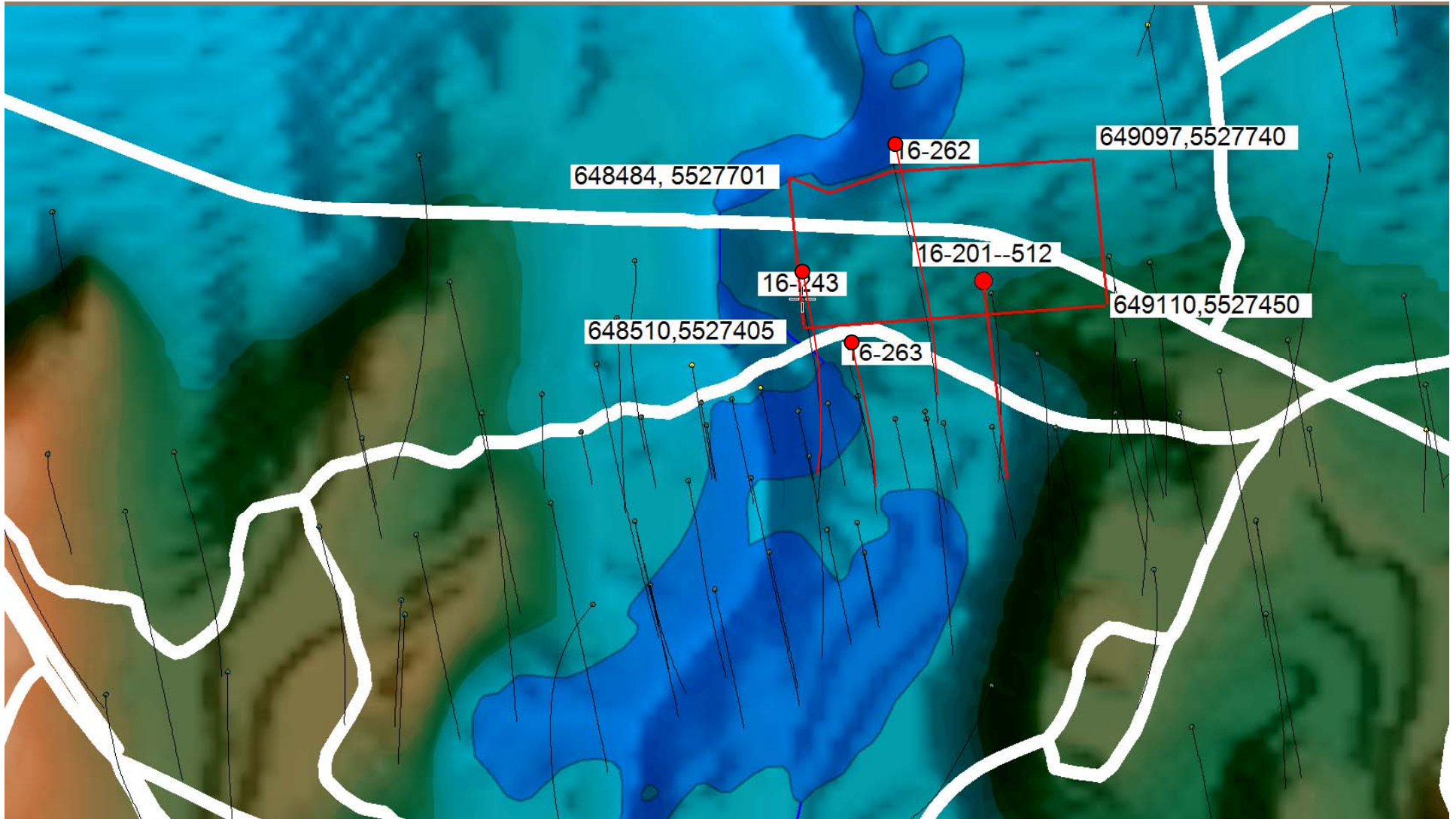




Sturgeon lake  
**BHEM 2010**

# ZONE 16 : Bell Creek LOOP and DDH LOCATION



# 16-243 BHEM CRONE 2010



Client : XSTRATA ZINC  
Propri t  : Bell Creek  
Date : 18 octobre 2010

Bouge : 16-243  
Bouie : 162010612  
Flotier : 216243.PEM

Composante Y - dB/dt nanoTesla/sec - 20 canaux et PP



X

Client : XSTRATA ZINC  
Propri t  : Bell Creek  
Date : 18 octobre 2010

Bouge : 16-243  
Bouie : 162010612  
Flotier : 216243.PEM

Composante X - dB/dt nanoTesla/sec - 20 canaux et PP



Y

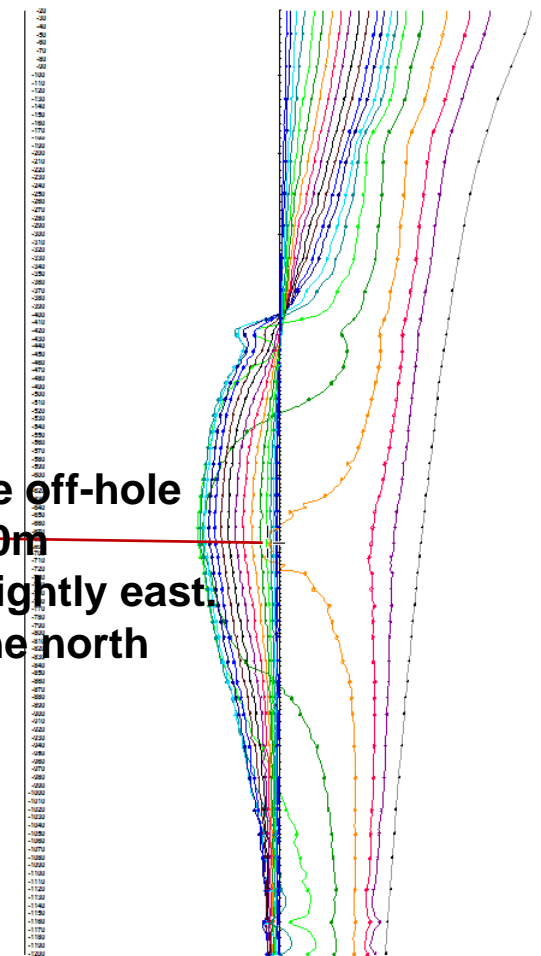
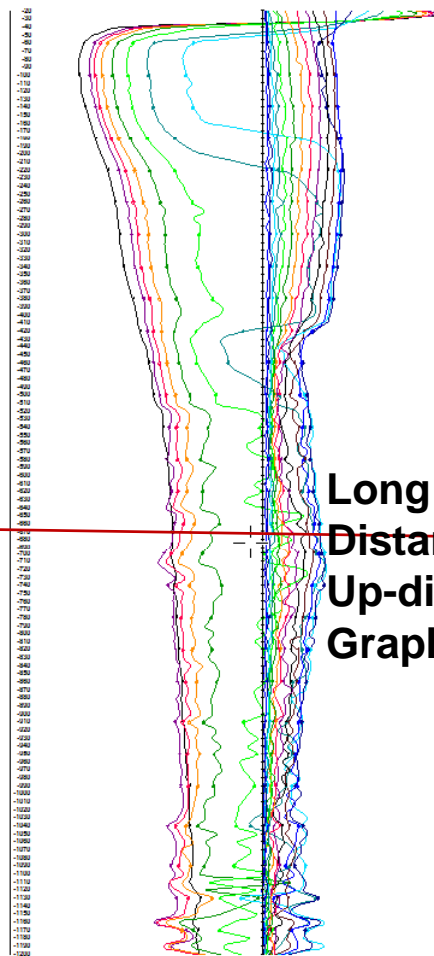
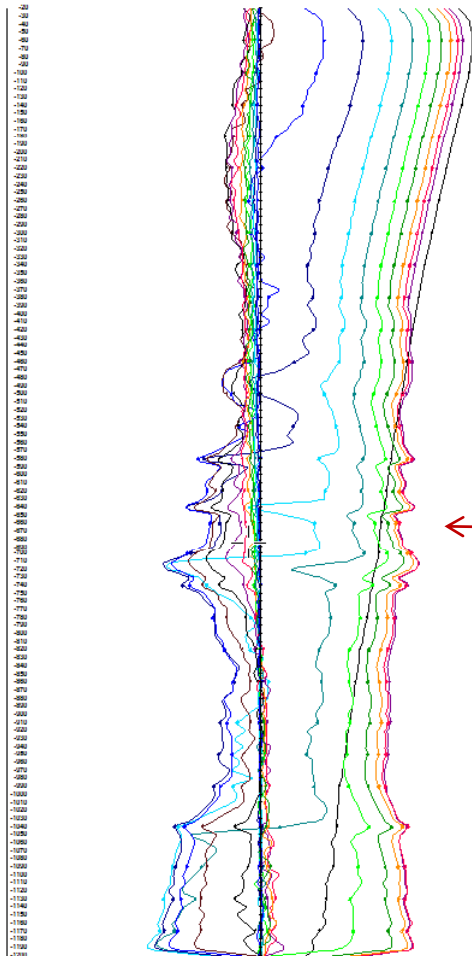
Client : XSTRATA  
Propri t  : BELL CREEK  
Date : Oct 19, 2010

Trou : 16-243  
Bouie : 162010612  
Flotier : 216243.PEM

Composante Z - dB/dt nanoTesla/sec - 20 canaux et PP



Z



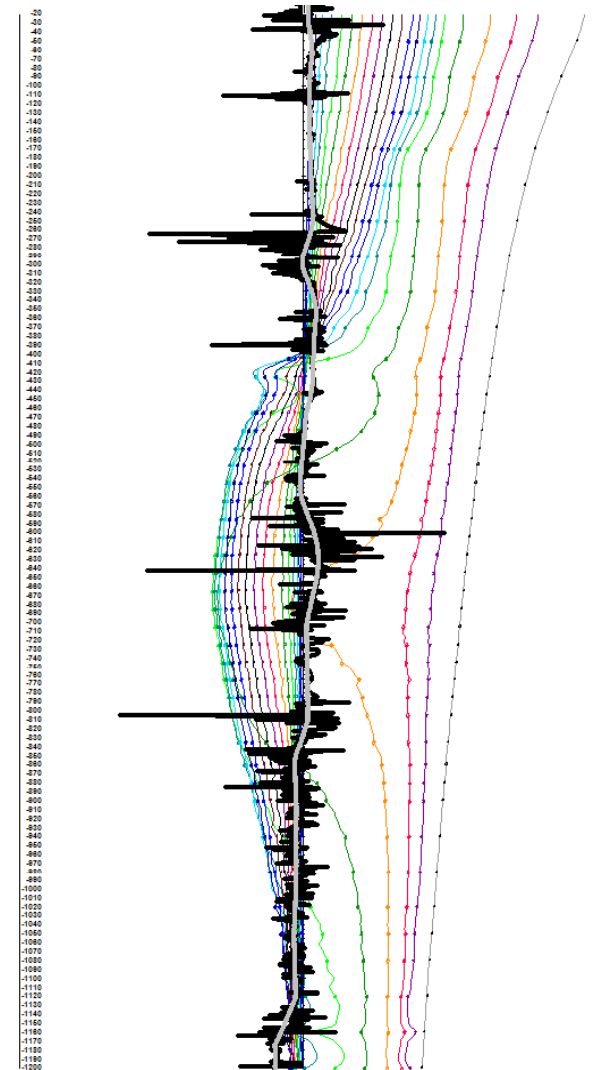
Long distance off-hole  
Distance : 150m  
Up-dip and slightly east  
Graphite to the north



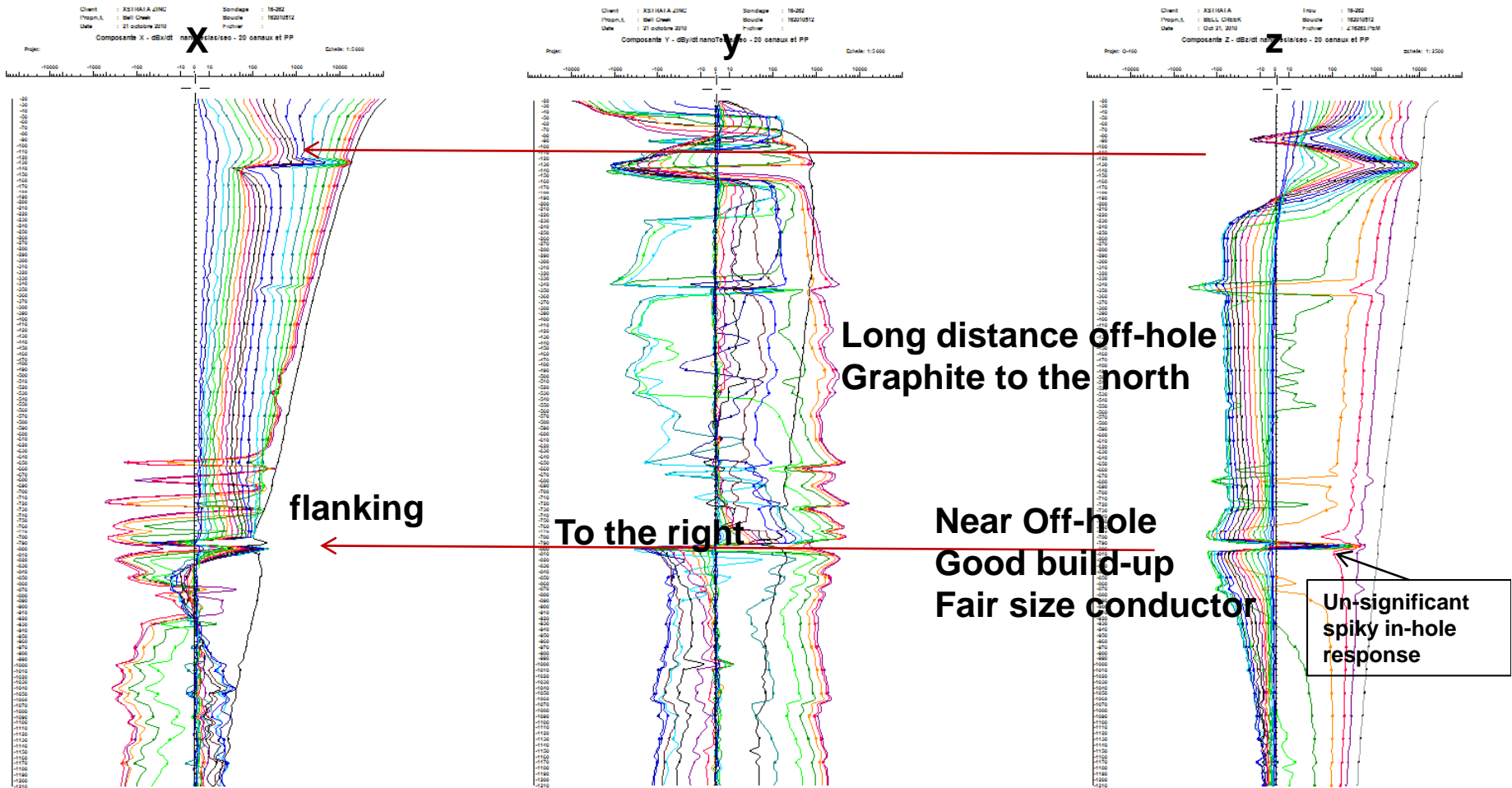
# 16-243 BH MAG CRONE 2010



No significant off-hole mag anomaly



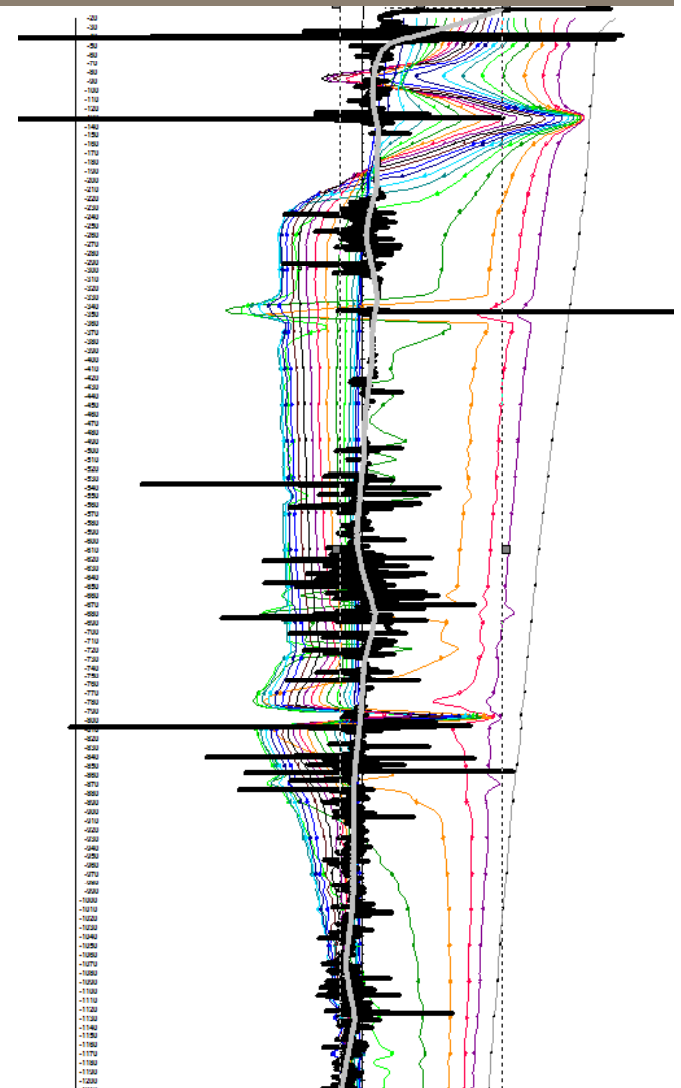
# 16-262 BHEM CRONE 2010



# 16-262 BHMAG CRONE 2010



No significant off-hole mag anomaly



# 16-263 CRONE 2010



CRONE GEOPHYSICS AND EXPLORATION LTD  
G=OPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATA ZINC      Sondage : 16-263  
Propri.Lt. : Bell Creek      Boucle : 162010512  
Date : 20 octobre 2010      Fichier :

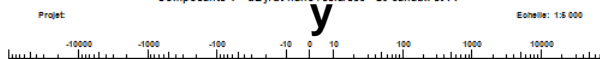
Composante X - dBx/dt nanoTesla/sec - 20 canaux et PP



CRONE GEOPHYSICS AND EXPLORATION LTD  
G=OPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATA ZINC      Sondage : 16-263  
Propri.Lt. : Bell Creek      Boucle : 162010512  
Date : 20 octobre 2010      Fichier :

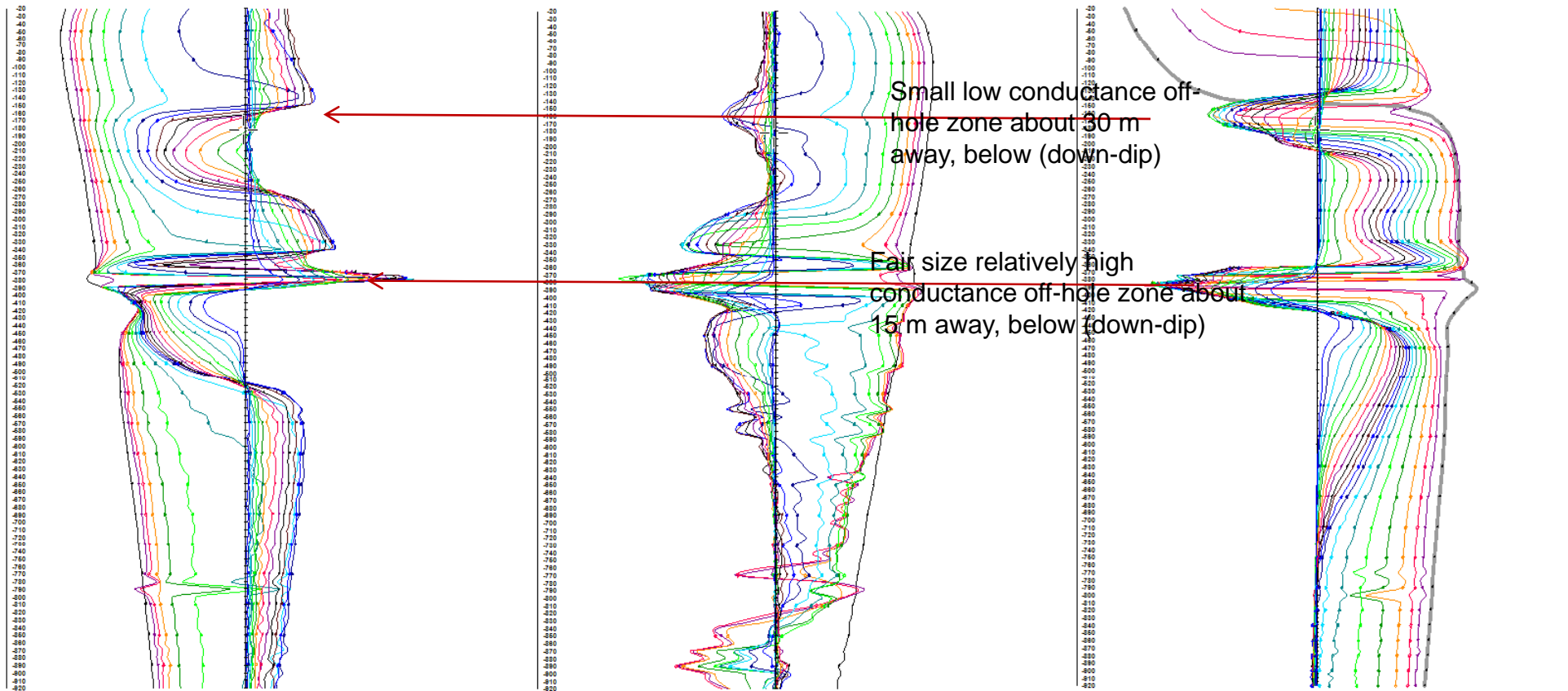
Composante Y - dB/dt nanoTesla/sec - 20 canaux et PP



CRONE GEOPHYSICS AND EXPLORATION LTD  
G=OPHYSIQUE TMC  
PULSE EM EN FORAGE

Client : XSTRATA      Trou : 16-263  
Propri.Lt. : BELL CREEK      Boucle : 162010512  
Date : Oct 20, 2010      Fichier : Z16263.PEM

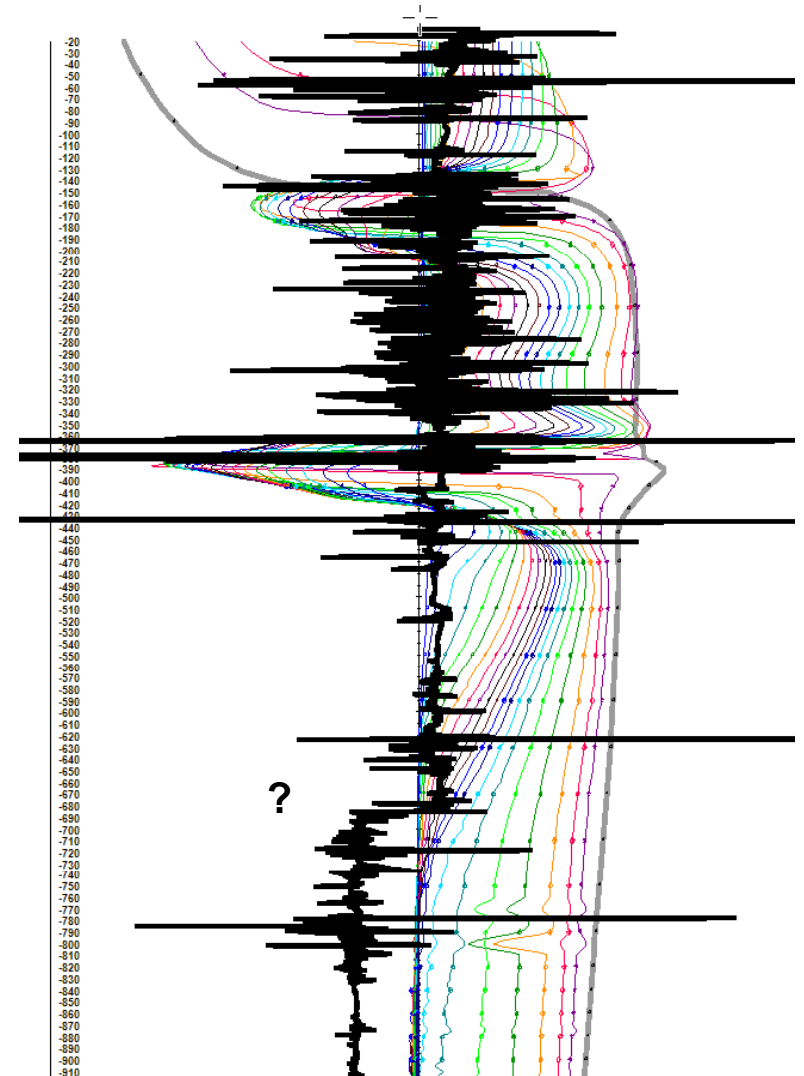
Composante Z - dBz/dt nanoTesla/sec - 20 canaux et PP



# 16-263 BH MAG CRONE 2010



No significant off-hole mag anomaly





# 16-2010-512 BHEM



Propriété : Bell Creek Boucle : 162010512  
Date : 18 octobre 2010 Fichier :

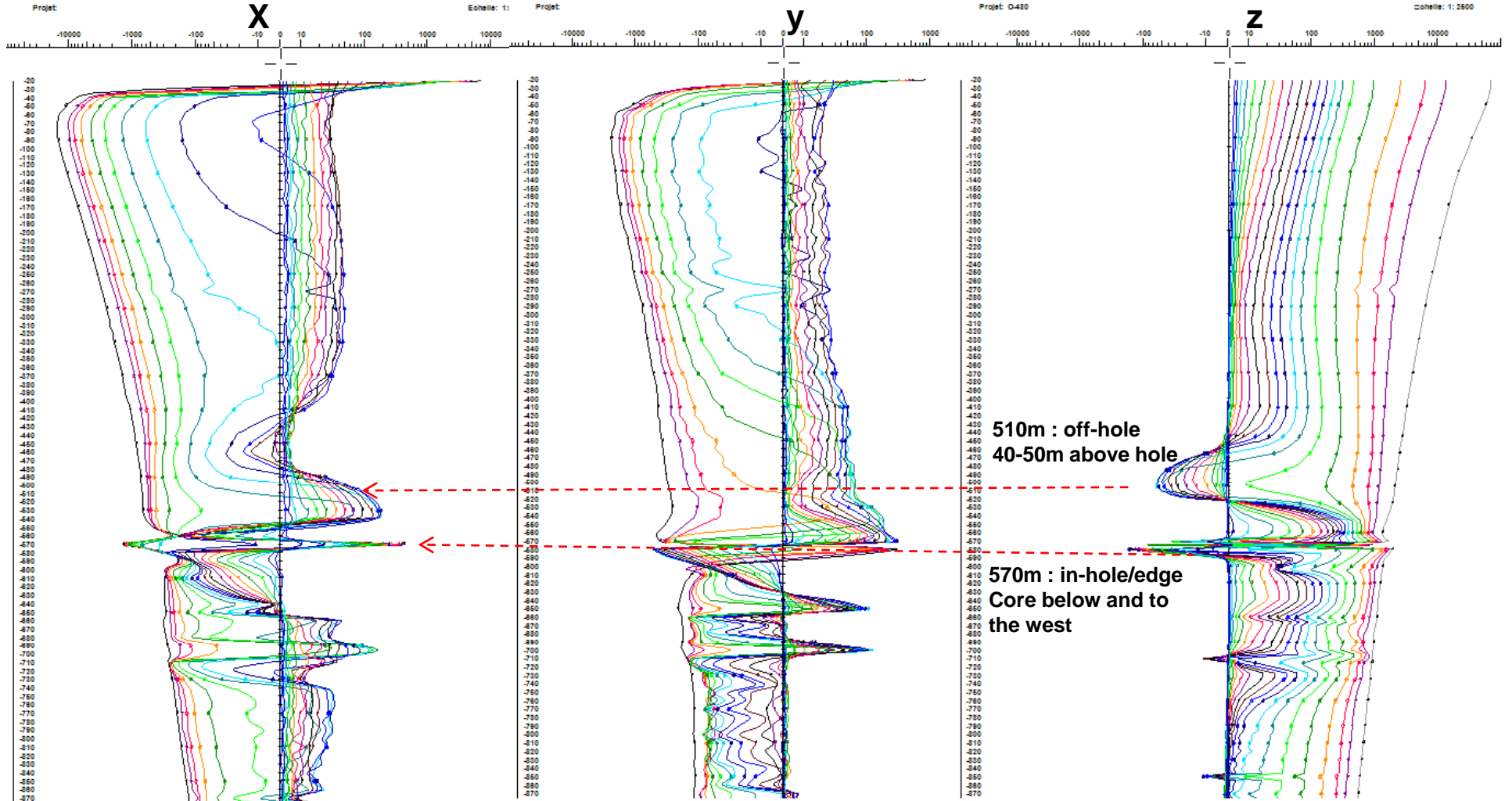
Propriété : Bell Creek Boucle : 162010512  
Date : 18 octobre 2010 Fichier :

Propriété : BELL CREEK Boucle : 162010512  
Date : Oct 18, 2010 Fichier : Z16512.PEM

Composante X - dBx/dt nanoTesla/sec - 20 canaux et PP

Composante Y - dB/dt nanoTesla/sec - 20 canaux et PP

Composante Z - dBz/dt nanoTesla/sec - 20 canaux et PP

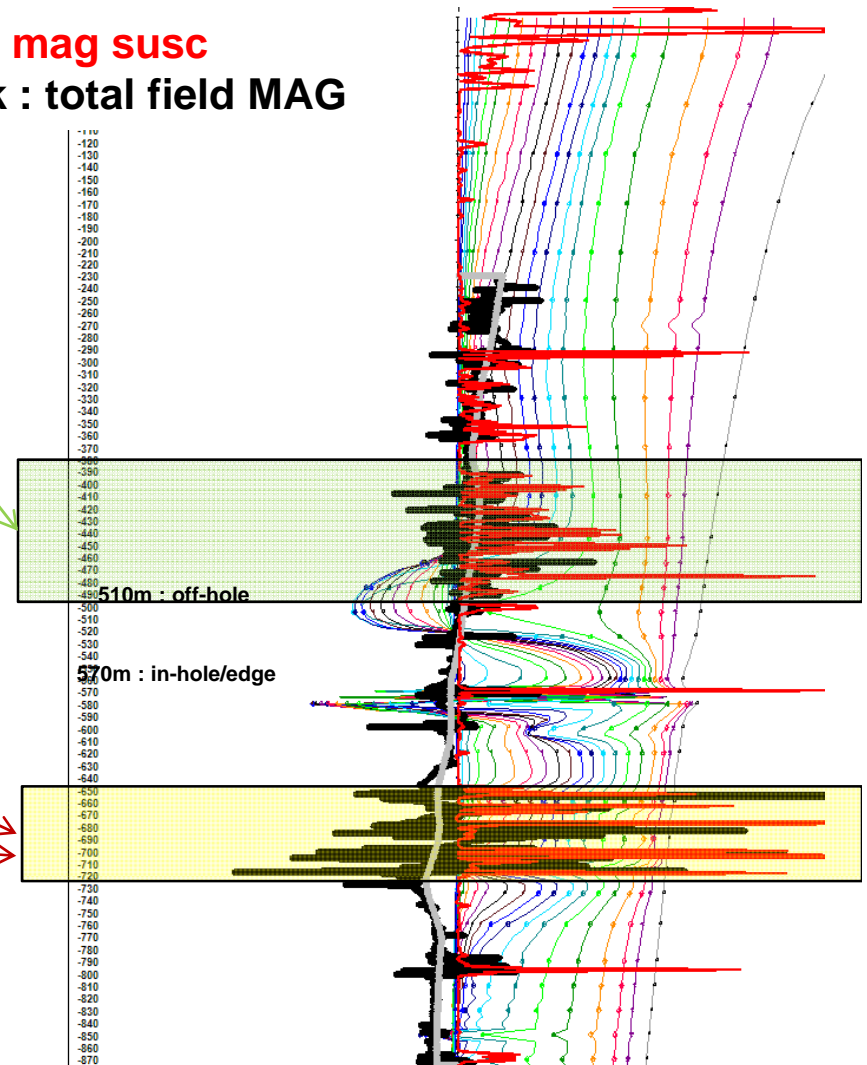


# 16-2010-512 BH MAG CRONE 2010



3.00	53.00	I2J
53.00	87.14	V2
87.14	142.90	V1(V1B)
142.90	182.83	V2(V1C)
182.83	230.50	V1B
230.50	284.10	V2/V2J
284.10	371.40	V1(V2?)
371.40	511.75	V2/V2J
511.75	529.35	V1/V1B/V1C
529.35	555.38	V2/V2J
555.38	562.87	V1/V1B/V1C
562.87	580.83	V1B
580.83	589.80	V1C/V1D
589.80	598.05	V1B
598.05	606.65	V1B
606.65	652.50	V1C/V1D
652.50	654.58	V1D/V2J
654.58	676.85	V1B/V1C
676.85	679.50	V1D/V2J
679.50	682.83	V1C/V1D
682.83	689.14	Mineralized Zone
689.14	692.70	V1C/V1D
692.70	695.90	I2J
695.90	706.93	V1C/V1D
706.93	712.60	Mineralized Zone
712.60	715.25	V1C/V1D
715.25	745.47	V1B/V1C
745.47	778.89	V1C
778.89	799.65	V1D/V2J
799.65	867.30	V1B
867.30	875.00	V1D/V2J

Red : mag susc  
Black : total field MAG

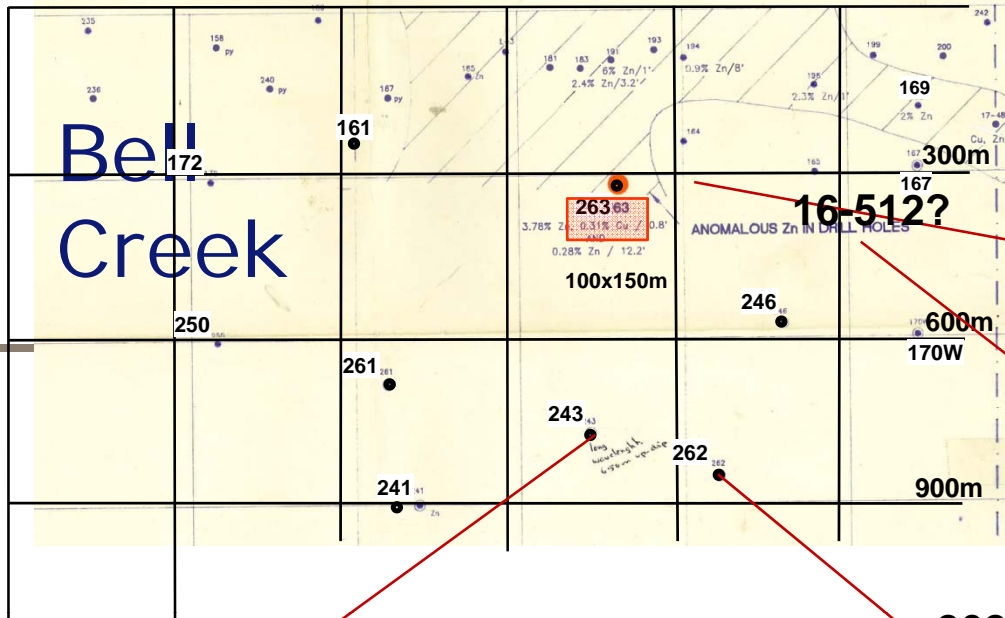


# 16-2010-512 in-hole/edge at 570m 562.87 580.83 V1B Rhyolite

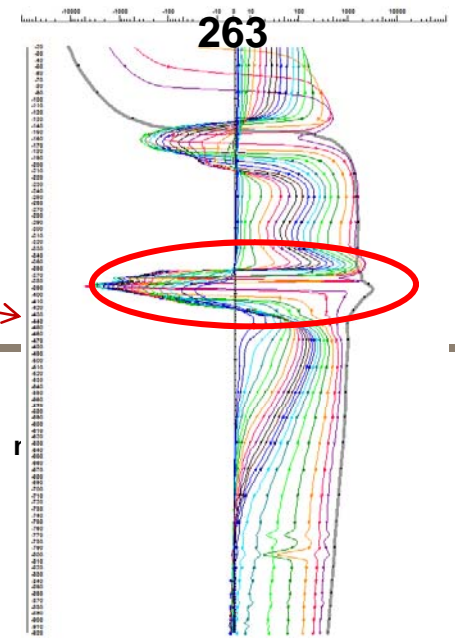


- Light grey with common darker grey bands and intervals; very fine to medium grained - quartz-phyric;
- with up to 5-10% blue and grey quartz eyes up to 4 mm in diameter; starting at 596.13 to lower contact;
- bedding (foliation?) moderate at 45-60 degrees to C.A.;
- patchy weak calcite throughout; moderate sericite throughout;
- **occasional intervals of stringer to net-textured Po > Py > Cpy - up to 30% over 0.5m;**
- 1-2% overall for the unit. Lower contact sharp and regular at 60 degrees to C.A.

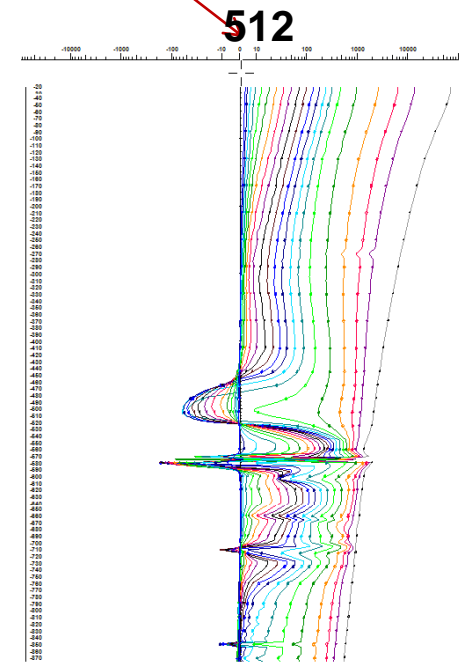
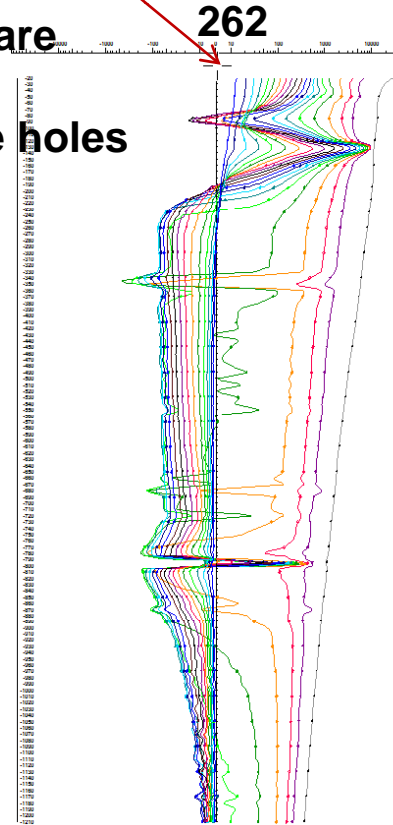
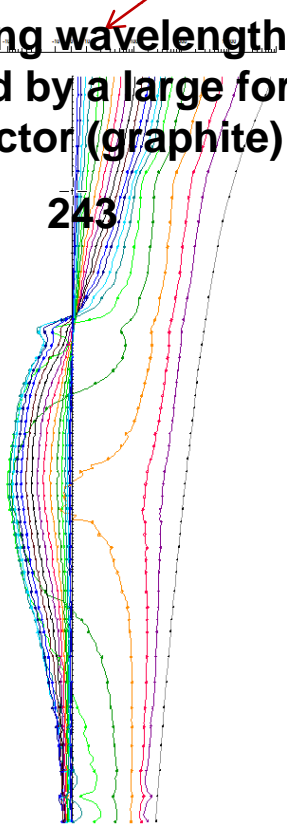




**2010 SURVEYS**



**The long wavelength anomalies are caused by a large formational conductor (graphite) north of the holes**



# BELL CREEK MAXWELL MODELLING



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**Based on the 2010 surveyed holes :**

**243, 262, 263, 512**

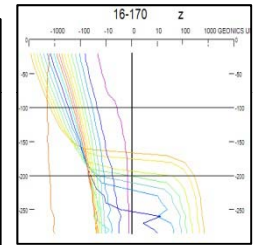
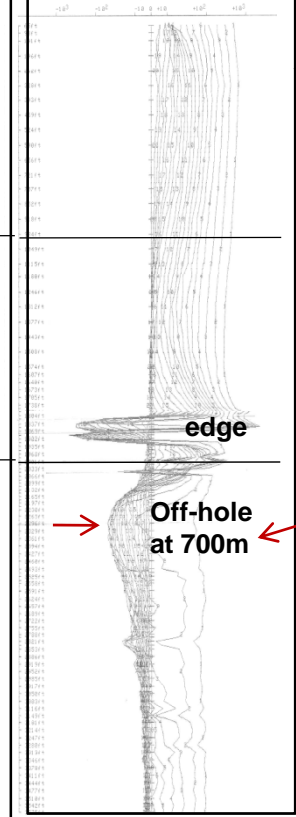
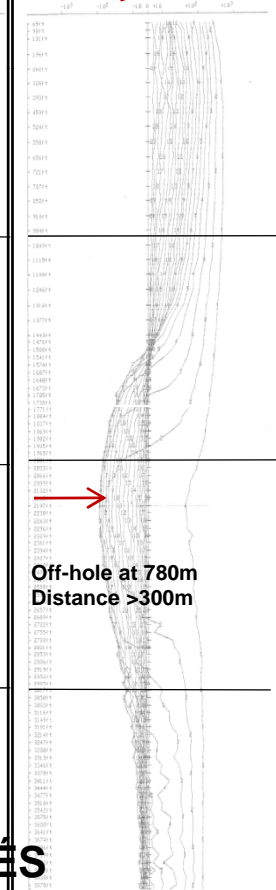
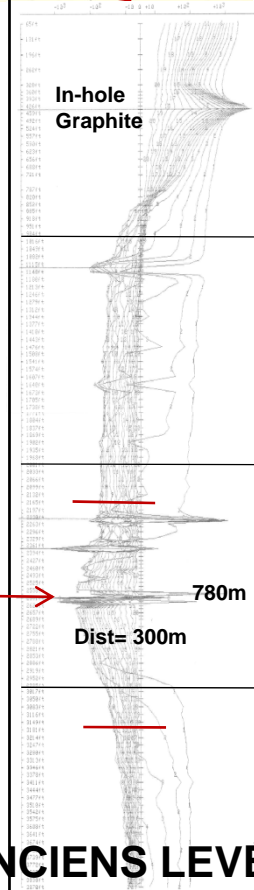
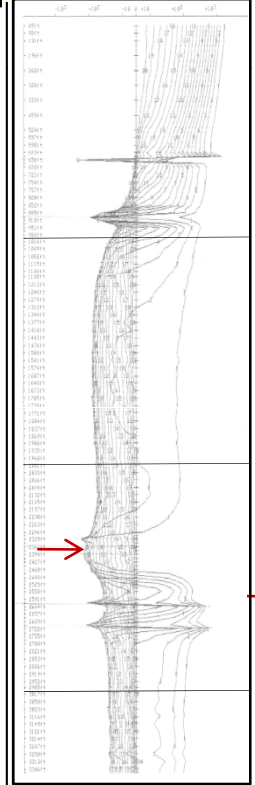
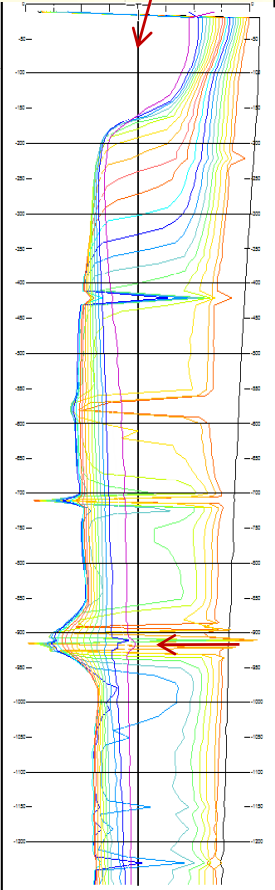
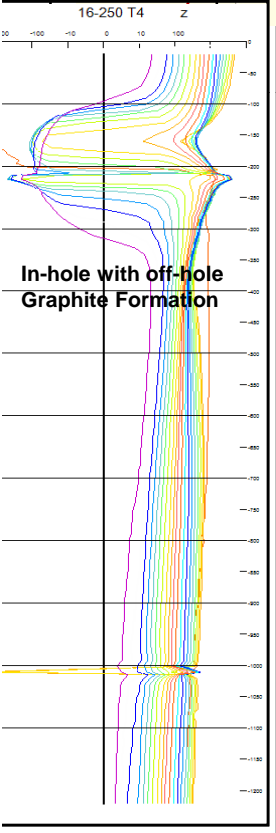
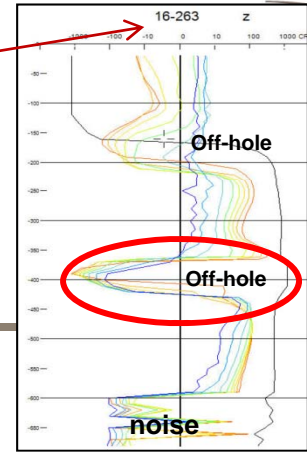
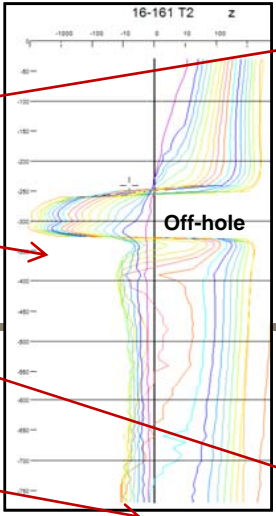
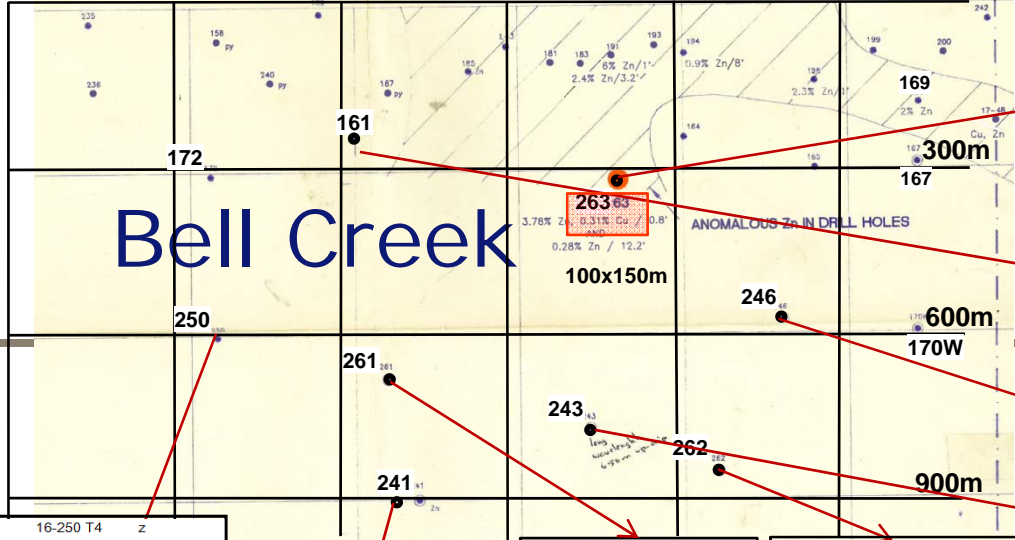
**Based also on 1989 GEONICS surveyed  
holes :**

**146, 161, 165, 167, 169, 170w, 241,  
246, 259, 261,**



# LOOPS GEONICS 1989





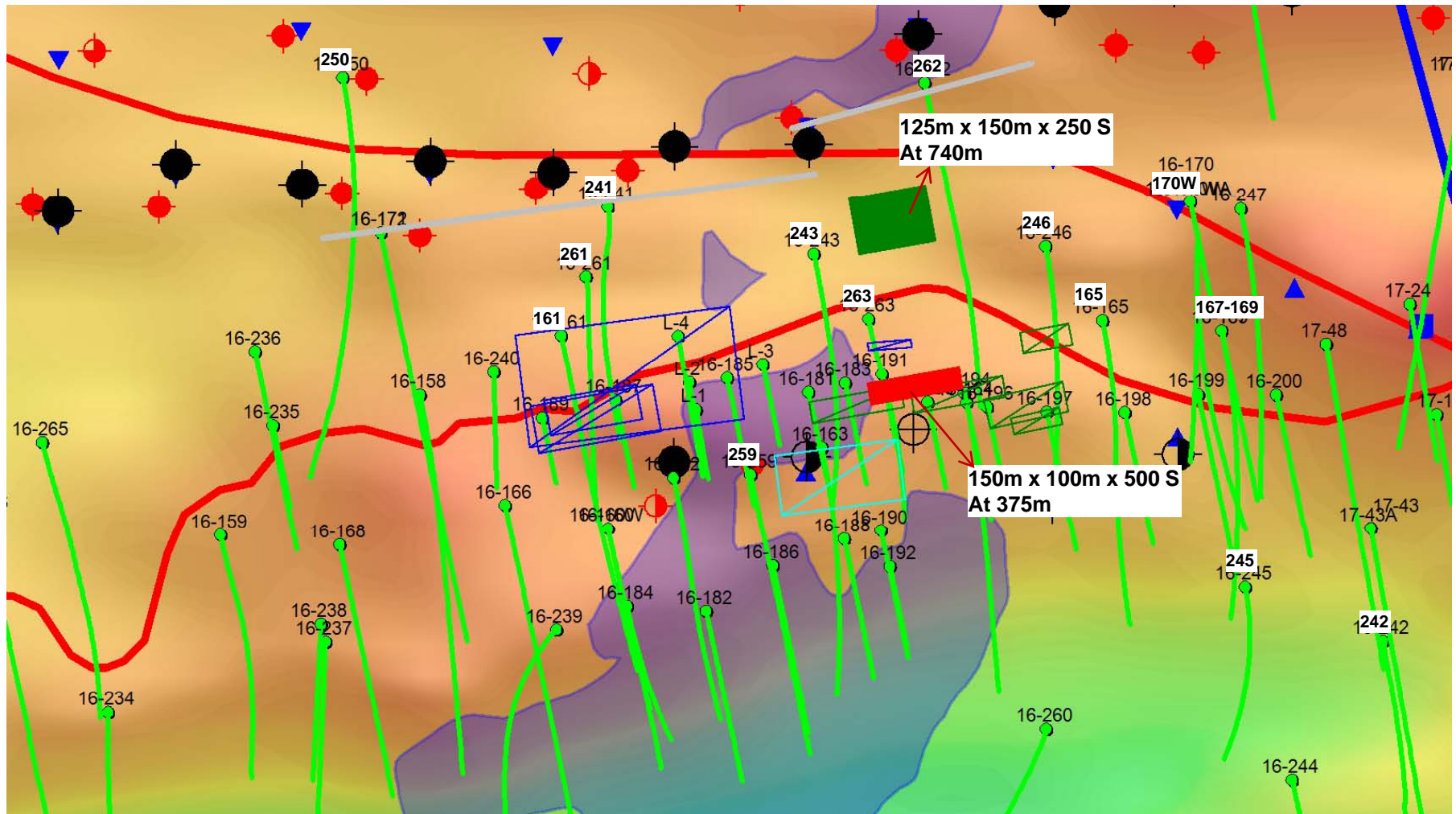
This off-hole is related to the in-hole/edge in 512

ANCIENS LEVÉS





# LOCATION of the PLATE DETECTED in 16-262 and 16-263



# Zone 16 Bell Creek Area Conclusion



Three vintage holes (16-262, 16-243 and 16-263) and one new hole (16-512) were surveyed. Numerous complex anomalies were detected as anticipated from previous surveys in 1980ies.

Directional information (x and y components) were recorded for the first time and allowed quantitative modelling using the Maxwell software package.

Based on previous ground surveys (IP and EM), three mineralised more or less conductive horizons were mapped. The BHEM revealed the same multi conductive horizons

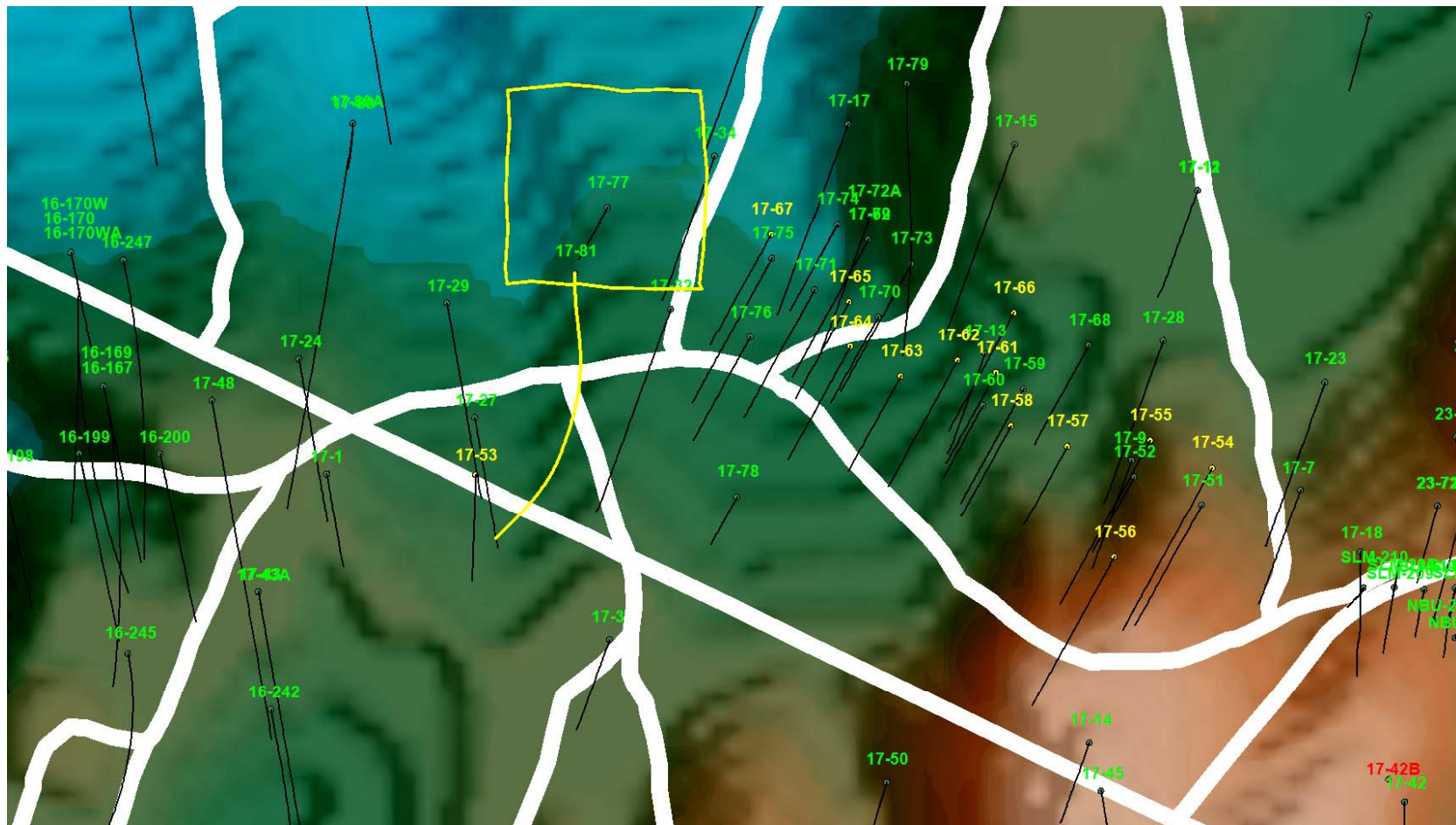
Large long wavelength fast decaying anomalies detected in many holes are explained by a graphitic formational conductor north of the zone that was intersected in the top part of ddh 262 and clearly detected by the MEGATEM survey.

12 conductors were modelled as plate. They may need to be reviewed in the light of all other geological information and distance to surrounding holes before further drilling. The best two conductors based on their size, conductance and possible nearby openings are :

- West of 16-262 at a depth of 730m there is a 250S conductor having a size of approximately 125mx150m. There is no hole in vicinity.
- Just down-dip of 16-263, there is a relatively high conductance zone which is interpreted at the right stratigraphic level. There is not a lot of open volume in the area.

# ZONE 17

# 17-81 BHEM LOOP LOCATION



# 17-81 BHEM CRONE 2010



CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC  
PULSE-EM EN FORAGE

Client : XSTRATA ZINC      Sondage : 17-81  
Propriété : Bell Creek      Boucle : 1782  
Date : 24 octobre 2010      Fichier :

Composante Y - dB/dt nanoTesla/sec - 20 canaux et PP

CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

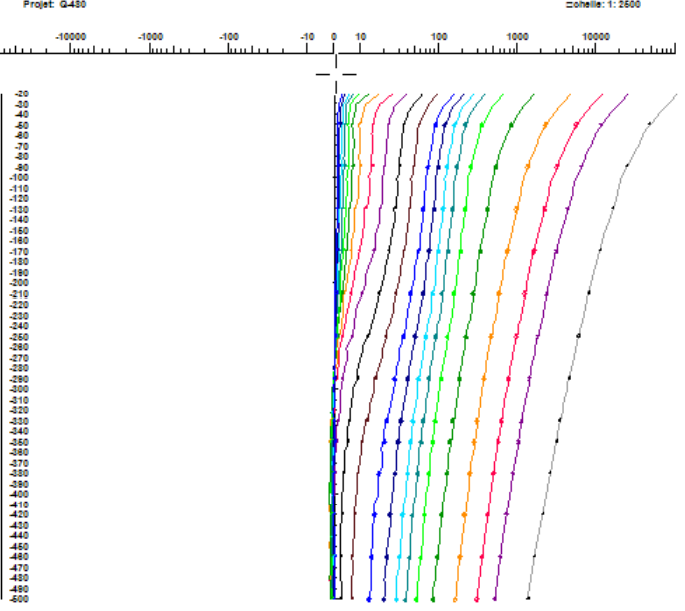
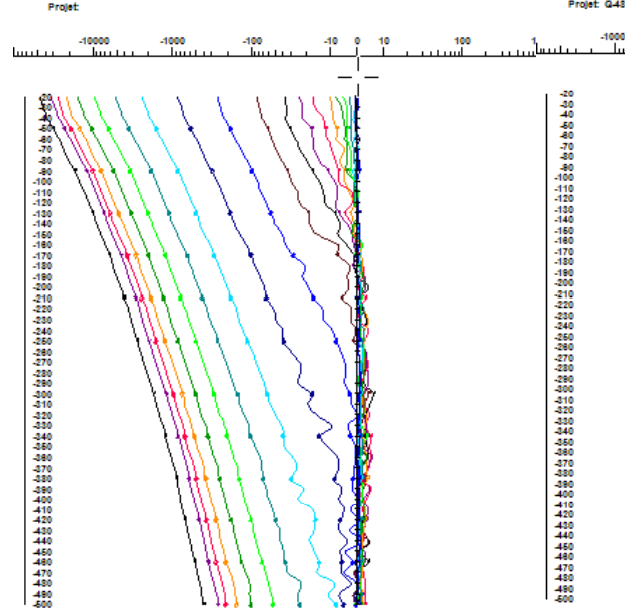
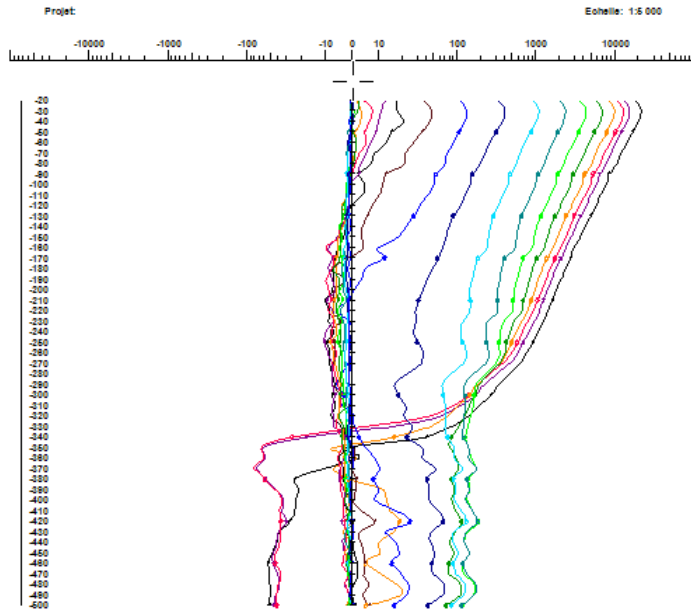
Client : XSTRATA ZINC      Sondage : 17-81  
Propriété : Bell Creek      Boucle : 1782  
Date : 24 octobre 2010      Fichier :

Composante X - dB/dt nanoTesla/sec - 20 canaux et PP

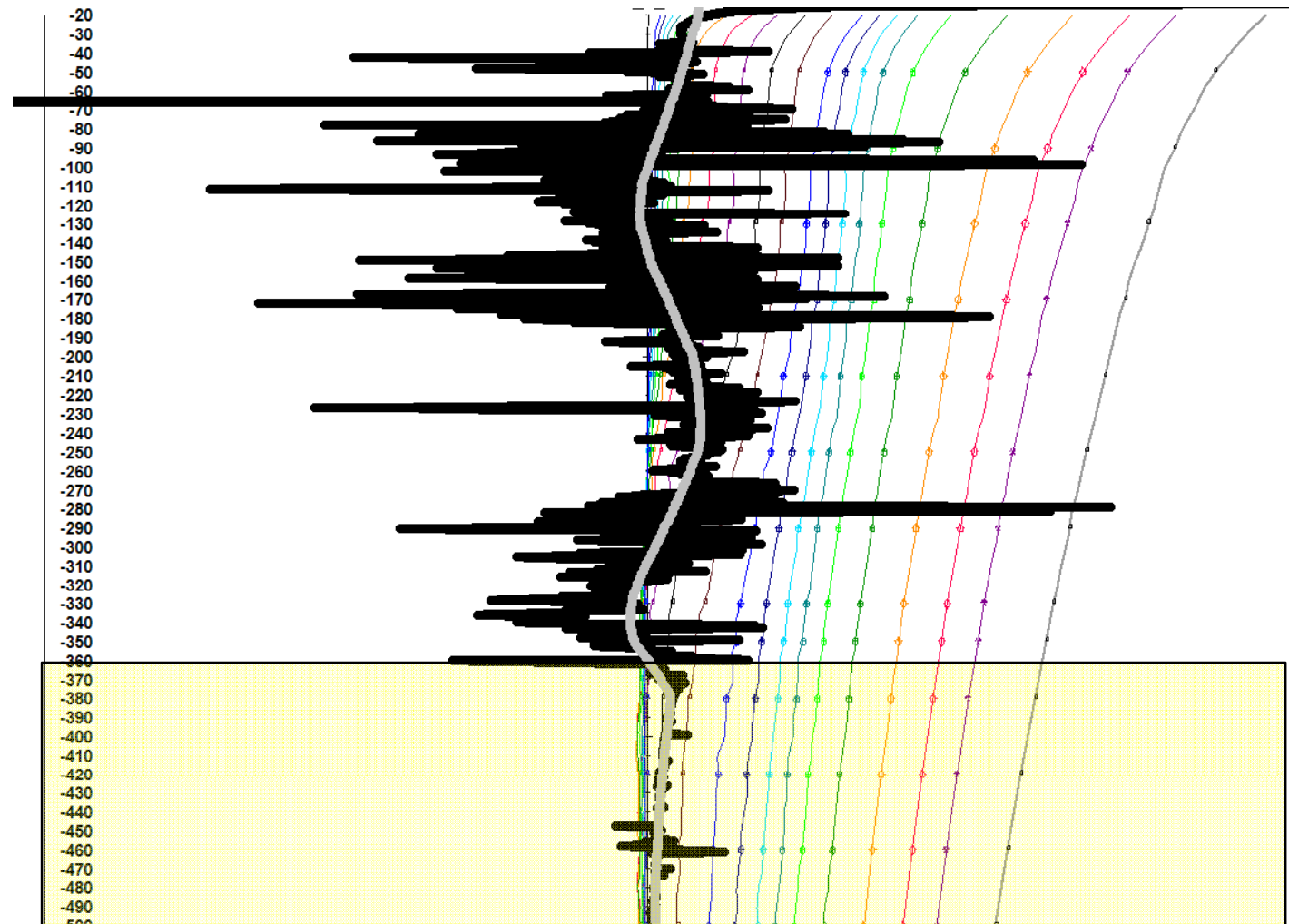
CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC  
PULSE EM EN FORAGE

Client : XSTRATA      Trou : 17-81  
Propriété : BELL CREEK      Boucle : 1782  
Date : Oct 24, 2010      Fichier : Z1781.PEM

Composante Z - dB/dt nanoTesla/sec - 20 canaux et PP



# 17-81 BH MAG CRONE 2010



# 17-2010-82 BHEM LOOP LOCATION





# 17-2010-82 BHEM



CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATA ZINC      Sondage : 17-82  
Propri.t. : Bell Creek      Boucle : 1782  
Date : 23 octobre 2010      Fichier :

Composante X - dBx/dt nanoTesla/sec - 20 canaux et PP

CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

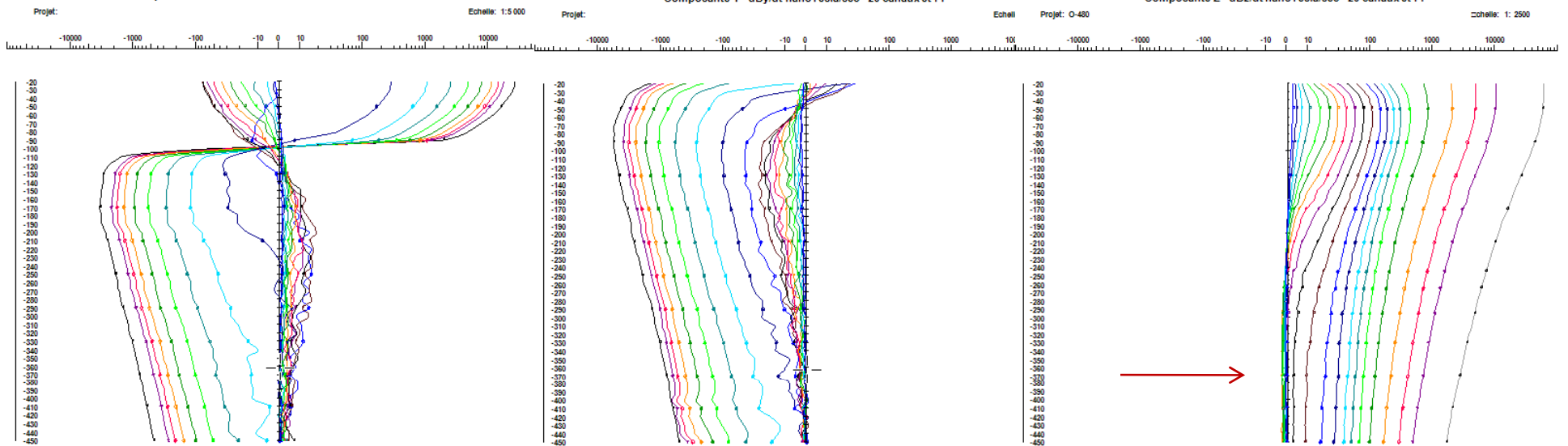
Client : XSTRATA ZINC      Sondage : 17-82  
Propri.t. : Bell Creek      Boucle : 1782  
Date : 23 octobre 2010      Fichier :

Composante Y - dB/dt nanoTesla/sec - 20 canaux et PP

CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC  
PULSE EM EN FORAGE

Client : XSTRATA      Trou : 17-82  
Propri.t. : BELL CREEK      Boucle : 1782  
Date : Oct 23, 2010      Fichier : Z1782.PEM

Composante Z - dBz/dt nanoTesla/sec - 20 canaux et PP

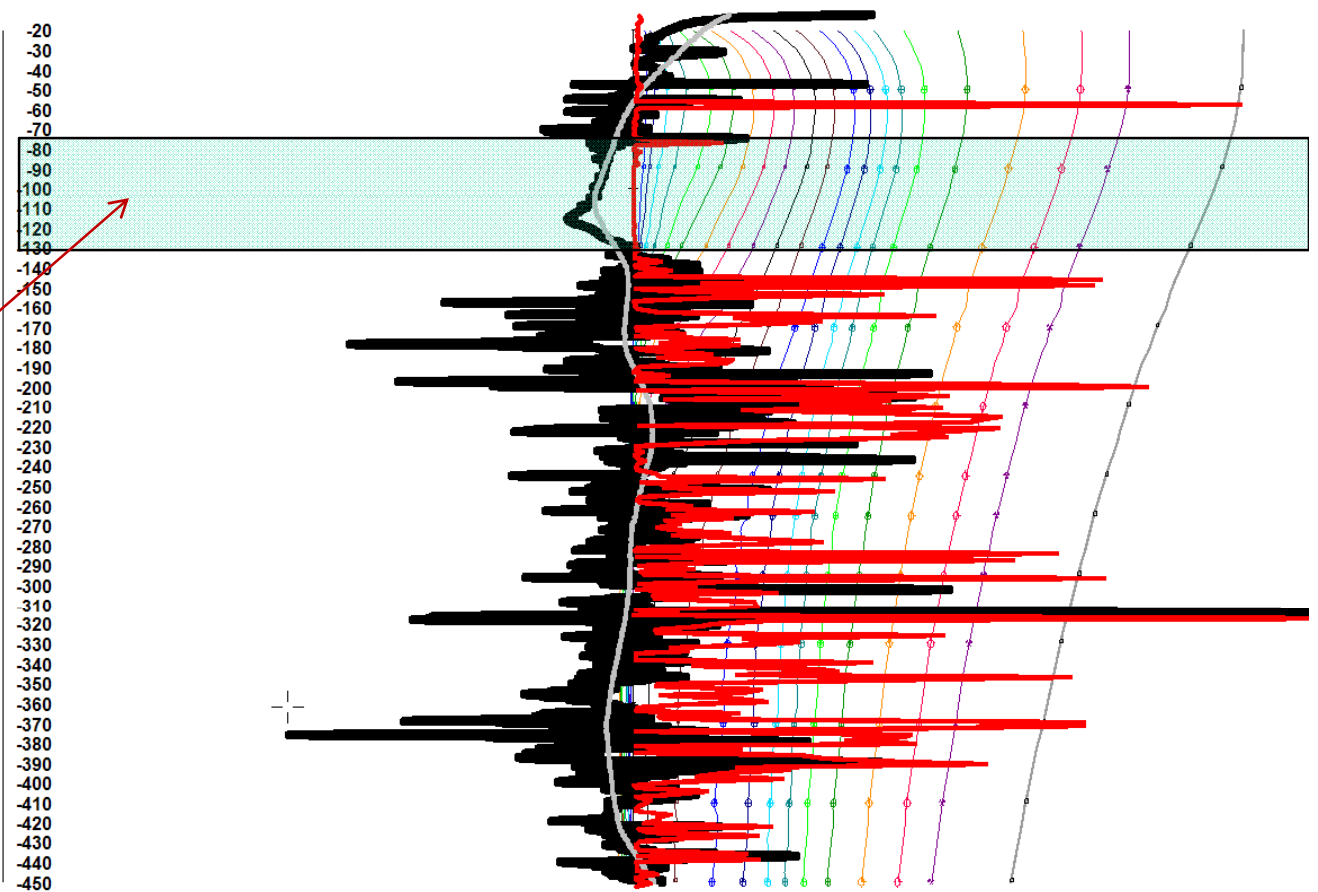


Maybe a weak long distance off-hole at the end of the hole ??

# 17-2010-82 BH MAG



From_m	To_m	RockCode
0.00	12.00	OV B
12.00	60.20	V2
60.20	62.80	T1
62.80	92.30	V1
92.30	123.60	T1
123.60	125.20	T2
125.20	233.00	V2/T1
233.00	340.00	V2/T1
340.00	400.45	V2/T1
400.45	401.60	V2
401.60	423.10	I2
423.10	452.00	V1



# 17-2010-83 BHEM LOOP LOCATION



# 17-2010-83 BHEM CRONE 2010



CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATA ZINC      Sondage : 17-83  
Propriété : Bell Creek      Boucle : 1783  
Date : 25 octobre 2010      Fichier :

Composante X - dBx/dt nanoTeslas/sec - 20 canaux et PP

CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

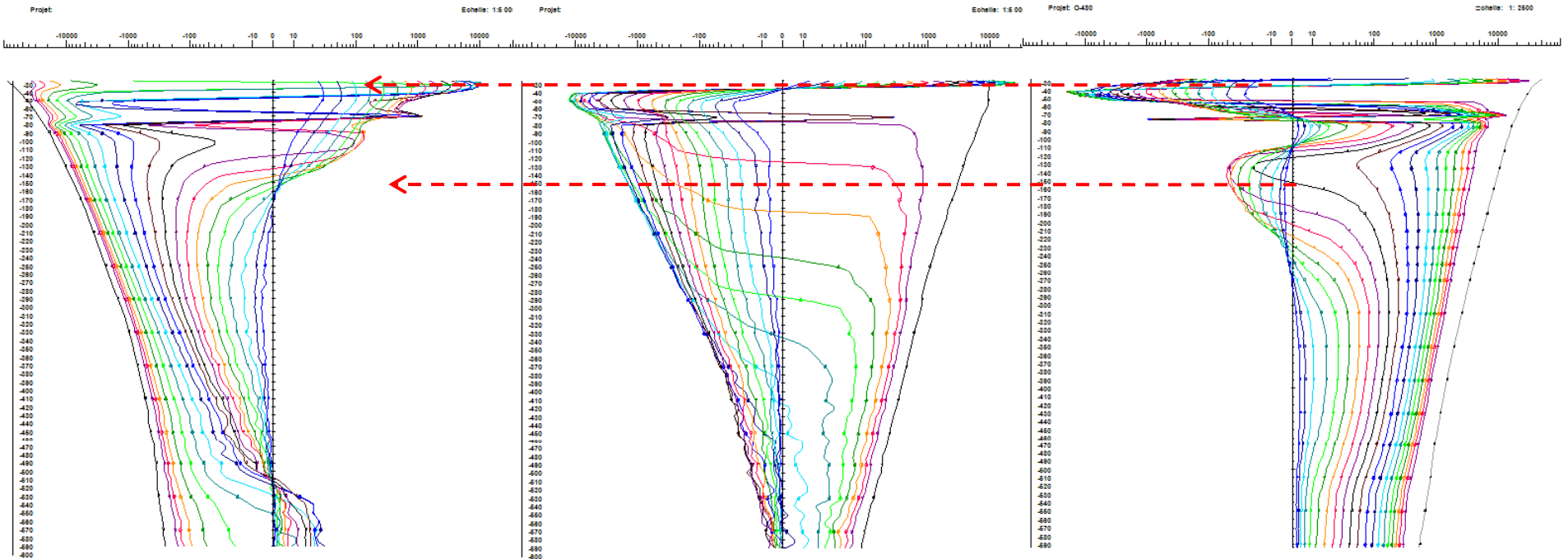
Client : XSTRATA ZINC      Sondage : 17-83  
Propriété : Bell Creek      Boucle : 1783  
Date : 25 octobre 2010      Fichier :

Composante Y - dB/dt nanoTesla/sec - 20 canaux et PP

CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC  
PULSE EM EN FORAGE

Client : XSTRATA      Trou : 17-83  
Propriété : BELL CREEK      Boucle : 1783  
Date : Oct 26, 2010      Fichier : Z1783.PEM

Composante Z - dBz/dt nanoTesla/sec - 20 canaux et PP



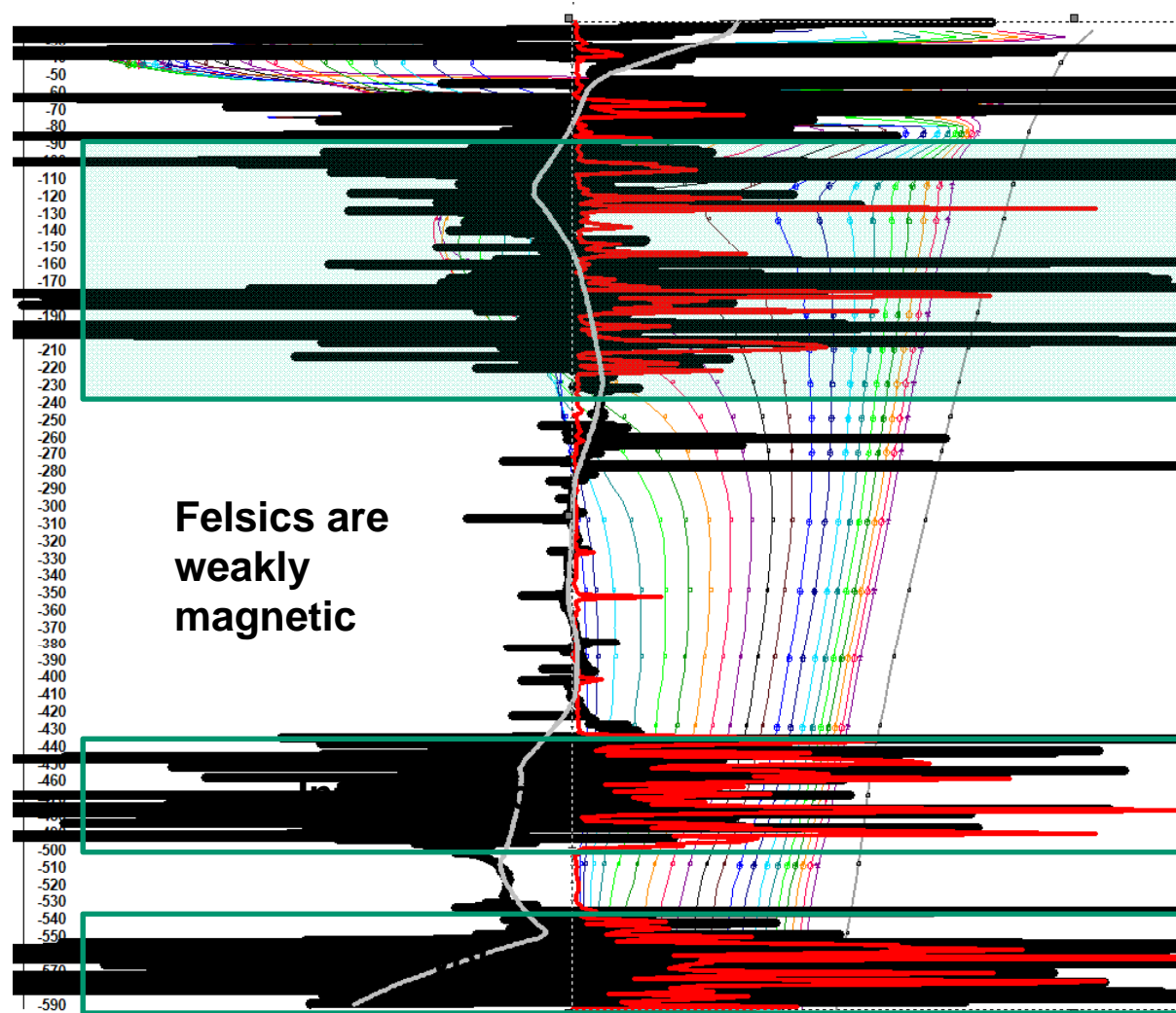
26.85	32.30	5.45	Po	1	stringer
38.33	39.93	1.60	Py	8-10	Stringer

145.50	156.90	11.40	Py	t	Bleb
--------	--------	-------	----	---	------

**Two off-holes anomalies**  
**40m: 10-20m to the right**  
**150m : fast decaying : 25m to 50m down-dip**

# 17-2010-83 BH MAG

From_m	To_m	Major Litho Log
0.00	20.00	OVB
20.00	38.33	T2
38.33	39.93	V2
39.93	65.30	V1
65.30	79.54	
79.54	90.23	T
90.23	110.20	V2J
110.20	162.80	V2
162.80	163.85	
163.85	168.76	V1B
168.76	201.18	V1
201.18	207.70	V2
207.70	221.94	V1
221.94	227.20	V2T
227.20	237.14	V2
237.14	259.80	V1B
259.80	263.13	V1C
262.13	272.97	V1D
272.97	281.88	V1C/T
281.88	289.38	V1D
289.38	293.38	V1C
293.38	305.60	V1C/V1D
305.60	320.80	V1C
320.80	328.08	V1D
328.08	353.19	V1C
353.19	380.25	V1D
380.25	380.90	V2
380.90	393.90	V1C
393.80	573.00	V2
573.00	593.25	V1





# 17-2010-84 BHEM CRONE 2010



CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATA ZINC      Sondage : 17-84  
Propri.L : Sturgeon Creek      Boucle : 1784  
Date : 30 octobre 2010      Fichier :

Composante X - dBx/dt nanoTesla/sec - 20 canaux et PP

CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

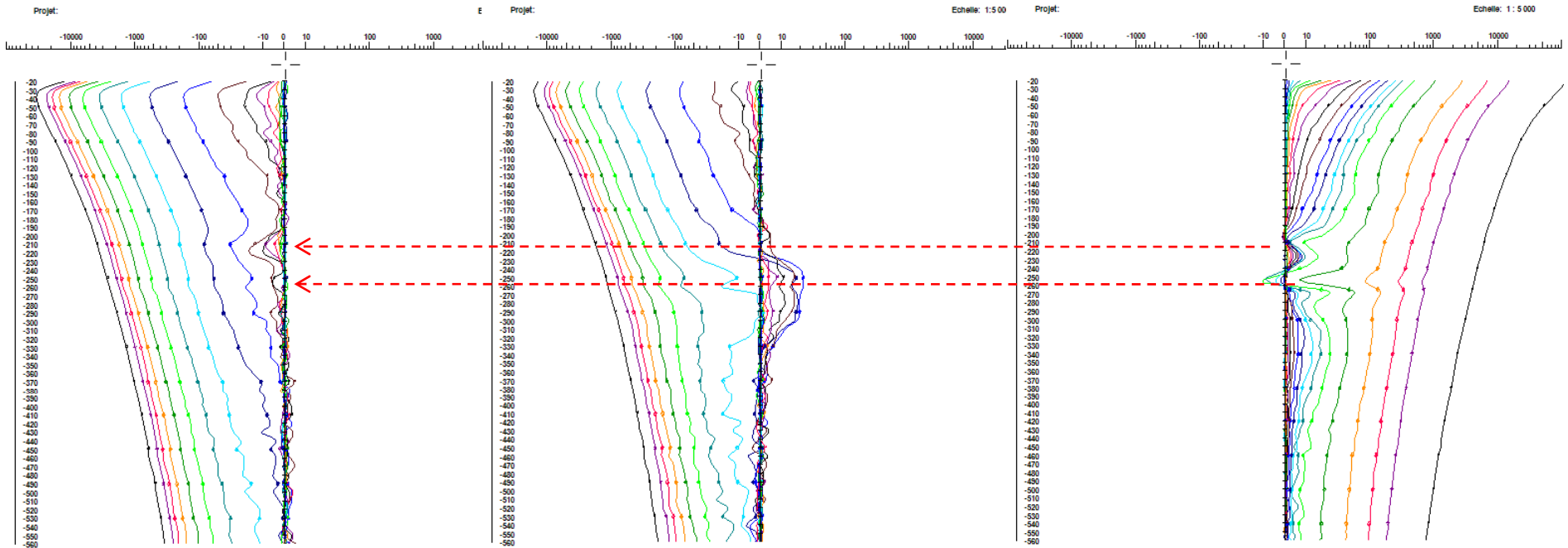
Client : XSTRATA ZINC      Sondage : 17-84  
Propri.L : Sturgeon Creek      Boucle : 1784  
Date : 30 octobre 2010      Fichier :

Composante Y - dB<sub>y</sub>/dt nanoTesla/sec - 20 canaux et PP

CRONE GEOPHYSICS AND EXPLORATION LTD  
GÉOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATA ZINC      Sondage : 17-84  
Propri.L : Sturgeon Creek      Boucle : 1784  
Date : 30 octobre 2010      Fichier :

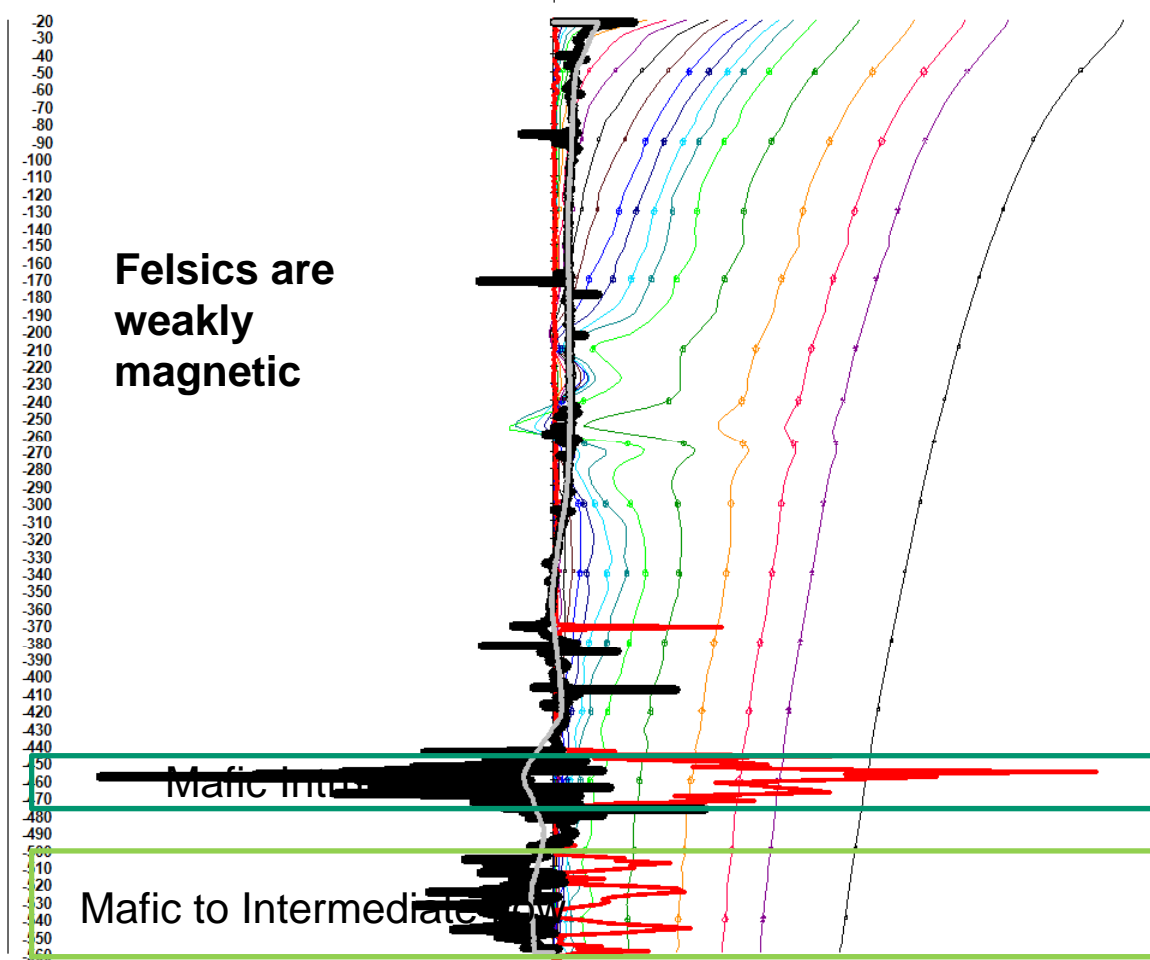
Composante Z - dB<sub>z</sub>/dt nanoTesla/sec - 20 canaux et PP



**Two weak off-hole anomalies related to small and weakly conductive zones at 215 and 260m**

# 17-2010-84 BH MAG

From_m	To_m	MajorRock Code
0.00	19.00	OVB
19.00	45.60	V1
45.60	92.20	V1
92.20	145.00	V1
145.00	181.90	V1
181.90	200.00	V1
200.00	286.40	V1
286.40	441.70	V2-V3
441.70	476.20	I3
476.20	563.00	V2-V3







# 17-2010-85 BHEM CRONE 2010



CRONE GEOPHYSICS AND EXPLORATION LTD  
GEOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATAZINC      Sondage : 17-85  
Propri. : Bell Creek      Boucle : 1785  
Date : 1er novembre 2010      Fichier :

Composante X - dB/dt nanoTesla/sec - 20 canaux et PP

Projet: Echelle: 1:5 000

CRONE GEOPHYSICS AND EXPLORATION LTD  
GEOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATAZINC      Sondage : 17-85  
Propri. : Bell Creek      Boucle : 1785  
Date : 1er novembre 2010      Fichier :

Composante Y - dBy/dt nanoTesla/sec - 20 canaux et PP

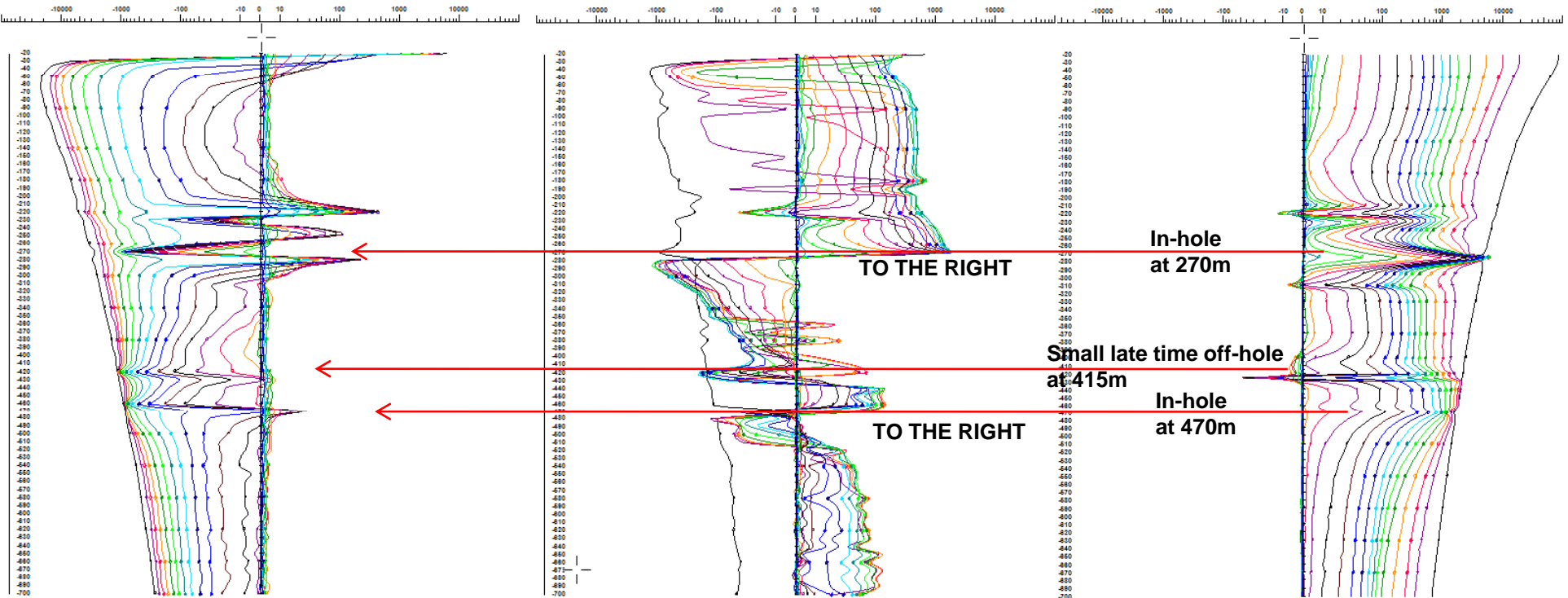
Projet: Echelle: 1:5 000

CRONE GEOPHYSICS AND EXPLORATION LTD  
GEOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATAZINC      Sondage : 17-85  
Propri. : Bell Creek      Boucle : 1785  
Date : 1er novembre 2010      Fichier :

Composante Z - dBz/dt nanoTesla/sec - 20 canaux et PP

Projet: Echelle: 1:5 000

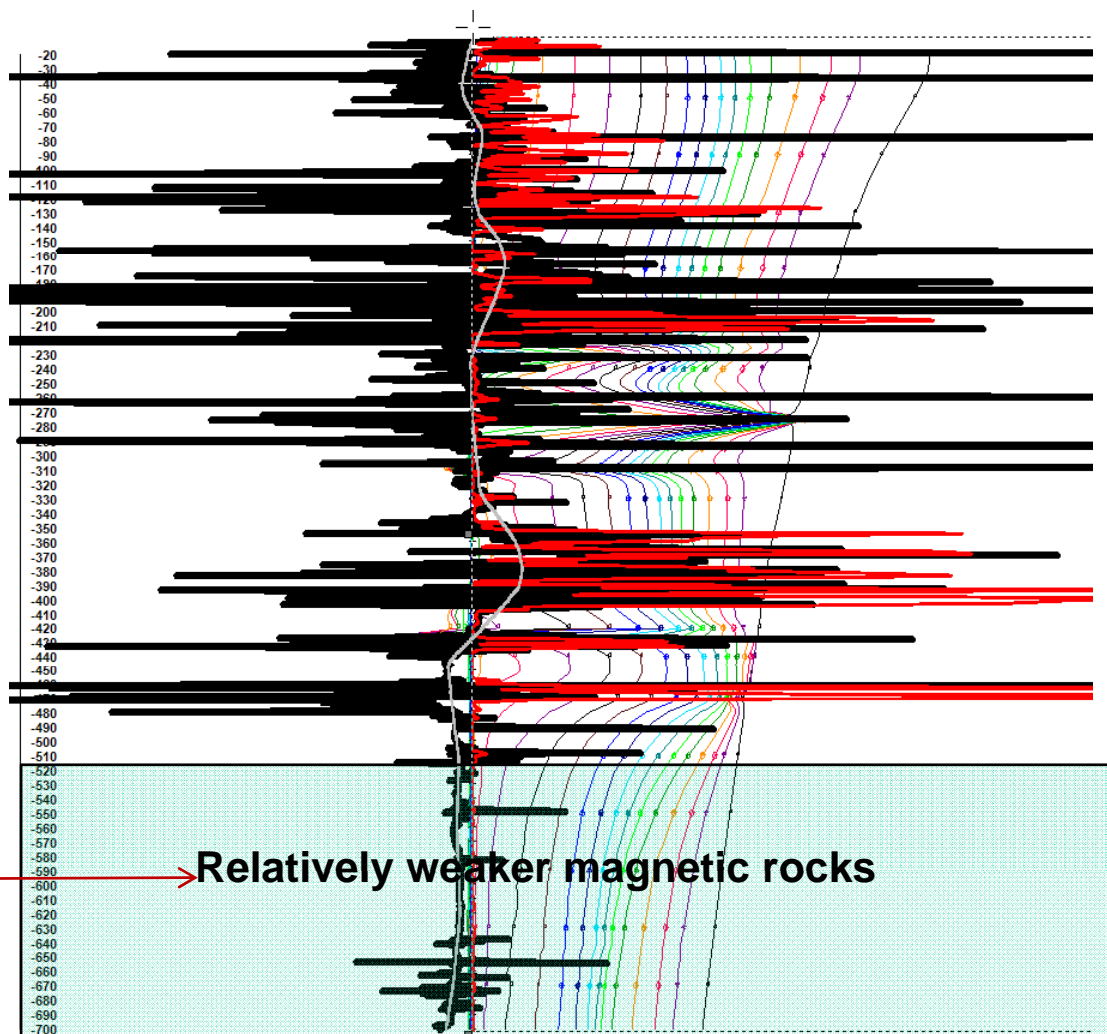


265.75	273.40	7.65	Po	1
273.40	274.00	0.60	Po-Cpy-Sph	15
274.14	274.27	0.13	Sph	25
475.07	492.35	17.28	P <sub>v</sub> -Po	10

→ 1.69%Zn /1m

# 17-2010-85 BH MAG

From_m	To_m	Major Rock Code
0.00	6.90	OVB
6.90	133.55	I2J
133.55	159.45	V2
159.45	174.10	V2
174.10	214.39	V2
214.39	240.90	V1
240.90	256.40	V2
256.40	265.75	V1
265.75	280.80	V1B
280.80	285.67	V2
285.67	333.03	V1B
333.03	418.48	V3
418.48	514.53	V1B
514.53	542.69	V1
542.69	701.00	V1



## Group 17 Conclusion

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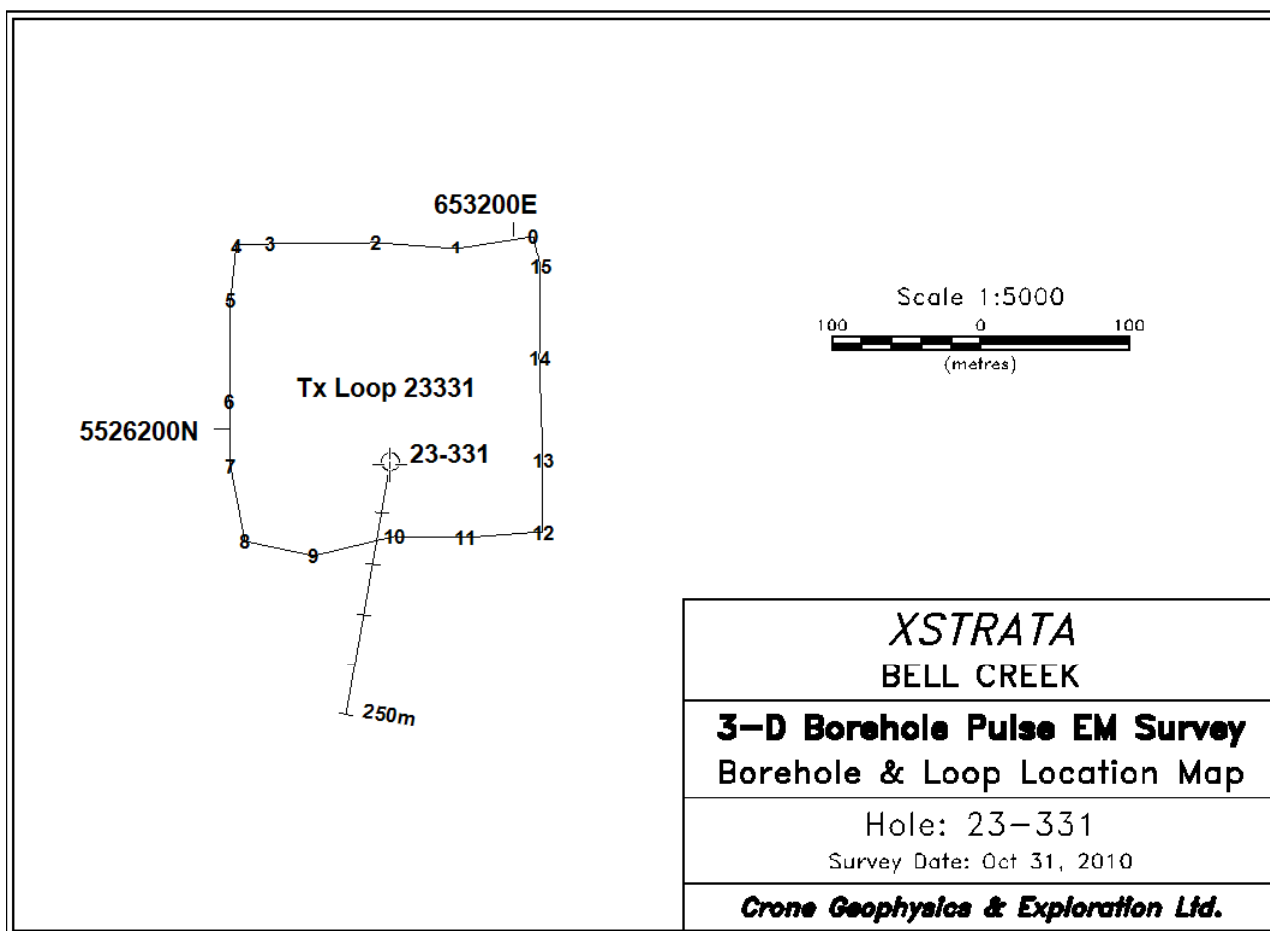
**No significant conductor were detected.**

**Only weak anomalies were detected in 17-2010-82, 17-2010-84 and an relatively small in-hole in 17-2010-85 at 270 m where 1.69% Zn, 0.12% Cu 6.4 ppm Ag / 1.00m was intersected.**

# GROUP 23



# 23-331 BHEM LOOP LOCATION



# 23-331 BHEM CRONE 2010



CRONE GEOPHYSICS AND EXPLORATION LTD  
GEOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATAZINC      Sondage : 23-331  
Propri. : Bell Creek      Boucle : 23331  
Date : 31 octobre 2010      Fichier :

Composante X - dBx/dt nanoTeslas/sec - 20 canaux et PP

Projet:      Echelle: 1:5 000

CRONE GEOPHYSICS AND EXPLORATION LTD  
GEOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATAZINC      Sondage : 23-331  
Propri. : Bell Creek      Boucle : 23331  
Date : 31 octobre 2010      Fichier :

Composante Y - dB/dt nanoTesla/sec - 20 canaux et PP

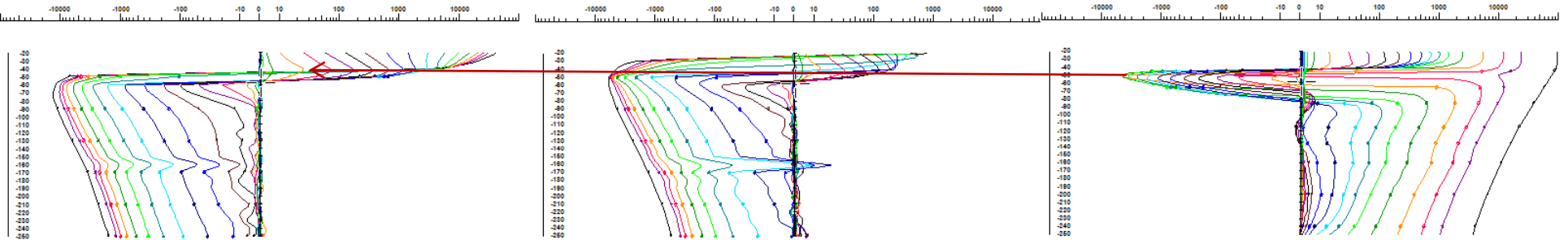
Projet:      Echelle: 1:5 000

CRONE GEOPHYSICS AND EXPLORATION LTD  
GEOPHYSIQUE TMC INC.  
PULSE-EM EN FORAGE

Client : XSTRATAZINC      Sondage : 23-331  
Propri. : Bell Creek      Boucle : 23331  
Date : 31 octobre 2010      Fichier :

Composante Z - dBz/dt nanoTesla/sec - 20 canaux et PP

Projet:      Echelle: 1:6 000

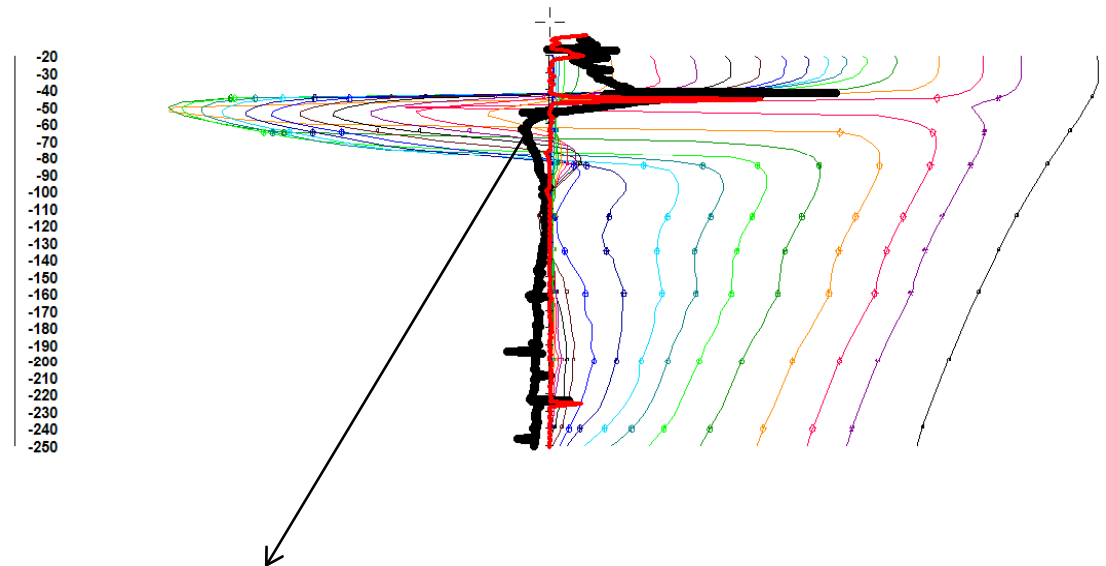


Small near off-hole at 50m  
47.83 - 48.17: 5-7% pyrrhotite stringers with moderate garnets



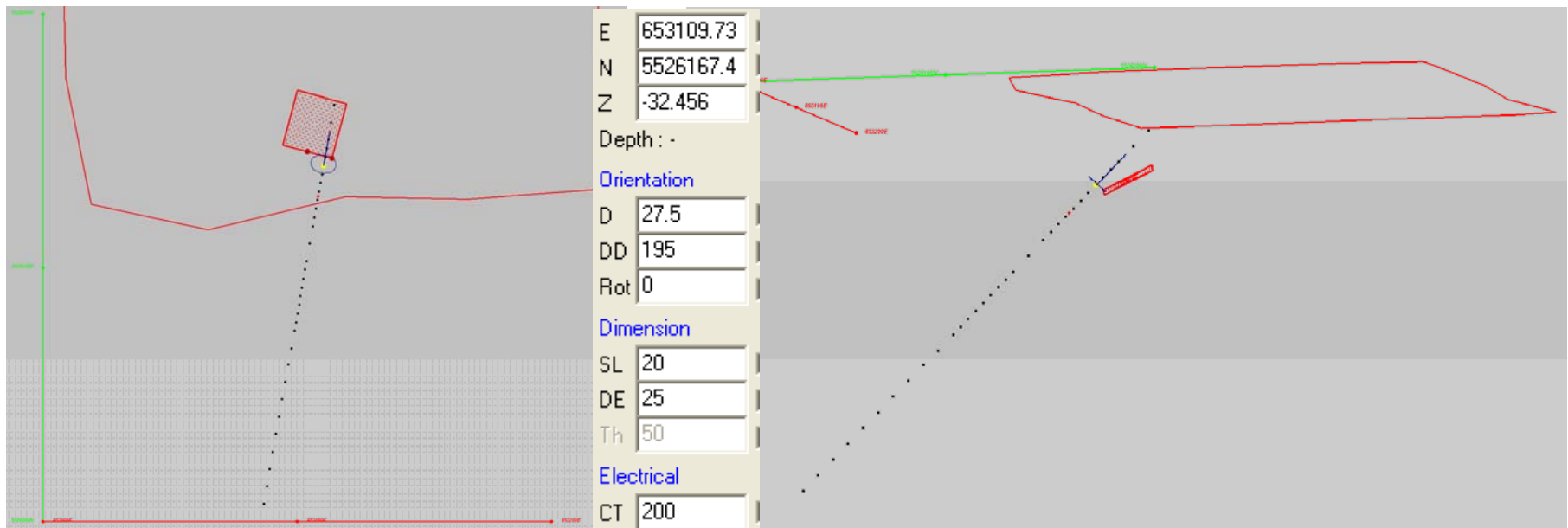
# 23-331 BH MAG

From_m	To_m	MajorRock Code
0.00	7.00	OVB
7.00	55.60	V2(V3?)
55.60	92.05	V1
92.05	119.50	V2
119.50	151.15	V1/V2
151.15	251.00	V2 (+V1?)



**A clearly defined off-hole small magnetic anomaly  
(cross-over type of anomaly)**

# 23-331 MAXWELL MODELLING



**Small conductor (20x25m) down-dip**

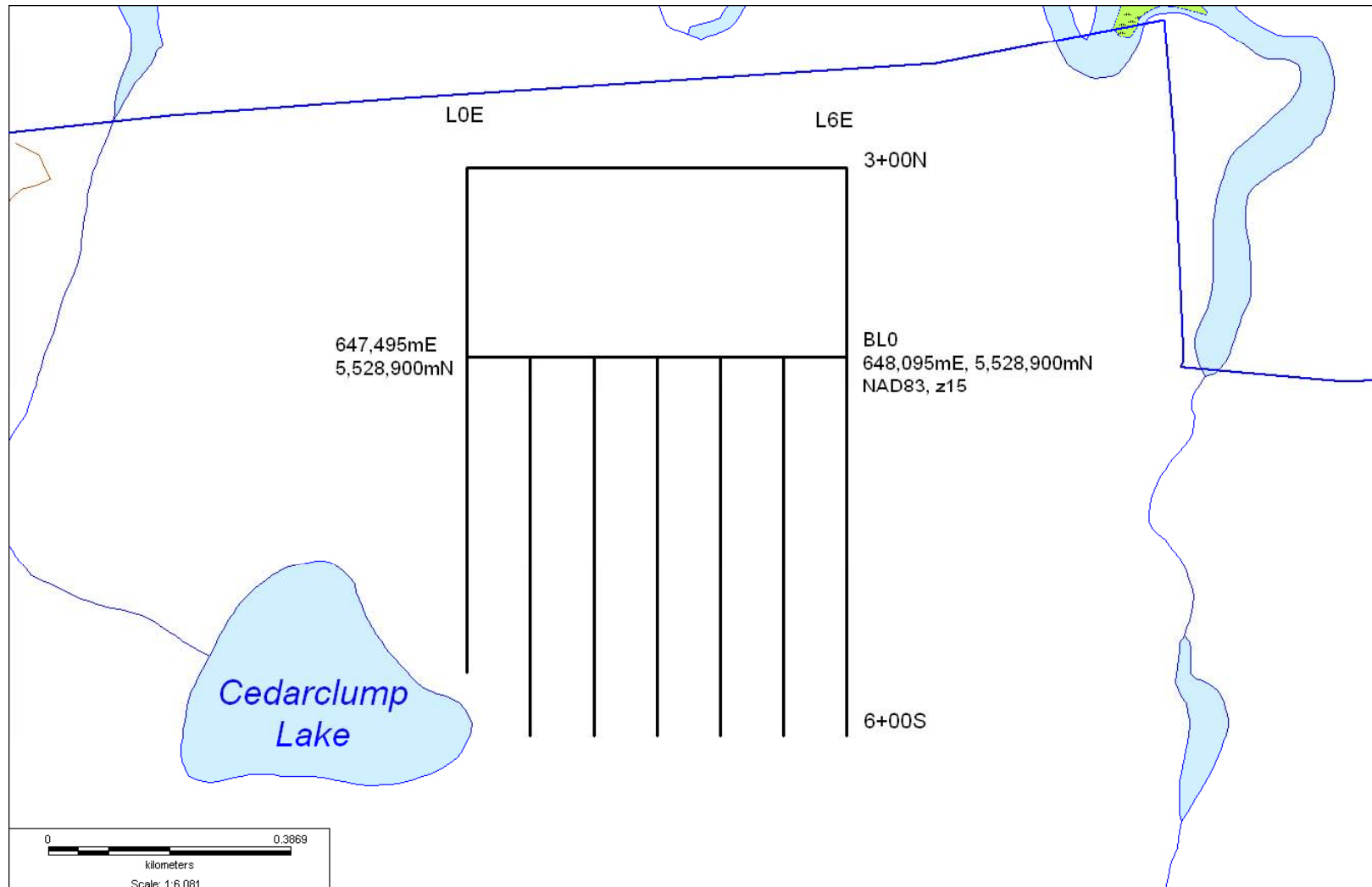
## Zone 23 Conclusion

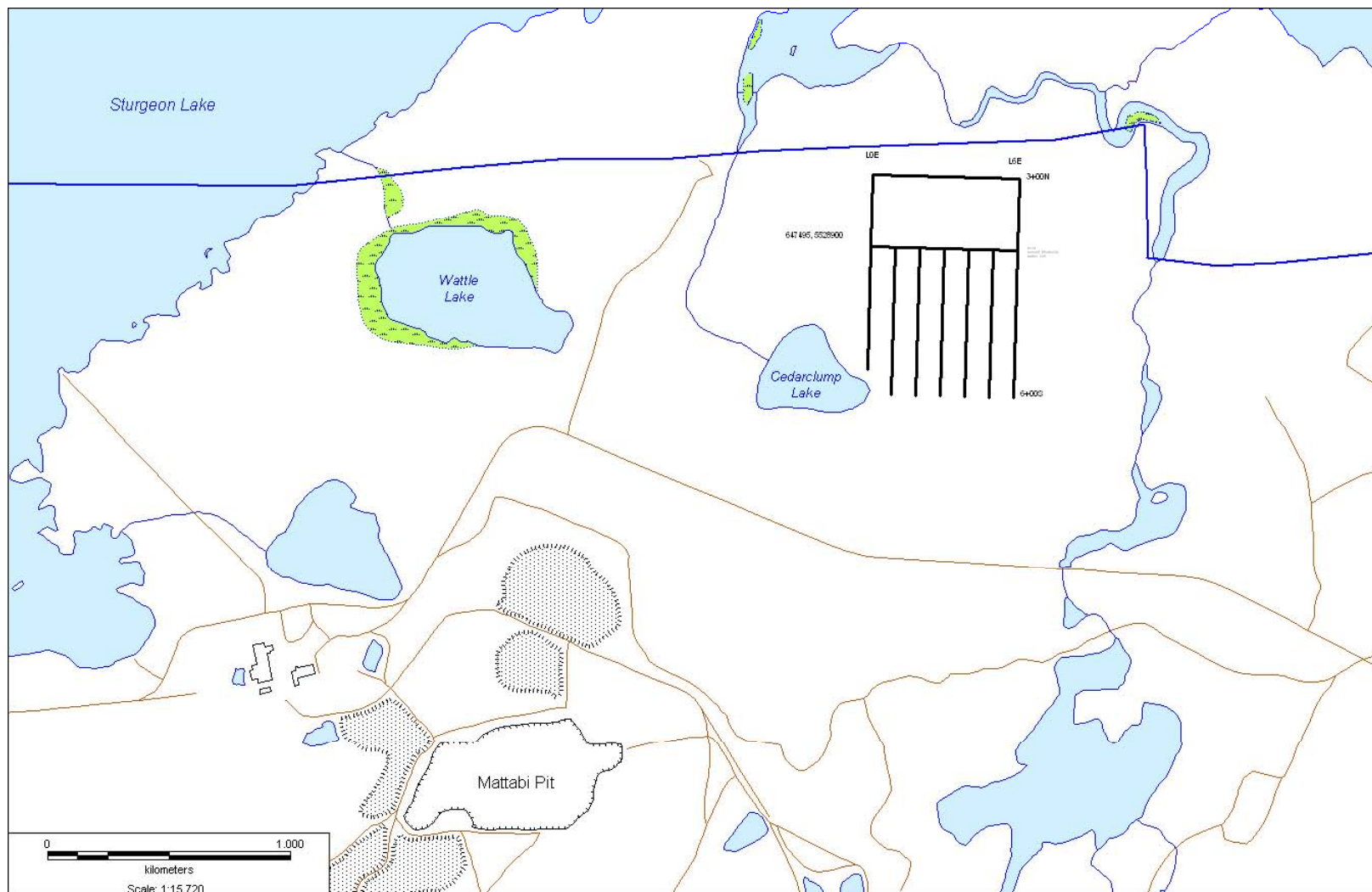
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**In ddh 23-2010-331, a small near off-hole was detected at 50m down the hole explaining the weak MEGATEM anomaly. A 20mx20m conductive plate is interpreted.**

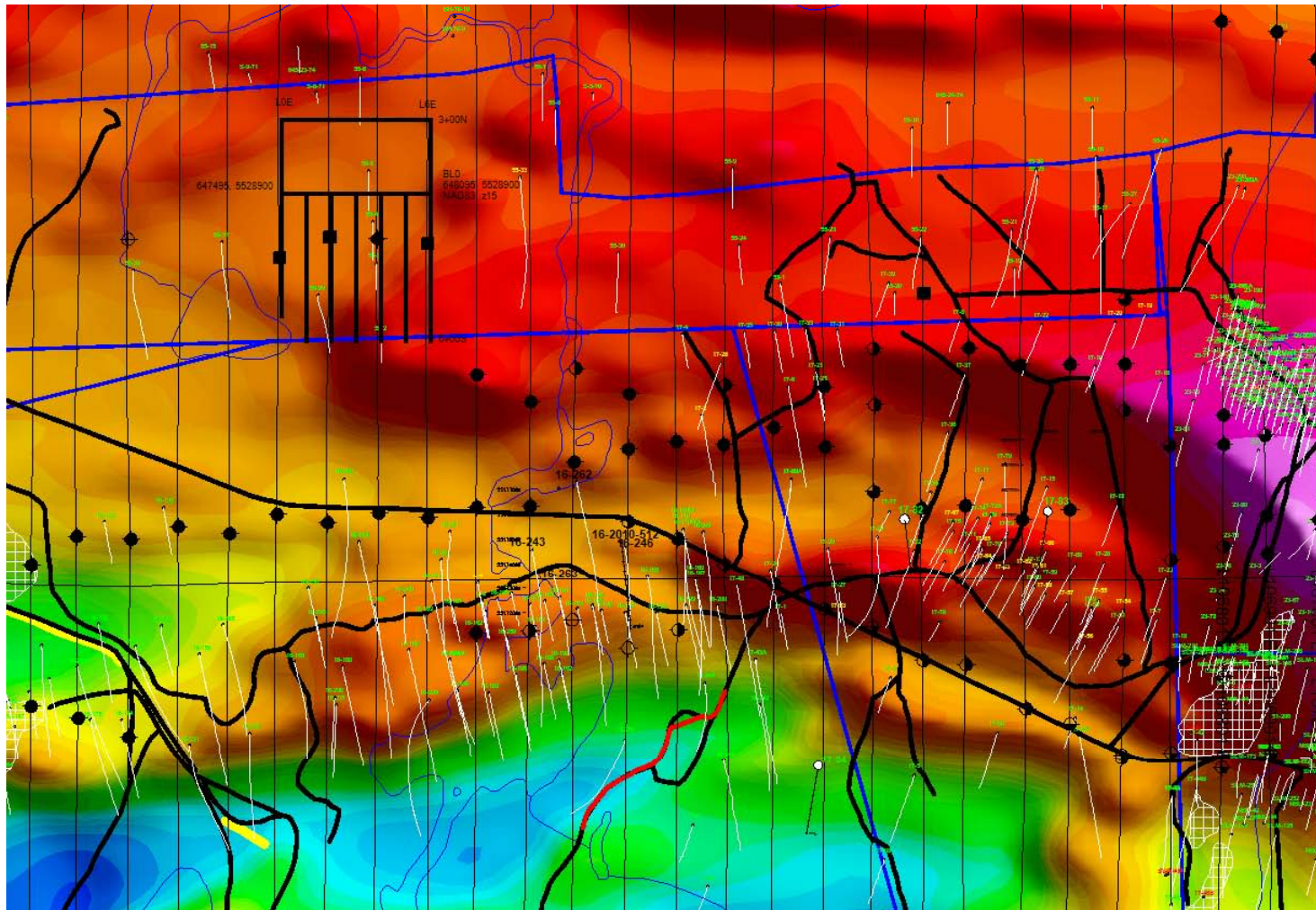


Sturgeon lake  
**DEEPEM 2010**

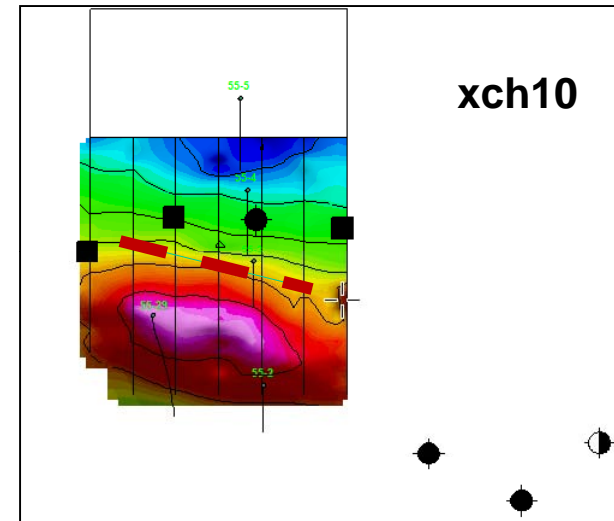
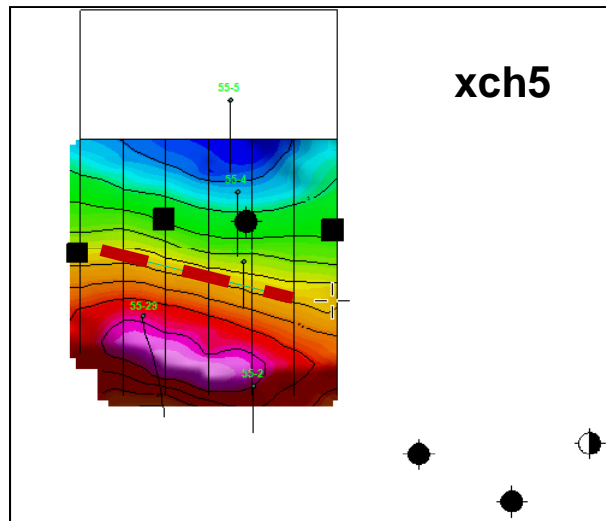




# DEEPEM 2010 MEGATEM anomalies on MAG MAP



# DEEPEM 2010 Comp X



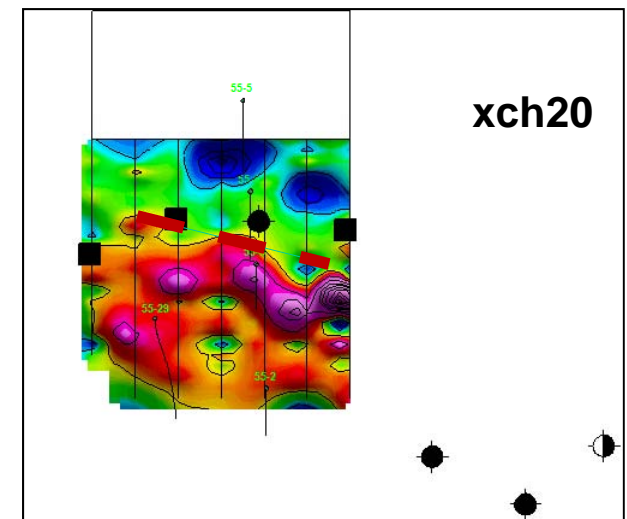
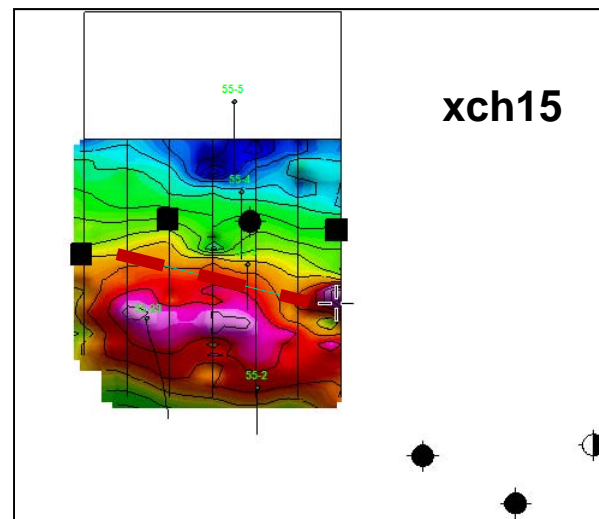
**Long wavelength : Deep conductor**

**Distance between min and max :  
550m (depth  $\approx$  225m)**

**Asymmetric anomaly : shallow  
dipping conductor**

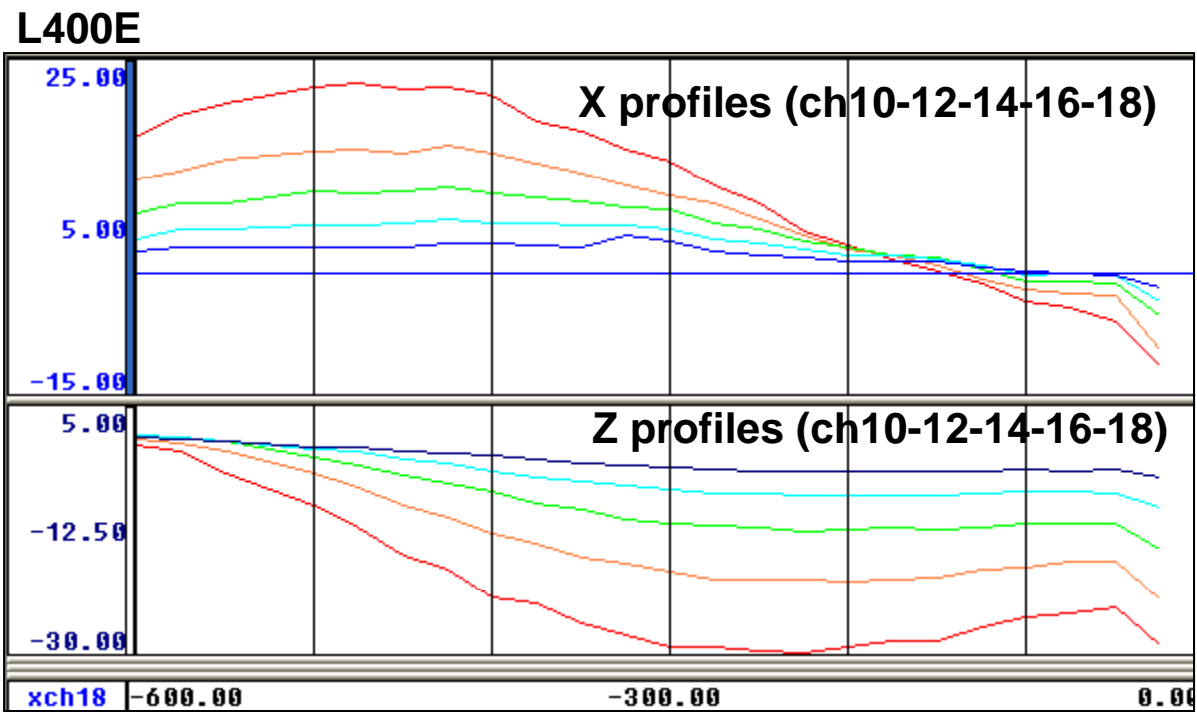
**Slight migration of the cross-over  
to the north : north dipping**

**Weak response on ch20 : relatively  
fast decaying : low conductance**



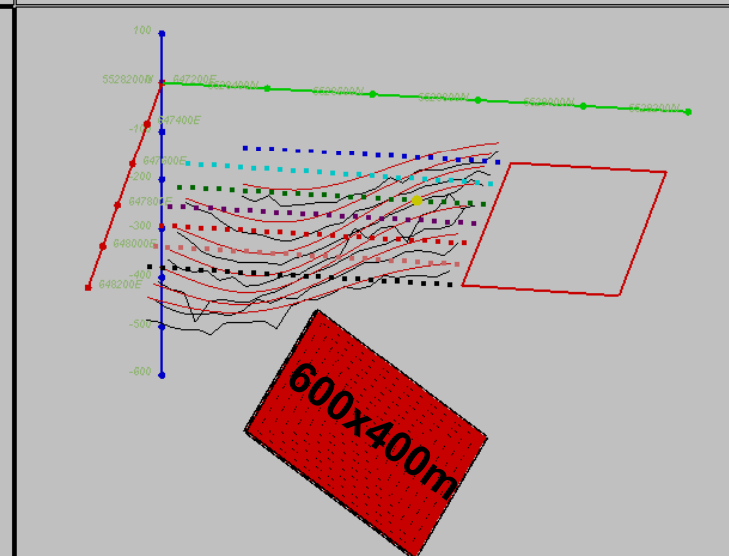
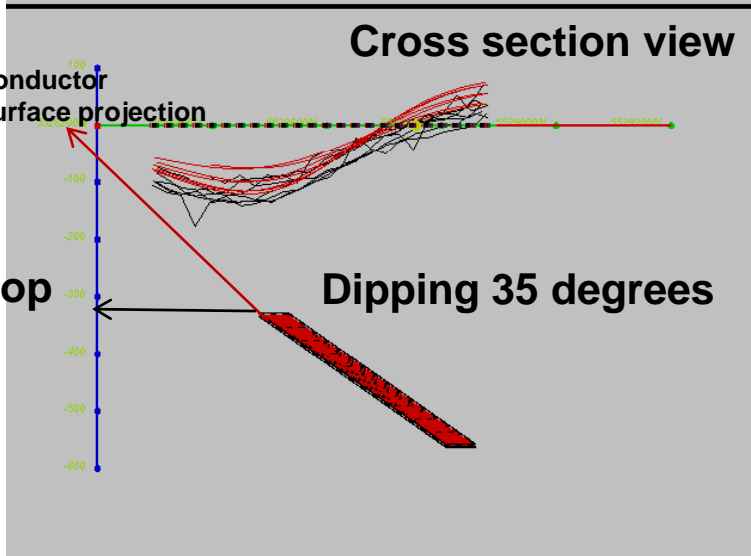
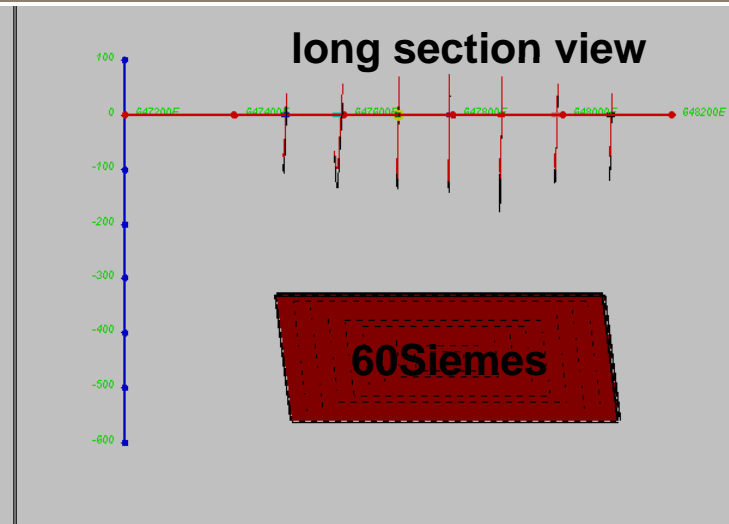
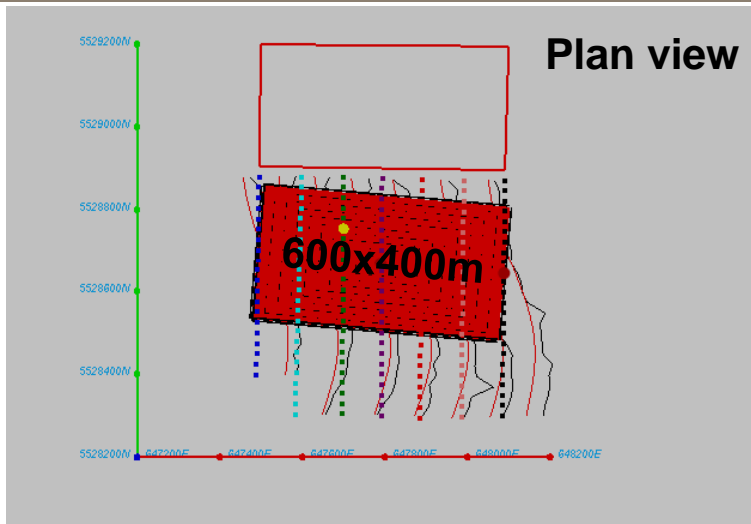


# DEEPEM 2010 Typical profiles



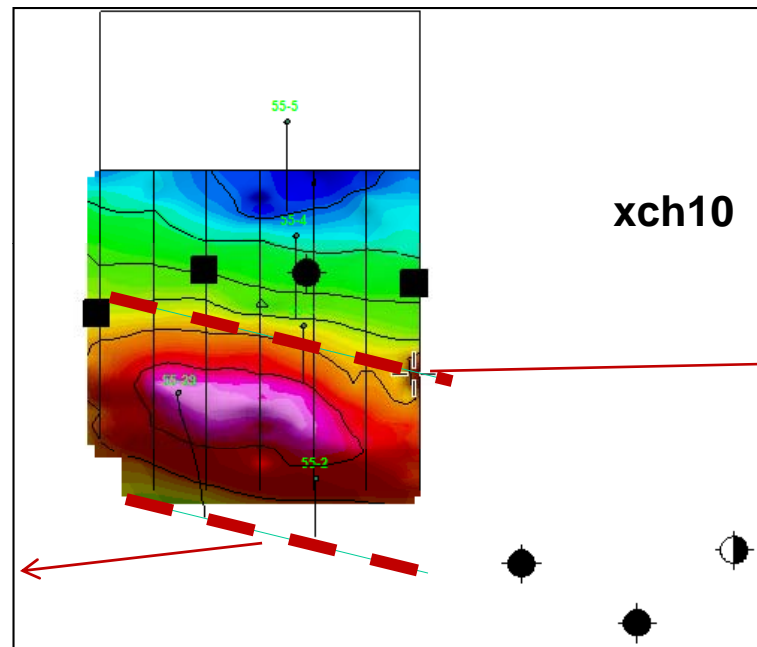
# Maxwell Modelling

E	647775.72
N	5528506.7
Z	-330.285
Depth :	-
Orientation	
D	35
DD	5
Rot	0
Dimension	
SL	600
DE	400
Th	50
Electrical	
CT	60



Depth to the top  
330m

# CONCLUSION



Center of the plate at depth  
450m

Projection on surface

Likely the down plunge  
of the shallow conductor  
detected to the east

Interpretation : Graphite :  
large low conductance plate