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**MICROFILMED**  
FICHE No.013182-

ANNUAL REPORT  
TO 5TH JUNE 1994  
EL 1/91 REDWATER  
FOR  
JERVOIS MINING N.L.

<b>MINES</b>		
FILE REF. EL1191		
25 MAY 1994		
DOC. REF.		
OFFICER	FOR ACTION	FOR INFO.
SEE COVERING		
LETTER F01083		

May 1994

SUMMARY

Two lines of transient electromegnetic moving loop survey were completed along existing tracks.

Anomalies were found towards the northern ends of both lines, and are interpreted to be possibly low grade sulphide mineralisation in bedrock.

Both anomalies occur at a position interpreted to be close to a granite contact. Elsewhere minor magnetite has been found near this contact.

Most of the area concerned is covered by Tertiary basalt.

Further work will be recommended.

The geophysical report by H. Rutter of Geophysical Exploration Consultants Pty. Ltd. follows.

**A REPORT ON TRANSIENT ELECTROMAGNETIC  
DATA FROM REDWATER, TASMANIA  
FOR JERVOIS MINING N.L.**

**HUGH RUTTER**

**APRIL 1994**

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## 1. INTRODUCTION

The location of the two reconnaissance lines at Redwater is shown in figure 1. Both are along pre-existing tracks with traverse distances measured along the tracks.

The Protem transient electromagnetic system was used with an in-loop array. The transmitting loop had the dimensions of 100m x 100m with the centre of the square loop 50m east of the track. The secondary EM field was measured with a roving vector receiver using a frequency of 25Hz. The results were presented by Geoterrex as plotted profiles and in a standard digital format. The digital data was used for the analysis that follows.

## 2. DATA INTERPRETATION

The transient electromagnetic field data is plotted with both linear and logarithmic scales for the amplitude; there are advantages in this when the anomalies are of low amplitude and at late times. The data was also converted to an apparent resistivity pseudosection to assist with the interpretation.

### Line 9850E

The voltage data is shown in figures 2 and 3; the apparent resistivity pseudosection in figure 4. The only anomalous response is at the northern end of the line between 5525N and 5575N. The anomaly is an early time response. An analysis of the decay curve at 5550N shows that the decay can be deconstructed in to two curves with a negative exponential form (figures 5a and 5b). Such decays are often indicative of metallic sulphide bodies. The decay constant,  $\tau$ , is indicative of the conductivity of the source; but in this case the value of  $\tau = 0.11$ msecs is very low (metallic sulphide ore zones tend to have values of 3.0msecs and greater). This can be interpreted as representing a mineralised mass with very little pyrite or chalcopyrite but still containing galena and sphalerite which are not particularly conductive minerals. Figure 5c shows how tenuous the interpretation is; the same data can be fitted to a curve following a power law, in which case the value of  $\alpha = -3.95$  suggests that the anomaly is caused by a patch of conductive overburden.

The result is ambiguous. Either the anomaly is indicating a zone of weak mineralisation, or a patch of surficial sediments. Examination of the geology at this location may be sufficient to decide which is the most likely.

The decay curve at 5200N (figure 6) is well away from the anomaly and most probably represents the response from the near surface weathered layer.

### Line 650E

The profile is very similar to the previous one, although the amplitude of the anomaly at the northern end of the line is greater.

The transient voltage data is shown in figures 7 and 8, with the apparent resistivity pseudosection in figure 9. The anomaly is between 6075N and 6175N. An analysis of the transient decay at 6100N produces similar results to those from the decay on line 9850E at 5550N. Figure 10 shows the curve fit that represents a conductive surface layer; but it does not satisfy the later time data. It requires two curves, the one fitting the later time data being a negative exponential form, to provide a better overall fit.

Therefore the anomaly can be caused either by a patch of surface material with increased conductivity, or low grade mineralisation in bedrock. At this location there is a slightly better chance that the source is mineralisation in bedrock.

Figure 11 is a decay curve at 5500N, away from the anomaly: the decay characteristics indicate a response from the surface alteration or thin overburden.

### 3. CONCLUSION

The two anomalies located by the survey do not unequivocally represent either a surficial response or mineralisation in bedrock. A third possibility is that they are caused by an increase in conductivity associated with a fault zone. The data has directed future follow-up to two well defined sections. Geological mapping or geochemical sampling might clarify the cause of the anomalies. There is also the possibility that they are related, in which case intermediate lines may be required in the future.



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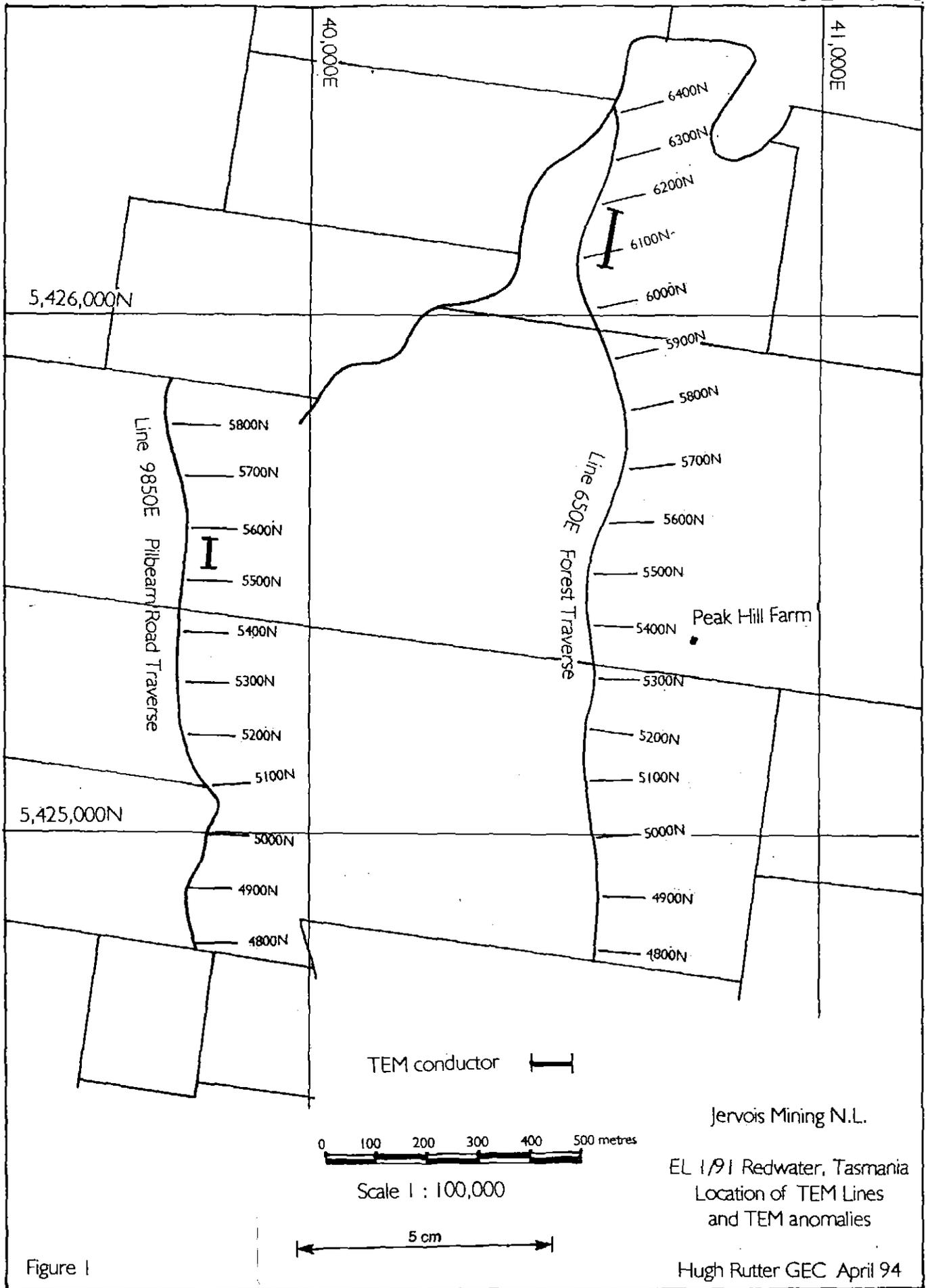
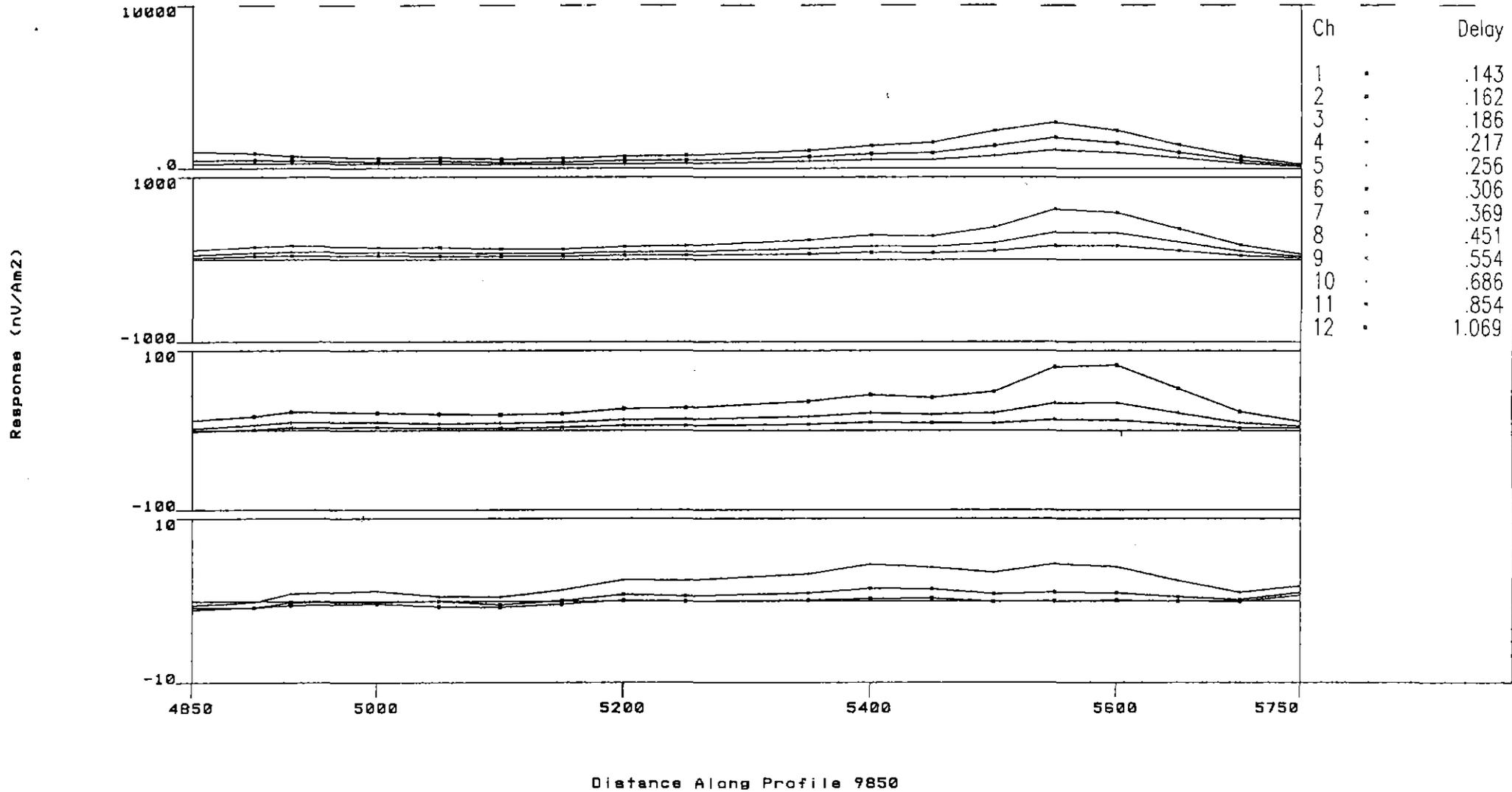


Figure 1

Jervois Mining N.L.  
 EL 1/91 Redwater, Tasmania  
 Location of TEM Lines  
 and TEM anomalies

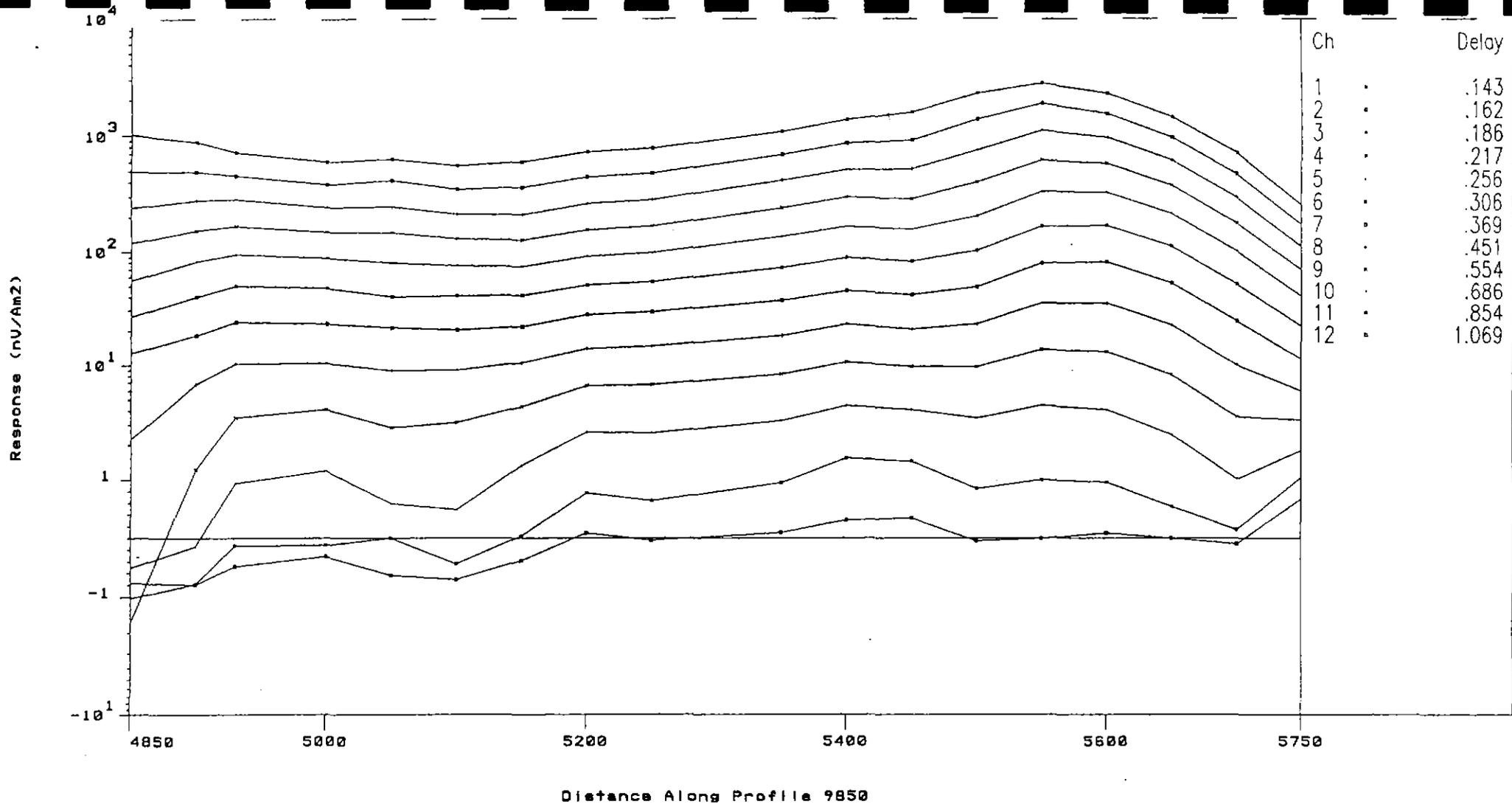
Hugh Rutter GEC April 94



Distance Along Profile 9850

Jarvois Mining N.L.	Geophysical Exploration Consultants	
EL1/91 : Redwater, TAS Line 9850E	Horizontal Scale : Default	
Instrument : Protom from Geoterrax	Vertical Scale : Linear	
Data : In-loop 100m x 100m, with RVR	Time Delay In : Milliseconds	
Date : Mar 1994	Date : 13/04/94	Figure 2

5 cm



Jervois Mining N.L.	Geophysical Exploration Consultants	
ELI/91 : Redwater, TAS Line 9850E	Horizontal Scale : Default Vertical Scale : Logarithmic Time Delay In : Milliseconds	
Instrument : Protom from Geoterrax		
Data : In-loop 100m x 100m, with RVR		
Date : Mar 1994	Date : 13/04/94	Figure 3

↔ 5 cm ↔

Jarvis Mining N.L.: Redwater, Tasmania  
 Moving Loop Tx, In Loop Dipole Rx, I Component  
 Field Data

Distance along profile 9850

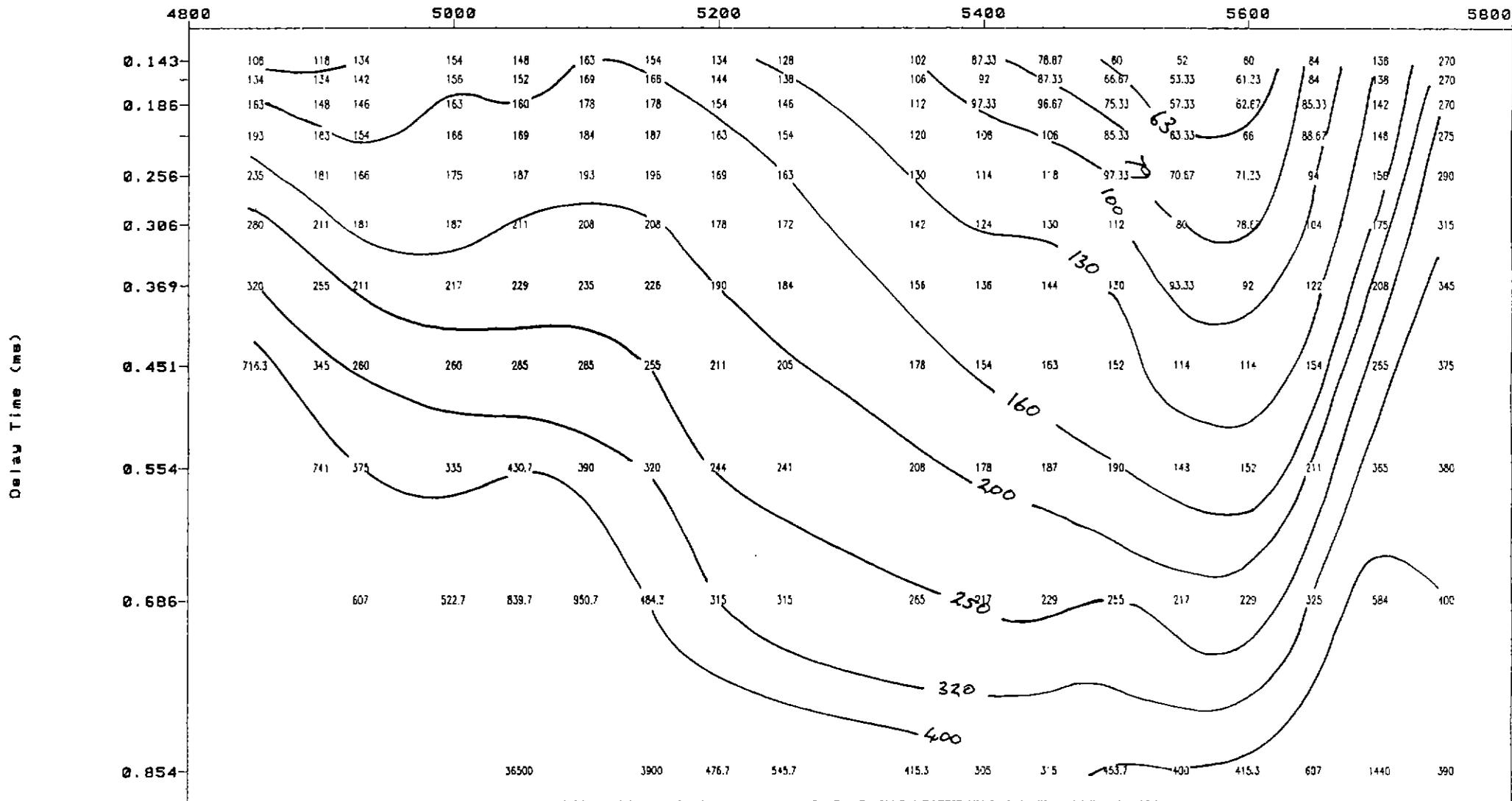


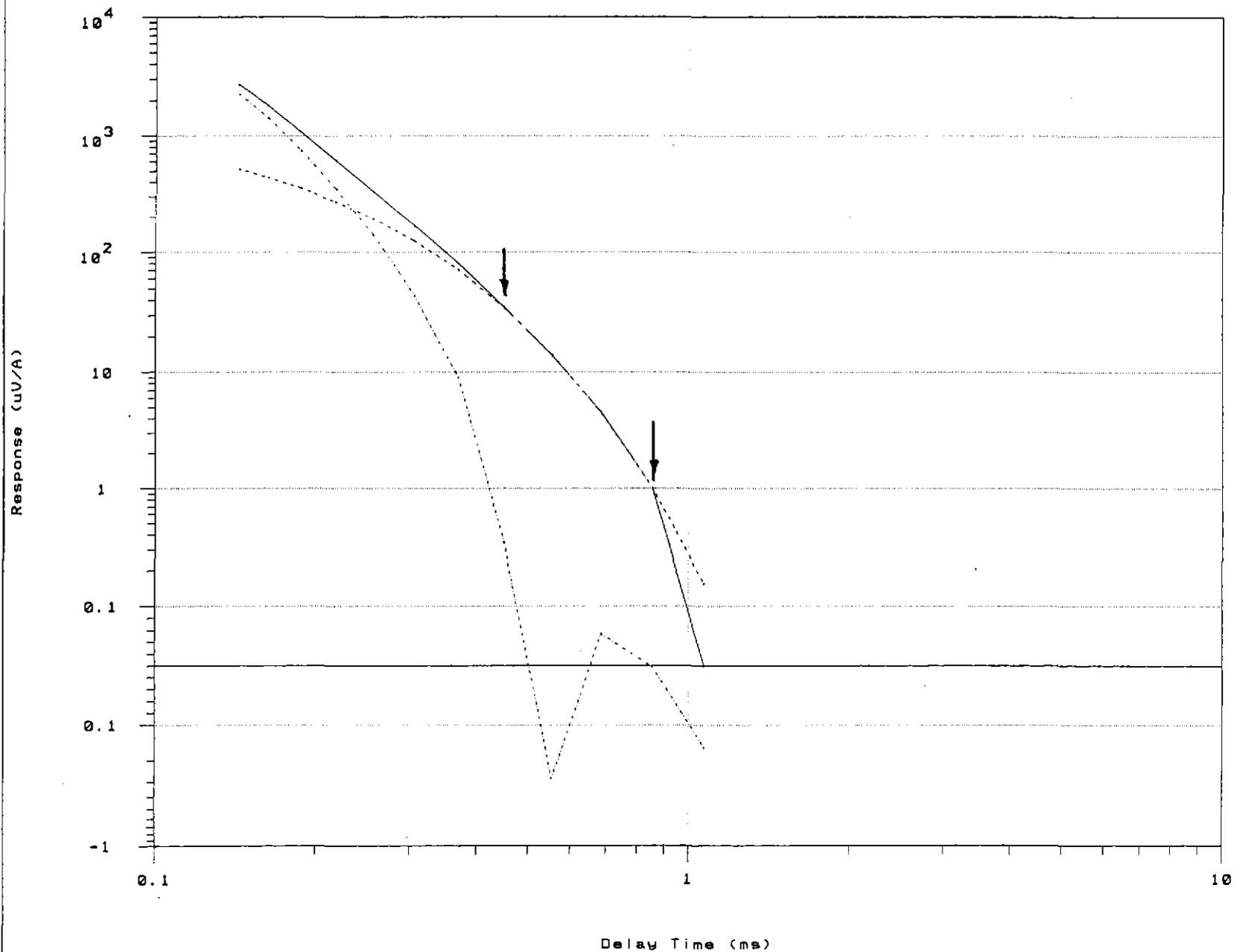
Figure 4

912012

Jervois Mining N.L.: Redwater, Tasmania

Fixed Loop Tx, Roving Surface Rx, Protem data

Data ——— Fitted Curve ..... Residual .....



Line 9850E  
at 5550N

Fit Params

$$d = K \text{EXP}(-t/\tau)$$

$$\tau = 0.11$$

$$K = 1814.39$$

$$R\text{-Sq} = 100.0\%$$

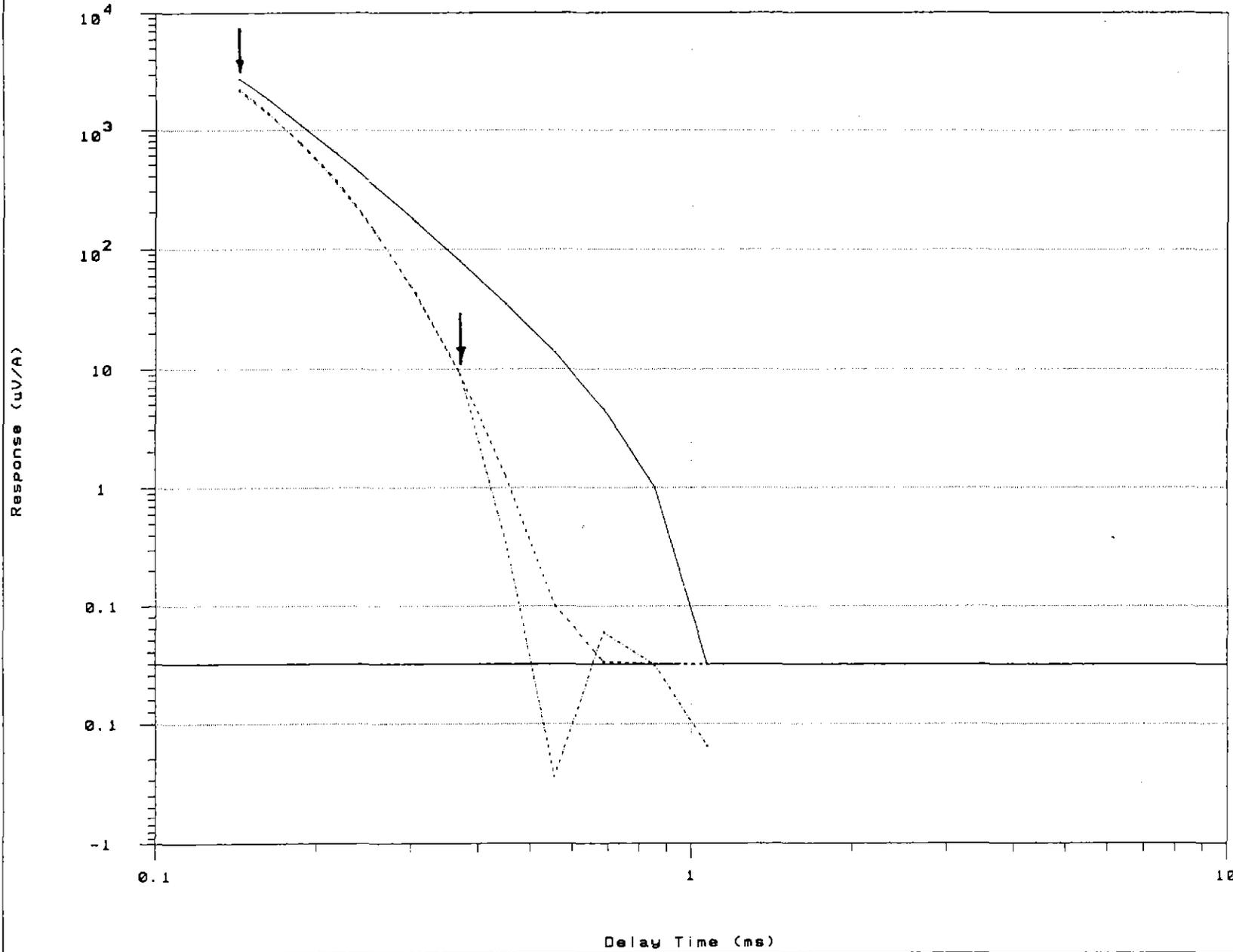
Figure 5a

Siroex : TEM Response Decay Analysis

Jervois Mining N.L.: Redwater, Tasmania

Fixed Loop Tx, Roving Surface Rx, Protem data

Data — Fitted Curve ..... Residual .....



Line 9850E  
at 5550N

Fit Params

$d = K \exp(-t/\tau)$   
 $\tau = 0.04$   
 $K = 70650.46$   
 $R-Sq = 100.0\%$

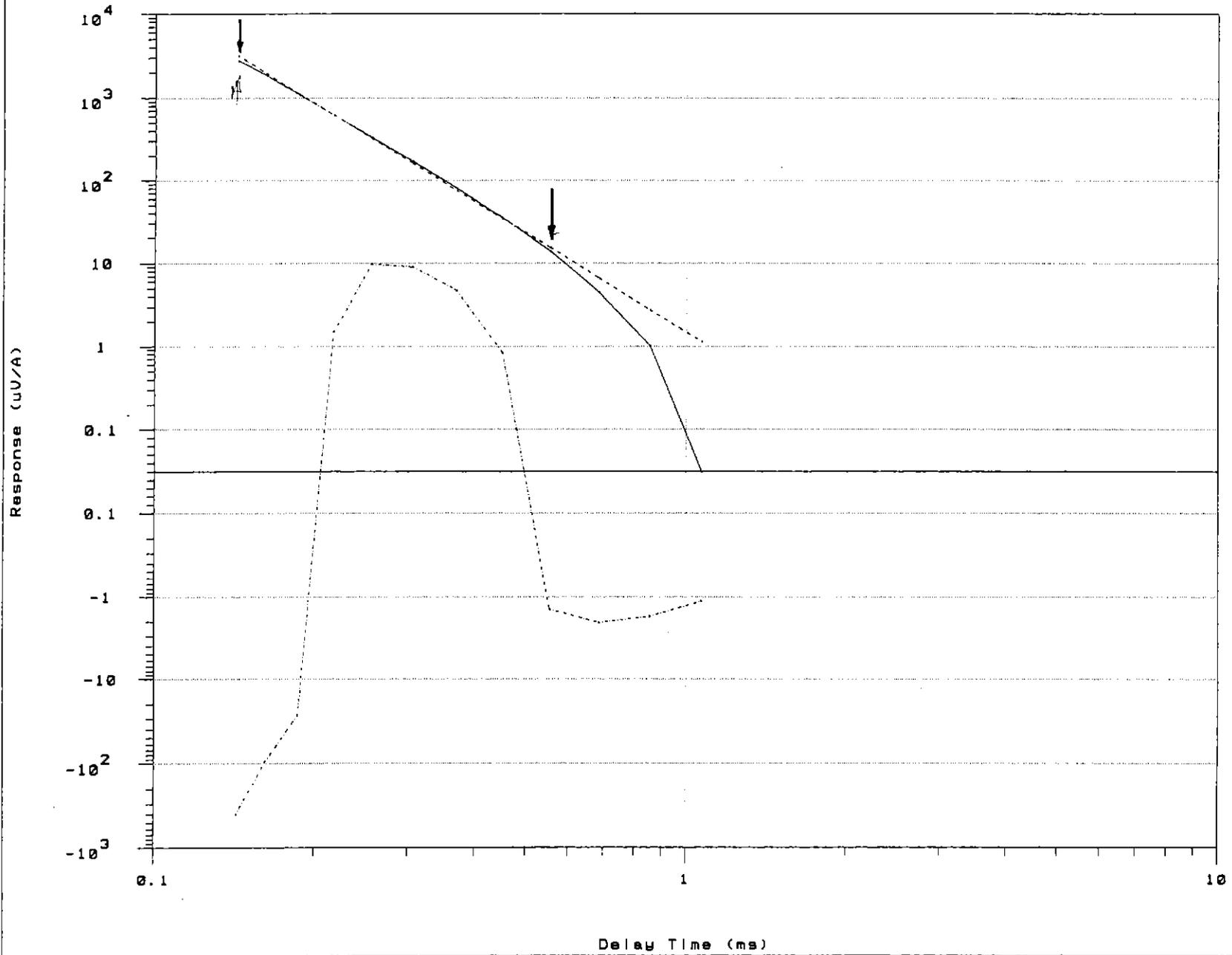
Figure 5b

912014

Jervois Mining N.L.: Redwater, Tasmania

Fixed Loop Tx, Roving Surface Rx, Protem data

Data — Fitted Curve ..... Residual .....



Line 9850E  
at 5550N

Fit Params

- $d = k + a$
- $a = -3.95$
- $k = 1.47$
- $R-Sq = 99.9\%$

Figure 5c

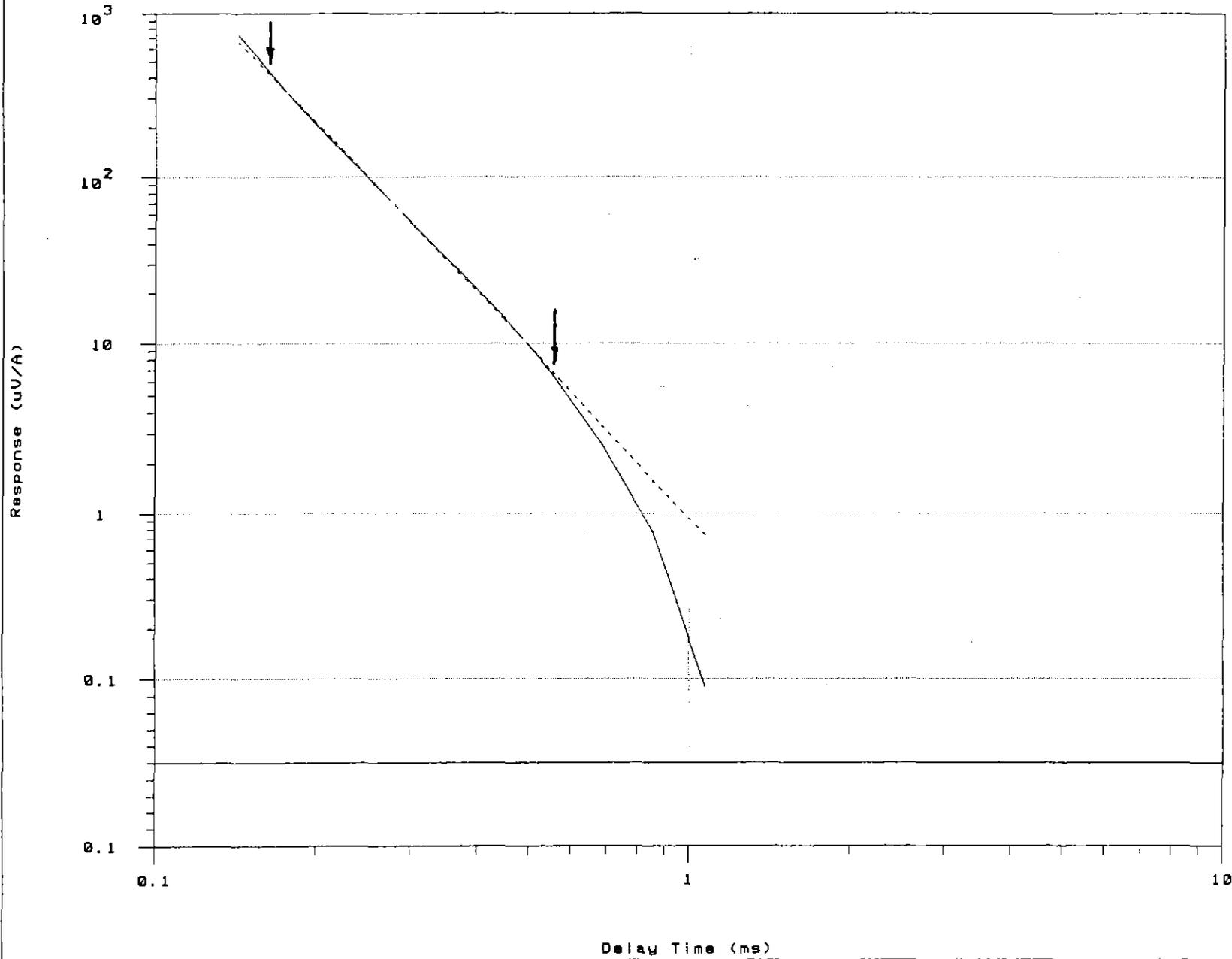
Siroex : Tau response Decay Analysis

Jarvols Mining N.L.: Redwater, Tasmania

Fixed Loop Tx, Roving Surface Rx, Protem data

Data

Fitted Curve



Line 9850E  
at 5200N

Fit Params

$d = Kt^{**a}$

$a = -3.37$

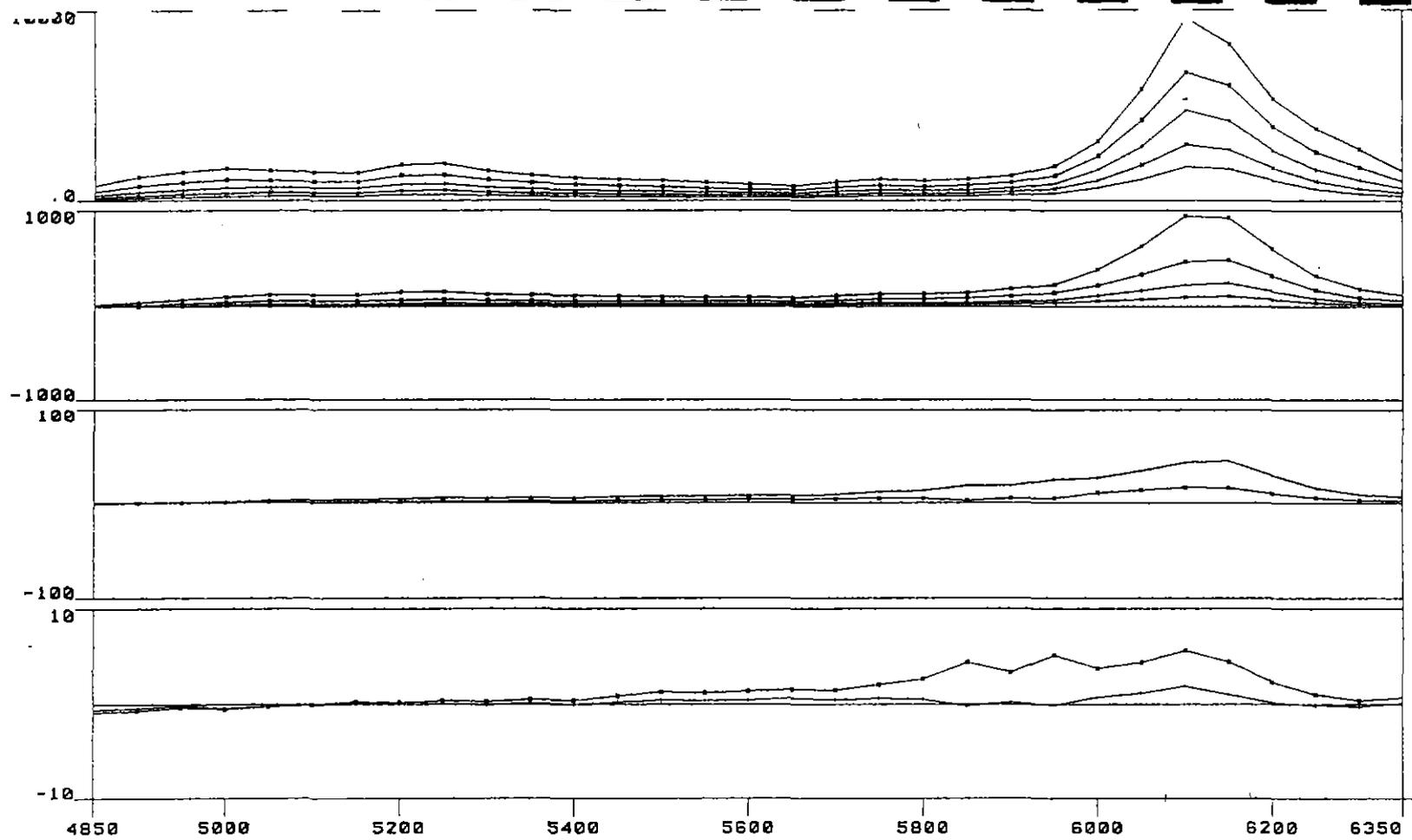
$K = 0.93$

R-Sq = 100.0%

Figure 6

912016

Response (nV/Am<sup>2</sup>)

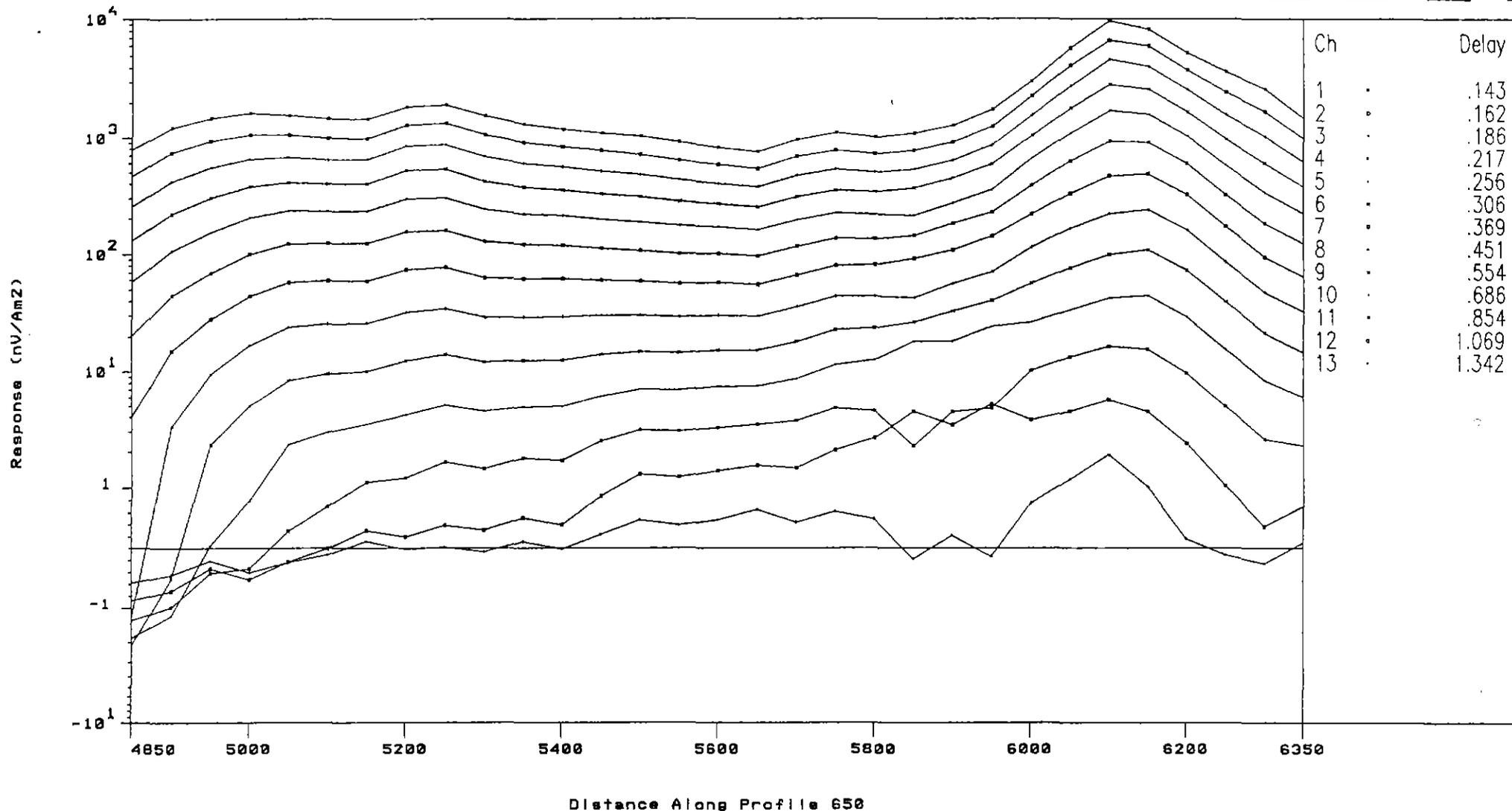


Ch	Delay
1	.143
2	.162
3	.186
4	.217
5	.256
6	.306
7	.369
8	.451
9	.554
10	.686
11	.854
12	1.069
13	1.342

Distance Along Profile 650

Jervois Mining N.L.	Geophysical Exploration Consultants	
EL1/91 : Redwater, TAS Line 650E	Horizontal Scale : Default	
Instrument : Protom from Geoterrnex	Vertical Scale : Linear	
Data : In-loop 100m x 100m, with RVR	Time Delay In : Milliseconds	
Date : Mar 1994	Date : 13/04/94	Figure 7

912017



Jervols Mining N.L.	Geophysical Exploration Consultants	
EL1/91 : Redwater, TAS Line 650E Instrument : Protom from Geotrex Data : In-loop 100m x 100m, with RVR Date : Mar 1994	Horizontal Scale : Default Vertical Scale : Logarithmic Time Delay In : Milliseconds	
	Date : 13/04/94	Figure 8

912018

JERVOIS MINING N.L. Redwater, Tasmania: Line 650E

Moving Loop Tx, In Loop Dipole Rx, I Component

Field Data

Distance along profile 650

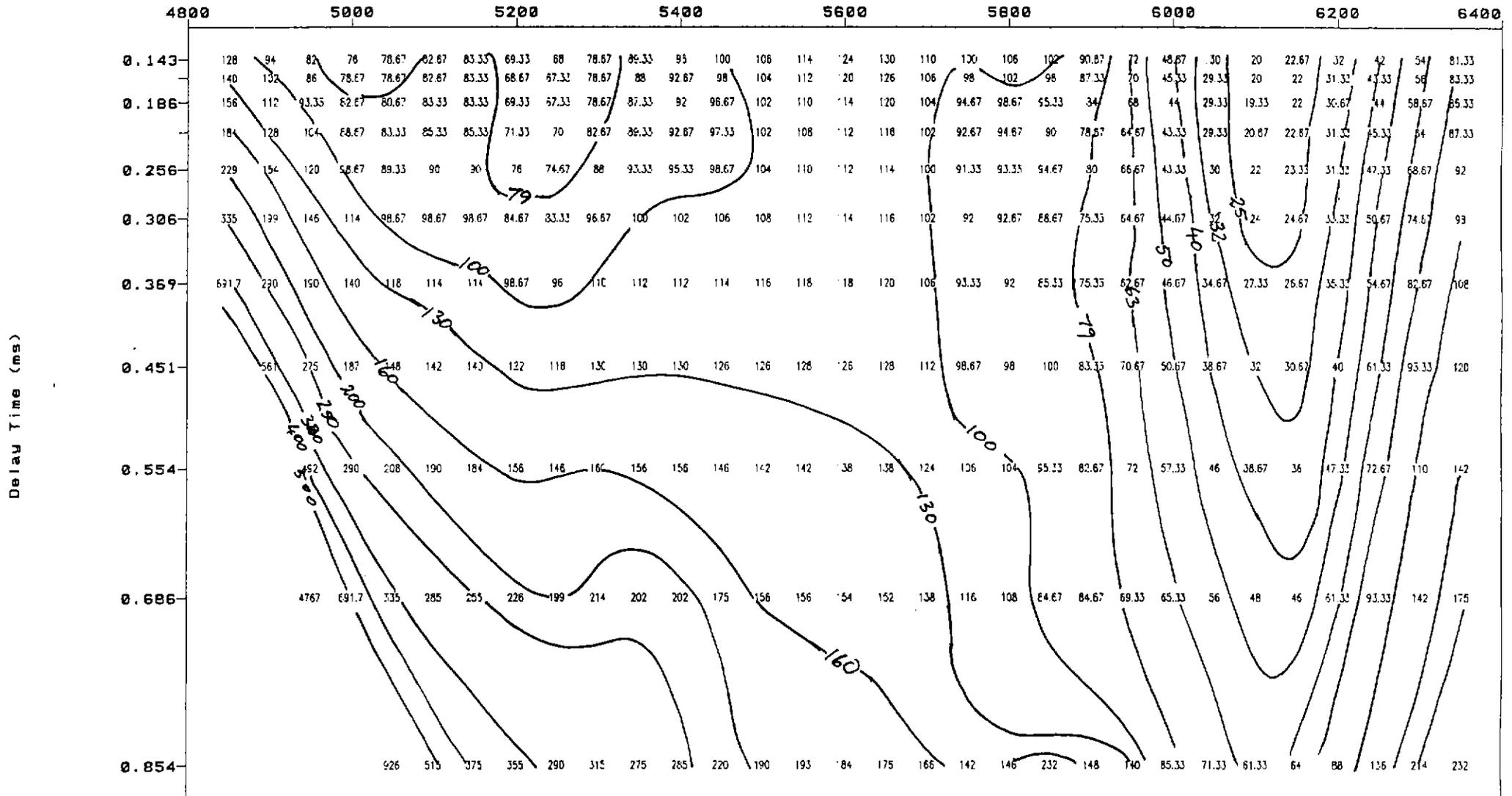


Figure 9

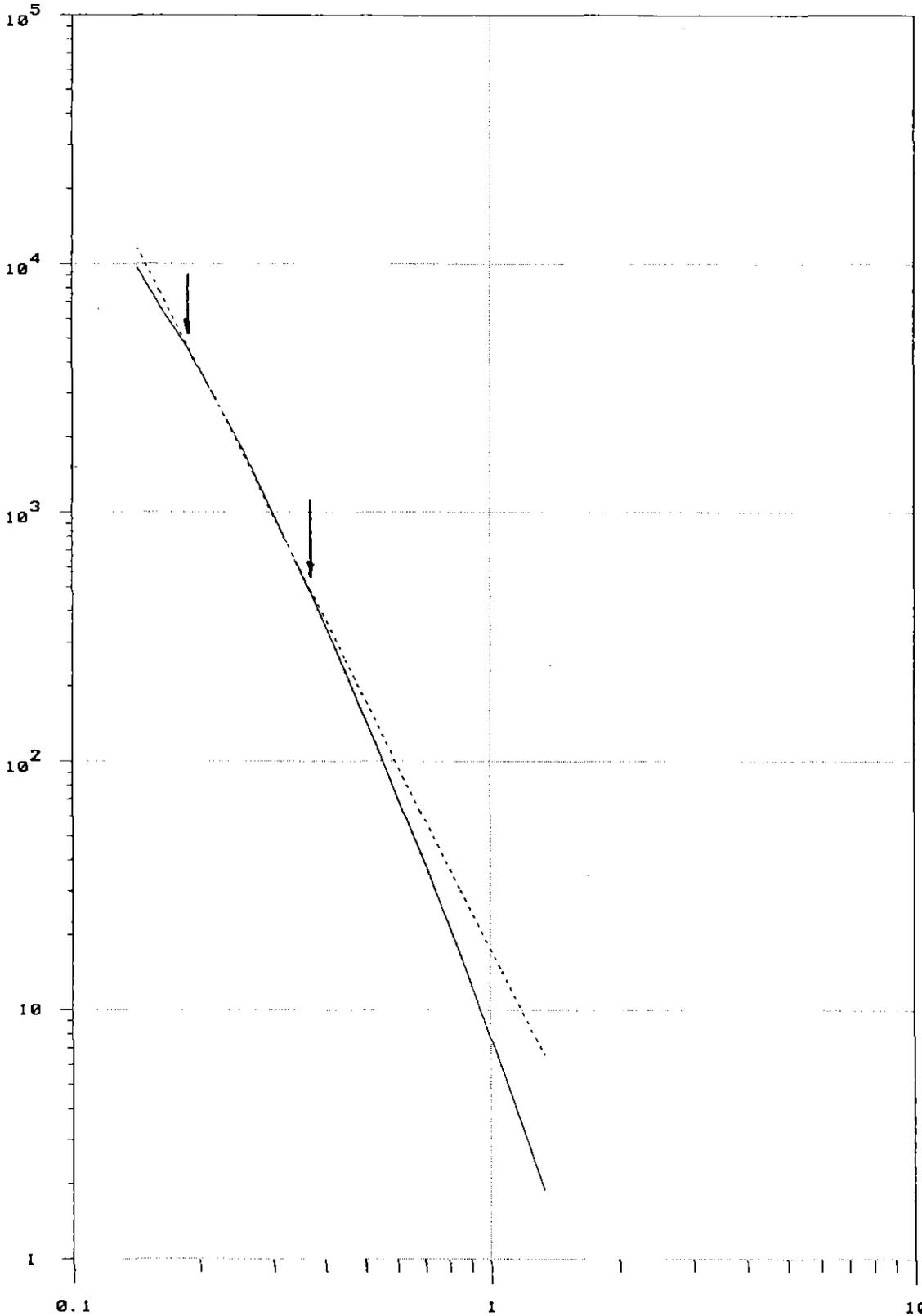
912019

Siroex : TEM Response Decay Analysis

JERVOIS MINING N.L. Redwater, Tasmania: Line 650E

Fixed Loop Tx, Roving Surface Rx, Protem data

Data — Fitted Curve - - - - -



Line 650E  
at 6100N

Fit Params

$d = k t^a$

$a = -3.33$

$k = 17.74$

$R-Sq = 99.9\%$

Delay Time (ms)

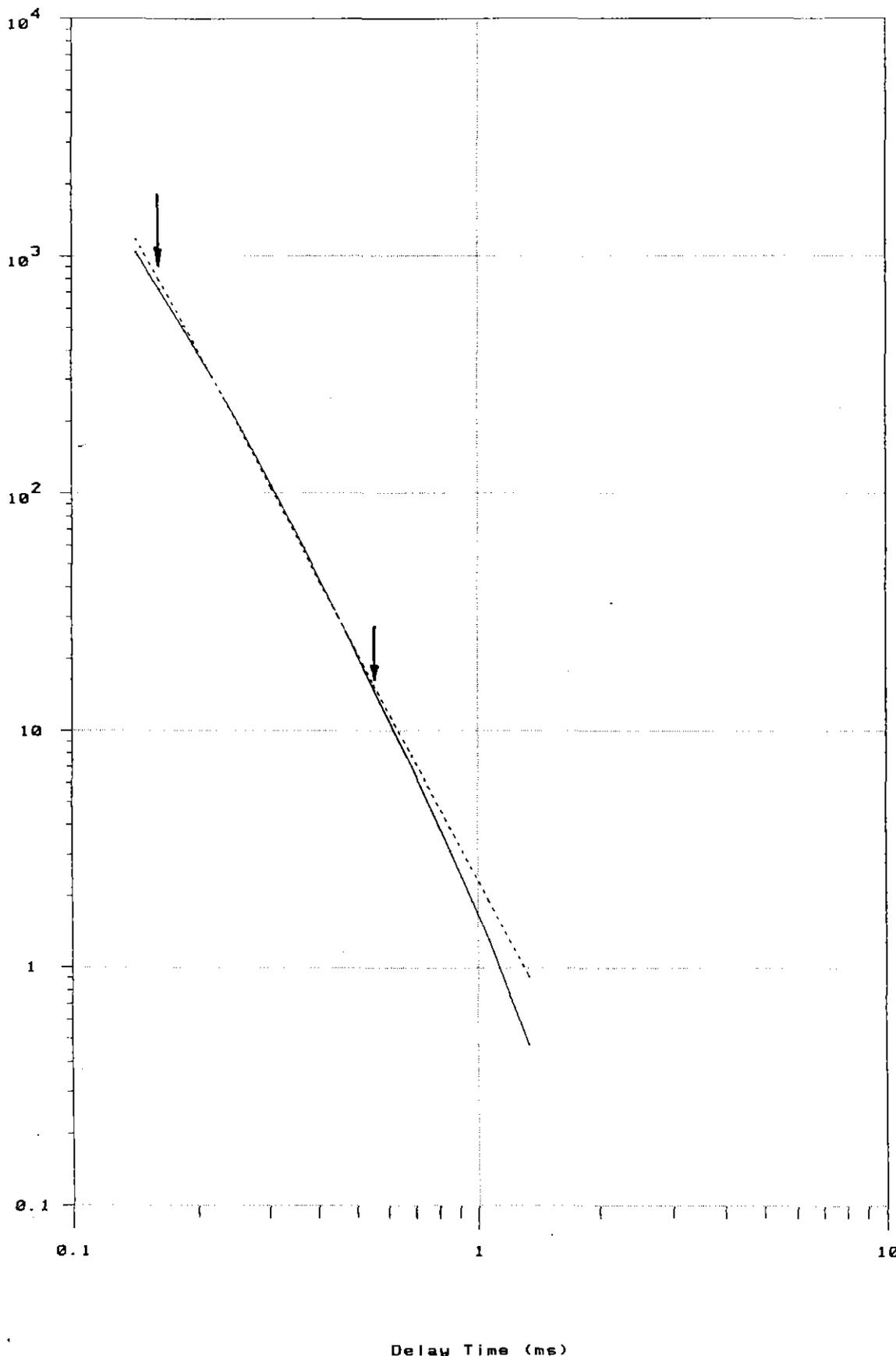
Figure 10

Siroex : TEM Response Decay Analysis

JERVOIS MINING N.L. Redwater, Tasmania: Line 650E

Fixed Loop Tx, Roving Surface Rx, Protem data

Data — Fitted Curve - - - - -



Line 650E  
at 5500N

Fit Params

$d = kt^{**a}$

$a = -3.20$

$k = 2.35$

$R-Sq = 99.9\%$

Figure 11