Zonge Engineering and Research Organization (Australia) Limited.

Langdons Hill

Gradient IP/Dipole-Dipole IP Survey

Logistics Summary

January 2004

for

Maiden Meadows Pty Ltd

Compiled by:

_____

A.D. Thompson

Report No: 606   Date : March 2004

FIGURES **Page**

APPENDICES

APPENDIX I

Plan Maps of Langdons Hill gradient IP data using a local grid projection

APPENDIX II

Black and white pseudosections of Langdons Hill Dipole-Dipole IP data

APPENDIX III

Colour inverted sections of Langdons Hill Dipole-Dipole IP data

SUMMARY

During January of 2004, Zonge Engineering and Research Organization (Zonge) mobilised a three-person geophysical field crew to the Langdons Hill Prospect located near Cygnet in southeastern Tasmania to gradient IP surveys Maiden Meadows.

A total of 562 gradient IP stations were collected from two separate transmitter dipoles were collected at 25 metre station intervals along 13 lines. The total amount of gradient IP data collected in total amounted to 14.05 line km.

A singleline of dipole-dipole data was also collected over the main gradient IP anomalous zone at 50m a-spacing. A total of 109 dipole-dipole IP points were collected from 22 stations.

Data quality and repeatability were monitored throughout the course of the survey. Strict acquisition procedures were adhered to, which ensured that good quality data were collected.

1. IP INSTRUMENTATION:

A Zonge multipurpose GDP-32 receiver was used to take all of the IP data for this project. These receivers are backpack-portable, microprocessor-controlled and capable of simultaneously gathering data on up to sixteen channels (usually configured for eight channels). Each day's data were downloaded every evening from the receiver's solid-state memory to a portable computer. Preliminary processing and plotting were completed in the field. Final processing and plotting were completed in Zonge Engineering's Adelaide office.

Transmitted fields were generated with a Zonge GGT-30 geophysical transmitter powered by a ZMG-30 generator system. Signal frequency and synchronisation were controlled directly by an XMT-32 controller.

2. IP SURVEY PARAMETERS:

The gradient IP grid lines are at 100 metre intervals and the station spacing is at 25 metre intervals. The data was collected at a frequency of 0.125 Hz in time domain. The location of the gradient IP transmitting pits is given in figure 1. The gradient IP transmitting wire passes along the existing grid lines and was moved to alternate grid lines when surveying on these lines to reduce EM coupling with the transmitting wire.

The dipole-dipole IP was also collected in time domain along line 5800N using a 50 metre a-spacing. Data was collected down to an n of 6 at a frequency of 0.125 Hz.

3. **PROBLEMS AND DATA QUALITY**

The data quality of the gradient IP survey was extremely good with errors generally less than 0.01 throughout the survey. The data quality of the dipole-dipole IP data was also generally of high standard with similar error levels to that of the gradient IP for the shallow n-spacings but with higher noise levels for the deeper n-spacings. There were negatives recorded at the higher n-spacings in the dipole-dipole IP data which may have been caused by interference from grounded and electric fences in a wet environment. These negative readings were not included in the inversion.

While most of the survey went without a hitch a problem developed with the receiver such that the back-up battery failed which meant that the line of dipole-dipole IP and some of the gradient IP data could not be dumped in the normal fashion. A subsequent dump of the GDP memory revealed that the data was in fact lost and due to the high importance of the dipole-dipole data, it was required to be recollected at the expense of Zonge.

There were three grounded fences located at 4975E, 4800E and 4550E.

4. PRODUCTION SUMMARY

Table 1 gives a short summary of the production of job 606.

Table 1. Production Summary

Date:	Description:
13th January	Mobilisation –Rosebery to Cygnet
14th January	Set up Tx1- Survey line 5100N.
15th January	Surveyed gradient IP lines 5200N-5300N – Set wires, 5300N
16th January	Surveyed gradient IP lines 5400N, 5600N, 5700N
17th January	Surveyed gradient IP lines 5700N, 5800N, 5900N
18th January	Shifted wires from grid 1, prep grid2.
19th January	Surveyed gradient IP lines 5900N, 5500N and 6000N
20th January	Surveyed gradient IP lines 6000N, 6100N, shift Tx wire, read 6200N
21st January	Surveyed gradient IP lines 6300N, 6400N, Pull down gradient Ip spread, Prep dipole-dipole IP line 5800N
22nd January	Prep dipole-dipole IP line, surveyed most of dipole-dipole IP line 5800N.
23rd January	Completed surveying dipole-dipole IP line 5800N and packed up wires.
24th January	Demobed to Rosebery
28th January	Remobilisation from Rosebery to Cygnet
29th January	Prep 5800N, Re-surveyed dipole-dipole IP line 5800N - 6 stations
30th January	Finish Surveying 5800N, and pack up.
31st January	Demobilisation to Adelaide

5. DATA PROCESSING

The gradient IP data were simply averaged and then gridded to form a plan map of the IP or chargeability and apparent resistivity (Appendix 1).

The dipole-dipole IP data were averaged (Appendix II) and then inverted using Zonges 2D inversion software in order to account for the dipole-dipole IP array geometry and produce a true section (Appendix III).

Prospect	Survey Type	Line	Start	Finish	No of stations
Langdons Hill	Gradient IP	5100N	4250E	5275E	39
Langdons Hill	Gradient IP	5200N	4250E	5250E	36
Langdons Hill	Gradient IP	5300N	4250E	5400E	43
Langdons Hill	Gradient IP	5400N	4250E	5250E	41
Langdons Hill	Gradient IP	5500N	4300E	5450E	45
Langdons Hill	Gradient IP	5600N	4200E	5400E	50
Langdons Hill	Gradient IP	5700N	4100E	5350E	52
Langdons Hill	Gradient IP	5800N	4100E	5400E	52
Langdons Hill	Gradient IP	5900N	4100E	5500E	55
Langdons Hill	Gradient IP	6000N	4550E	5425E	40
Langdons Hill	Gradient IP	6100N	4550E	5400E	37
Langdons Hill	Gradient IP	6200N	4550E	5350E	36
Langdons Hill	Gradient IP	6300N	5000E	5300E	36
Langdons Hill	Dipole-Dipole IP	5800N	4150E	5250N	109
Total Number of gradient IP stations					562
Total Number of Dipole-Dipole IP points					109

No other data were processed during this survey

6. <u>EXPLANATION OF FILES</u>

Digital data is provided on diskette along with paper plots of the data. File formats are explained here. All of the data has also been compressed into zip files.

The gradient IP and dipole-dipole IP data are stored under their separate file names under the data directory.

Each grid line of **dipole-dipole** data has been zipped into four separate files. For example, line 5800N files are titled ZE5800N.ZIP, HP5800N.ZIP, SM5800N.ZIP and GS5800N.ZIP. The 'ZE' stands for Zonge Engineering files, 'HP' for Hewlett Packard vector graphics files, 'SM' stands for Smooth Modelling files and 'GS' for Geosoft files.

The **Gradient IP** data are stored in grid files rather than line files with each file containing all the data pertaining to a certain transmitter grid. The files will therefore be called ZEGRID1.ZIP for all Zonge Engineering files collected from transmitter 1. The processed gradient IP data is stored in a single zipped file called Gsgradient.ZIP which contains all geosoft data including a database of all the data.

For example,

The **ZE*.ZIP** file contains:

*.RAW - the edited raw data downloaded from the GDP-32

*.MDE - files containing processing information

*.AVG - files created by Zonge's CRAVG containing averaged data

*.Z - files used for plotting containing apparent resistivities, raw phases and three point decoupled phases

The **HP*.zip** file contains HPGL print files that can be copied to a printer.

*.xar – contain plot files of black and white "Apparent Resistivity" pseudosections

*.xnc – contain plot files of black and white "Newmont Chargeability" pseudosections

*.xmf – contain plot files of black and white "Metal Factor" pseudosections

*.xpv – contain plot files of black and white "Peak Voltage" pseudosections

The **GS*.zip** file contains files produced by Geosoft, ready to plot in Geosoft, of the inversion results

*.ATT – contains the attributes of the geosoft files

* .GRD – contains the gridded data of the geosoft files

*.PLT – contains the line work of the geosoft files,

*.ZON – contains the colour scale of the gridded data.

*.GDB – contains a database of gradient IP data points

The **SM*.zip** file contains:

*..SCS - contains transmitter location information, topography, data, etc.,

*.M1D - contains the inverted resistivity information and is plotted in Geosoft,

*.OBS - contains the calculated and observed data, allowing for examination of "inversion quality",
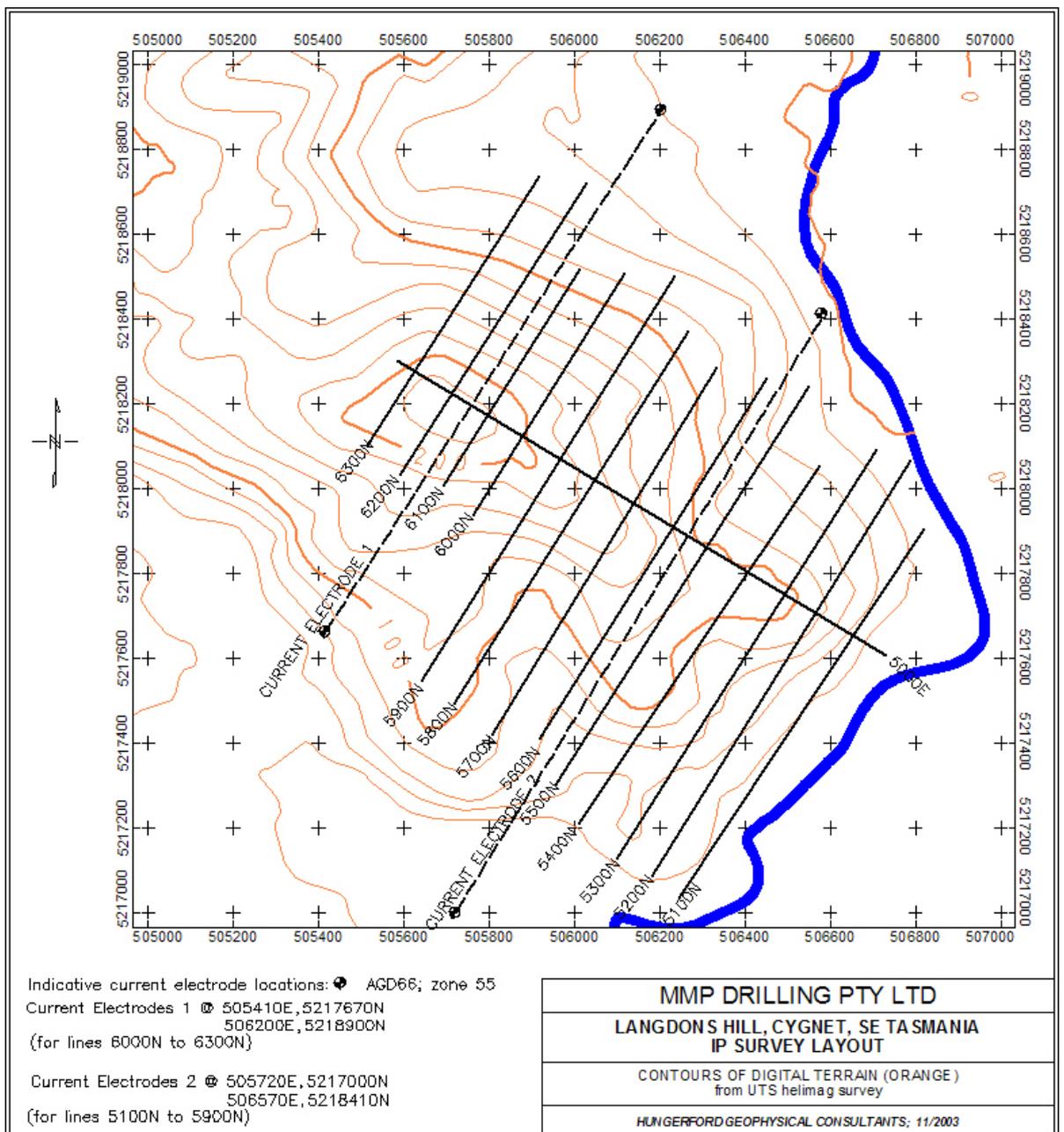
Figure 1. Gradient IP location map.

Appendix 1

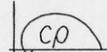Plan Maps of Langdons Hill gradient IP data using a local grid projection
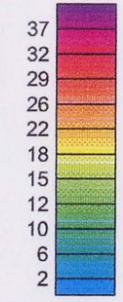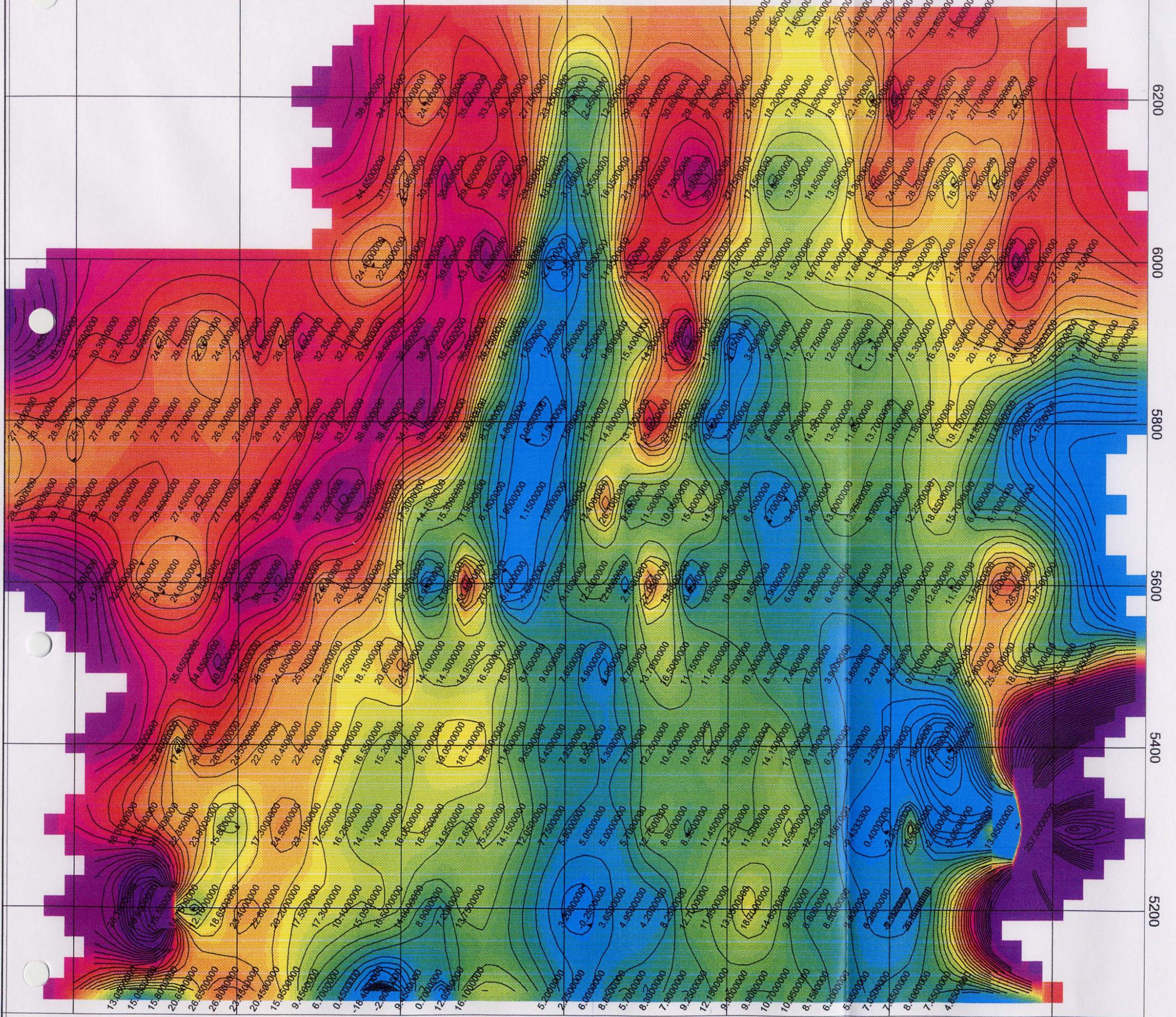
05_5098 ⑪

Third Annual Exploration Report for Year Ended 25
October 2004 - EL 34/2001 - Cygnet
Maiden Meadows Pastoral Proprietary Limited*
Vanzino, L.   EL34/2001

Scale 1:5000

50   0   50   100   150   200   250   300   350
                                          metres
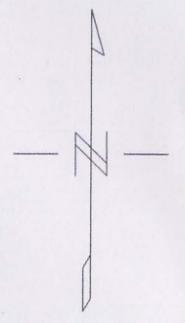
Maiden Meadows

Langdons
Gradient IP Survey
Newmont Chargeability

ADT

Appendix II

Black and white pseudosections of Langdons Hill Dipole-Dipole IP
data

Line 5800N
Langdons Hill
for
Maiden Meadows Pty Ltd

Field Job 606
ZONGE ZPLOT 7.27
File 5800N.Z, Plotted 16 Mar 04
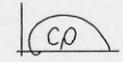
TIME DOMAIN IP SURVEY DATA
Apparent RESISTIVITY

values in ohm-meters

SURVEY LINE DATA
A - Spacing=   50 m

Survey Date= January 20

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.10)
      [19.6]   158.
       20.0   200.
       25.1   251.
       31.6   316.
       39.8   398.
       50.1   [493.]
       63.1
       79.4
      100.*
      126.

Apparent resistivity contour section for Line 5800N (W to E), with station positions labelled 4100 through 5300 at 50 m intervals.

Line 5800N	TIME DOMAIN IP SURVEY DATA	[Plot limits] and ARITHMETIC CONTOURS

Line 5800N
Langdons Hill
for
Maiden Meadows Pty Ltd

Field Job 606
ZONGE ZPLOT 7.27
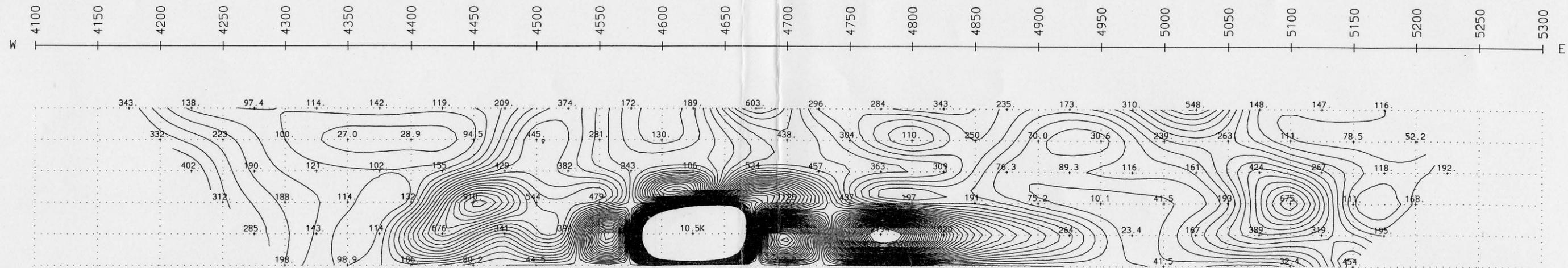File 5800N.Z, Plotted 16 Mar 04

CP

TIME DOMAIN IP SURVEY DATA
METAL FACTOR

using Newmont Chargeability
and Apparent Resistivity

SURVEY LINE DATA
A - Spacing=   50 m

Survey Date= January 20

[Plot limits] and ARITHMETIC CONTOURS
 (Interval: 50.00)

[-876.]	-400.	100.	600.	1100	1600
-850.	-350.	150.	650.	1150	1650
-800.	-300.	200.	700.	1200	1700
-750.*	-250.*	250.*	750.*	1250*	1750*
-700.	-200.	300.	800.	1300	1800
-650.	-150.	350.	850.	1350	1850
-600.	-100.	400.	900.	1400	1900
-550.	-50.0	450.	950.	1450	1950
-500.*	0.00*	500.*	1000*	1500*	2000*
-450.	50.0	550.	1050	1550	[10.5K]

Line 5800N
Langdons Hill
for
Maiden Meadows Pty Ltd

Field Job 606
ZONGE ZPLOT 7.27
File 5800N.Z, Plotted 16 Mar 04

TIME DOMAIN IP SURVEY DATA
Newmont CHARGEABILITY
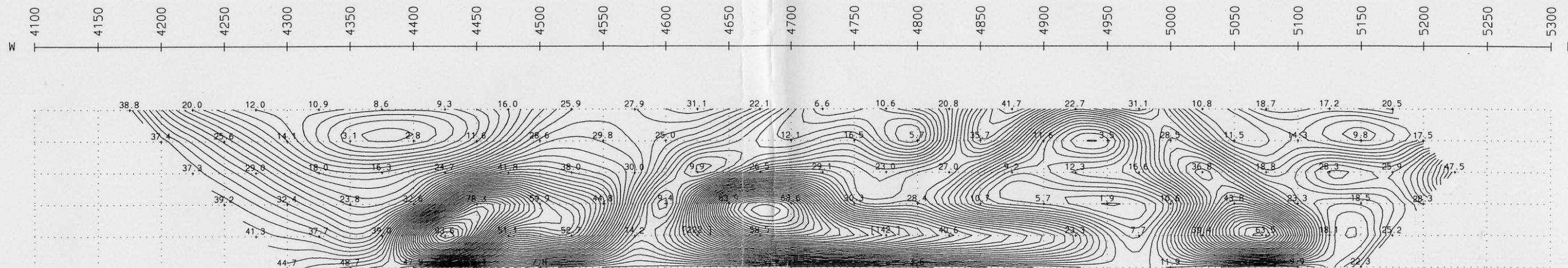
values in milliseconds

SURVEY LINE DATA
A - Spacing=   50 m

Survey Date= January 20

[Plot limits] and ARITHMETIC CONTOURS
(Interval: 2.00)

[1.35]	20.0*	40.0*	60.0*	80.0*
2.00	22.0	42.0	62.0	82.0
4.00	24.0	44.0	64.0	84.0
6.00	26.0	46.0	66.0	86.0
8.00	28.0	48.0	68.0	88.0
10.0*	30.0*	50.0*	70.0*	90.0*
12.0	32.0	52.0	72.0	92.0
14.0	34.0	54.0	74.0	[93.6]
16.0	36.0	56.0	76.0	
18.0	38.0	58.0	78.0	

| Line 5800N Langdons Hill for Maiden Meadows Pty Ltd	TIME DOMAIN IP SURVEY DATA PEAK VOLTAGE Vp
Field Job 606 ZONGE ZPLOT 7.27 File 5800N.Z, Plotted 16 Mar 04	values in millivolts SURVEY LINE DATA A – Spacing= 50 m Survey Date= January 20

TIME DOMAIN IP SURVEY DATA
PEAK VOLTAGE Vp

values in millivolts

SURVEY LINE DATA
A – Spacing= 50 m

Survey Date= January 20

[Plot limits] and ARITHMETIC CONTOURS
(Interval: 10.00)

[3.3]	100*	200*	300*	400*	500*
10.	110	210	310	410	510
20.	120	220	320	420	520
30.	130	230	330	430	530
40.	140	240	340	440	540
50.*	150*	250*	350*	450*	550*
60.	160	260	360	460	560
70.	170	270	370	470	570
80.	180	280	380	480	580
90.	190	290	390	490	[1.5K]
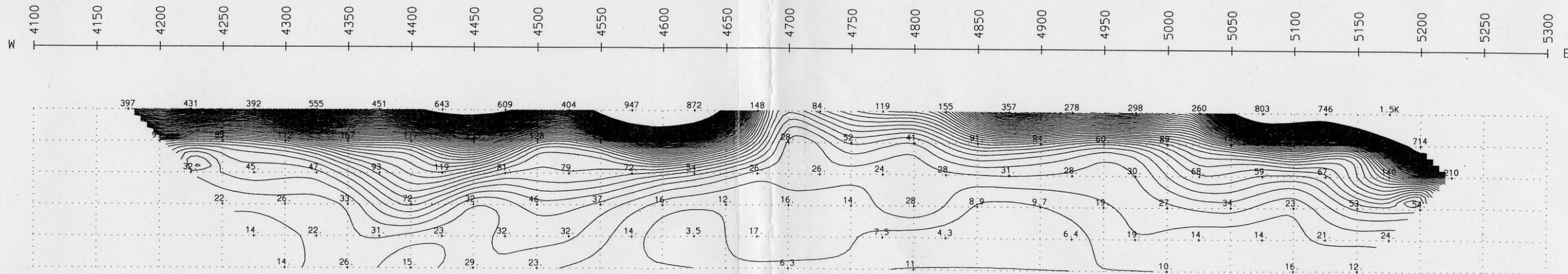
Appendix III

Colour inverted sections of Langdons Hill Dipole-Dipole IP data

Smooth-model Resistivity (ohm-m)
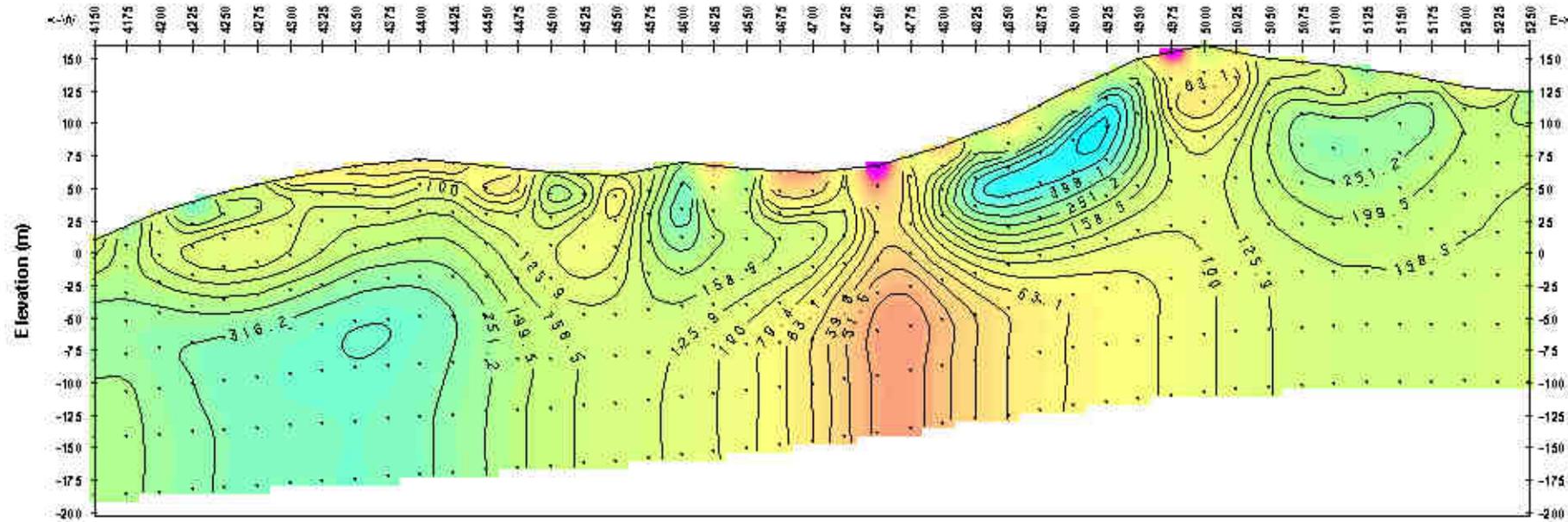
Langdons
Line 5800N

Calculated Apparent Resistivity (ohm-m)
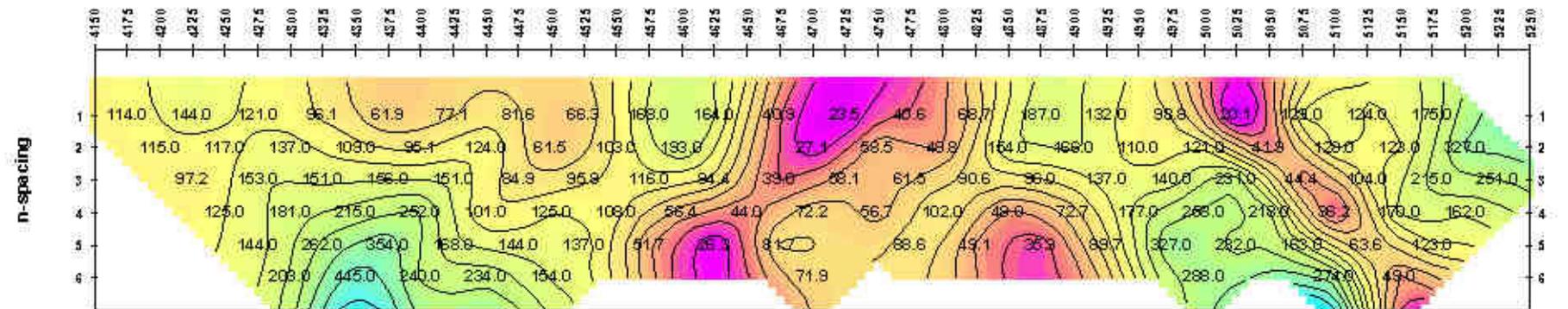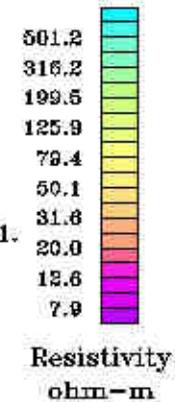
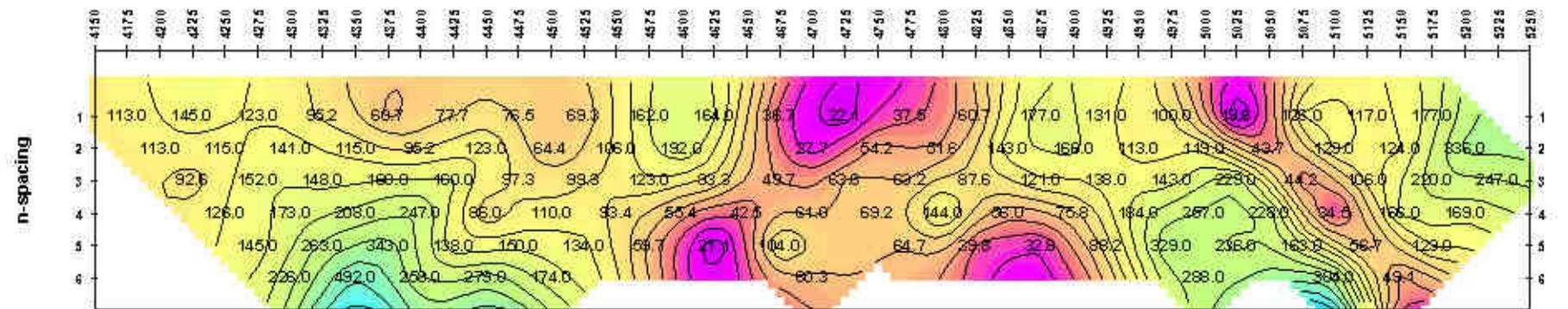Observed Apparent Resistivity (ohm-m)

Survey Parameters:
50m dipole-dipole data
0.125 hertz repetition rate
Observed data from 5800NA.AVG

Inversion Control Parameters:
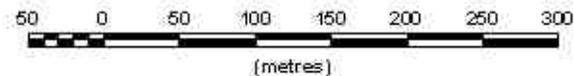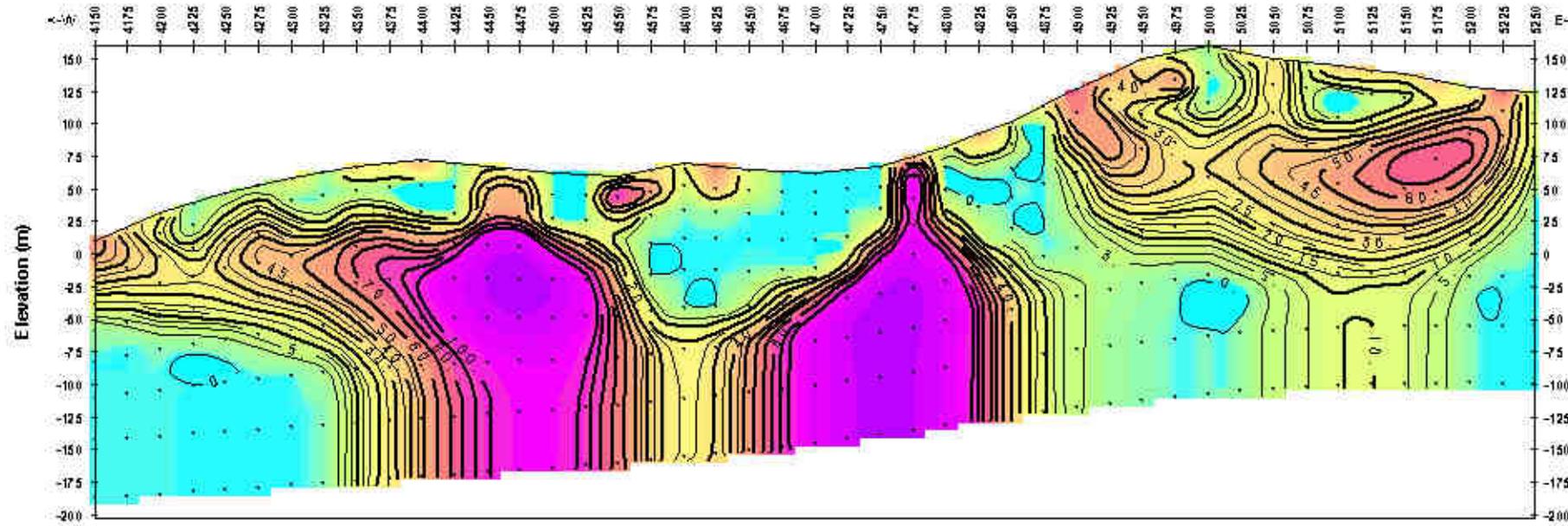ResSmth=1.,dpW=0.5,dxW=1.,dzW=1.

Resistivity
ohm-m

501.2
316.2
199.5
125.9
79.4
50.1
31.6
20.0
12.6
7.9

Zonge

50 0 50 100 150 200 250 300
(metres)

Langdons
Line 5800N
Smooth-Model Inversion of
Dipole-Dipole Resistivity Data

AUTHOR	DRAWN	DATE	SCALE	REPORT
Zonge	Zonge	060204	1:5000	Job 600
REF: Job 600			R5800NA.*	

Smooth-model IP (msec)

Langdons

Line 5800N
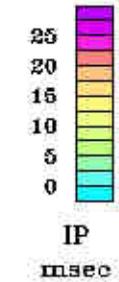
Calculated IP Response (msec)
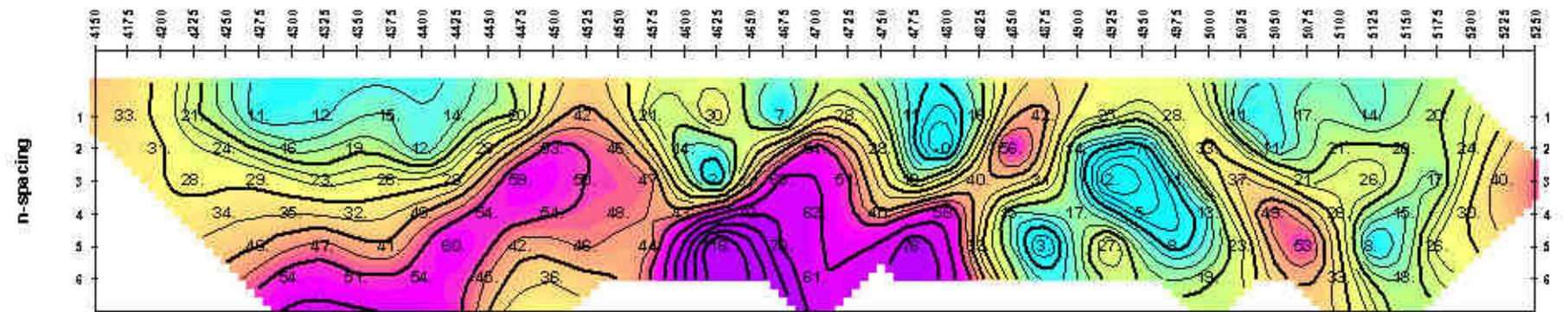
Observed IP Response (msec)
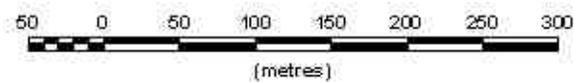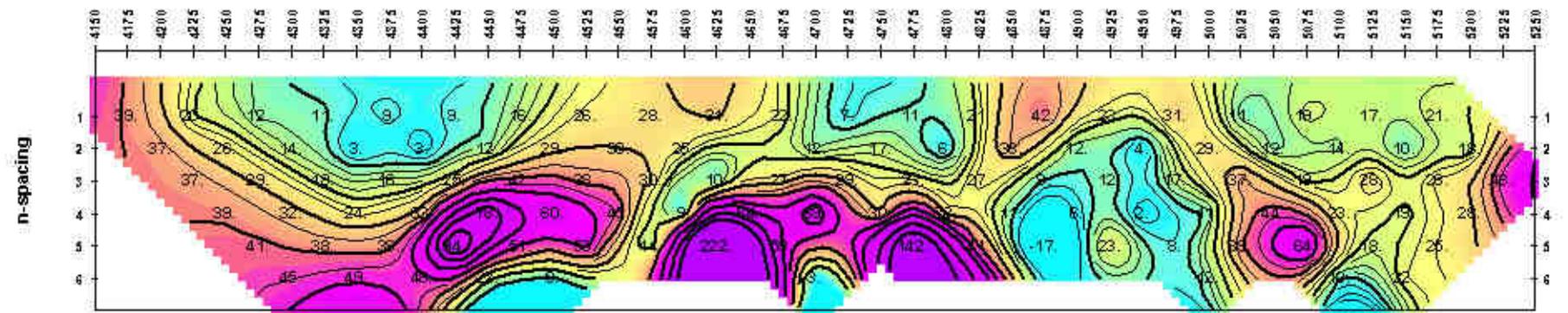
Survey Parameters:
50m dipole-dipole data
0.125 hertz repetition rate
Observed data from 5800NA.AVG

Inversion Control Parameters:
IPSmth=0.1,dpW=0.5,dxW=1.,dzW=1.

IP
msec

Zonge

AUTHOR	DRAWN	DATE	SCALE	REPORT
Zonge	Zonge	060204	1:5000	Job 600
REF: Job 600			R5800NA.*	

Langdons

Line 5800N

Smooth-Model Inversion of

Dipole-Dipole IP Data