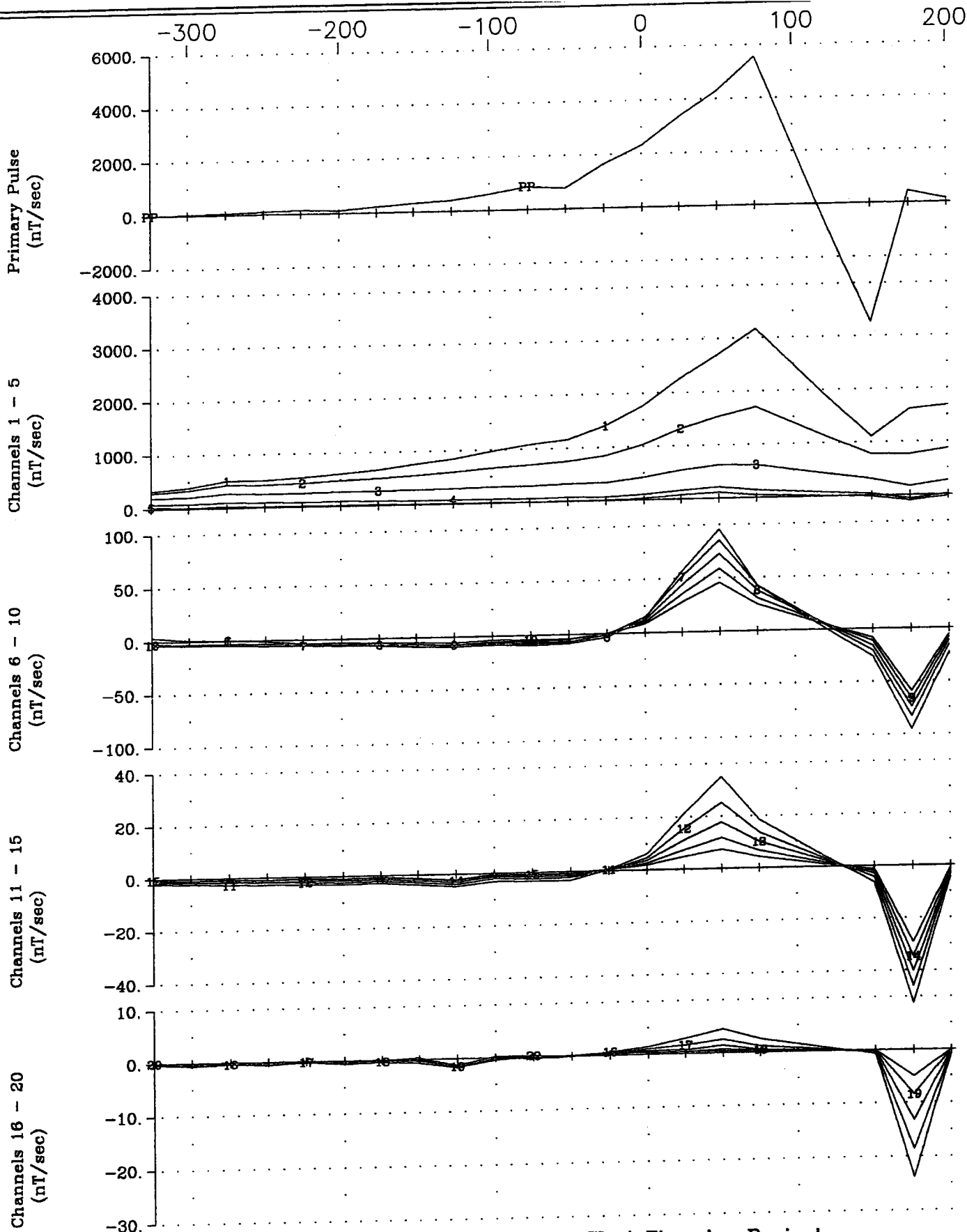
APPENDIX I:
SURFACE PEM DATA



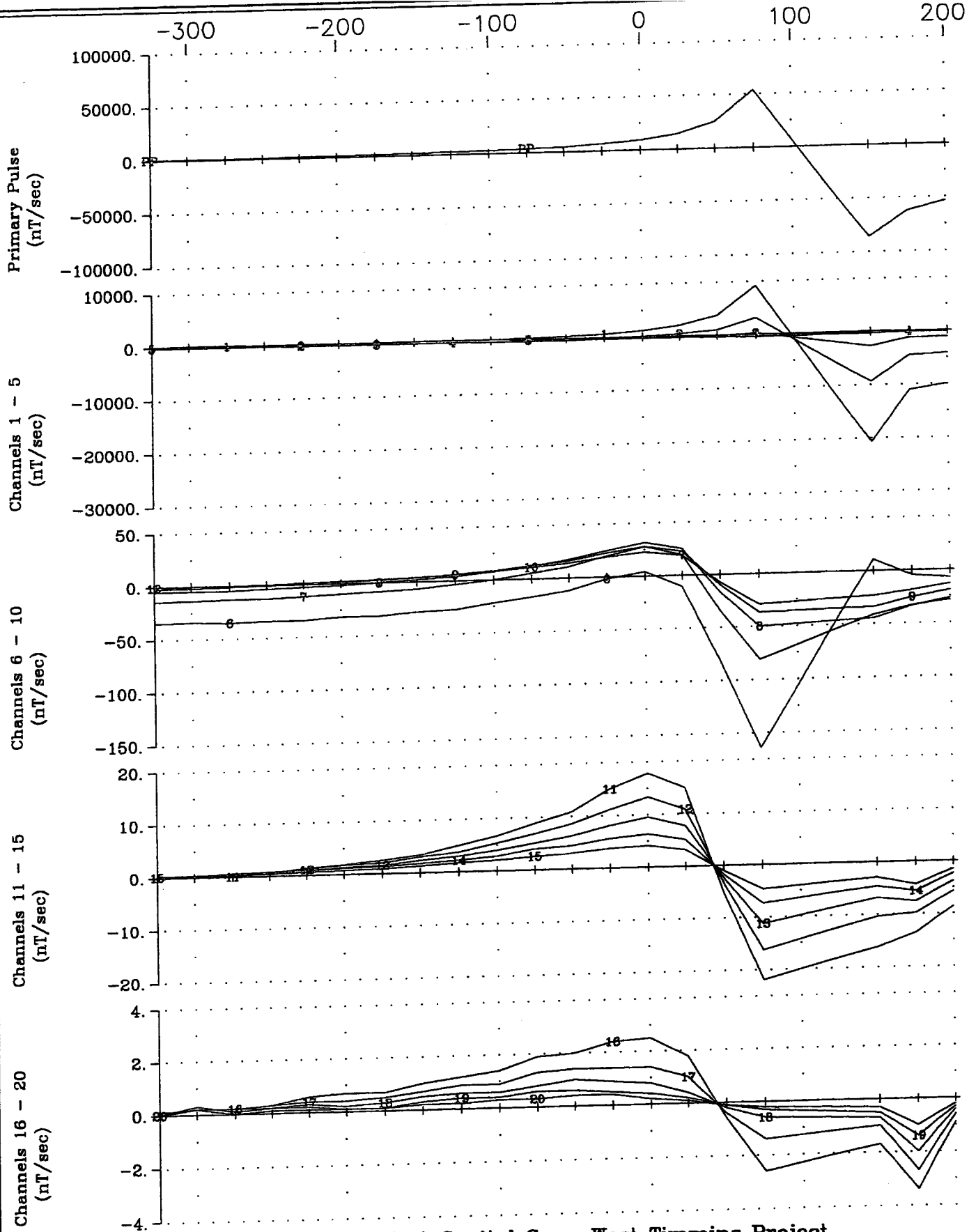
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West Timmins Project -GRID3
Surface Pulse EM Survey
Loop Location Map
Vertical Z Component
Survey Date: Nov 25, 2005
<i>Crone Geophysics & Exploration Ltd.</i>



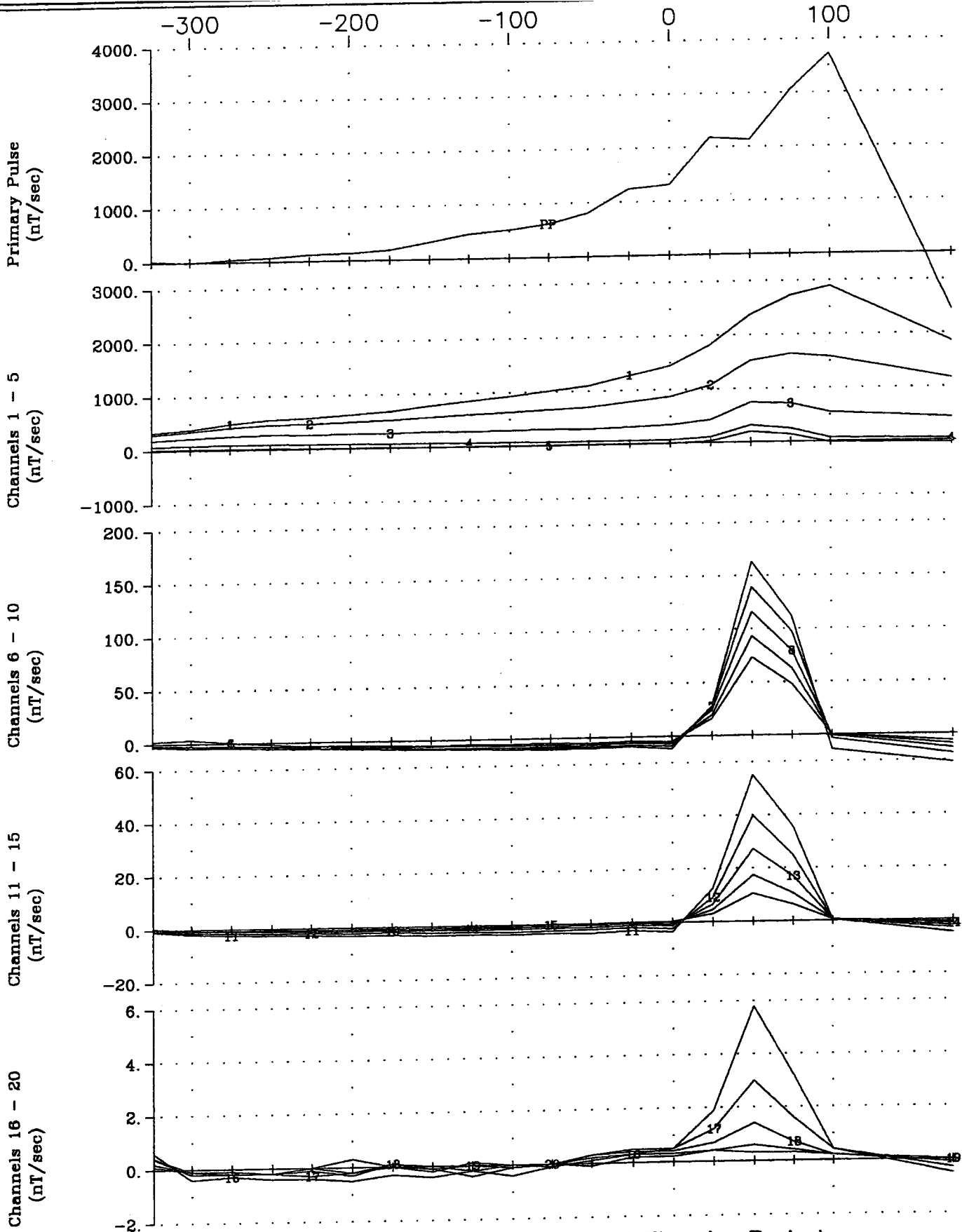
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<i>West Timmins Project - GRID 3</i>
Surface Pulse EM Survey
Loop Location Map
Horizontal X Component
Survey Date: Nov 25, 2005
<i>Crone Geophysics & Exploration Ltd.</i>



Pacific North West Capital Corp. West Timmins Project
 Line L400N (GRID 3) X Component
 Crone Geophysics & Exploration Ltd.



Pacific North West Capital Corp. West Timmins Project
 Line L400N (GRID 3) Z Component
 Crone Geophysics & Exploration Ltd.



Pacific North West Capital Corp. West Timmins Project
 Line L450N (GRID 3) X Component
 Crone Geophysics & Exploration Ltd.

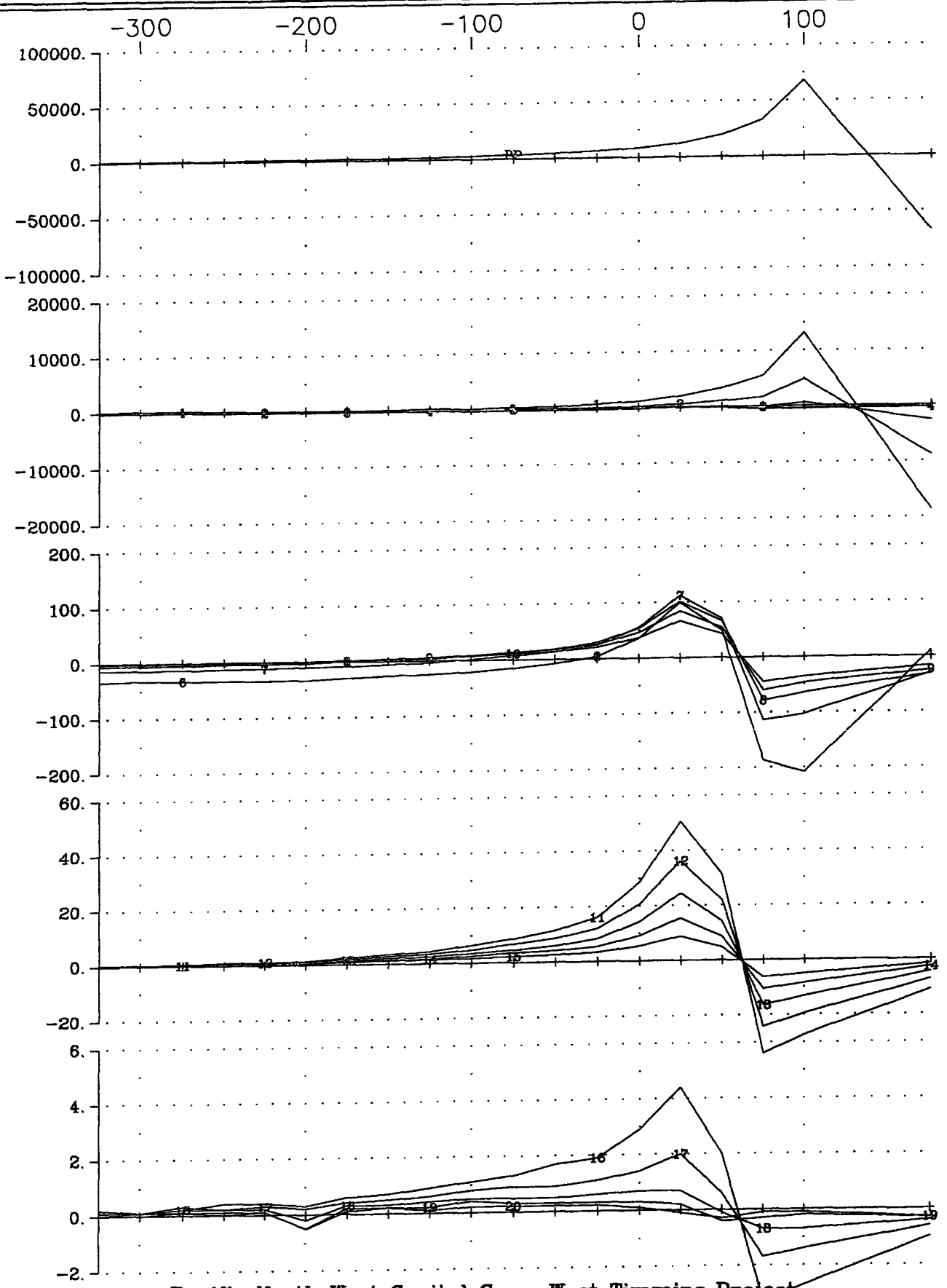
Primary Pulse
(nT/sec)

Channels 1 - 5
(nT/sec)

Channels 6 - 10
(nT/sec)

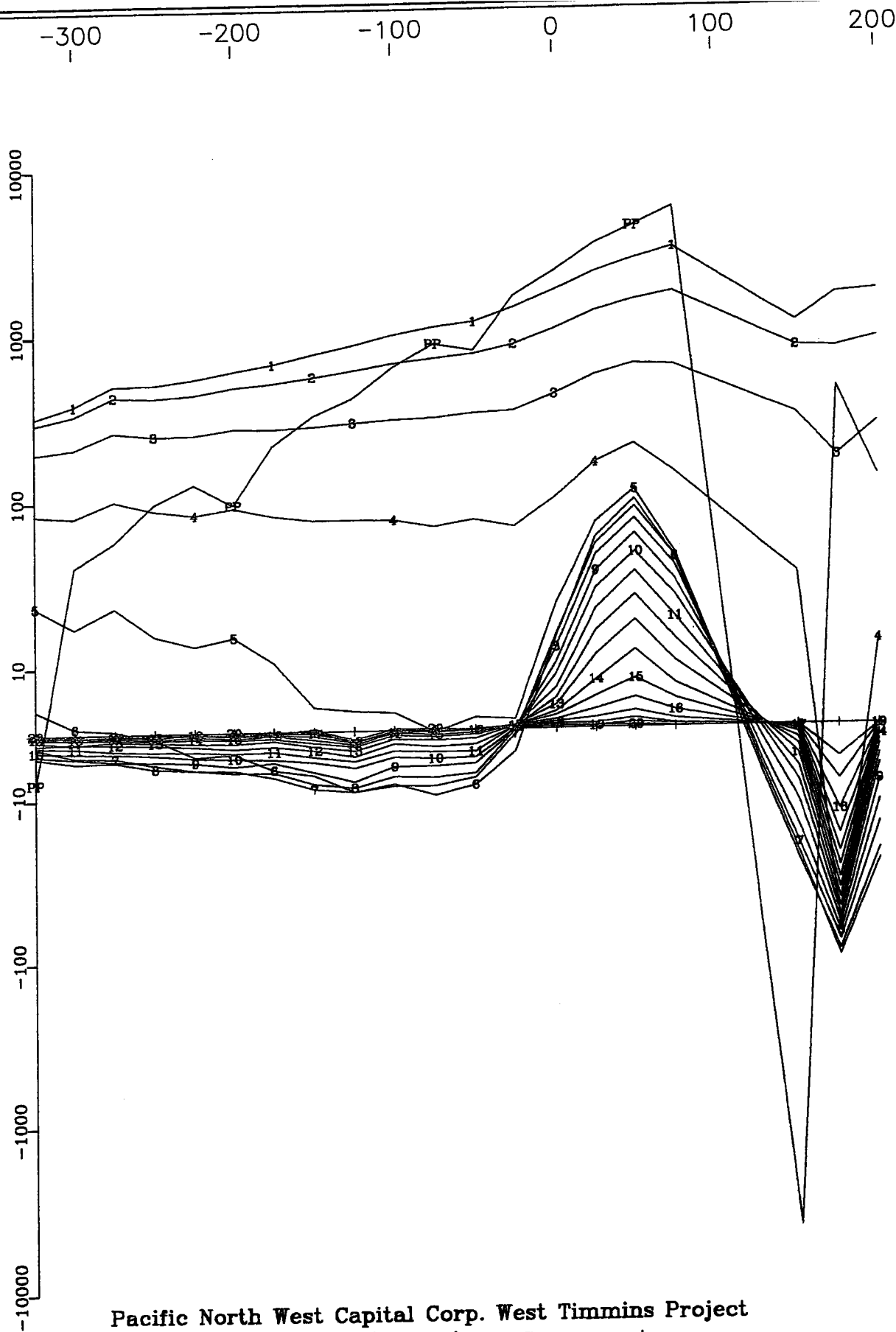
Channels 11 - 15
(nT/sec)

Channels 16 - 20
(nT/sec)



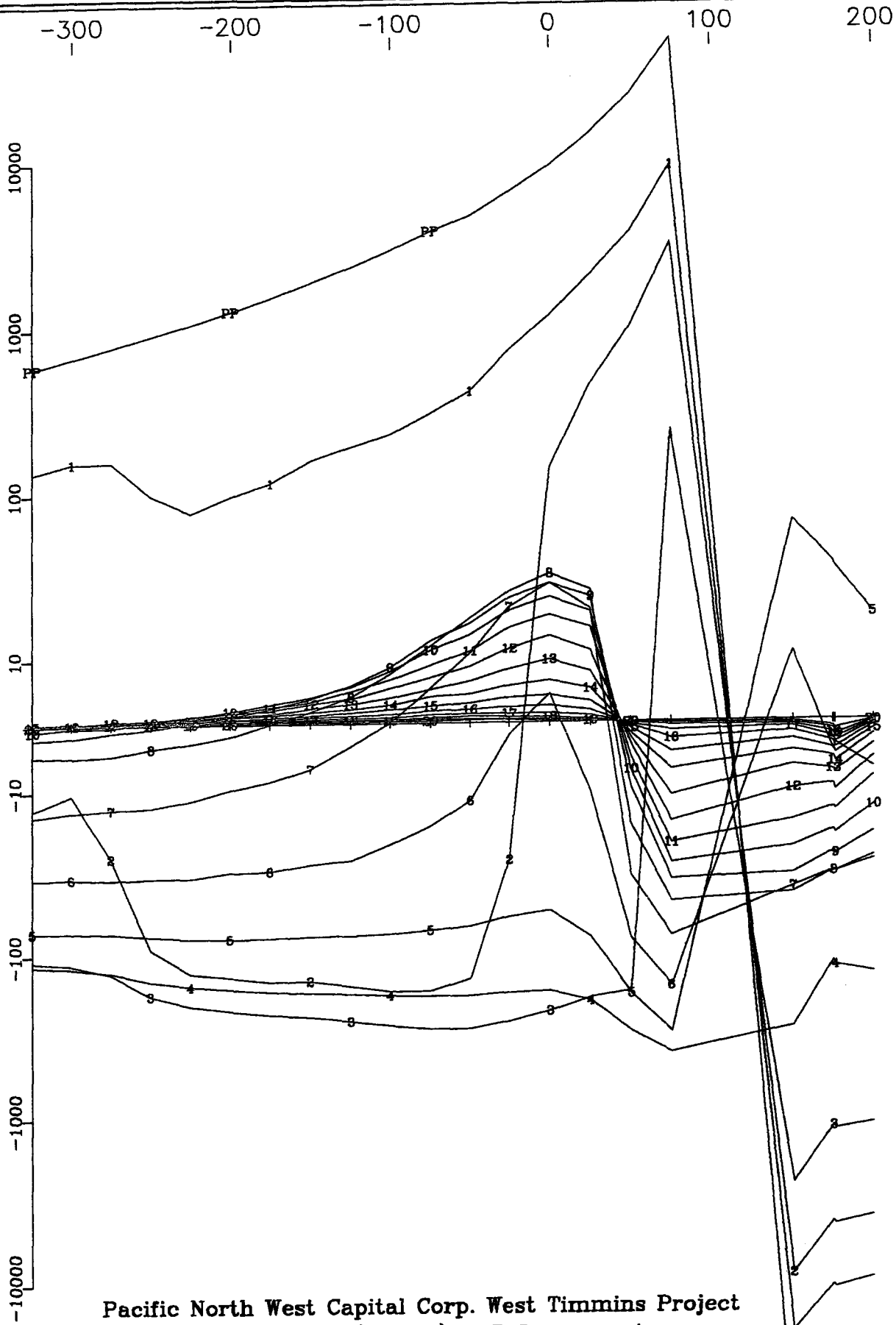
Pacific North West Capital Corp. West Timmins Project
Line L450N (GRID 3) Z Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 20 Off-time Channels
(nT/sec)



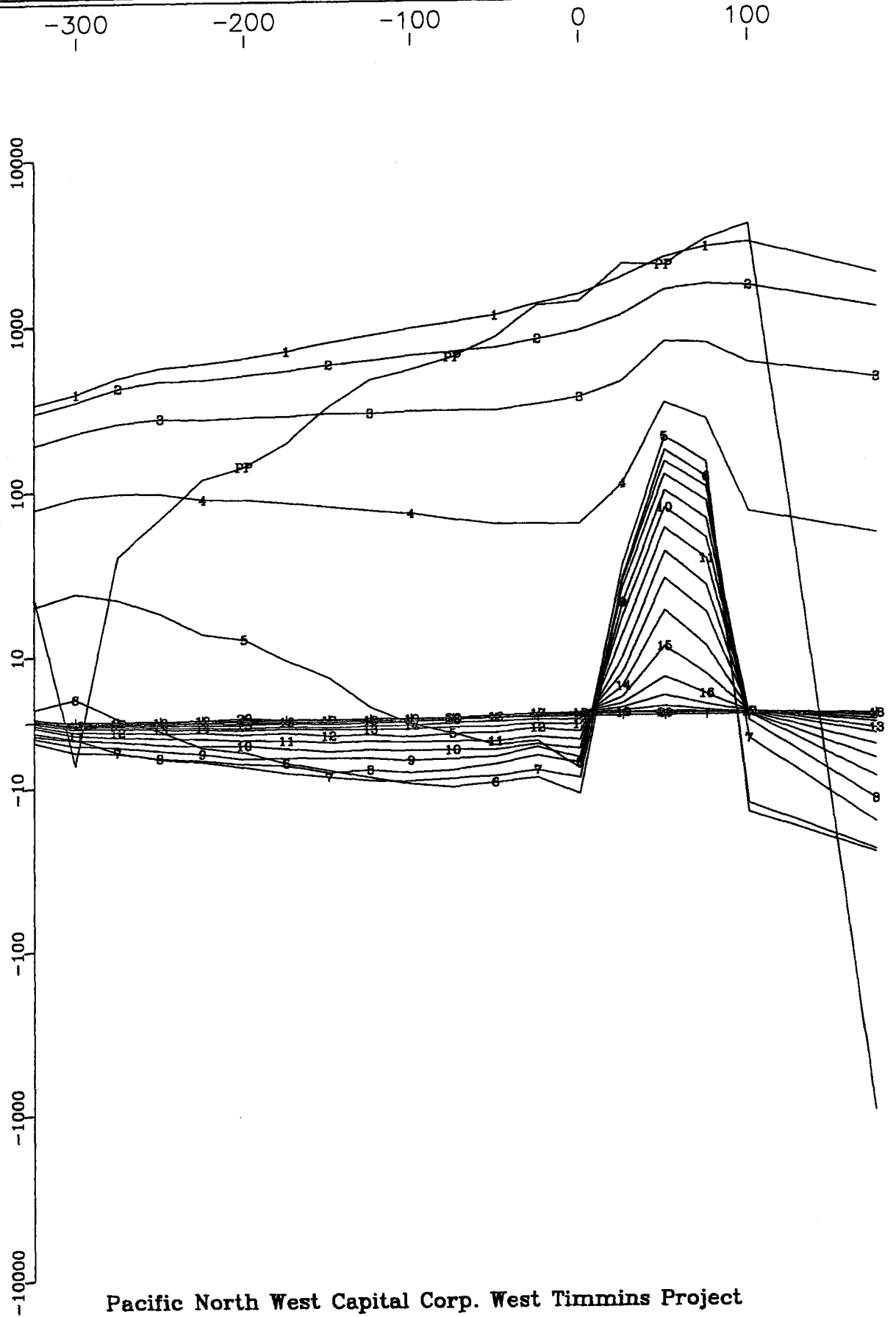
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Line L400N (GRID 3) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 20 Off-time Channels
(nT/sec)



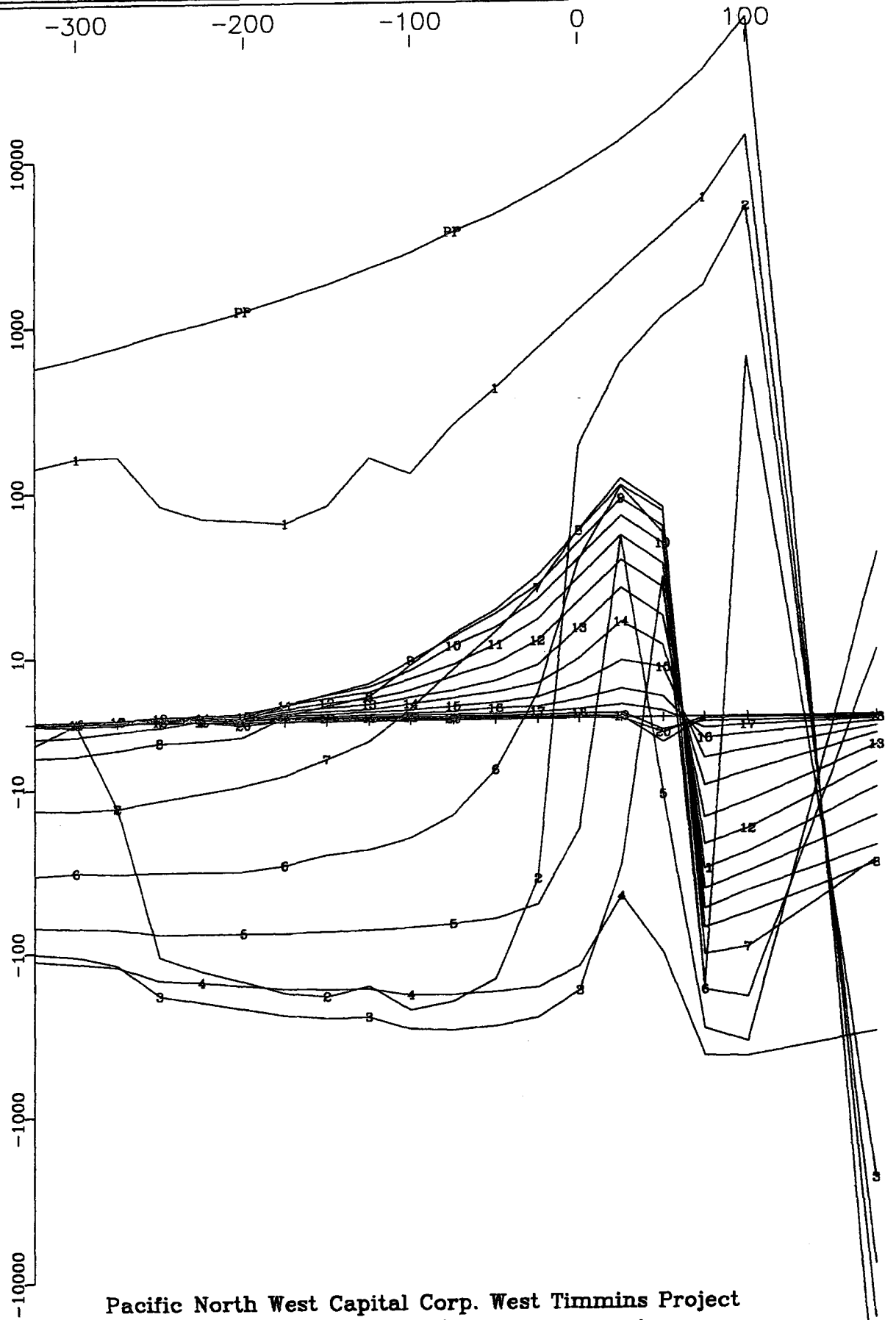
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Line L400N (GRID 3) Z Component
Crone Geophysics & Exploration Ltd.

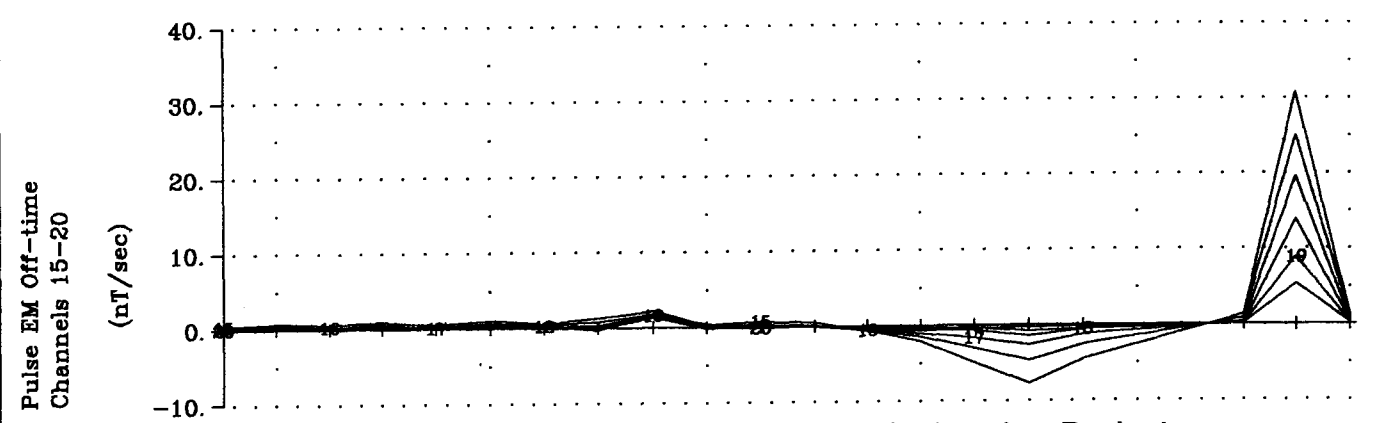
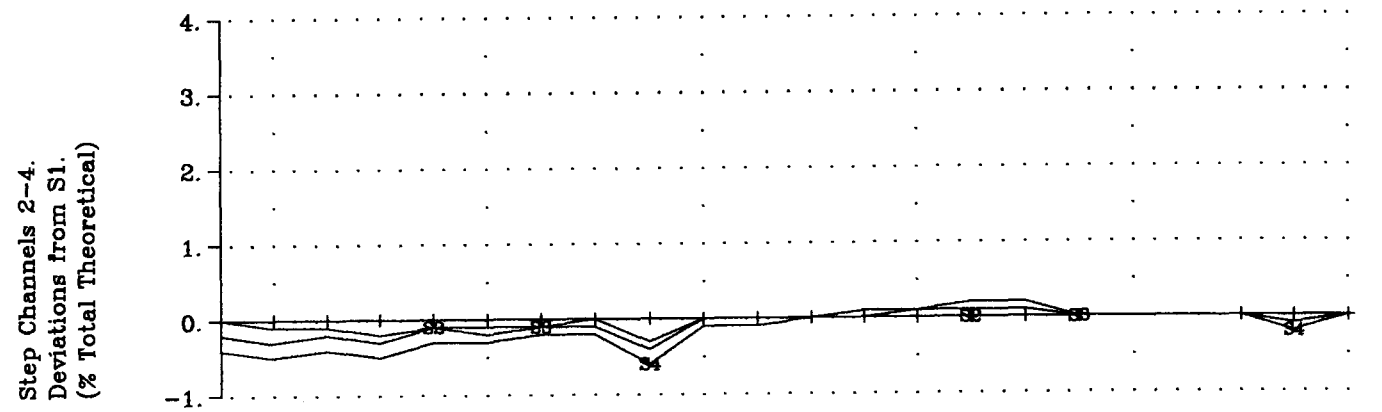
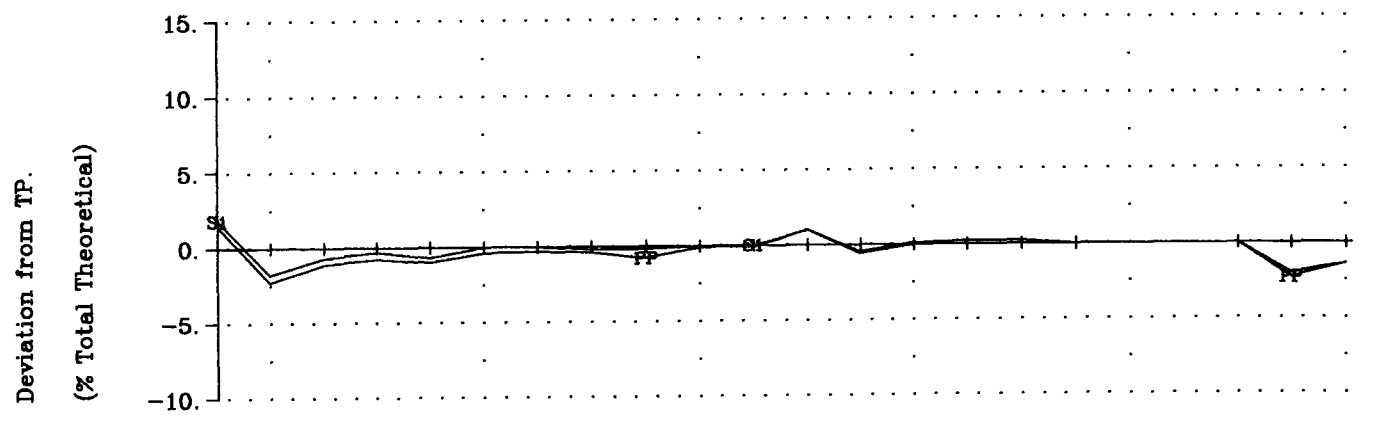
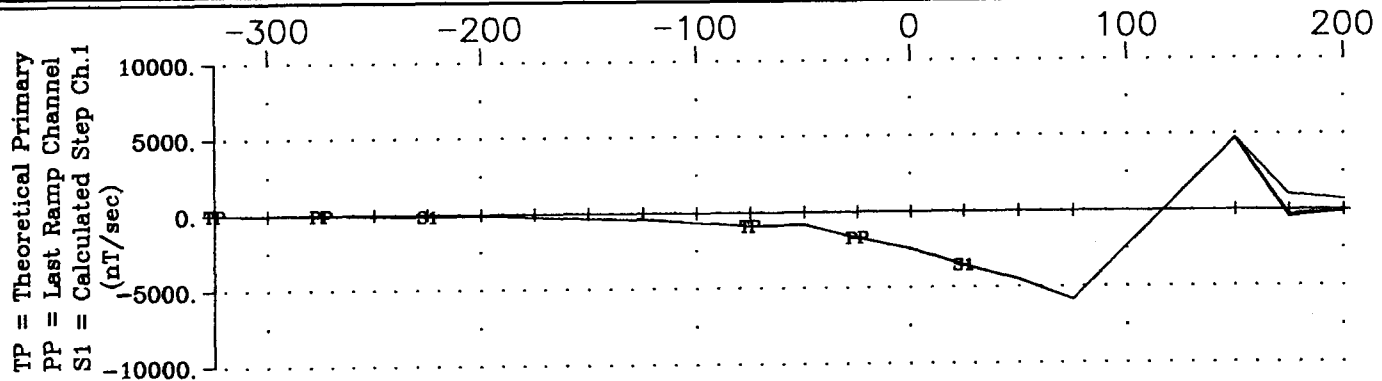
Primary Pulse and 20 Off-time Channels
(nT/sec)



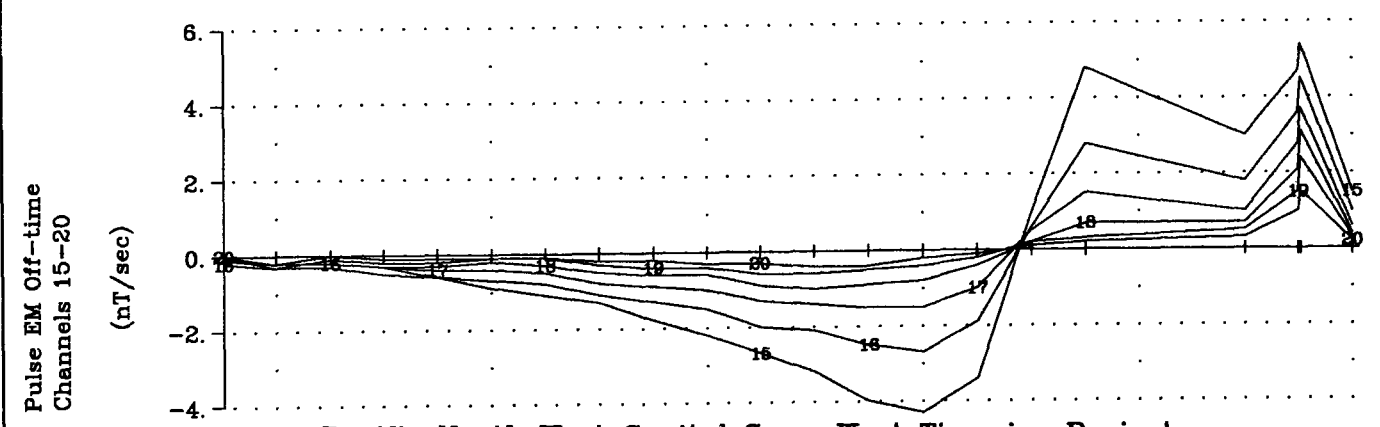
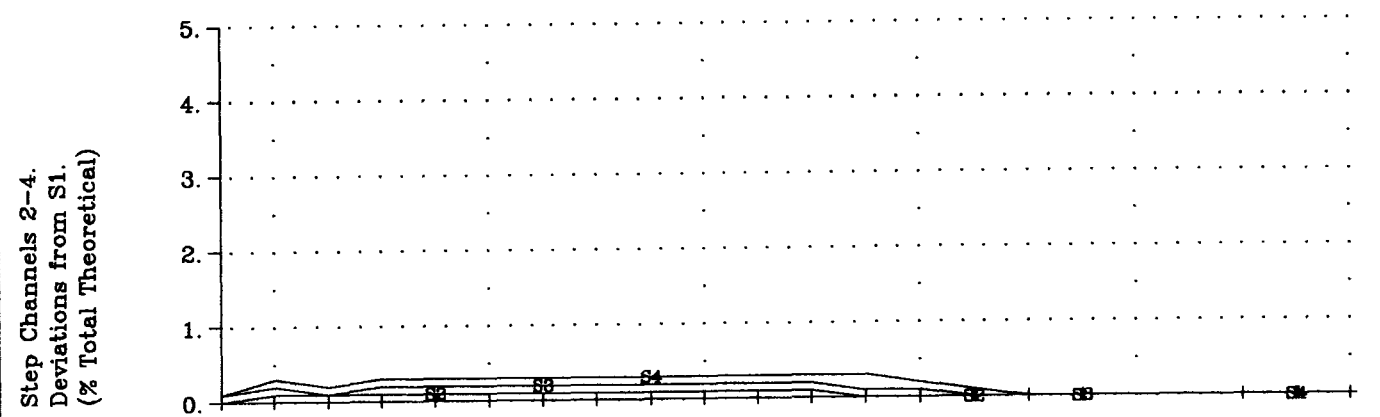
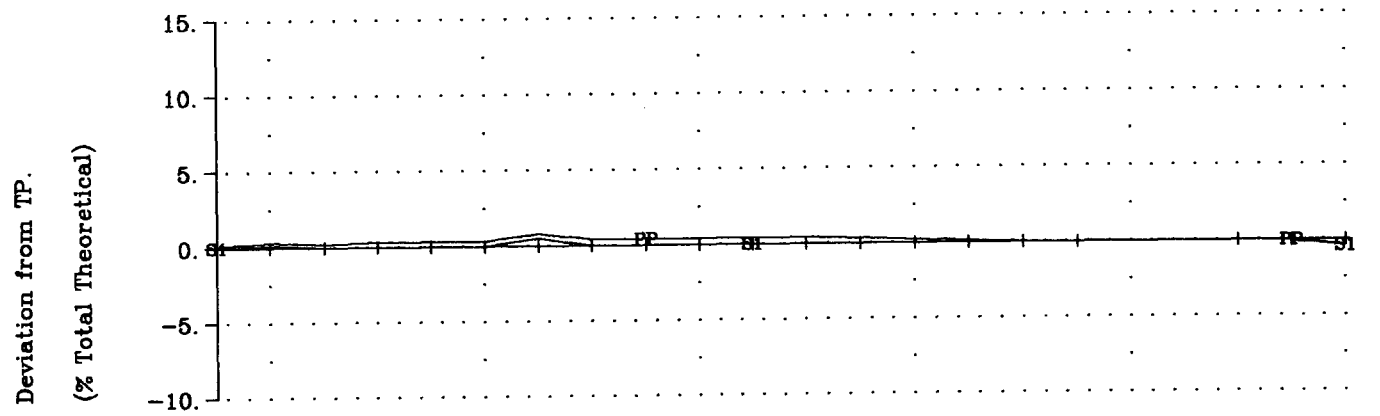
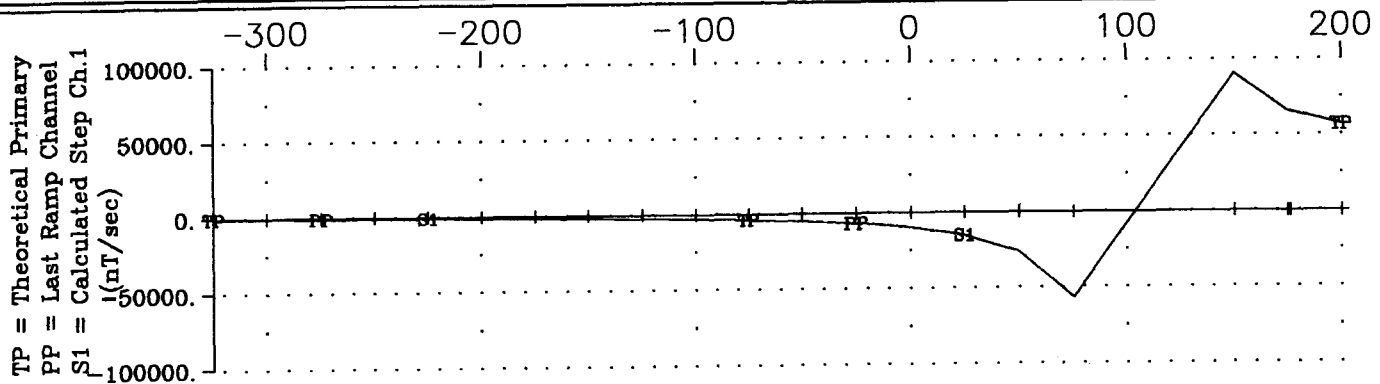
Pacific North West Capital Corp. West Timmins Project
Line L450N (GRID 3) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 20 Off-time Channels
(nT/sec)





Pacific North West Capital Corp. West Timmins Project
 Line L400N (GRID 3) X Component
 Crone Geophysics & Exploration Ltd.



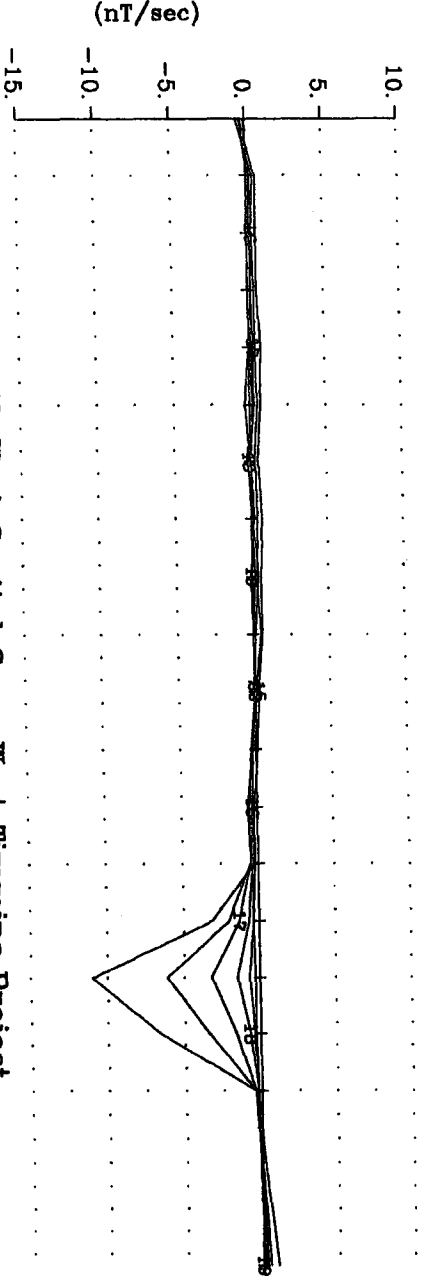
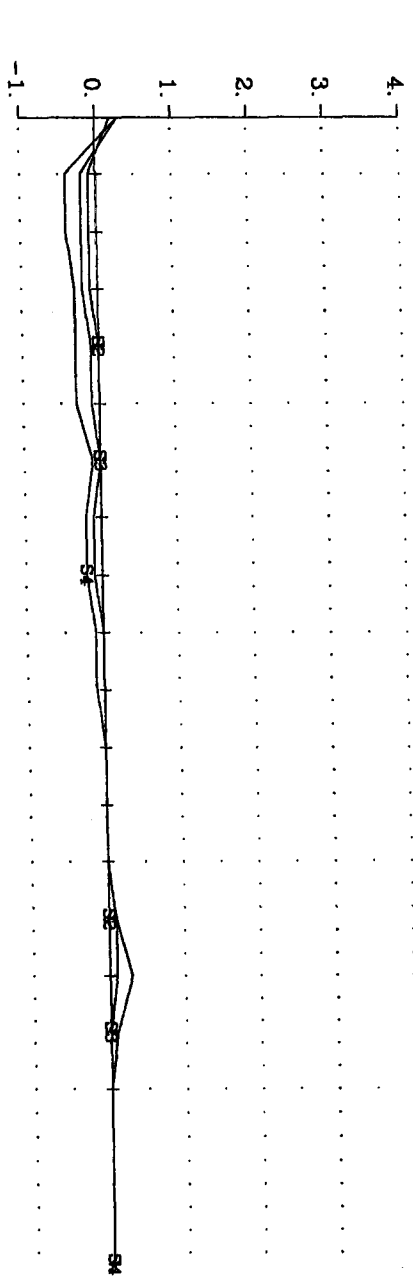
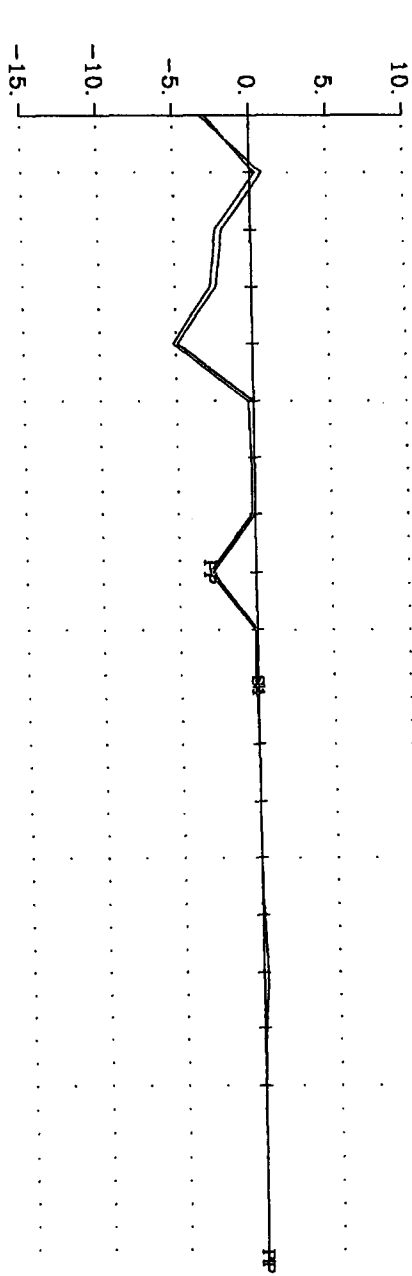
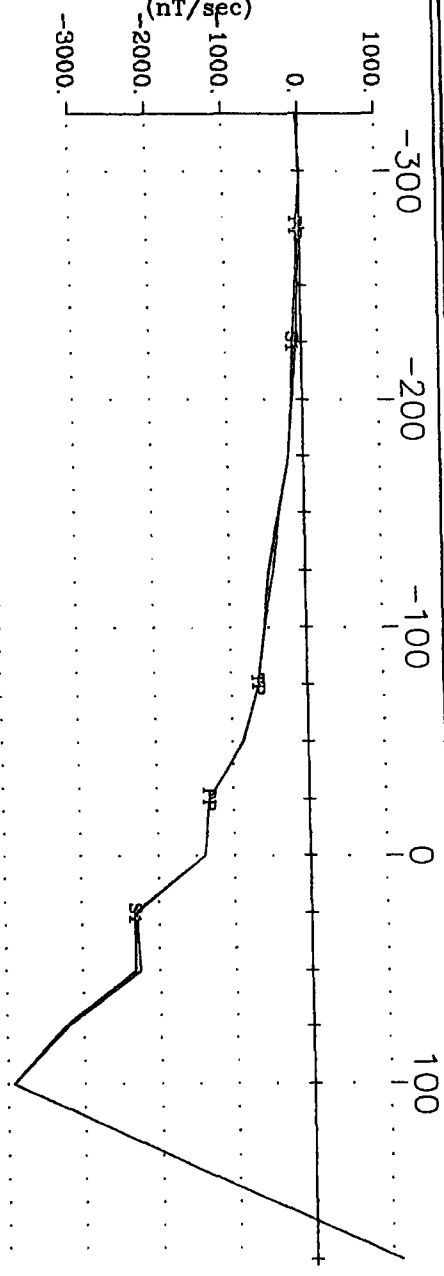
Pacific North West Capital Corp. West Timmins Project
 Line L400N (GRID 3) Z Component
 Crone Geophysics & Exploration Ltd.

TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1
 (nT/sec)

Deviation from TP.
 (% Total Theoretical)

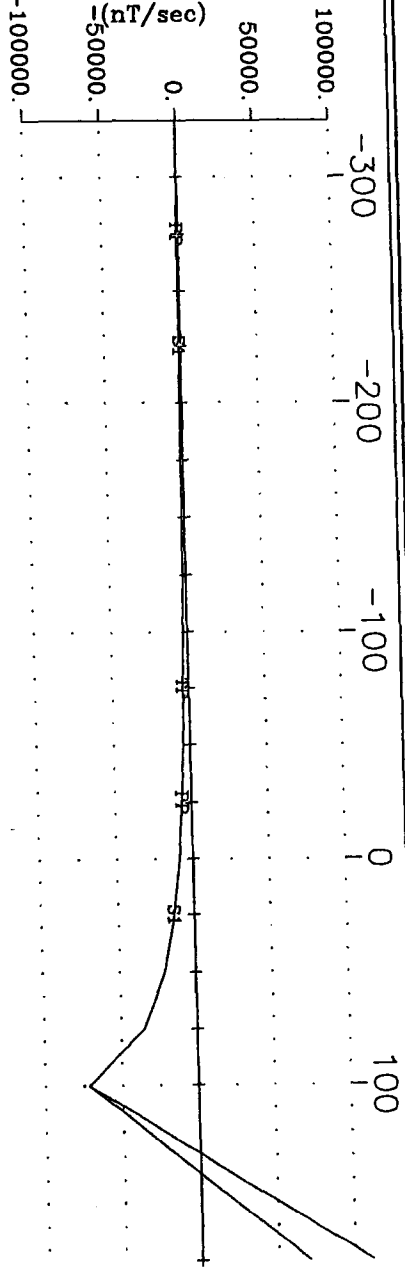
Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

Pulse EM Off-time
 Channels 15-20
 (nT/sec)

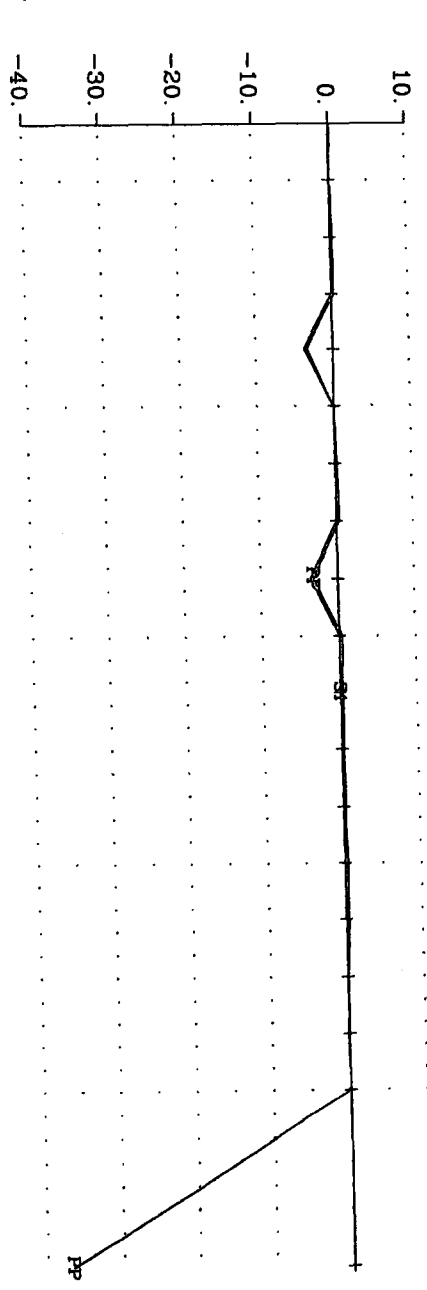


Pacific North West Capital Corp. West Timmins Project
 Line L450N (GRID 3) X Component
 Crone Geophysics & Exploration Ltd.

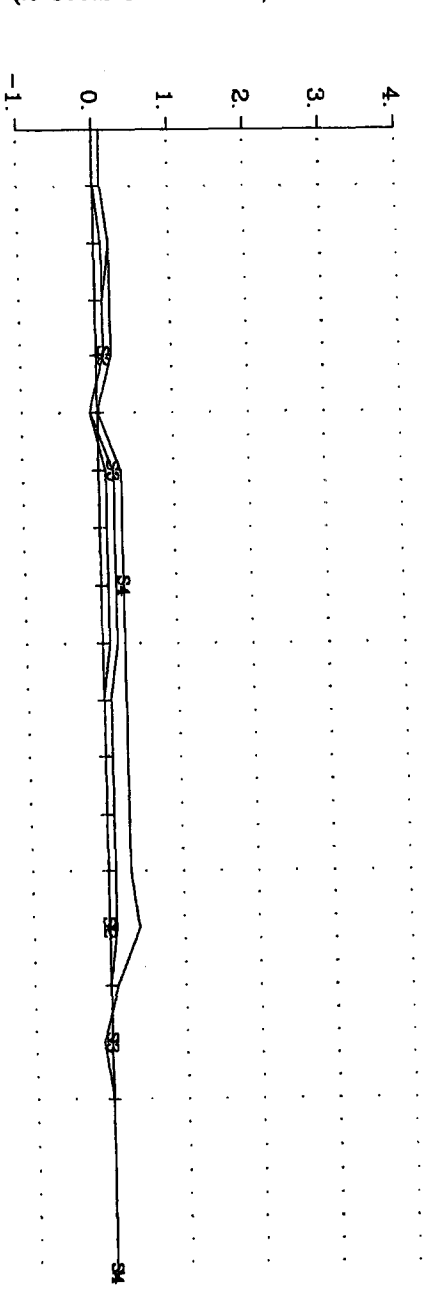
TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1



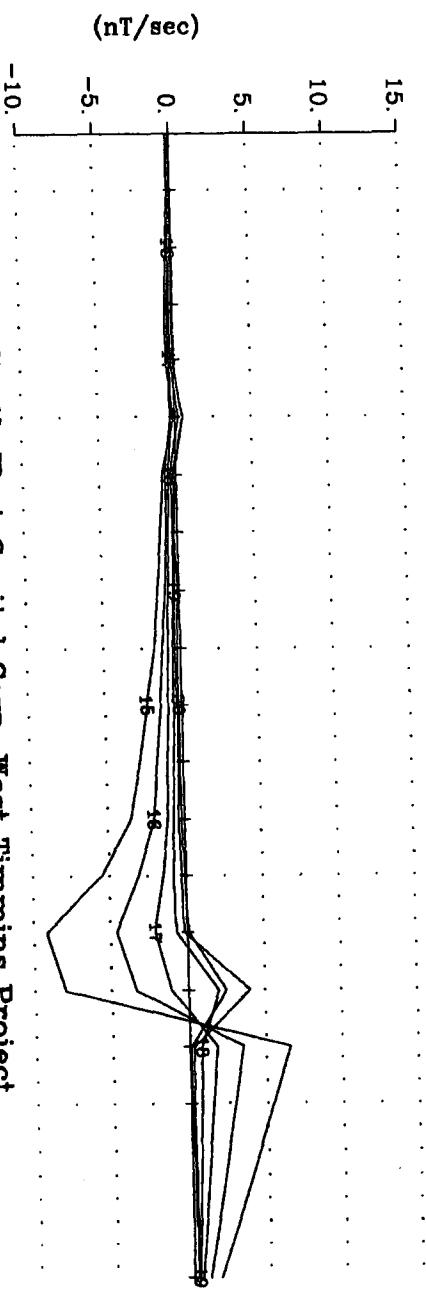
Deviation from TP.
 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)



Pulse EM Off-time
 Channels 15-20
 (nT/sec)



Pacific North West Capital Corp. West Timmins Project
 Line LA50N (GRID 3) Z Component
 Crone Geophysics & Exploration Ltd.

APPENDIX II:

BOREHOLE PLAN AND SECTION MAPS

406600E 406700E 406800E 406900E 407000E 407100E

5378800N -

5378700N -

5378600N -

5378500N -

5378400N -

5378300N -

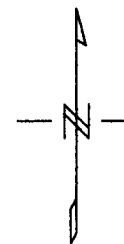
5378200N -

W05Z

WTM-05-05

Tx Loop 05-05

NOVA TOWNSHIP -CLAIM # P300238



Scale 1:5000
50 0 50 100
(meters)

Pacific North West Capital Corp.

West Timmins Project - Grid 8

**3-D Borehole Pulse EM Survey
Borehole & Loop Location Map**

Hole: WTM-05-05

Survey Date: Nov 19, 2005

Crone Geophysics & Exploration Ltd.

406600E 406700E 406800E 406900E 407000E 407100E
5378800N -

5378700N -

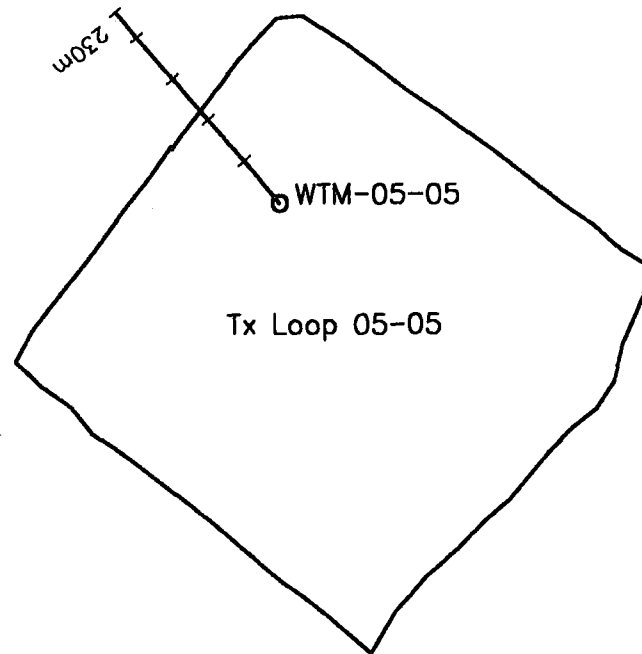
5378600N -

5378500N -

5378400N -

5378300N -

5378200N -



Scale 1:5000
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(meters)

Pacific North West Capital Corp.

West Timmins Project - Grid 8

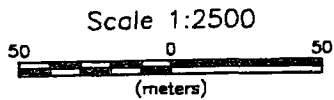
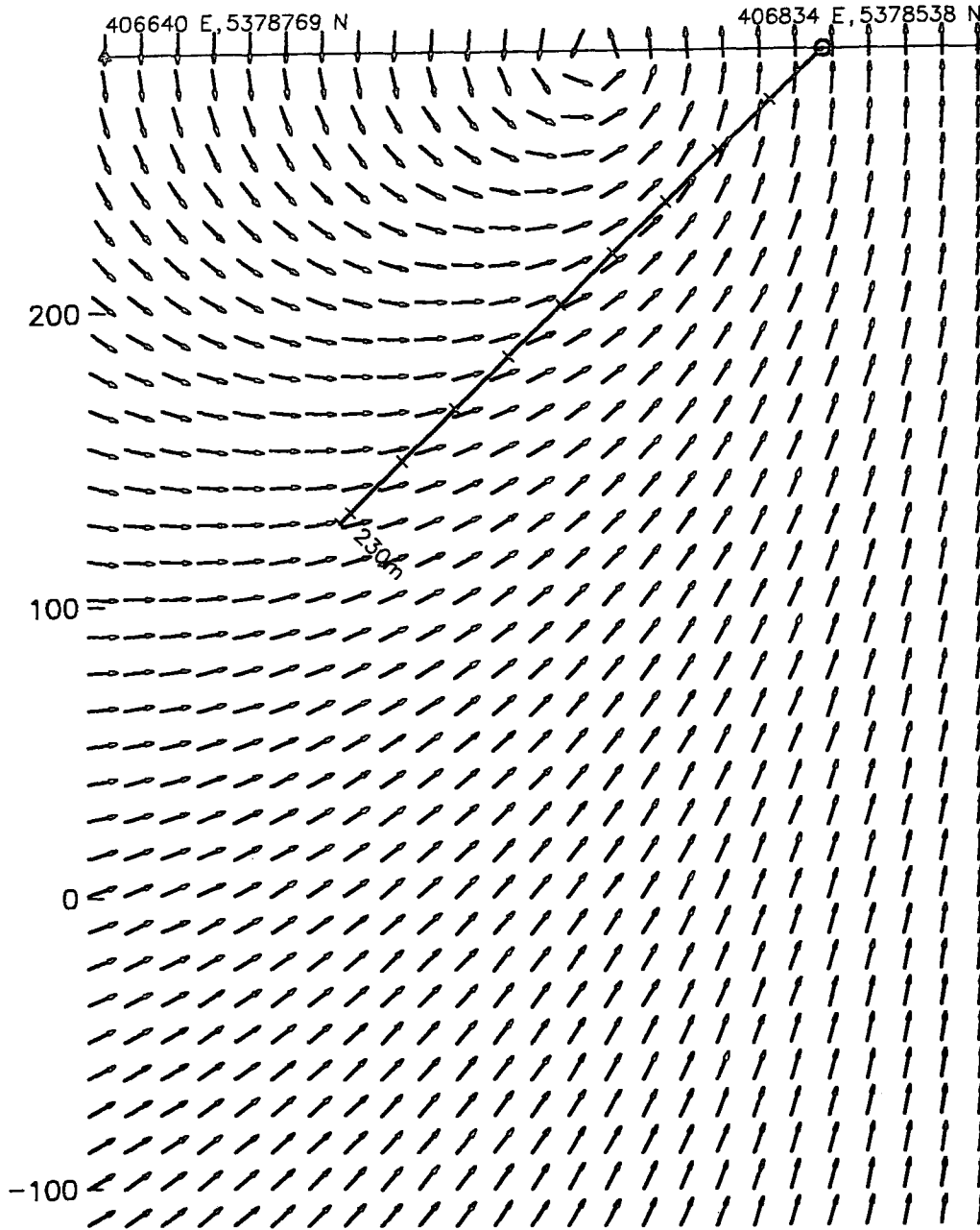
*3-D Borehole Pulse EM Survey
Borehole & Loop Location Map*

Hole: WTM-05-05

Survey Date: Nov 19, 2005

Crona Geophysics & Exploration Ltd.

WTM-05-05



Pacific North West Capital Corp.

West Timmins Project - Grid 8

3-D Borehole Pulse EM Survey

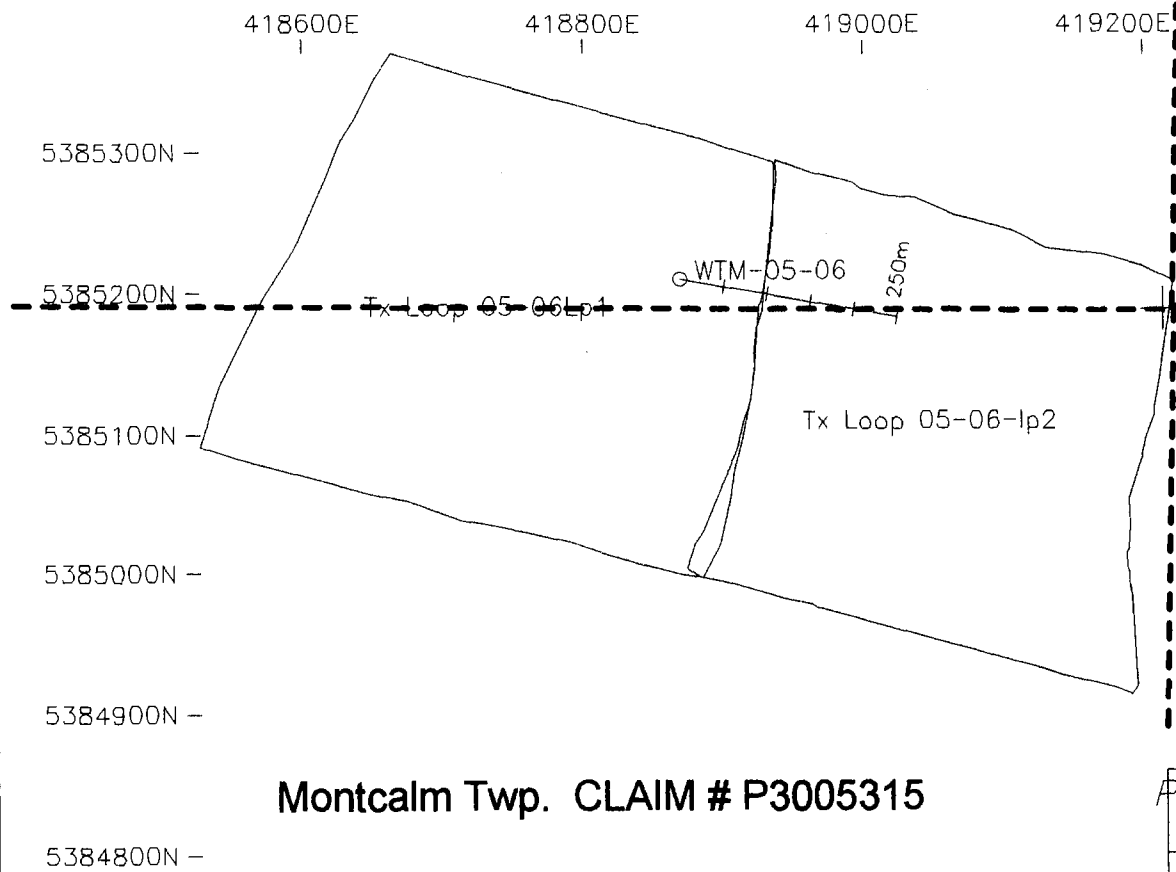
Hole Section with Primary Field

Hole: WTM-05-05

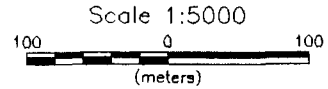
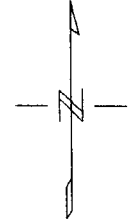
Survey Date: Nov 19, 2005

Crone Geophysics & Exploration Ltd.

Montcalm Twp. CLAIM # P3005311



Montcalm Twp.
CLAIM # P3005310



Montcalm Twp. CLAIM # P3005315

<i>Pacific North West Capital Corp.</i> West Timmins Project - GRID 3
3-D Borehole Pulse EM Survey Borehole & Loop Location Map
Hole:WMT-05-06 Survey Date:November, 2005
<i>Crone Geophysics & Exploration Ltd.</i>

418500E 418600E 418700E 418800E 418900E 419000E 419100E
5385400N -

5385300N -

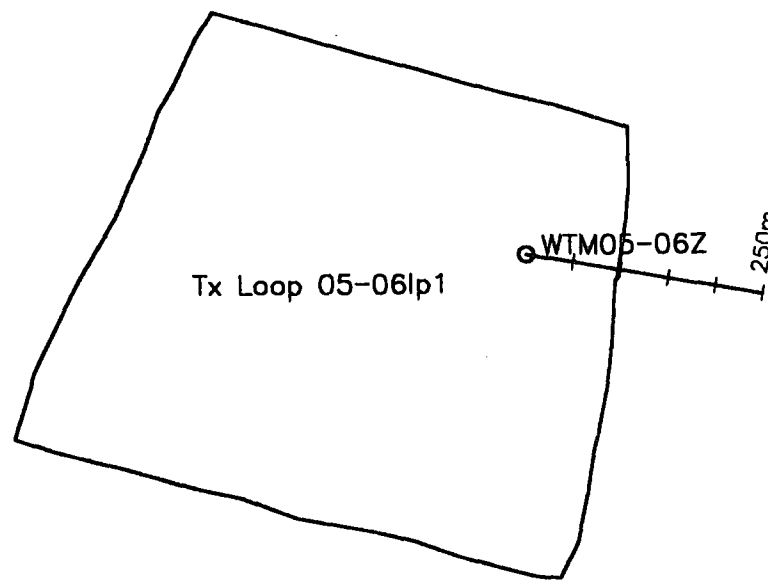
5385200N -

5385100N -

5385000N -

5384900N -

5384800N -



Scale 1:5000
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(meters)

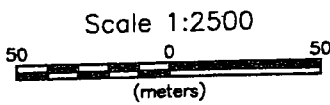
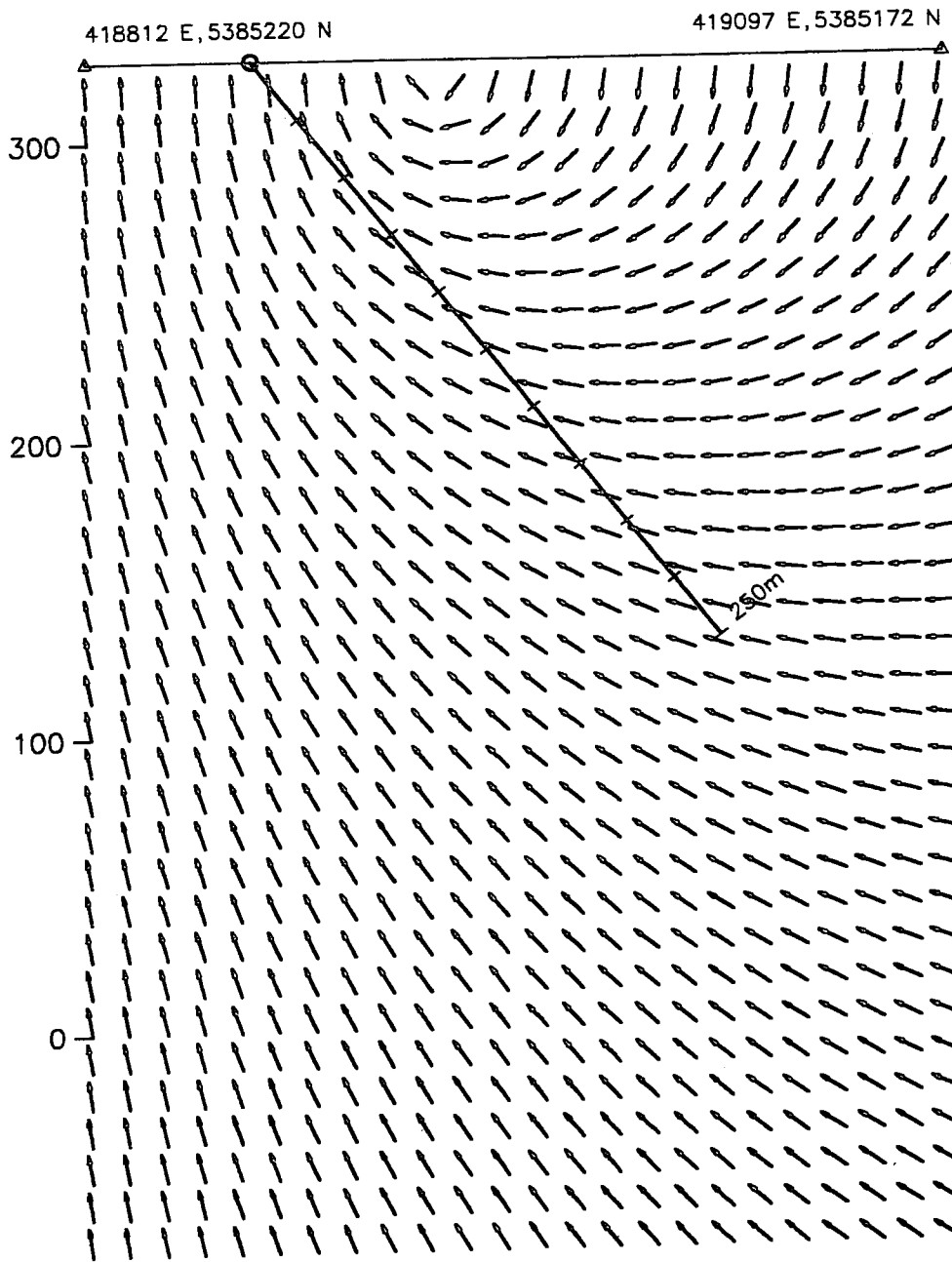
Pacific North West Capital Corp
West Timmins Project - Grid 3

3-D Borehole Pulse EM Survey
Borehole & Loop Location Map

Hole: WTM05-06 - Loop 1
Survey Date: Nov 13, 2005

Crone Geophysics & Exploration Ltd.

WTM05-06



Pacific North West Capital Corp.
West Timmins Project - Grid 3

3-D Borehole Pulse EM Survey
Hole Section with Primary Field

Hole: WTM05-06
Survey Date: Nov 13, 2005

Crone Geophysics & Exploration Ltd.

418800E 418900E 419000E 419100E 419200E 419300E 419400E
5385400N -

5385300N -

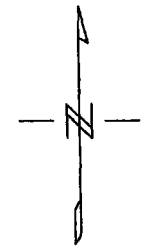
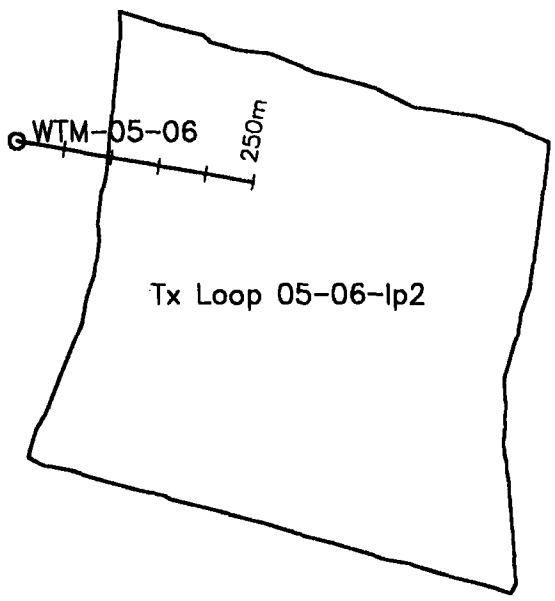
5385200N -

5385100N -

5385000N -

5384900N -

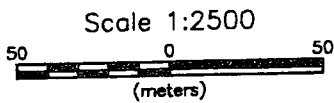
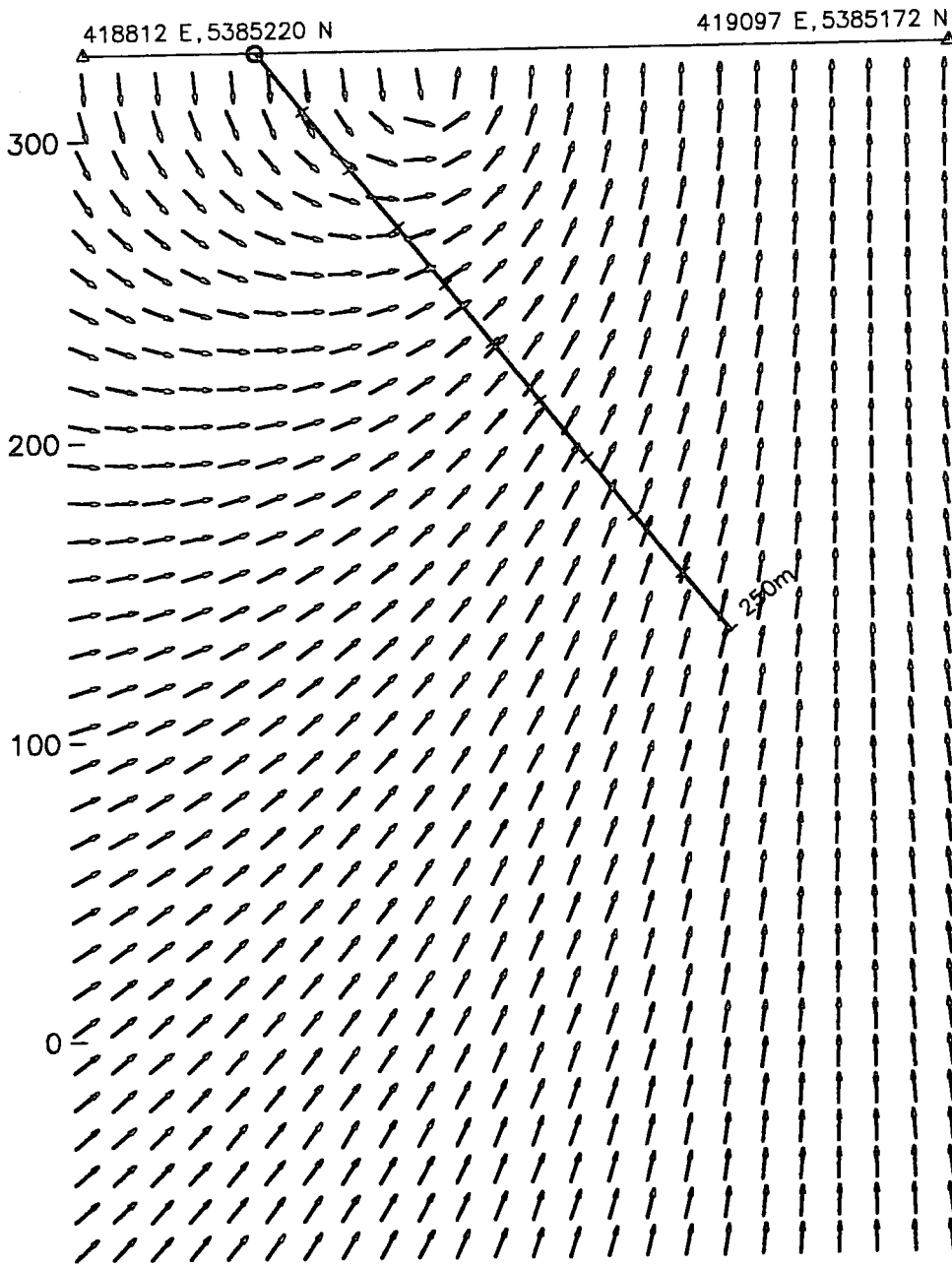
5384800N -



Scale 1:5000
50 0 50 100
(meters)

Pacific North West Capital Corp
West Timmins Project-Grid 3
3-D Borehole Pulse EM Survey
Borehole & Loop Location Map
Hole: WTM-05-06
Survey Date: Nov 21, 2005
Crone Geophysics & Exploration Ltd.

WTM-05-06



<i>Pacific North West Capital Corp.</i>
West Timmins Project - Grid 3
3-D Borehole Pulse EM Survey
Hole Section with Primary Field
Hole: WTM-05-06
Survey Date: Nov 21, 2005
<i>Crone Geophysics & Exploration Ltd.</i>

418900E 419000E 419100E 419200E 419300E 419400E 419500E
5385300N -

**Montcalm Twp.
CLAIM # P3005311**

5385200N -

5385100N -

W07

Tx Loop 05-07
WTM-05-07

5385000N -

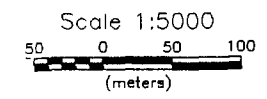
5384900N -

Montcalm Twp. CLAIM # P3005310

5384800N -

**Montcalm Twp.
CLAIM # P3005315**

5384700N -



<i>Pacific North West Capital Corp.</i>
<i>West Timmins Project (GRID 3)</i>
<i>3-D Borehole Pulse EM Survey Borehole & Loop Location Map</i>
<i>Hole: WTM-05-07 Survey Date: Nov 24, 2005</i>
<i>Crone Geophysics & Exploration Ltd.</i>

418900E 419000E 419100E 419200E 419300E 419400E 419500E
5385300N

5385200N -

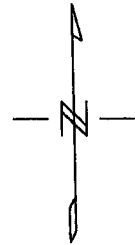
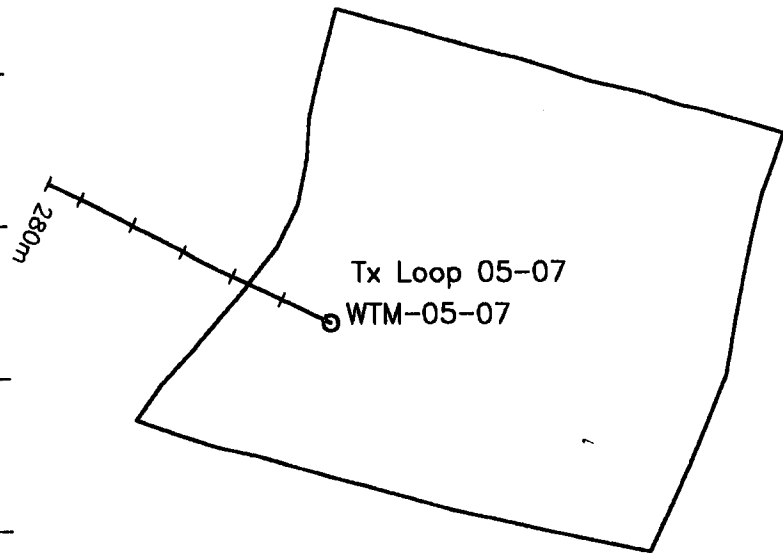
5385100N -

5385000N -

5384900N -

5384800N -

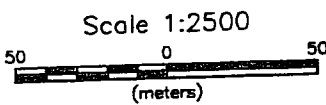
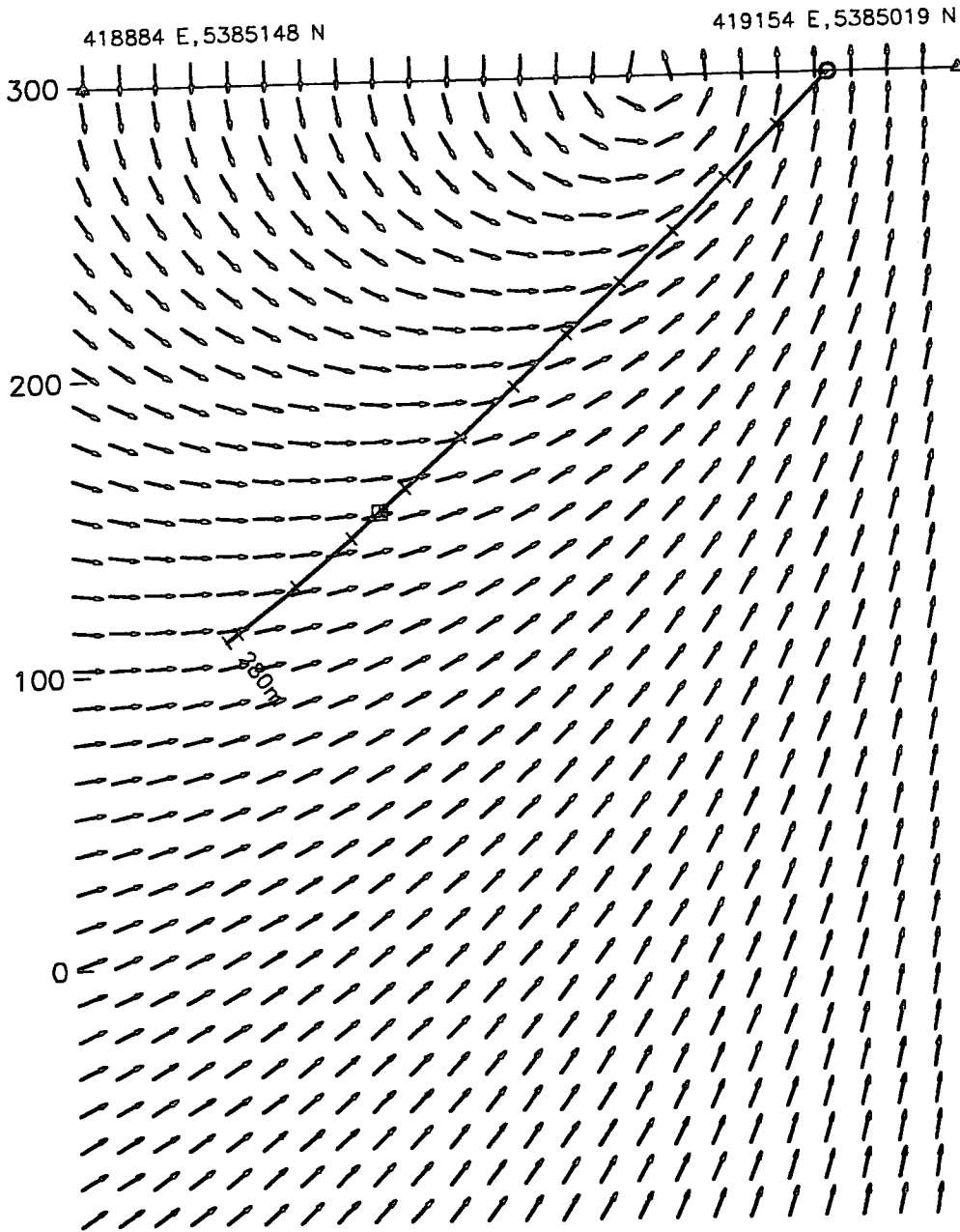
5384700N -



Scale 1:5000
50 0 50 100
(meters)

<i>Pacific North West Capital Corp</i>
<i>West Timmins Project (GRID 3)</i>
<i>3-D Borehole Pulse EM Survey</i>
<i>Borehole & Loop Location Map</i>
Hole: WTM-05-07
Survey Date: Nov 24, 2005
<i>Crone Geophysics & Exploration Ltd.</i>

WTM-05-07



<i>Pacific North West Capital Corp.</i>
West Timmins Project (Grid 3)
3-D Borehole Pulse EM Survey
Hole Section with Primary Field
Hole: WTM-05-07
Survey Date: Nov 24, 2005
Crone Geophysics & Exploration Ltd.

415000E 415100E 415200E 415300E 415400E 415500E 415600E
5385700N -

5385600N -

Montcalm Twp. CLAIM # P3010804

5385500N -

200m

WTM-05-08
Tx Loop 05-08

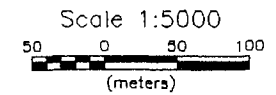
5385400N -

5385300N -

5385200N -

5385100N -

Montcalm Twp. CLAIM # P3010803



<i>Pacific North West Capital Corp.</i> West Timmins Project - GRID 4
3-D Borehole Pulse EM Survey Borehole & Loop Location Map
Hole: WTM-05-08 Survey Date: Nov 17, 2005
<i>Crone Geophysics & Exploration Ltd.</i>

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5385700N -

5385600N -

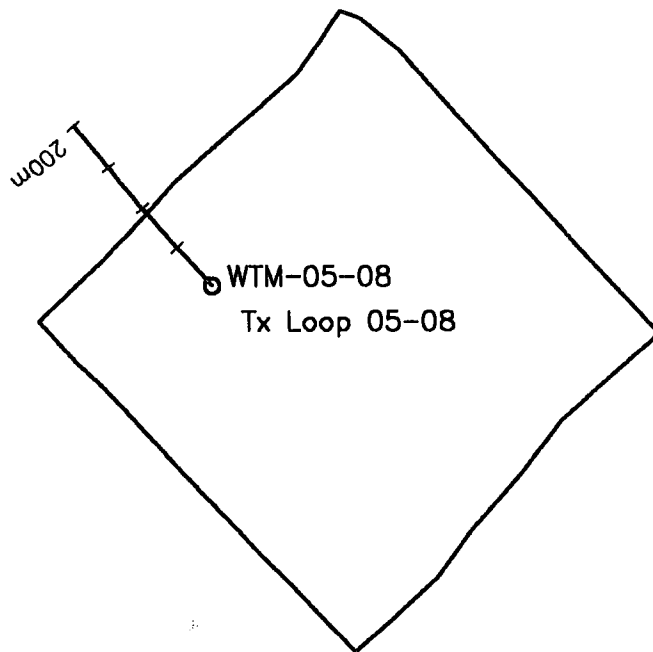
5385500N -

5385400N -

5385300N -

5385200N -

5385100N -



Scale 1:5000
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(meters)

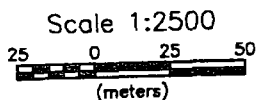
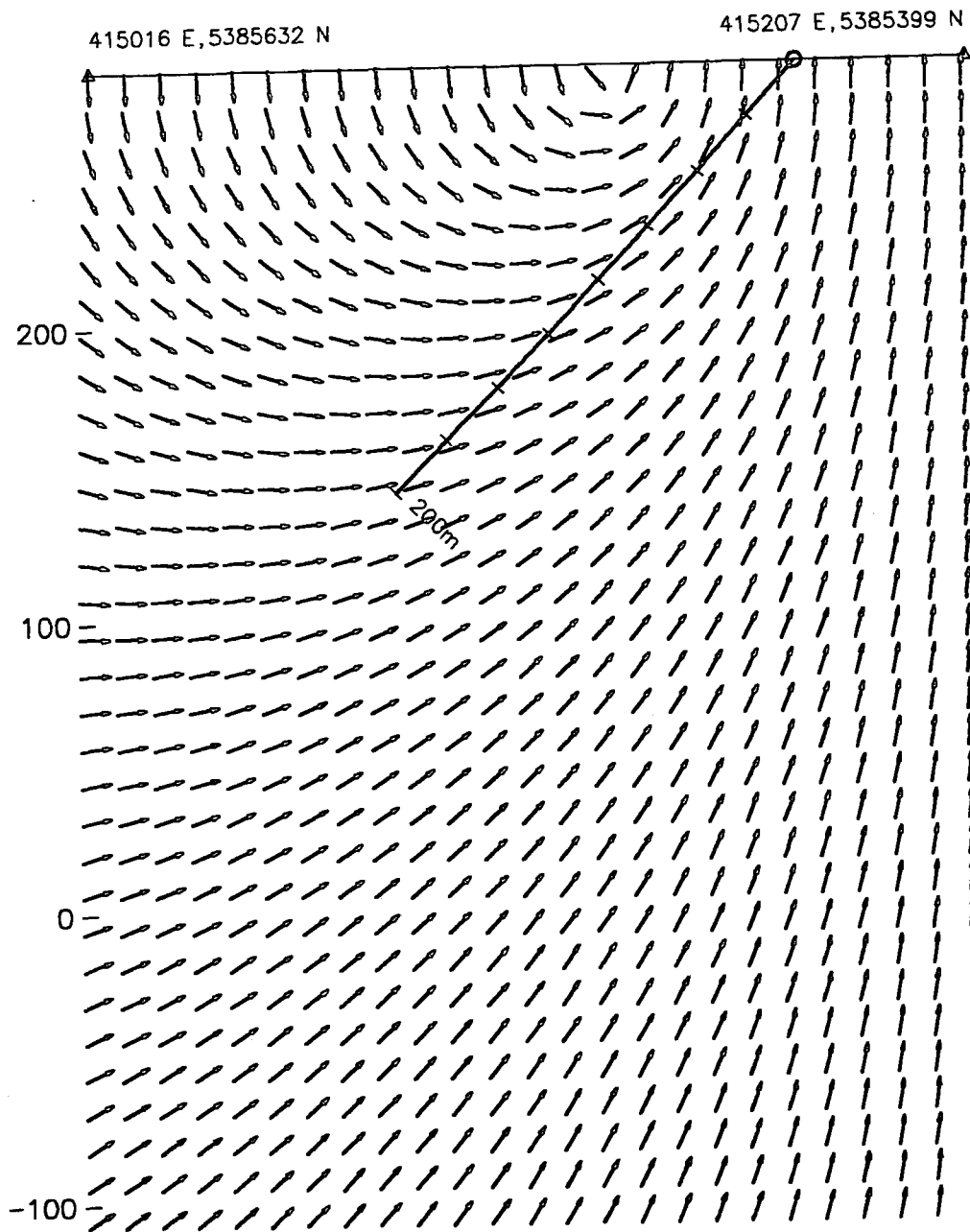
Pacific North West Capital Corp.
West Timmins Project - GRID 4

3-D Borehole Pulse EM Survey
Borehole & Loop Location Map

Hole: WTM-05-08
Survey Date: Nov 17, 2005

Crone Geophysics & Exploration Ltd.

WTM-05-08

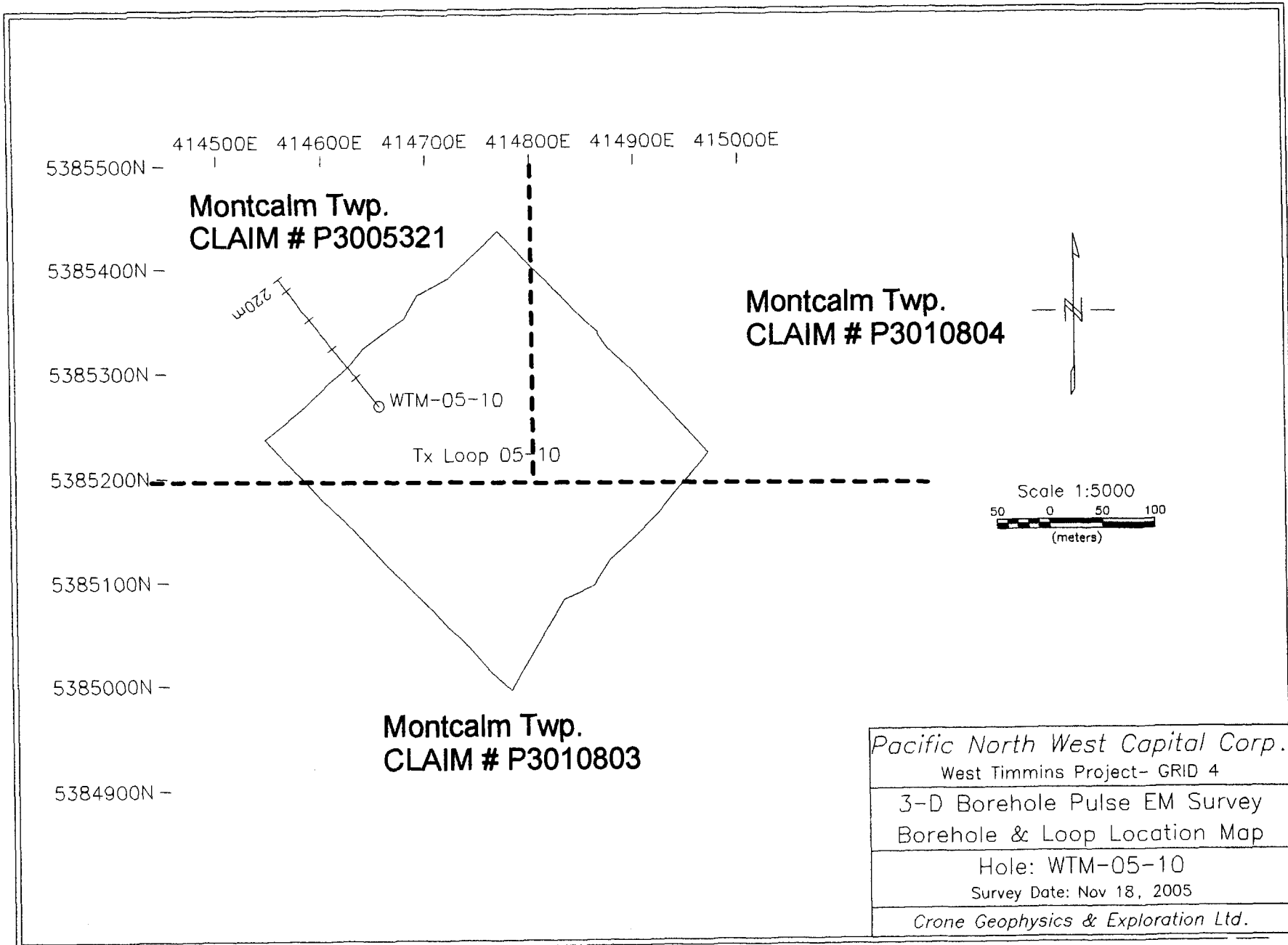


Pacific North West Capital Corp.
West Timmins Project - GRID 4

3-D Borehole Pulse EM Survey
Hole Section with Primary Field

Hole: WTM-05-08
Survey Date: Nov 17, 2005

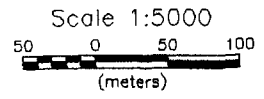
Crone Geophysics & Exploration Ltd.



Montcalm Twp.
CLAIM # P3005321

Montcalm Twp.
CLAIM # P3010804

Montcalm Twp.
CLAIM # P3010803



<i>Pacific North West Capital Corp.</i>
West Timmins Project- GRID 4
3-D Borehole Pulse EM Survey Borehole & Loop Location Map
Hole: WTM-05-10 Survey Date: Nov 18, 2005
<i>Crone Geophysics & Exploration Ltd.</i>

414500E 414600E 414700E 414800E 414900E 415000E

5385500N -

5385400N -

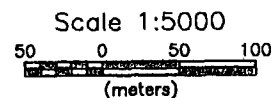
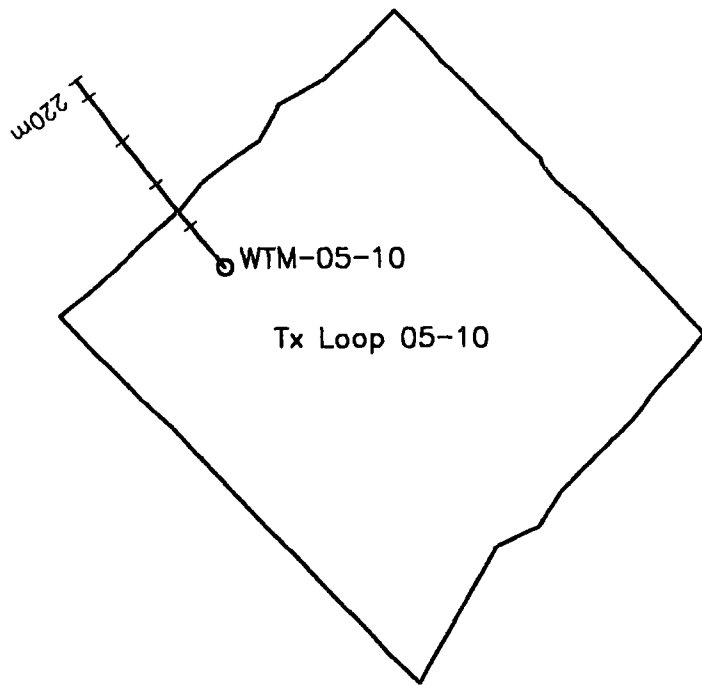
5385300N -

5385200N -

5385100N -

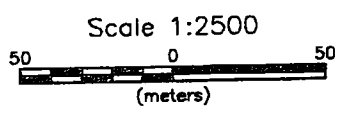
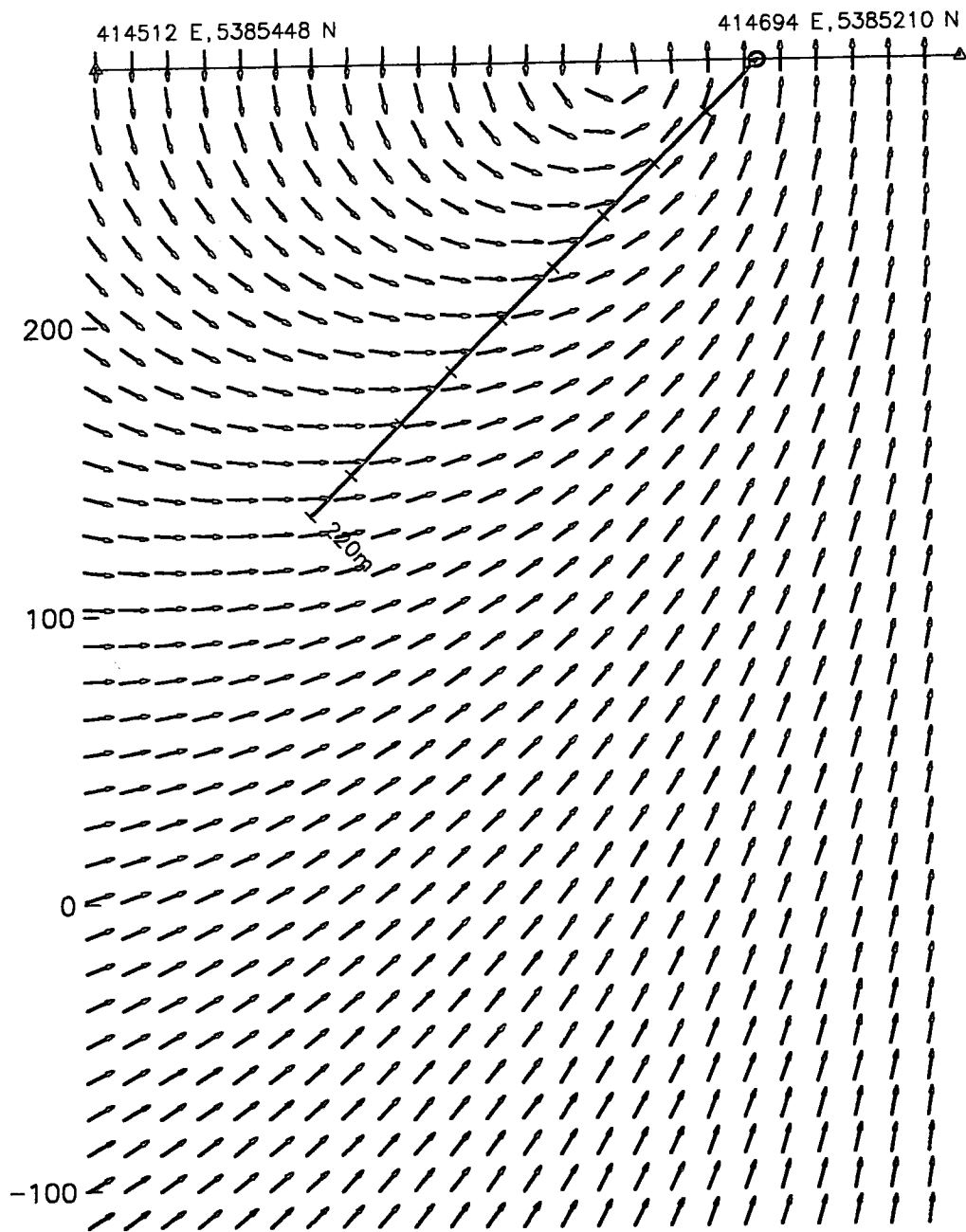
5385000N -

5384900N -

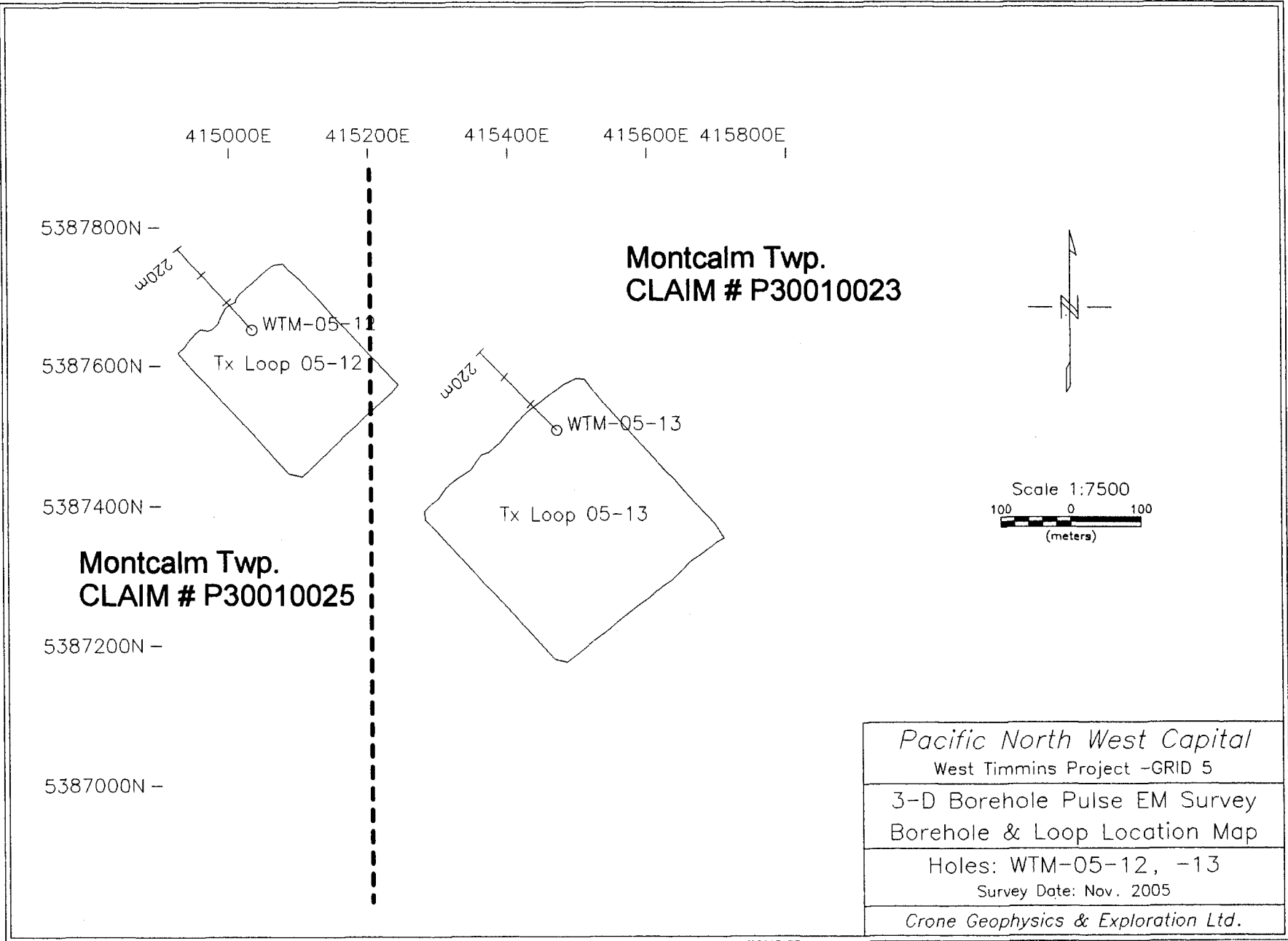


<i>Pacific North West Capital Corp.</i> West Timmins Project- GRID 4
3-D Borehole Pulse EM Survey Borehole & Loop Location Map
Hole: WTM-05-10 Survey Date: Nov 18, 2005
<i>Crone Geophysics & Exploration Ltd.</i>

WTM-05-10



<i>Pacific North West Capital Corp.</i> West Timmins Project- GRID 4
3-D Borehole Pulse EM Survey Hole Section with Primary Field
Hole: WTM-05-10 Survey Date: Nov 18, 2005
Crone Geophysics & Exploration Ltd.



414800E 414900E 415000E 415100E 415200E 415300E 415400E
5387900N -

5387800N -

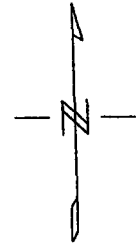
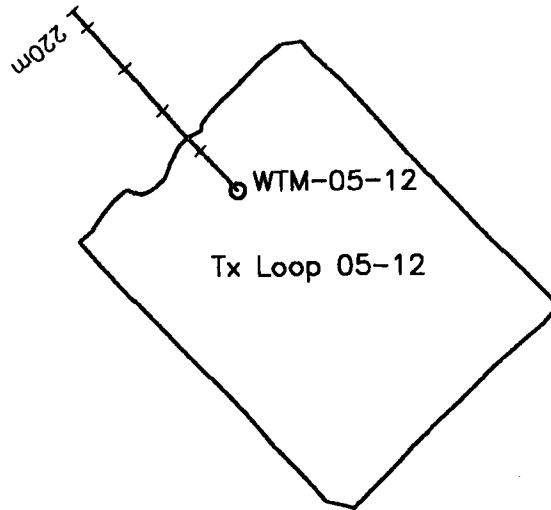
5387700N -

5387600N -

5387500N -

5387400N -

5387300N -



Scale 1:5000
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(meters)

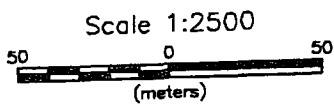
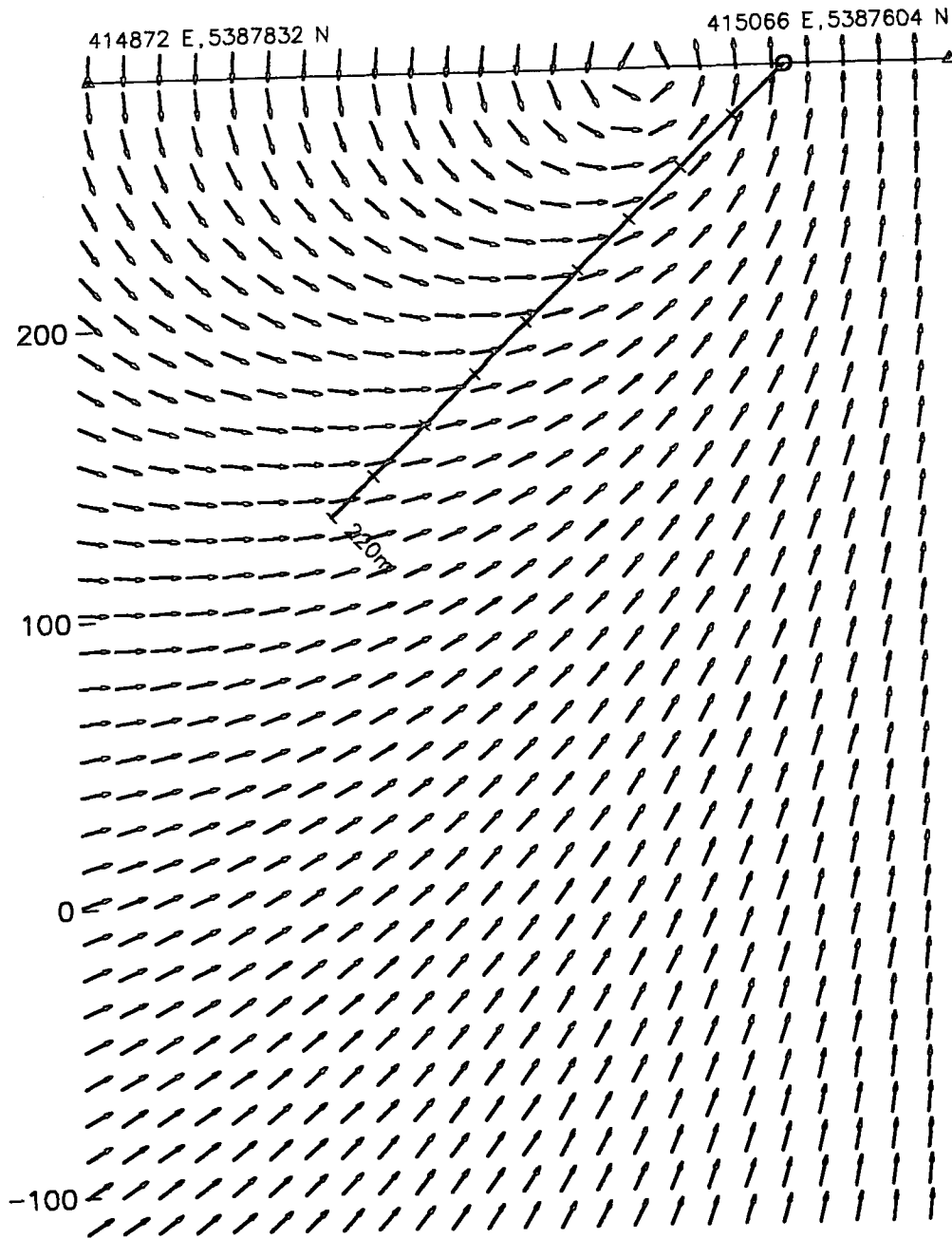
Pacific North West Capital Corp.
West Timmins Project (Grid 5)

3-D Borehole Pulse EM Survey
Borehole & Loop Location Map

Hole: WTM-05-12
Survey Date: Nov 15, 2005

Crone Geophysics & Exploration Ltd.

WTM-05-12



<i>Pacific North West Capital Corp.</i>
West Timmins Project -GRID 5
3-D Borehole Pulse EM Survey
Hole Section with Primary Field
Hole: WTM-05-12
Survey Date: Nov 15, 2005
<i>Crone Geophysics & Exploration Ltd.</i>

415200E 415300E 415400E 415500E 415600E 415700E 415800E
5387700N -

5387600N -

5387500N -

5387400N -

5387300N -

5387200N -

5387100N -

220m

WTM-05-13

Tx Loop 05-13



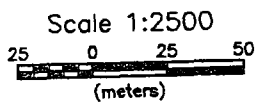
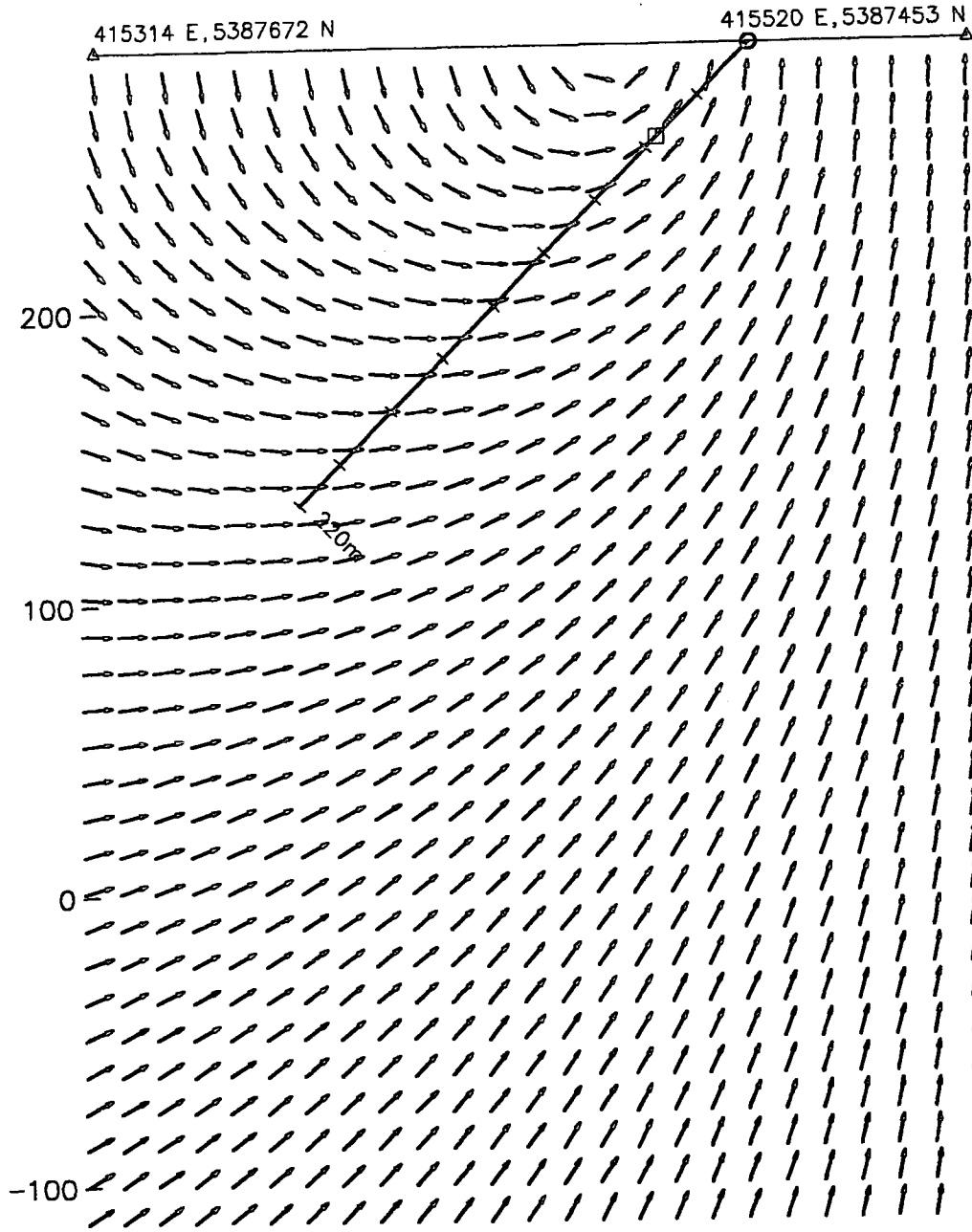
Scale 1:5000
50 0 50 100
(meters)

Pacific North West Capital Corp.
West Timmins Project -GRID 5
3-D Borehole Pulse EM Survey
Borehole & Loop Location Map

Hole: WTM-05-13
Survey Date: Nov 23, 2005

Crone Geophysics & Exploration Ltd.

WTM-05-13



Pacific North West Capital Corp.
West Timmins Project - GRID 5

3-D Borehole Pulse EM Survey
Hole Section with Primary Field

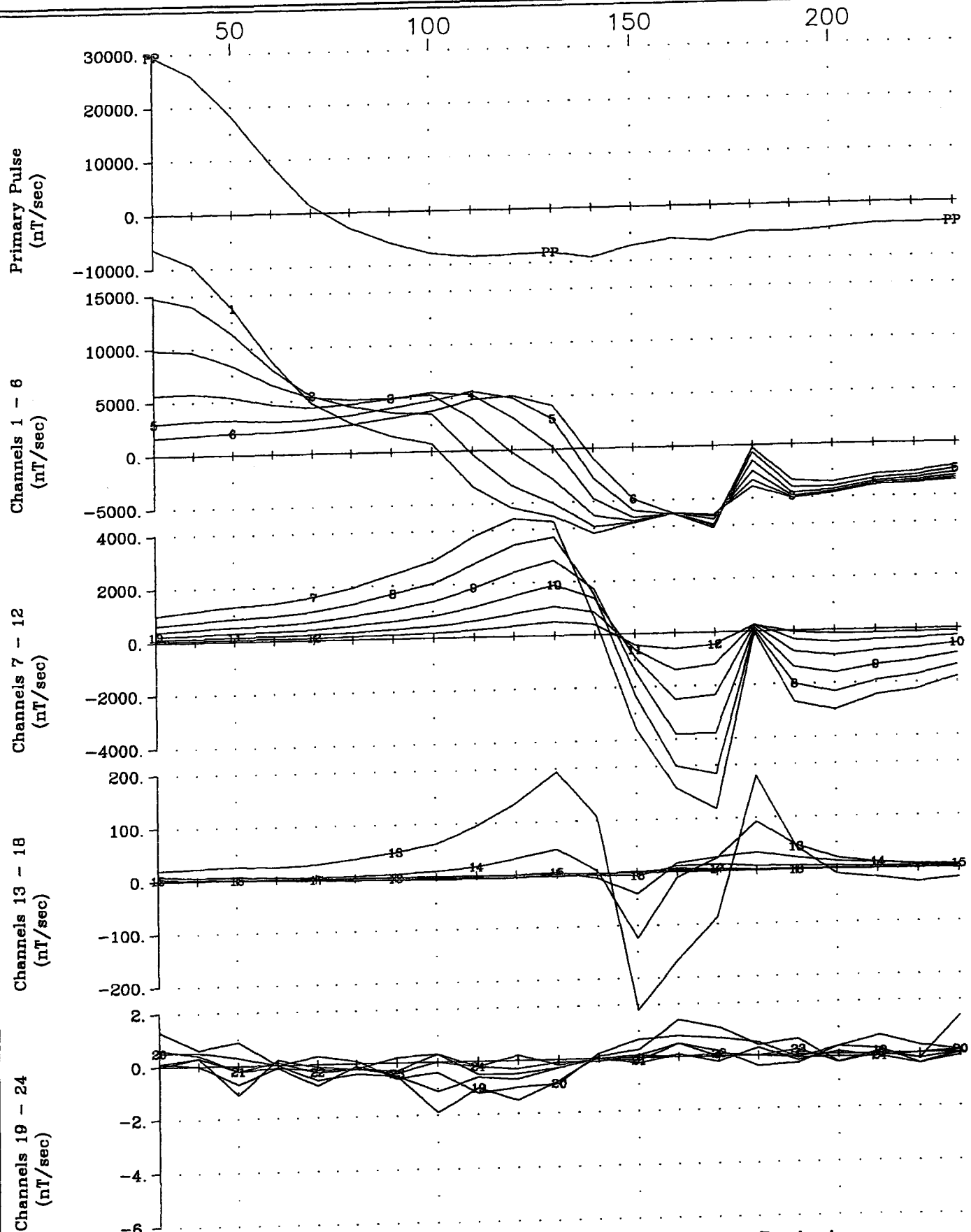
Hole: WTM-05-13

Survey Date: Nov 23, 2005

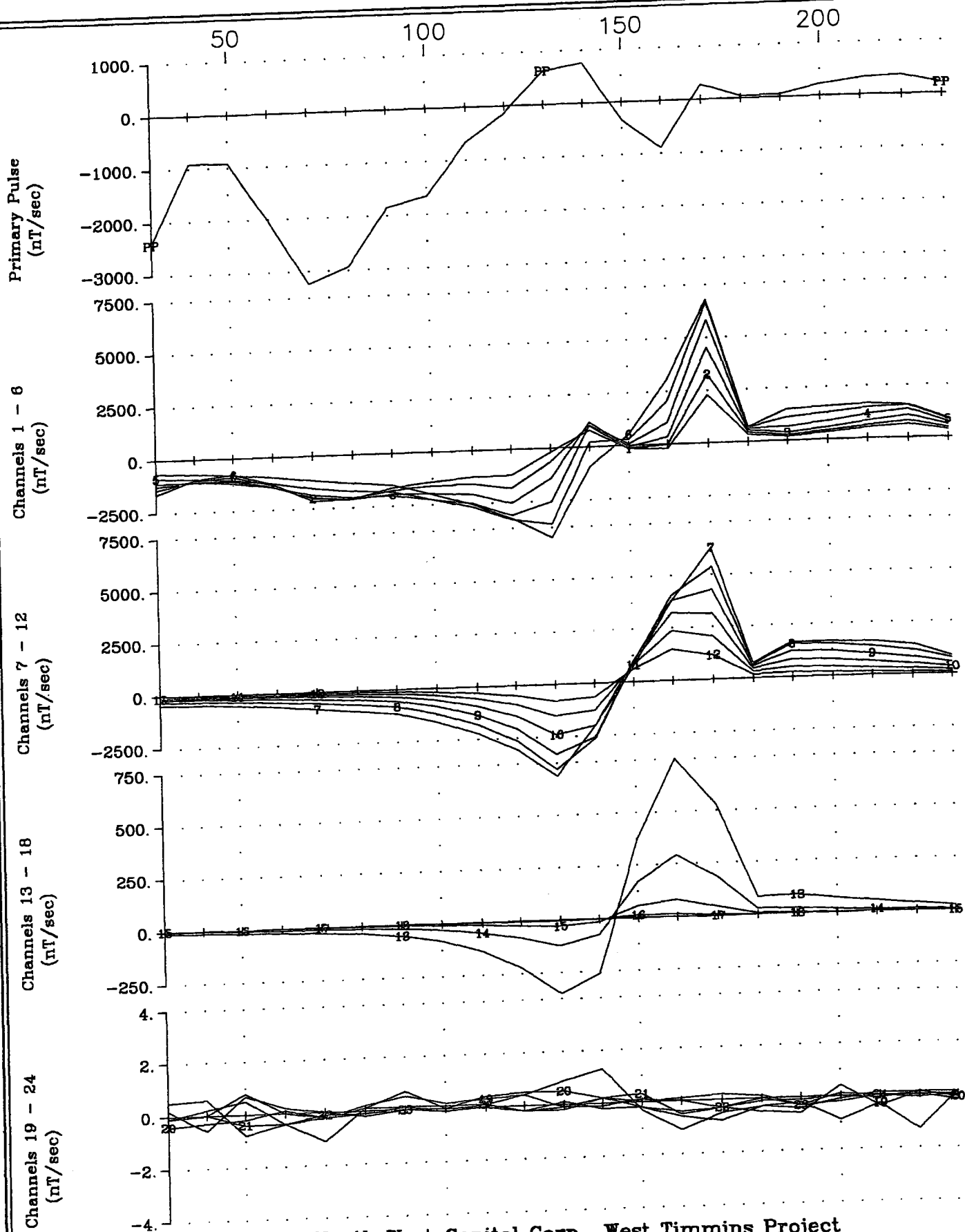
Crone Geophysics & Exploration Ltd.

APPENDIX III:

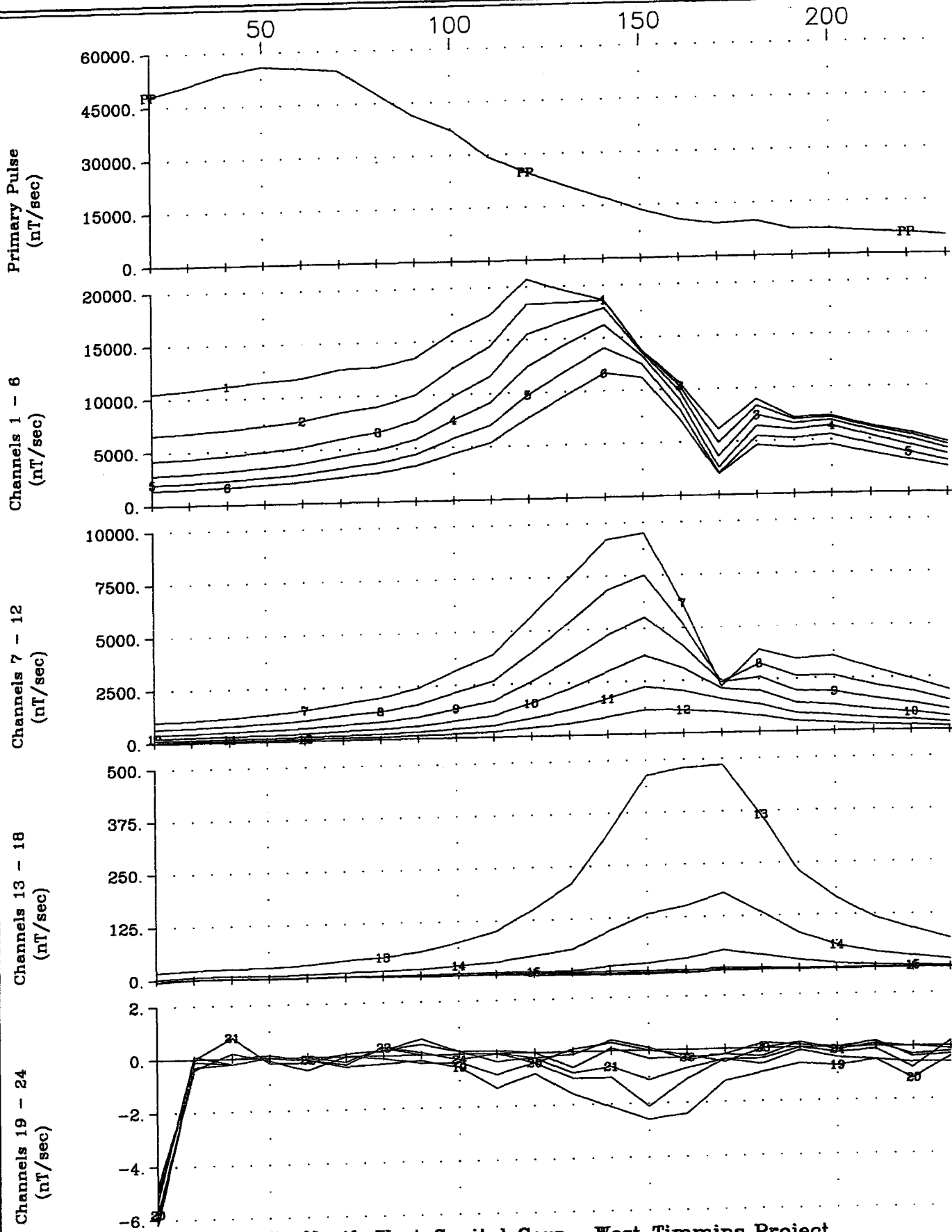
BOREHOLE EM DATA - LINEAR PROFILES



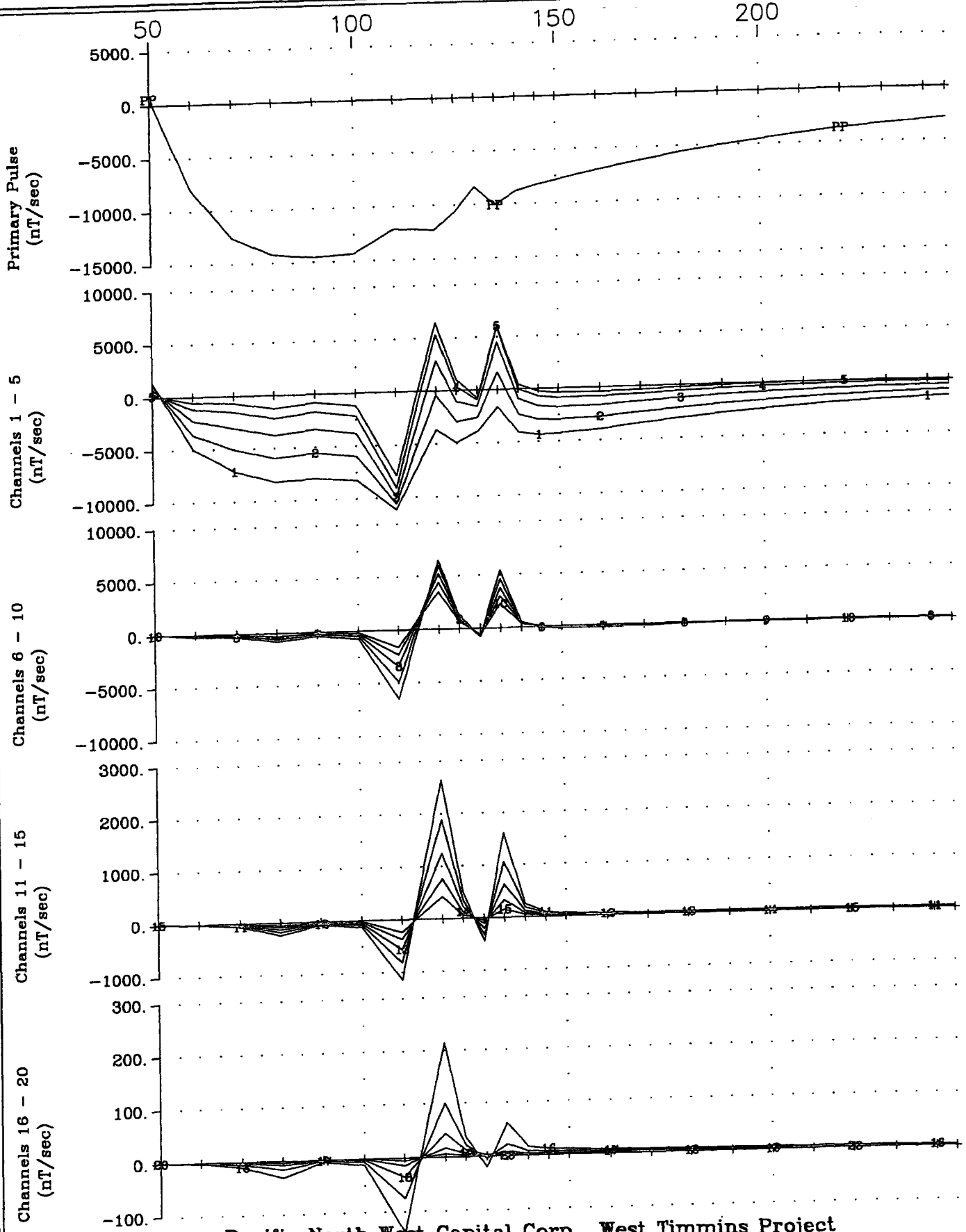
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-05 (Grid 8) X Component
 Crone Geophysics & Exploration Ltd.



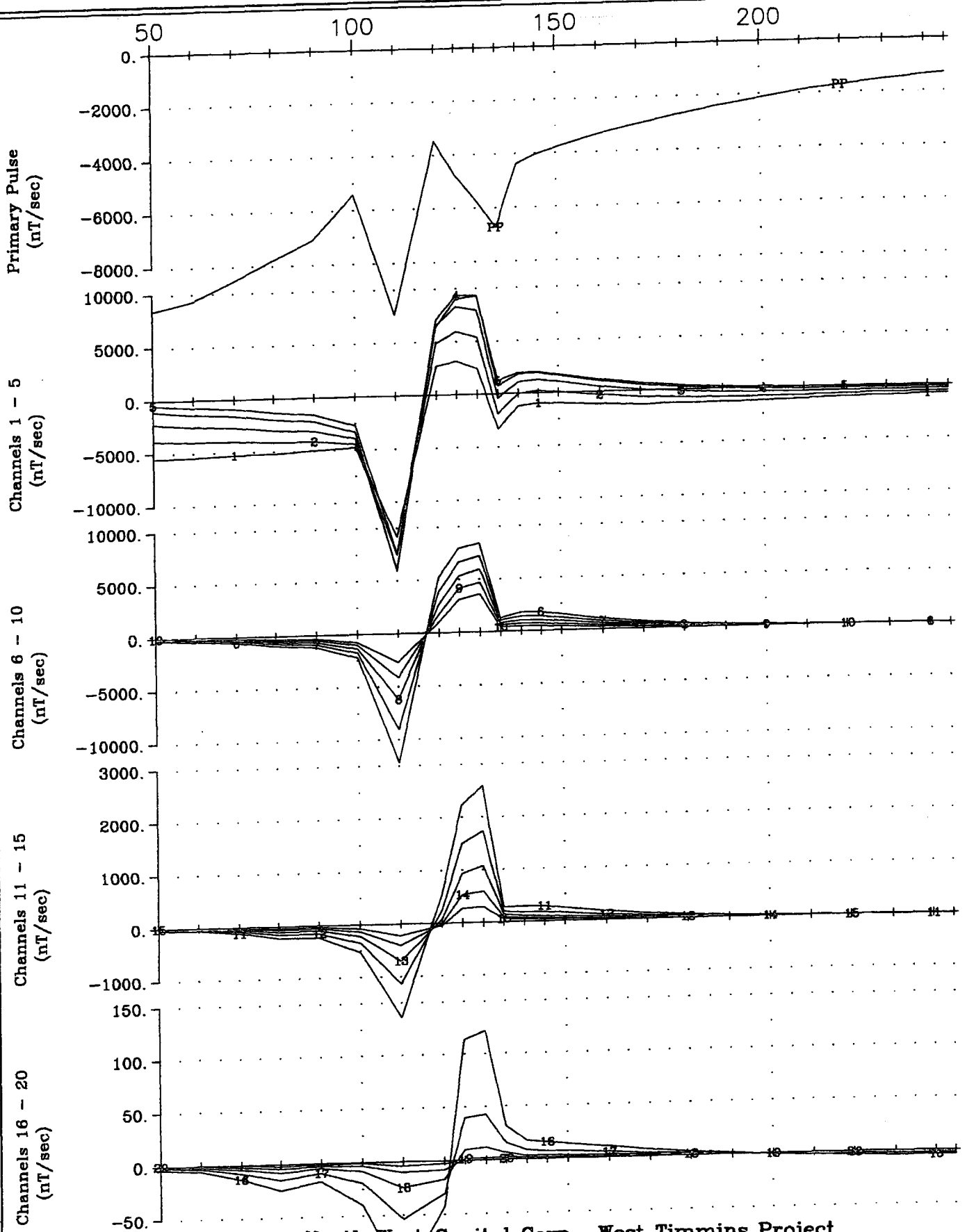
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-05 (Grid 8) Y Component
 Crone Geophysics & Exploration Ltd.



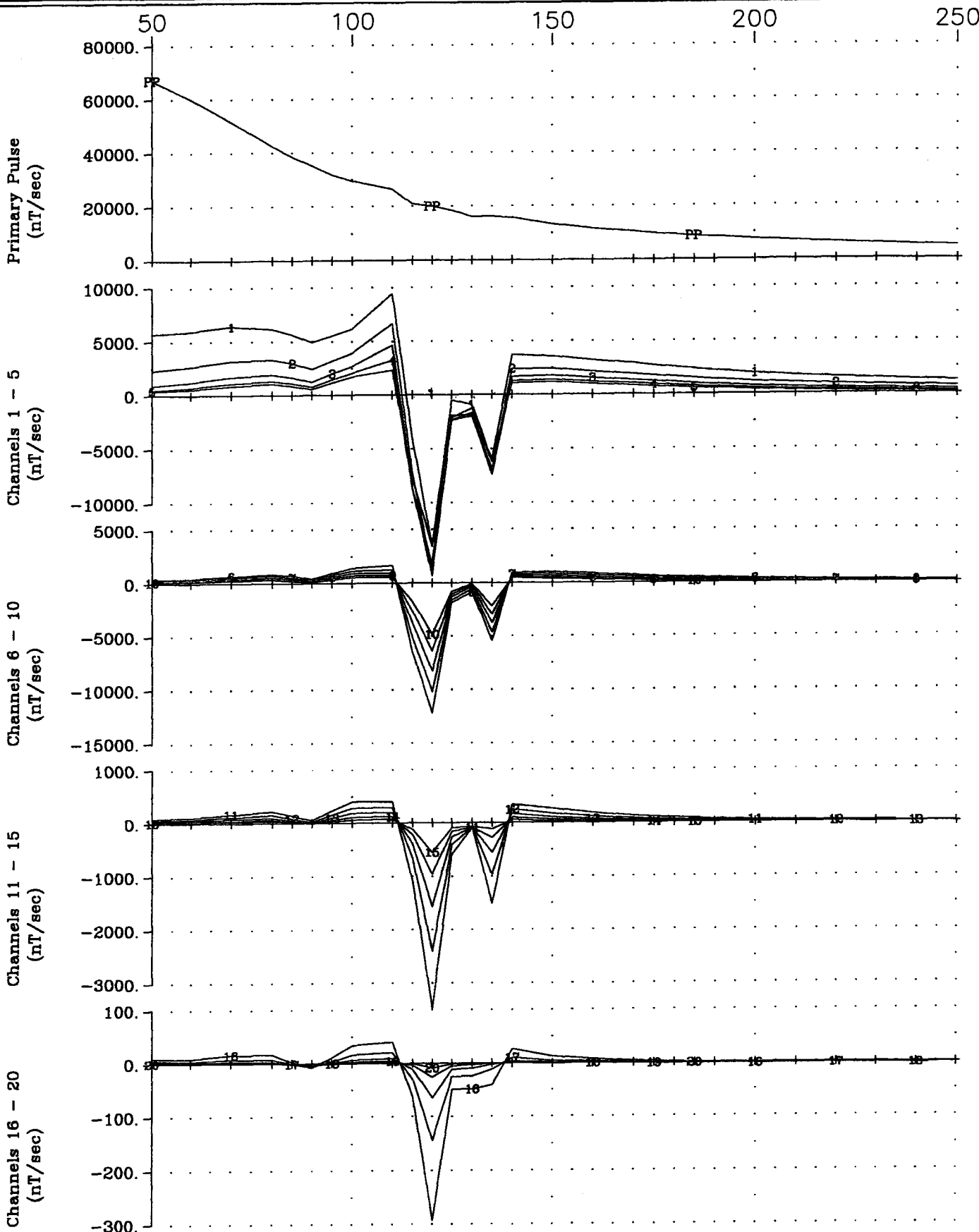
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-05 (Grid 8) Z Component
 Crone Geophysics & Exploration Ltd.



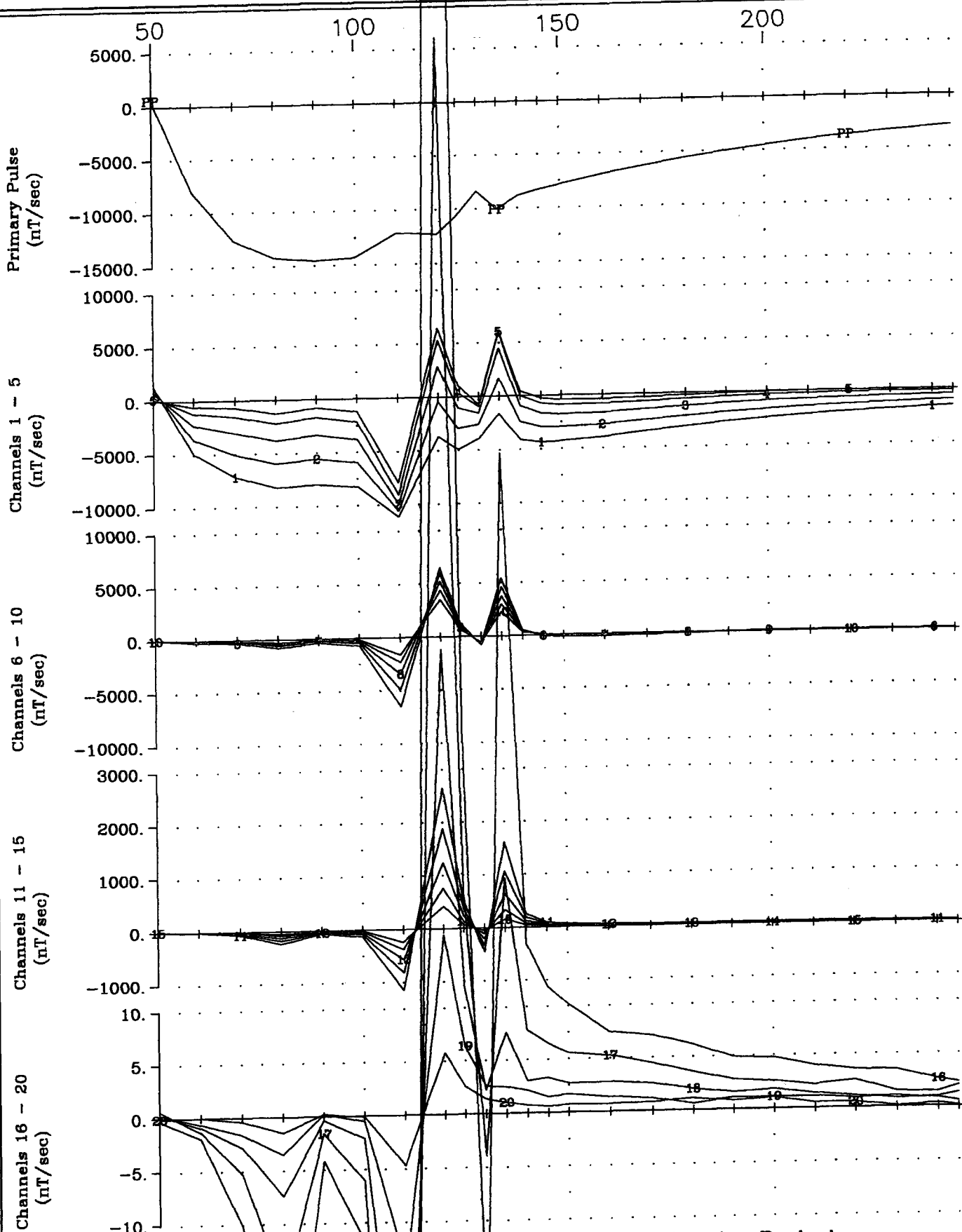
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) X Component
 Crone Geophysics & Exploration Ltd.



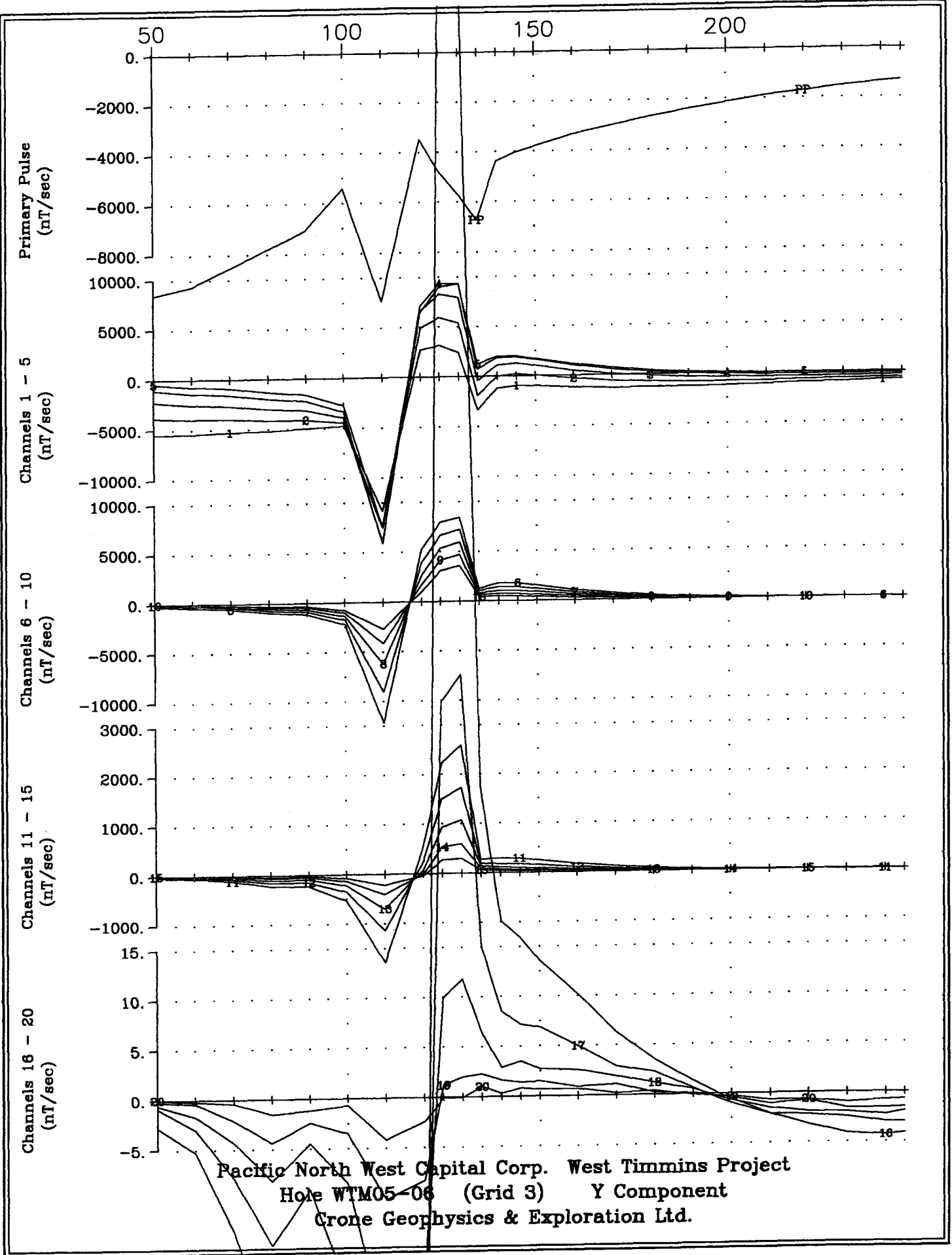
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) Y Component
 Crone Geophysics & Exploration Ltd.



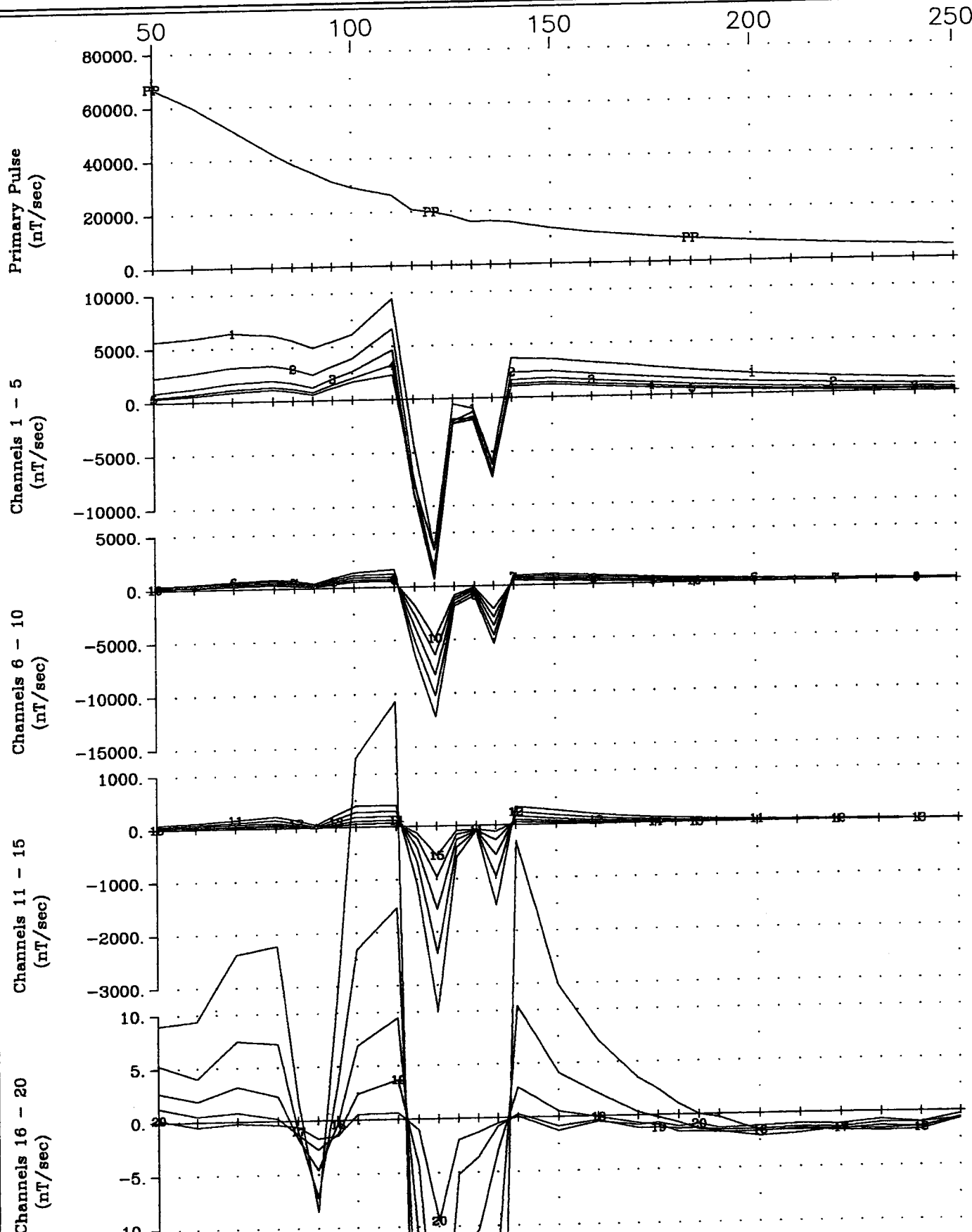
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) Z Component
 Crone Geophysics & Exploration Ltd.



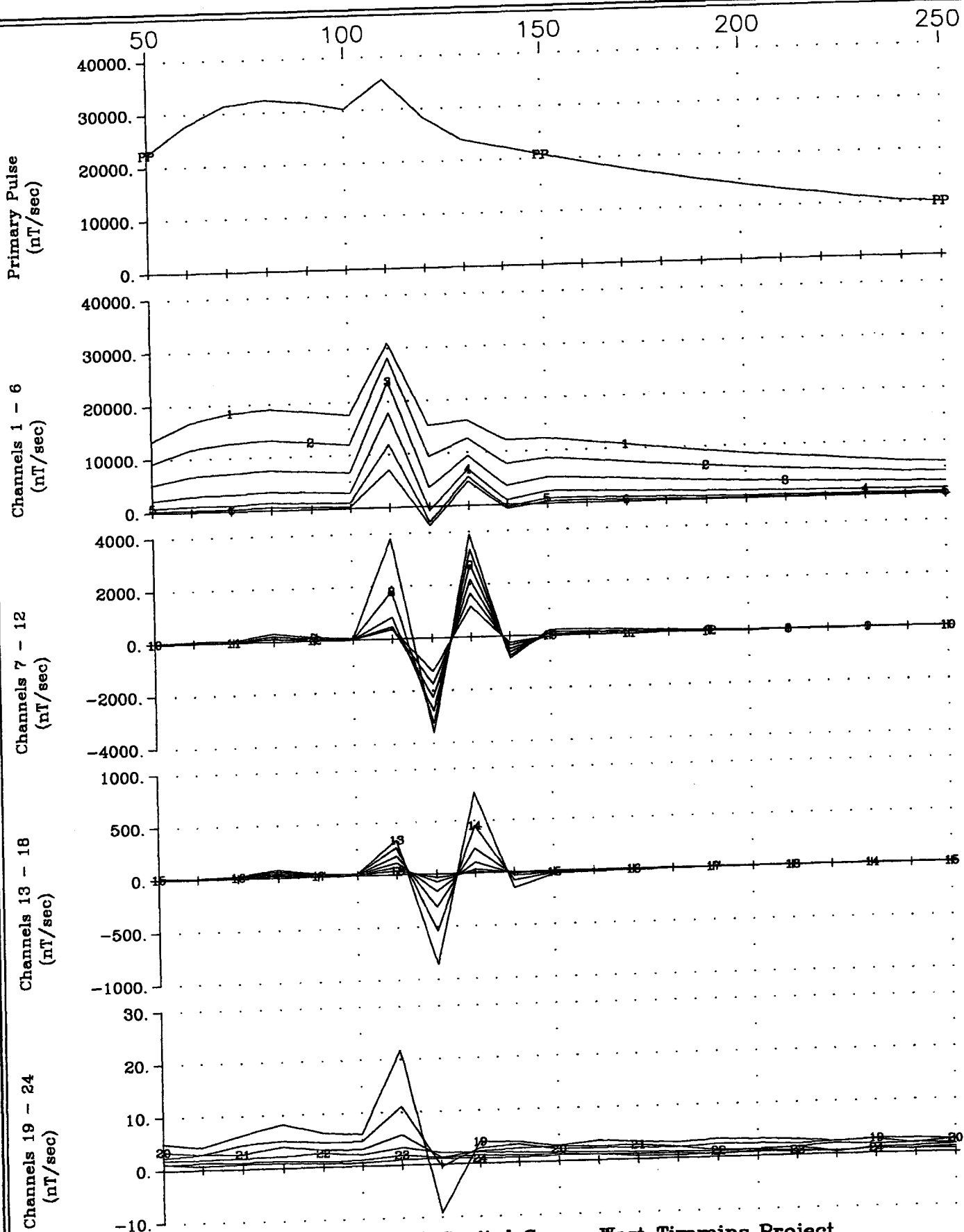
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) X Component
 Crone Geophysics & Exploration Ltd.



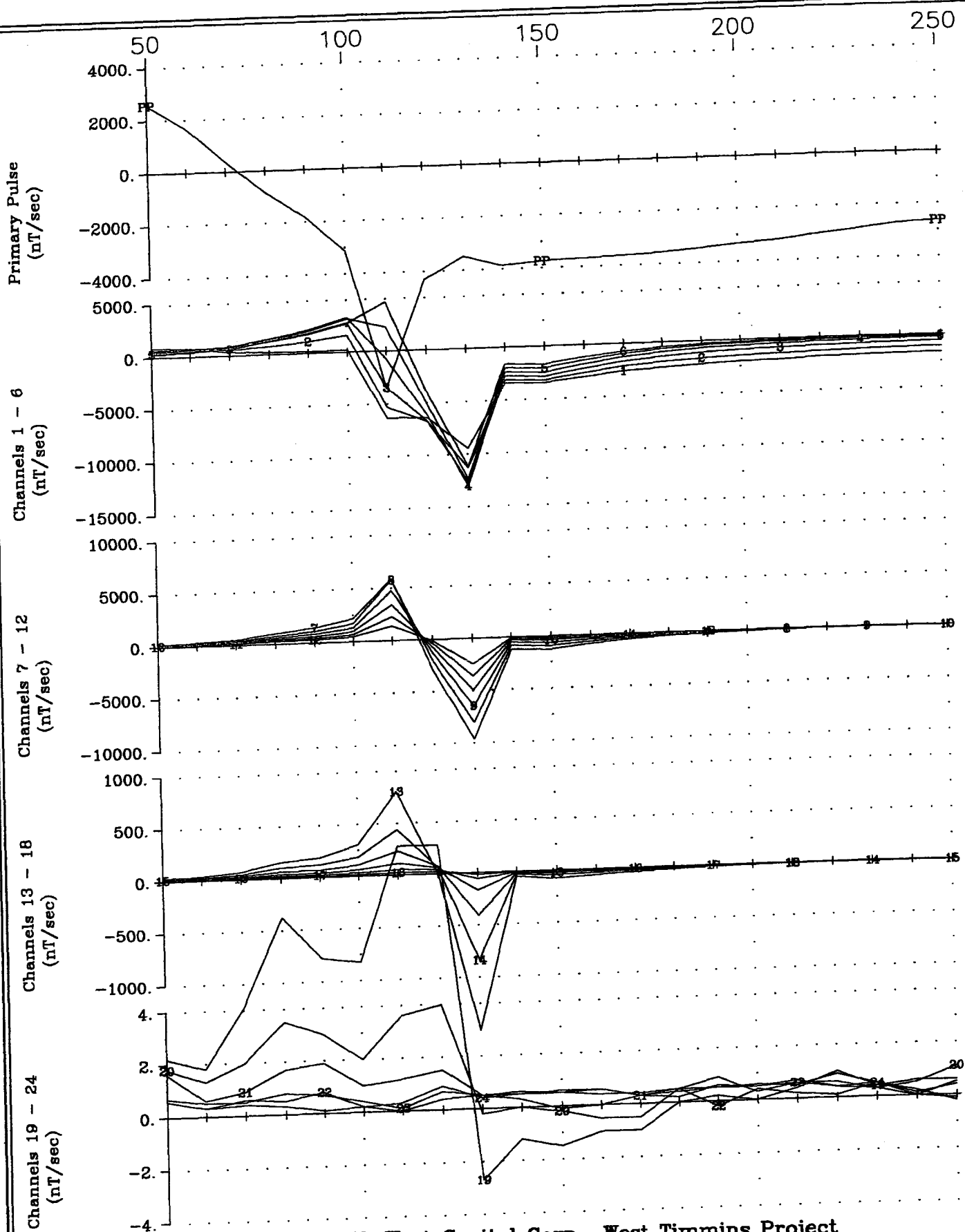
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) Y Component
 Crone Geophysics & Exploration Ltd.



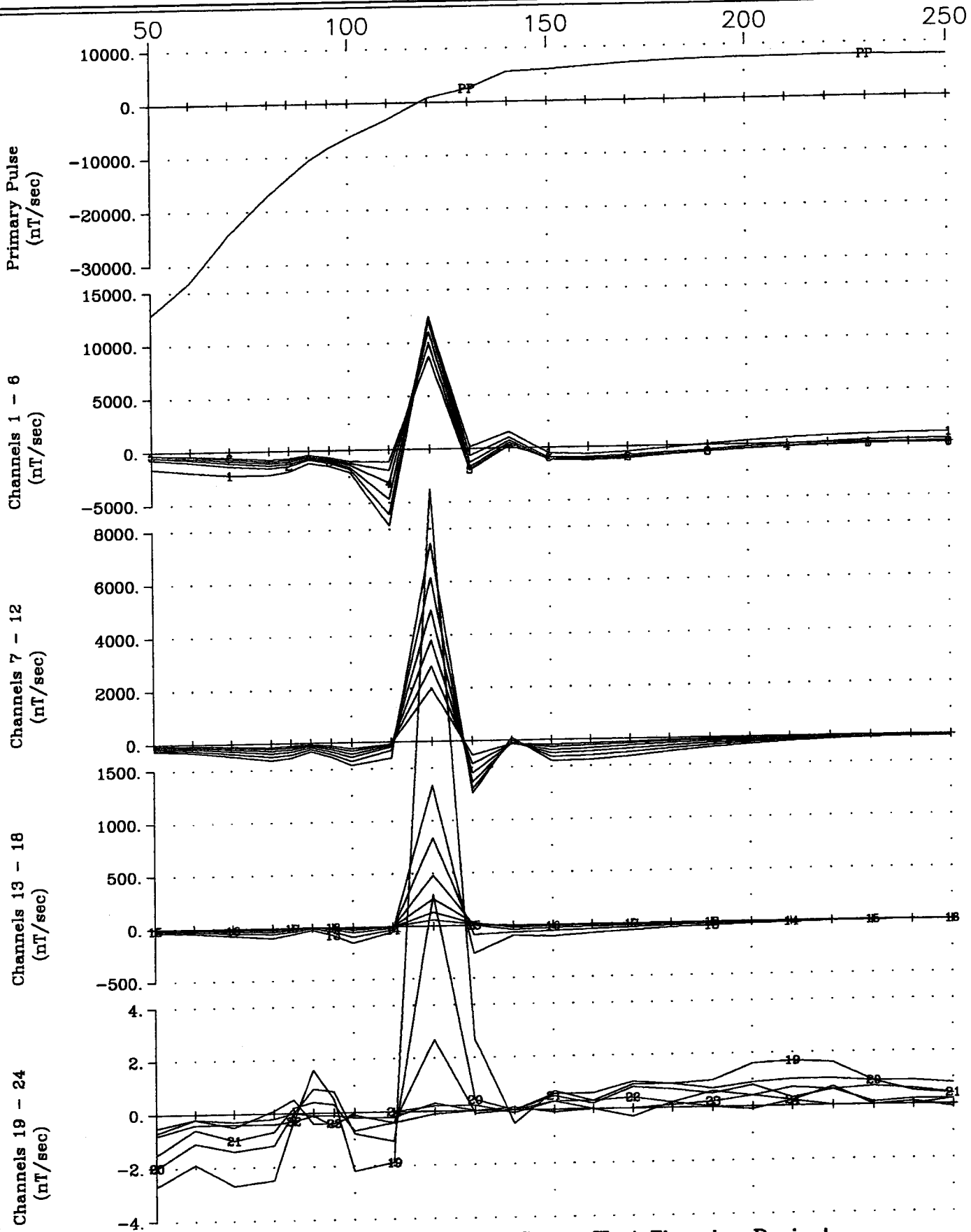
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) Z Component
 Crone Geophysics & Exploration Ltd.



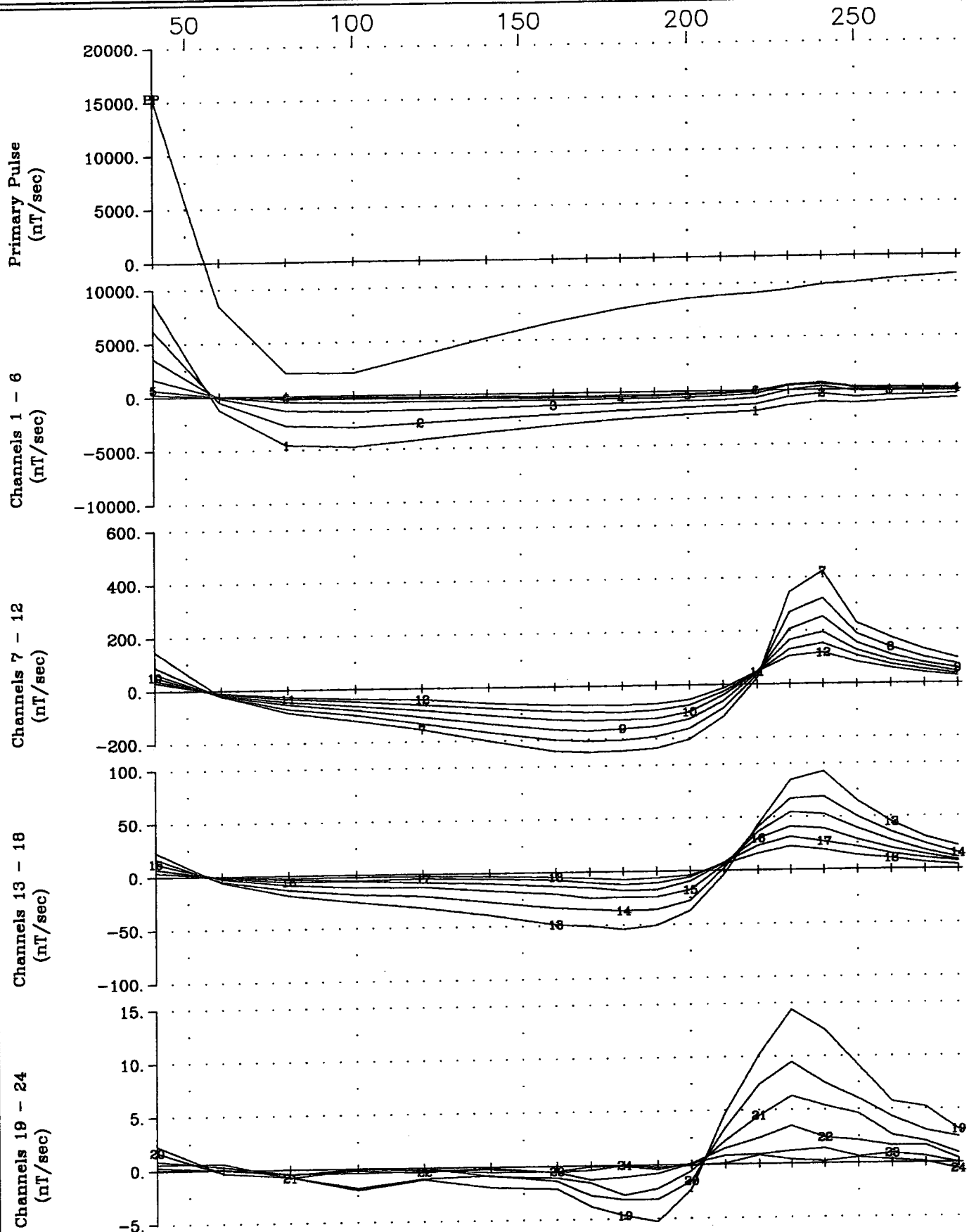
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) (Loop 2) X Component
 Crone Geophysics & Exploration Ltd.



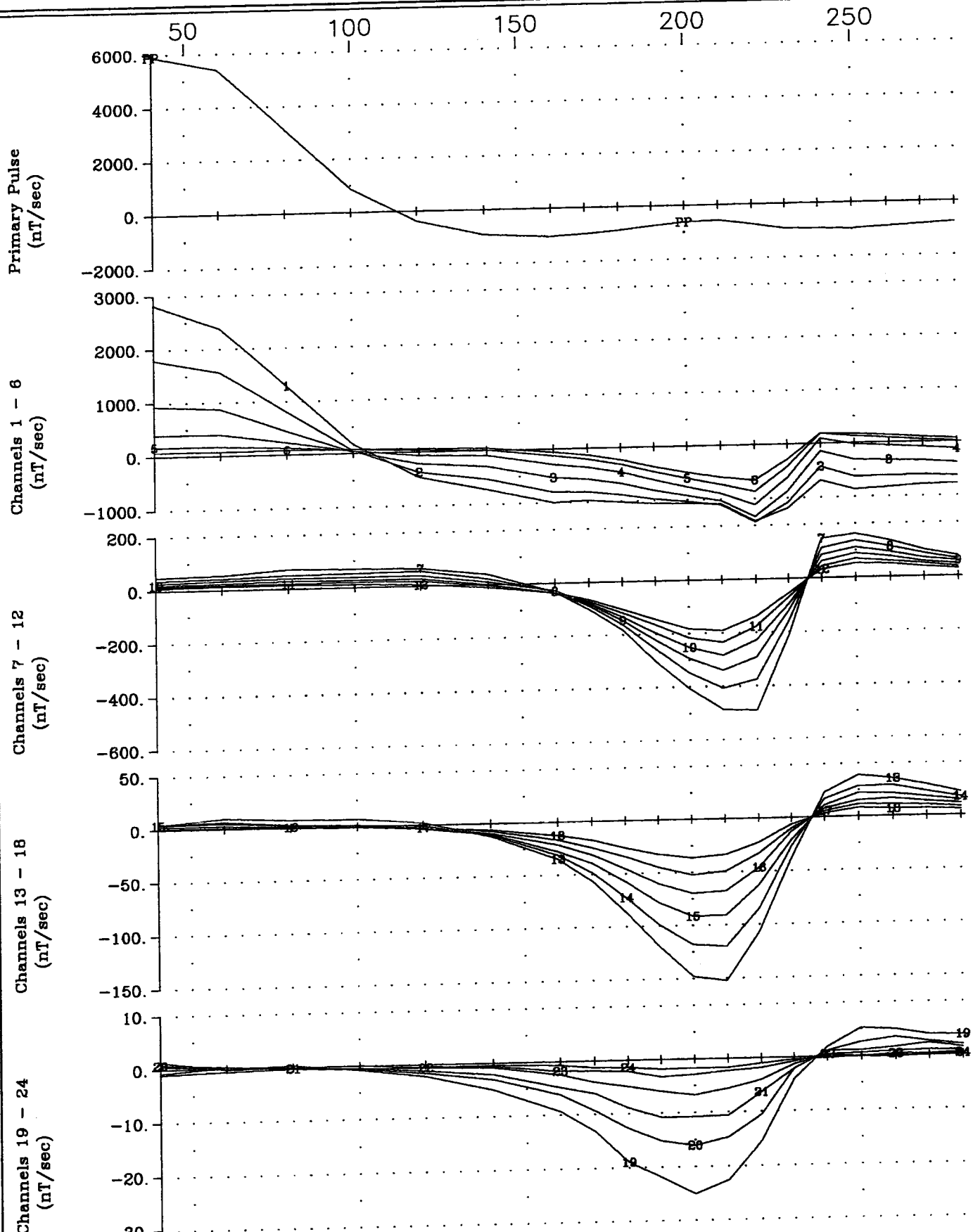
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) (Loop 2) Y Component
 Crone Geophysics & Exploration Ltd.



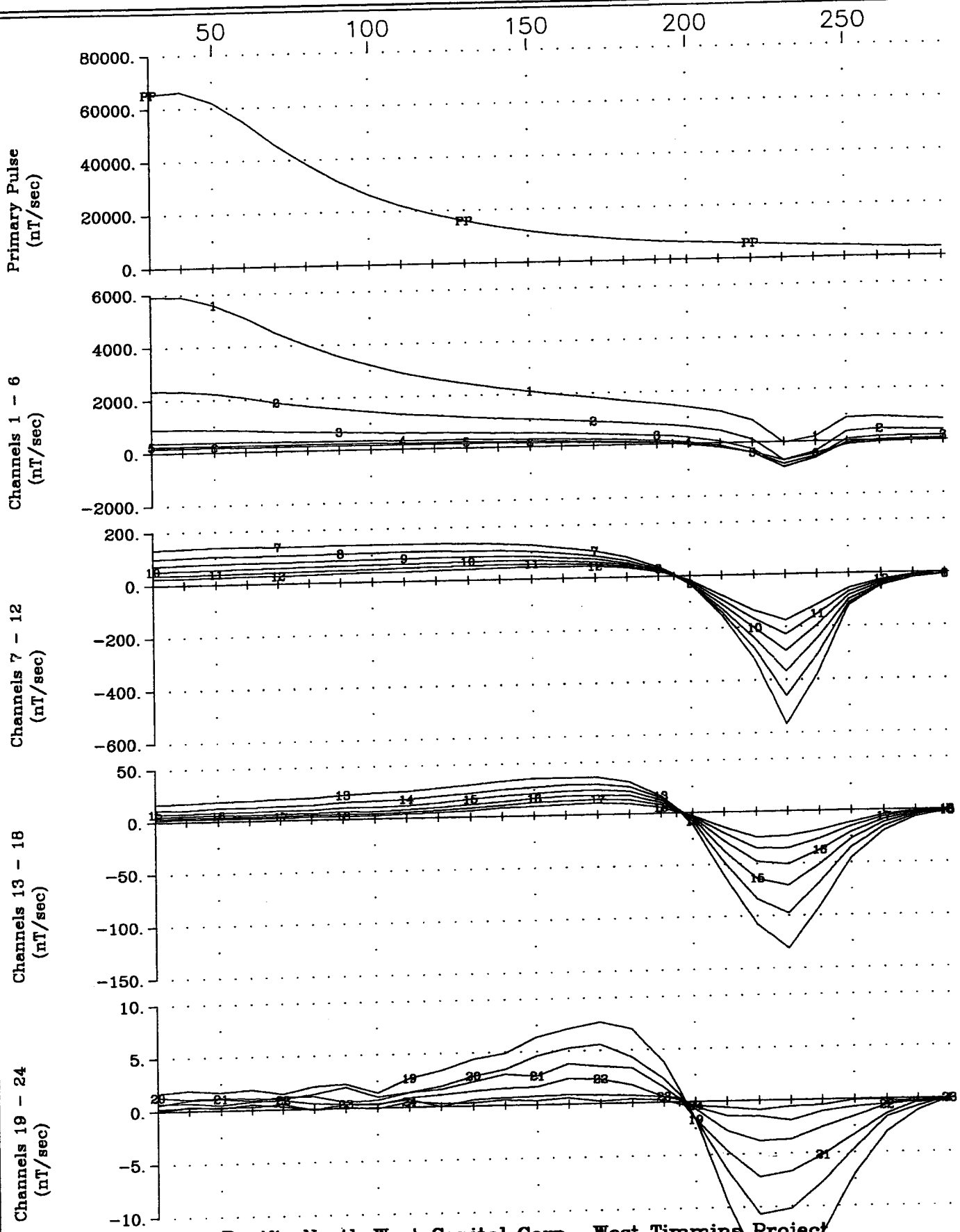
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) (Loop 2) Z Component
 Crone Geophysics & Exploration Ltd.



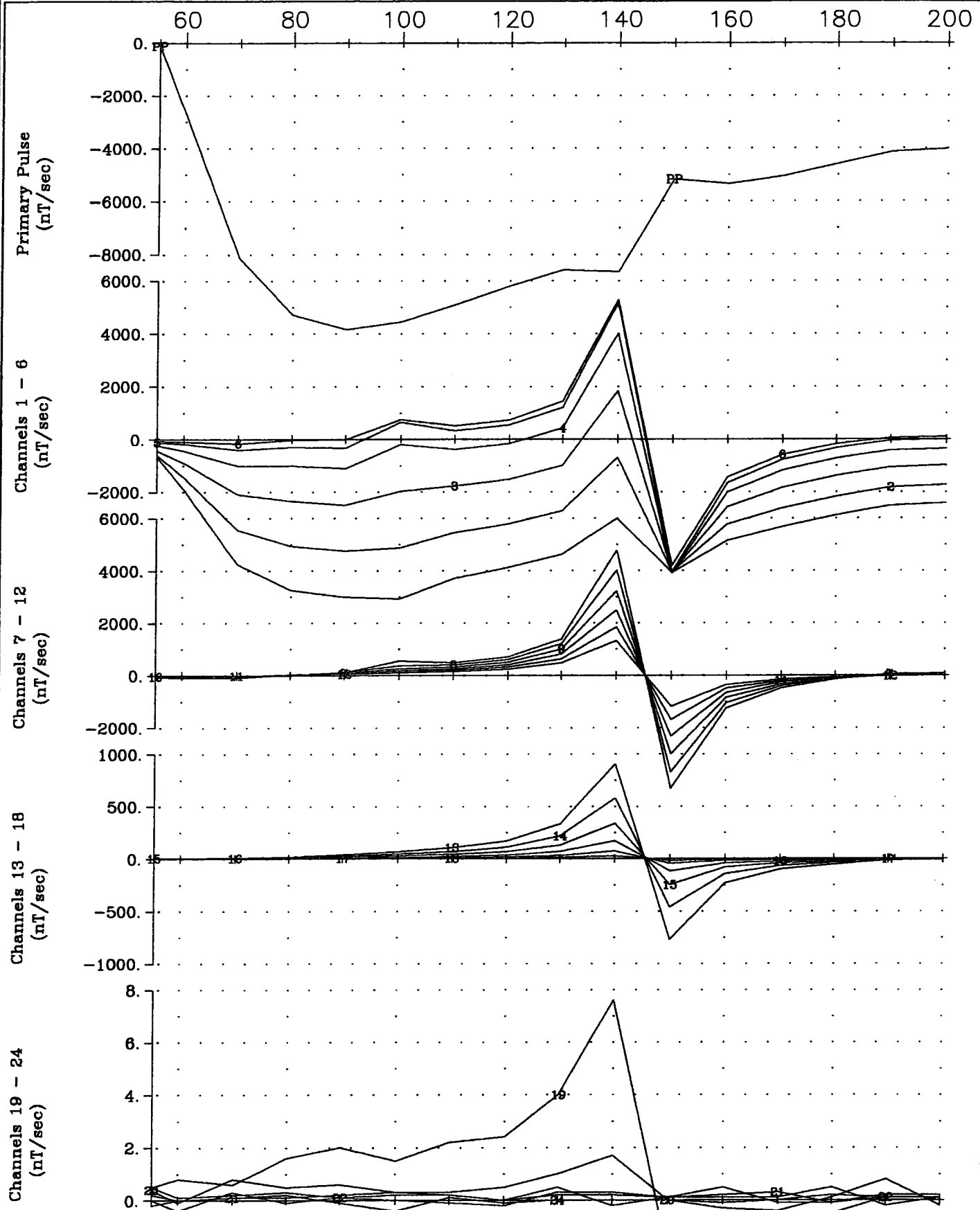
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-07 (GRID 3) X Component
 Crone Geophysics & Exploration Ltd.



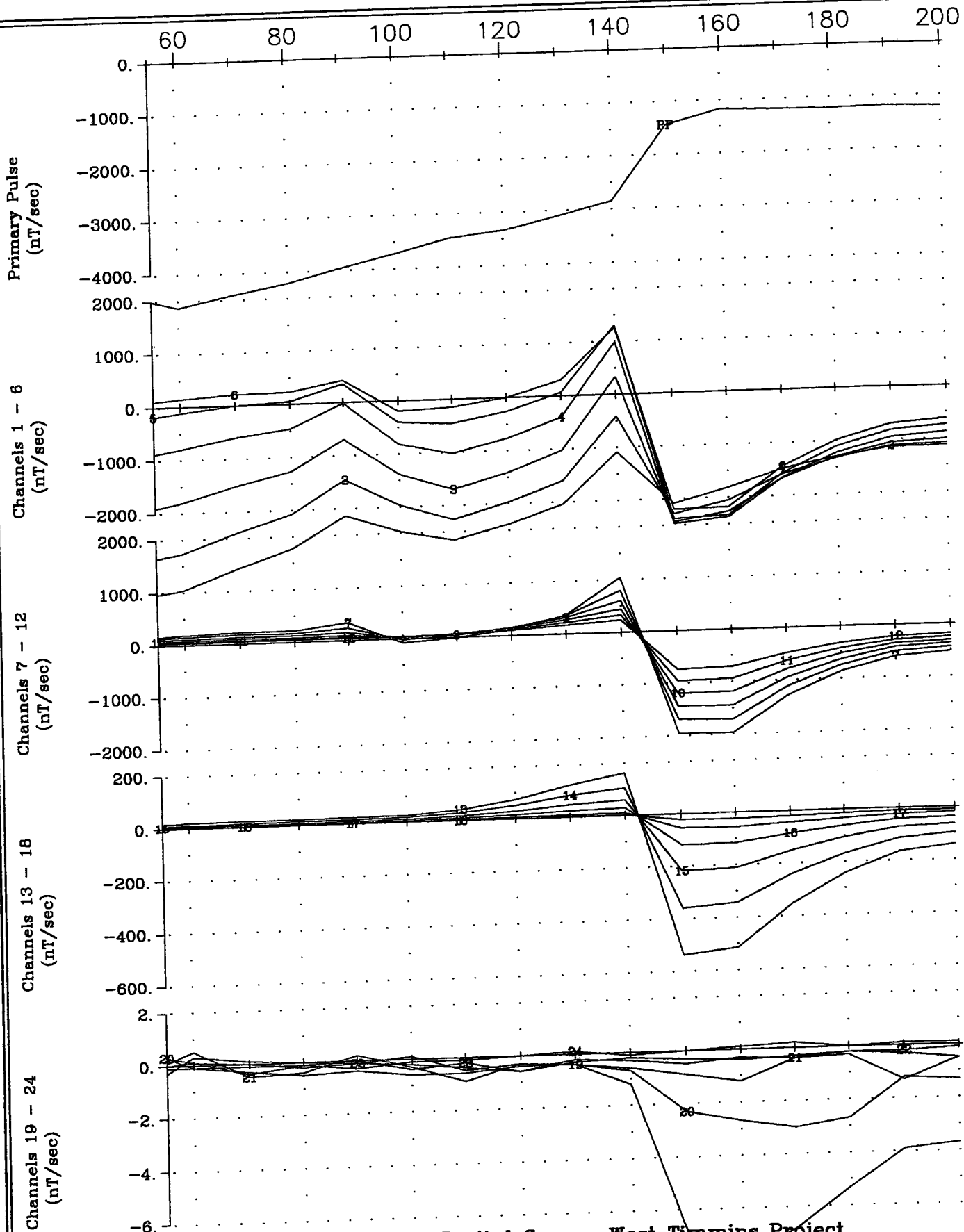
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-07 (GRID 3) Y Component
 Crone Geophysics & Exploration Ltd.



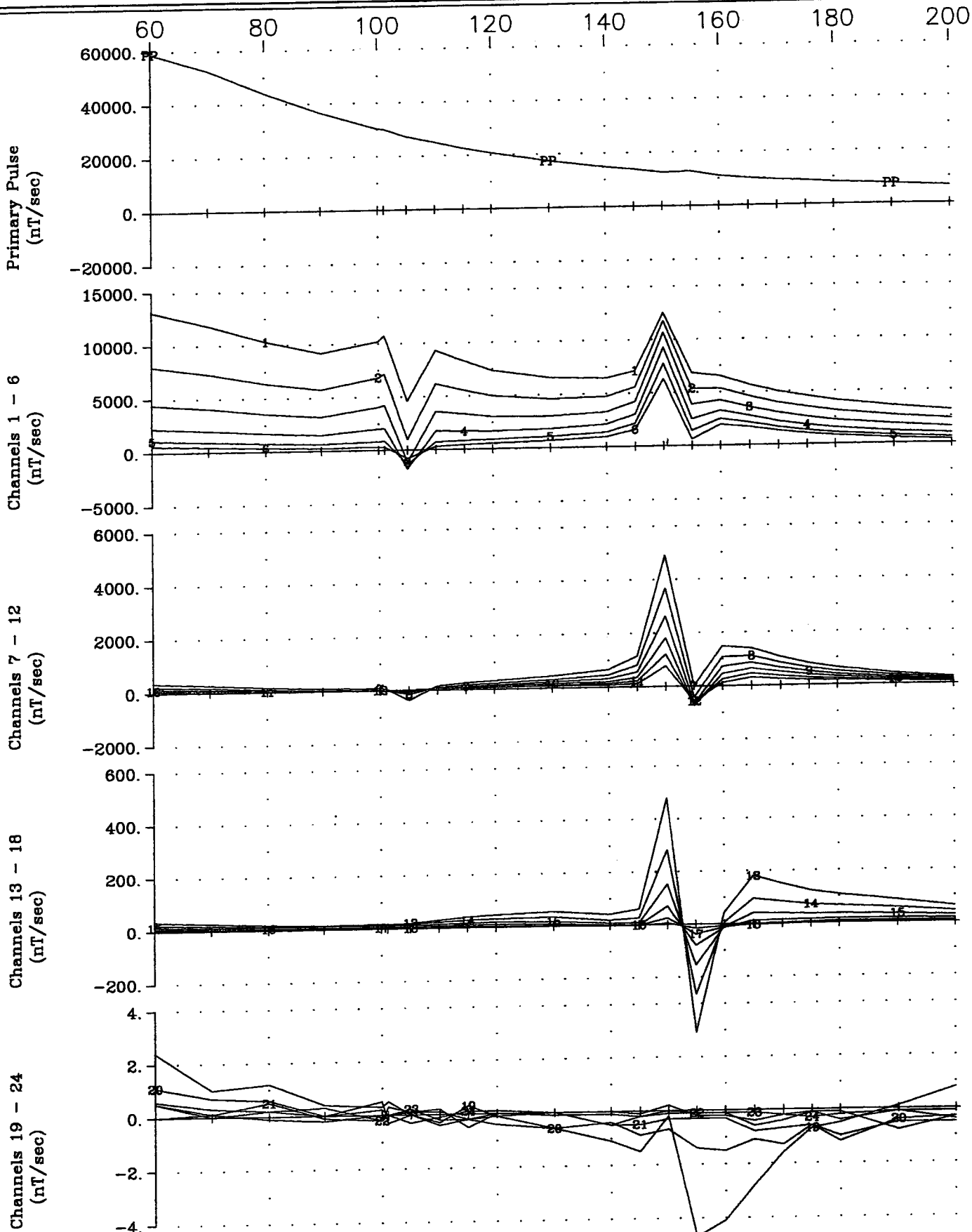
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-07 (GRID 3) Z Component
 Crone Geophysics & Exploration Ltd.



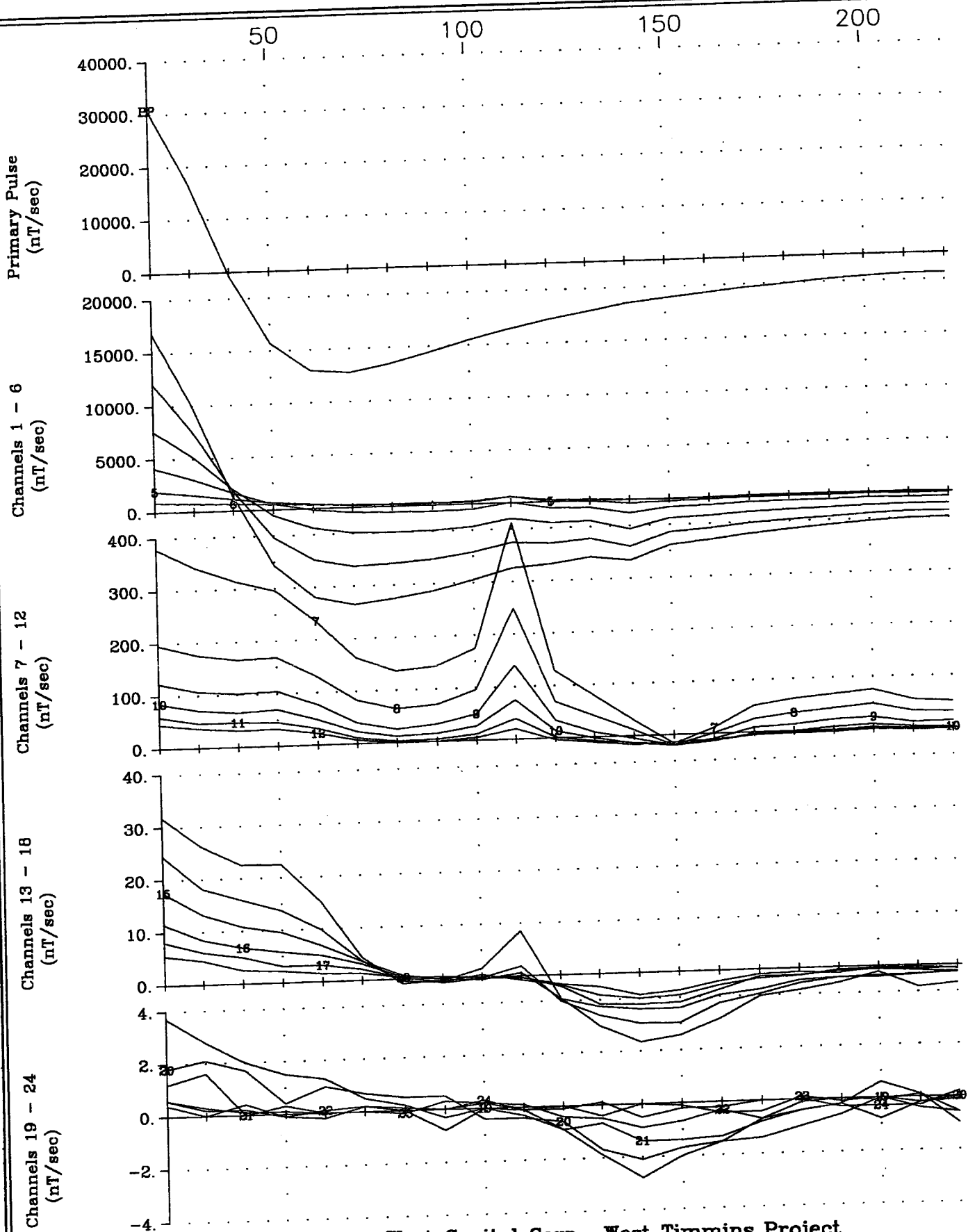
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-08 (GRID 4) X Component
 Crone Geophysics & Exploration Ltd.



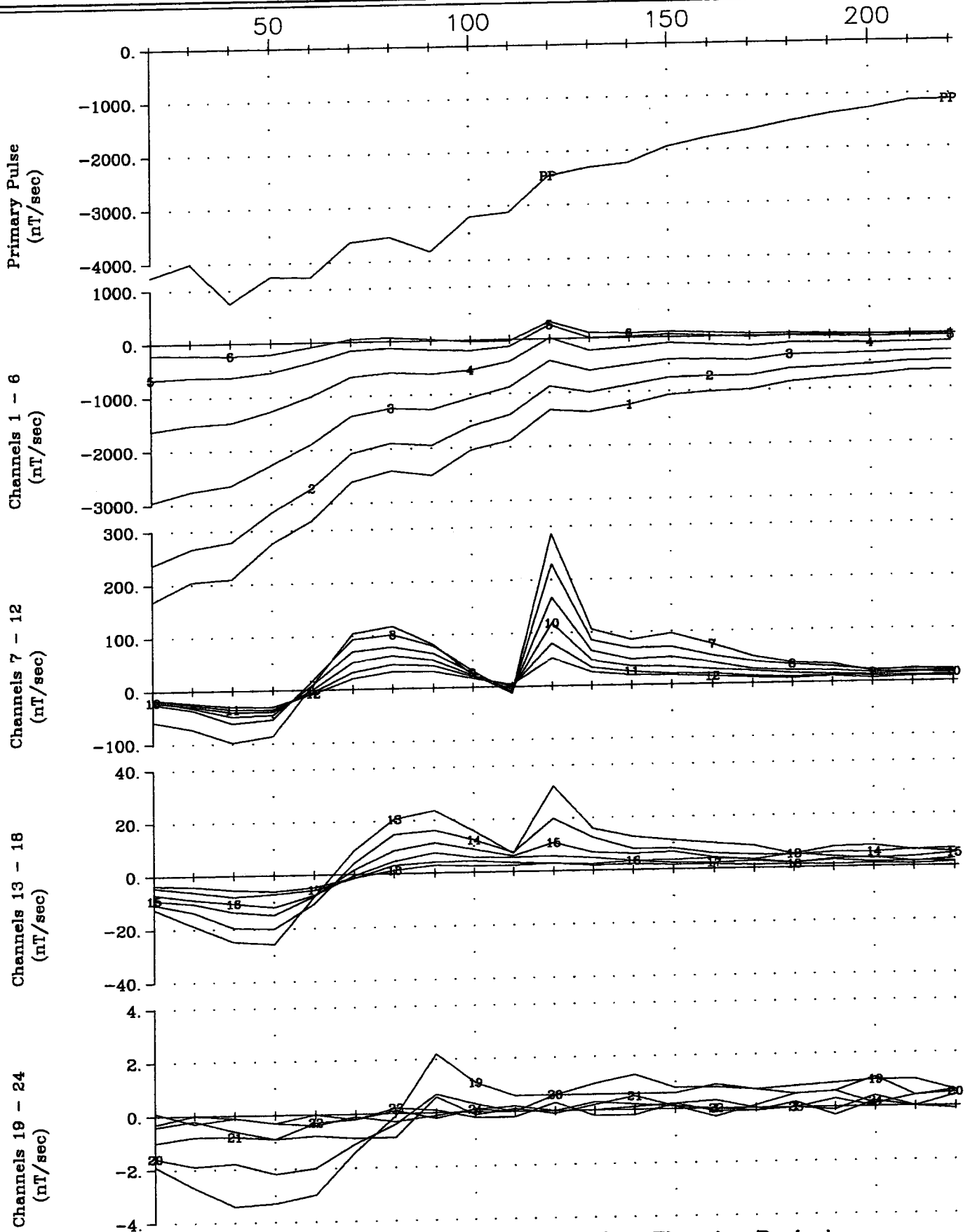
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-08 (GRID 4) Y Component
 Crone Geophysics & Exploration Ltd.



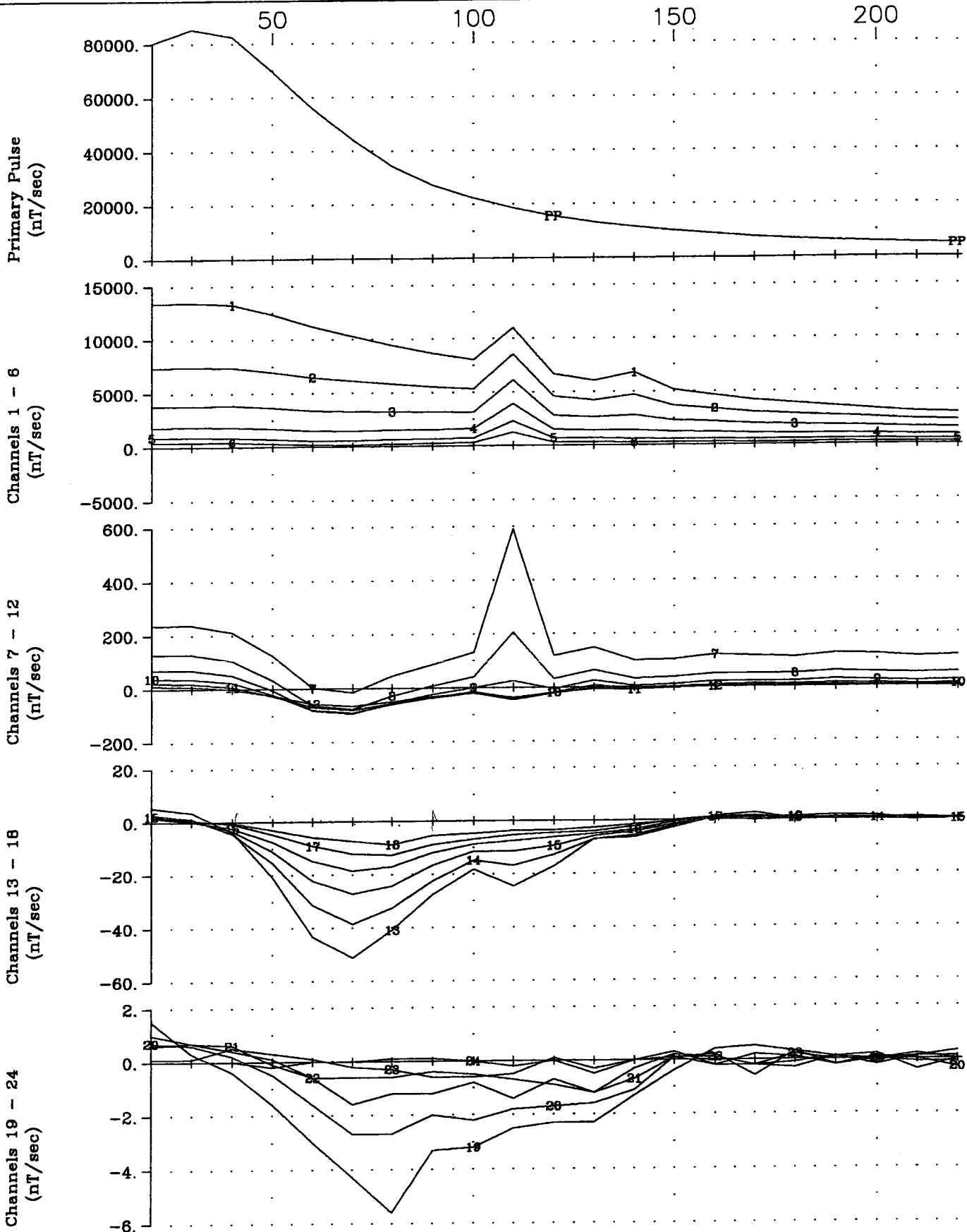
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-08 (GRID 4) Z Component
 Crone Geophysics & Exploration Ltd.



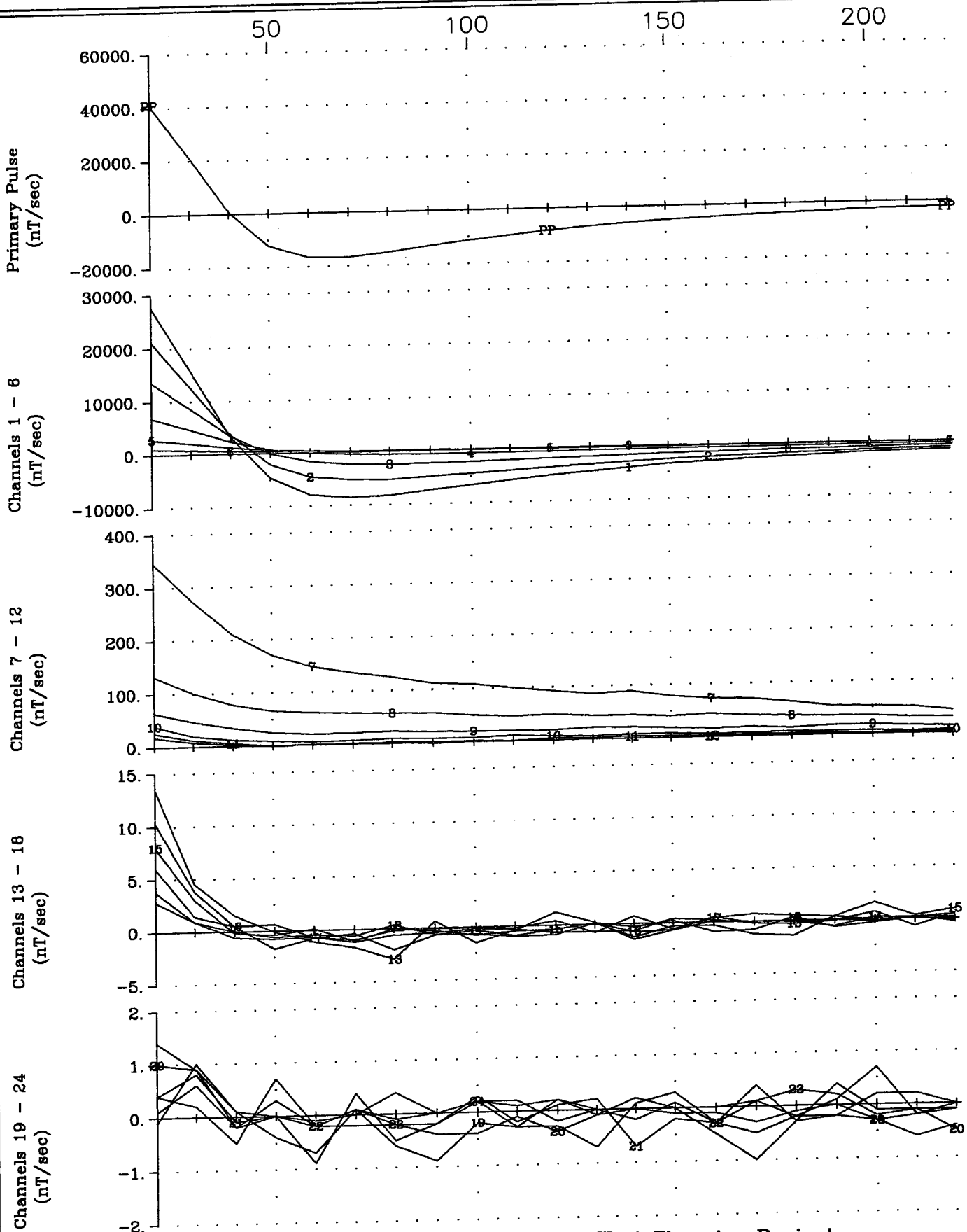
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-10 (GRID 4) X Component
 Crone Geophysics & Exploration Ltd.



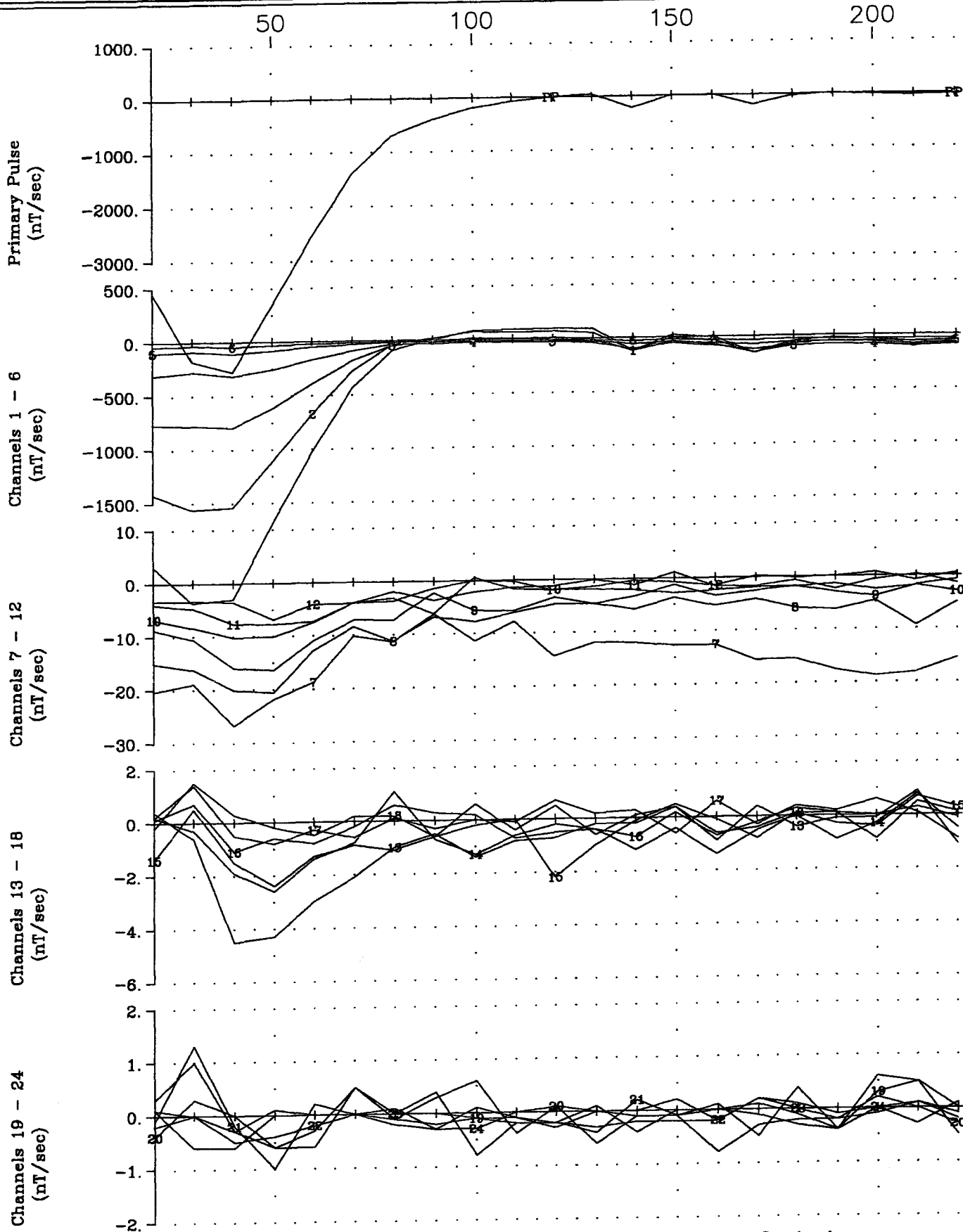
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-10 (GRID 4) Y Component
 Crone Geophysics & Exploration Ltd.



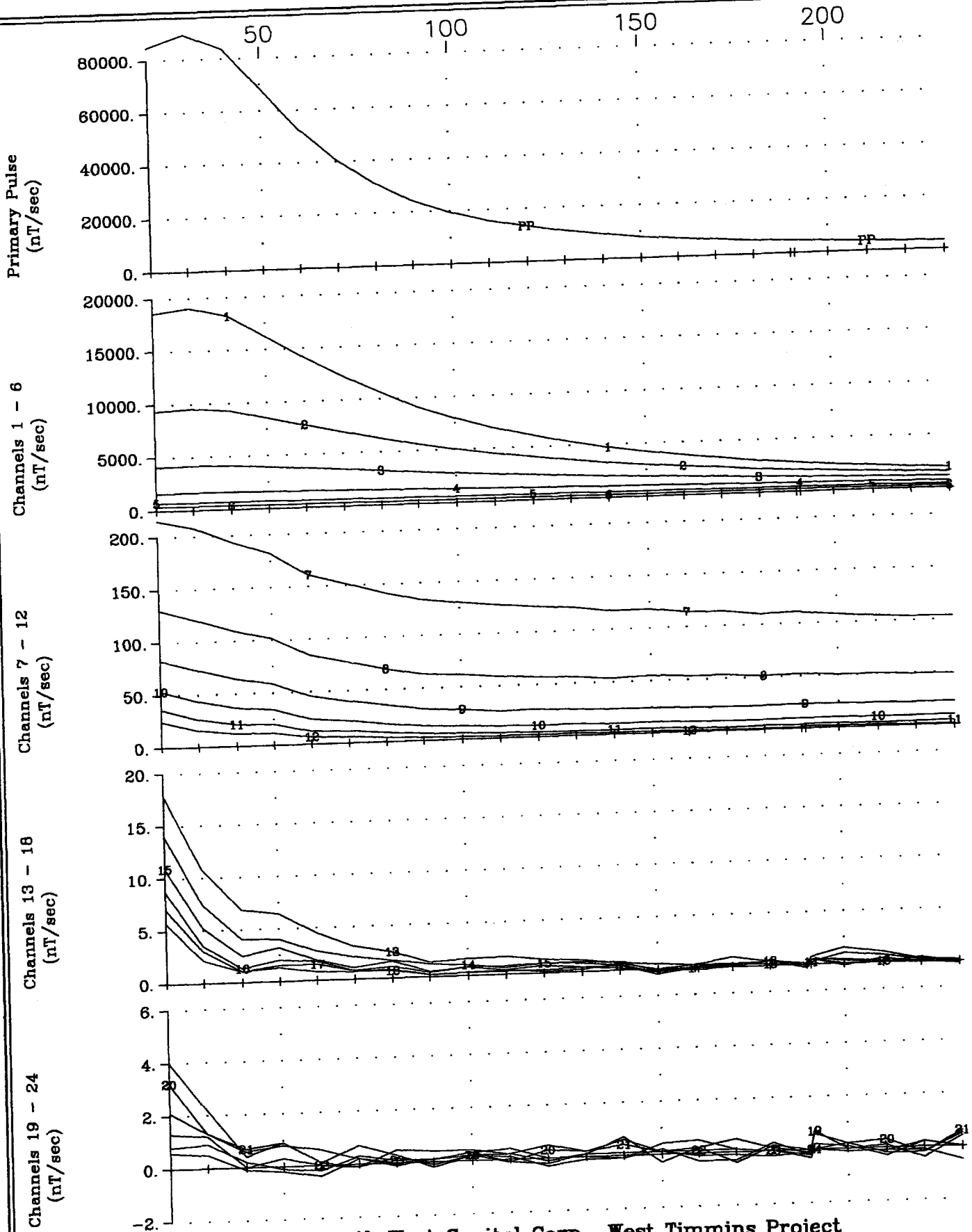
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-10 (GRID 4) Z Component
 Crone Geophysics & Exploration Ltd.



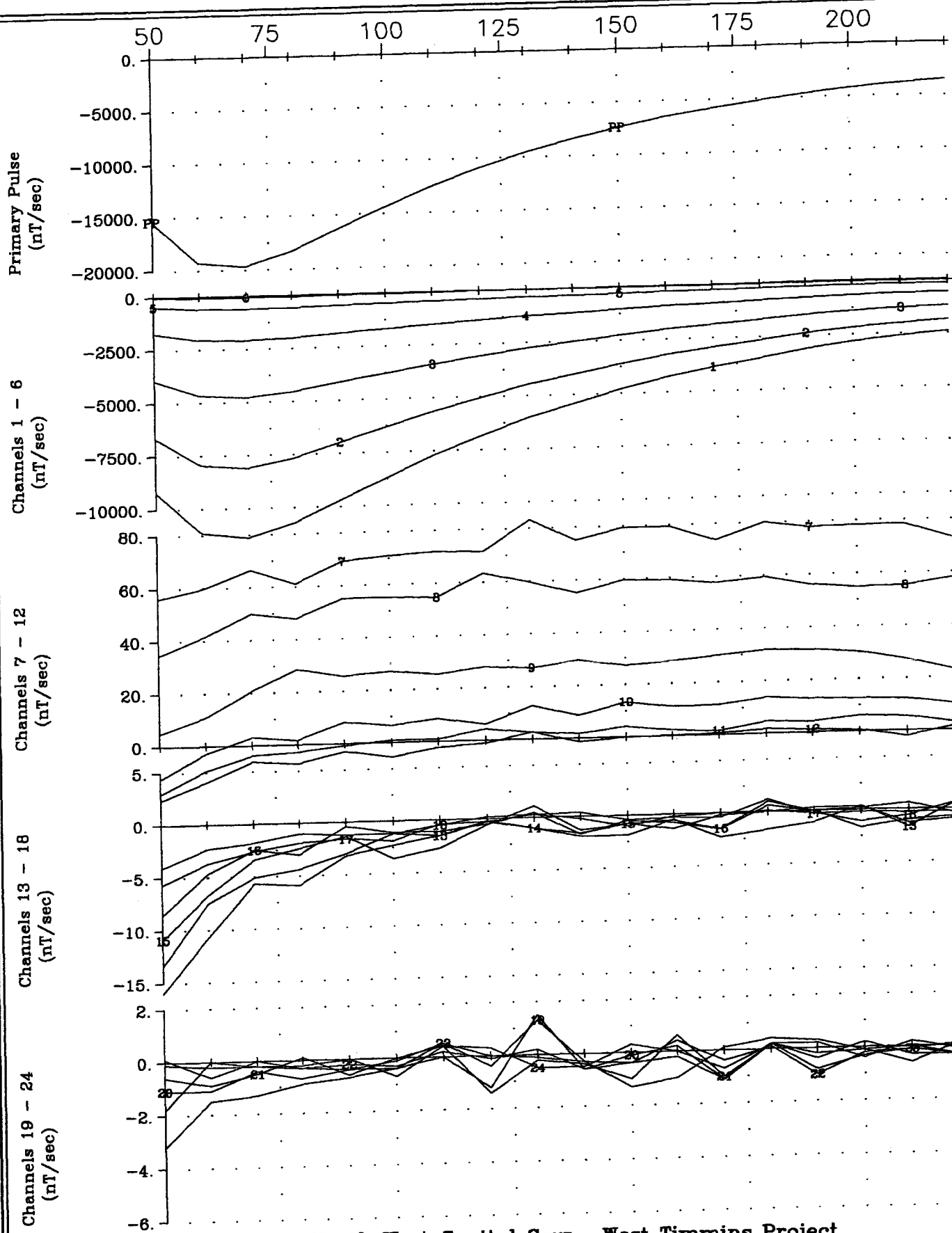
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-12 (GRID 5) X Component
 Crone Geophysics & Exploration Ltd.



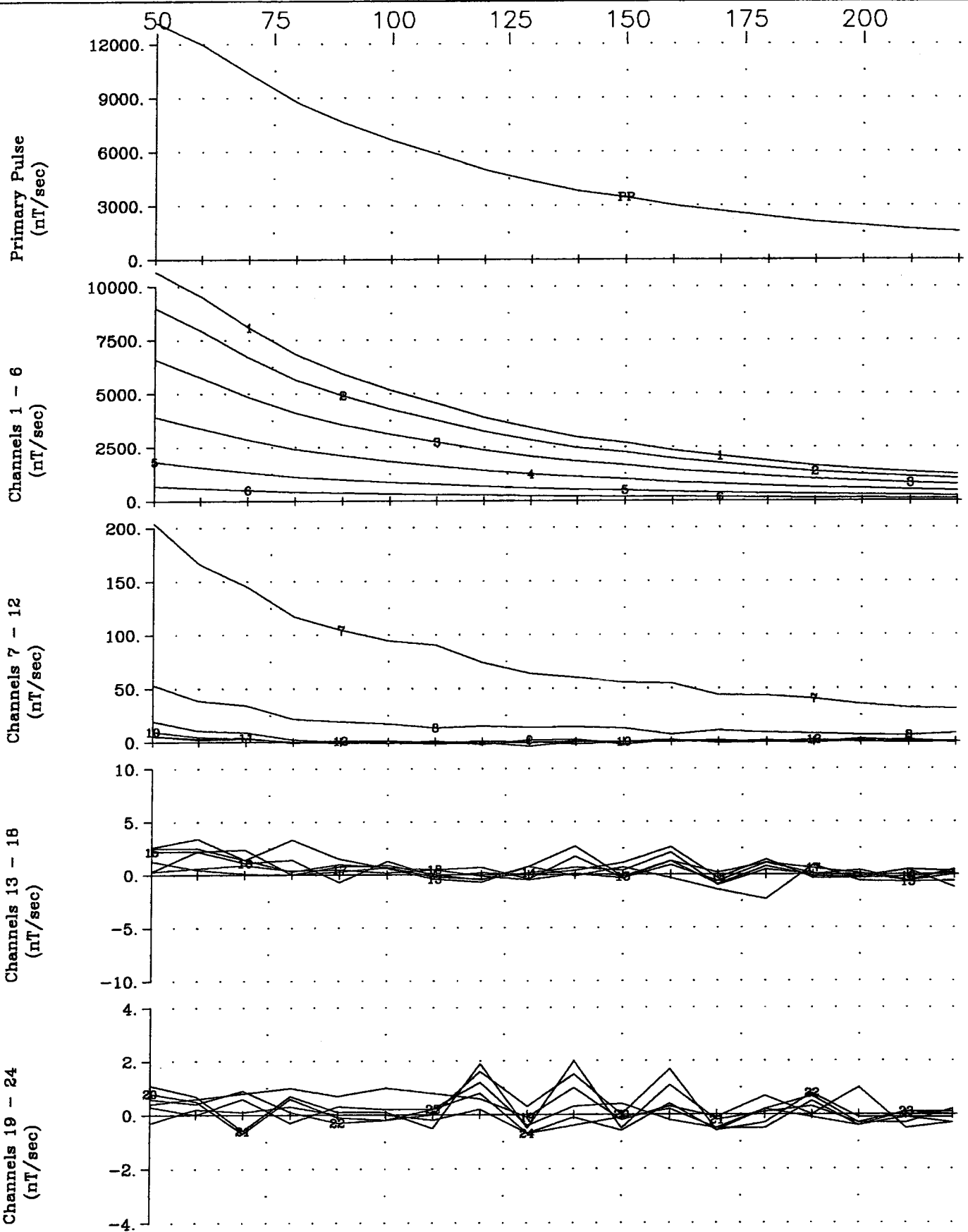
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-12 (GRID 5) Y Component
 Crone Geophysics & Exploration Ltd.



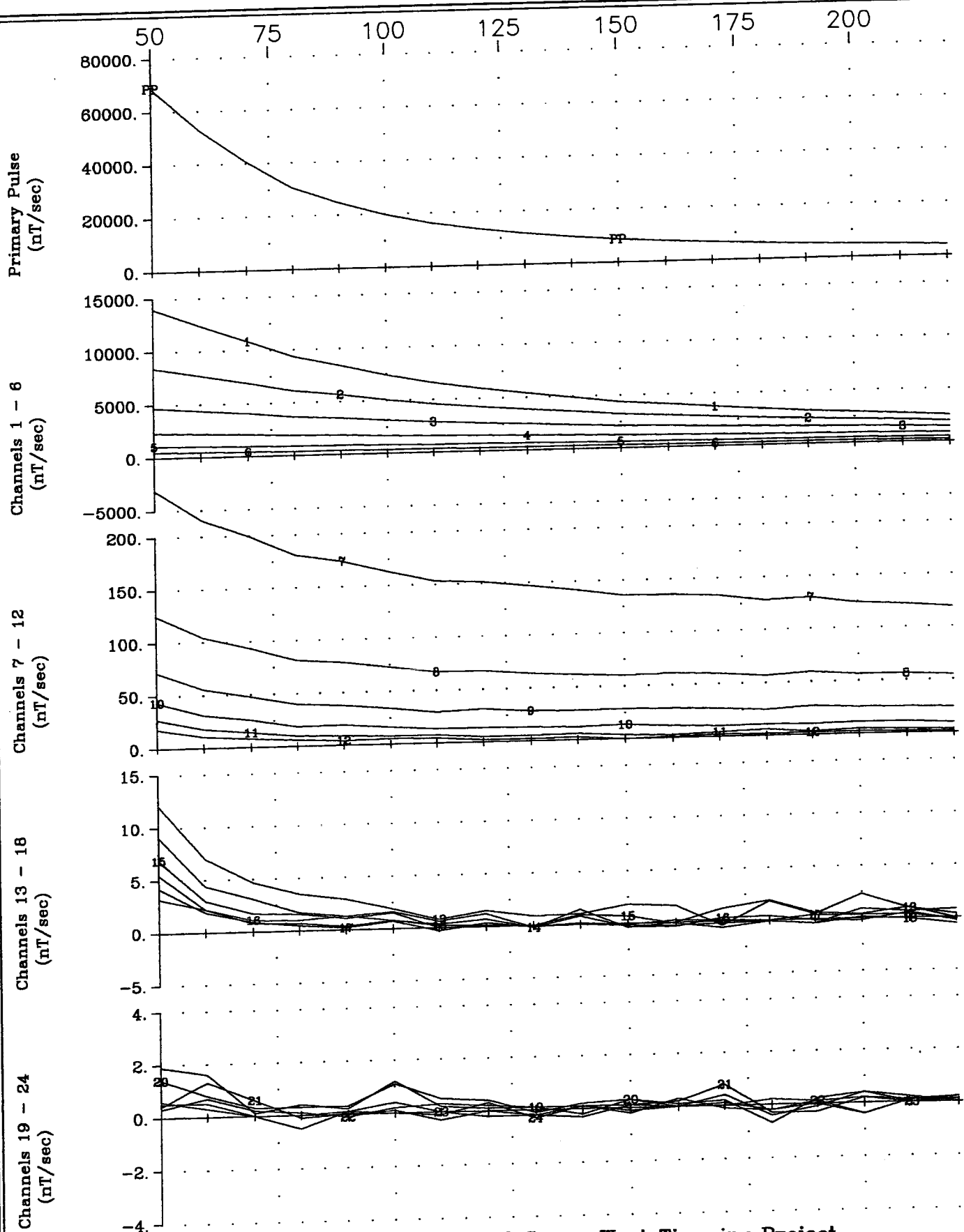
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-12 (GRID 5) Z Component
 Crone Geophysics & Exploration Ltd.



Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-13 (GRID 5) X Component
 Crone Geophysics & Exploration Ltd.



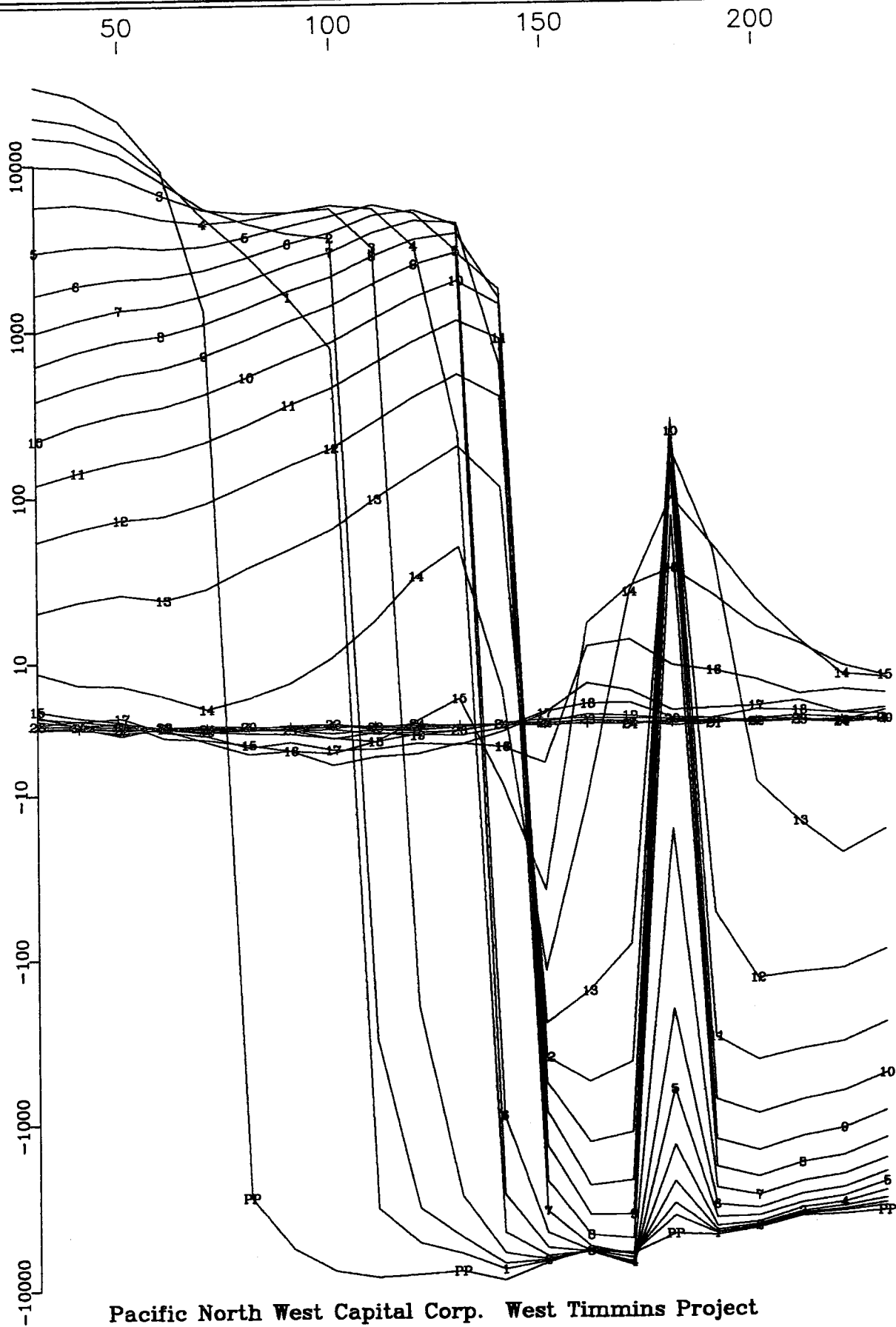
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-13 (GRID 5) Y Component
 Crone Geophysics & Exploration Ltd.



Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-13 (GRID 5) Z Component
 Crone Geophysics & Exploration Ltd.

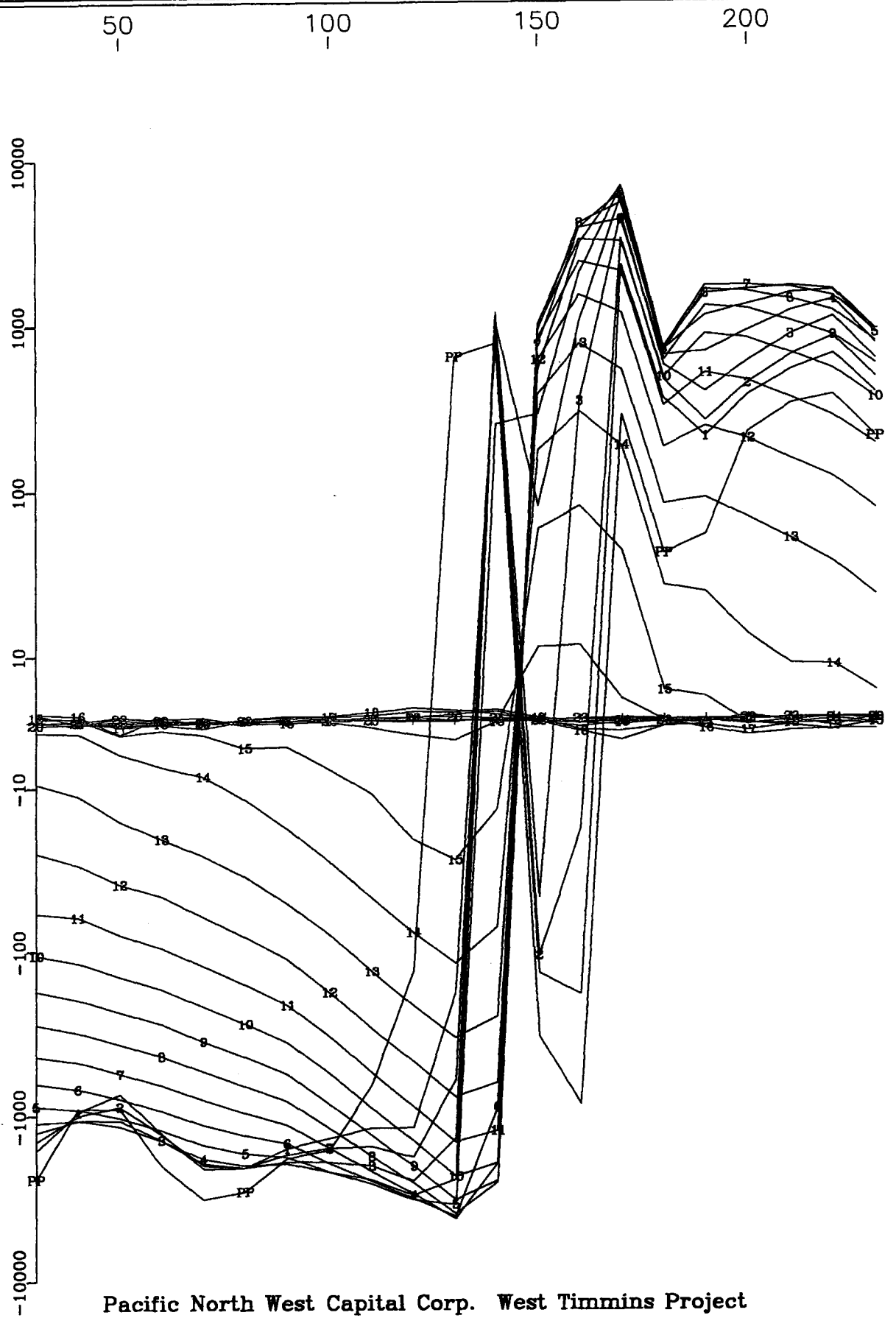
APPENDIX IV:
BOREHOLE EM DATA – LOG PROFILES

Primary Pulse and 24 Off-time Channels
(nT/sec)



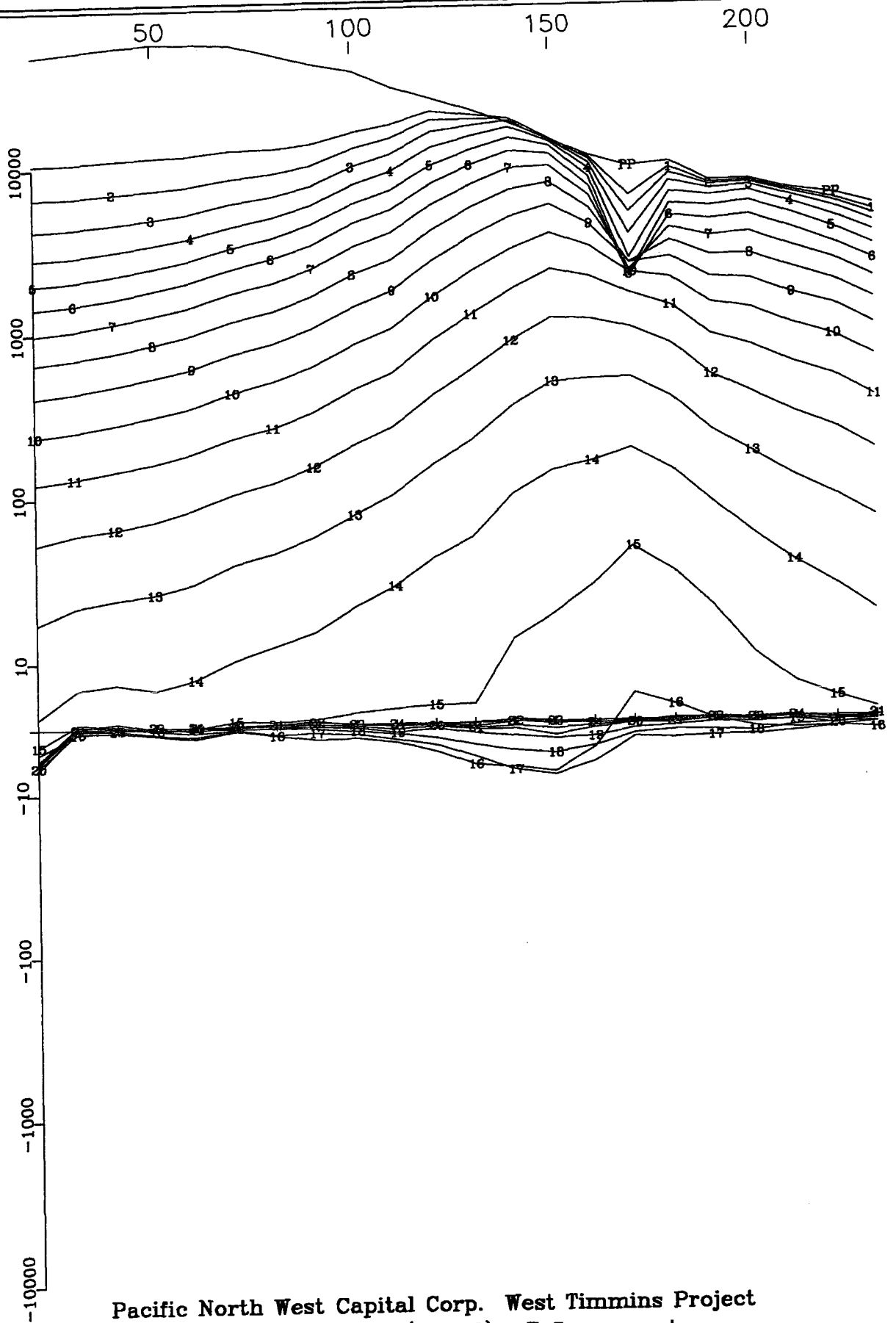
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-05 (Grid 8) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



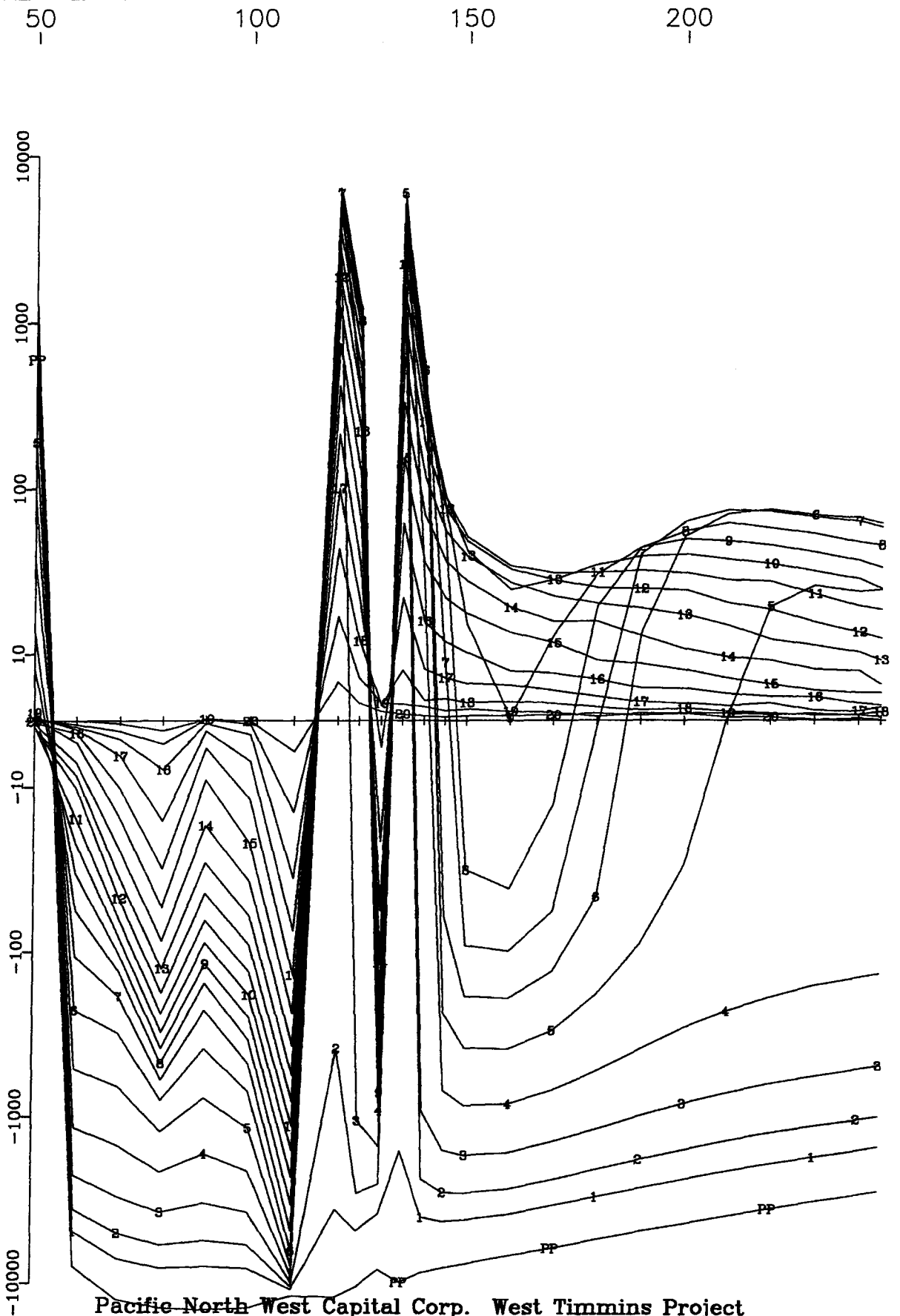
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-05 (Grid 8) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



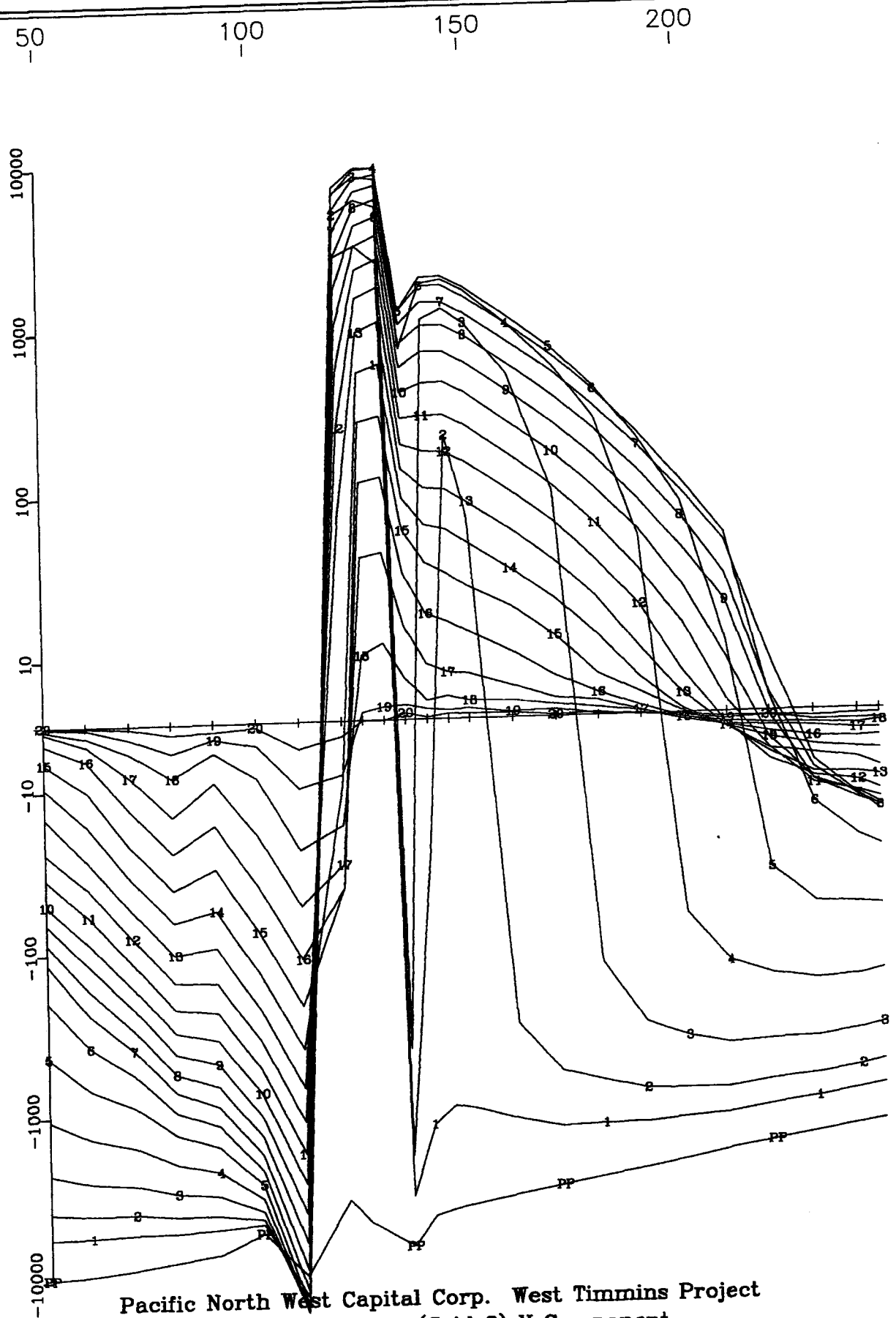
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-05 (Grid 8) Z Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 20 Off-time Channels
(nT/sec)



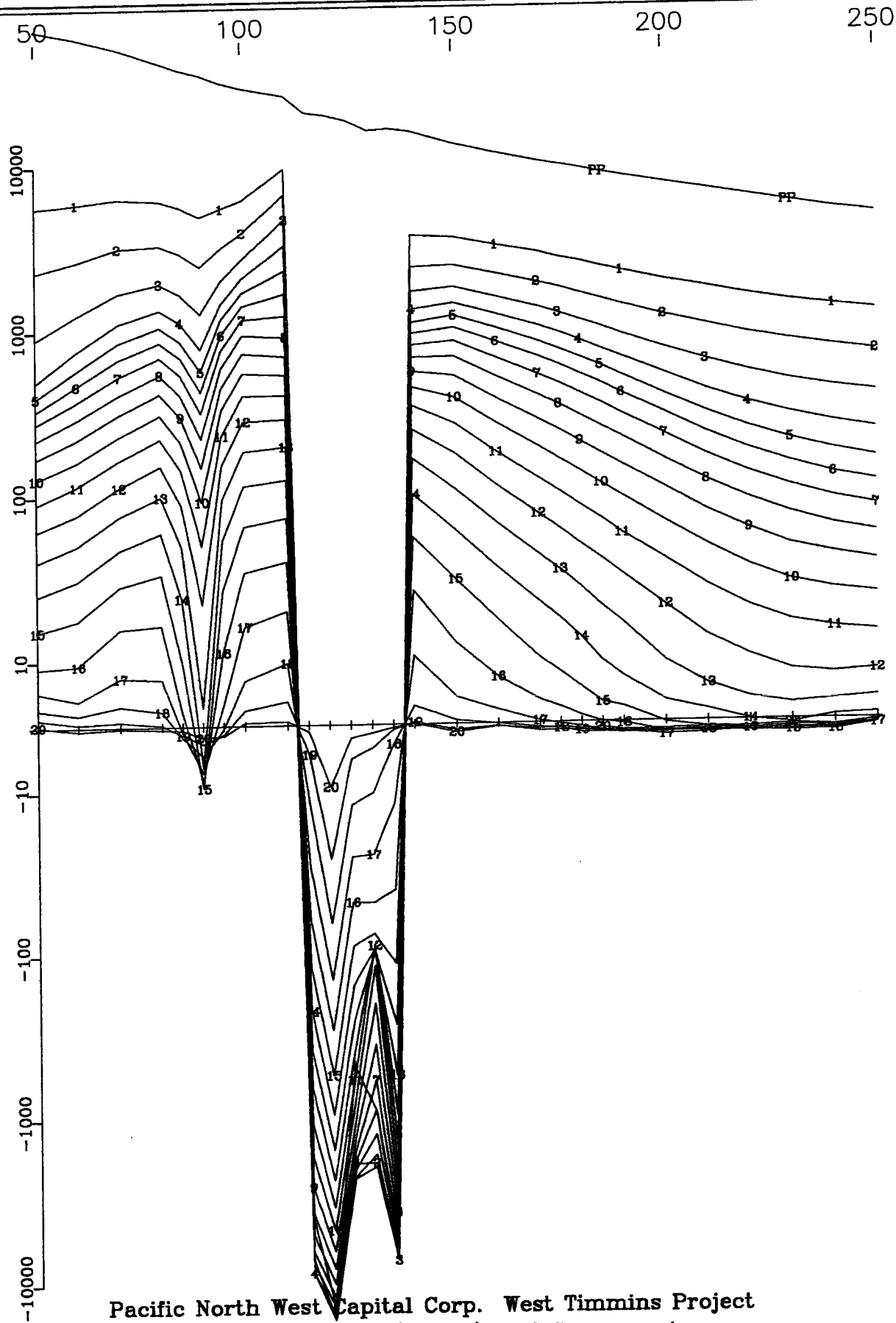
Pacific North West Capital Corp. West Timmins Project
Hole WTM05-06 (Grid 3) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 20 Off-time Channels
(nT/sec)



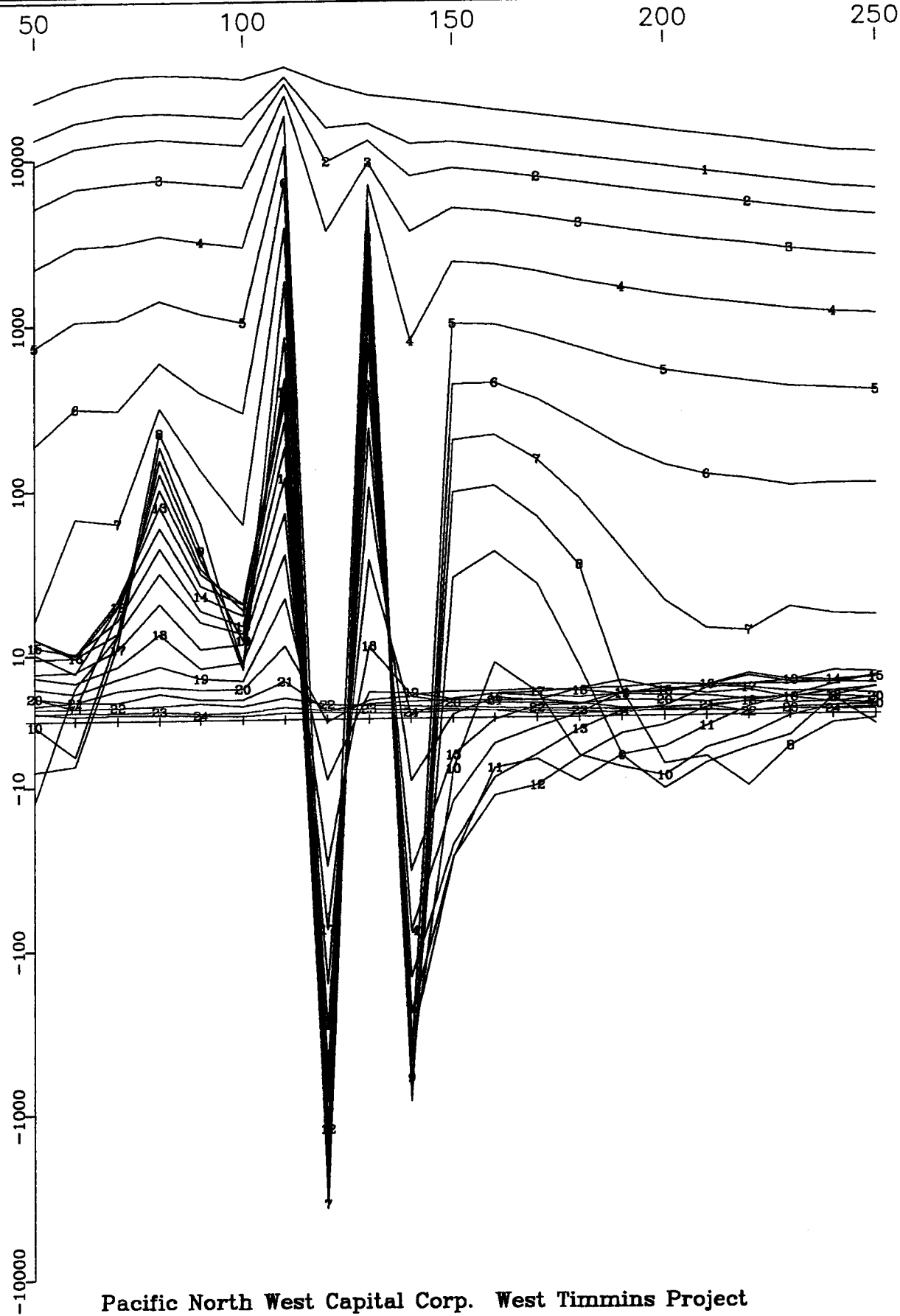
Pacific North West Capital Corp. West Timmins Project
Hole WTM05-06 (Grid 3) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 20 Off-time Channels
(nT/sec)



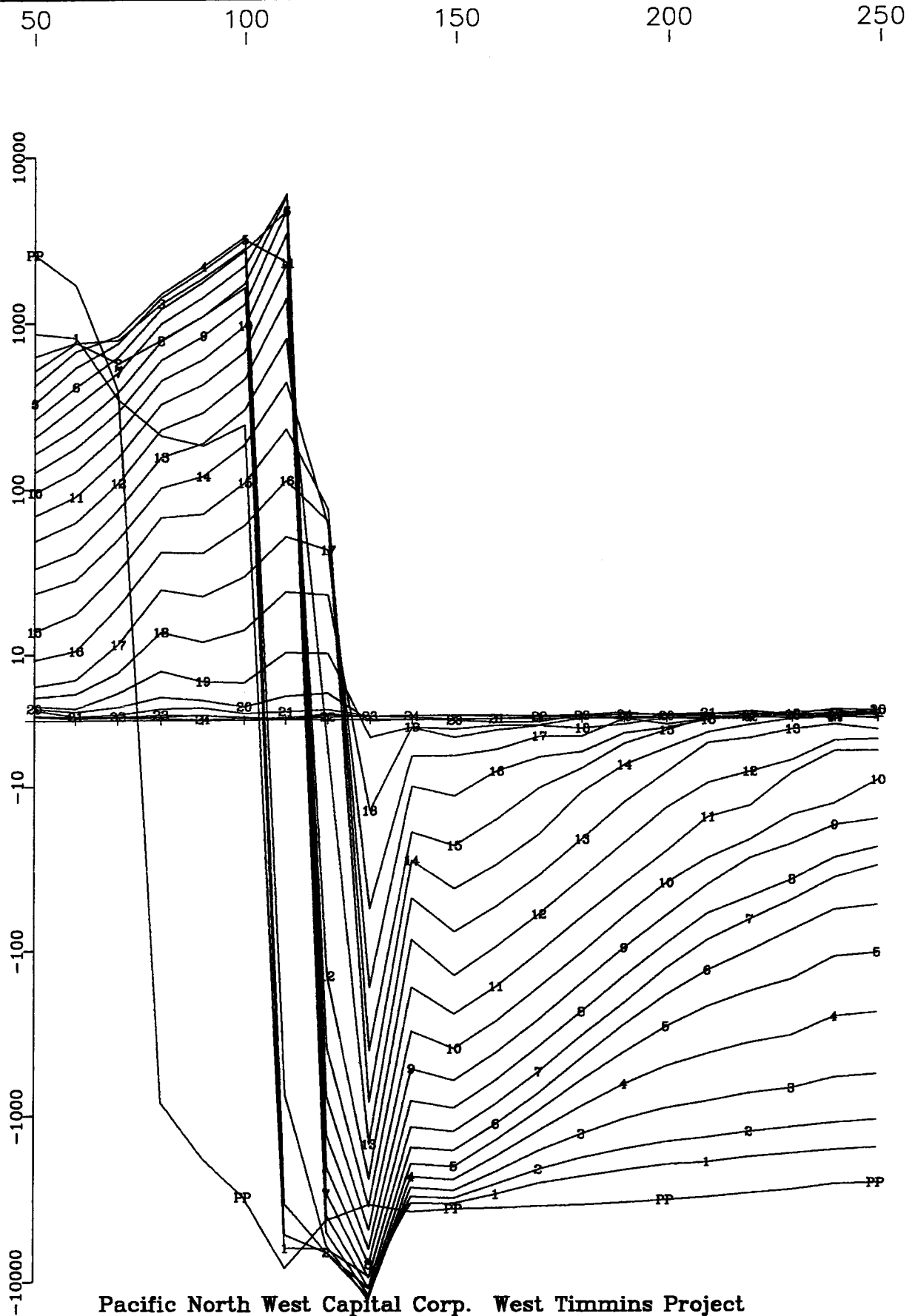
Pacific North West Capital Corp. West Timmins Project
Hole WTM05-06 (Grid 3) Z Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



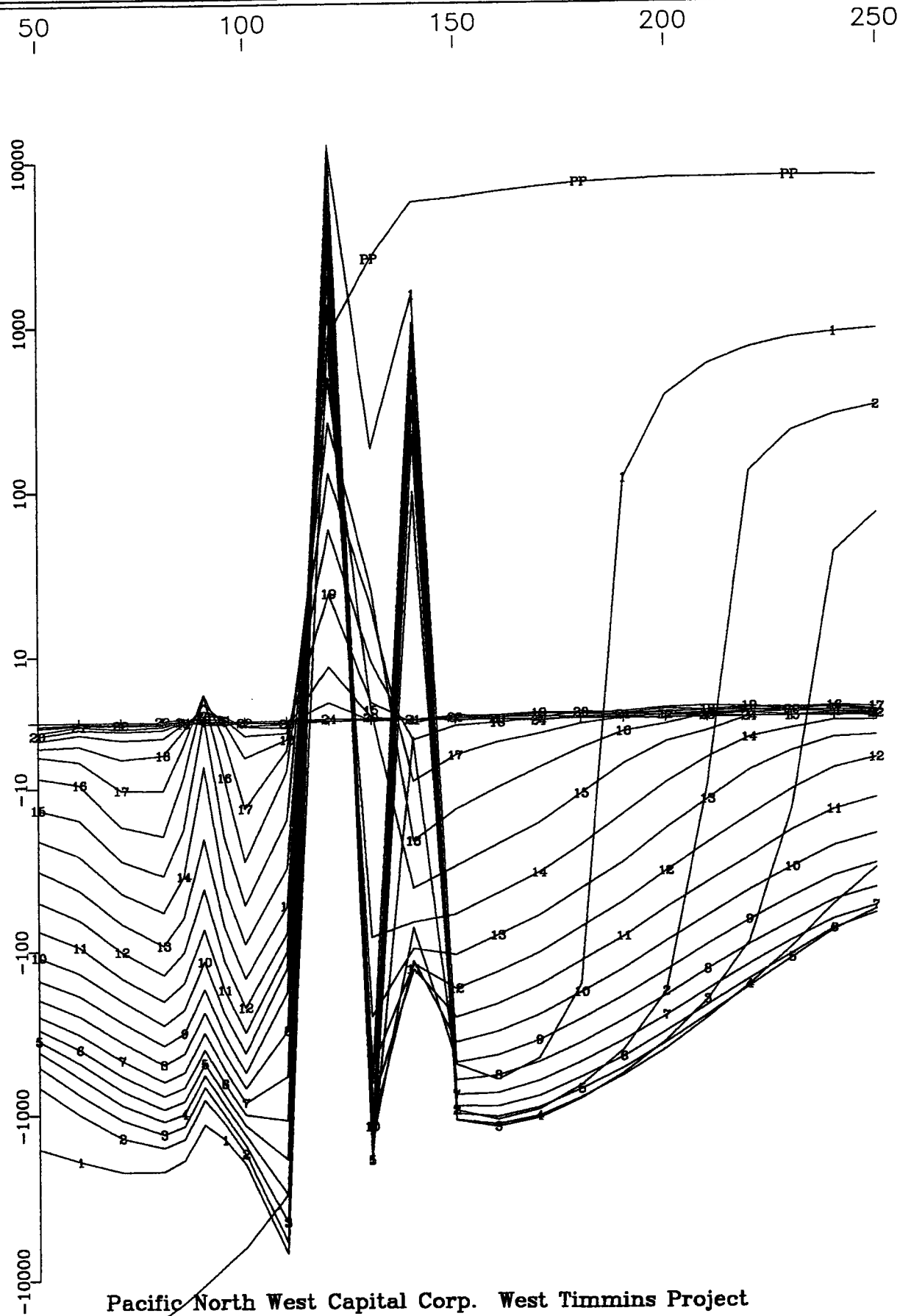
Pacific North West Capital Corp. West Timmins Project
Hole WTM05-06 (Grid 3) (Loop 2) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



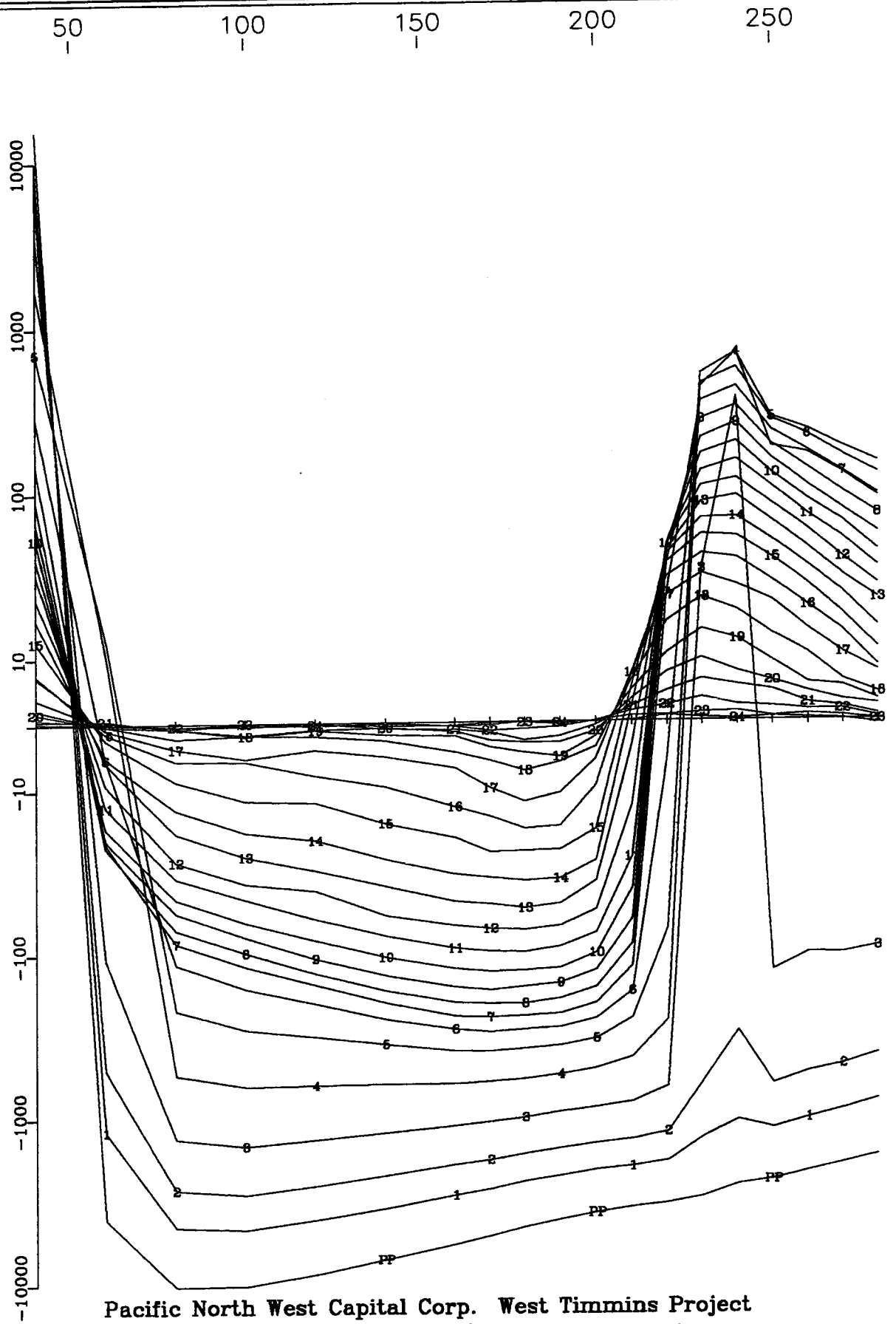
Pacific North West Capital Corp. West Timmins Project
Hole WTM05-08 (Grid 3) (Loop 2) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



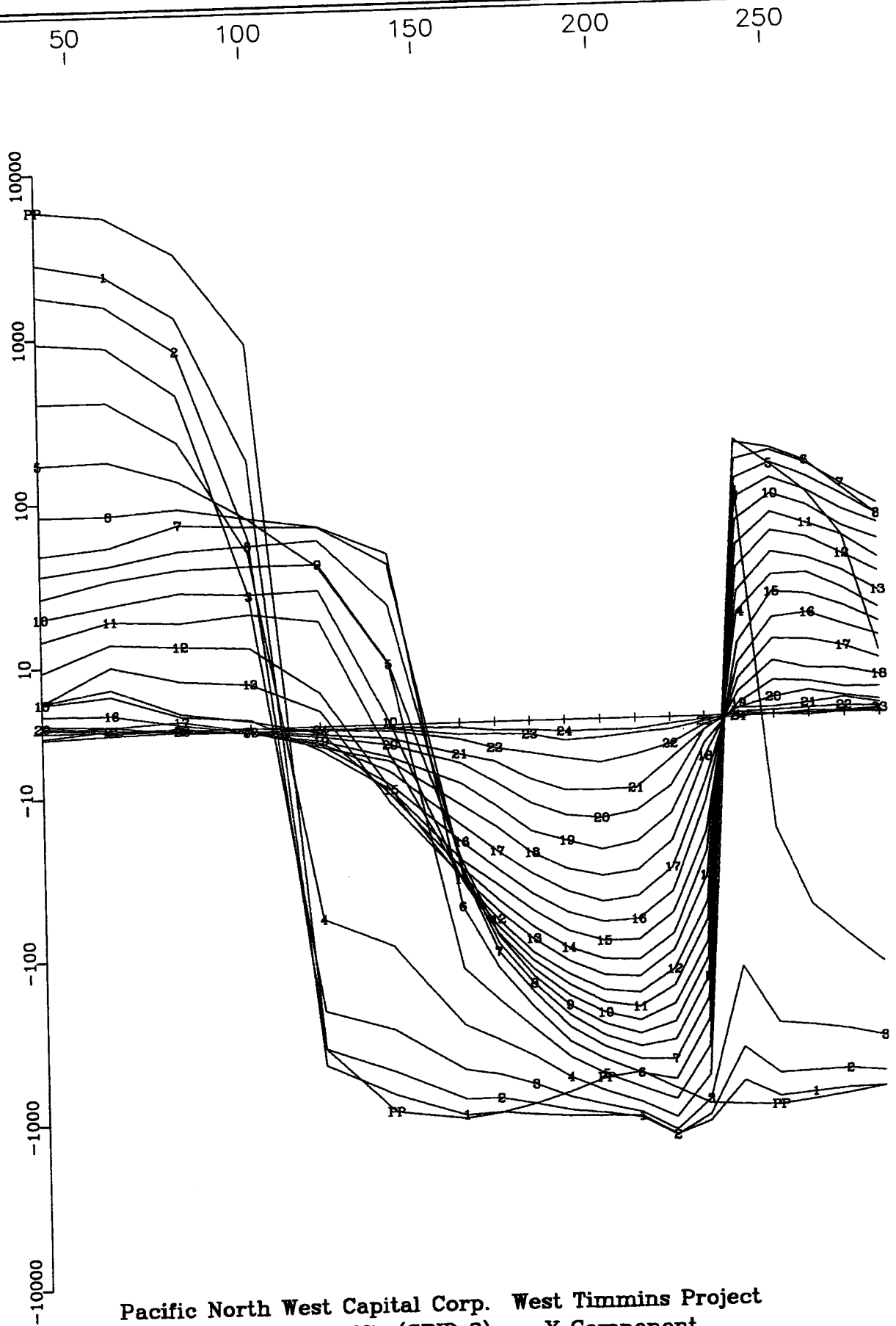
Pacific North West Capital Corp. West Timmins Project
Hole WTM05-06 (Grid 3) (Loop 2) Z Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



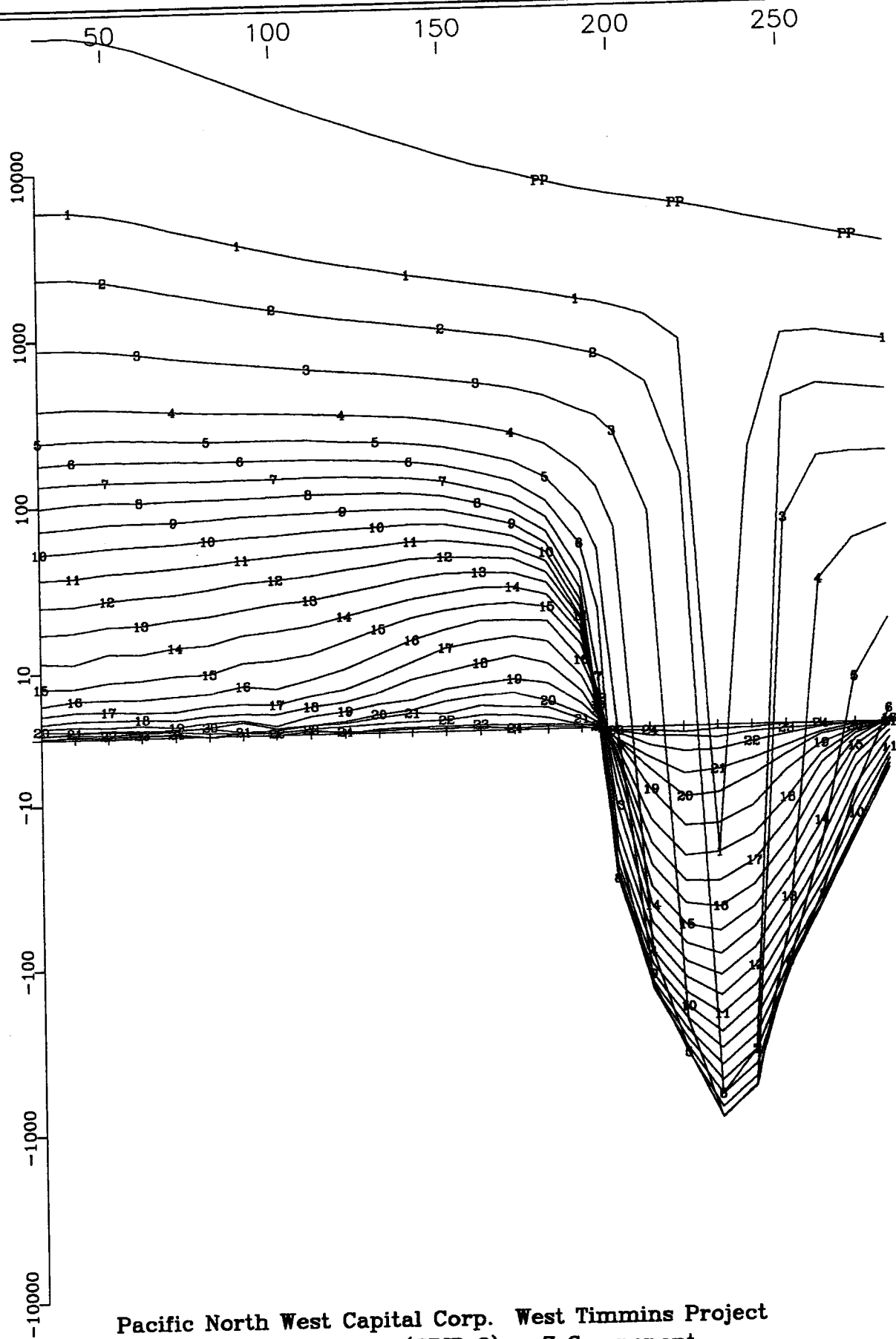
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-07 (GRID 3) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



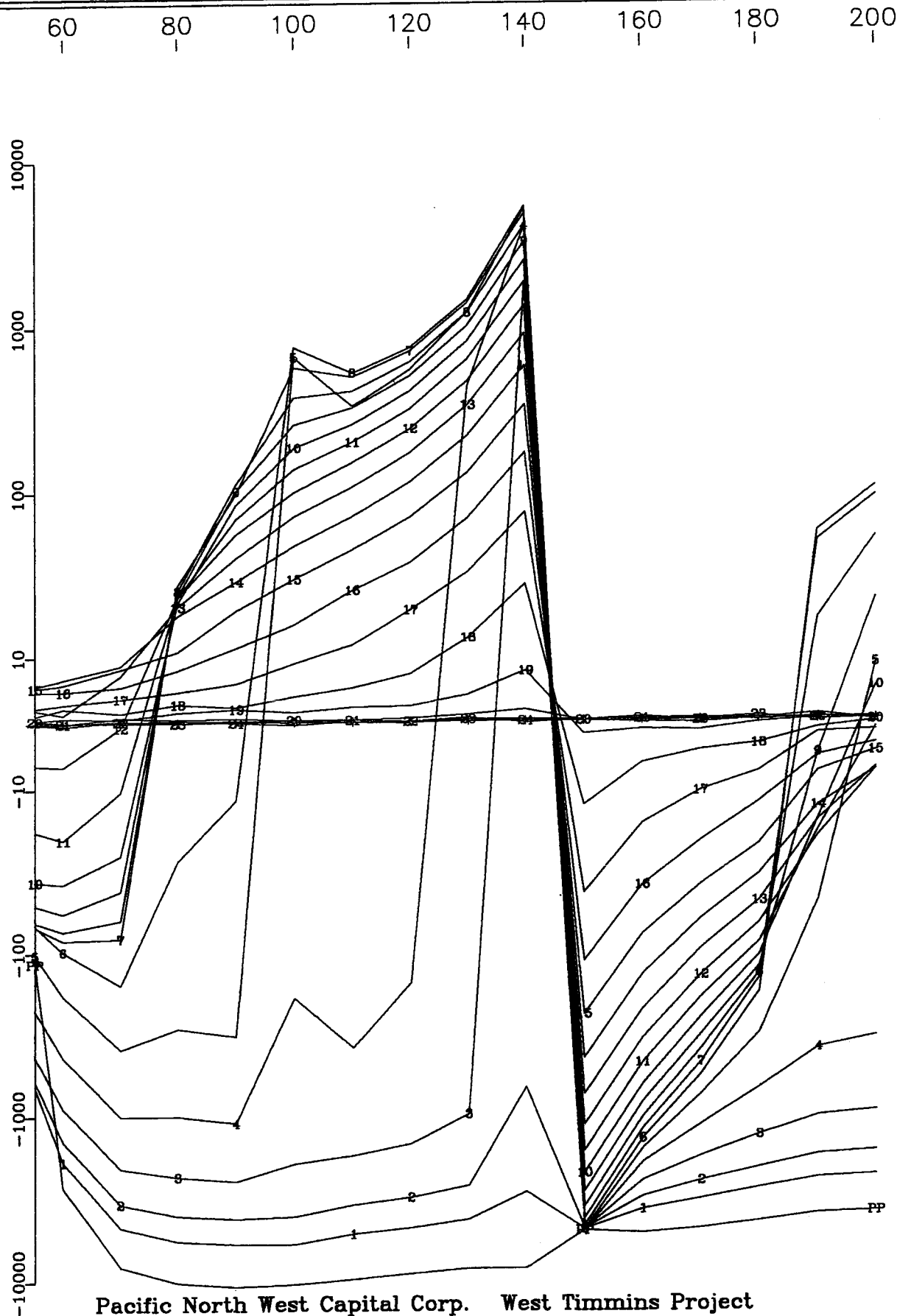
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-07 (GRID 3) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



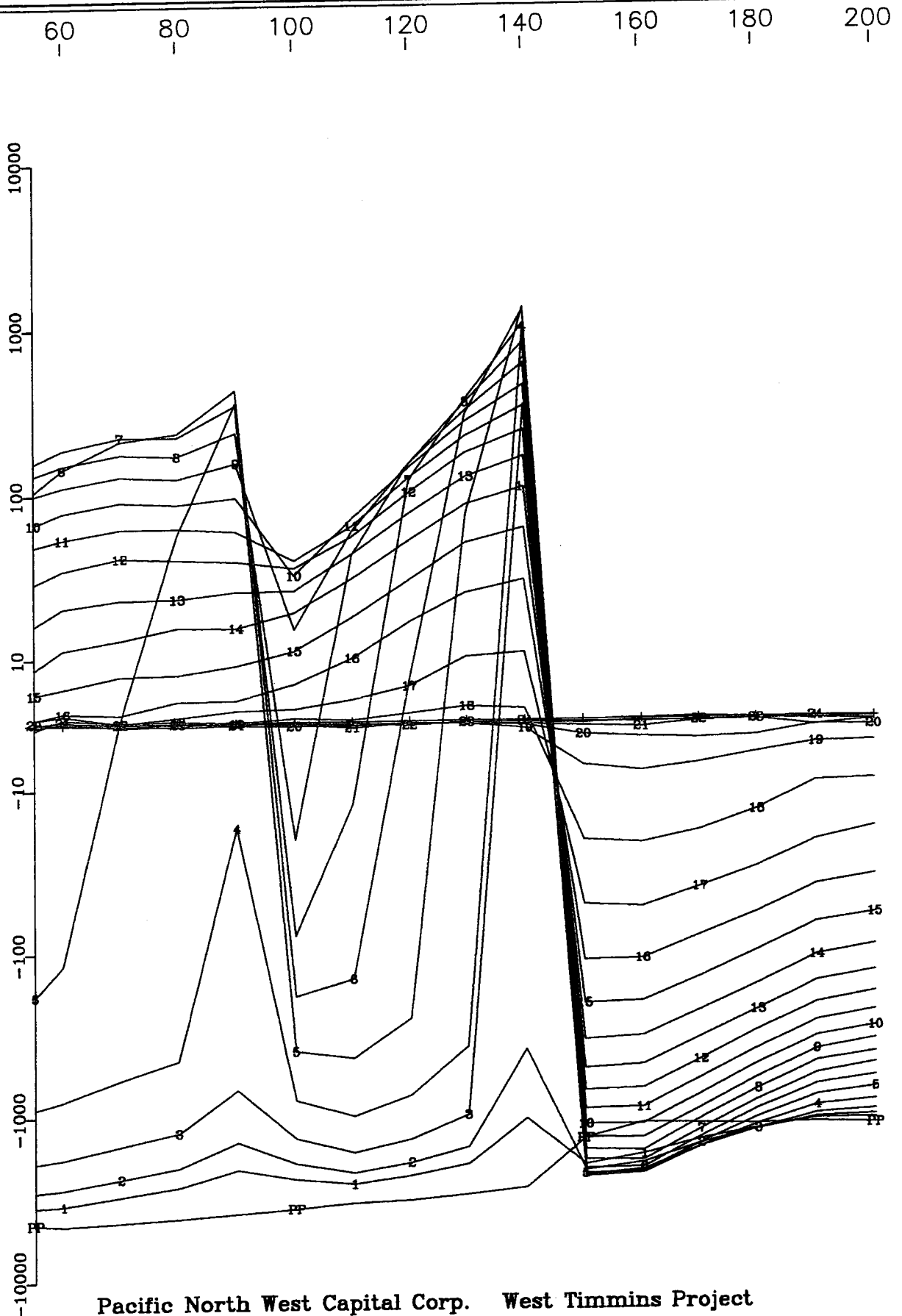
Pacific North West Capital Corp. West Timmins Project
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Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



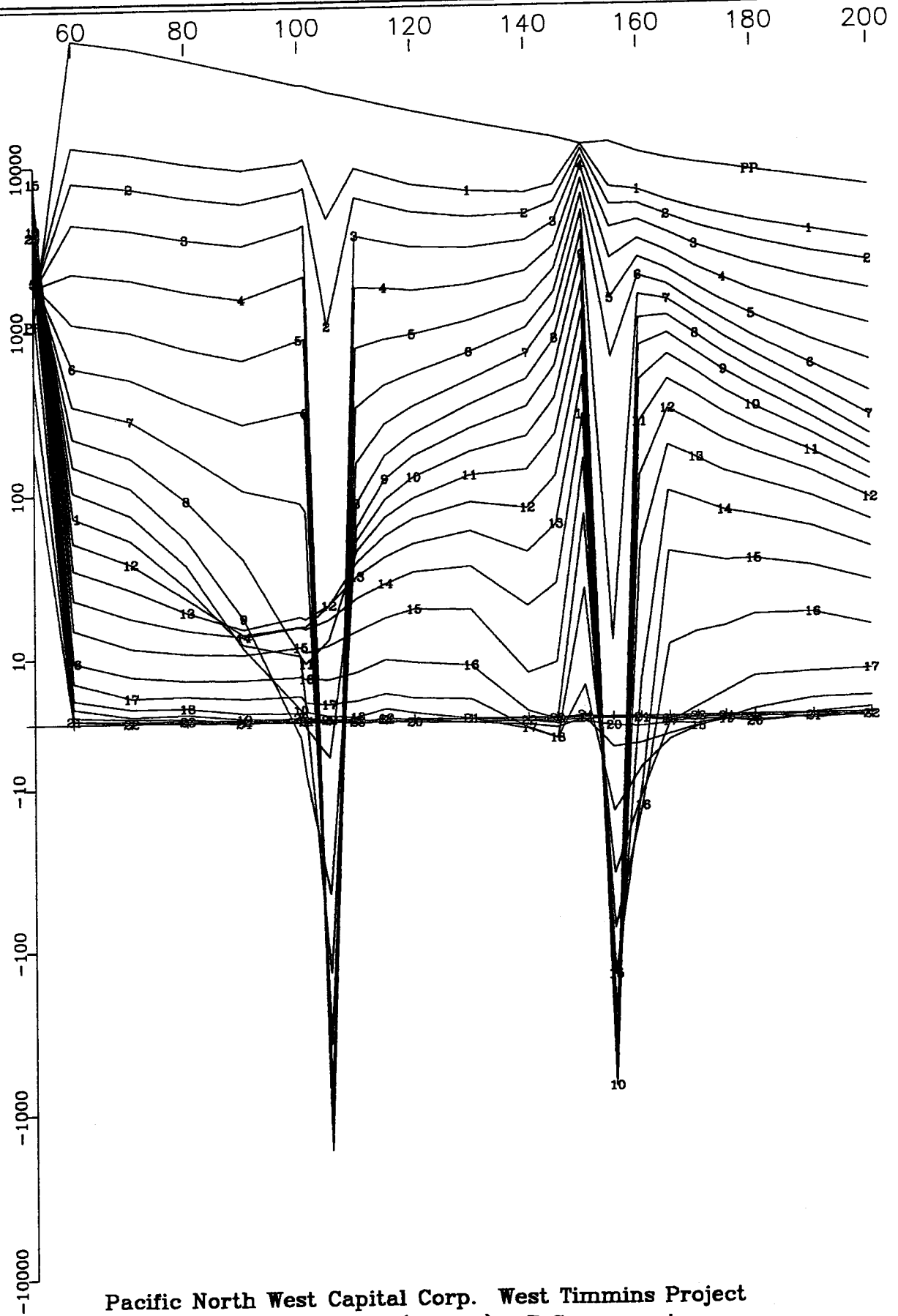
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-08 (GRID 4) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



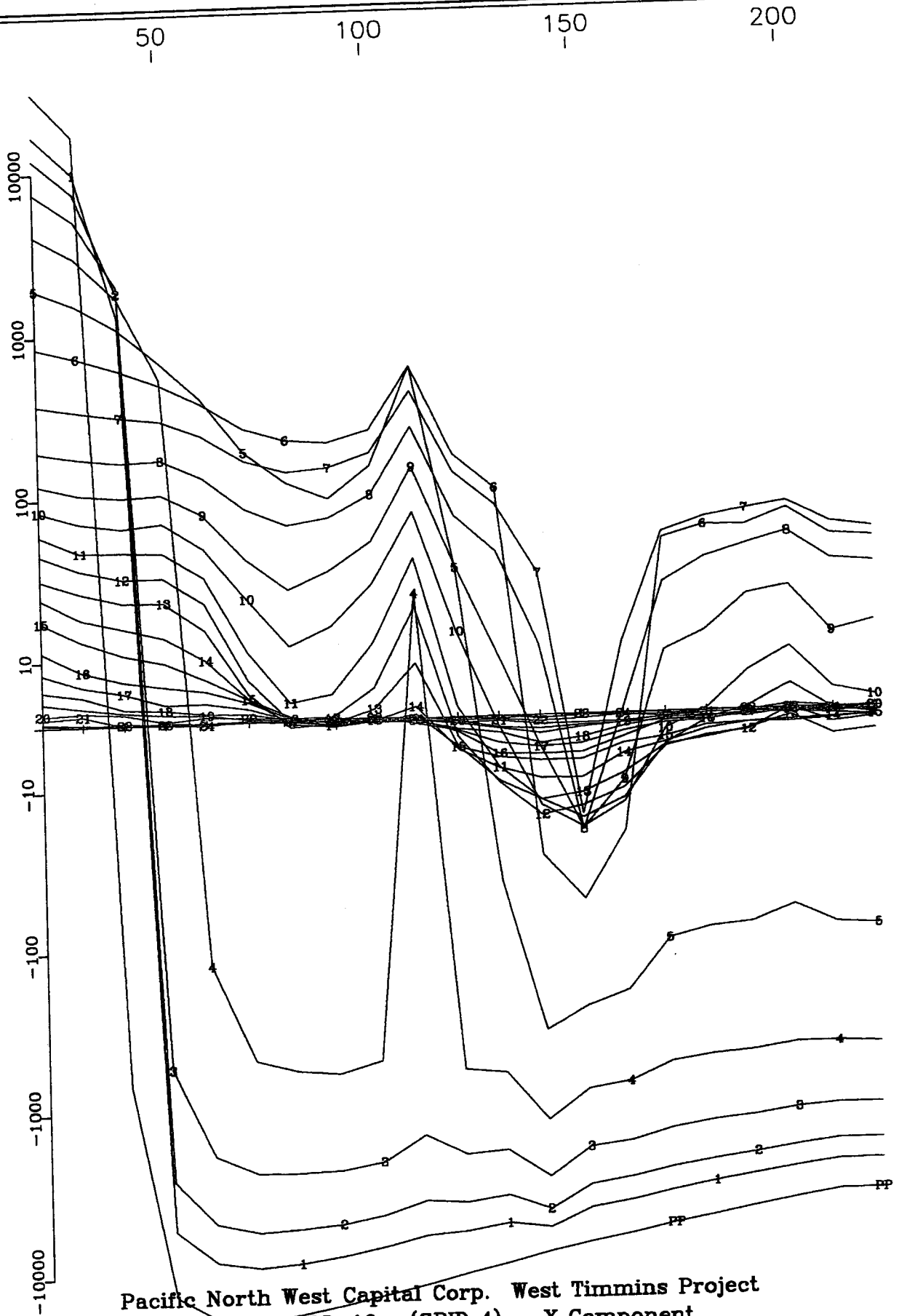
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-08 (GRID 4) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



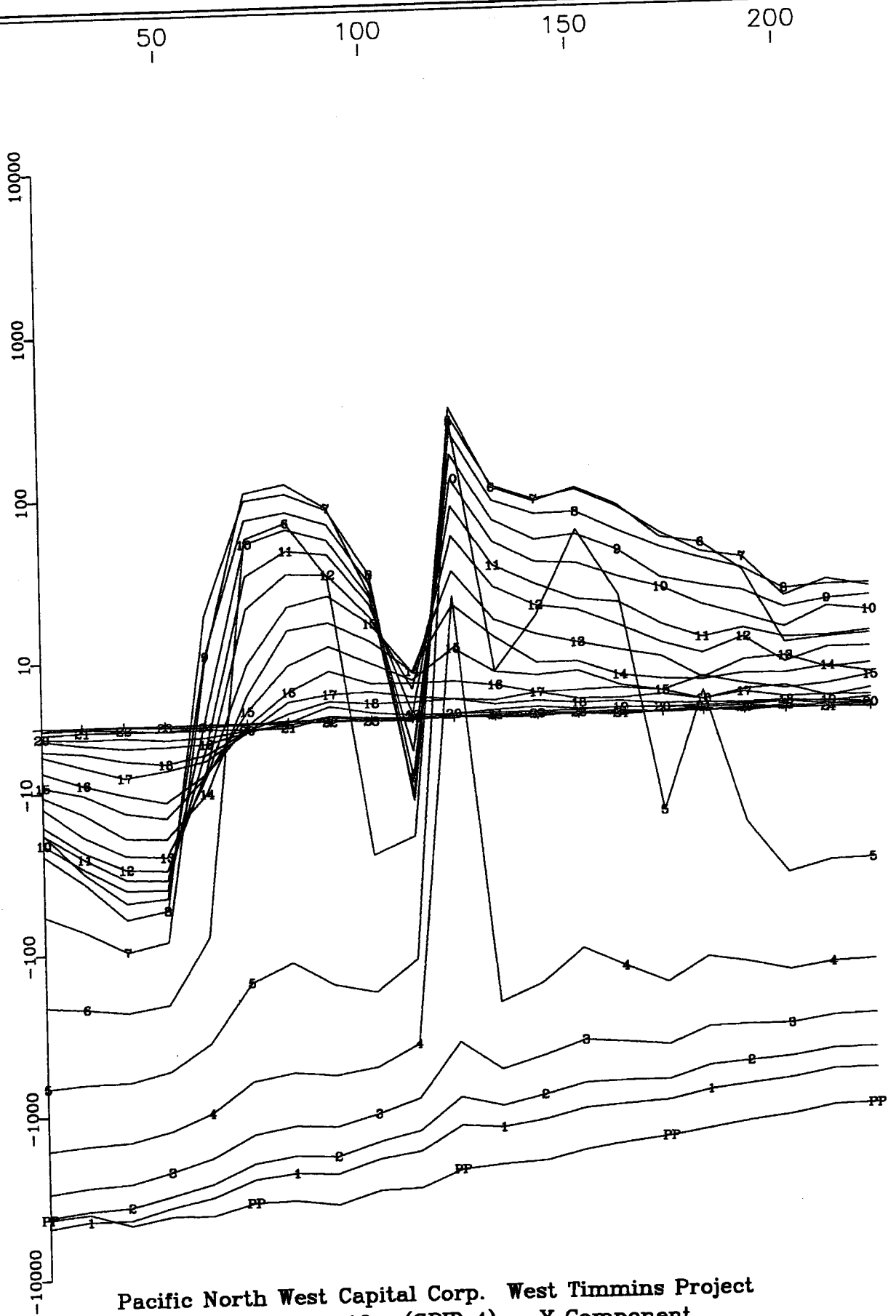
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-08 (GRID 4) Z Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



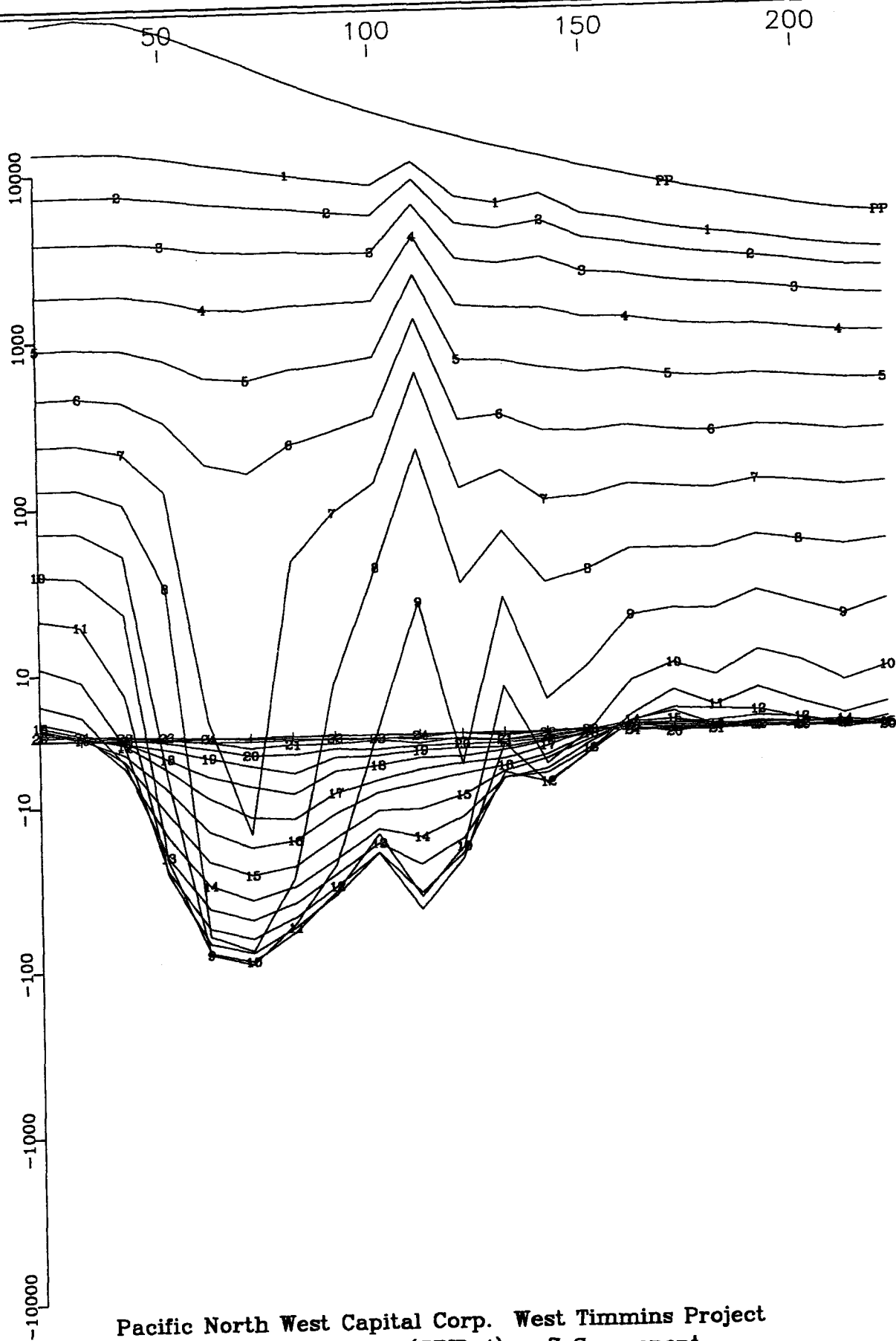
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-10 (GRID 4) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



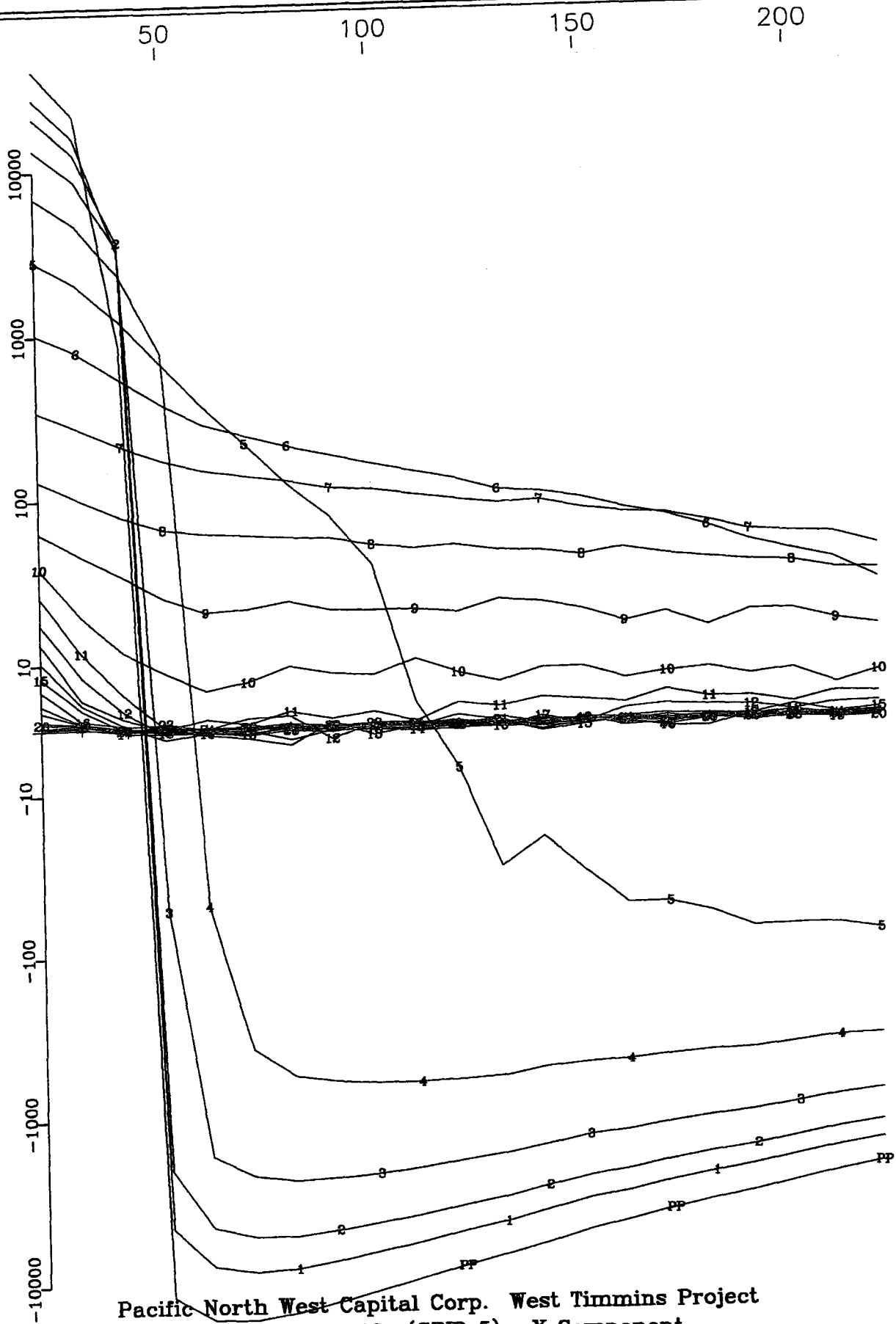
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-10 (GRID 4) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



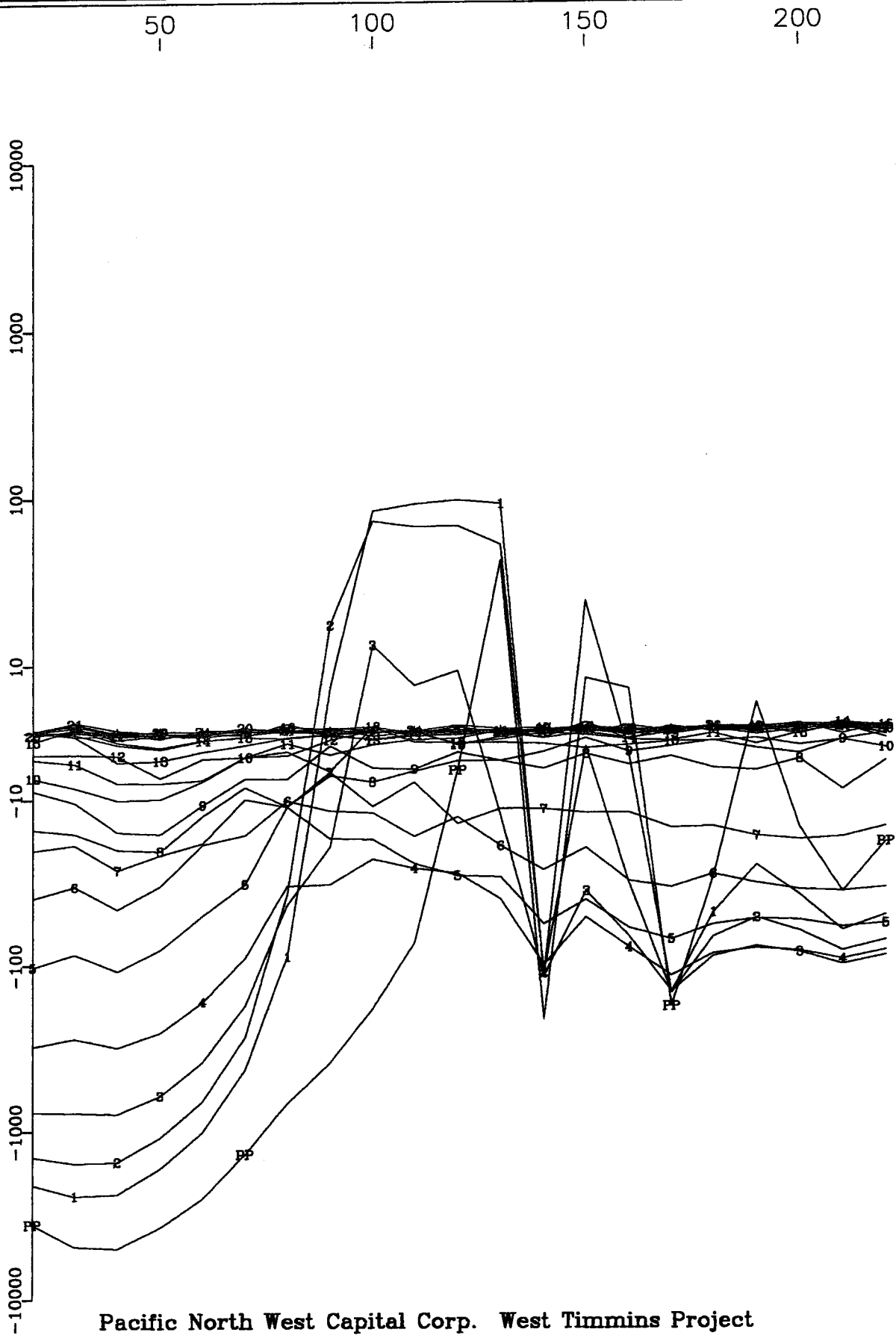
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-10 (GRID 4) Z Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



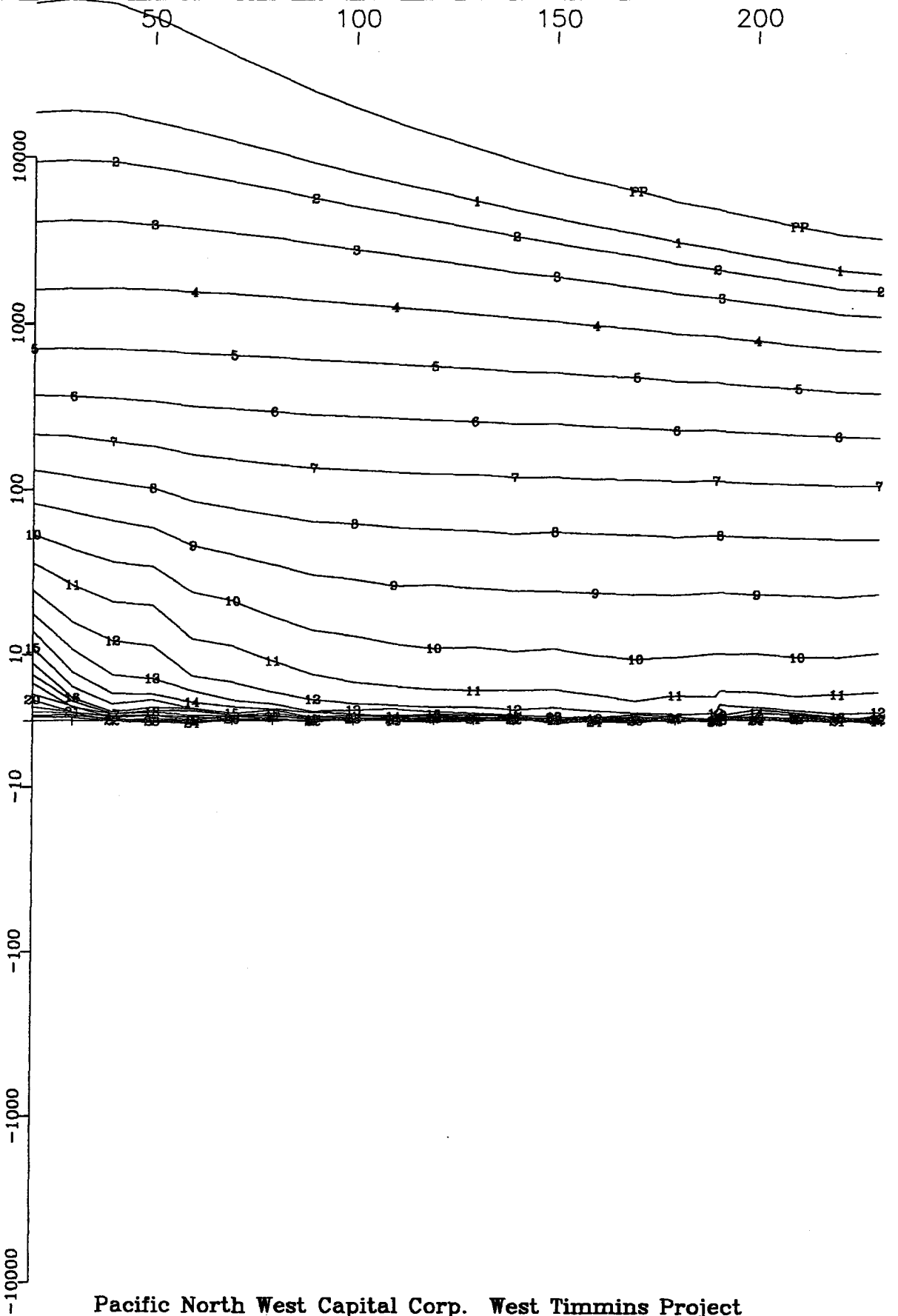
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-12 (GRID 5) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



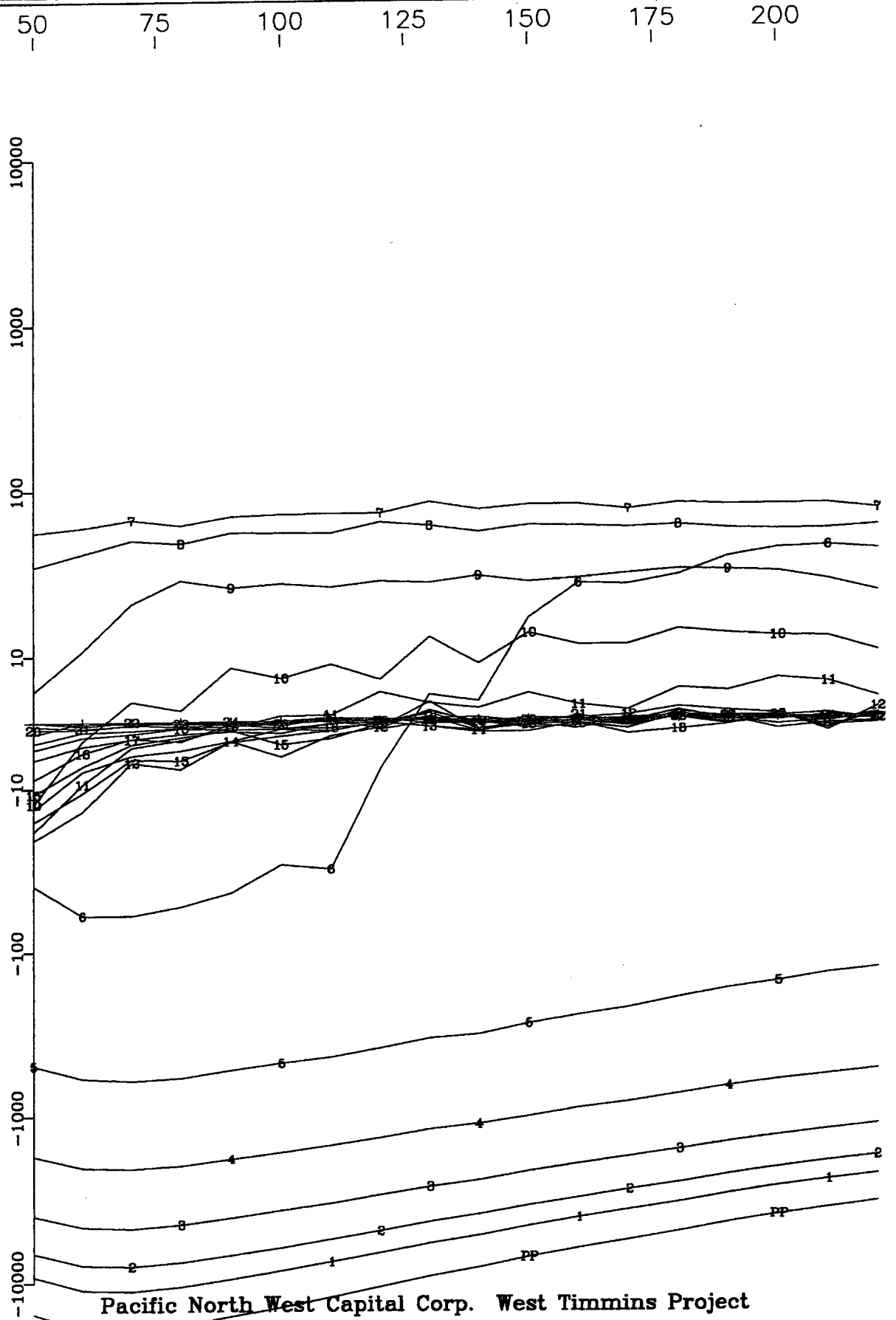
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-12 (GRID 5) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



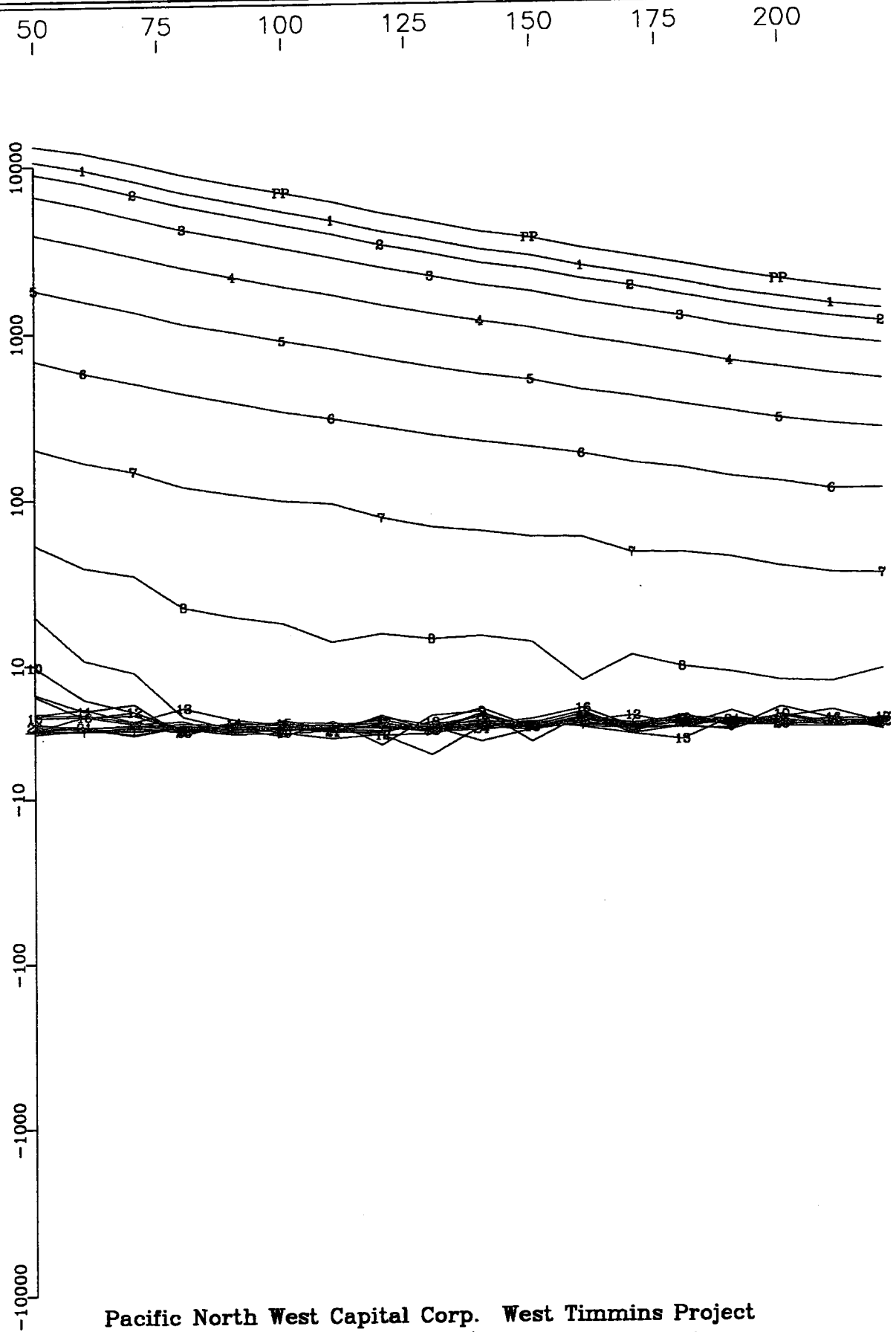
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-12 (GRID 5) Z Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



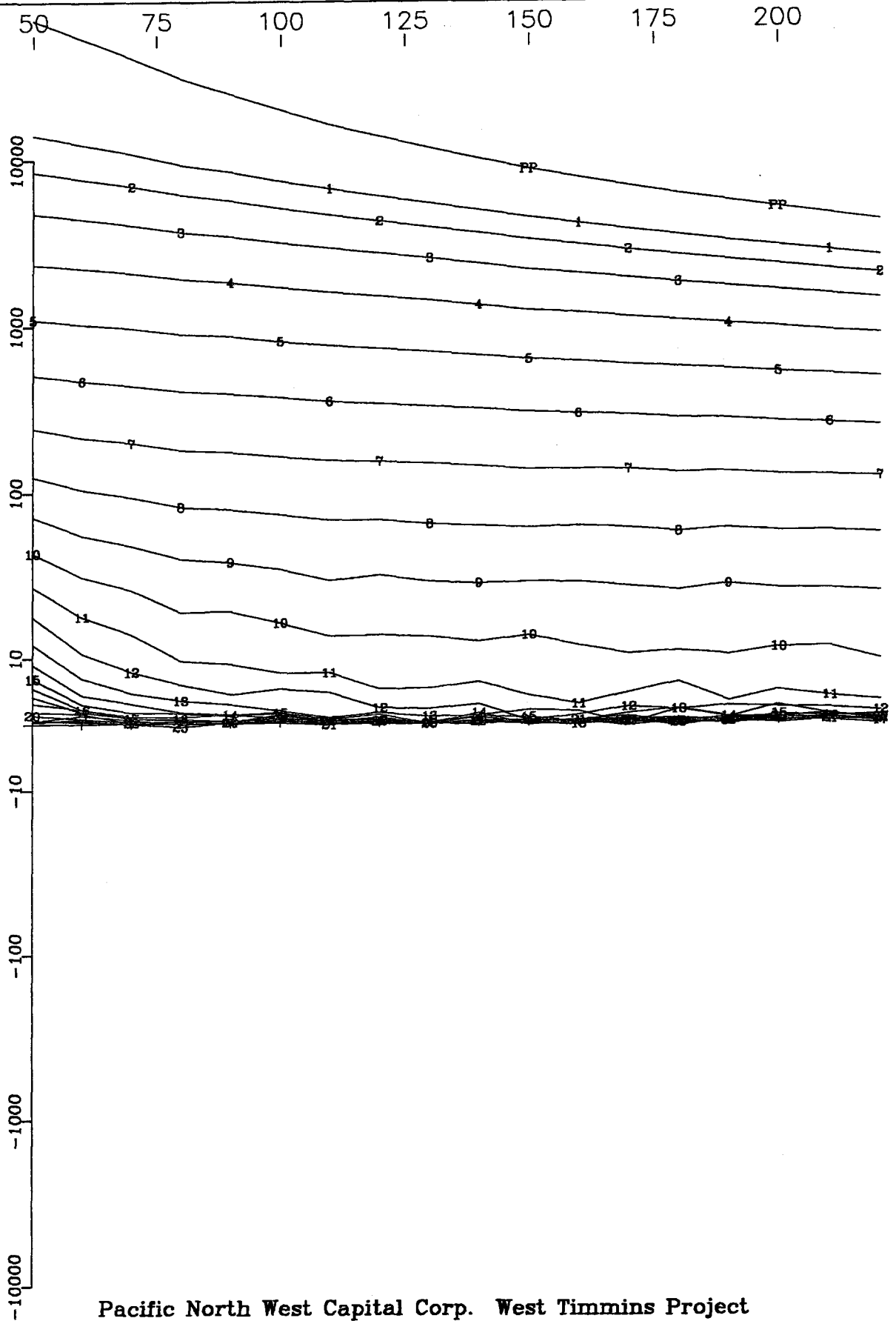
Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-13 (GRID 5) X Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)



Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-13 (GRID 5) Y Component
Crone Geophysics & Exploration Ltd.

Primary Pulse and 24 Off-time Channels
(nT/sec)

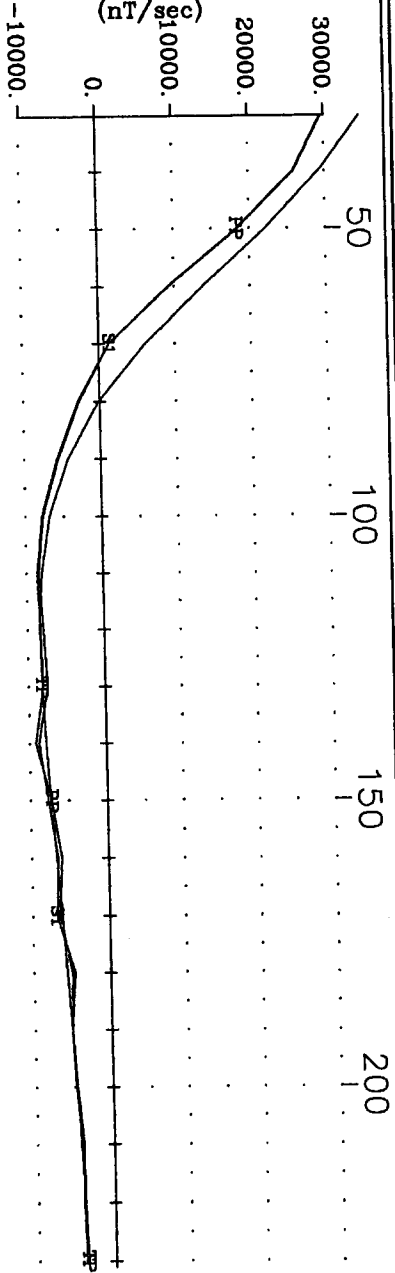


Pacific North West Capital Corp. West Timmins Project
Hole WTM-05-13 (GRID 5) Z Component
Crone Geophysics & Exploration Ltd.

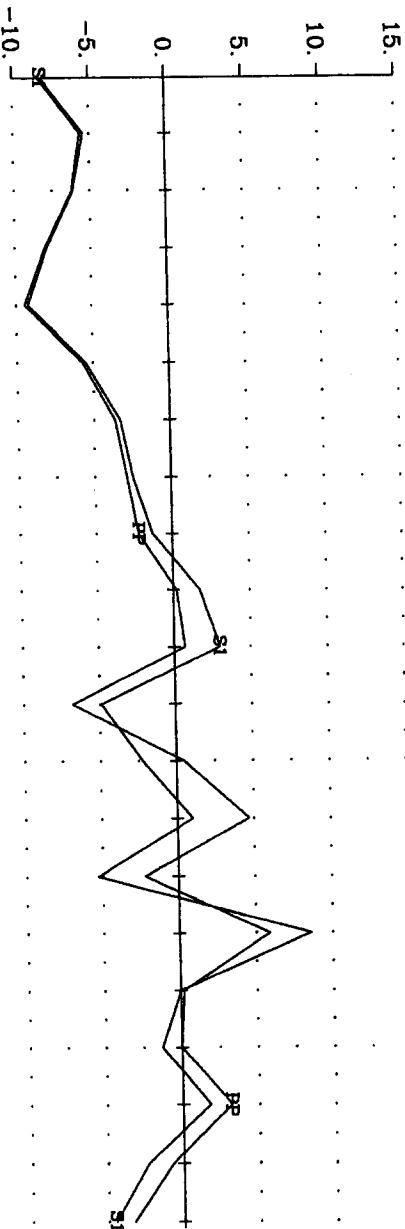
APPENDIX V:

BOREHOLE EM DATA – STEP REPOSENSE PROFILES

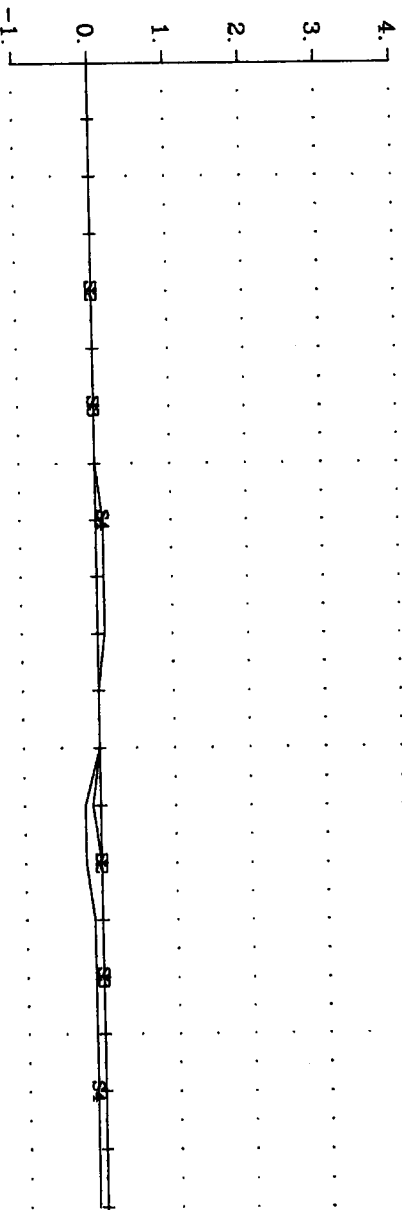
TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1
 (nT/sec)



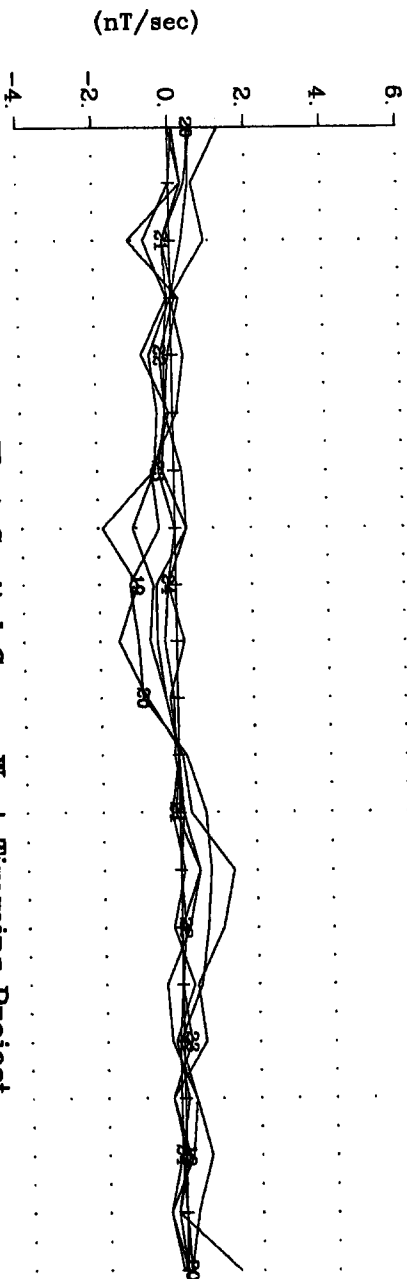
Deviation from TP.
 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

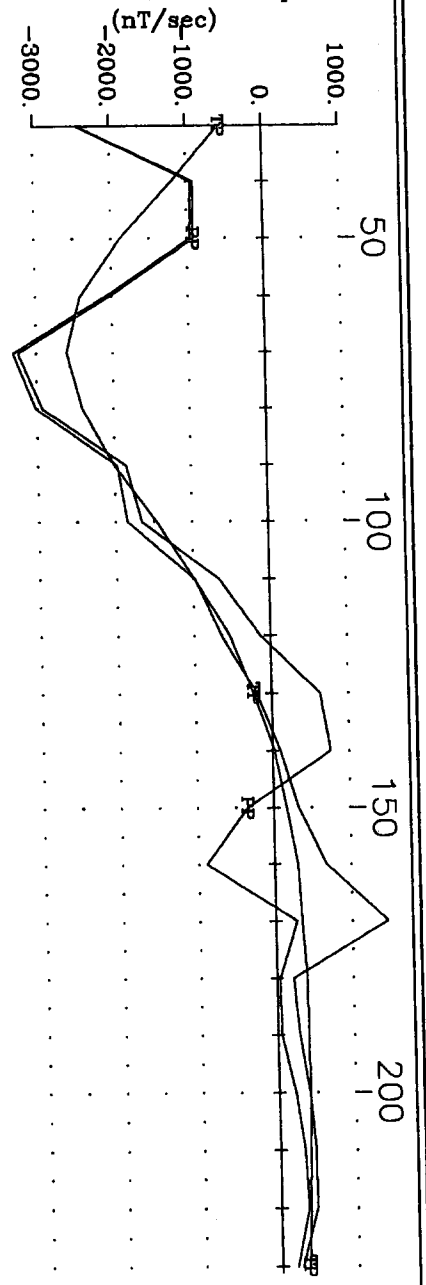


Pulse EM Off-time
 Channels 19-24

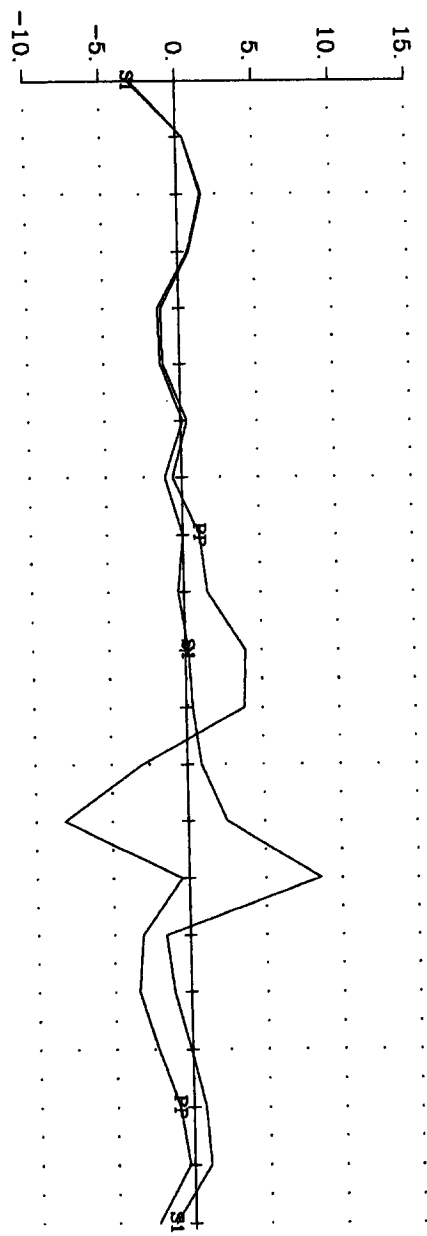
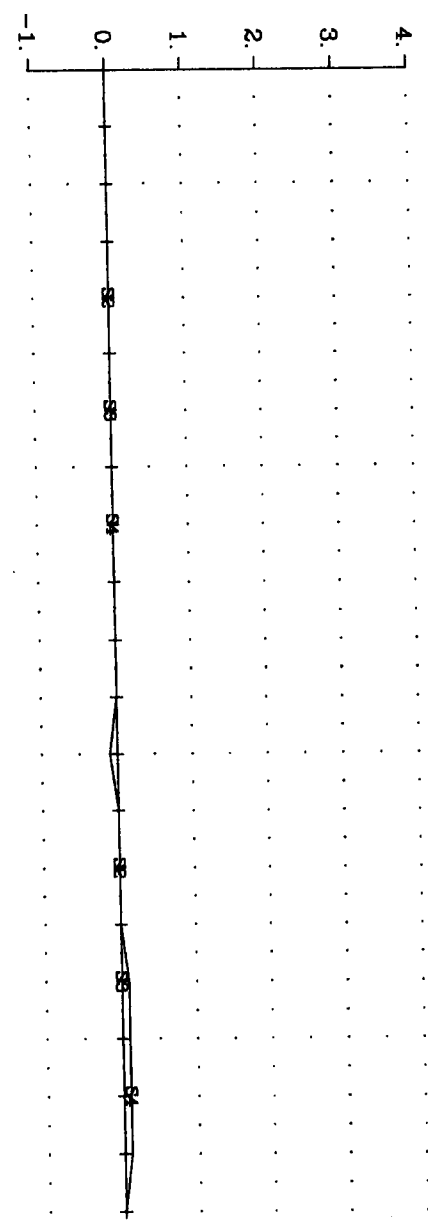


Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-05 (Grid 8) X Component
 Crone Geophysics & Exploration Ltd.

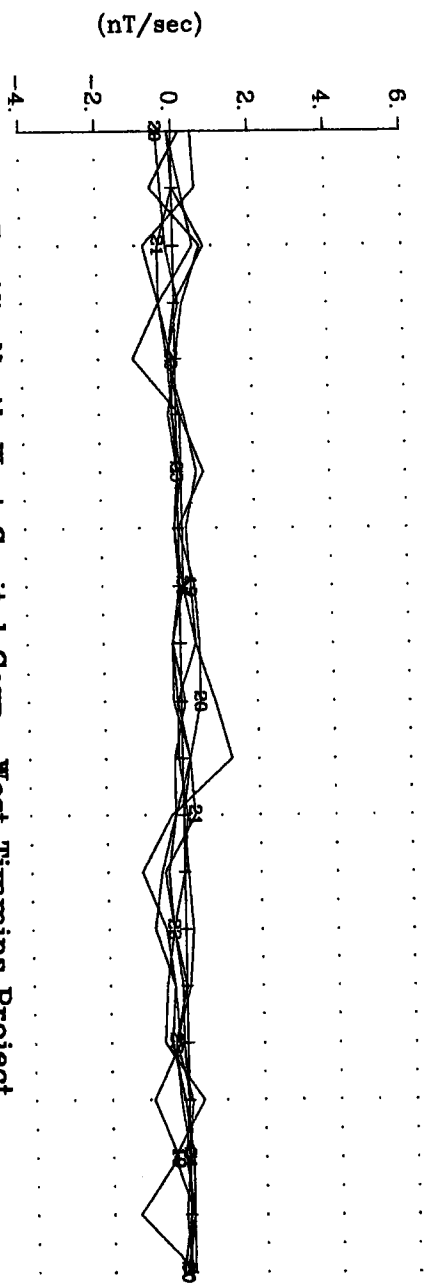
TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1



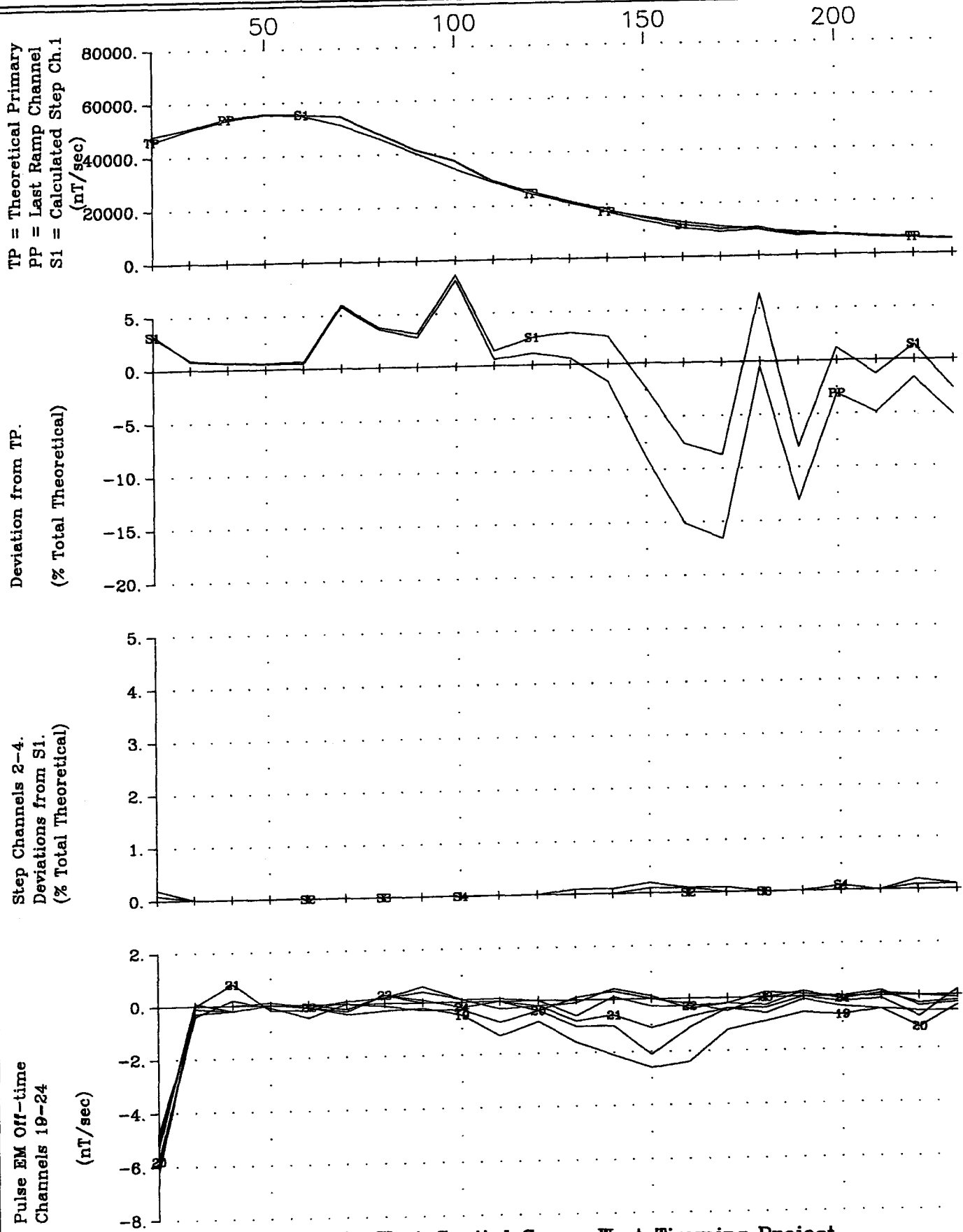
Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)



Pulse EM Off-time
 Channels 19-24

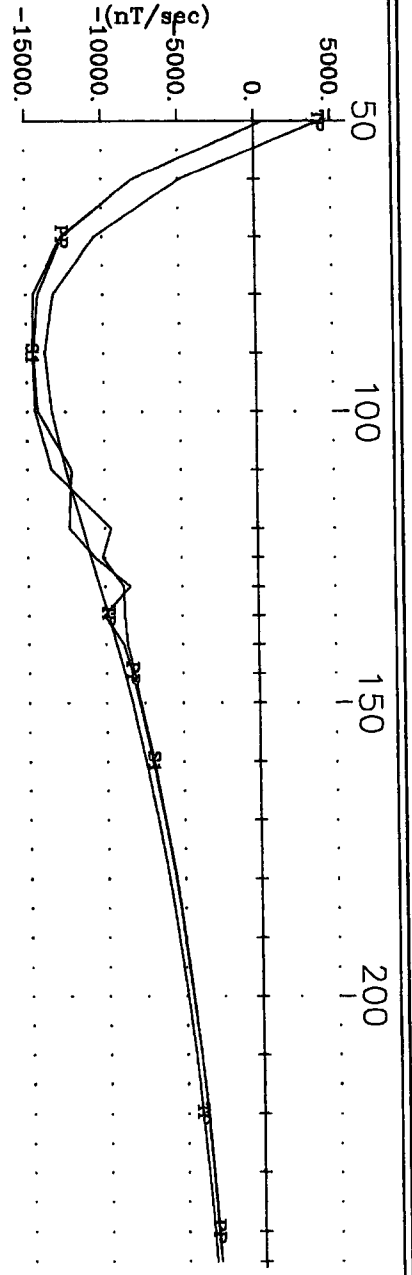


Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-05 (Grid 8) Y Component
 Crone Geophysics & Exploration Ltd.

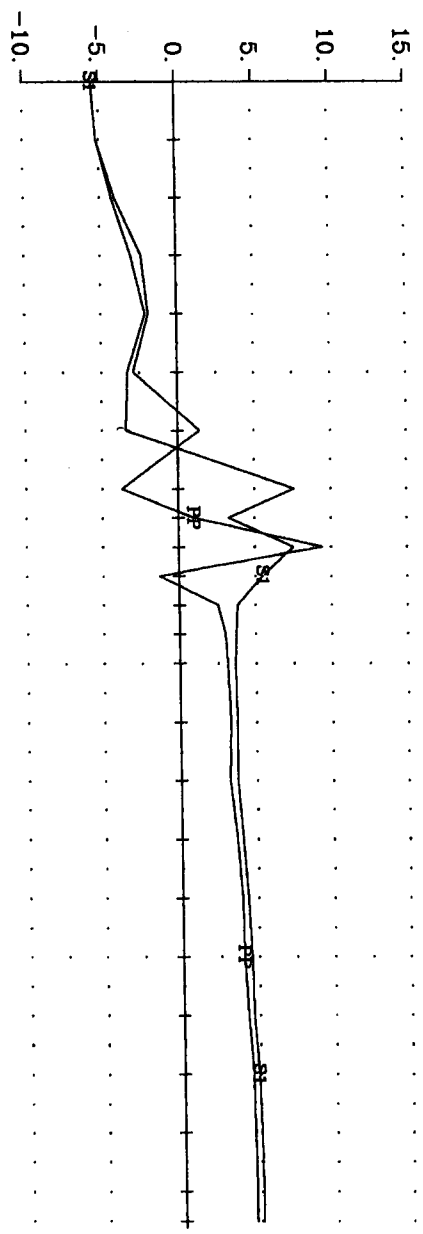


Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-05 (Grid 8) Z Component
 Crone Geophysics & Exploration Ltd.

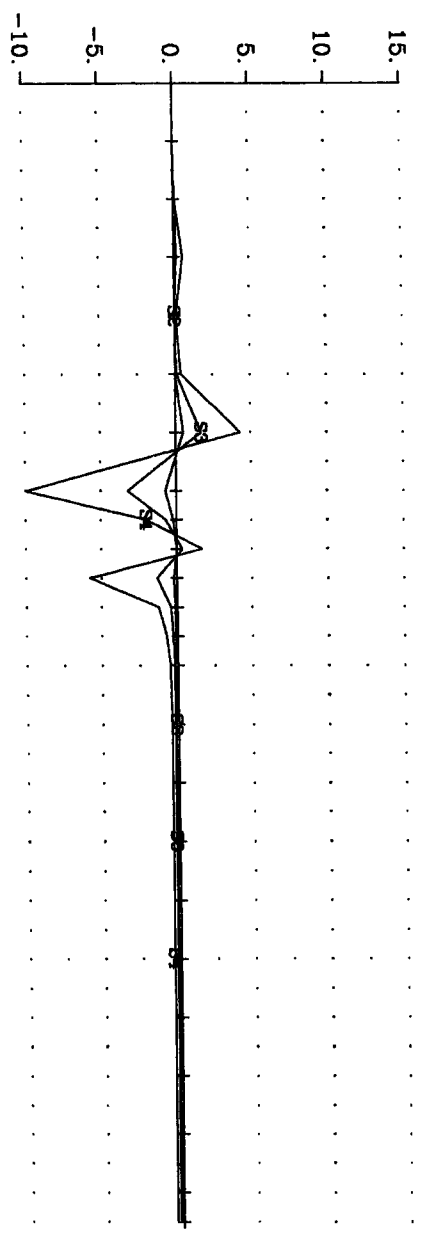
TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1



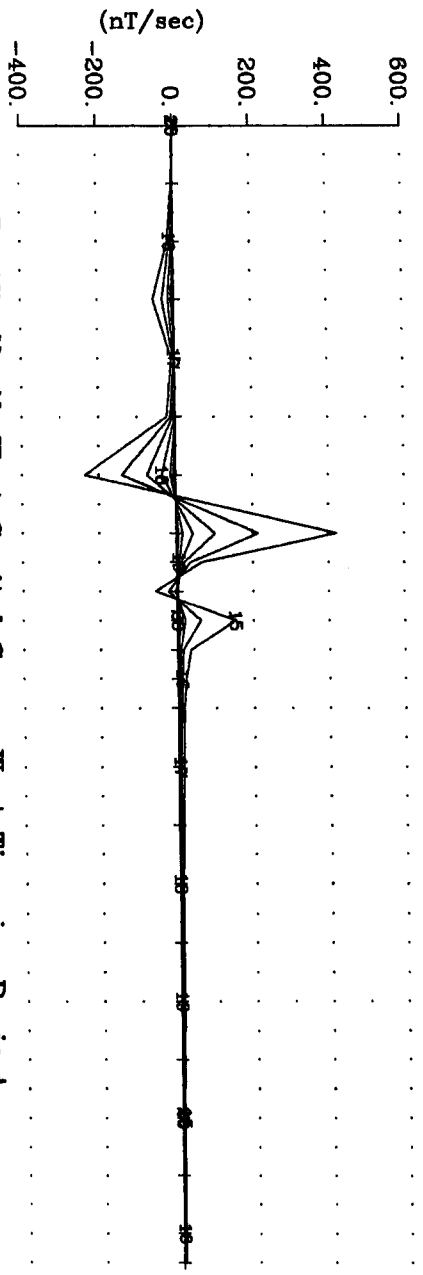
Deviation from TP.
 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

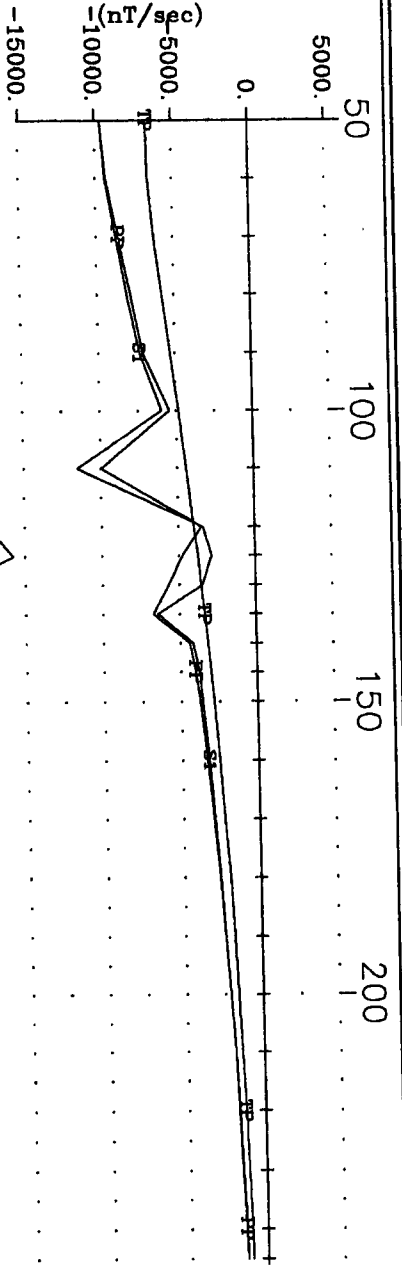


Pulse EM Off-time
 Channels 15-20

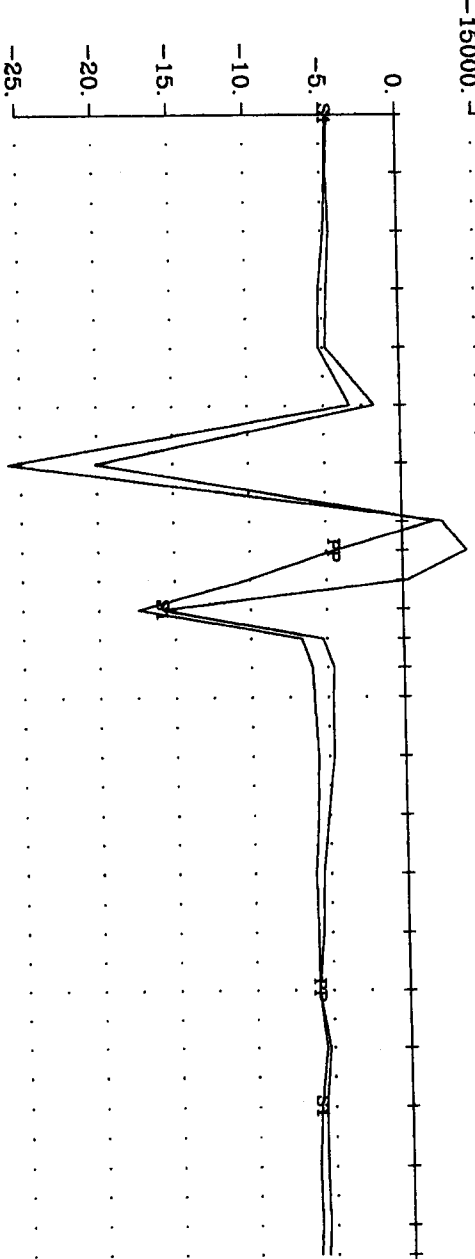


Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) X Component
 Crone Geophysics & Exploration Ltd.

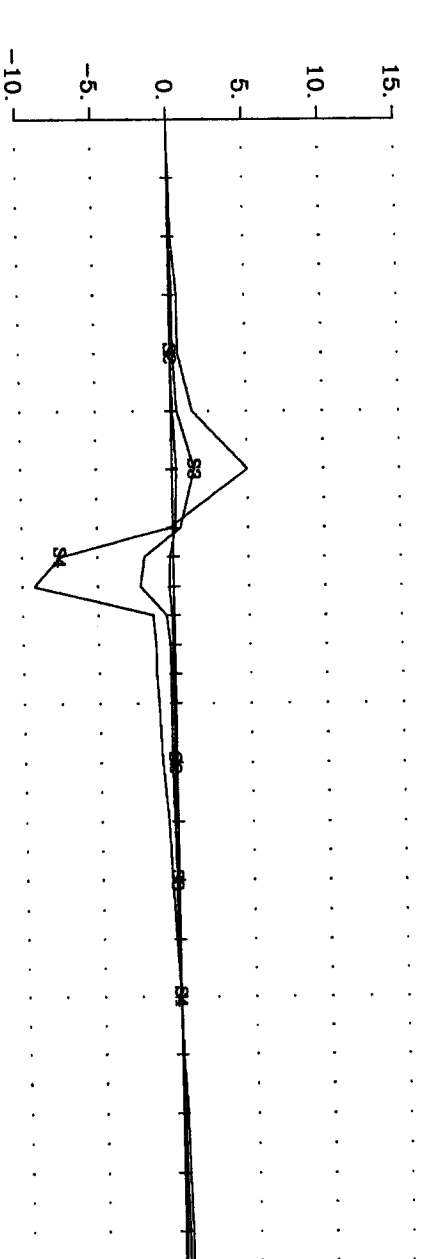
TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1



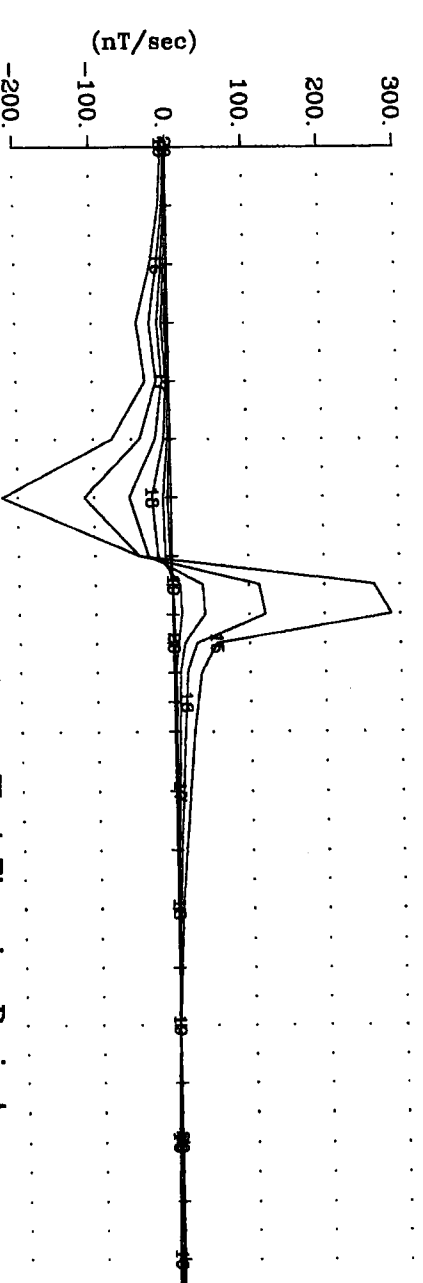
Deviation from TP.
 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)



Pulse EM Off-time
 Channels 15-20



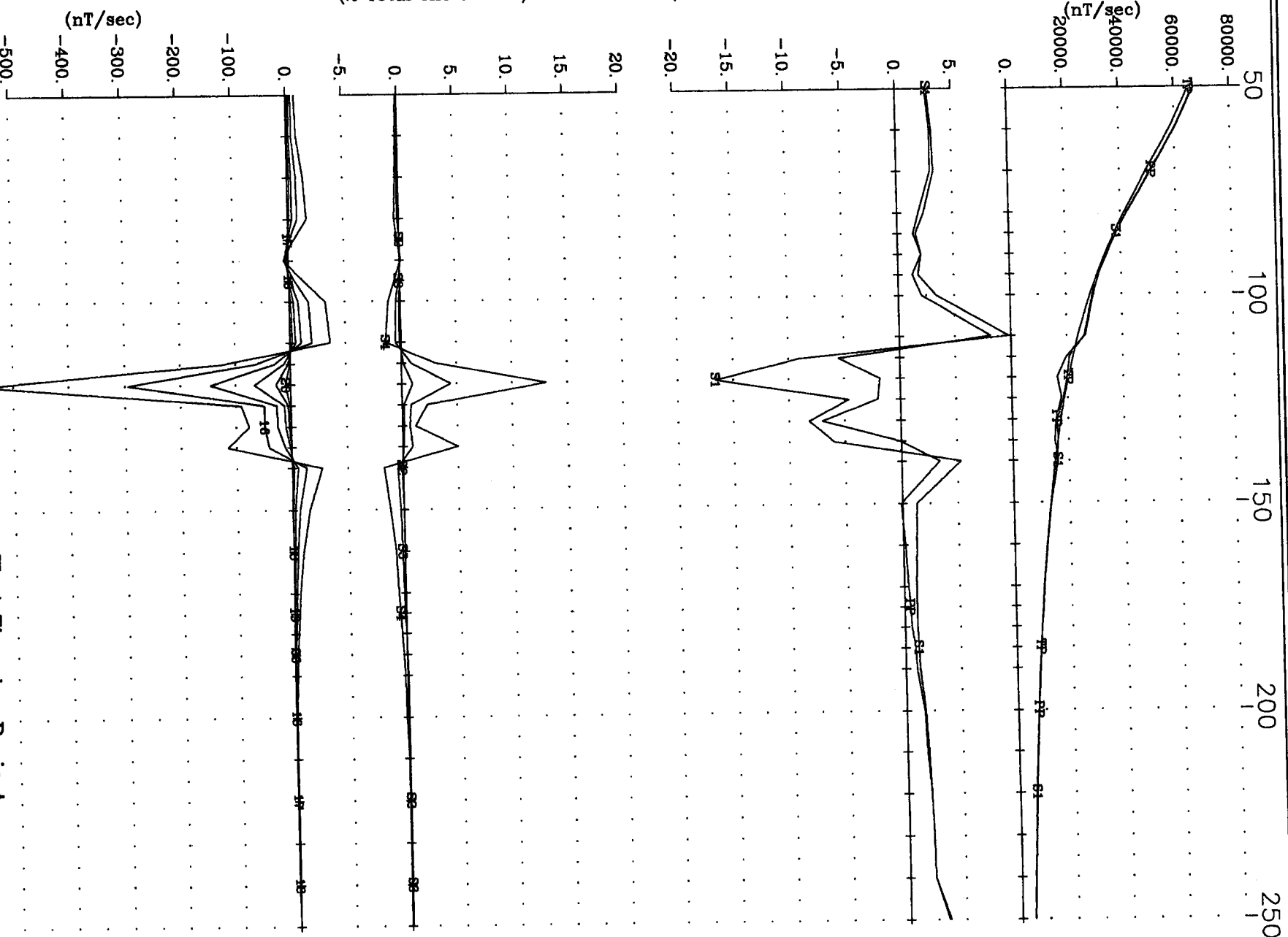
Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) Y Component
 Crone Geophysics & Exploration Ltd.

TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1

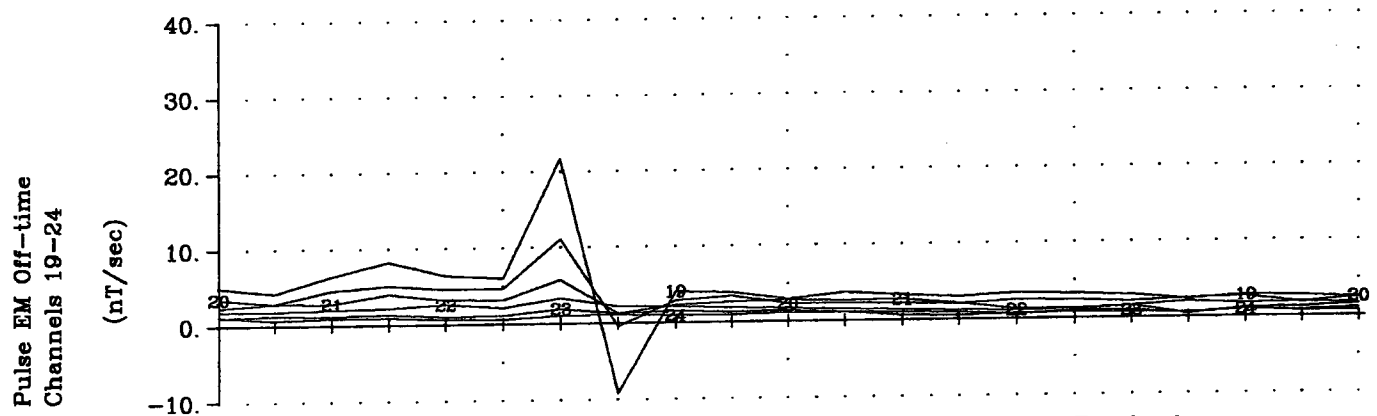
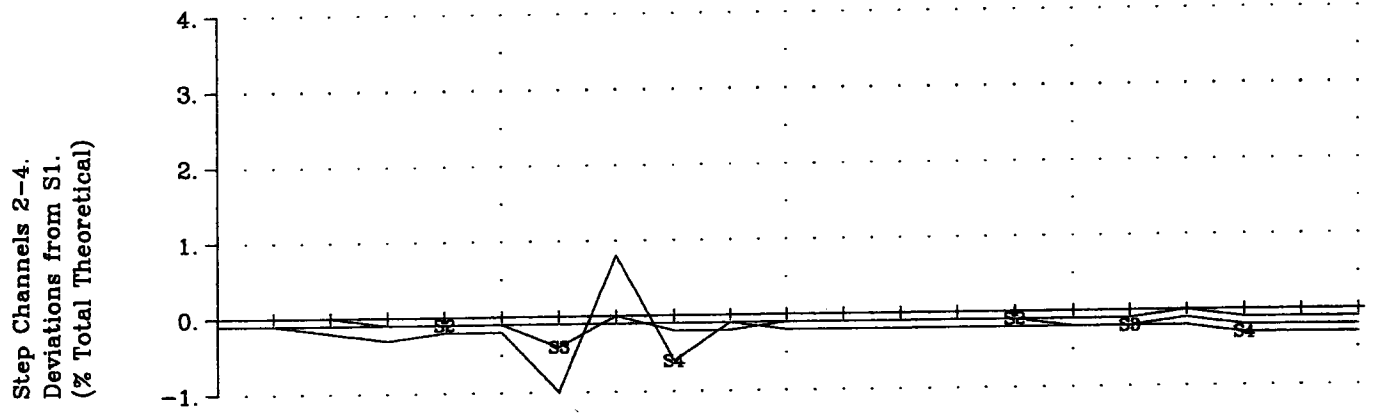
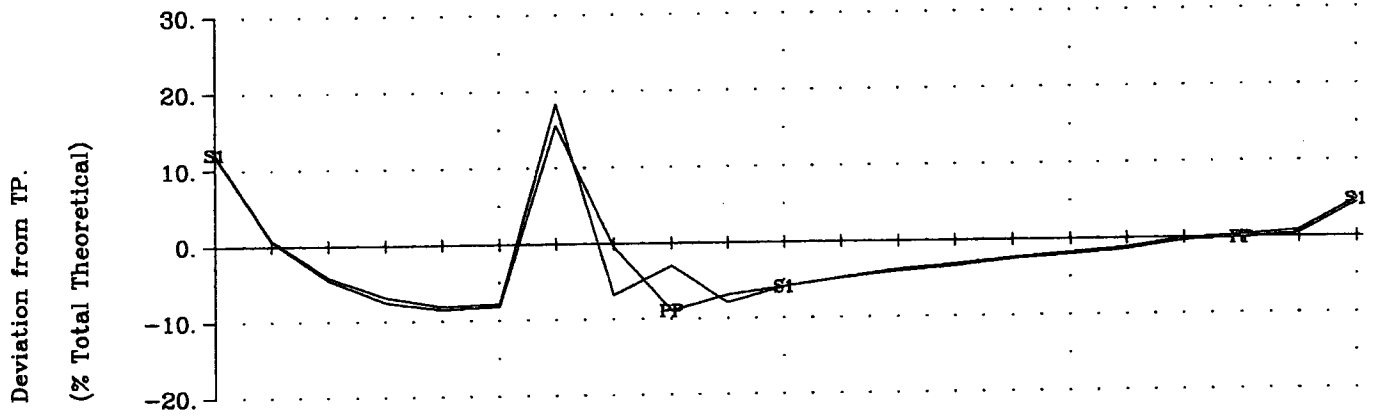
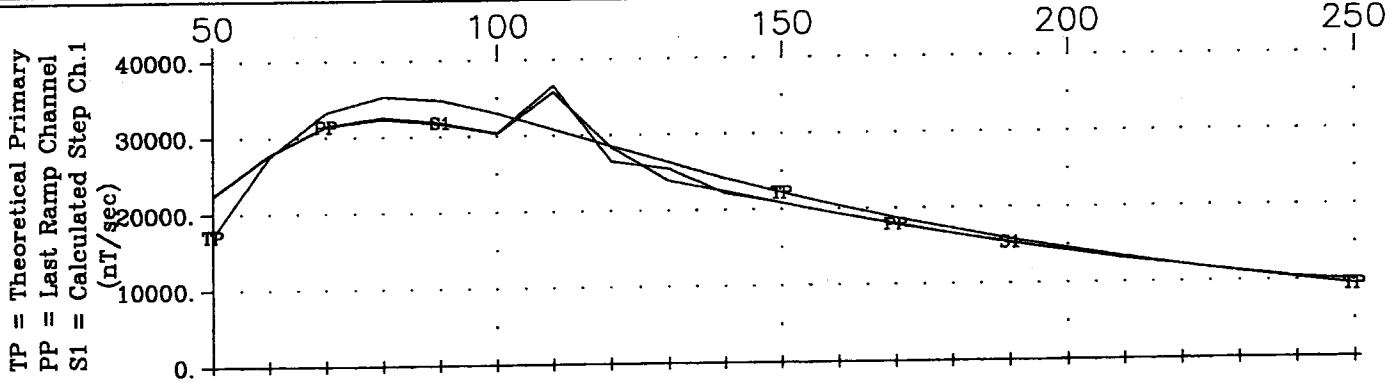
Deviation from TP.
 (% Total Theoretical)

Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

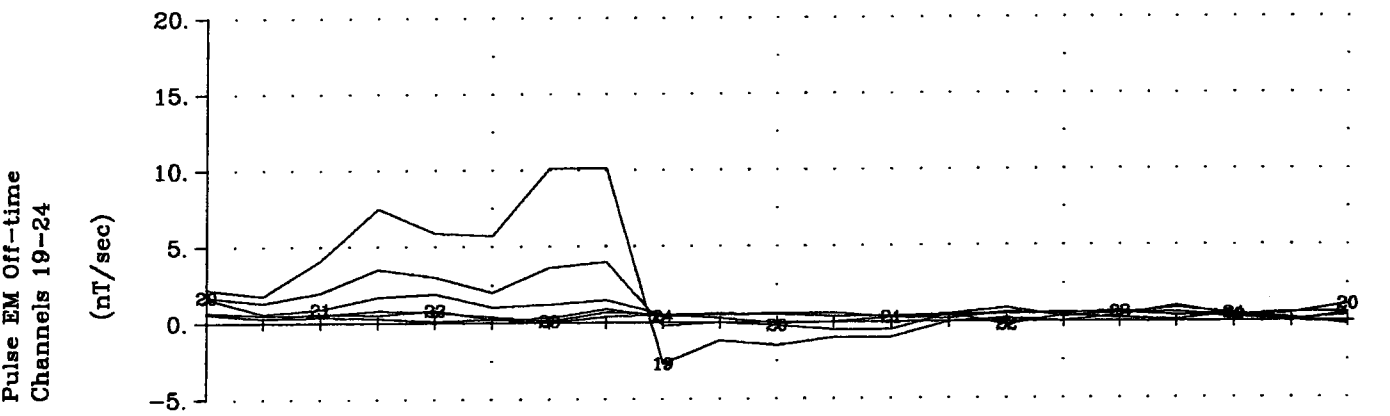
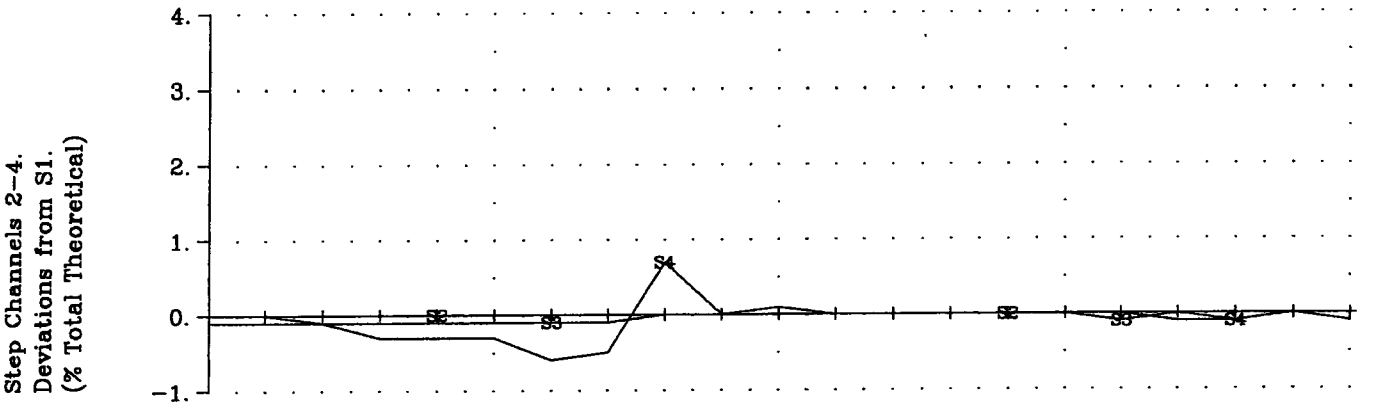
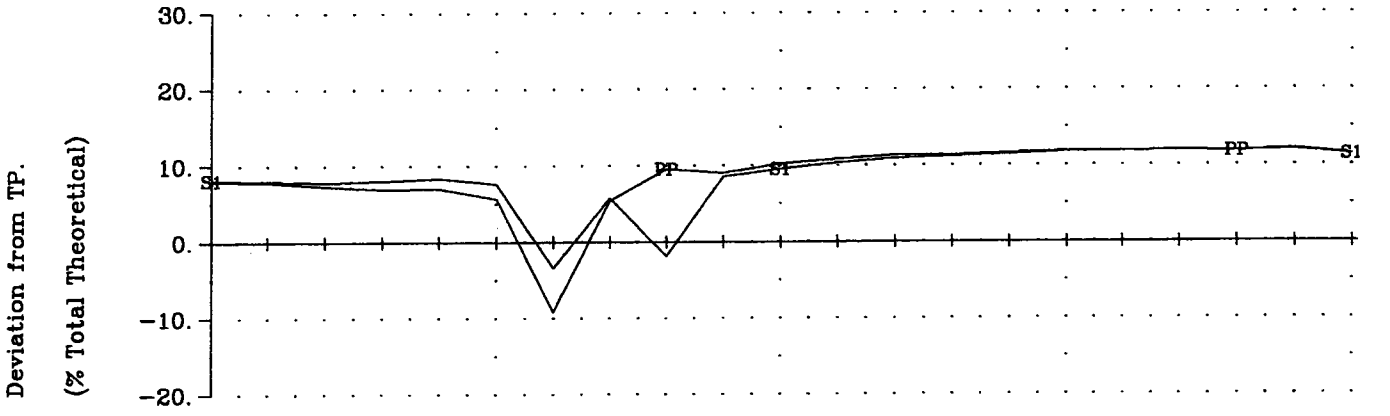
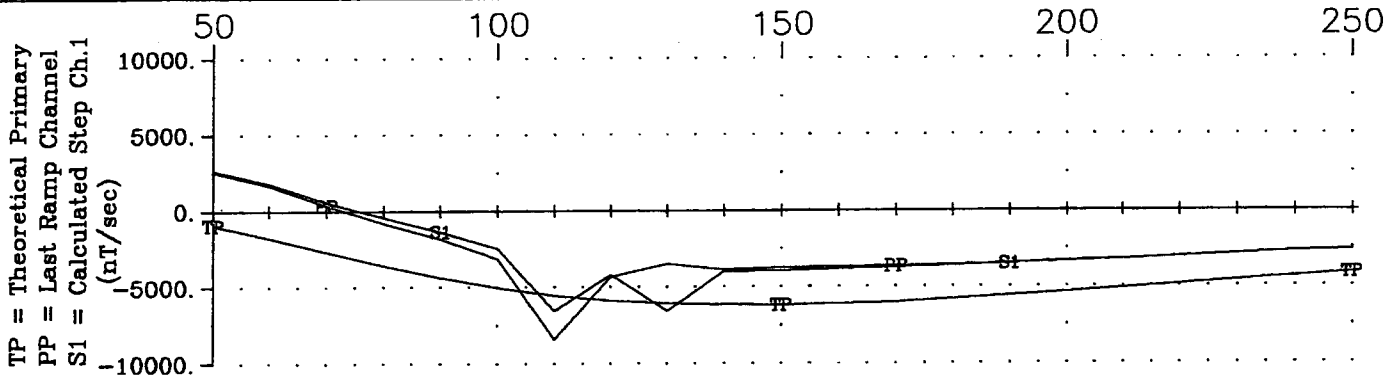
Pulse EM Off-time
 Channels 15-20



Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) Z Component
 Crone Geophysics & Exploration Ltd.

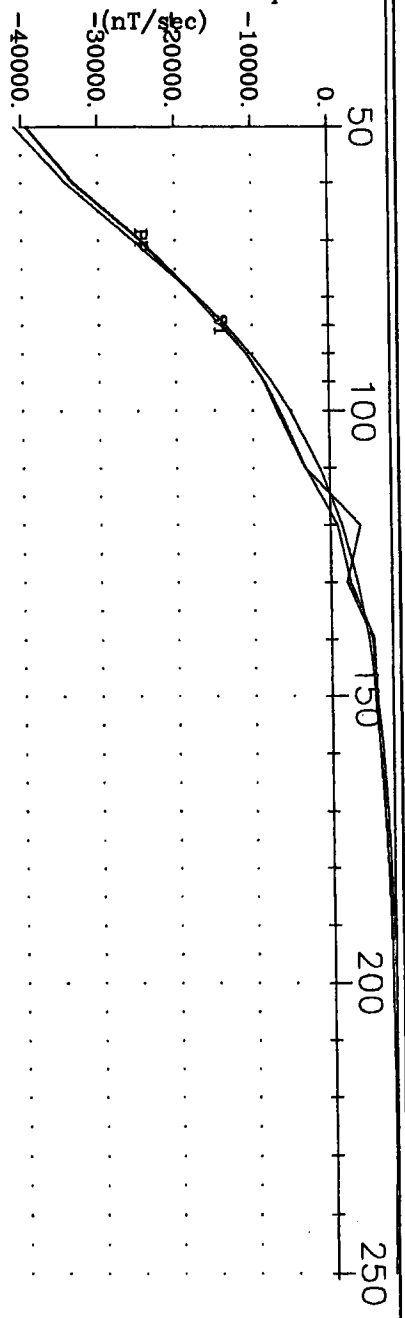


Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) (Loop 2) X Component
 Crone Geophysics & Exploration Ltd.

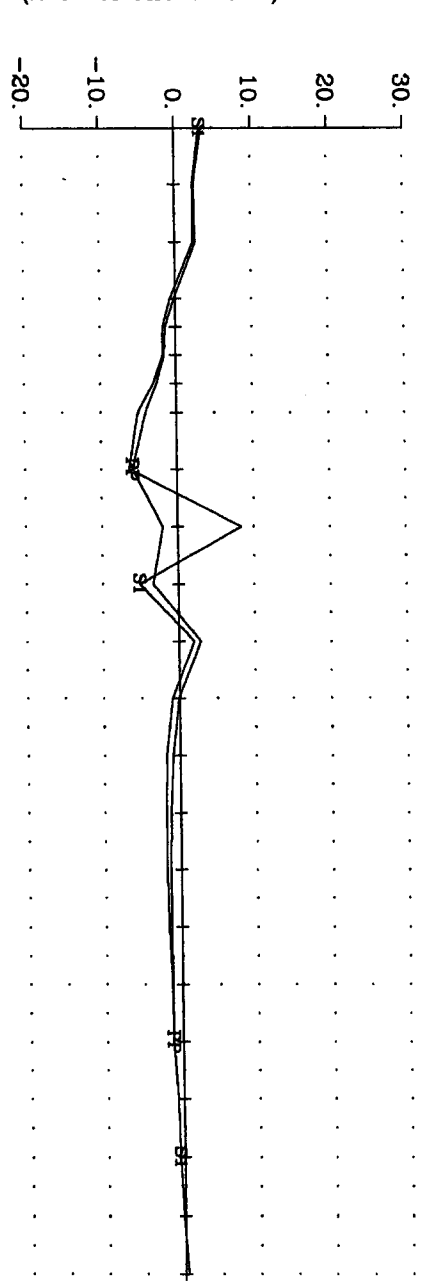


Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) (Loop 2) Y Component
 Crone Geophysics & Exploration Ltd.

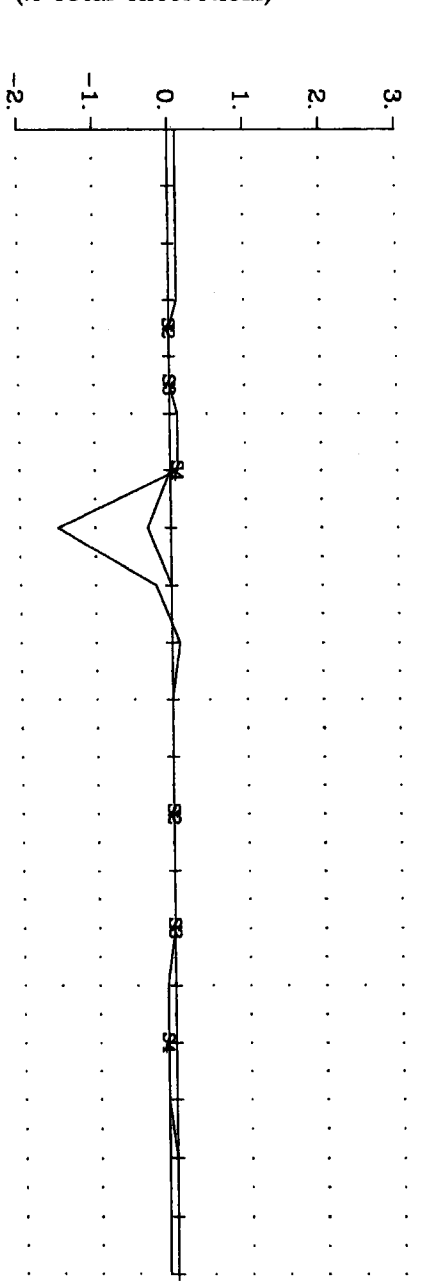
TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1



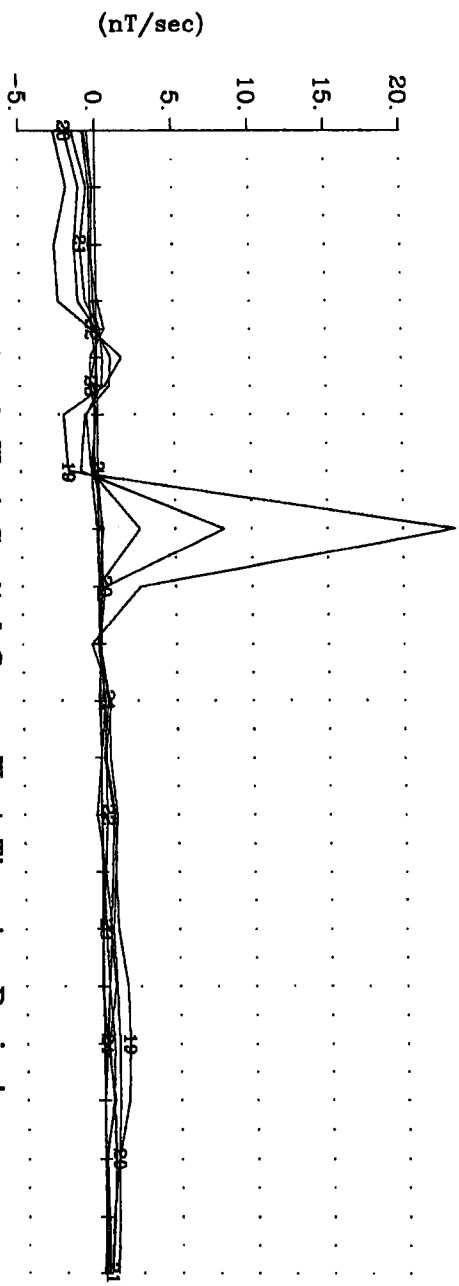
Deviation from TP.
 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

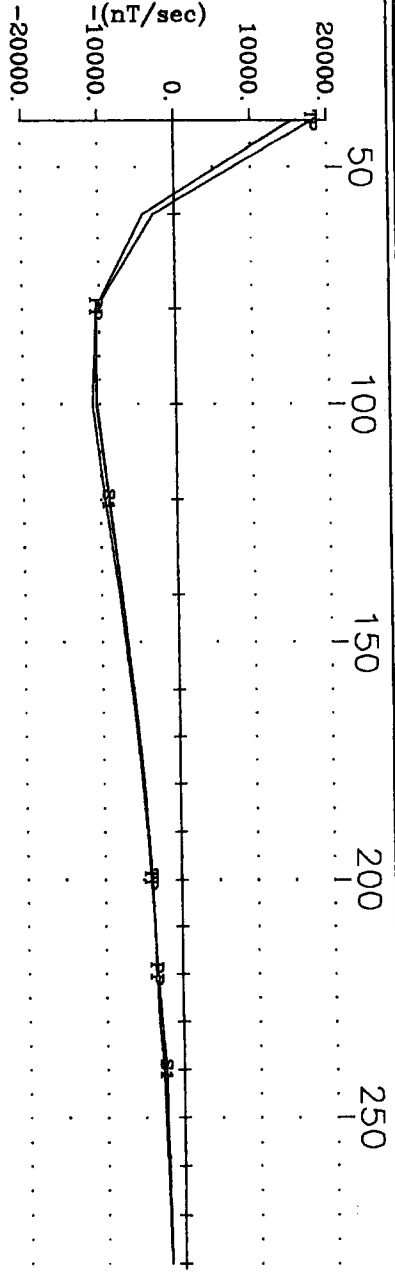


Pulse EM Off-time
 Channels 19-24
 (nT/sec)

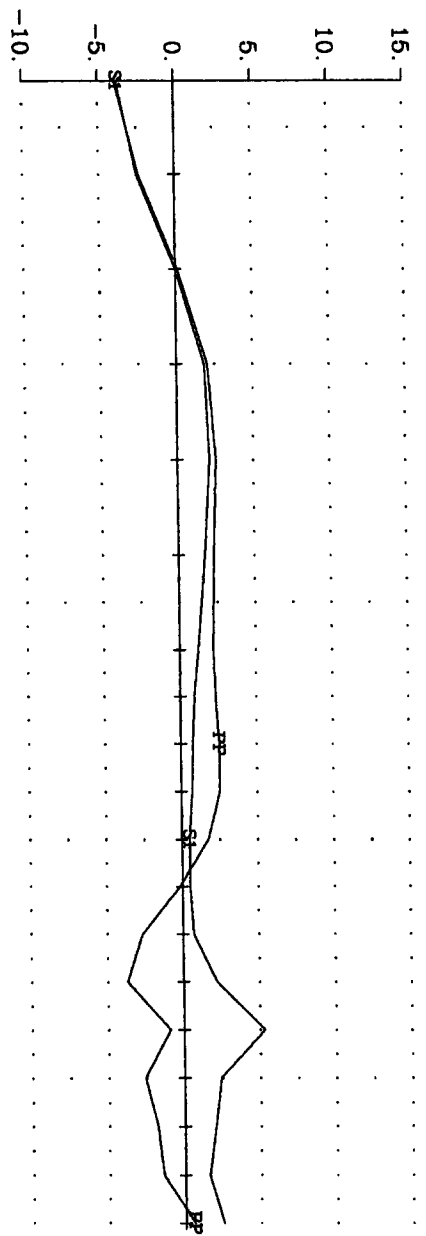


Pacific North West Capital Corp. West Timmins Project
 Hole WTM05-06 (Grid 3) (Loop 2) Z Component
 Crone Geophysics & Exploration Ltd.

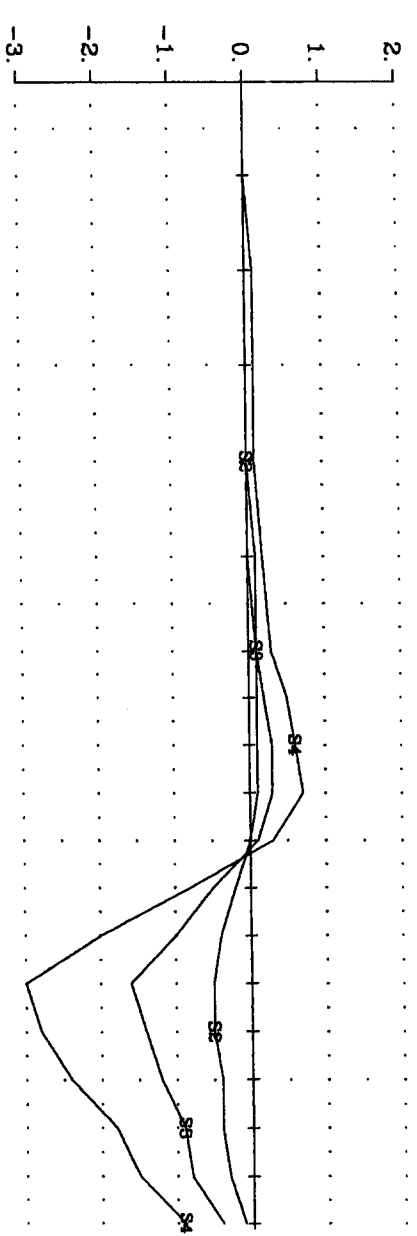
TP = Theoretical Primary
 PP = Last Ramp Channel
 S1 = Calculated Step Ch.1



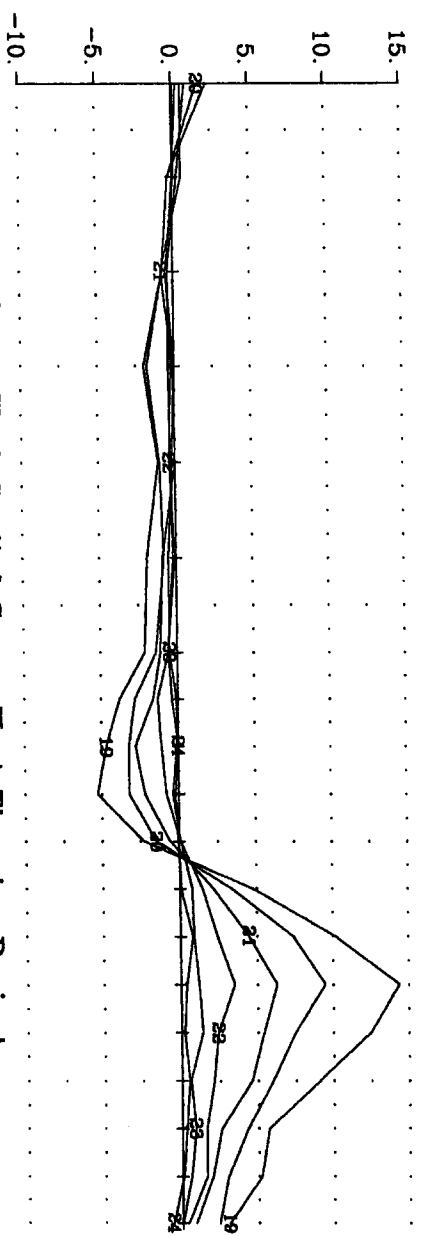
Deviation from TP.
 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

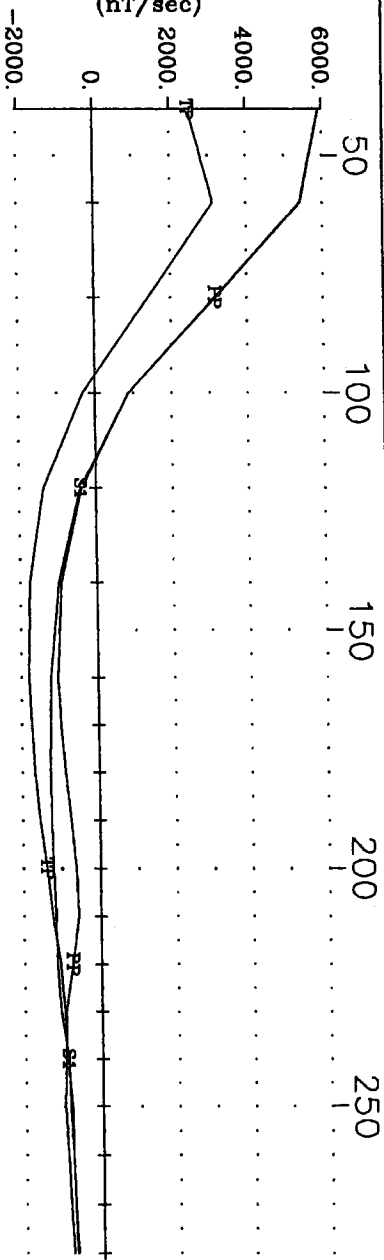


Pulse EM Off-time
 Channels 19-24
 (nT/sec)

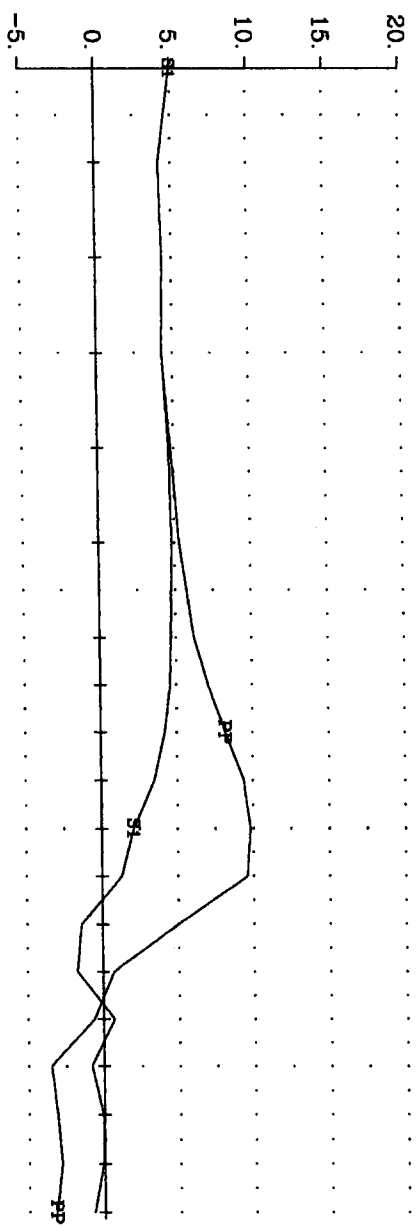


Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-07 (GRID 3) X Component
 Crone Geophysics & Exploration Ltd.

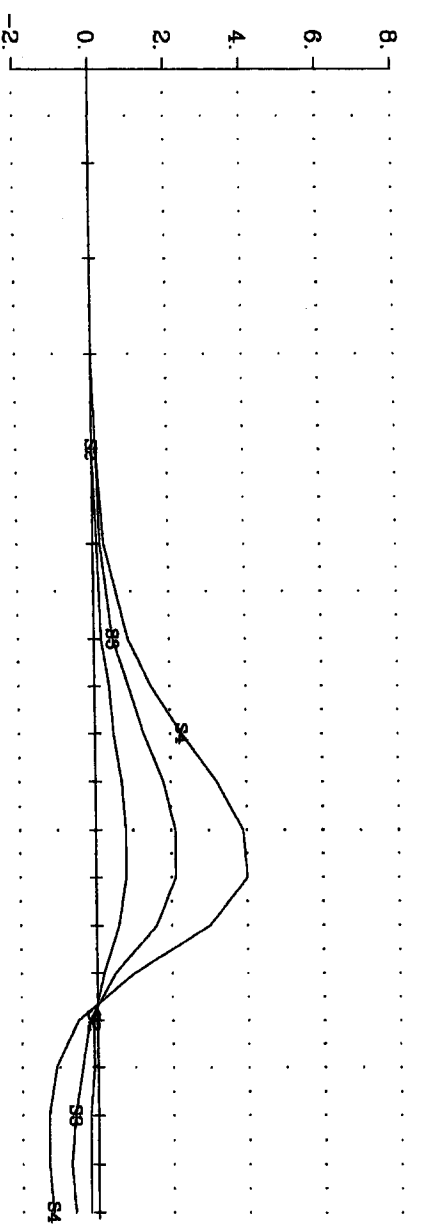
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 S1 = Calculated Step Ch.1
 (nT/sec)



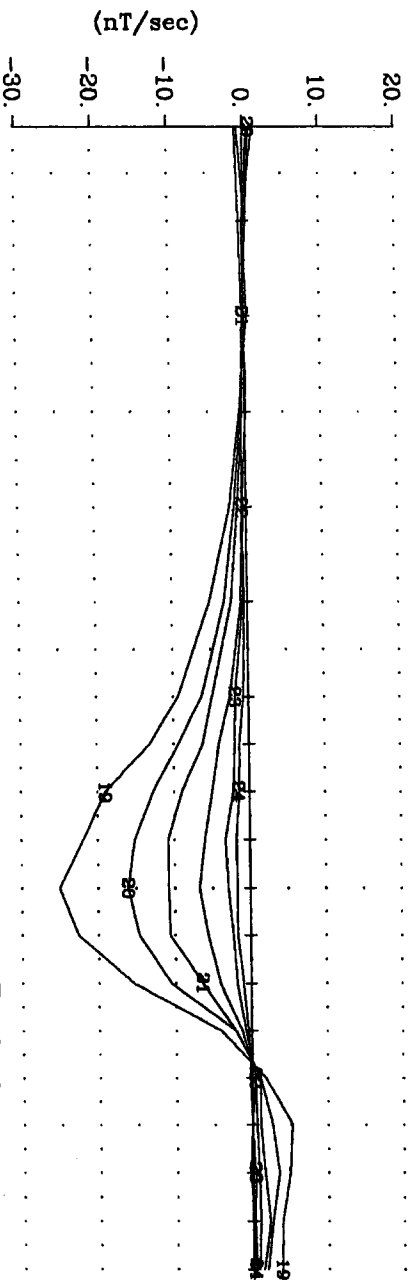
Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)



Deviation from TP.
 (% Total Theoretical)

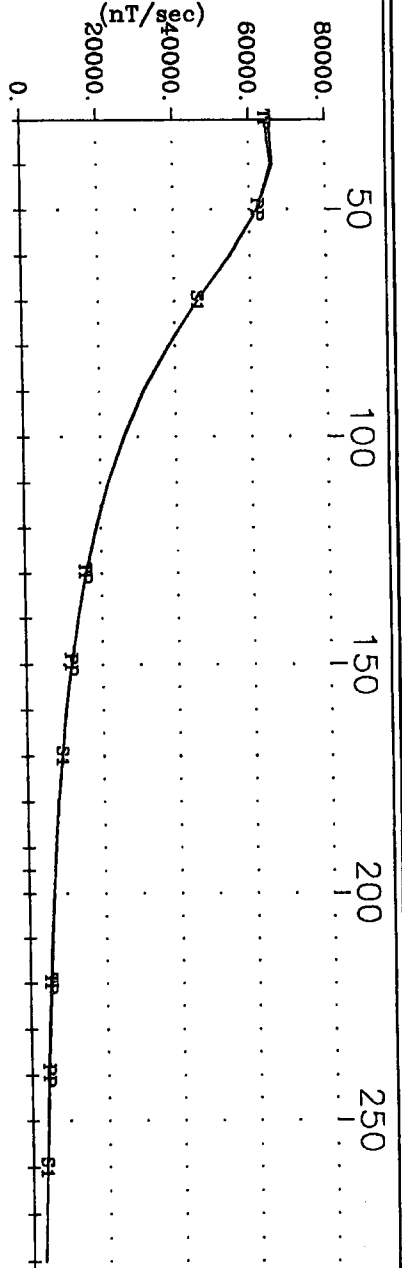


Pulse EM Off-time
 Channels 19-24

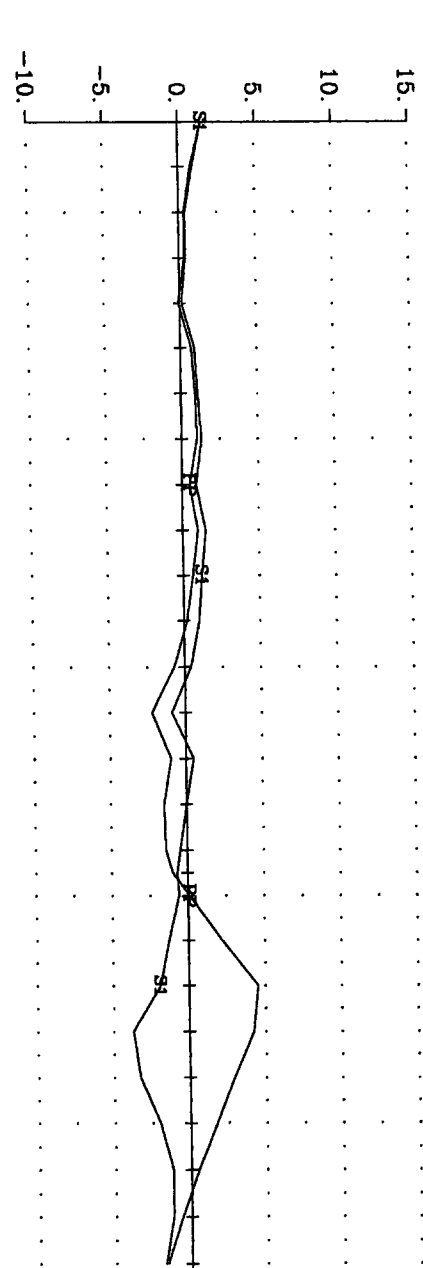


Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-07 (GRID 3) Y Component
 Crone Geophysics & Exploration Ltd.

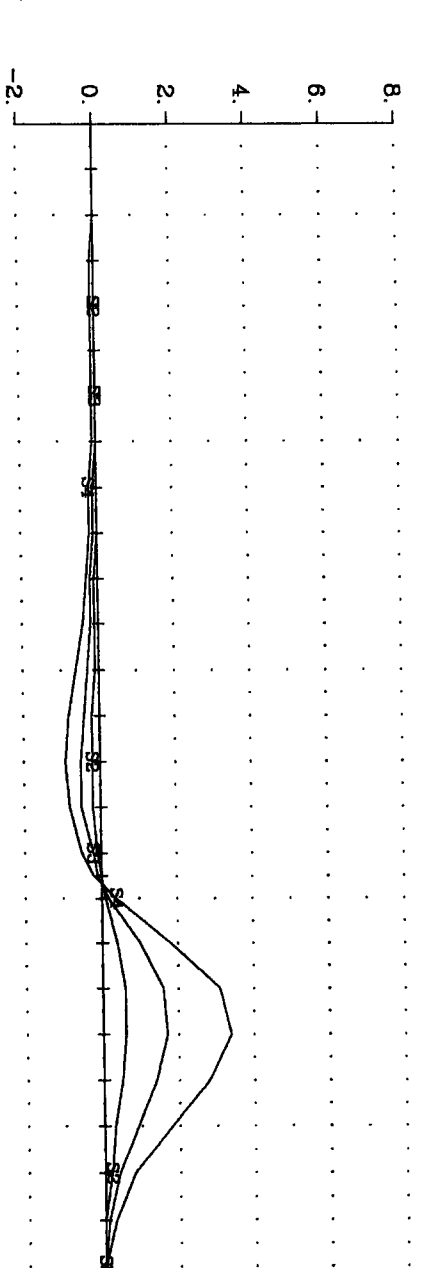
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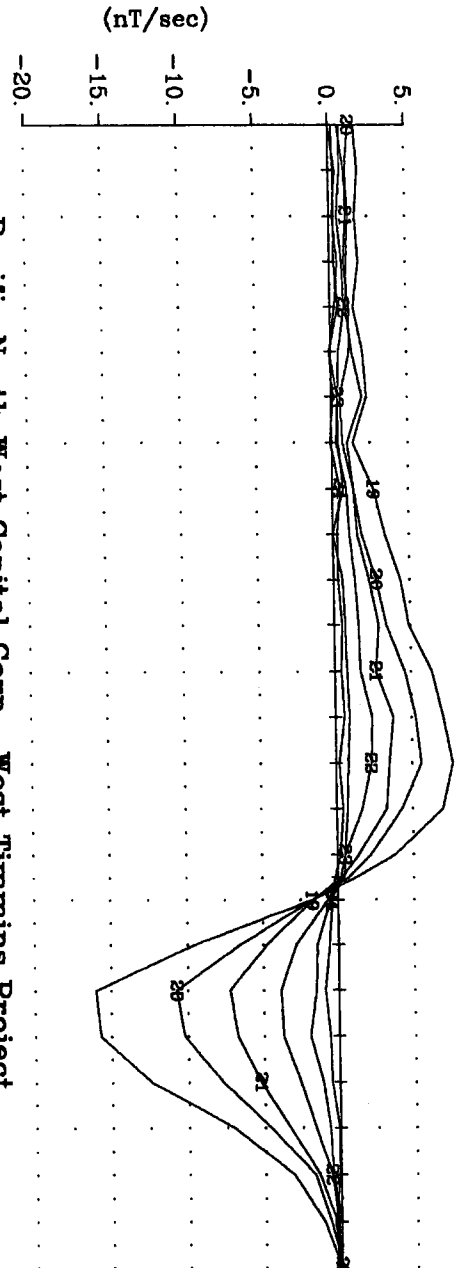
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Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

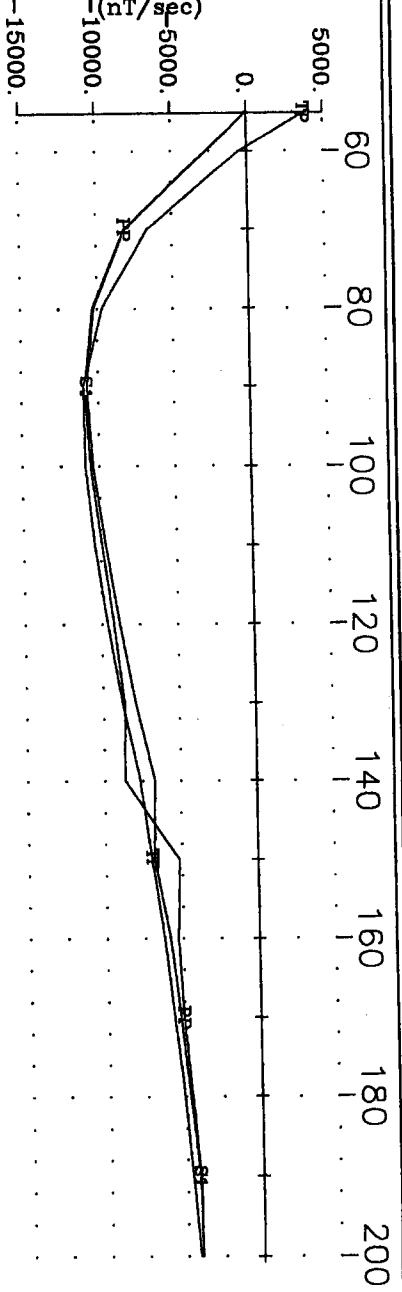


Pulse EM Off-time
 Channels 19-24
 (nT/sec)

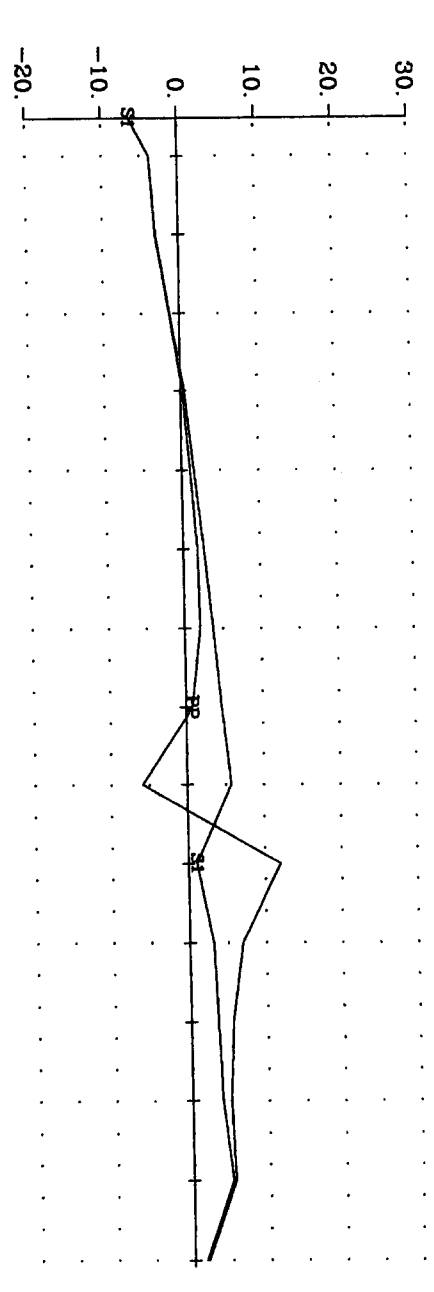


Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-07 (GRID 3) Z Component
 Crone Geophysics & Exploration Ltd.

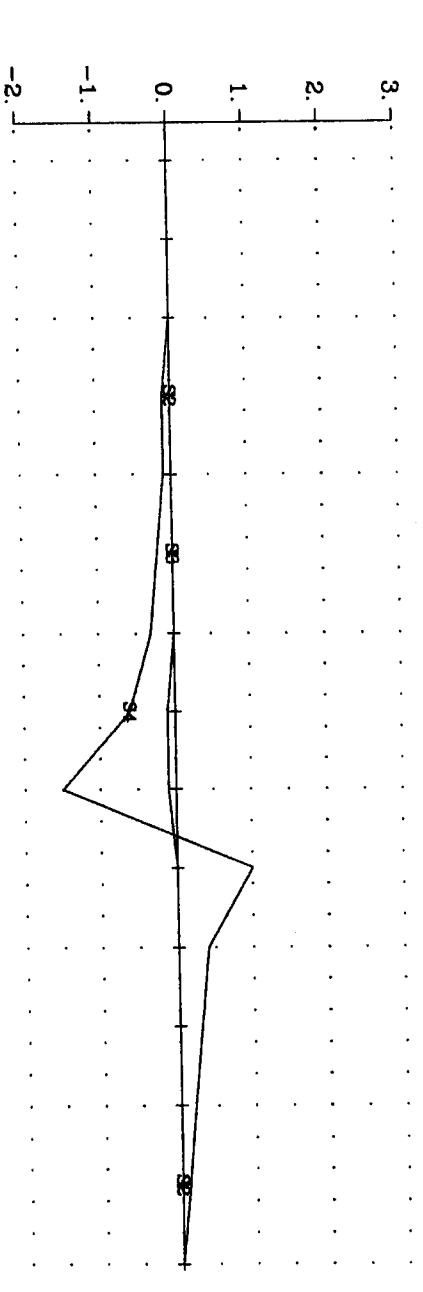
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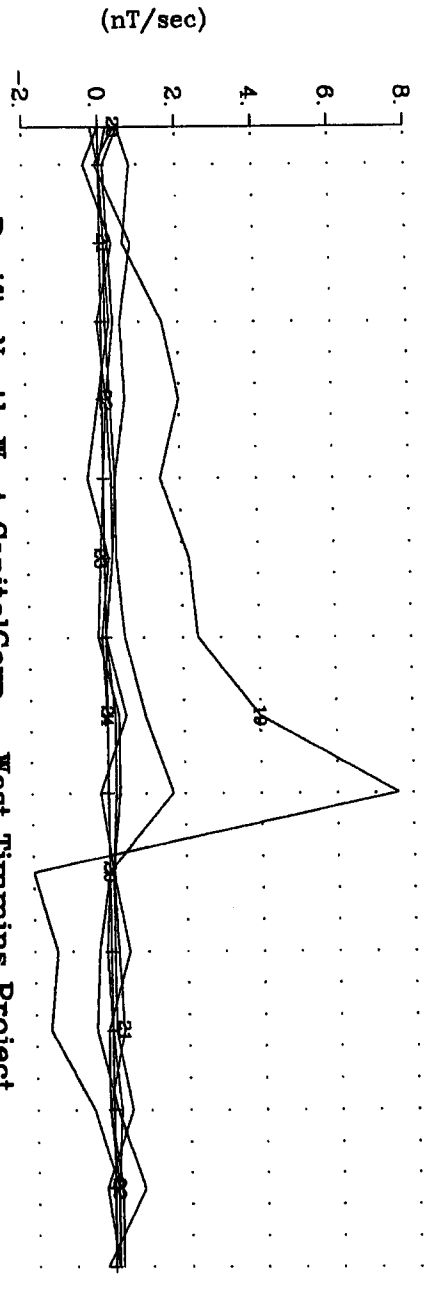
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Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

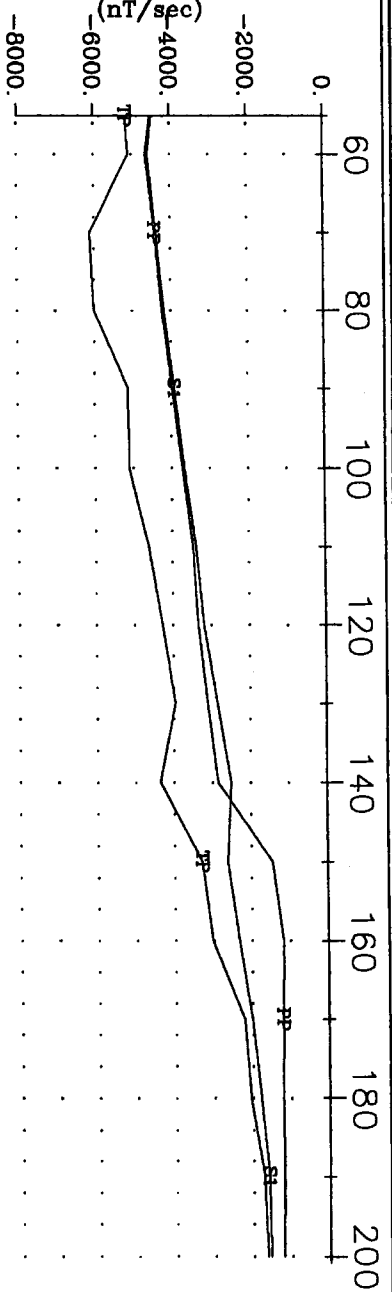


Pulse EM Off-time
 Channels 19-24

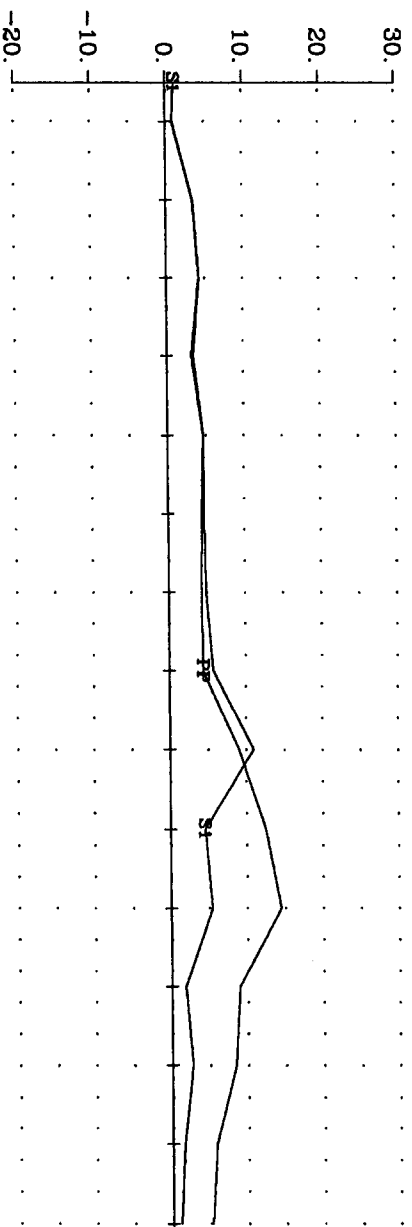


Pacific North West CapitalCorp. West Timmins Project
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 Crone Geophysics & Exploration Ltd.

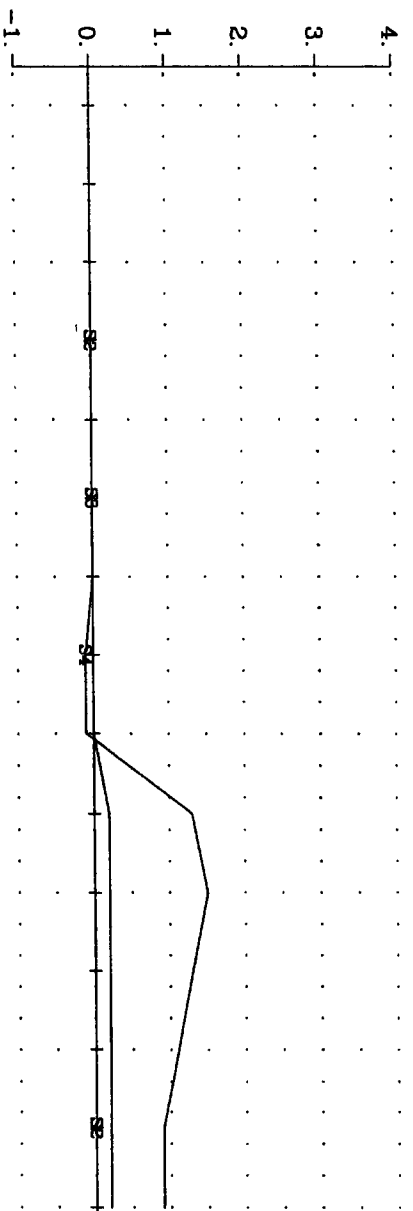
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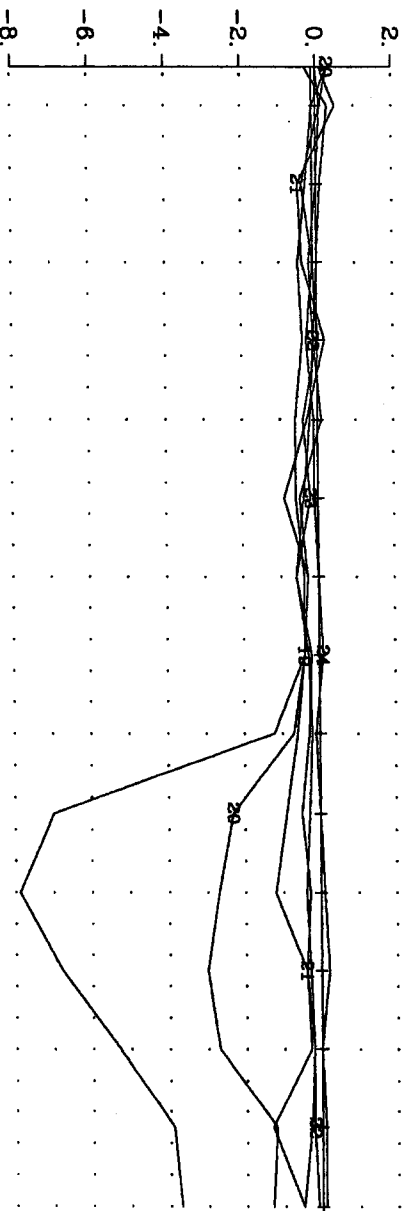
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Step Channels 2-4.
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 (% Total Theoretical)

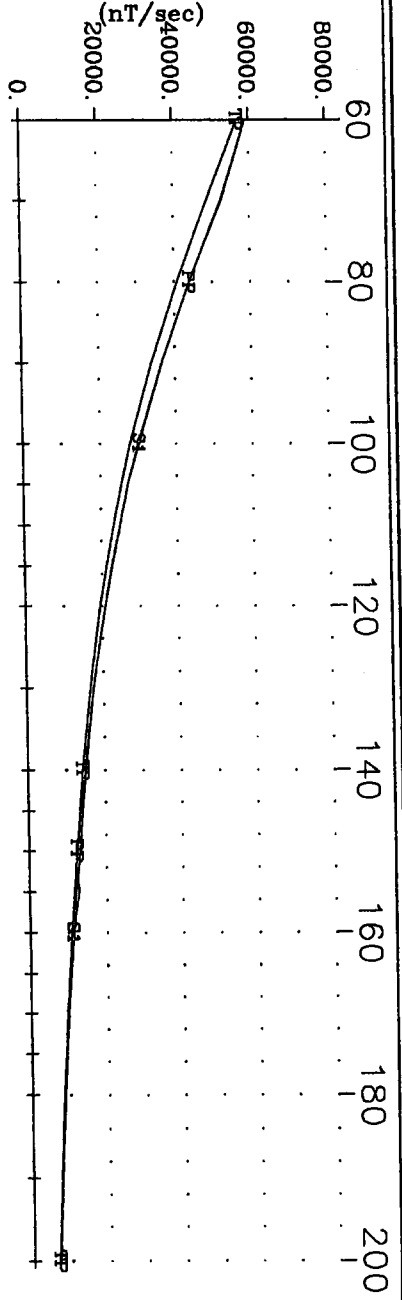


Pulse EM Off-time
 Channels 19-24
 (nT/sec)

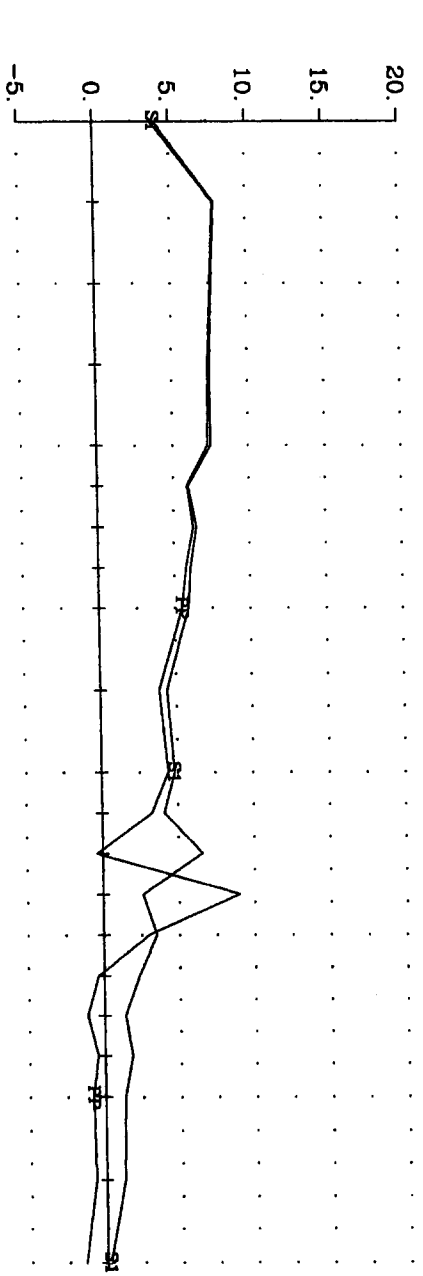


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 Crone Geophysics & Exploration Ltd.

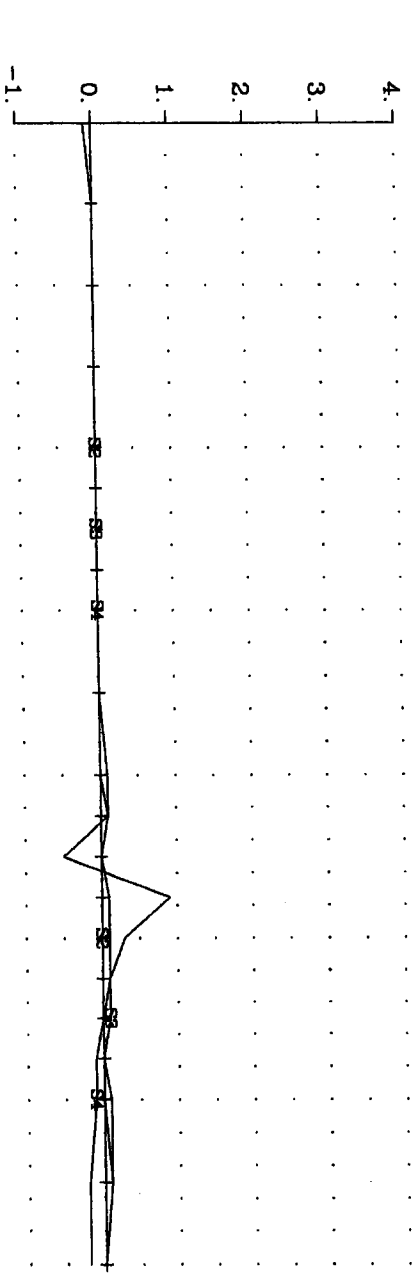
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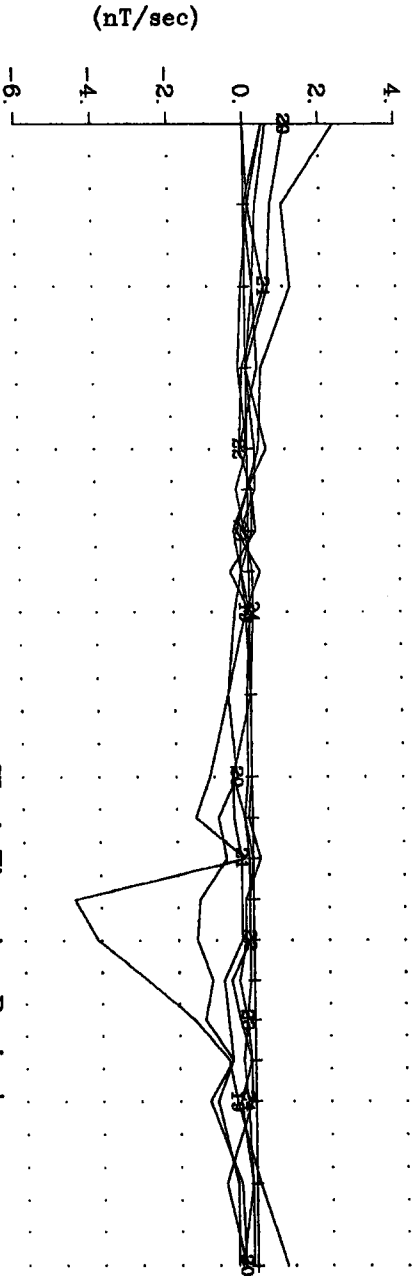
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 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)



Pulse EM Off-time
 Channels 19-24
 (nT/sec)



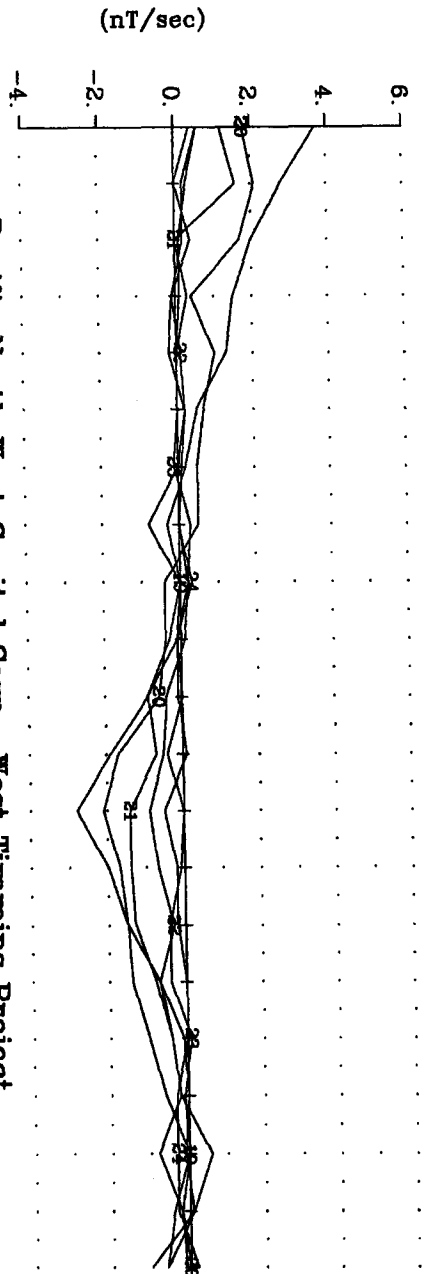
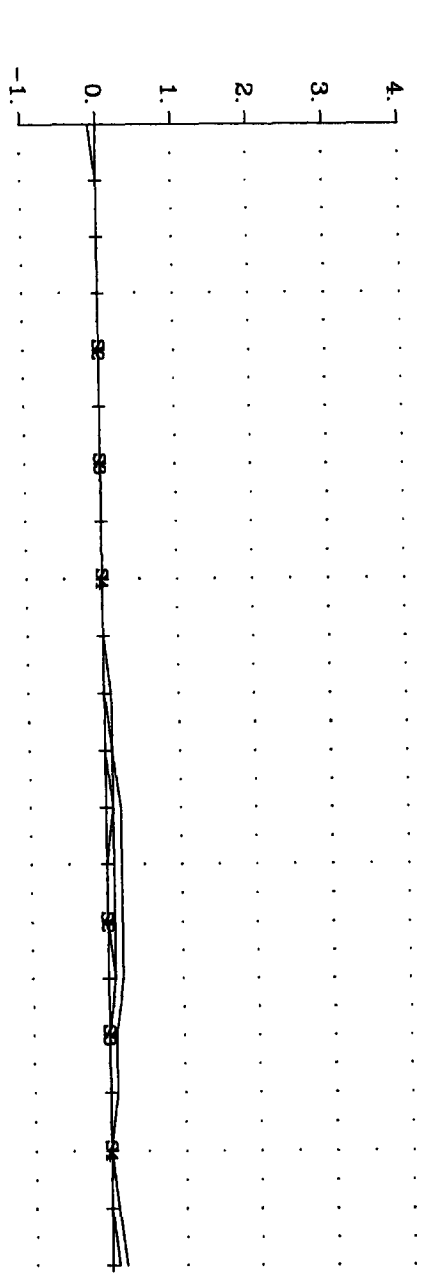
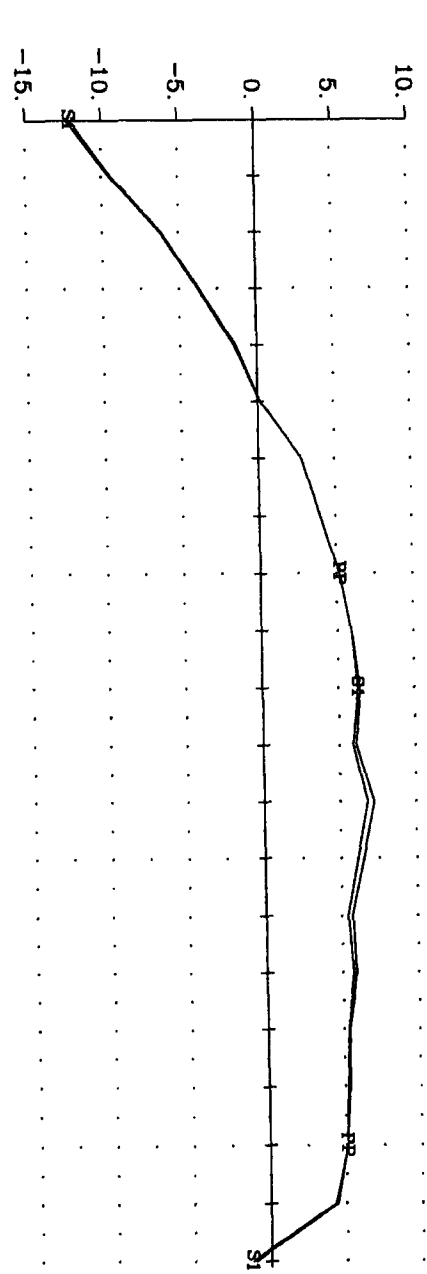
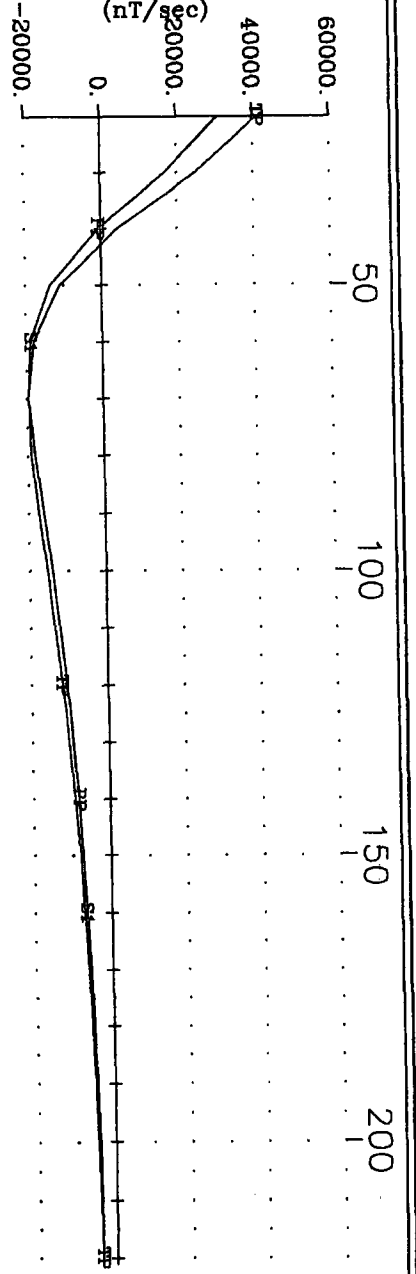
Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-08 (GRID 4) Z Component
 Crone Geophysics & Exploration Ltd.

TP = Theoretical Primary
 PP = Last Ramp Channel
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 (nT/sec)

Deviation from TP.
 (% Total Theoretical)

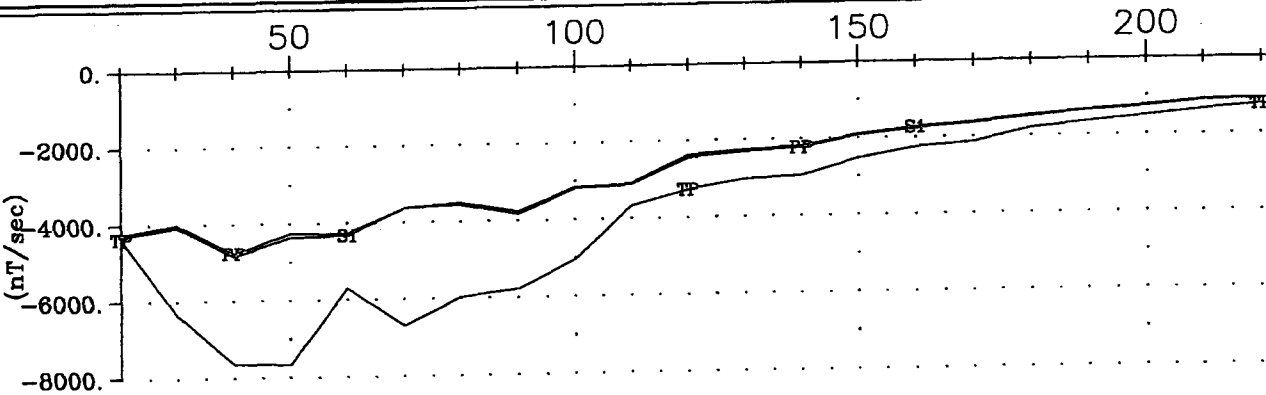
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Pulse EM Off-time
 Channels 19-24
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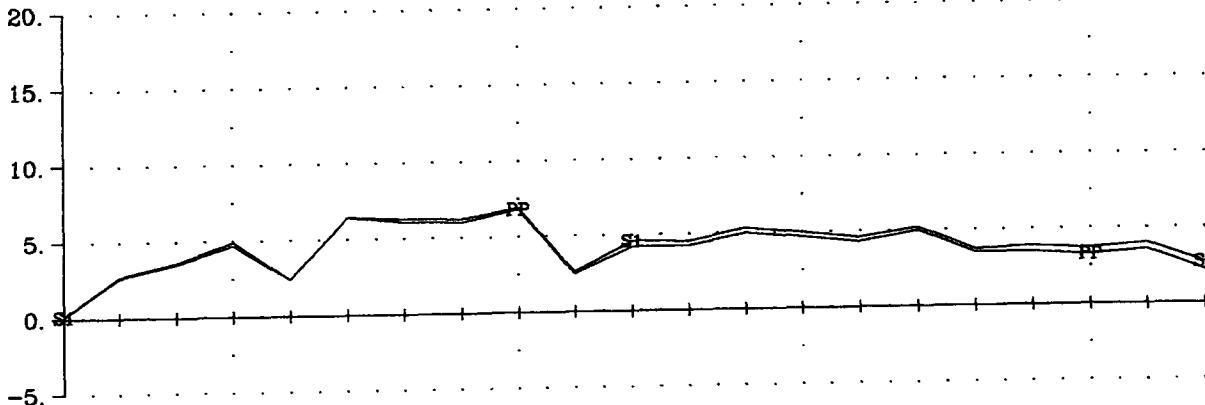


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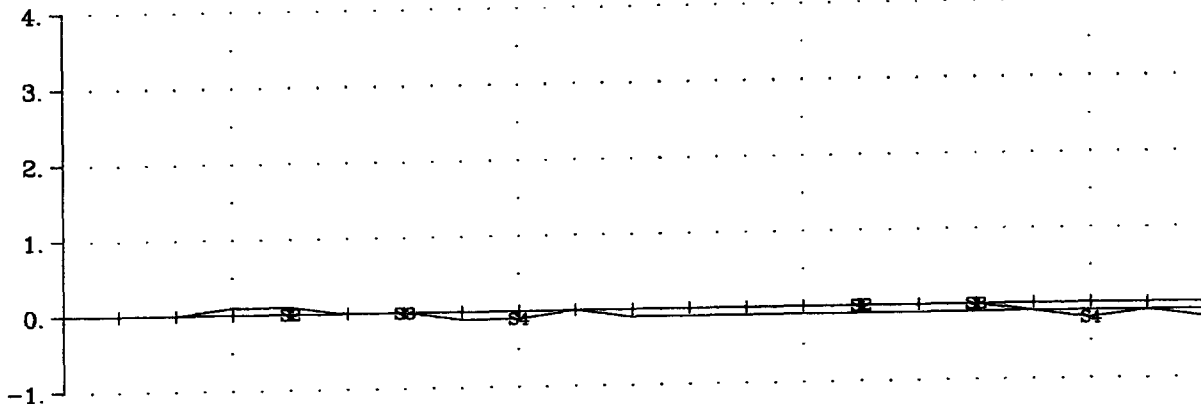
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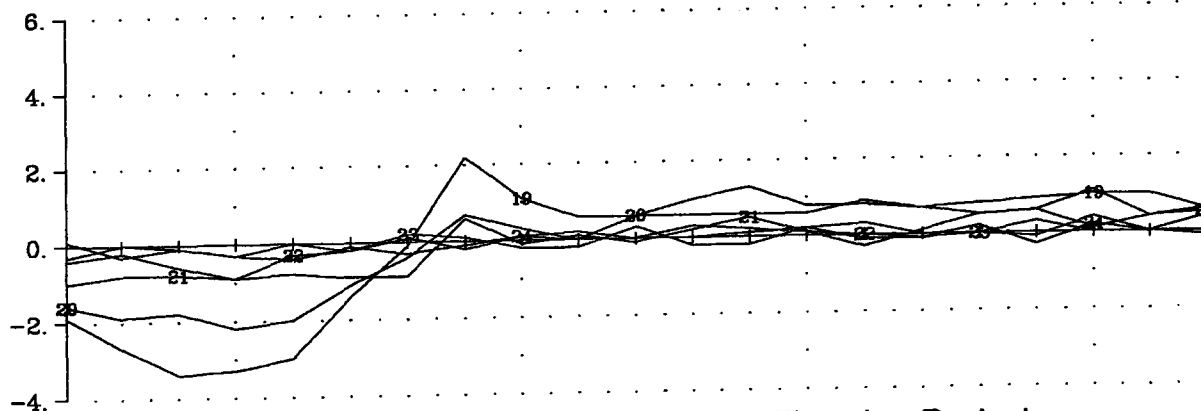
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Step Channels 2-4.
 Deviations from S1.
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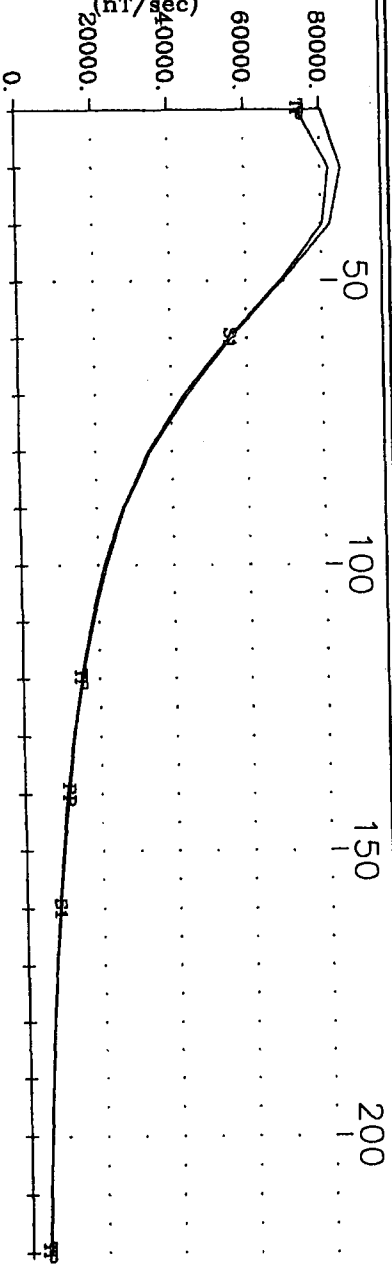


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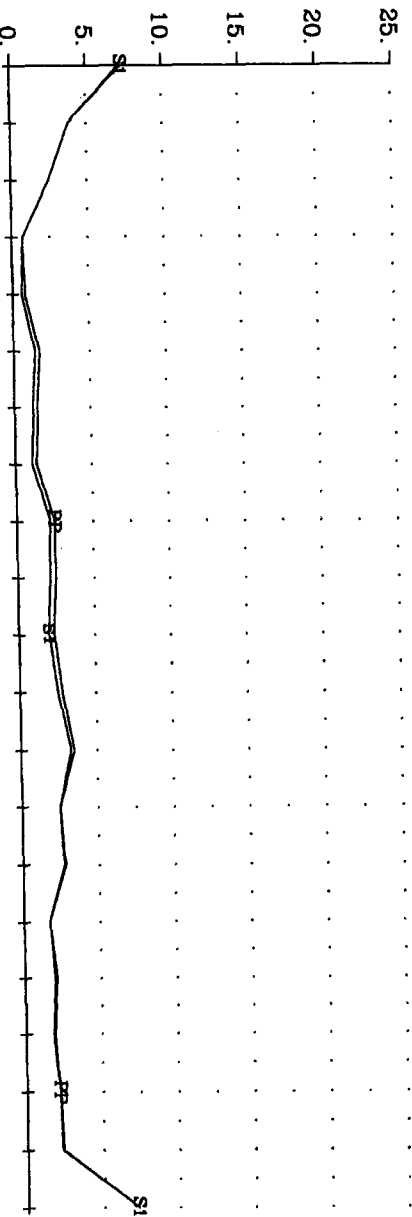
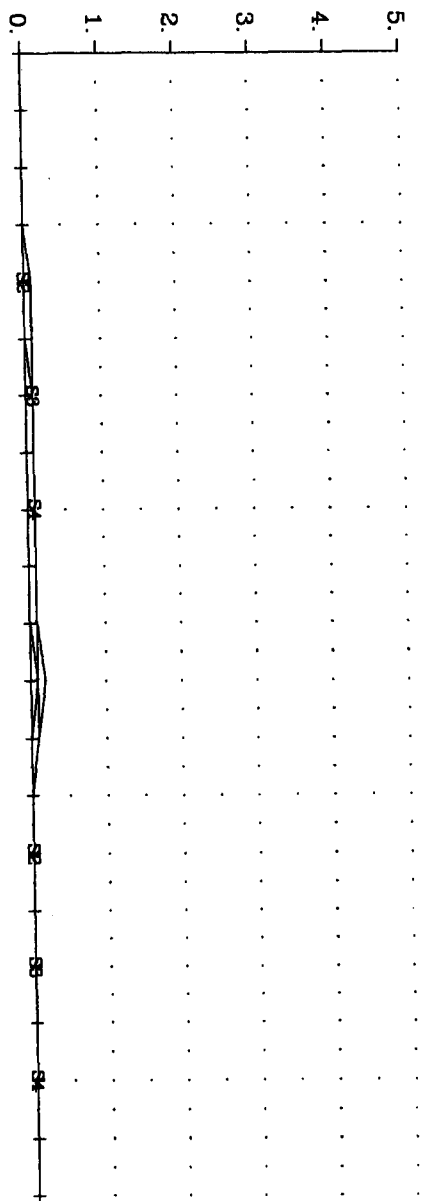


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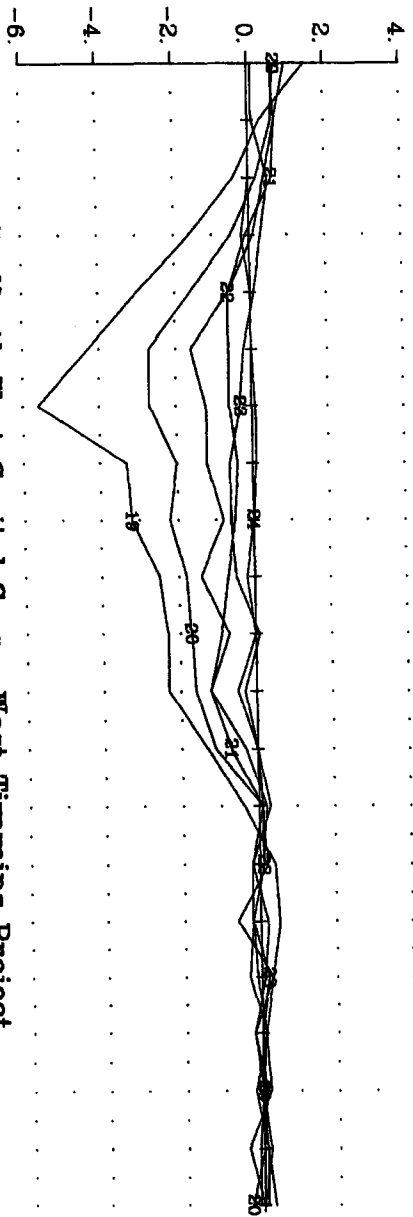
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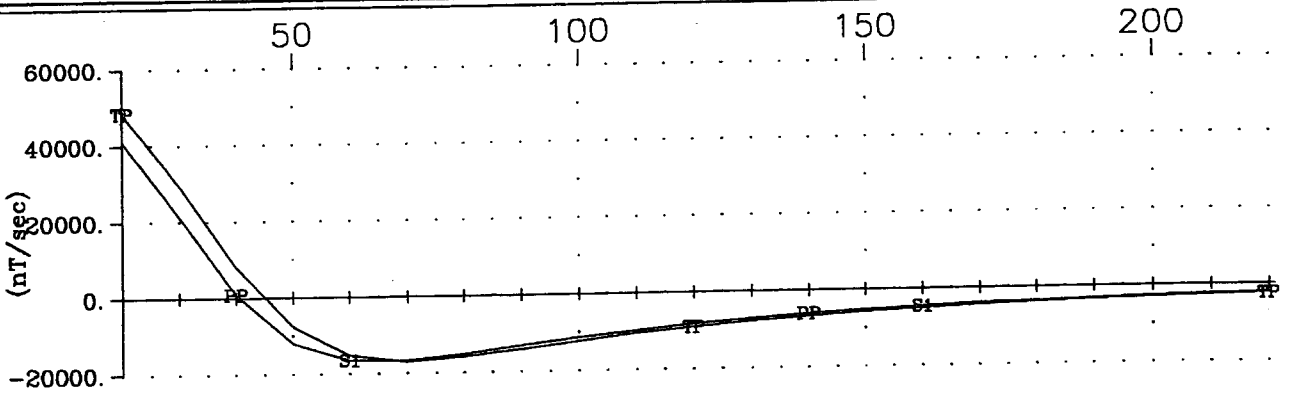


Pulse EM Off-time
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 (nT/sec)

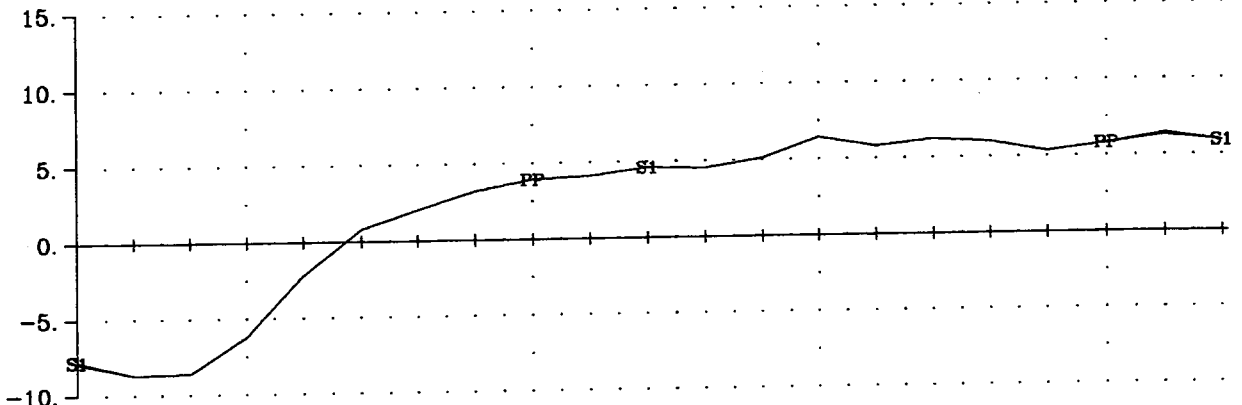


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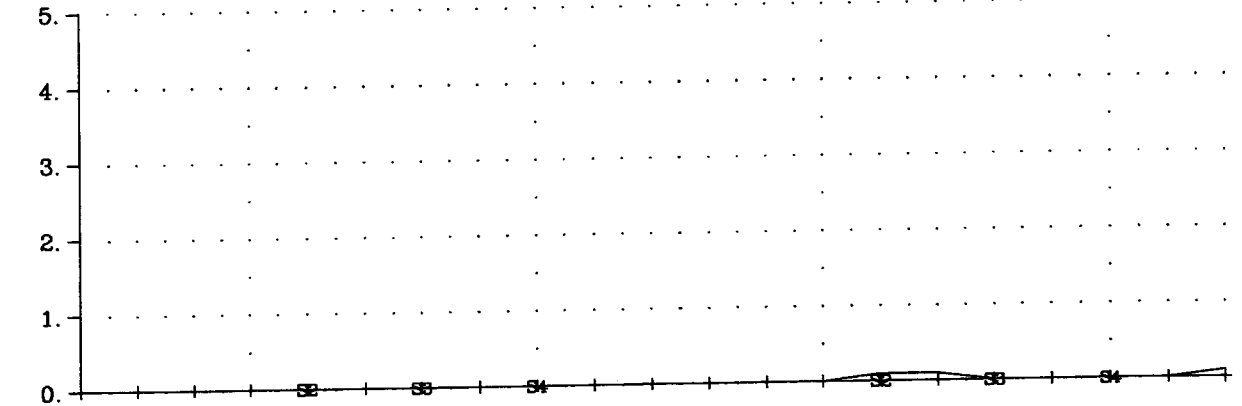
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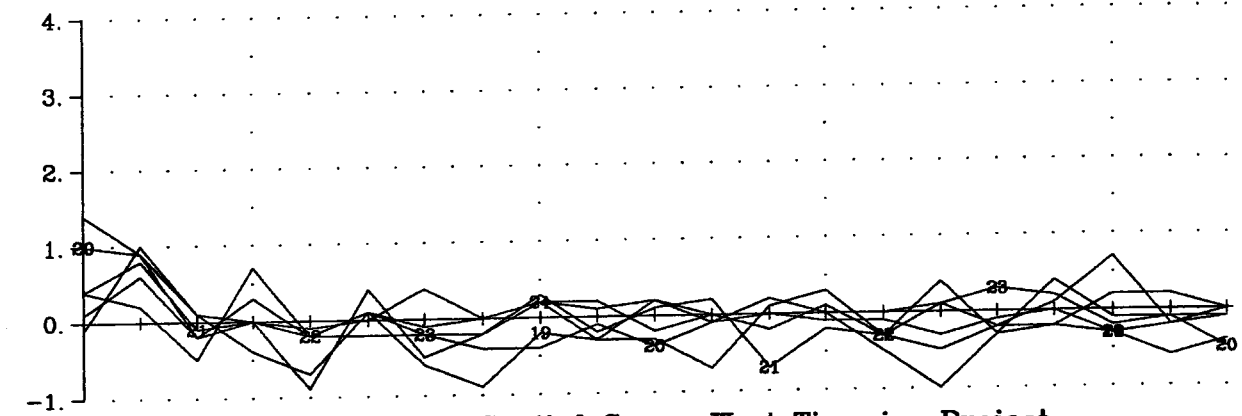
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Step Channels 2-4.
 Deviations from S1.
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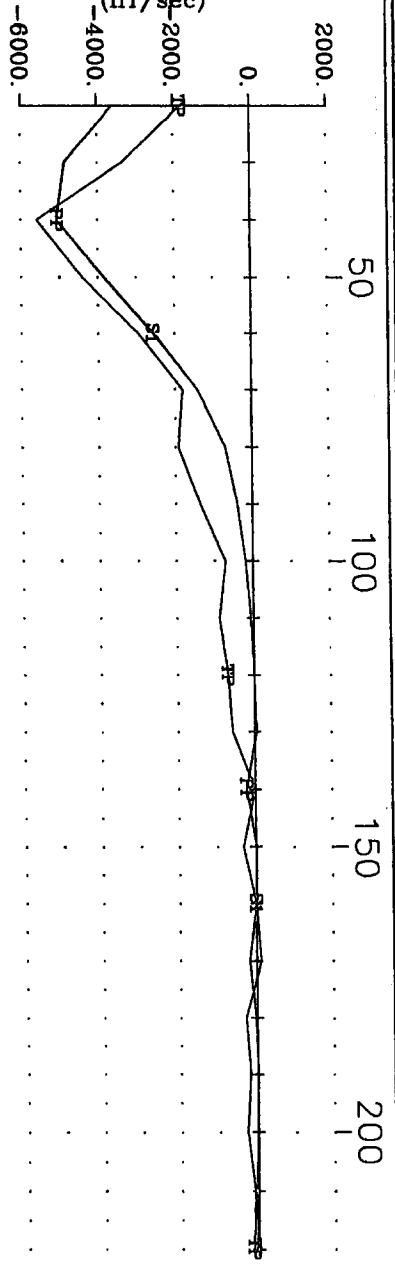


Pulse EM Off-time
 Channels 19-24
 (nT/sec)

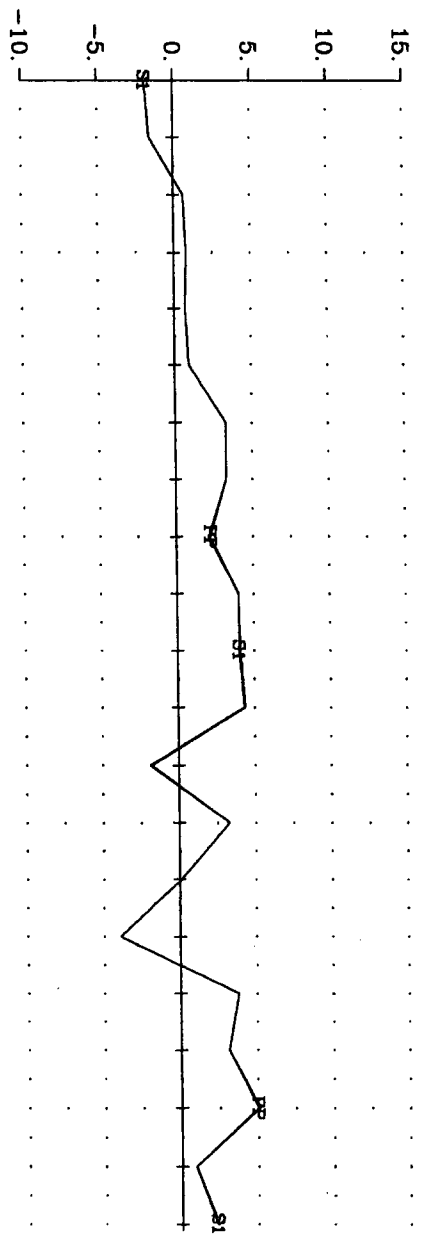


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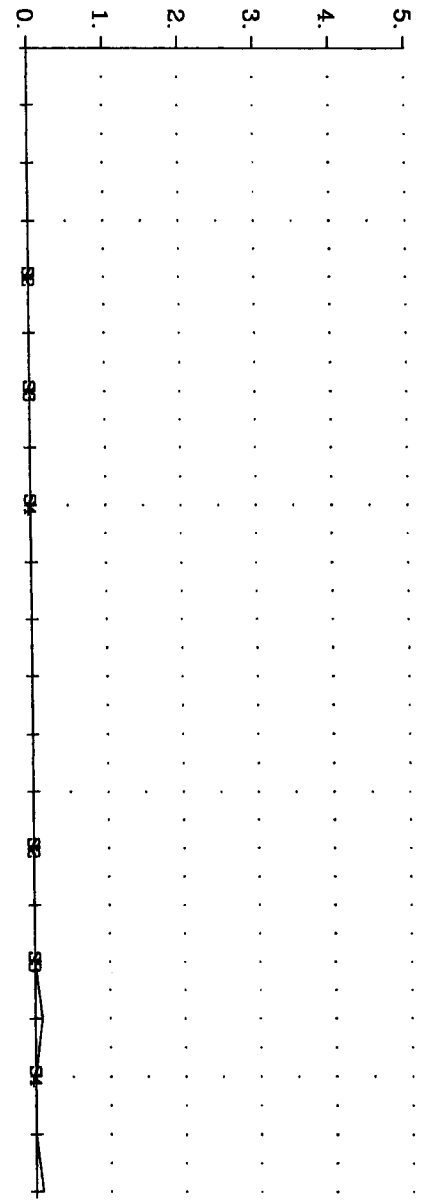
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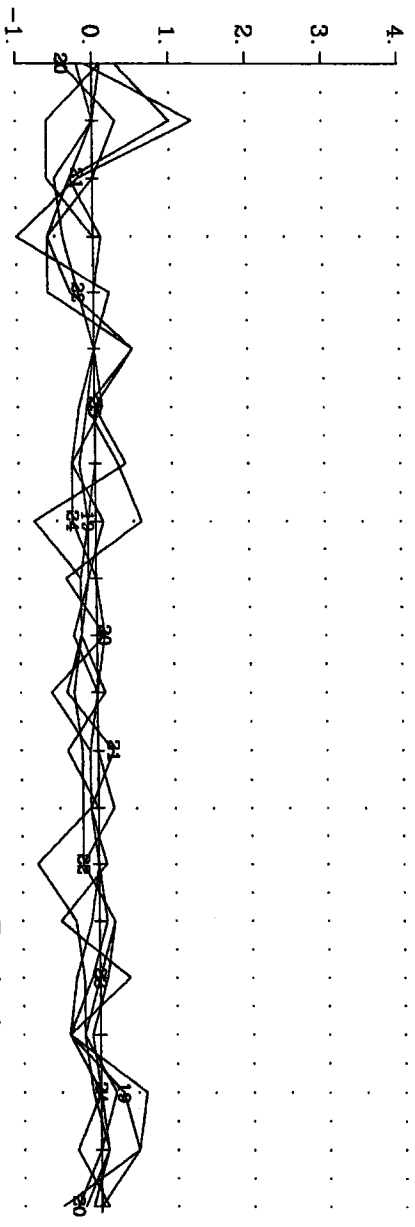
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Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

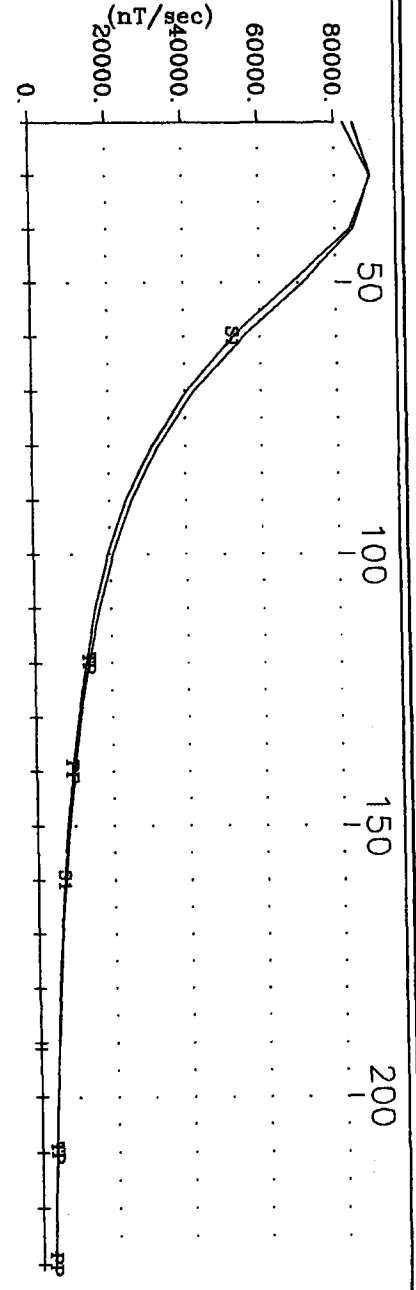


Pulse EM Off-time
 Channels 19-24
 (nT/sec)

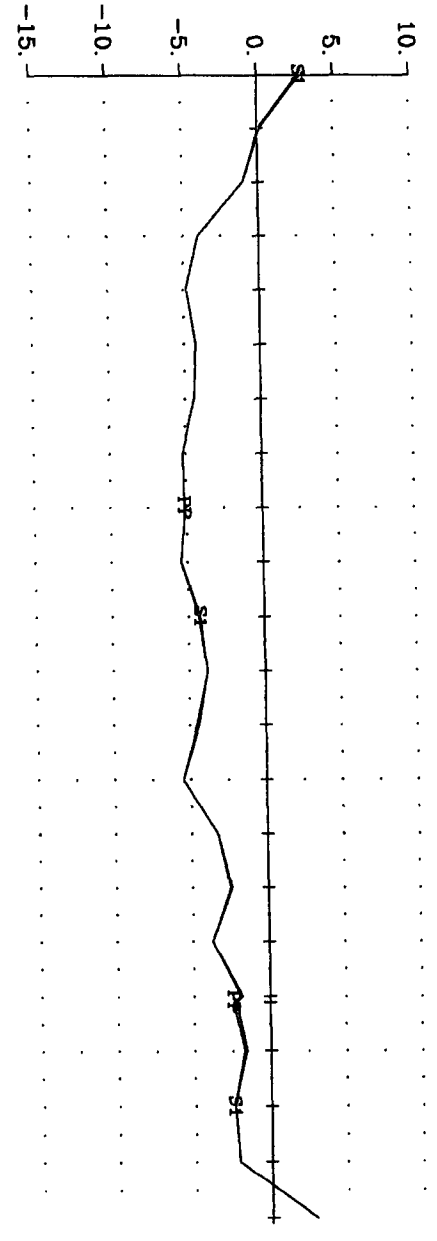


Pacific North West Capital Corp. West Timmins Project
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 Crone Geophysics & Exploration Ltd.

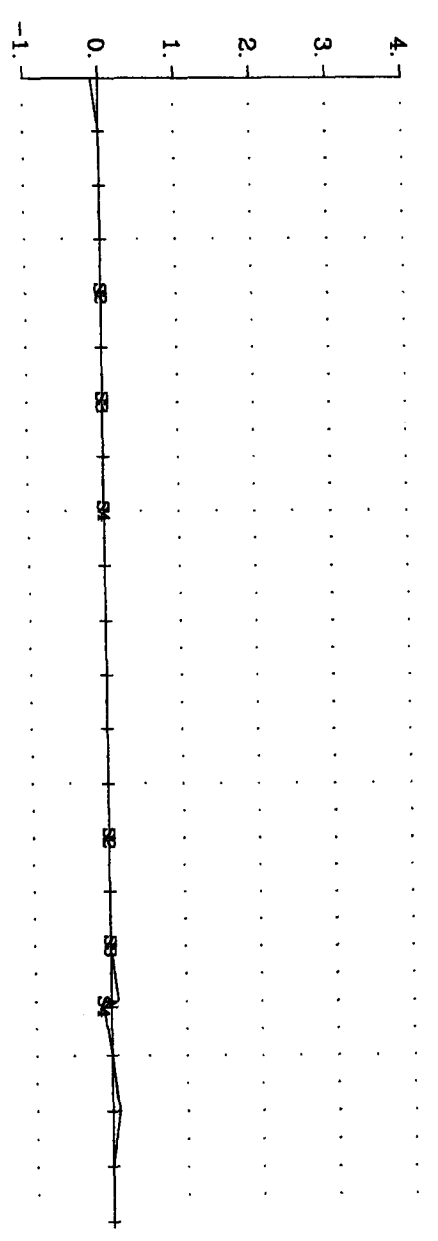
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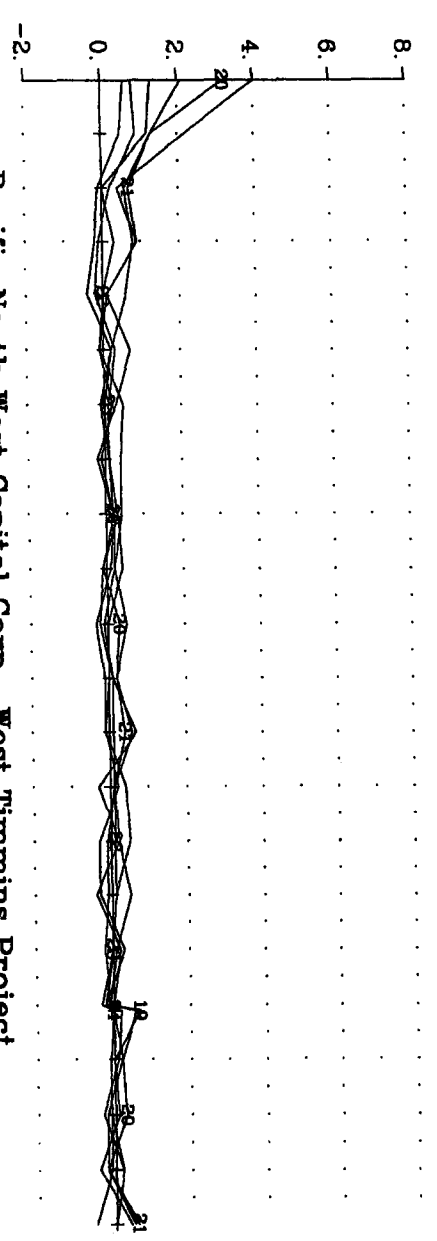
Deviation from TP.
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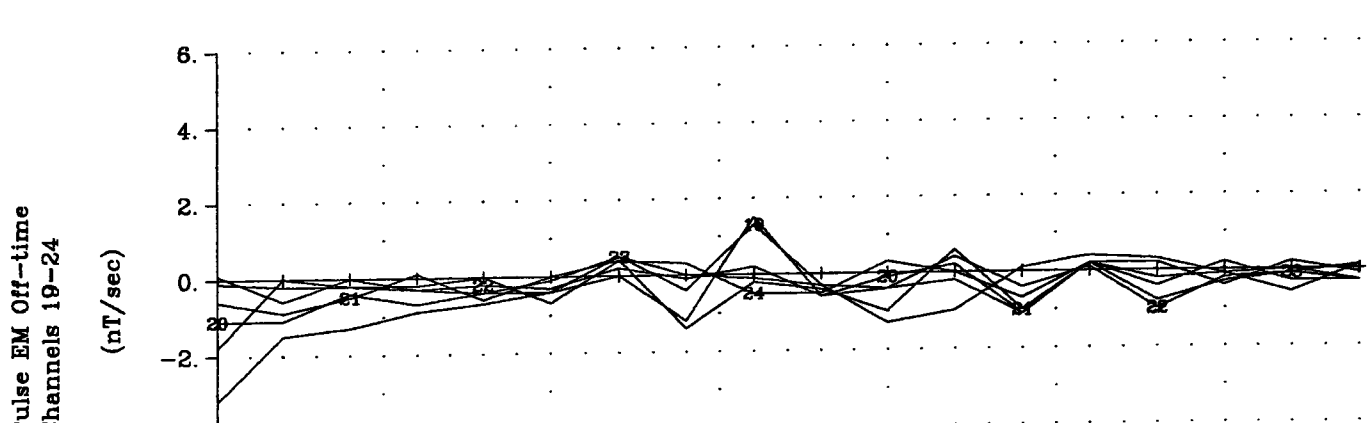
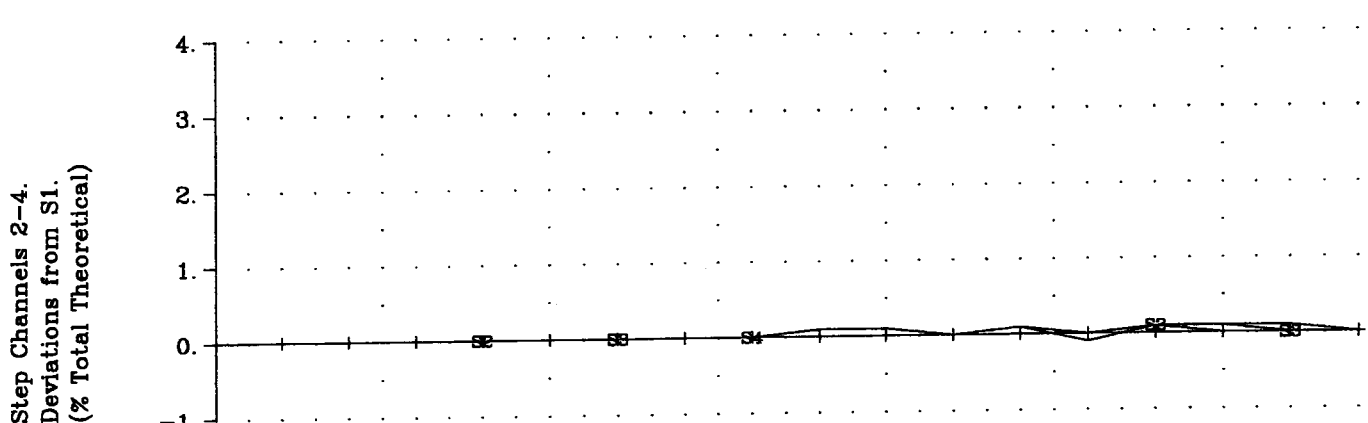
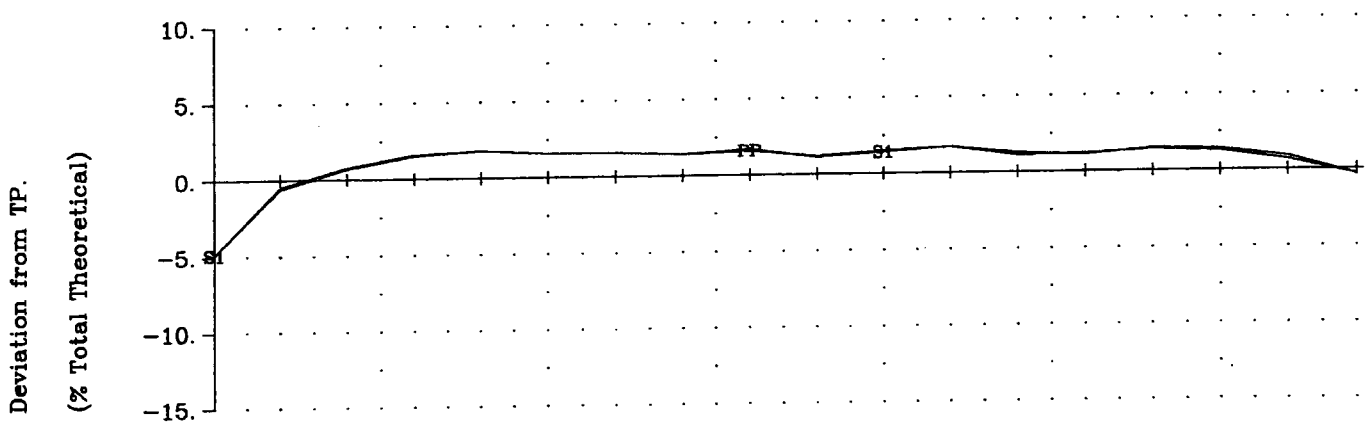
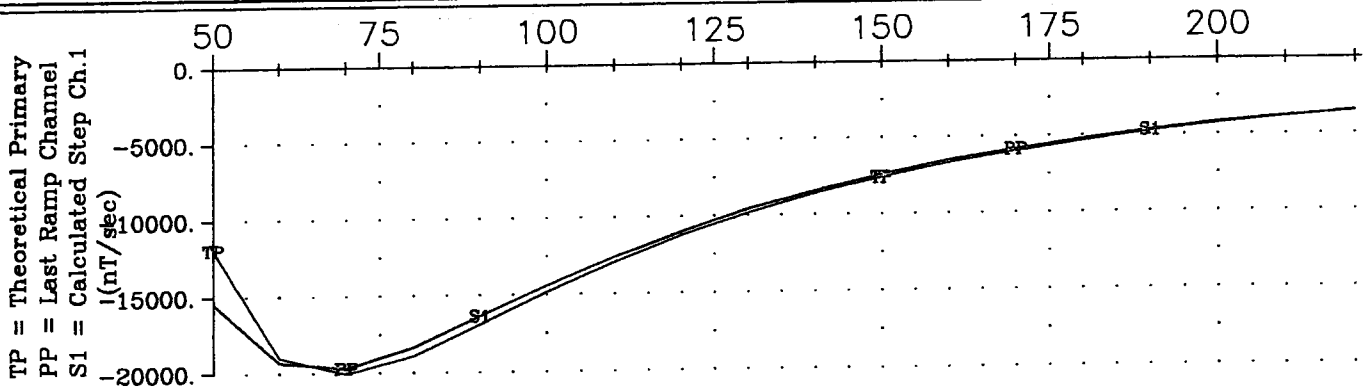
Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)



Pulse EM Off-time
 Channels 19-24
 (nT/sec)

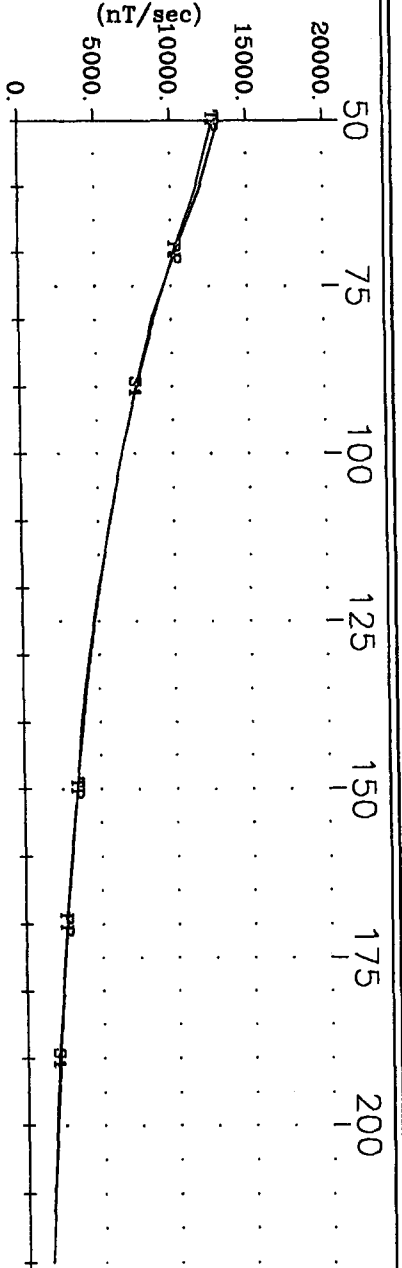


Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-12 (GRID 5) Z Component
 Crone Geophysics & Exploration Ltd.

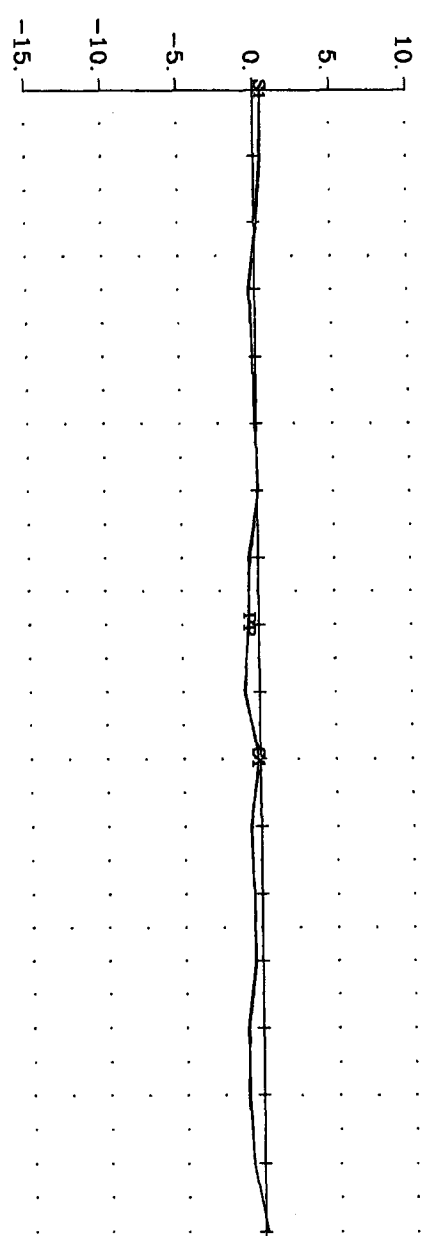


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 Crone Geophysics & Exploration Ltd.

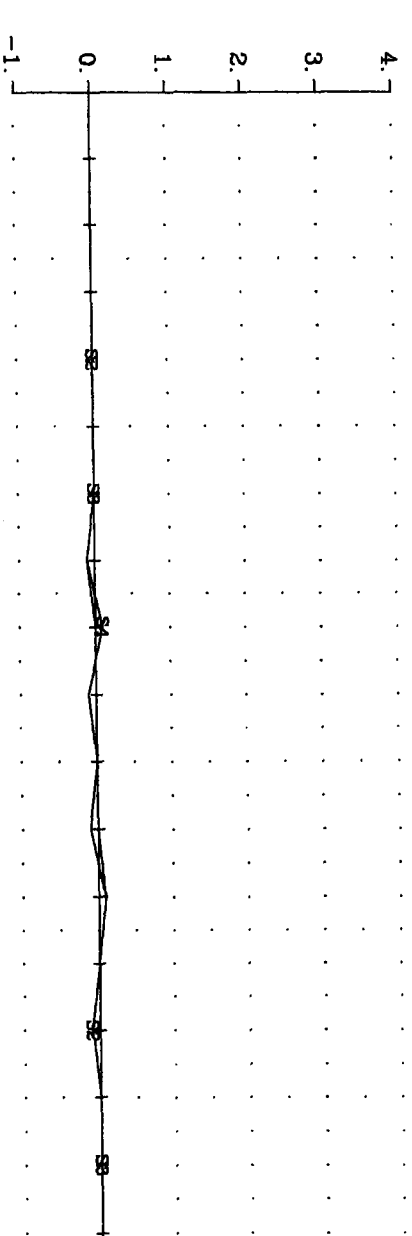
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 S1 = Calculated Step Ch.1
 (nT/sec)



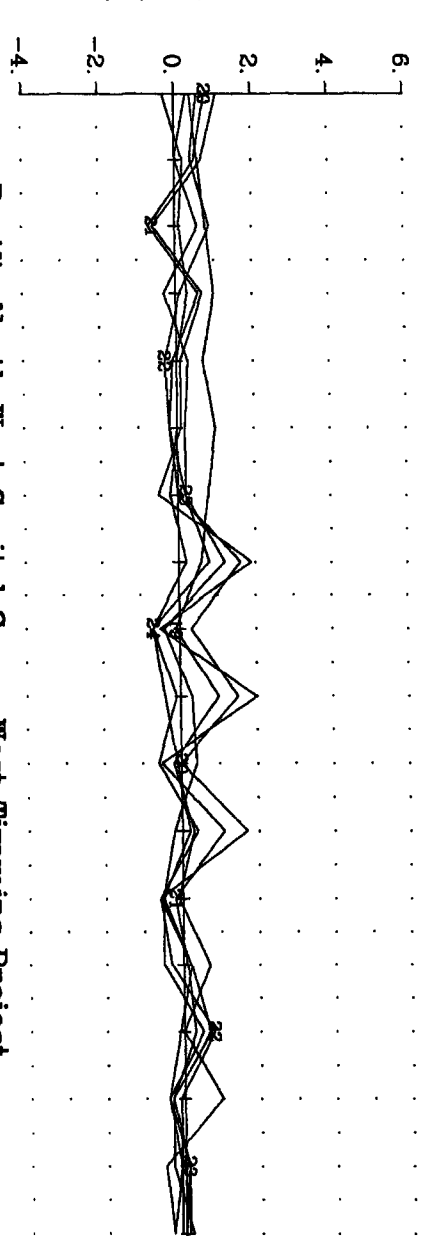
Deviation from TP.
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Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)

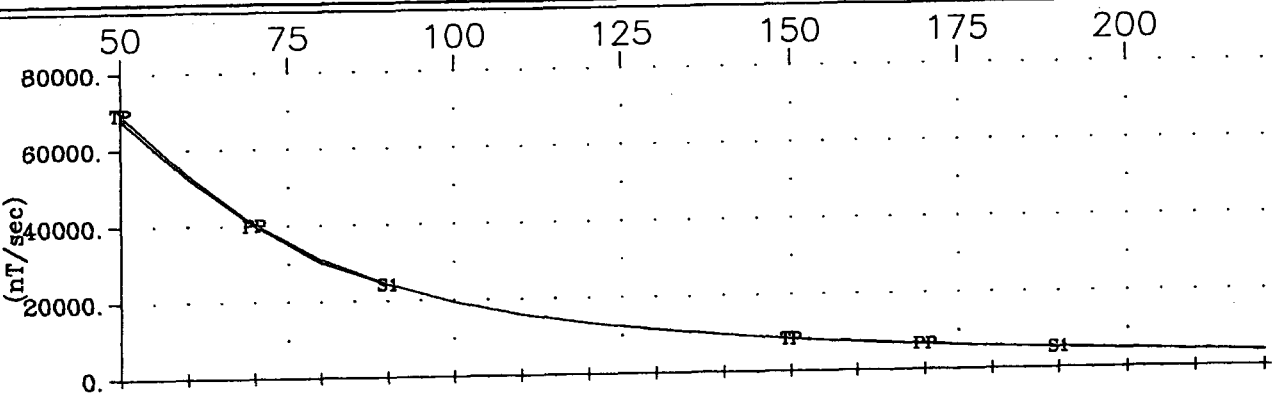


Pulse EM Off-time
 Channels 19-24
 (nT/sec)

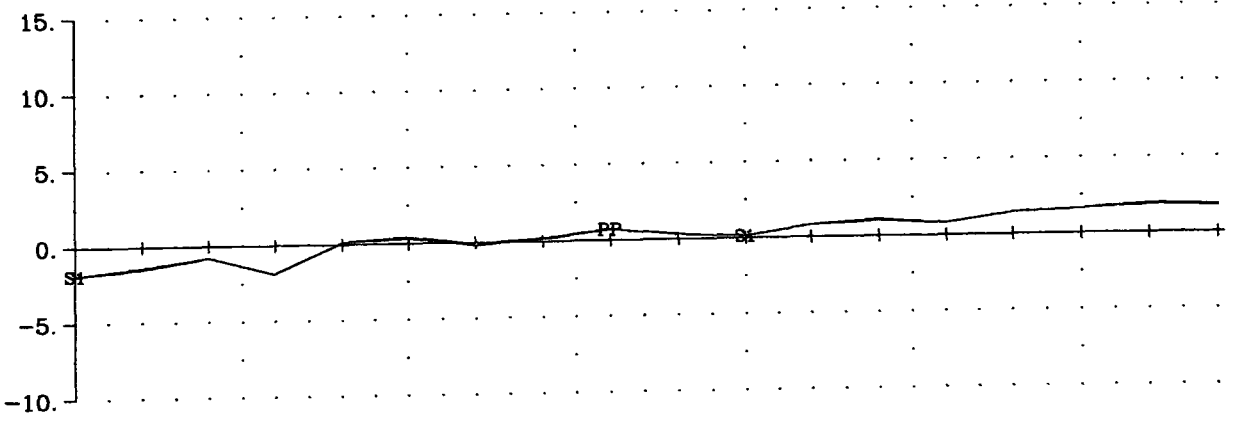


Pacific North West Capital Corp. West Timmins Project
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 Crone Geophysics & Exploration Ltd.

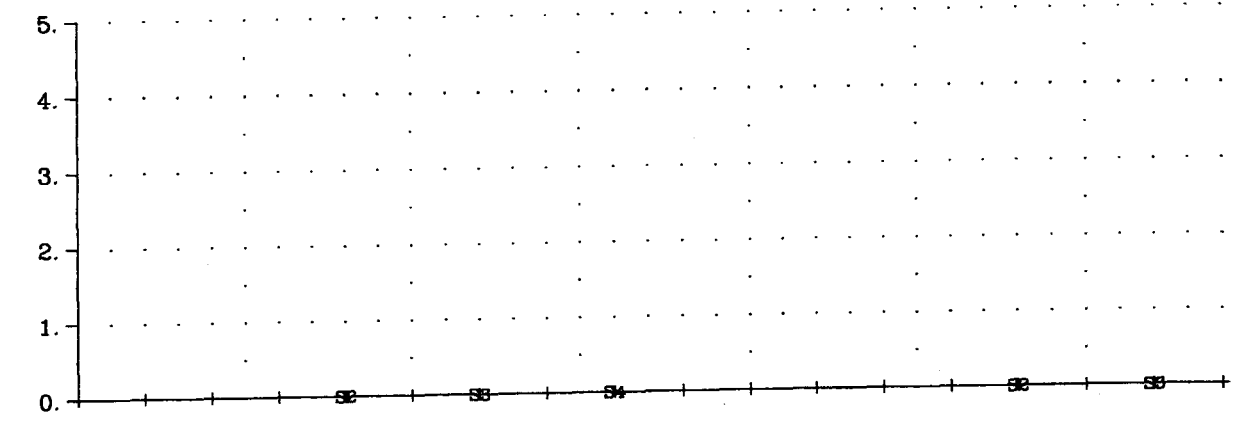
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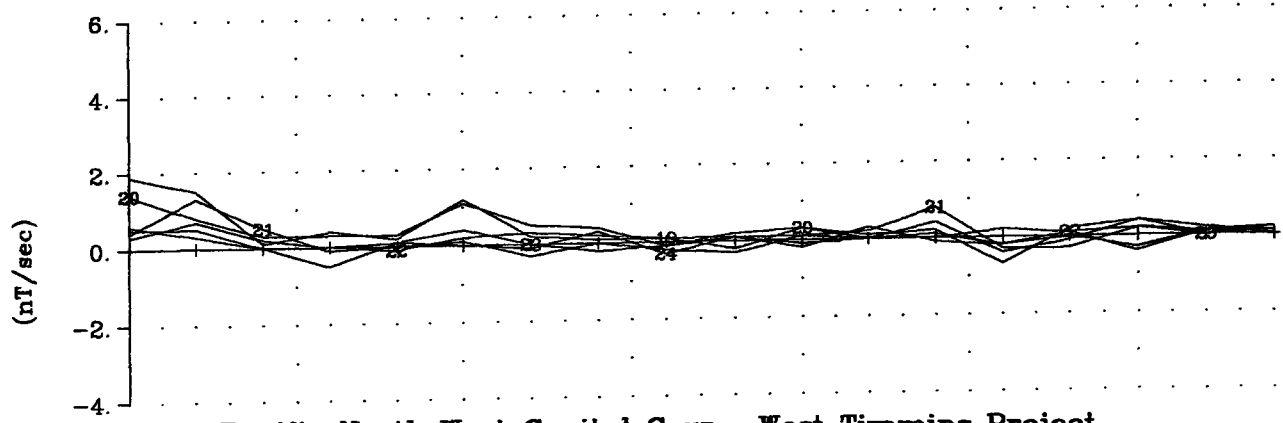
Deviation from TP.
 (% Total Theoretical)



Step Channels 2-4.
 Deviations from S1.
 (% Total Theoretical)



Pulse EM Off-time
 Channels 19-24
 (nT/sec)



Pacific North West Capital Corp. West Timmins Project
 Hole WTM-05-13 (GRID 5) Z Component
 Crone Geophysics & Exploration Ltd.

APPENDIX VI:
CRONE INSTRUMENT SPECIFICATIONS

CRONE PULSE EM SYSTEM

SYSTEM DESCRIPTION

The Crone Pulse EM system is a time domain electromagnetic method (TDEM) that utilizes an alternating pulsed primary current with a controlled shut-off and measures the rate of decay of the induced secondary field across a series of time windows during the off-time. The system uses a transmit loop of any size or shape. A portable power source feeds a transmitter which provides a precise current waveform through the loop. The receiver apparatus is moved along surface lines or down boreholes.

The transmitter cycle consists of slowly increasing the current over a few milliseconds, a constant current, abrupt linear termination of the current, and finally zero current for a selected length of time in milliseconds. The EMF created by the shutting-off of the current induces eddy currents in nearby conductive material thus setting-up a secondary magnetic field. When the primary field is terminated, this magnetic field will decay with time. The amplitude of the secondary field and the decay rate are dependent on the quality and size of the conductor. The receiver, which is synchronized to the off-time of the transmitter, measures this transient magnetic field where it cuts the surface coil or borehole probe. These readings are across fixed time windows or "channels".

SYSTEM TERMINOLOGY

Ramp Time

"Ramp time" refers to the controlled shut-off of the transmitter current. Three ramp times are selectable by the operator; 0.5ms, 1.0ms, and 1.5ms. By controlling the shut-off rather than having it depend on the loop size and current ensures that the same waveform is maintained for different loops so data can be properly compared.

The 1.5ms ramp is the normally used setting for good conductors. It keeps the early channel responses on scale and decreases the chance of overload. The faster ramp times of 1.0ms and 0.5ms will enhance the early time responses. This can be useful for weak conductors when data from the higher end of the frequency spectrum is desired.

Time Base

Time base is the length of time the transmitter current is off (it includes the ramp time). This also equals the on time of the current. Eight time bases are selectable by the operator. They include the original time bases used in the analog system as well as time bases to eliminate the effects of powerline interference. The eight time bases are as follows: compatible to analog Rx: 10.89ms, 21.79ms; 60hz powerline noise reduction: 8.33ms, 16.66ms, & 33.33ms; 50hz powerline noise reduction: 10.00ms, 20.00ms, & 40.00ms

Since readings are taken during the off cycles, the time base will have an effect on the receiver channels. Normally, a standard time base is selected for the type of system and survey being used, but this can be changed to suit a particular situation. A longer time base is preferred for conductors of greater time constants, and in surveys such as resistive soundings where more channels are desired.

Zero Time Set

The term "zero time set" or "ZTS" refers to the starting point for the receiver channel measurements. It is manually set on the receiver by the operator thus allowing adjustments for the ramp times and fine tuning for any fluctuations in the transmitter signal.

Receiver Channels

The rate of decay of the secondary field is measured across fixed time windows which occupy most of the off-time of the transmitter. These time windows are referred to as "channels". These channels are numbered in sequence with "1" being the earliest. The analog and datalogger receivers measured eight fixed channels. The digital receiver, being under software control, offers more flexibility in the channel positioning, channel width, and number of channels.

PP Channel

The PEM system monitors the primary field by taking a measurement during the current ramp and storing this information in a "PP channel". This means that data can be presented in either normalized or unnormalized formats, and additional information is available during interpretation. The PP channel data can provide useful diagnostic information and helps avoid critical errors in field polarity.

Synchronization

Since the PEM system measures the secondary field in the absence of the primary field, the receiver must be in "sync" with the transmitter to read during the off-time. There are three synchronization methods available: cable connection, radio telemetry, and crystal clock. This flexibility enhances the operational capabilities of the system.

SURVEY METHODS

The wide frequency spectrum of data produced by a Pulse EM survey can be used to provide structural geological information as well as the direct detection of conductive or conductive associated ore deposits. The various types of survey methods, from surface and borehole, have greatly improved the chances of success in deep exploration programs. There are eight basic profiling methods as well as a resistivity sounding mode.

Moving Coil

A small, multi-turn transmitter loop (13.7m diameter) is moved for each reading while the receiver remains a fixed distance away. This method is ideal for quick reconnaissance in areas of high background conductivity.

Moving Loop

Same as Moving Coil method, but with a larger transmit loop (100 to 300 meters square). This method provides deeper penetration in areas of high background conductivity, and works best for near-vertical conductors. This method can be used in conjunction with the Moving In-loop survey for increased sensitivity to horizontal conductors.

Moving In-Loop

A transmit loop of size 100 to 300 meters square is moved for each reading while the receiver remains at the center of the loop. This method provides deep penetration in areas of very high background conductivity, and works best for near-horizontal conductors. It can be used in conjunction with the Moving Loop survey.

Large In-Loop

A very large, stationary transmit loop (800m square or more) is used, and survey lines are run inside the loop. This mode provides very deep penetration (700m or more) and couples best with shallow dip conductors (<45 deg.) under the loop.

Deepem

A large, stationary transmit loop is used, and survey lines are run outside the loop. This mode provides very deep penetration, and couples best with steeply dipping conductors (>45 deg.) outside the loop.

Borehole (Z Component only)

Isolated Borehole: A drill hole is surveyed by lowering a probe down a hole and surveying it with a number of transmit loops laid out on surface. The data from multiple loops gives directional information on the conductors.

Multiple Boreholes: One large transmit loop is used to survey a number of closely spaced holes. The change in anomaly from hole to hole provides directional information. These methods have detected conductors to depths of 2500m from surface and up to 200m from the hole.

3-D Borehole

Drill holes are surveyed with both the Z and the XY borehole probes. The X and Y components provide accurate direction information using just one transmit loop.

Since the probe rotates as it moves down the hole a correction is required for the X-Y data. This is accomplished in one of two ways. The standard approach is to use the measurement of the primary field from the "PP" channel, apply a "cleaning" algorithm to remove most of the secondary field contamination, and compare this to theoretical values. The amount of probe rotation is then calculated, and the correction can be made. The second method involves the use of an optional orientation device for the X-Y probe which is produced in co-operation with IFG Corp. This attachment uses dipmeters to calculate the probe rotation.

Underground Borehole

Underground drill holes can be surveyed in any of the above mentioned borehole methods with one or more transmit loops on the surface. Near-horizontal holes can be surveyed using a push-rod system.

Resistivity Soundings

By reading a large number of channels in the centre of a transmit loop it is possible to perform a decay curve analysis giving a best-fit layer earth model using programs such as ARRTI or TEMIX.

EQUIPMENT

Transmit Loops

The PEM system can operate with practically any size of transmit loop, from a multi-turn circular loop 13.7m in diameter, to a 1 or 2 turn loop of any shape up to 1 or 2 kilometers square using standard insulated copper wire of 10 or 12 gauge. The multi-turn loop is made in two sections with screw connectors. The 10 or 12 gauge loop wire comes on spools in either 300m or 400m lengths. The spools can be mounted on packframe winders for laying out or retrieving.

Power Supply

The PEM system normally operates with an input voltage from 24v to 120v. Modifications have recently been made to increase the power to 240 volts. The maximum current is still 20 amps. For low power surveys a 20amp/hr 24v battery can be used. The power supply requires a motor generator and a voltage regulator to control and filter the input voltage to the transmitter.

Specifications: PEM Motor Generator

- 4.5 hp Wisconsin, (2 kw) - 11 hp Honda (4 kw); 4 cycle engine
- belt drive to D.C. alternator
- cable output to regulator

- maximum output: 120v, 20amp (2 kw); 240v, 20amp (4 kw)
- fuse type overload protection

- steel frame
- external gas tank
- unit weight: 33kg (2 kw); 52kg (4 kw)
- optional packframe
- wooden shipping box
- shipping weight: 47kg (2 kw); 80kg (4 kw)

Specifications: PEM Variable Voltage Regulator

- selectable voltage between 24v and 120v or 48v and 240v
- 20amp maximum current
- fuse and internal circuit breaker protection
- cable connections to motor generator and transmitter
- anodized aluminum case
- unit weight 10kg; shipping weight 18kg
- padded wooden shipping box

Transmitter

The transmitter controls the bi-polar on-off waveform and linear current shut-off ramp. The latest 2000w PEM Transmitter has the following specifications:

Specifications: PEM Transmitter

- time bases: 10.89ms, 21.79ms, 8.88ms, 16.66ms, 33.33ms, 10ms, 20ms, 30ms
- ramp times: 0.5ms, 1.0ms, 1.5ms
- operating voltage: 24v to 120v (2 kw); 48v to 240v (4 kw)
- output current: 5amp to 20amp
- monitors for input voltage, output current, shut-off ramp, tx loop continuity, instrument temperature, and overload output current
- automatic shut-off for open loop, high instrument temperature, and overload
- fuse and circuit breaker overload protection
- three sync modes: 1) built-in radio and antenna
2) cable sync output for direct wire link to receiver or remote radio
3) connectors for the crystal clock
- anodized aluminum case
- optional packframe
- unit weight 12.5kg; shipping weight 22kg
- padded wooden shipping box

Receiver

The receivers measure the rate of decay of the secondary field across several time channels. Three types of receivers are available with the PEM system: Analog Rx, Datalogger Rx, and Digital Rx. The Analog Rx and Datalogger Rx read eight fixed time channels while the Digital Rx, under software control, offers a variety of channel configurations. The Digital Rx has been used in the field for contract surveys since 1987.

Specifications: Digital PEM Receiver

- operating temperature -40°C to 50°C
- optional packframe
- unit weight 15kg; shipping weight 25.5kg
- padded wooden shipping box

Menu driven operating software system offering the following functions:

- controls channel positions, channel widths, and number of channels
- time bases: 10.89ms, 21.79ms, 8.88ms, 16.66ms, 33.33ms, 10ms, 20ms, and 30ms
- ramp time selection
- sample stacking from 512 to 65536
- scrolling routines for viewing data
- graphic display of decay curve and profile with various plotting options
- routines for memory management
- control of data transmission
- provides information on instrument and operating status

Sync Equipment

There are three modes of synchronization available; radio, cable, and crystal clock. The radio sync signal can be transmitted through a booster antenna from either the PEM Transmitter internal radio or through a Remote Radio.

Specifications: Sync Cable

- 2 conductor, 24awg, Teflon coated
- approx. 900m per aluminum spool with connectors

Specifications: Remote Radio

- operating frequency 27.12mhz
- 12v rechargeable gel cell battery supply
- fuse protection
- sync wire link to transmitter
- coaxial link to booster antenna
- anodized aluminum case
- unit weight 2.7kg

Specifications: Booster Antenna

- 8m, 4 section aluminum mast
- guide rope support
- ¼ wave CB fiberglass antenna
- range up to 2km
- coaxial connection to transmitter or remote radio

Specification: Crystal Clocks

- heat stabilized crystals
- 24v rechargeable gel cell battery supply
- anodized aluminum case
- rx unit can be separate or housed in the receiver
- outlet for external supplementary battery supply

Surface PEM Receive Coil

The Surface PEM Receive Coil picks up the EM field to be measured by the receiver. The coil is mounted on a tripod that can be positioned to take readings of any component of the field.

Specifications: Surface PEM Receive Coil

- ferrite core antenna
- VLF filter
- 10khz bandwidth
- two 9v transistor battery supply
- tripod adjustable to all planes

- unit weight 4.5kg; shipping weight 13.5kg
- padded wooden shipping box

Borehole PEM Z Component Probe

The Z component probe measures the axial component of the EM field. The Z component data is not affected by probe rotation so no correction are required.

Specifications: Borehole PEM Z Component Probe

- ferrite core
- dimensions: length - 1.6m; dia - 3.02cm (3.15cm for high pressure tested probes)
- internal rechargeable ni-cad battery supply
- replaceable heat shrink tubing for abrasion protection
- pressure tested for depths 1300m, 2000m, and 2800m
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total weight 17kg

Borehole PEM XY Component Probe

The XY probe measures two orthogonal components of the EM field perpendicular to the axis of the hole. Correction for probe rotation can be achieved by two methods. The standard approach is to use the measurement of the primary field from the "PP" channel, apply a "cleaning" algorithm to remove most of the secondary field contamination, and compare this to theoretical values. The amount of probe rotation is then calculated, and the correction can be made. The second method involves the use of an optional orientation device for the X-Y probe that uses dipmeters to calculate the probe rotation.

Specifications: Borehole PEM XY Component Probe

- ferrite core
- dimensions: length - 2.01m; dia - 3.02cm
- internal rechargeable ni-cad battery supply
- selection of X or Y coils by means of a switch box on surface or automatic switching with Digital

receiver

- replaceable heat shrink tubing for abrasion protection
- pressure tested for depths to 2800m
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total shipping weight 20kg

Orientation Device

The orientation device is an optional attachment for the XY probe which measures the rotation of the probe using two dipmeters.

Specifications: Orientation Device

- 2 axis tilt sensors
- sensitivity +/- 0.1 deg.
- operating range -89.5 to -10 deg.
- dimensions: length - 0.94m; dia - 28.5cm
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total shipping weight 11kg

Borehole Equipment

To lower the probe down a drill hole requires a cable and spool, winch assembly frame and cable counter. Borehole surveys also require equipment to "dummy probe" the hole before doing the survey.

Specifications: Borehole Cable

- two conductor shielded cable
- kevlar strengthened
- lengths are available up to 2600m on three sizes of spools.
- shipped in wooden box

Specifications: Slip Ring

- attaches to side of borehole cable spool providing a connection to the receiver while allowing the spool to turn.
- VLF filter
- pure silver contacts

Specifications: Borehole Frame

- welded aluminum frame
- removable axle
- chain driven, 3 speed gear box
- hand or optional power winding
- hand brake and lock
- two sizes: standard for up to 1300m cable; larger for longer cables
- shipped in wooden box

Specifications: Borehole Counter

- attaches to the drill hole casing
- calibrated in meters
- shipped in wooden box; total weight 13kg

Specifications: Dummy Probe and Cable

- solid steel or steel pipe
- same dimensions as borehole probe
- shear pin connection to dummy cable
- steel dummy cable on aluminum spool
- cable mounts on borehole frame
- various lengths to 2600m on 3 spool sizes.

