



Zonge Engineering and Research Organization (Australia) Pty. Ltd.

## **Chamberlain Down-Hole EM Survey**

### **Logistics Summary**

**May 2005**

**for**

**Zinifex Ltd**

Compiled by:

John Caon

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**Zonge Engineering & Research Organization (Australia) Pty. Ltd.**

98 Frederick Street Welland S.A. 5007  
Tel +61 8 83404308 Fax +61 8 83404309

1.	<b><u>SUMMARY</u></b>	<b><i>1</i></b>
2.	<b><u>TEM Instrumentation</u></b>	<b><i>1</i></b>
3.	<b><u>TEM Survey Parameters</u></b>	<b><i>1</i></b>
4.	<b><u>Problems</u></b>	<b><i>2</i></b>
5.	<b><u>Production Summary</u></b>	<b><i>2</i></b>
6.	<b><u>DataList</u></b>	<b><i>3</i></b>
7.	<b><u>Processing Summary</u></b>	<b><i>3</i></b>
8.	<b><u>Explanation of Files</u></b>	<b><i>3</i></b>

## TABLES

<b>Table 1.</b>	Production Summary.....	<b>2</b>
<b>Table 2.</b>	Data summary of down-hole EM data.....	<b>3</b>

## APPENDIX I

Chamberlain down-hole EM dB/dt Profiles.

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## 1. **SUMMARY**

During May of 2005, Zonge Engineering and Research Organization (Zonge) mobilised a four-person geophysical field crew to Rosebery, western Tasmania to conduct a down-hole EM survey for Zinifex Ltd.

Two holes were surveyed within the Chamberlain prospect, producing a total of 42 stations of data read over a total depth of 1175 metres.

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.

## 2. **TEM INSTRUMENTATION**

A Zonge multipurpose GDP-32 receiver was used to take all of the 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-10 geophysical transmitter powered by a ZMG-7.5 generator system. Signal frequency and synchronisation were controlled directly by an XMT-32 controller.

## 3. **TEM SURVEY PARAMETERS**

The transmitting loop for the down-hole EM was approximately 900m by 700m wide and was made up of a single turn of standard 2.5mm<sup>2</sup> insulated copper wire. The transmitting loop was laid out by the client and so the position of the loop was not recorded by the field crew. The transmitting current was maintained at a

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consistent 11.0 amperes throughout the survey. Data was taken at a frequency of 4 Hz, using a station spacing of 25 or 50 metres. For each station, data was read on two channels, the first read with an automatic gain dictated by the GDP, the second, manually gained 32 times to enhance late time data. The transmitter delay (ramp) was measured using an oscilloscope and then set in the receiver at 180 microseconds.

#### **4. PROBLEMS**

Transmitter problems were encountered on the final day of production, preventing the reading of Hole 4 at Tullah. No other problems affecting production occurred during the survey.

#### **5. PRODUCTION SUMMARY**

Table 1 gives a summary of the production of Job 667.

**Table 1.** Production Summary.

<u>Date:</u>	<u>Description:</u>
25 <sup>th</sup> May	Travelled to Rosebery. Set-up transmitter loop, tested transmitter and met with client.
26 <sup>th</sup> May	Read hole 353.
27 <sup>th</sup> May	Read hole 348.
25 <sup>th</sup> May	Travel to Tullah and set-up transmitter. Transmitter failure prevented reading. Completed packing up equipment.

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## 6. DATALIST

Table 2 presents a brief summary of the data taken on Job 667.

**Table 2.** Data summary of down-hole EM data.

Prospect	Survey Type	Hole	Start	Finish	Frequency	Surveying interval	No of stations
Chamberlain	Down-hole EM	353	50m	875m	4 Hz	25 / 50m	27
Chamberlain	Down-hole EM	348	100m	450m	4Hz	25m	15
Total number of down-hole EM readings							42

No other data were collected during this survey.

## 7. PROCESSING SUMMARY

The down-hole EM data was first averaged using Zonge's TEMAVG program to produce a single decay curve for each station where multiple readings were taken. The data from the automatically gained and manually gained channels was then merged using Zonge's TEMTRIM program, producing the final .avg, .tem and .z files included with this report. The resulting dB/dt data was then plotted to produce the pseudo sections presented in appendix I.

## 8. EXPLANATION OF FILES

Digital data is provided on CD along with paper plots of the data. All processed data files are located in subdirectories organised by hole name under the "processed data" directory on the accompanying CD. Copies of raw data as sent from the field are located in the "field data" directory on the accompanying CD. File formats are explained below:

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

\*.**MDE** files containing processing information

\*.**AVG** files created by Zonge's AMTAVG containing averaged data

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- \*.**TEM** files created by Zonge's CRAVG program containing averaged data in AMIRA format.
  - \*.**X01** contains plots of dB/dt signal magnitudes for each station. These files are in HP Vector format, and can be viewed in programs such as CorelDraw.
  - \*.**Z** files used for plotting containing amplitudes normalised by the amperage.

## **Appendix 1**

Chamberlain down-hole EM dB/dt Profiles.