

**Interpretation of Chamberlain Prospect
CP 348 and CP 353 DHEM Data**

For

Zinifex Ltd

By

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SUMMARY

CP348 and CP 343, from loop DHEM data set cannot be reconciled with a simple single conductive sheet target located in an area not tested by the two drill holes. Instead using conductor sheet (plate) models, a minimum of three conductive plates are required to reconcile the amplitudes and the characteristics of the two drill hole five loop data set. On the basis of the analysis of this complex data a target area close to the bottom of drill hole CP353 is recommended for additional drill testing.

1. INTRODUCTION

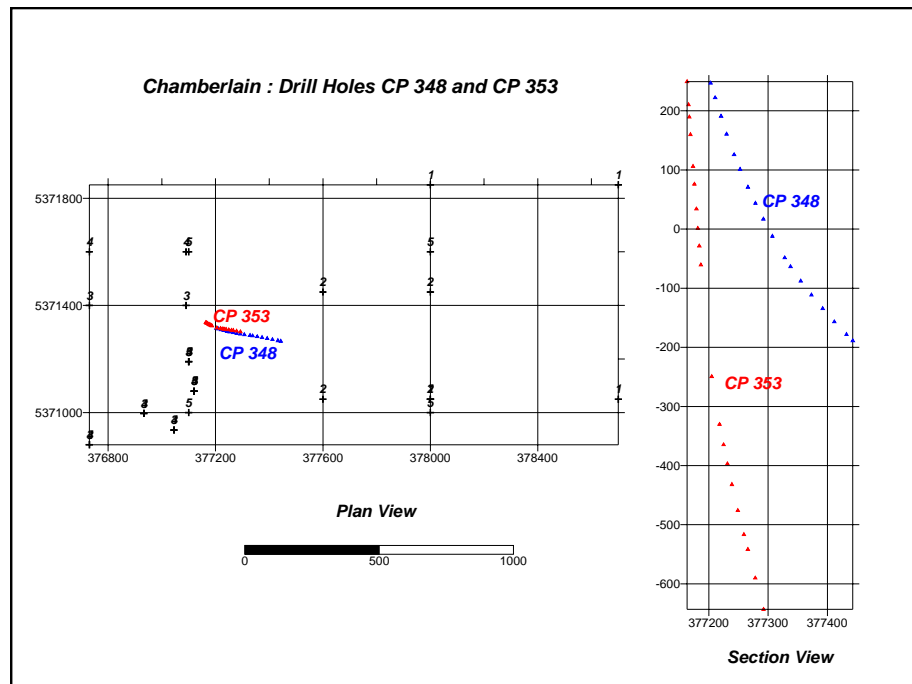


Figure 1. *Chamberlain: Drill Holes CP 348 and CP 353*

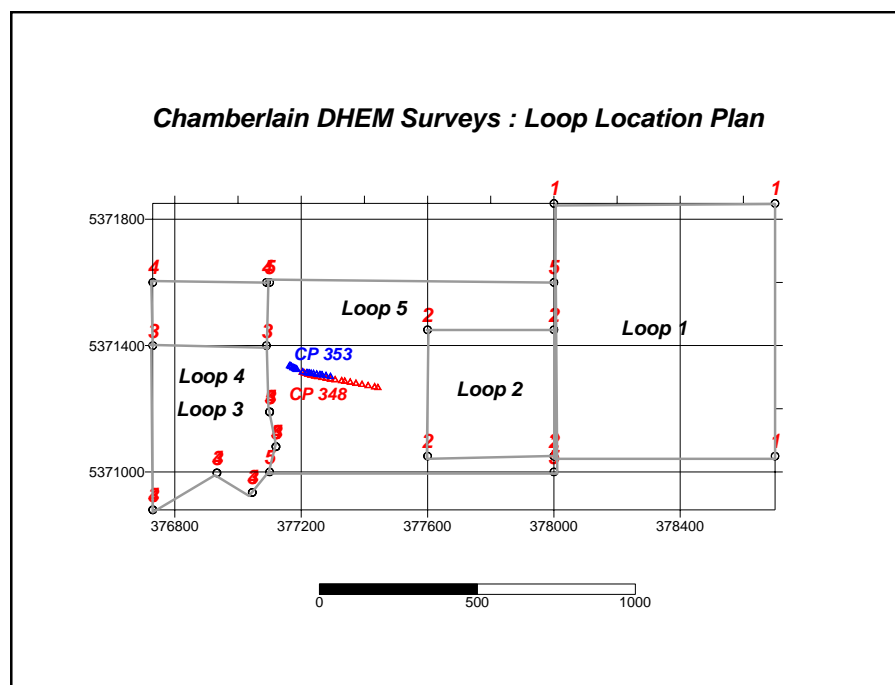


Figure 2. *Chamberlain DHEM Survey: Loop Location Plan*

Two drill holes CP 348 and CP 353 at the Chamberlain prospect some 2-3 kilometres to the south of town of Rosebery failed to intersect a large conductor interpreted from surface EM data to be below 500 -600 meters from the surface (Figure 1). DHEM data was collected in both drill holes using five loops (Figure 2) and two DHEM systems. Drill hole CP 348 was surveyed using the Crone EM system and Loops 2 and 3, whereas Zonge EM system was used to survey drill hole CP 348 and 353 with Loops 1, 4 and 5 (Figure 2).

The purpose of this report is to discuss the analysis and interpretation of the two drill hole five loop EM data set and to recommend options for future explanation in the area.

2. CP348 AND CP353 DHEM DATA SET

One of the striking features of the CP348 and CP353 DHEM data set, is the lack of similar profile shapes (with or without the sign change) for same drill hole data collected using different loops Figure 3 to Figure 7a).

For example profiles of DHEM data from drill hole CP353 collected using loops 1, 4 and 5 (Figure 3, 6 and 5) do not even closely resemble each other. Similarly profiles of data from drill hole CP348 collected using loops 2 and 3 (Figure 4 and 5), shows late time loop p 2 along hole component response (Figure 4) increasing in amplitude toward the bottom of the drill hole, whereas the corresponding response from loop 3 data shows a decrease in amplitude progressively becoming negative towards the bottom of the drill hole (Figure 5).

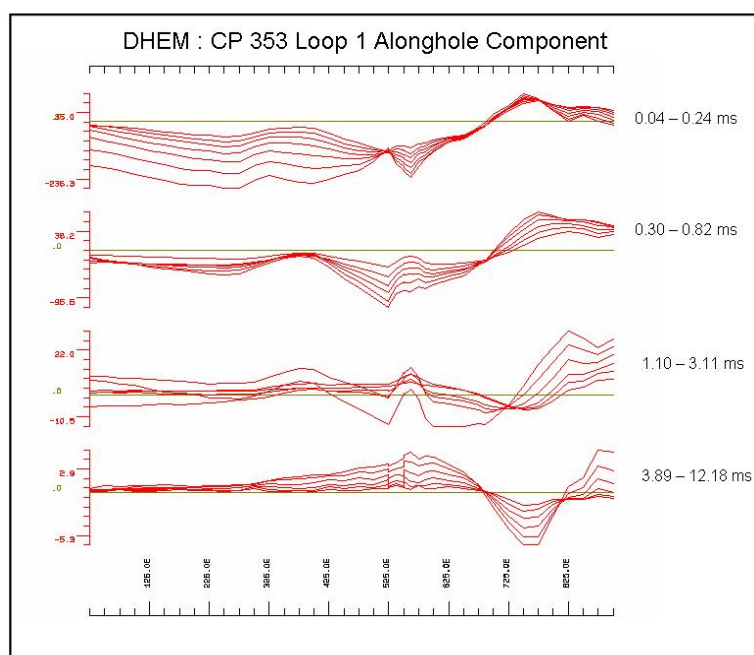


Figure 3. DHEM" CP 353 Loop 1 Along hole Component

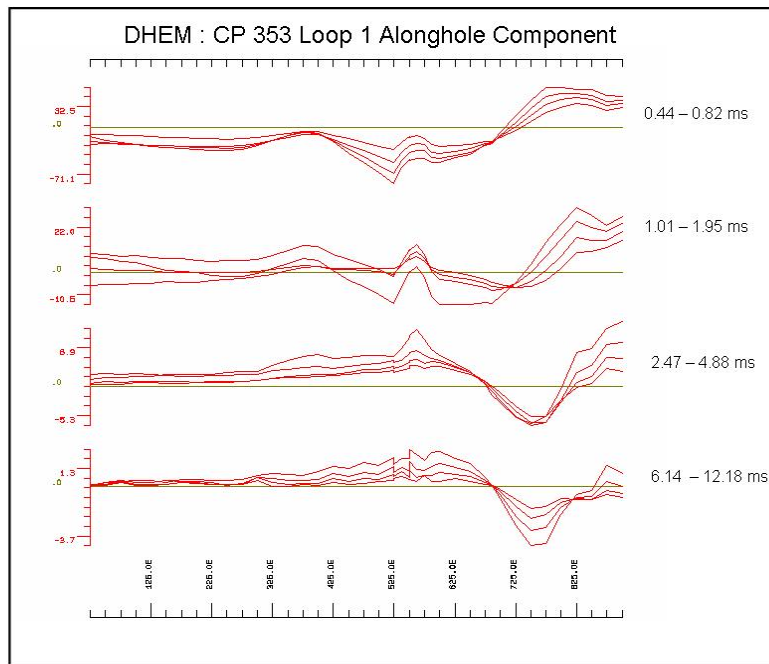


Figure 3a. *DHEM: CP 353 Loop 1 Along hole Component*

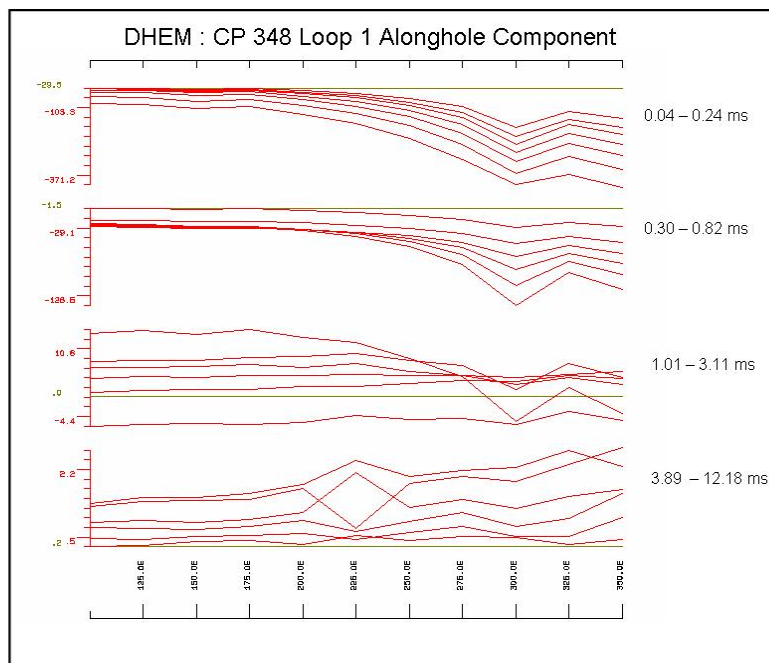


Figure 3b. *DHEM: CP 348 Loop 1 Along hole Component*

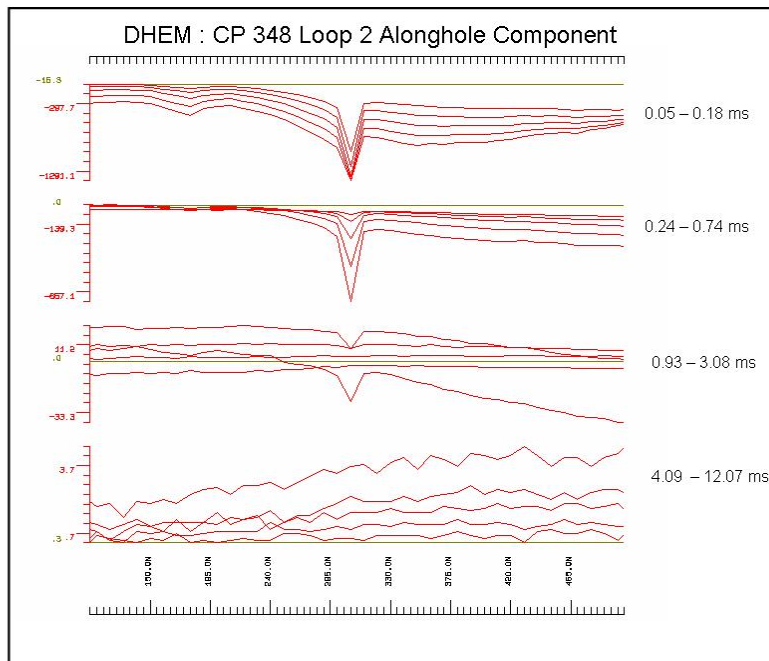


Figure 4. DHEM: CP 348 Loop 2 Along hole Component

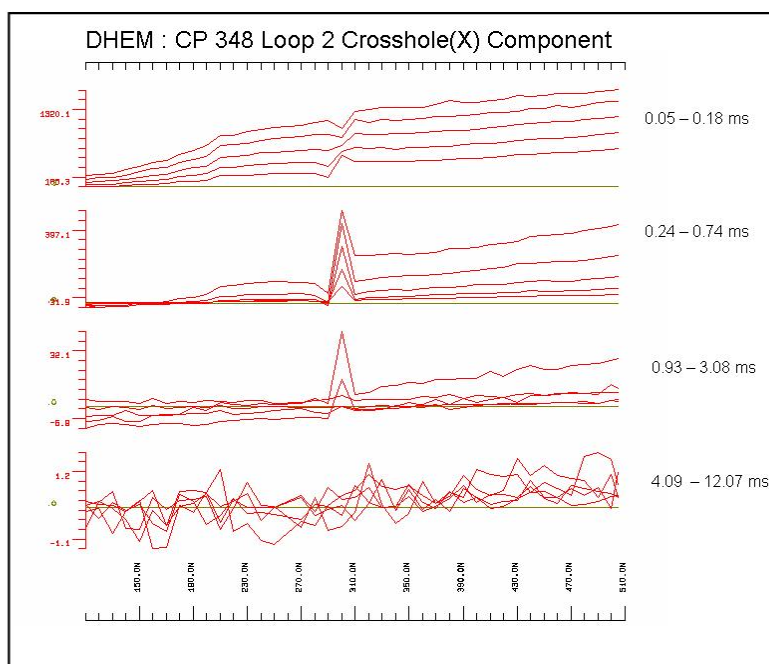


Figure 4a. DHEM: CP 348 Loop 2 Cross hole (X) Component

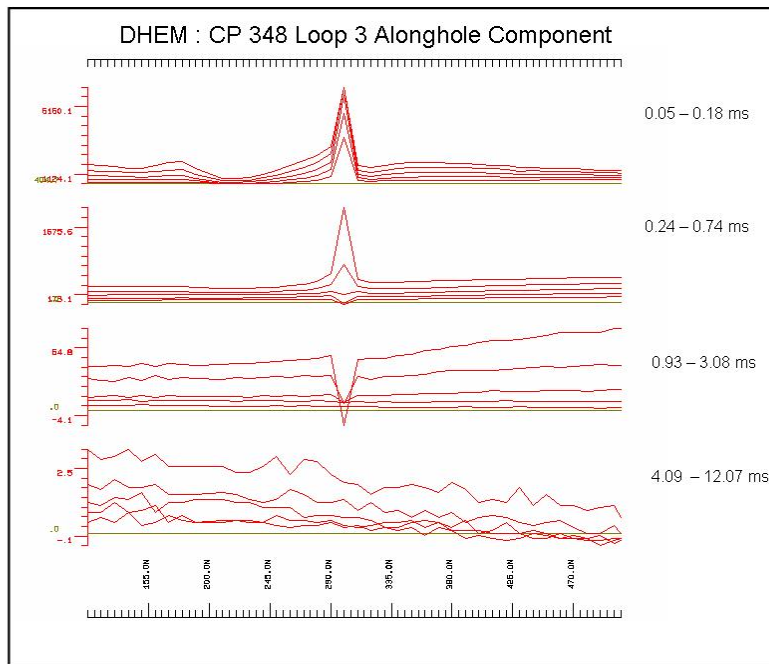


Figure 5. *DHEM: CP 348 Loop 3 Along hole Component*

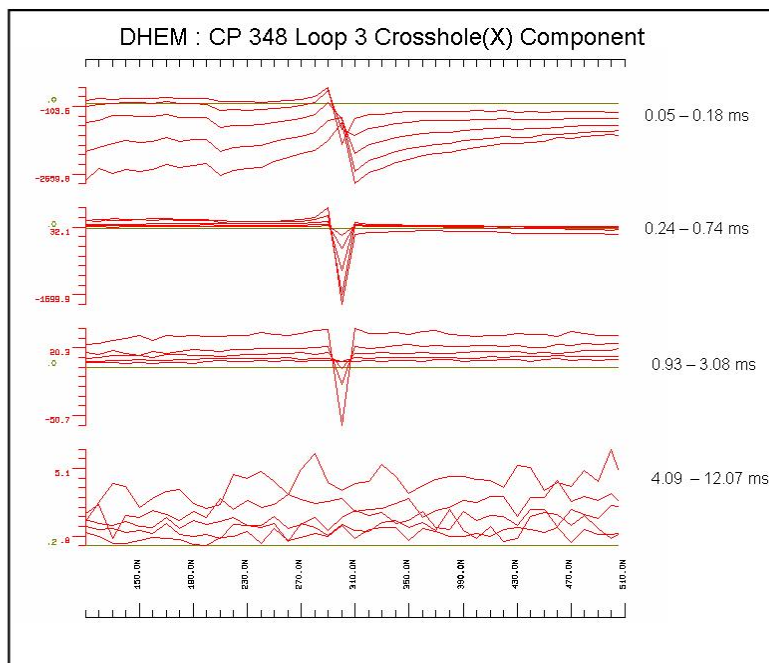


Figure 5a. *DHEM: CP 348 Loop 3 Cross hole (X) Component*

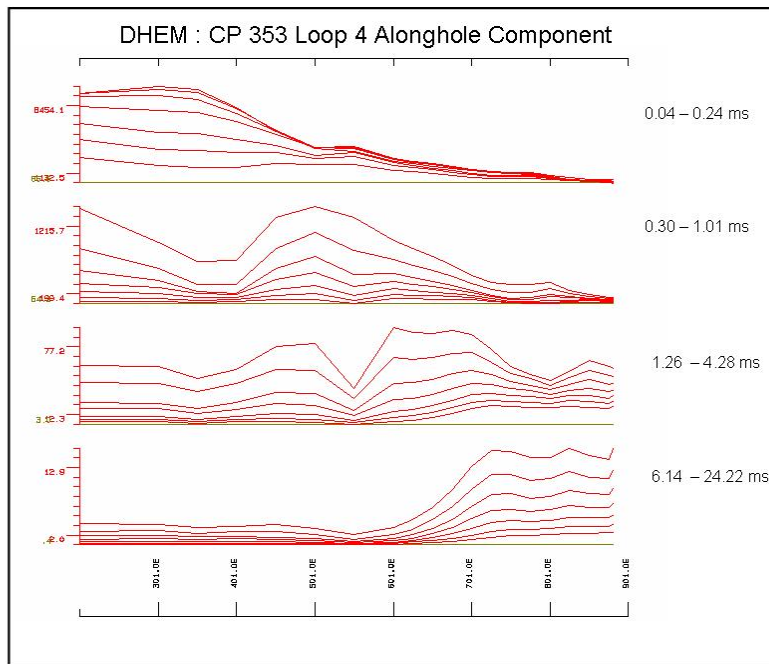


Figure 6. *DHEM: CP 353 Loop 4 Along hole Component*

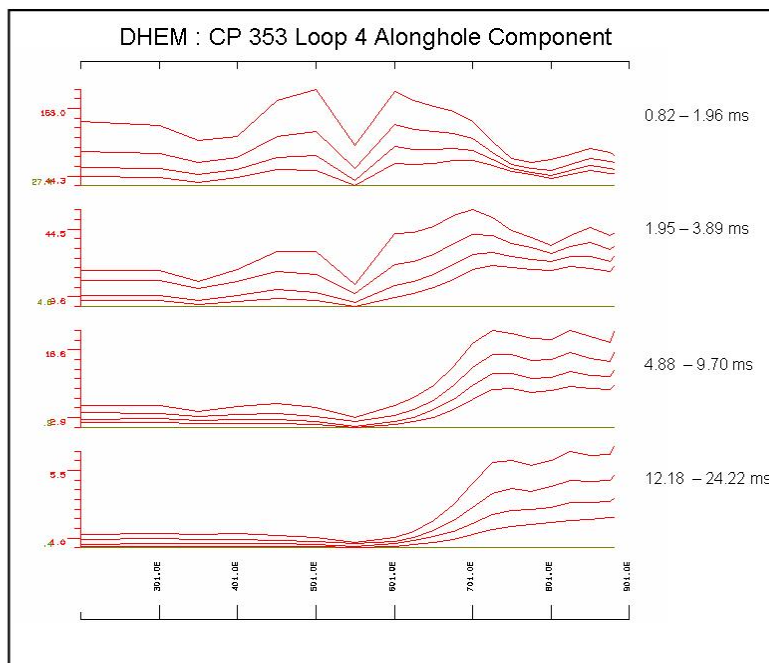


Figure 6a. *DHEM: CP 353 Loop 4 Along hole Component*

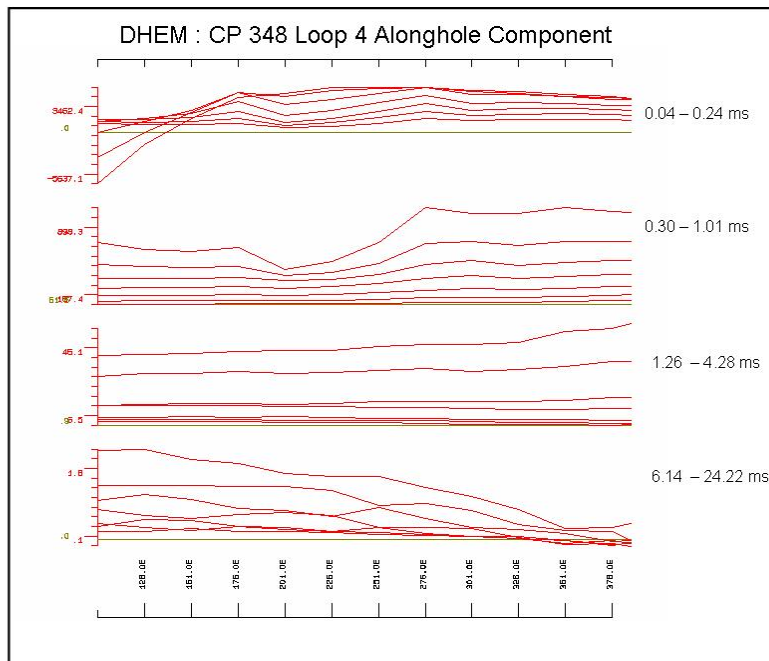


Figure 6b DHEM: CP 348 Loop 4 Along hole Component

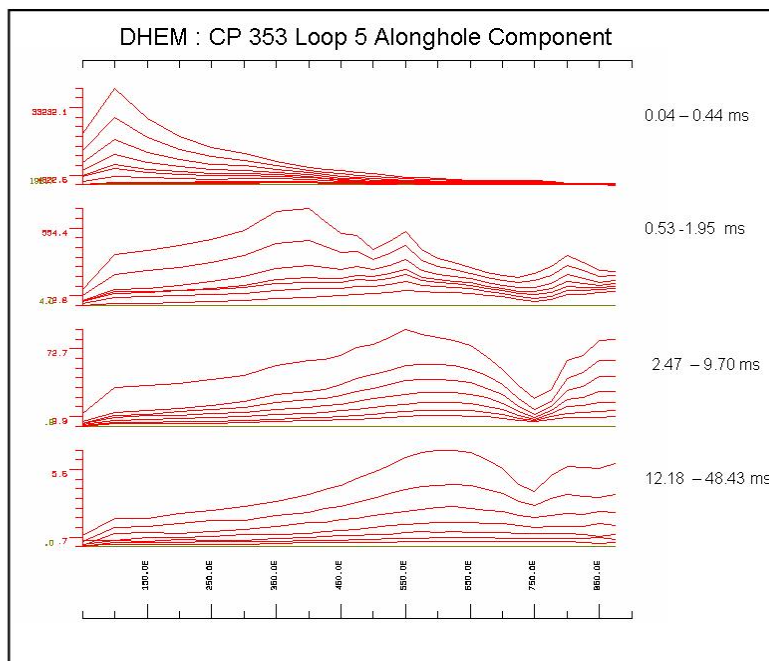


Figure 7. DHEM: CP 353 Loop 5 Along hole Component

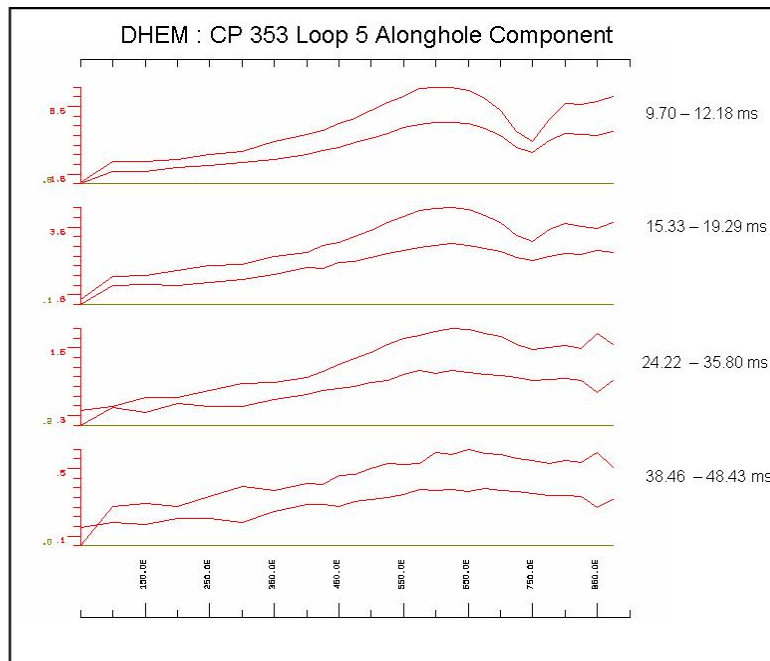


Figure 7a. DHEM: CP 353 Loop 5 Along hole Component

As a result these responses cannot be explained in terms of a single simple sheet conductor located approximately between 377300 – 377450 E or in the area not tested by the two drill holes (Figure 1). If that was the case, then at the very least the expectation would be that the DHEM data would have similar profile shapes from all the loops, but with changing amplitudes and different signs. At the very least a simple single conductor response would be characterized by change in the sign of the EM data from the westerly (loop 3 and 4) to the easterly (loop 1 and 2) modes of conductor excitation. As is evident from Figure 3 to 7a, no such simple pattern is observed with response in most parts of the drill holes being essentially positive for all the loops.

On the basis of the preceding observations it was concluded that the DHEM data set is outlining number of conductive targets or number of different current systems.

3. INTERPRETATION OF CP348 AND CP353 DHEM DATA SET

The interpretation/inversion of the DHEM data set proceeded by modelling/inverting the data and attempting to reconcile not only the amplitude but also the profile shape variations within the five loop, two drill hole EM data set. In most cases this was done by simultaneously inverting /modelling the data by using different combinations of drill holes and loops. Because of the data complexity this process required about seventy different modelling and inversion attempts.

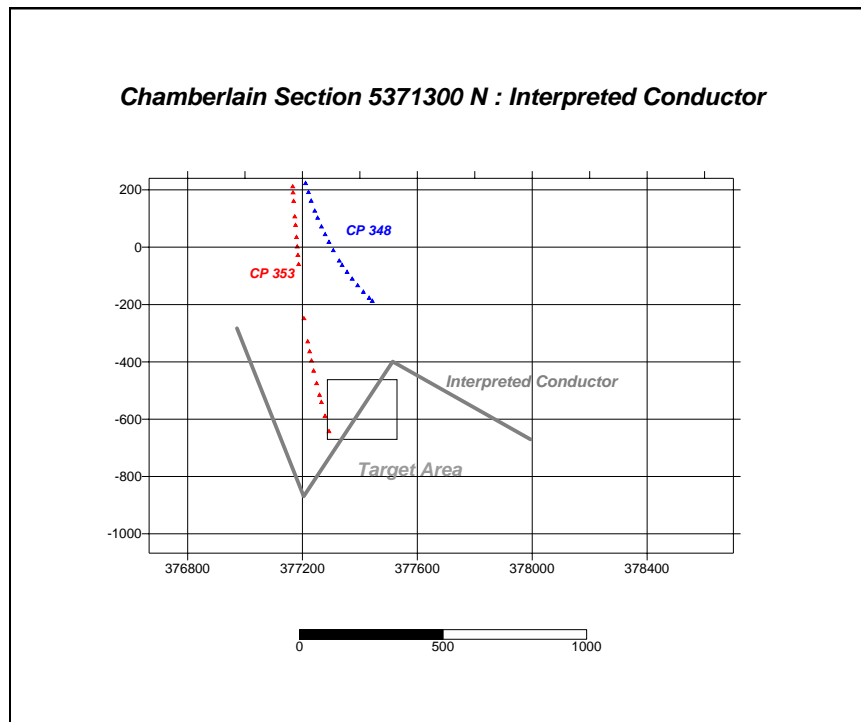


Figure 8. *Chamberlain Section 5371300N: Interpreted Conductor*

On the basis of these procedures, it was interpreted that the whole data set can be reasonably reconciled with a three sheet conductor model as shown in Figure 8. Using reasonable geological consideration it is possible that the conductive sheet model represents a folded structure as is inferred Figure 8. However on basis of EM modelling alone this cannot be inferred with any certainty. The three conductive targets may not be joined as shown in Figure 8 and may be separate.

From the inversion of data it was apparent that the two conductors best defined by the EM data are the western and the central sheet targets. As a result it is recommended that the interpretation be tested by targeting a drill hole into the designated area as shown in Figure 8.

For completeness the goodness of fit between the observed and calculated response is shown in profile form in Figure 9 -13. As is evident from these figures, the agreement between the observed and the calculated response is good.

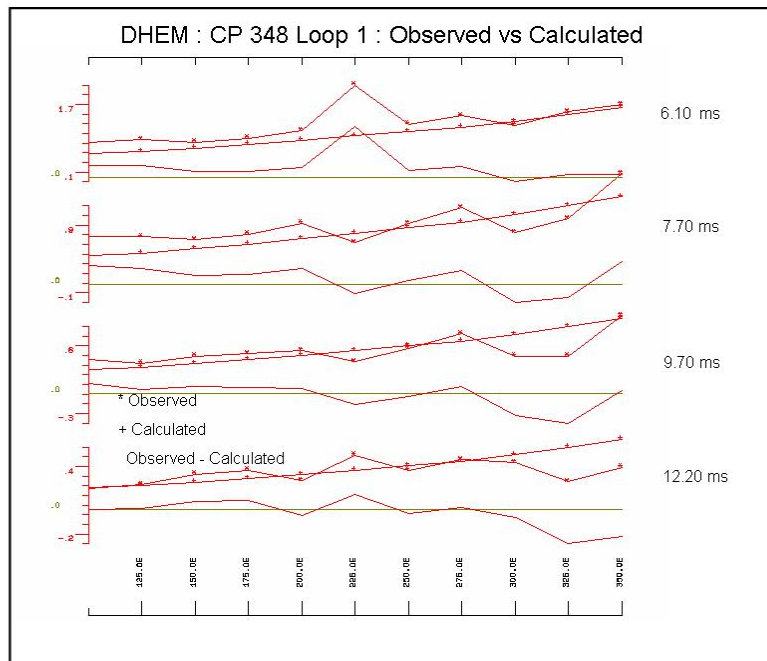


Figure 9. DHEM: CP 348 Loop 1: Observed vs. Calculated

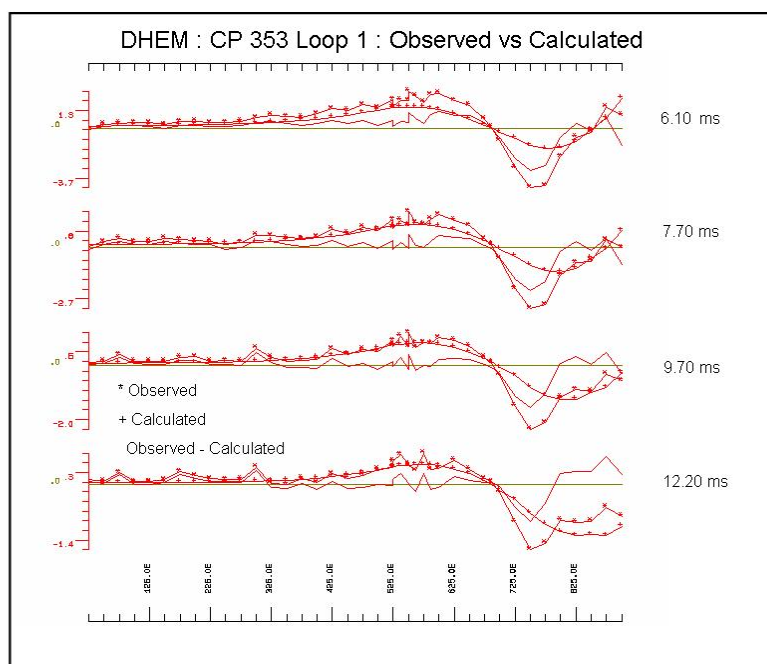


Figure 9a. DHEM: CP 353 Loop 1: Observed vs. Calculated

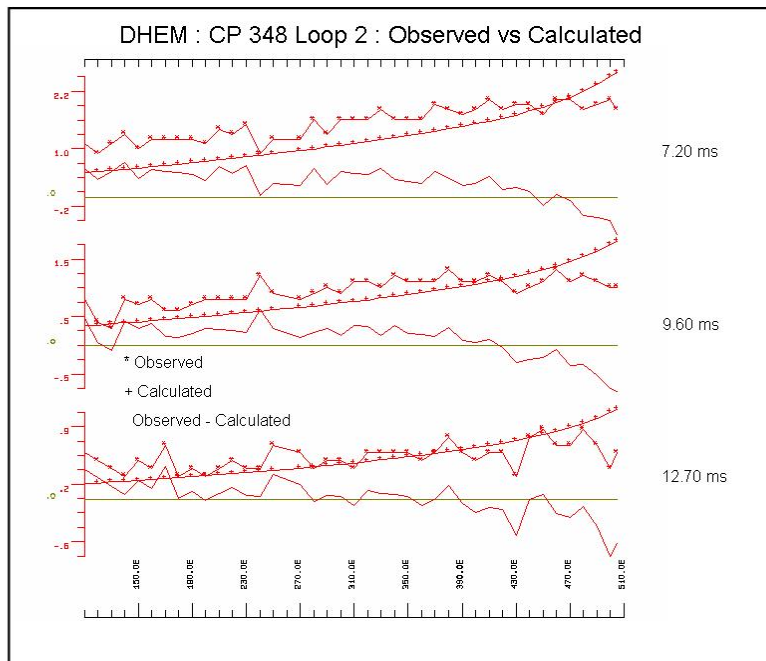


Figure 10. *DHEM: CP 348 Loop 2: Observed vs. Calculated*

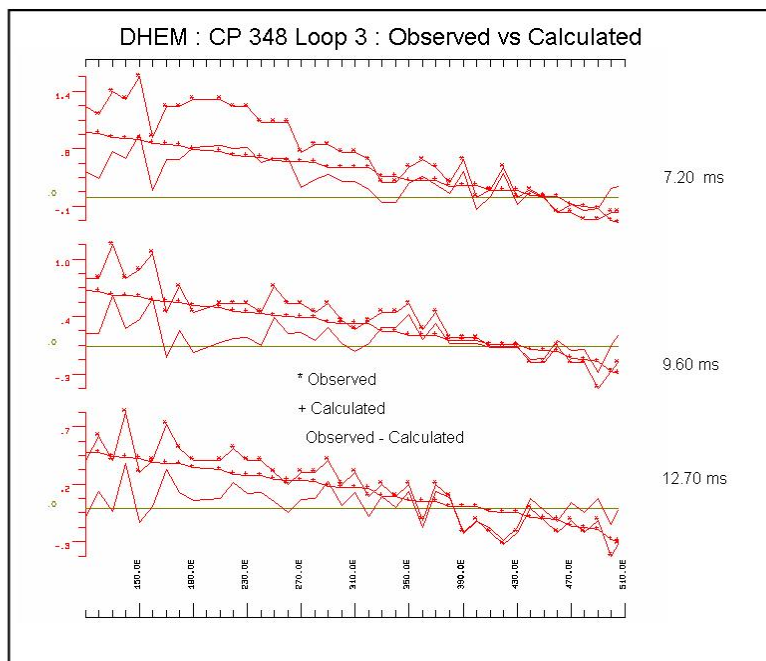


Figure 11. *DHEM: CP 348 Loop 3: Observed vs. Calculated*

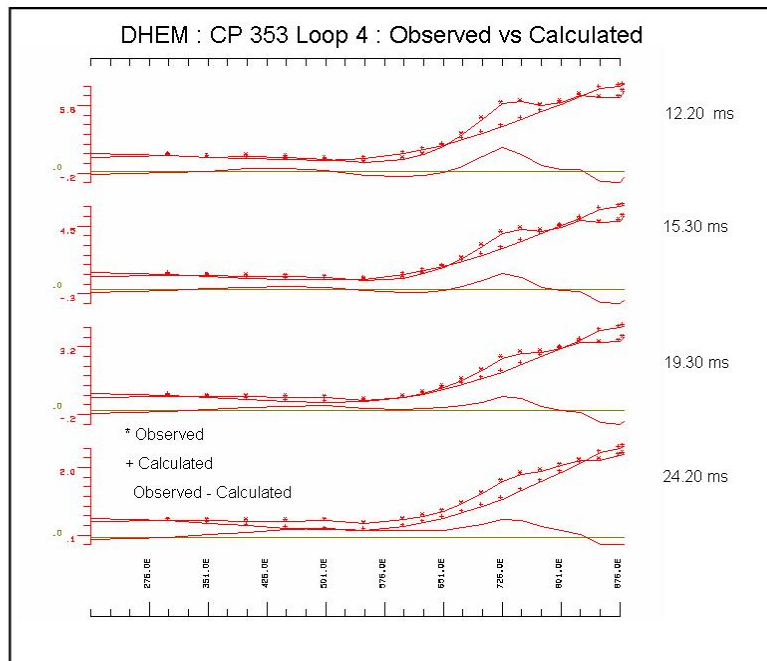


Figure 12. DHEM: CP 353 Loop 4: Observed vs. Calculated

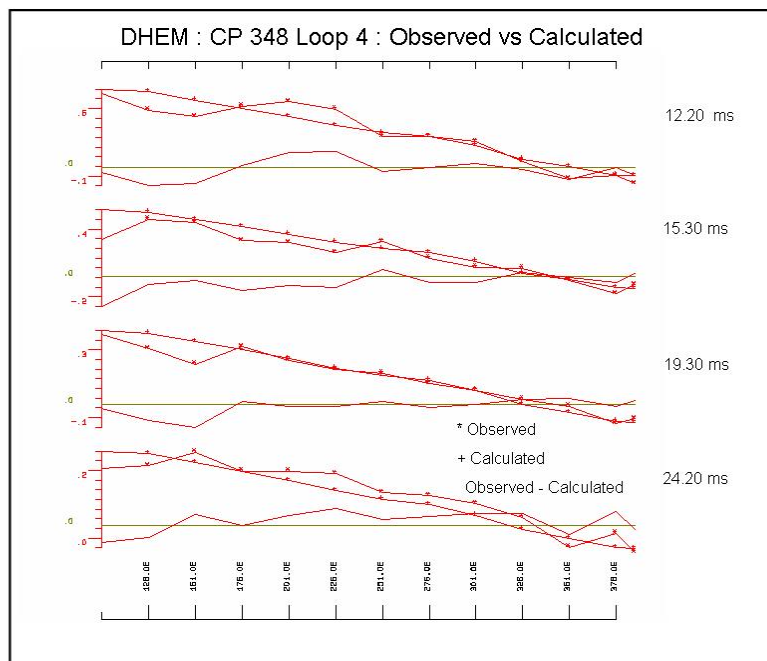


Figure 12a. DHEM: CP 348 Loop 4: Observed vs. Calculated

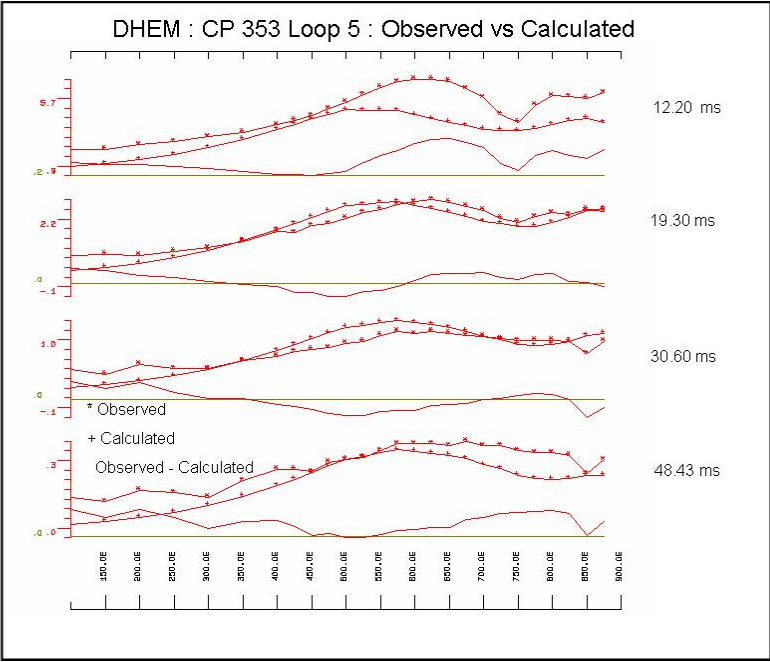


Figure 13. DHEM: CP 353 Loop 5: Observed vs. Calculated

CONCLUSION

CP348 and CP 343, from loop DHEM data set cannot be reconciled with a simple single conductive sheet target located in an area not tested by the two drill holes. Instead using conductor sheet (plate) models, a minimum of three conductive plates are required to reconcile the amplitudes and the characteristics of the two drill hole five loop data set. On the basis of the analysis of this complex data a target area close to the bottom of drill hole CP353 is recommended for additional drill testing.

REFERENCES: