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HATFIELD EXPLORATION LICENCE 15/73
TASMANIA
PROGRESS REPORT
FOR THE PERIOD
26 DECEMBER 1984 - 27 MAY 1985

<u>DISTRIBUTION:</u>
Aberfoyle - Hawthorn
Aberfoyle - Burnie
Department of Mines

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REGIONAL MANAGER

MAY 1986

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MAC86	1:10,000	Hatfield EL 15/73, Exploration Activity 28 December 1984 to 27 May 1985
HT61(G)	1:1,000	DDH MC-12 SECTION
HT61(H)	1:1,000	DDH MC-13 SECTION
HT62	1:2,500	MURCHISON HIGHWAY PROSPECT, EXPLORATION SUMMARY MAP
HT55	1:2,500	MT. CHARTER AREA, EXPLORATION SUMMARY MAP

FIGURES

FIG. 1	HATFIELD E.L., LOCATION PLAN.

APPENDICES

APPENDIX I	"Report on the 1985 UTEM survey on the Mackintosh Hatfield Licences", E.T. Eadie, July 1985 Aberfoyle Exploration Internal Report (Abridged to Include Data on Hatfield Licence Only)
APPENDIX II	"Interim report to Aberfoyle Exploration Pty Ltd on the significance of Lead Isotopic Compositions of Samples from the Mt. Charter Area, Western Tasmania" G.R. Carr, B.L. Gulson, May 1985 Sirotope Confidential Report
APPENDIX III	"Supplementary Report on Mt. Charter DDH Samples", G.R. Carr, July 1985. Sirotope Report
APPENDIX IV	Geological Log, DDH MC-12
APPENDIX V	Report on Petrological Samples from DDH MC-12 by Central Mineralogical Services
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APPENDIX VII	Report on Petrological Samples from DDH MC-13 by Central Mineralogical Services
APPENDIX VIII	"Report on CSMAT Measurements, Hatfield Project, Waratah, Tasmania for Aberfoyle Exploration Pty Ltd" Zonge Engineering and Research Organisation.

1. SUMMARY

Exploration activity on the Hatfield Exploration Licence (15/73) for the period 25 December 1984 to 27 May 1985 is located and annotated on Plate MAC 86.
Major tasks completed included:

- Cutting of approximately 37 line Km of grid lines for approximately 30 line km of UTEM surveying, completed in February 1985. No high priority anomalies were detected.

- Completion of DDH MC-12 to test beneath the N.W. Mt. Charter Pb/Zn soil anomaly. The soil geochemical anomaly was explained but the interpreted Hellyer ore position was not intersected.

- Completion of DDH MC-13 at the Murchison Highway Prospect. The interpreted Hellyer ore position was intersected but was not visibly mineralised.

- Completion of a Pb-isotope survey on samples from the S.W. Mt. Charter prospect and the Mt. Charter Barite Horizon. The Barite and the interpreted ore horizon from MC-9 at S.W. Mt. Charter were both shown to have Que River - Hellyer style isotopic signatures.

Routine core grind sampling and borehole E.M. continued for all drill holes.
Future exploration on the Hatfield Licence should include -

(1) Follow-up of the MC-9 intersection by drilling of a hole to the west.
(2) Tracing of the interpreted Hellyer ore position by drilling down dip to the west, below the limit of detection of surface geophysics looking for sedimentary or geochemical features which can be used as indicators of the direction to massive sulphide mineralisation.

2. INTRODUCTION

The Hatfield Exploration Licence 15/73 was pegged on May 5, 1973, by Cominco Exploration Pty. Ltd. (Figure 1). The Exploration Licence was transferred from Cominco to Abminco N.L. on April 10, 1978; to Cleveland Tin Limited on March 28, 1979; and most recently to Aberfoyle Exploration Pty. Ltd. The Licence is partly over private land owned by Associated Forest Holdings Pty. Ltd., who have a timber concession covering the entire licence area.

Revised conditions governing exploration licences applied by the Department of Mines from July 1, 1982, now require that exploration be completed on the Hatfield Licence by June 25, 1988. However, since the current licence area is only 65 sq. km., that is less than the maximum area permitted for a five year licence (125 sq. km.), then no reduction in area is required during this period.

This report describes exploration activity on the licence during the period December 26, 1984 to May 27, 1985.

3. UTEM SURVEY

3.1 INTRODUCTION

Approximately 37 line km. of line cutting and 30 km. of UTEM surveying were completed on the Hatfield E.L. during December 1984 to February 1985. Coverage is shown on Plate MAC 86 and a detailed report on the survey is included as Appendix 1.

The survey loops were designed to cover the down dip extension of the interpreted Hellyer ore position (IHOP) below the Que River Shale around the western margin of the volcanic belt. Readings were made inside the loops to increase the response to the expected flat lying conductors.

No anomalies attributed to massive sulphides were detected. The dominant response was the conductivity contrast between the shale and the volcanics.

3.2 ANOMALIES DETECTED

On Loop 17, a strong conductor (J2) (Location, HT55) detected by the 1979 UTEM survey was re-interpreted to be due to the positioning of the survey loop over the shale/volcanic contact. Loop 17 was designed to close off the J2 anomaly to the south. No anomalous responses were detected (See also Section 4, CSMAT Survey).

A large moderately conductive anomaly (Anomaly M, HT 55) was detected on Loop 18 and detailed by Loop 28. The source of the anomaly is interpreted to have a strike length of +400m and lie within the Que River Shales (this anomaly was also surveyed with the CSMAT technique - See Section 4). The anomalous zone was tested by DDH MC-13 (Section 8). Graphite is well developed in the shales intersected, and is interpreted as the source of anomaly M. Borehole Sirotem gave a strong in-hole response in the shale, supporting this interpretation.

On Loop 22, a conductive feature (anomaly N, MAC 86) was detected along the western margin of the loop. The source of the anomaly is most probably a variation in the shale thickness; (it has not yet been checked on the ground).

3.3 CONCLUSIONS, RECOMMENDATIONS

No significant anomalies from the 1985 survey remain to be followed up. Anomalies detected in the 1984 survey (see Hespe 1984 a, b) are still being monitored.

007

4. CSMAT SURVEY

In February 1985 two lines of CSMAT (Controlled Source Audio Magnetic Tellurics) were read to check UTEM responses on Loops 17 and 18. The survey lines are shown on Plate MAC 86 and a report on the survey is included as Appendix VIII.

On Loop 17 the survey confirmed that the J2 UTEM response did not extend to 4000N. A low resistivity feature between stations 2-3 (4000N/3400E-3500E) is of interest as it coincides with an interpreted N.W. striking fault zone through the area.

On Loop 18, the survey was run along line 5800N to refine the interpretation of anomaly "M". Results indicate a very low surface resistivity in the area of the UTEM anomaly, with no indication of a deep conductive source.

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5. MT CHARTER PROSPECT

5.1 INTRODUCTION

Work completed on the Mt. Charter prospect during the reporting period consisted of core grinding on DDH's MC-5 and MC-6 and a Pb isotope programme which included two samples from the Mt. Charter barite horizon.

5.2 CORE GRINDING SAMPLING MC-5 AND MC-6

Core grind sampling and analyses were completed on MC-5 (30 samples) and MC-6 (34 samples). The sample intervals were lithology boundaries or 10m intervals within uniform lithologies. All samples were analysed for Cu, Pb, Zn, Ag, As, Ba, Cr, Au. Results are briefly discussed here as all core grind data are currently being entered into data base for plotting and detailed analysis.

MC-5 was collared in andesite lava and passed into dacite lavas and minor volcaniclastics at 180.8m, the interpreted position of the Mt. Charter barite horizon (Log and section of MC-5 included in Hespe, 1984 (a). Barite is not enriched at the contact, which confirms the small dimensions of the surface barite body. The andesites and dacites are distinguished geochemically by the low As, Ba and Ag values in the andesites. Zn values are anomalous in both lithologies. The geochemical differences are associated with the quartz/pyrite/sericite alteration style which predominates in the dacites contrasted with late stage sulphide mineralisation associated with quartz/albite/adularia veinlets in the andesites. Au values are weakly anomalous in quartz/pyrite/sericite altered dacites, averaging about 0.1ppm with a maximum of 0.16ppm over a 10m interval. Low Cr values throughout confirm the absence of Hellyer type basalts.

MC-6 intersected in andesite lavas throughout its length (see log and section in Hespe, 1984 (a). Pb and Zn values are strongly anomalous around a zone of intense pyrite/sericite/quartz alteration between 47.0 and 62.6 metres. In other sections of the hole Pb and Zn values are low compared with andesites in MC-8 and MC-5. Scattered low gold values (average 0.05ppm) occur throughout the hole. High Cr values from 274-8 to EOH have not been explained.

5.3 Pb-ISOTOPE PROGRAMME

Two surface samples of barite from around MC-2 were collected by C.S.I.R.O. as part of a programme of Pb isotope characterisations of mineralisation in the Mt. Charter area. A report on the programme is included as Appendix II. Pb-Isotope ratios from the barite samples are similar to those from Hellyer and Que River and are consistent with a Cambrian origin.

5.4 CONCLUSIONS AND RECOMMENDATIONS

As mentioned in the previous six monthly report (Hespe, 1984 (a)) no further exploration of the Mt. Charter prospect is recommended. Work completed in the reporting period has not changed this recommendation.

6. SOUTH WEST MT. CHARTER PROSPECT

6.1 INTRODUCTION

During the reporting period core grind sampling and borehole E.M. were completed on MC-10 and a report on Pb-isotope analyses of samples from MC-9, the 3900N/4100E costean and from near MC-10 was received.

6.2 DDH MC-10

Geochemistry

Twenty-nine (29) core grind samples from MC-10 were analysed for Cu, Pb, Zn, Ag, As, Ba, Au, Cr. Sample intervals were lithology boundaries or 10m intervals within zones of uniform lithology. The results are only briefly discussed here as all core grinding data are being entered into a database for plotting and detailed analysis (For log and section of MC-10 see Hespe 1984 (a)).

Cr values sharply define the andesite, basalt contact at 49.8m. Cr values average less than 10ppm in the andesite and greater than 500ppm in the basalt. However, samples of andesite from below the basalt (250.4m to EOH at 264.4m) have unexpectedly high Cr values, averaging 350ppm, although still much lower than overlying basalts. Examples of high Cr andesites will be reviewed when all information has been entered in the data base.

Pb and Zn values are anomalous to around 120m downhole; base metal sulphides are associated with feldspar/quartz/carbonate veining in the core and are interpreted to be the source of the anomalous values in soil samples adjacent to MC-10.

Scattered Au values, all less then 0.017ppm, occur throughout the hole.

Geophysics

A borehole Sirotem survey was completed on MC-10. A report has not yet been received, but an examination of the results in the field indicated no in-hole or off-hole response.

6.3 Pb-ISOTOPE SAMPLING PROGRAMME

For an investigation of Pb-isotope signatures of mineralisation in the Mt. Charter area C.S.I.R.O. personnel collected the following samples:

S30, S31, S32	sulphides in qtz/feld/carbonate veins in andesite/basalt, 3900N/4100E costean
S33	as above, from 4100N/4150E near MC-10 collar.
S36	MC-9/159.5m; syngenetic sulphides in tuffaceous sediment (interpreted ore horizon).
S37	MC-9/159.5m; sulphides in qtz/carb/feld vein.

A report on the results is included as Appendix II.

Samples from the 3900N/4100E costean all have a Cambrian signature, while similar mineralisation from near MC-10 is radiogenic. There is an unresolved conflict in the results.

Both samples from MC-9 were initially reported as being radiogenic. Because sample S36 was from a rock unit interpreted to be a mineralised ore horizon in the Hellyer ore position, these results were queried. C.S.I.R.O. re-examined the samples and made corrections for Pb and U contents in both. The corrections moved S36 (the ore horizon) back into the field typical of Que River and Hellyer mineralisation while S37 remained radiogenic. A report on this work is included as Appendix III.

6.4 CONCLUSIONS, RECOMMENDATIONS

Surface UTEM and borehole Sirotem coverage in MC-9 and MC-10 diminished the chances of massive sulphide mineralisation occurring at less than 350m (Hellyer size deposit) or less than 150m for a Que River size deposit.

However the interpreted ore horizon intersected in MC-9 (see full discussion in Hespe 1984 (a)) is of prime exploration significance because

(i) it is in a stratigraphic position equivalent to Hellyer

(ii) it is the only example to date of such an ore horizon (others were intersected in MC-13 and HL-80) containing sygenetic base metal sulphides

(iii) sulphides from the horizon have a homogenous Cambrian Pb-isotope signature.

A hole collared to the west of MC-9 is proposed to test the down dip extent of the MC-9 intersection, where massive sulphides may be developed at depths below the detection limits of surface E.M. systems.

7. N.W. MT. CHARTER PROSPECT

7.1 INTRODUCTION

Drilling of MC-12, borehole E.M. in MC-11 and MC-12, and core grind sampling of MC-11 and MC-12 were completed during the reporting period. Drilling of DDH MC-11 was completed during the previous reporting period (see Hespe 1984 (a)).

7.2 DDH MC-11

Geochemistry

Analyses of 28 core grind samples were completed during the reporting period. Samples were analysed for Cu, Pb, Zn, As, Ba, Cr, Au. Sample intervals were lithology boundaries or 10m intervals within zones of uniform lithology. The results are only briefly discussed here as all core grinding data are being entered into a database for plotting and detailed analysis.

Cr analyses confirmed the existence of a thin basalt unit between 239.1m and 240.6m. Anomalous zinc values occur in andesite lavas from surface to 170m. Between 140-170m the lavas are intensively pink feldspar/silica altered and are associated with the highest zinc values. Andesite lavas below 170m are quite low in zinc. Au values throughout the hole are below the limit of detection (0.008ppm).

Geophysics

Borehole Sirotem was completed on MC-11 but a report has not yet been received.

7.3 DDH MC-12

Geology

MC-12 was designed to test beneath the extensive Pb/Zn anomaly at N.W. Mt. Charter (shown on Plate HT62). At the time the hole was proposed, the Interpreted Hellyer Ore Position was thought to lie in the vicinity of the soil anomaly and allowance was made for the hole to traverse the complete stratigraphic section containing IHOP from shale to dacite. A detailed log of the hole is included as Appendix IV and a section as Plate HT61(G). A report on petrological samples from the hole is included as Appendix V. Geology intersected is summarised below:

0 - 130.5m	Massive, featureless black shale. Lustrous broken surfaces indicate graphite
130.5 - 134.7m	Andesitic medium lapilli volcaniclastic, interpreted to be a glassy, scoriaceous andesitic tuff-lava. correlatable with 137.05 - 145.1m in DDH-H2
134.7 - 340.2m	Andesite lava breccia. Chloritic porphyritic andesite lava clasts in a matrix of dolomitic chert and later quartz/albite/adularia alteration. Sulphides, predominately brown granular sphalerite, strongly developed between 139.5 - 247.4m.
340.2 - 343.0m	Polymict lapilli volcaniclastic. A mixture of andesite and basalt lava fragments, probably gradational between units above and below.
343.0 - 349.3m	Massive chloritized vesicular basalt with marginal zones of quench shattering.

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349.3 - 387.9m Weakly flow banded, pink feldspar/silica altered no-porphyritic dacite lava. Weakly brecciated

A definite correlation can be made between the shale/volcanic contact in the hole and in the overlying costean. However, a dip of 80 degrees is a result of this correlation, much steeper than any encountered in drilling to date or measured on surface. Folding or faulting may explain this anomaly.

The basalt unit at 343.0 - 343.3m is correlated with a zone of high Cr geochemistry in a similar stratigraphic position in the overlying costean, although basalt was not identified there during mapping.

The soil geochemistry is explained by sulphides, predominately granular brown sphalerite, associated with late quartz/albite/adularia alteration in andesite lavas between 139 - 247.0m. This style of mineralisation, typically low in Ag, As, Ba, as in the overlying costean, is known at the Mt. Charter and S.W. Mt. Charter prospects. The concentration of sulphides towards the shale contact suggests that the shale may have acted as an aquiclude controlling mineral deposition. An analagous relationship occurs at Hellyer between shale and fuchsite alteration. This implies that the hydrothermal system was active after deposition of the shales

The stratigraphy containing the IHOP and the overlying Hellyer basalts is missing in MC-12. The hole went from shale conformably into feldsparphyric andesites, which are footwall rocks at Hellyer. The same situation occurs in MC-8 and H2, and is illustrated in Plate HT67. The empirical relationship between basalt and the underlying ore position is explained if basalt and sulphide hosting sediments pond in depressions on the andesite surface, which implies that the IHOMP need not necessarily be continuous. The general trend of the IHOP has been re-routed behind DDH H-2 and MC-12 (Plate HT62) although it need not necessarily occur there.

The occurrence of a thin unit of basalt between 343.0 - 349.3m is confirmed by Cr analyses and petrology. A similar unit occurs in MC-11 between 239.1 - 240.6m and a correlation is likely.

Geochemistry

Analyses were completed on 40 core grind samples form MC-12. Samples were analysed for Cu, Pb, Zn, Ag, As, Ba, Cr, Au. Sample intervals were lithology boundaries or ten metre lengths in areas of uniform lithology. Results are only briefly discussed here as all core grinding data are being entered into a database for plotting and detailed analysis.

Anomalous Pb (max 2650ppm) and Zn (max 5350ppm) values are due to sulphide aggregates associated with quartz/feldspar veining. Low Ba, As, Ag values are typical of this style of mineralisation. Au values are not anomalous, being generally below the limit of detection (0.008ppm). Cr values in shale are constant at about 80ppm. High Cr values (998ppm) occur in the basalt unit (343.0 - 349.2m).

Geophysics

A borehole Sirotem survey has been completed on MC-12 but results have not yet been interpreted in detail. Field inspection indicates no anomalous responses.

Pb isotope Study

Four samples of core form MC-12 containing galena associated with feldspar/silica alteration and five high Pb samples from the overlying 5400N/3600E costean were sent to C.S.I.R.O. for Pb-isotope assessment. A written report has not yet been received but C.S.I.R.O. have informed us that all samples have homogeneous Cambrian signature

7.4 CONCLUSIONS, RECOMMENDATIONS

The NW Mt. Charter soil geochemical anomaly has been adequately tested by MC-12 and its origin explained. Subject to receipt of the borehole E.M. report, no further work on the immediate area of the soil geochemical anomaly is recommended. The homogeneous Cambrian signature for veinlet mineralisation is strong encouragement for continued exploration in the Mt. Charter area (see Section 9).

8. MURCHISON HIGHWAY PROSPECT

8.1 INTRODUCTION

The geology of the Murchison Highway Prospect (MHP) was discussed in the previous six-monthly report (Hespe 1984 (a)). A shallow south west plunging syncline was mapped in Que River shales. Below it occurs a typical Hellyer sequence of basalt, fine tuffaceous sediment representing an ore horizon, and feldsparphyric andesite (as intersected in DDH H-1 (1976) (Location on Plate HT62).)

During the reporting period, a UTEM survey was conducted over the prospect, (see Section 3.2) and DDH MC-13 was completed and surveyed with borehole Sirotem.

8.2 DDH MC-13

Geology

MC-13 was designed to intersect the IHOP in the keel of the Murchison Highway Zone syncline. The hole was also designed to test the shallow anomaly "M" detected by the 1985 UTEM survey.

A detailed log of MC-13 is included as Appendix VI, and is summarized below. A section is included as Plate HT61H Descriptions of petrological samples from MC-13 are included as Appendix VII.

0 - 242.0m	Massive black shale. Lustrous broken surfaces indicate graphite. Traces of sulphides associated with Quartz-Carbonate veins. Bottom contact obscured by strong veining.
242.0 - 252.4m	greygreen, non-porphyritic, vesicular basalt lava.

252.4 - 252.7m	Impure limestone containing fine pyrite, sericite, carbonaceous matter, possible fossil fragments.
252.7 - 257.3m	Tuffaceous siltstone and sandstone with pyrite, carbonaceous matter, possible radiolarian fossils.
257.3 - 269.0m	Feldsparphyric andesite lava breccia with black shaley matrix
269.0 - 288.4m	Andesite lava breccia, siliceous matrix. Yellow sphalerite impregnating rock matrix 269.6 - 276.5
288.4 - 373.7m	Scoriaceous basaltic breccia

The IHOP is interpreted to be represented by the impure limestone and tuffaceous sediments below basalt (252.4 - 257.3m). No visible mineralisation was logged in these units. Core grinding analyses are not yet available. The IHOP is underlain by andesite lavas, as at Hellyer, which are in turn underlain by scoriaceous basaltic volcaniclastics. These may be equivalent of the Lower Epiclastic Sequence at Hellyer. Correlation of the shale contact to surface shows an apparent dip of 45 degrees west, in good agreement with surface measurements. The subsurface trend of the IHOP has been changed to include the MC-13 intersection although as discussed in Section 9 development of the IHOP may be intermittent if it is controlled by the palaeotopography of the underlying andesite lava.

Geophysics

Borehole Sirotem has been competed on MC-13 but a report has not yet been issued. Field inspection of the data identified a strong in hole response in the shale section which would explain UTEM anomaly "M". No other responses were identified.

Geochemistry

Core grind sampling is in progress on MC-13.

8.3 CONCLUSIONS, RECOMMENDATIONS

MC-13 explained UTEM anomaly M and intersected the IHOP. Further drilling would be necessary to demonstrate the existence of the Murchison Highway Zone syncline.

Further exploration should concentrate on diamond drilling down dip to the west to locate mineralisation at the IHOP below the limit of detection of surface geophysics.

9. STRATIGRAPHIC RELATIONSHIPS, S.W. MT. CHARTER TO MURCHISON HIGHWAY PROSPECTS

An updated version of a diagramatic long section showing stratigraphic relationships for the Mt. Charter area as interpreted from surface mapping and diamond drilling is presented as HT67.

Basalt intersections in MC-11 and MC-12 have been correlated. The unit below basalt in MC-11 was originally logged as andesite but is tentatively re-named dacite in conformity with the sequence in MC-12. The stratigraphy intersected by MC-12 and MC-13 is described in detail in previous sections of the report. The geology of MC-13 has been simplified by omitting the intersection of basaltic volcaniclastic encountered at the bottom of the hole. This is because MC-13 is much further west than other holes in the section.

A possible sequence of Cambrian events associated with alteration and mineralisation in the Mt. Charter area is as follows:

1 Deposition of submarine dacite lavas

2 Formation of hydrothermal systems producing zones of pyrite/sericite/silica alteration in the dacite (Mt. Charter, MC-4 areas) and minor Pb-Zn sulphide, barite in a stringer style zone at Mt. Charter.

3 A brief period of deposition of bedded barite on the sea floor above the stringer zone at Mt. Charter.

4 Burial of the dacite pile and barite horizon by autobrecciated feldsparphyric andesite lavas.

5 Persistence of the hydrothermal system for some time after burial as indicated by pyrite/sericite alteration in andesites intersected in MC-5 and MC-8.

6 A change in the chemistry of the hydrothermal system or development of a new system with an unidentified source feeding fluids laterally through highly permeable andesite breccias. A change in the chemistry of the hydrothermal system is implied by a change in alteration style to pink or white quartz/albite/adularia/carbonate as matrix fillings and veinlets. This system was capable of transporting metals. Sulphides are commonly associated with the silica/feldspar alteration style in MC-5, MC-8, MC-11 and MC-12. Pb isotope studies on MC-12 have demonstrated a Cambrian Que/Hellyer signature for the sulphides. Cross cutting relationships in MC-8 and MC-5 show that the silica/feldspar alteration is later than the pyrite/sericite type in the dacite. The silica/feldspar alteration is also distinguished by low As, Ba and Ag values relative to the sericite/pyrite type.

7 A local hiatus in volcanic activity, with development of fine tuffaceous sediments in local depressions on the surface of the andesite lava. The hydrothermal system was still active and deposited minor sulphides in fine tuffaceous sediments in the MC-9 area. This period is the time equivalent of the Hellyer ore position.

8 Re-activation of volcanic activity with deposition of chrome rich basalt lavas in the depressions on the andesite surface, burying the fine tuffaceous sediments. Local depressions are indicated by absence of the basalt/sediment stratigraphic section

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in MC-8 and MC-12. Precursor basalt flows do occur, (e.g. MC-10, MC-11 MC-12, MC-13) but the Hellyer ore position equivalent is always underlain by andesite. The hydrothermal system continued after deposition of the basalt as shown by the pink silica/feldspar alteration in basalt in MC-9.

9 Cessation of volcanic activity and conformable deposition of black shales with a facies change to micaceous shales and mica sandstones south of Mt. Charter. Persistence of the hydrothermal system up to and after deposition of the sediments is suggested by the concentration of sulphide mineralisation towards the shale contact in MC-12; and the occasional occurrence of sulphides in silica/carbonate veins in the shale.

The area remains of prime exploration interest because of the evidence for a widespread, persistent hydrothermal system or systems capable of transporting base metals. Future exploration will be directed towards locating faults where low permeability may have focussed hydrothermal flow; or zones in the shale and sandstone which could have been fed by faults breaching a pool of hydrothermal fluids trapped by the sealing action of the sediments.

10. EXPENDITURE

HATFIELD EL 15/73

SUMMARY OF EXPENDITURE FOR SIX MONTHS ENDED 27 MAY 1985

Expenditure pertains to the Aberfoyle Periods 1 to 6/85 (13 November 1984 thru 28 May 1985)

GEOLOGY	28864.06
SURVEY	18986.70
GEOPHYSICS	29207.01
GEOCHEMISTRY	13012.98
TRENCHING	3745.00
DIAMOND DRILLING	47891.87
ACCESS	7900.00
TENURE	2240.00
OTHER SERVICES	10317.53
INDIRECT COSTS	24324.75
TOTAL	$186489.90

Prepared:
21/5/86

11. REFERENCES

HESPE, A.M. 1984(a)	"Hatfield Exploration Licence 15/73 Tasmania. Progress Report for the Period 28 May 1984 to 25 December 1984".
HESPE, A.M. 1984 (b)	"Hatfield Exploration Licence 15/73 Tasmania. Progress Report for the Period 26 December 1982 to 27 May 1984".

MAPS

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init	Date	Init	Date
AMH/GC	1·2·84		
AMHglc	30·9·85		

NORTH WEST TASMANIA

HATFIELD E.L.15/73

EXPLORATION ACTIVITY
28/12/84 - 27/5/85

Location Code K55/6/44

Scale 1:10,000

Date October, 1984

Compiled DJJ, AMH

Drawn DJJ, RJE

Traced RJE

Checked

Plate No Mac 86

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REVISIONS			
Init	Date	Init.	Date
AMH	5.9.85		

TASMANIA
HATFIELD E.L. 15/73
MT. CHARTER AREA
SECTION MC 12

Compiled: AMH
Drawn: AMH
Traced: KJO
Checked:

Location Code: K55/6/44
Scale: 1 : 1000
Date: August, 1985
Plate No: HT 61G

RMO 554

028

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Aberfoyle Exploration Pty Ltd

REVISIONS			
Init.	Date	Init.	Date
AMH	5·9·85		

TASMANIA
HATFIELD E.L. 15/73
MT. CHARTER AREA
SECTION MC 13

Compiled: AMH
Drawn: AMH
Traced: KJO
Checked:

Location Code: K55/6/44
Scale: 1 : 1000
Date: August, 1985
Plate No: HT 61H

RMO 554

Jurassic ?

Dol.	32	Dolerite
R - D	26	Rhyolitic - Dacitic Volcanics — Quartz - feldspar porphyritic intrusives, lavas, pyroclastics interbedded with Que River slates, sandstones.
QRS	68	Que River Slates — Black finely laminated slates, containing very fine graphite and pyrite in places. Conformable on underlying volcanics.
QRms	71	Que River Micaceous Sandstone — Olive - Khaki quartz / muscovite sandstone. Massive. Probably facies equivalent of black slates.
A / B	48 45	Andesite Andesitic lavas and lava breccias. Dark green, commonly feldspar porphyritic. Aggregates of galena and sphalerite associated with qtz./carb. veining in areas of high Pb-Zn soil geochem. Includes vesicular basalt lavas and pillow lavas (containing primary chromite). Extent not yet known. Proposed ore horizon occurs at contact between basalt and underlying andesites.
Ba	22	Barite Horizon Limonitic, pyritic banded barite ; coarse crystalline barite ; poddy and disseminated barite in sericitic schist.
D / Dp	63 6	Dacite (D) - Dacitic trachytic intrusives, lavas, pyroclastics, tuffs. Pyritic Dacite (Dp) - Strongly silicified, sericitised, pyritised in Mt. Charter area around MC4 and in Zone E costeans. Extent interpreted from I.P. frequency effect contours.

CAMBRIAN

Geological contact, interpreted

Trend and dip at surface of proposed ore horizon

UTEM conductor axis, definite correlation

UTEM conductor axis, possible correlation

Pb soil geochemistry contours at 100, 250 ppm (Murchison Hwy. prospect area)
250, 1000 ppm (Mt. Charter area)

Diamond drill hole

Anticlinal axis with plunge 65°

Synclinal axis with plunge

Strike and dip of bedding

Stream or creek

Track, costean

Cut grid line

Subsurface trend of proposed ore horizon

Strike and dip of cleavage

Strike and dip of jointing

024031

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init.	Date	Init.	Date
AMH/ACD	14·3·85		
AMH glc	19·9·85		
AMHglc	23·9·85		

NORTH WEST TASMANIA

HATFIELD E.L. 15/73

MURCHISON HIGHWAY PROSPECT
EXPLORATION SUMMARY MAP

Compiled: AMH
Drawn: AMH
Traced: GLC
Checked:

Location Code K55/6/44
Scale: 1 : 2500
Date: February, 1985
Plate No HT 62

RMO 557

Jurassic ?

Jurassic ?	Dol.	32	<u>Dolerite</u>
CAMBRIAN	R-D	26	Rhyolitic - Dacitic Volcanics - Quartz-feldspar porphyritic intrusives, lavas, pyroclastics interbedded with Que River slates, sandstones
	QRS	68	Que River Slates - Black finely laminated slates, containing very fine graphite and pyrite in places. Conformable on underlying volcanics
	QRms	71	Que River Micaceous Sandstone - Olive-Khaki quartz/muscovite sandstone. Massive. Probably facies equivalent of black slates
	A / B	48 45	Andesite - Andesitic lavas and lava breccias. Dark green, commonly feldspar porphyritic. Aggregates of galena and sphalerite associated with qtz./carb. veining in areas of high Pb-Zn soil geochem. — Includes vesicular basalt lavas and pillow lavas (containing primary chromite). Extent not yet known. Proposed ore horizon occurs at contact between basalt and underlying andesites.
	Ba	22	Barite Horizon - Limonitic, pyritic banded barite; coarse crystalline barite; poddy and disseminated barite in sericitic schist.
	D / Dp	63 6	Dacite(D) - Dacitic-trachytic intrusives, lavas, pyroclastics, tuffs. Pyritic Dacite (Dp) - Strongly silicified, sericitised, pyritised in Mt. Charter area around MC4 and in Zone E costeans. Extent interpreted from I.P. frequency effect contours.

Geological contact, interpreted

Subsurface trend of proposed ore horizon

Trend and dip at surface of proposed ore horizon

X——X UTEM conductor axis, definite correlation

X- - -X UTEM conductor axis, possible correlation

Pb Soil geochemistry, contours at 250, 1000 ppm (Mt. Charter area)
100, 250 ppm (Murchison Hwy. prospect area)

Diamond drill hole

Anticlinal axis with plunge 65°

Synclinal axis with plunge

Strike and dip of bedding

Strike and dip of cleavage

Strike and dip of jointing

Stream or creek

Track, costean

Cut grid line

5 cm

HT 62
HT 55

024032

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init.	Date	Init.	Date
AMH	2-10-84		
AMH glc	19·9·85		
AMH glc	23·9·85		

NORTH WEST TASMANIA

HATFIELD E.L. 15/73

MT. CHARTER AREA
EXPLORATION SUMMARY MAP

Compiled: AMH
Drawn: AMH
Traced: RJE
Checked: AMH

Location Code: K55/6/44
Scale: 1:2500
Date: October, 1984
Plate No: HAT 55

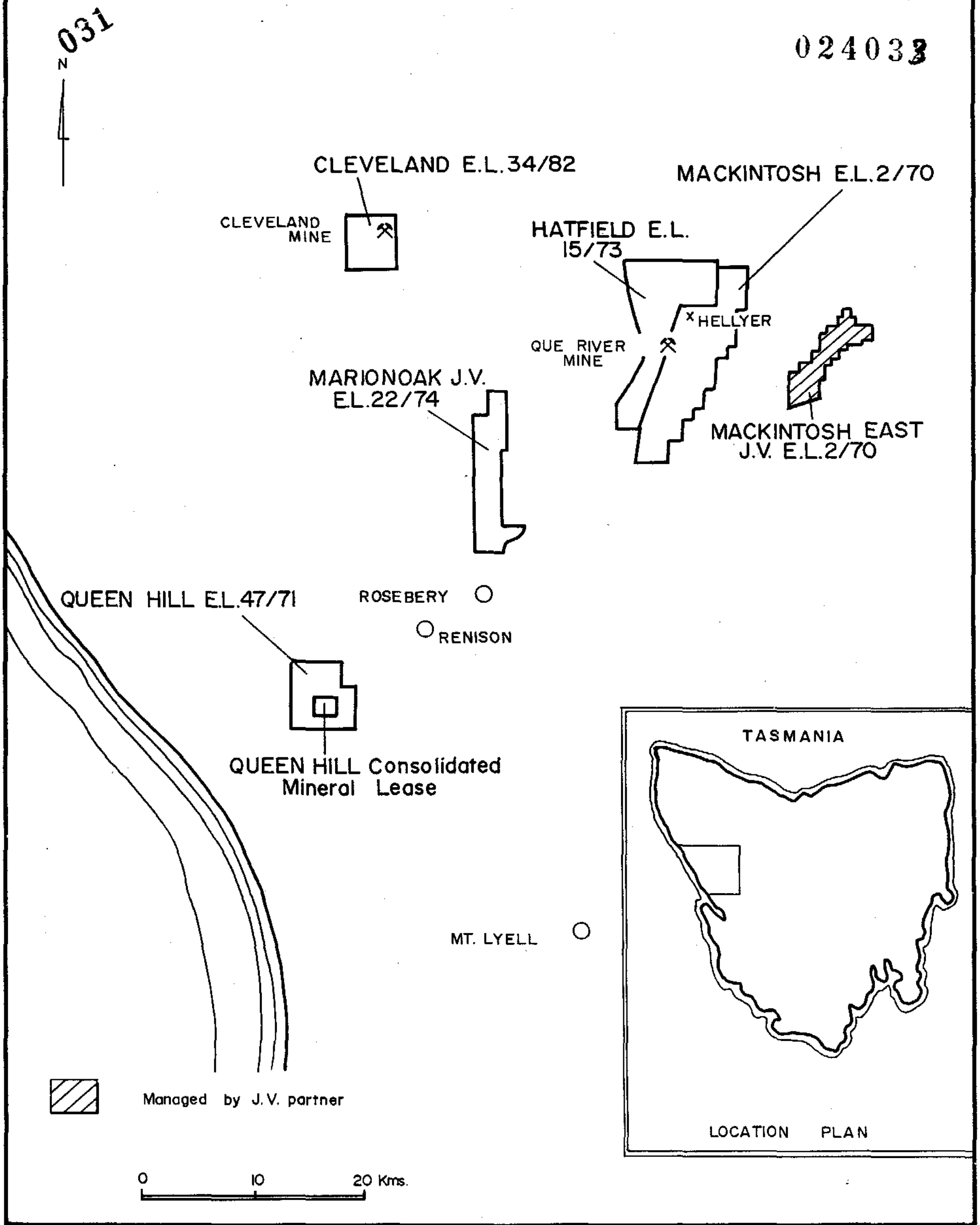
RMO 557

030

5 cm

031

024033



Aberfoyle Exploration Pty Ltd

Drawn: JRS
Traced: RJE/GLC
Checked:
Revised by: JRS Date: 15/10/85

NORTH WEST TASMANIA

EXPLORATION LICENCES

Location code:
Date: OCT. 1985
Scale: As shown
Plate Nº FIG. 2

032

APPENDIX I

024035

033

ABERFOYLE EXPLORATION PTY LTD
(INTERNAL REPORT)

REPORT ON THE 1985 UTEM SURVEY
ON THE
MACKINTOSH-HATFIELD LICENCES

(ABRIDGED

DISTRIBUTION
Aberfoyle, Burnie (2)
Aberfoyle, Hawthorn
Tom Eadie

Tom Eadie
Geophysicist
July 19, 1985

034

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- Loop 21 7
- Loop 22 7
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- Loop 25 9

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APPENDICES

/APPENDIX I/ COMPUTER MODELLING TO DETERMINE DETECTION LIMITS OF THE UTEM SYSTEM FOR HELLYER AND QUE RIVER SIZED TARGETS

APPENDIX II UTEM DATA SECTIONS

035

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Figure 3	Loop 18 - Channel 5 Data
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Figure 13	Loop 23 - Channel 4 Data
Figure 14	Loop 24 - Channel 8 Data
Figure 15	Loop 25 - Channel 4 Data
Figure 16	Loop 25 - Channel 5 Data
Plate Mac 80	UTEM and EM37 Coverage

REPORT ON THE 1985 UTEM SURVEY ON THE MACKINTOSH-HATFIELD LICENCES

I INTRODUCTION

In January, 1985, approximately 50 line kilometres of UTEM data were collected by Lamontagne Geophysics on the Mackintosh-Hatfield Licences. Most of the surveying was done inside the transmitter loop, to maximize energization of the expected flat-lying targets. The frequency used was 25 hertz, with only the vertical component of the magnetic field measured.

The area covered (shown in red on Plate MAC 80) was in general very close to the surface trace of the shale-volcanic contact . The system proved to be very sensitive to this contact and was able to map it at almost all locations. Only in one area was there an obvious strong conductor, and this was interpreted to be within the shales or closely underlying them. However, since the anomaly is in such an interesting geological position (in the Murchison Highway Zone syncline and near a large structure), drilling is proposed.

A second area of interest lies within loop 25, where there is a very subtle late time anomaly that could possible represent a conductor at a depth approaching the detection limit of the UTEM system. In spite of the lack of total confidence in this geophysical anomaly, a drill holes is proposed because there are also geological reasons for drilling in the general area. The geophysics is able to supply a precise target.

A third location, within loop 22, merits follow up by more geophysics.

In order to aid in the understanding and the interpretation of the UTEM data, a quantitative study of the depth detection limits of the system for Hellyer and Que River size ore bodies is included in Appendix I. It is concluded that a Hellyer-sized body would be detected to a depth of about 300 metres, and Que River to a depth of 150 metres.

II INTERPRETATION

Selected channels of the data inside the loop have been presented in a contoured plan format. The values plotted are the measured total field reduced to the channel 1 response (to remove the primary field and geometrical errors) and normalized to the value of the primary field in the centre of the loop. It is felt by the author that this is the optimum method of presentation in that it gives the most accurate presentation of the secondary field. The only problem with it is that there always tends to be an increase in values in the immediate vicinity of the loop edge. This can be seen in all plots, particularly where the amplitudes are low (later times) and is not related to anything geological.

In addition to these contoured plans, all of the data is presented in profile in Appendix II.

Loop 17

Loop 17 was surveyed in order to detail a relatively strong conductor detected in the original 1979 survey and attempt to close it off to the south. The 1985 work has shown conclusively that the anomaly is caused by the Que River Shales. The conductive unit does not extend any further south than already interpreted from the 1979 UTEM.

The conductive shales are best outlined by the channel 8 data (figure 1), which shows a feature from about 4100N to the north, with the strongest responses on the eastern half of the grid. This corresponds with the known area of shale outcrop and the trace of the 1979 UTEM anomaly. The fact that the anomaly does not continue to later times, shows that the shale is not overlying any conductive sulphide mineralisation.

039

It remains a bit of a mystery that the 1979 data apparently showed this shale unit to be a better conductor than the 1985 work. This is undoubtably due to the fact that one edge of the 1979 transmitter loop ran right through the most conductive part of the shale, inducing a large amount of current in it, and making the close-in receiver positions, where the anomaly was, ambiguous to interpret.

To check this disappointing conclusion, Line 4000N was surveyed with the very deep penetrating Controlled Source Audio Magneto Tellurics method (CSAMT). The resistivities from the survey are shown in figure 2. It confirmed the UTEM interpretation of no hidden conductive bodies in the vicinity.

Loops 18 and 28 (Detail)

Loop 18 was intended to cover the synclinal feature of the Murchison Highway Zone and to extend coverage of the Northwest Mt. Charter Zone to the north. Loop 28 was surveyed to detail a large, shallow, moderately conductive feature detected within Loop 18.

The feature of interest is best outlined by the channel 5 data from loop 18 (figure 3). The very high amplitude response in the southwest corner of the grid is clearly due to a large (strike length > 400 metres), shallow body that dips to the west. The source is undoubtably within the Que River Shales. However it must be noted that nowhere else are the shales as conductive as this.

It is interesting to speculate on why the shales are so conductive here. It could be that the shales here were deposited in the reducing environment of a trough that increased the graphite content. Alternatively a heat source beneath such as a hydrothermal vent or a small intrusion could have caused a conductivity increasing

040

alteration. A third possibility is a major fault causing the increase in conductivity; there appears to be a major structure running through this conductor. Any of these hypotheses, or a combination of any of them make this conductivity anomaly very interesting.

However, on the negative side, the anomaly is from a shallow source, with no evidence of a deeper, highly conductive body. The weak response in the channel 4 data (figure 4) is clearly also from a shallow body, and there is no response at all at later times. Therefore, there is no chance of there being a Hellyer-like orebody down to 300 metres, although of course there is a chance of either a smaller or less conductive one within this depth, particularly if it is right at the shale-volcanic contact, where its response would be very difficult to separate from that of the shale.

The data from the detail loop 28 supports this interpretation.

CSAMT was also tested here on Line 5800N (figure 5). The results have not yet been interpreted by the Zonge experts in Tucson, but a preliminary interpretation is that the shales are about 150 - 200 metres thick, with nothing but resistive rock beneath them. The CSAMT data was adversely affected by power lines even though these were greater than 500 metres away. It is hoped that processing can remove this problem.

There are two other possible anomalous zones within loop 18. The first is a northerly continuation of the Northwest Mt. Charter UTEM anomaly that was drilled by MC 11. This is best seen in the channel 4 data (figure 4) from 5600N - 5900N at about 3500E. Drilling (MC 11) showed this to be a weakly pyritic zone. The EM data in this

041

area is undoubtably distorted somewhat by the proximity to the major HEC line and the loop edge effect.

The other anomaly runs along the extreme northwestern edge of the loop and is best seen in the channel 5 data (figure 3). It looks to be too strong and consistent to be a loop edge effect (as described in the introduction). It is probably just another anomalously conductive shale unit, but it should be thoroughly detailed if Aberfoyle obtains the ground to the west of the Murchison Highway.

Loop 19

Loop 19 is the first of a series of three loops which straddle the shale volcanic contact on the northwestern margin of the volcanics on the Hatfield property.

The early time data (channel 8 - figure 6), which generally can be relied on to map the shale-volcanic contact (see Loops 20, 21), fails in this case for two reasons. The first is that as can be seen from the raw data on Lines 7800N and 7900N, there has been a shift in the timing of the clocks, causing a severe break in the data. This disturbs the pattern in figure 6. The second reason is that the dacite unit in the northeast corner of the grid, appears to be a weak conductor, probably because of disseminated pyrite.

The late time data (from channel 5 onwards) shows no anomaly at all, indicating that there are no conductive targets in the vicinity of the loop.

Loop 20

Loop 20 maps out the shale contact very well as shown by the channel 7 data, figure 7. There are no later time anomalies and therefore no geophysical targets.

Loop 21

The channel 7 data (figure 8) maps out the shale contact reasonably well. The fact that the anomaly and the contact do not correlate well on Lines 9100N and 9200N suggests that the shale is either very thin on these lines, or not very conductive. There is no indication of a geophysical target as shown by the lack of any late time responses.

In this case, the lack of conductivity in the shale where it is expected, may be very valuable information because it may represent considerable thinning of the shale unit overlying the prospective volcanics. These areas may be the best places to drill initially in any pattern drilling programme.

Loop 22

The channel 7 data (figure 9) outlines a slightly conductive area on the western margin of the loop. The fact that channel 5 (figure 10) is also slightly anomalous suggests that this area is worth following up with further UTEM work. However the lack of anomaly in the channel 4 data indicates that it is unlikely that a large ore deposit is being directly detected. Most likely this conductive area simply indicates a thickening of the shale unit.

Just as with loop 21, the lack of conductivity in the shale in certain areas may represent thinning of the shale unit and therefore may point to good areas to pattern drill the prospective volcanics that lie beneath. Anywhere within the eastern three hundred metres of Loop 22 falls into this category.

Data taken outside the transmitter to the east was limited to only Lines 9300N and 9500N because of the HEC transmission line. There are no target conductors on the lines covered.

III CONCLUSIONS

Only two drill targets have been located in the survey. The first is a west dipping, shallow conductor within loop 18 that stretches from about 5600N to 5900N. A hole located at about 3200E and drilled at 45 degrees to the east would definitely intersect the source of this anomaly.

The second is an east (?) dipping, deep conductor in the northwest corner of loop 25. A hole located to test 9900N, 5725E at a depth of 300 metres would probably hit the target and would definitely get close enough to it to check the validity of the response with DHEM.

In addition, an anomaly on the western edge of Loop 22 is worth following up with more geophysics. Because it is quite close to our property boundary, this may not be possible. If however, pattern drilling is planned for the area, a position close to 9700N, 3000E, might be more interesting than most. Other possible locations for early pattern drill holes might be where the shale is interpreted to be abnormally thin, such as near 9700N, 3400E or 9200N, 3800E.

In general, the UTEM data quality was excellent and I have no hesitation in saying that no conductive ore bodies were missed within the depth limits mentioned in the introduction.

045

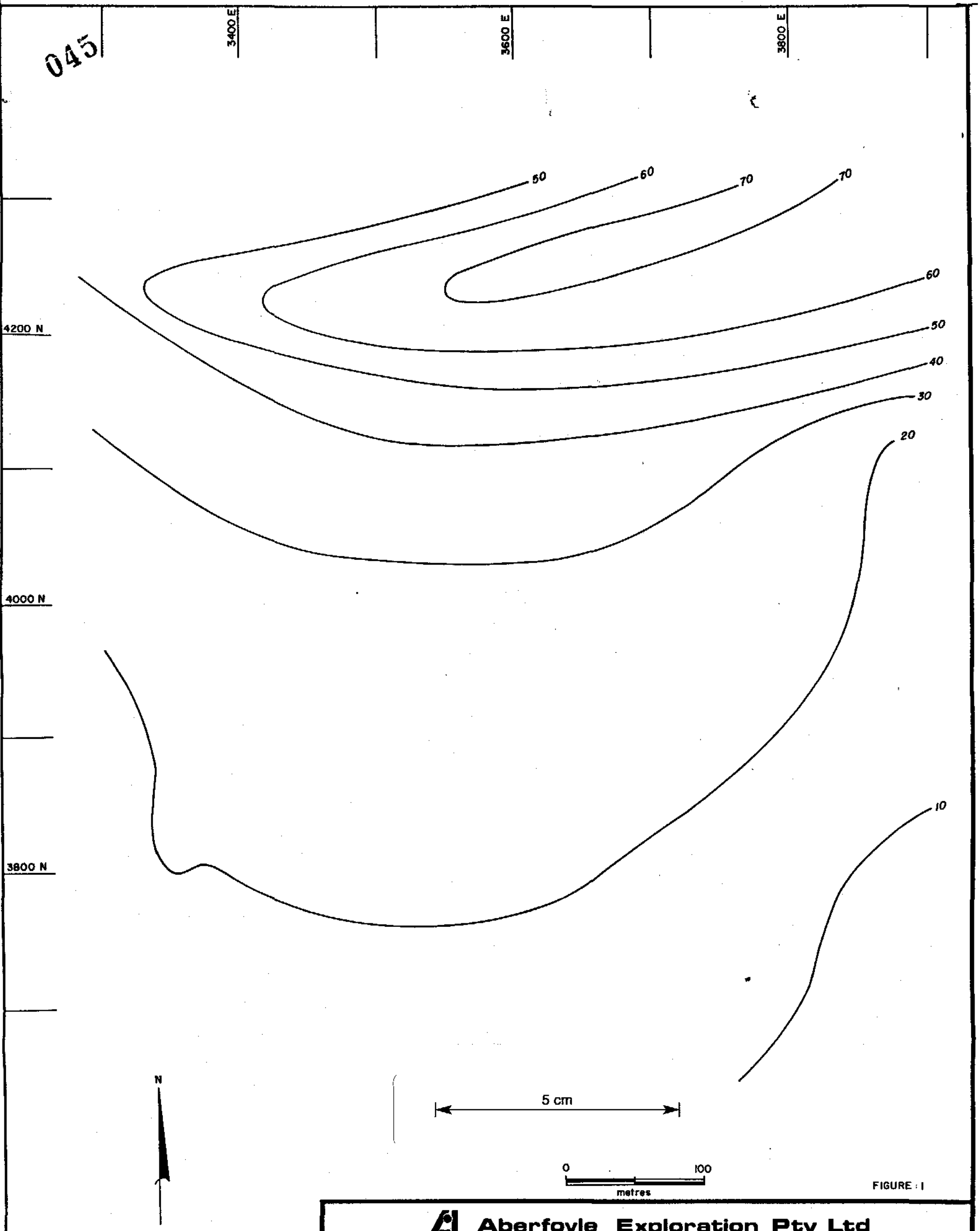


FIGURE : I

Aberfoyle Exploration Pty Ltd

TASMANIA

HATFIELD UTEM

LOOP 17 - CHANNEL 8 DATA

REVISIONS			
Init	Date	Init	Date

Location Code: K55/6/44

Scale: 1:2500

Date: April, 1985

Compiled: ETE

Drawn: ETE

Traced: LML

Checked:

Plate No: HT 75

csAMT PSEUDO-SECTION

FIGURE 2

CLIENT Aberfoyle
JOB NUMBER 484
DATE 25-2-85
OPERATOR BC
PLOT OF ρ, UNITS Ωm

LOCATION Hatfield
LINE 40 (4000mN)
BEARING E-W
a-SPACING 100m

Tx LENGTH 1000 m
DISTANCE 10 km
BEARING E-W
DIRECTION N

ZONGE ENGINEERING
& RESEARCH ORGANIZATION
Tucson, Arizona USA

fHz	Tx 1	2	3	4	5	6	7	fHz
2048		(1172)	1275	(905)	1044	1655	978	2048
1024		(5342)	(4611)	(760)	1063	(2107)	744	1024
512		(1093)	(1623)	15731	1119	2416	616	512
256		(1066)	(1699)	1650	1323	1552	724	256
128		(2950)	(39707)	(14493)	1074	(10597)	(3131)	128
64		(505)	(554)	660	804	1609	349	64
32		343	663	1713	3410	4161	1462	32
16		566	1575	4335	7490	9632	3303	16
8								8
4								4
2								2

024049

047

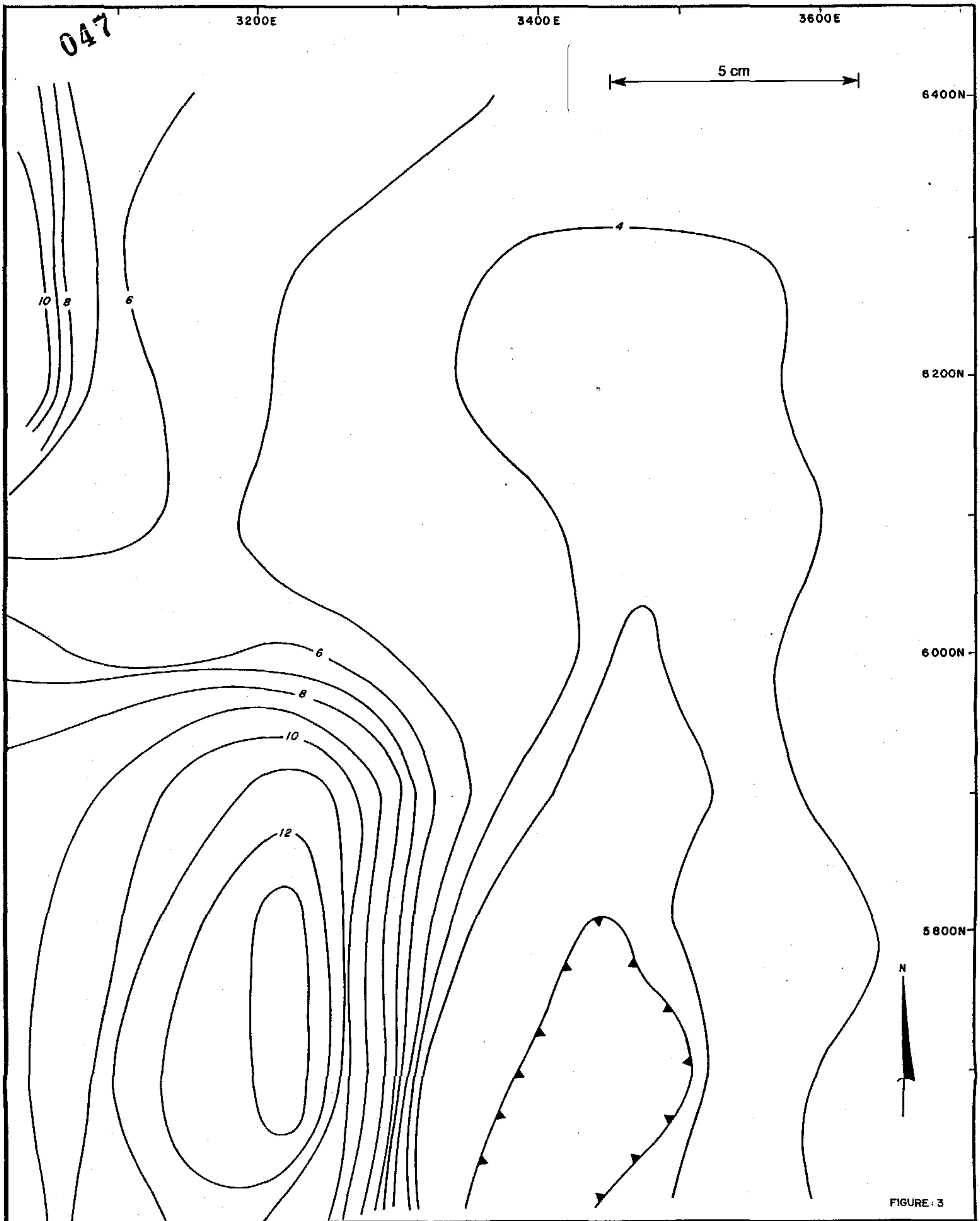


FIGURE : 3

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init.	Date	Init.	Date

TASMANIA

HATFIELD UTEM

LOOP 18 - CHANNEL 5 DATA

Compiled: ETE
Drawn: ETE
Traced: EUM
Checked:

Location Code K55/6/44
Scale: 1 : 2500
Date: February, 1985
Plate No: HT 63

024050

048

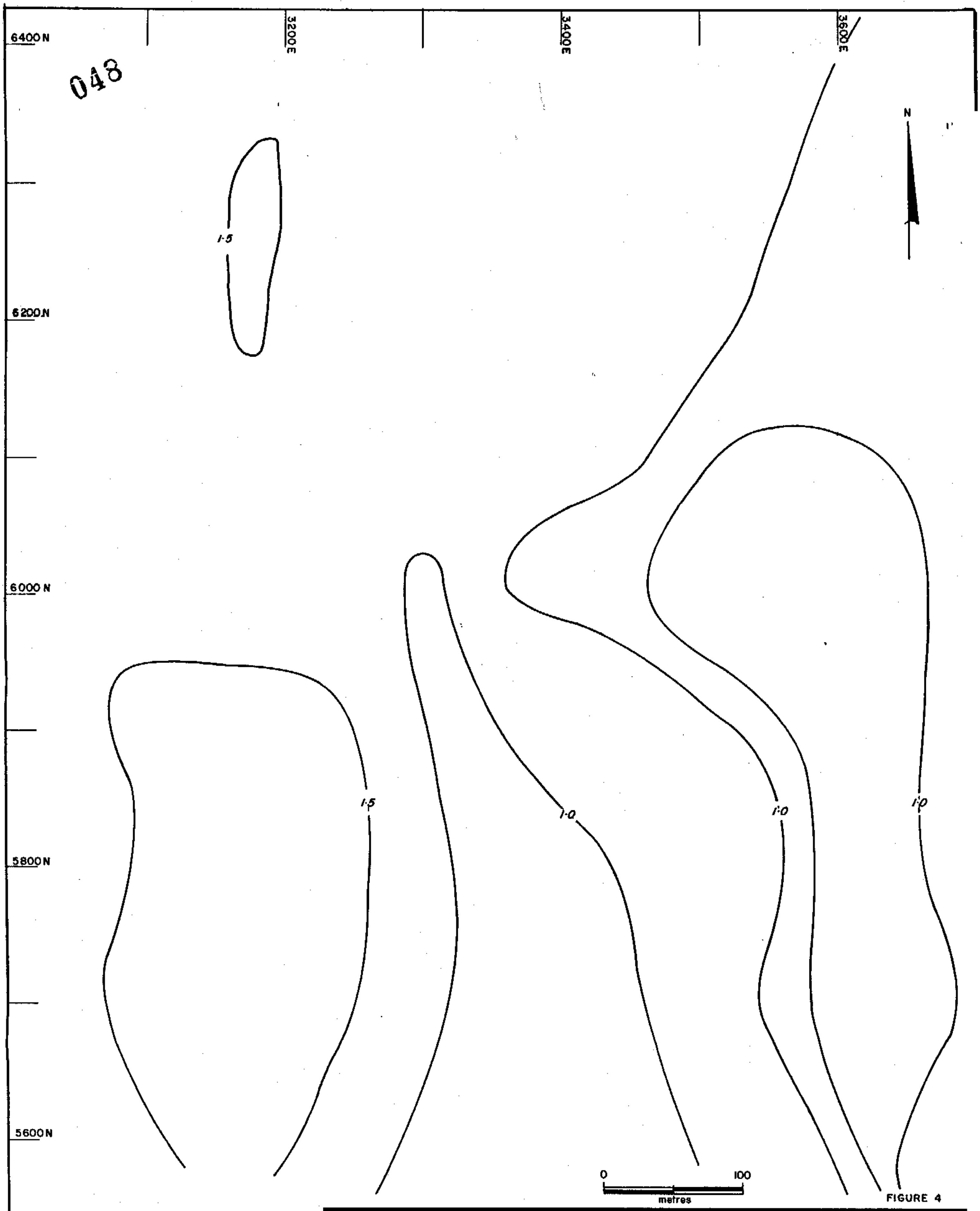


FIGURE 4

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init	Date	Init	Date

TASMANIA

HATFIELD UTEM

LOOP 18 - CHANNEL 4 DATA

Compiled: ETE

Drawn: ETE

Traced: EUM

Checked:

Location Code: K55/6/44

Scale: 1:2500

Date: April, 1985

Plate No: HT 68

5 cm

FIGURE 5

049

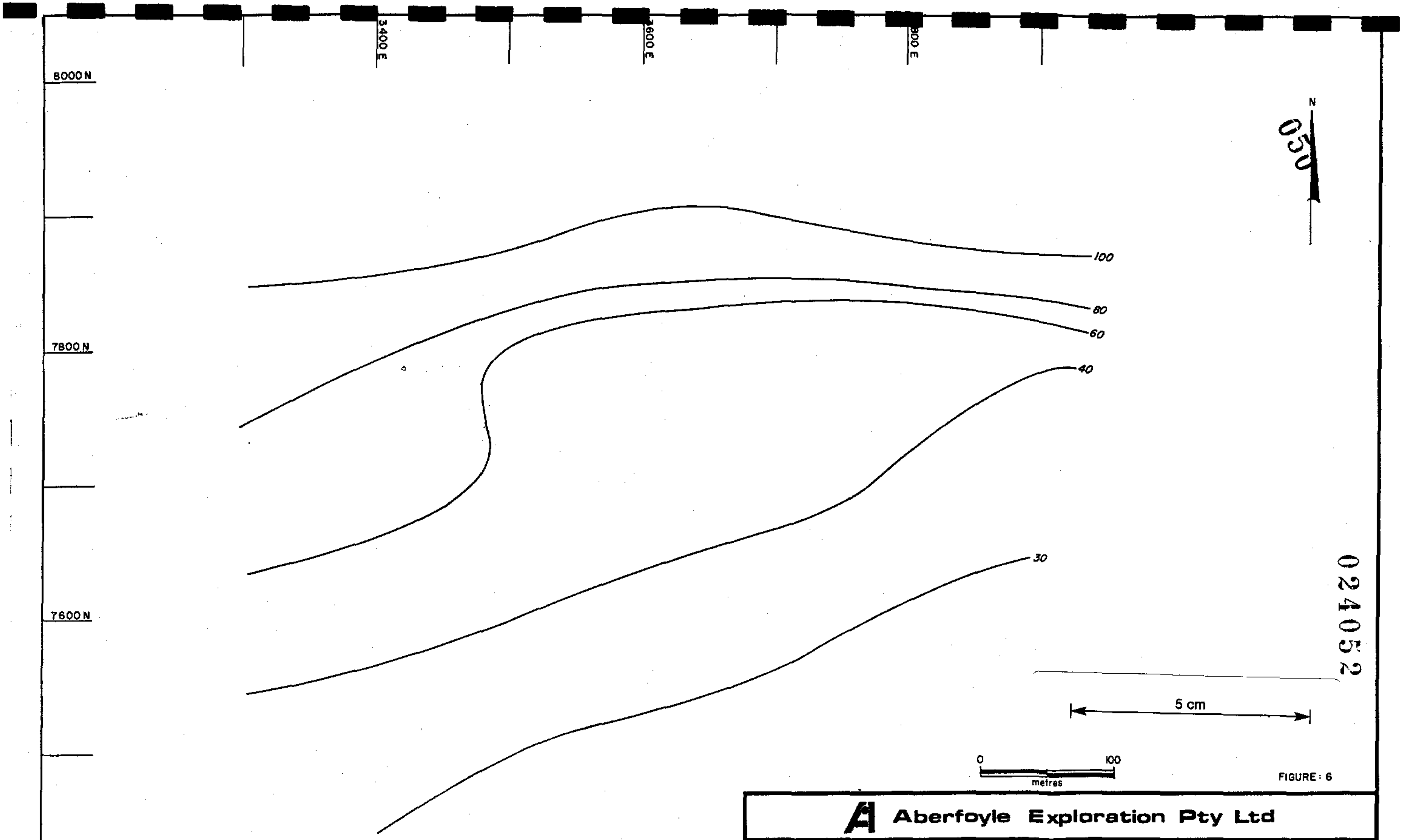
CLIENT : Aberfoyle
JOB # : 384
DATE : 23-2-85
OPERATOR : BC
PLOT OF : ρ

LOCATION : Hatfield
LINE : 58 (5800mN)
BEARING : N90E
a-SPACING : 50m
UNITS : Ωm

Tx LENGTH : 1000m
DISTANCE : 12 km
BEARING : E-W
DIRECTION : N

fHz	1	2	3	4	5	6	7	8	9	f#	fHz
2048	79	172	48	79	40	30	22	18	113	15	~~2048~~ 4096
1024	(129)	(121)	(18)	80	(66)	(120)	(28)	(27)	(146)	14	~~1024~~ 2048
512	44	181	38	86	53	32	21	10	126	13	~~512~~ 1024
256	40	1663	38	(152)	757	27	27	9	108	12	~~256~~ 512
128	(463)	(667)	(171)	(5479)	(3083)	(33)	(31)	(25)	(232)	11	~~128~~ 256
64	26	210	29	249	111	28	20	52	171	10	~~64~~ 128
32	70	69	94	848	349	101	71	25	293	9	~~32~~ 64
16	121	1286	216	1434	631	192	156	65	630	8	~~16~~ 32
8	192	2205	416	2330	1066	338				7	~~8~~ 16
4											4
2											2

024051



024052

FIGURE : 6

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init	Date	Init	Date

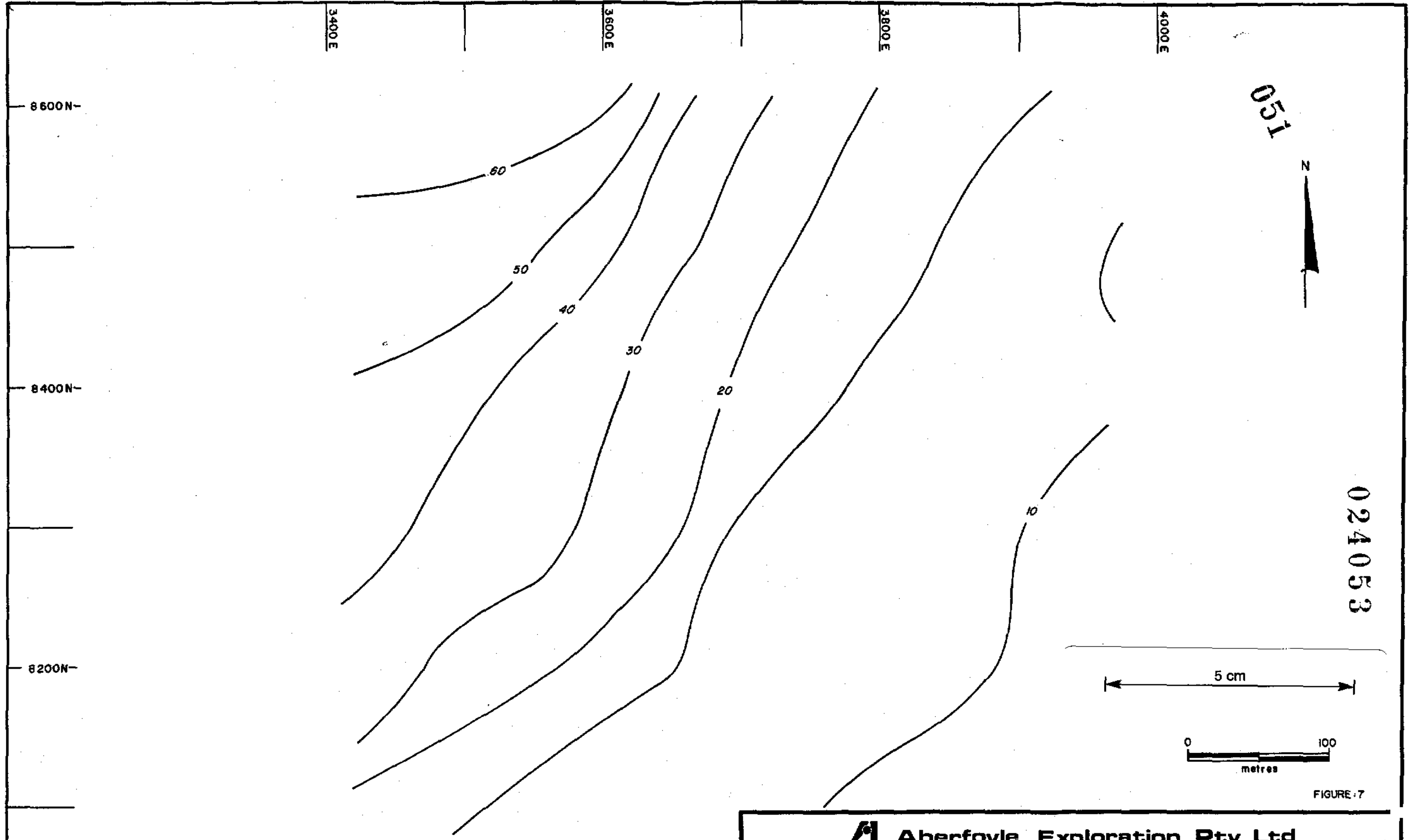
TASMANIA

HATFIELD UTEM

LOOP 19 - CHANNEL 8 DATA

Compiled: ETE
Drawn: ETE
Traced: EUM, LML
Checked:

Location Code: K55/6/44
Scale: 1: 2500
Date: April, 1985
Plate No: HT 69



051

024053

FIGURE: 7

Aberfoyle Exploration Pty Ltd

TASMANIA

HATFIELD UTEM

LOOP 20 - CHANNEL 7 DATA

REVISIONS			
Init.	Date	Init.	Date

Location Code: K55/6/44

Scale: 1:2500

Date: February, 1985

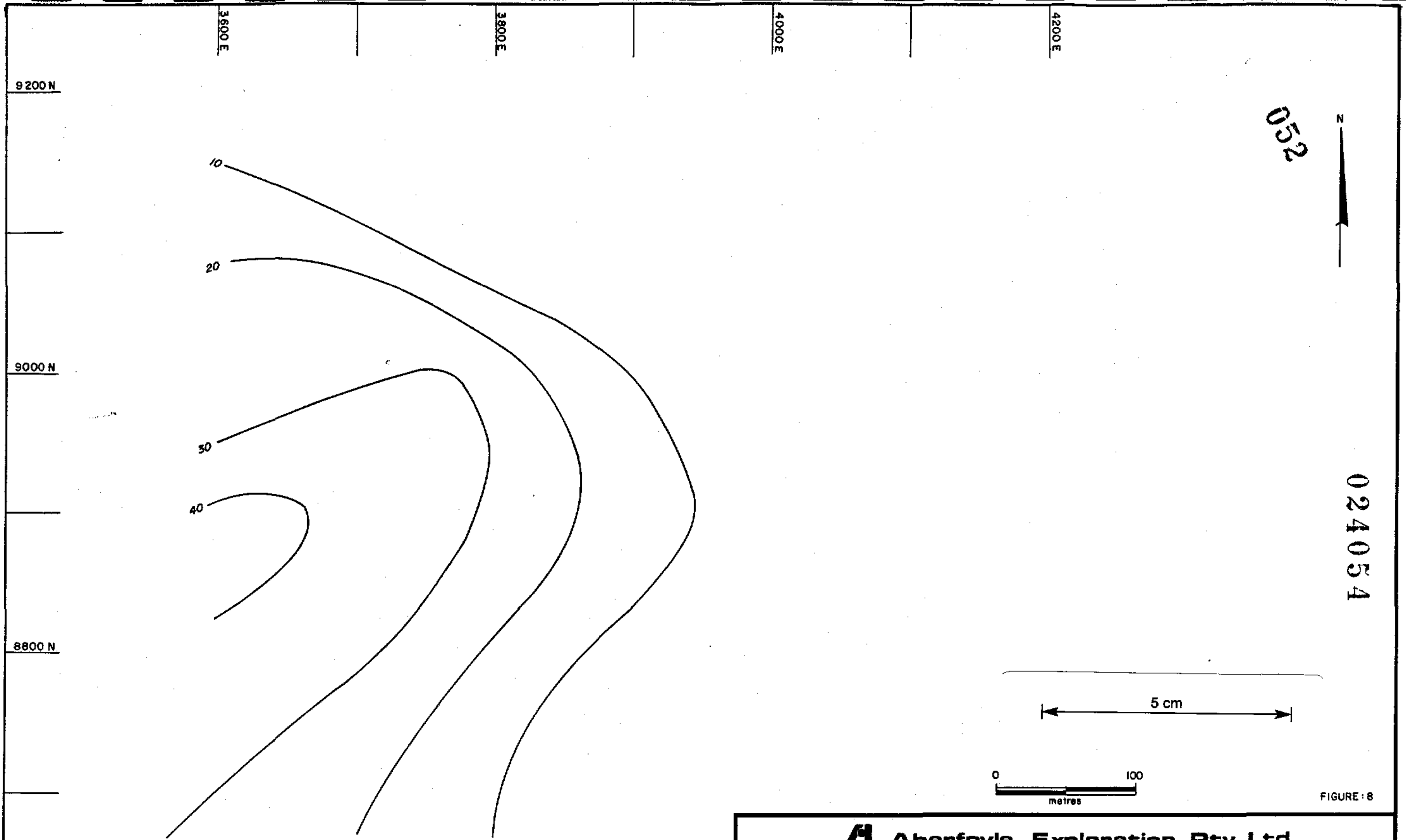
Compiled: ETE

Drawn: ETE

Traced: EUM

Checked:

Plate No: HT 64



052

024054

FIGURE : 8

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init	Date	Init	Date

TASMANIA

HATFIELD UTEM

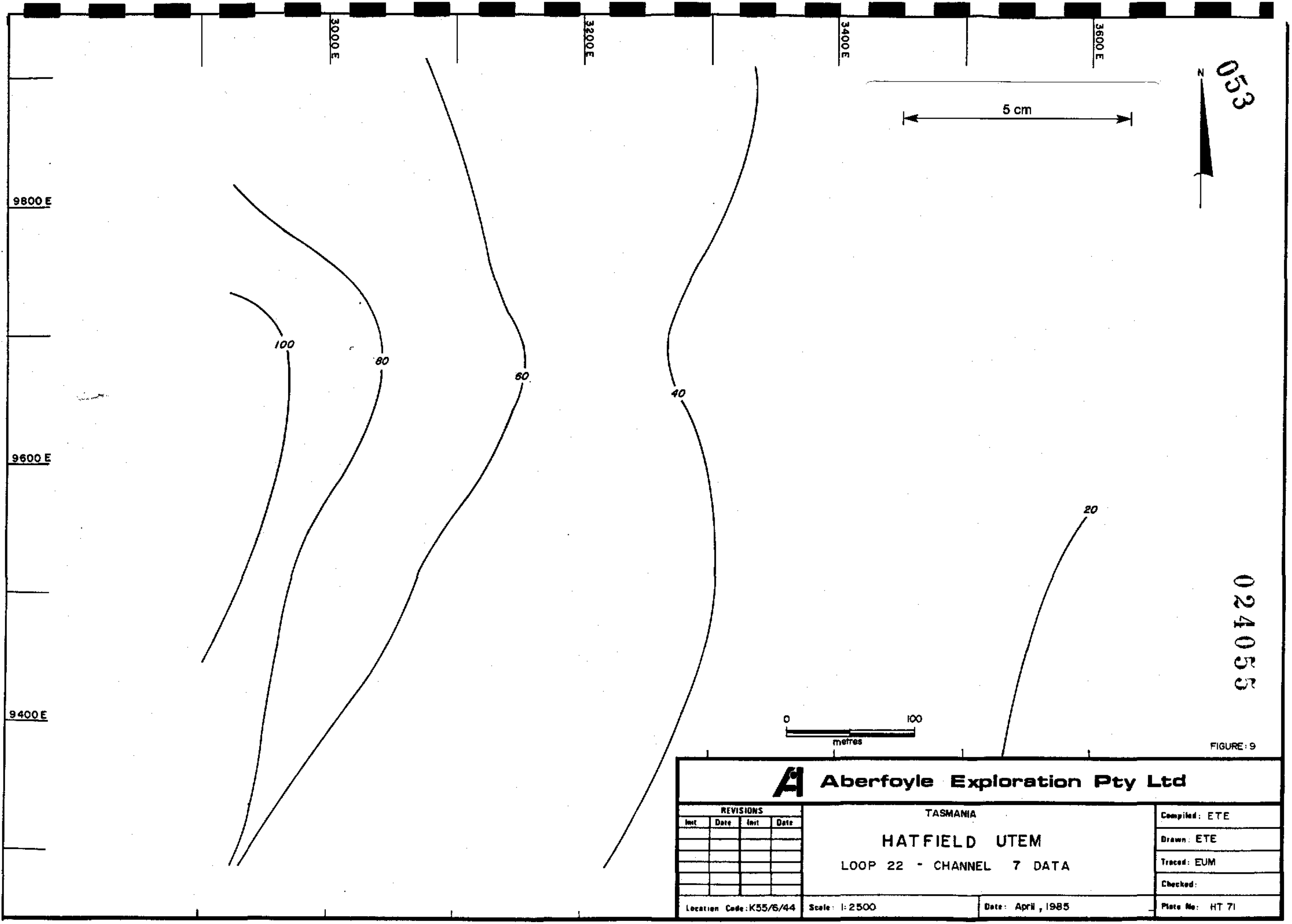
LOOP 21 - CHANNEL 7 DATA

Compiled: ETE
Drawn: ETE
Traced: LML, EUM
Checked:

Location Code: K55/6/44
Scale: 1:2500
Date: April, 1985
Plate No: HT 70

RMO 554

053



024055

FIGURE: 9

Aberfoyle Exploration Pty Ltd

REVISIONS			
Init	Date	Init	Date

TASMANIA

HATFIELD UTEM

LOOP 22 - CHANNEL 7 DATA

Compiled: ETE
Drawn: ETE
Traced: EUM
Checked:

Location Code: K55/6/44
Scale: 1:2500
Date: April, 1985
Plate No: HT 71

RMO 554

054

024056

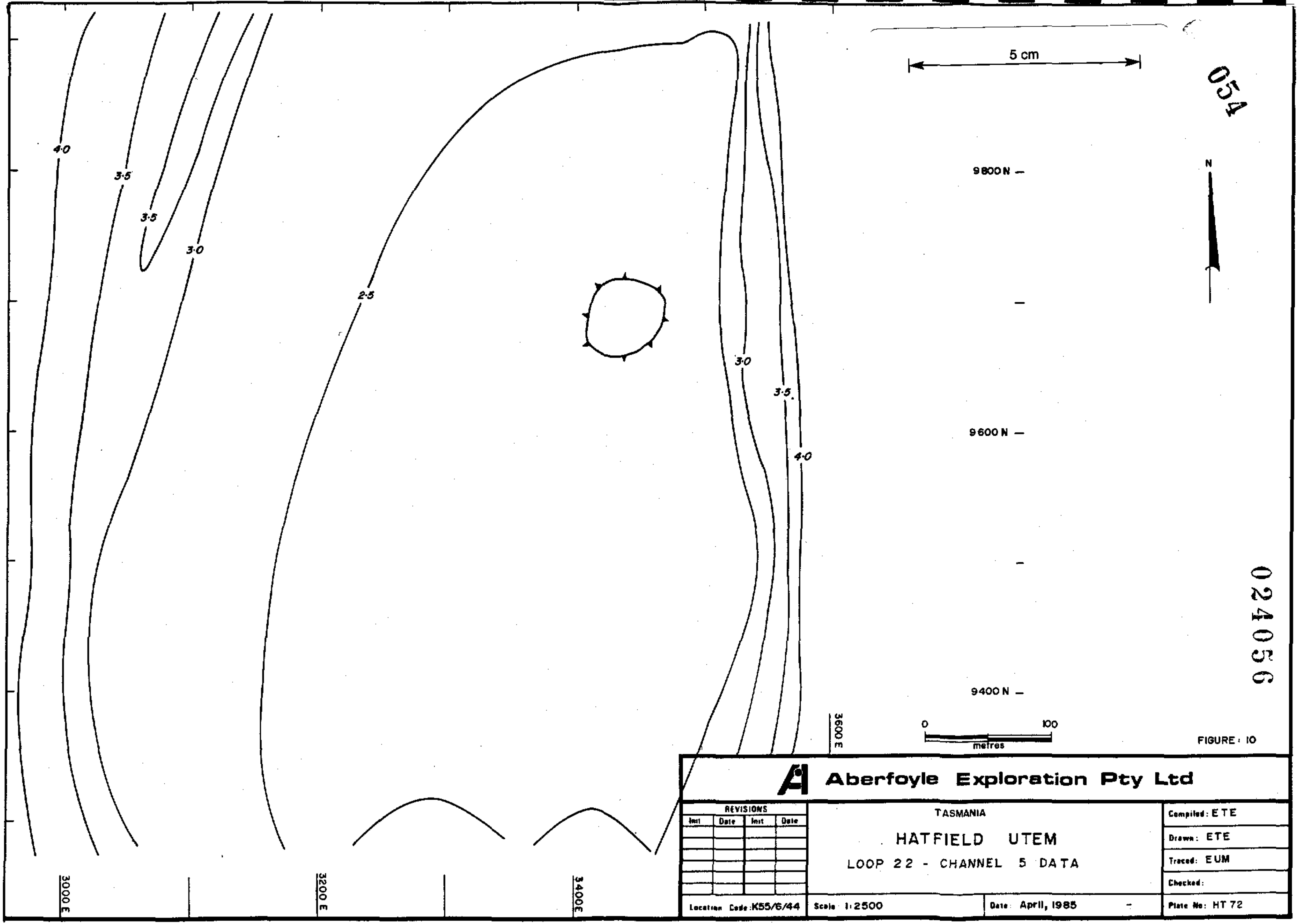


FIGURE : 10

Aberfoyle Exploration Pty Ltd

REVISIONS

Init	Date	Init	Date

TASMANIA

HATFIELD UTEM

LOOP 22 - CHANNEL 5 DATA

Compiled: E T E

Drawn: ETE

Traced: EUM

Checked:

Location Code: K55/6/44

Scale 1:2500

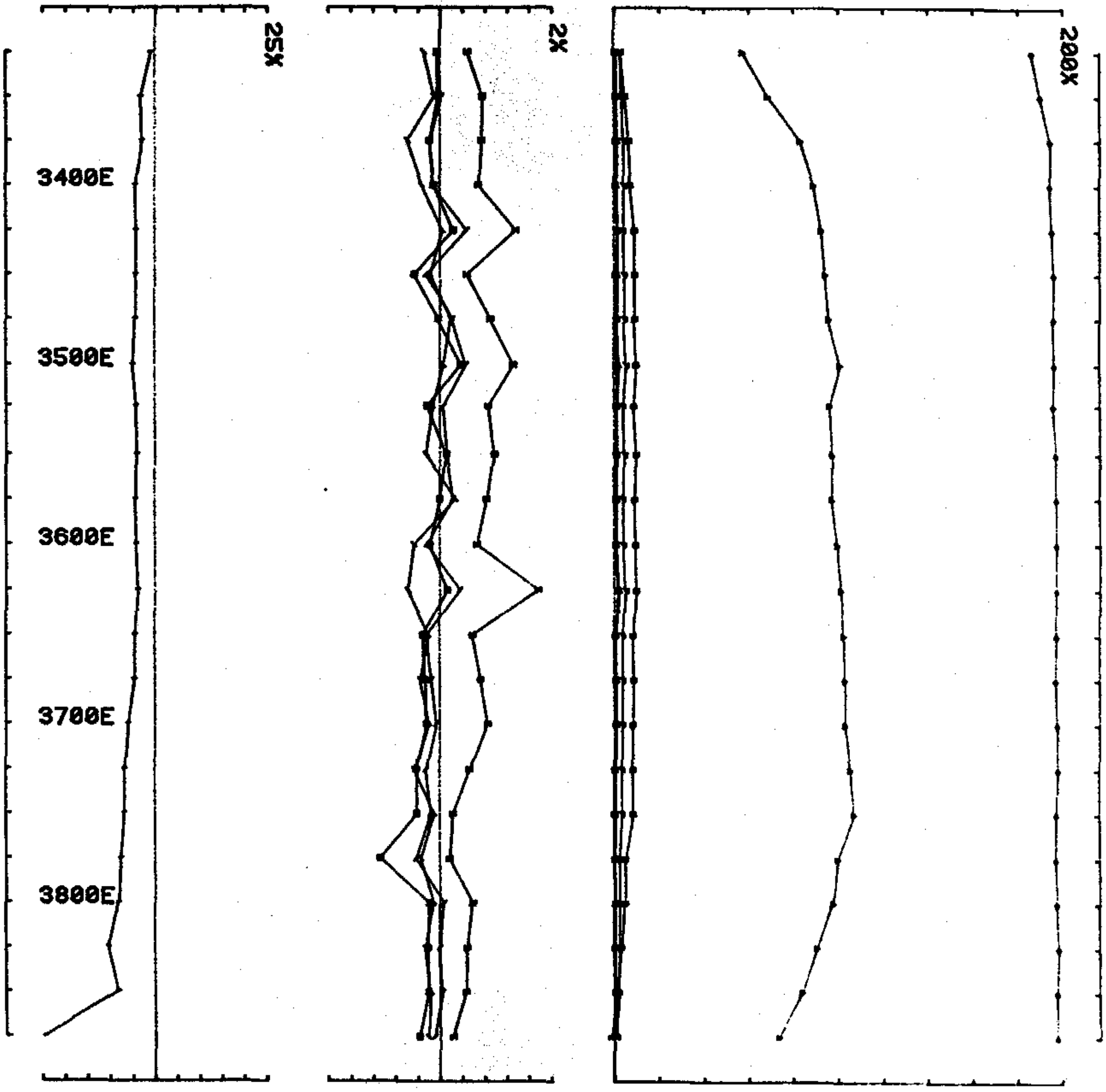
Date April, 1985

Plate No: HT 72

BMO 554

055

APPENDIX II



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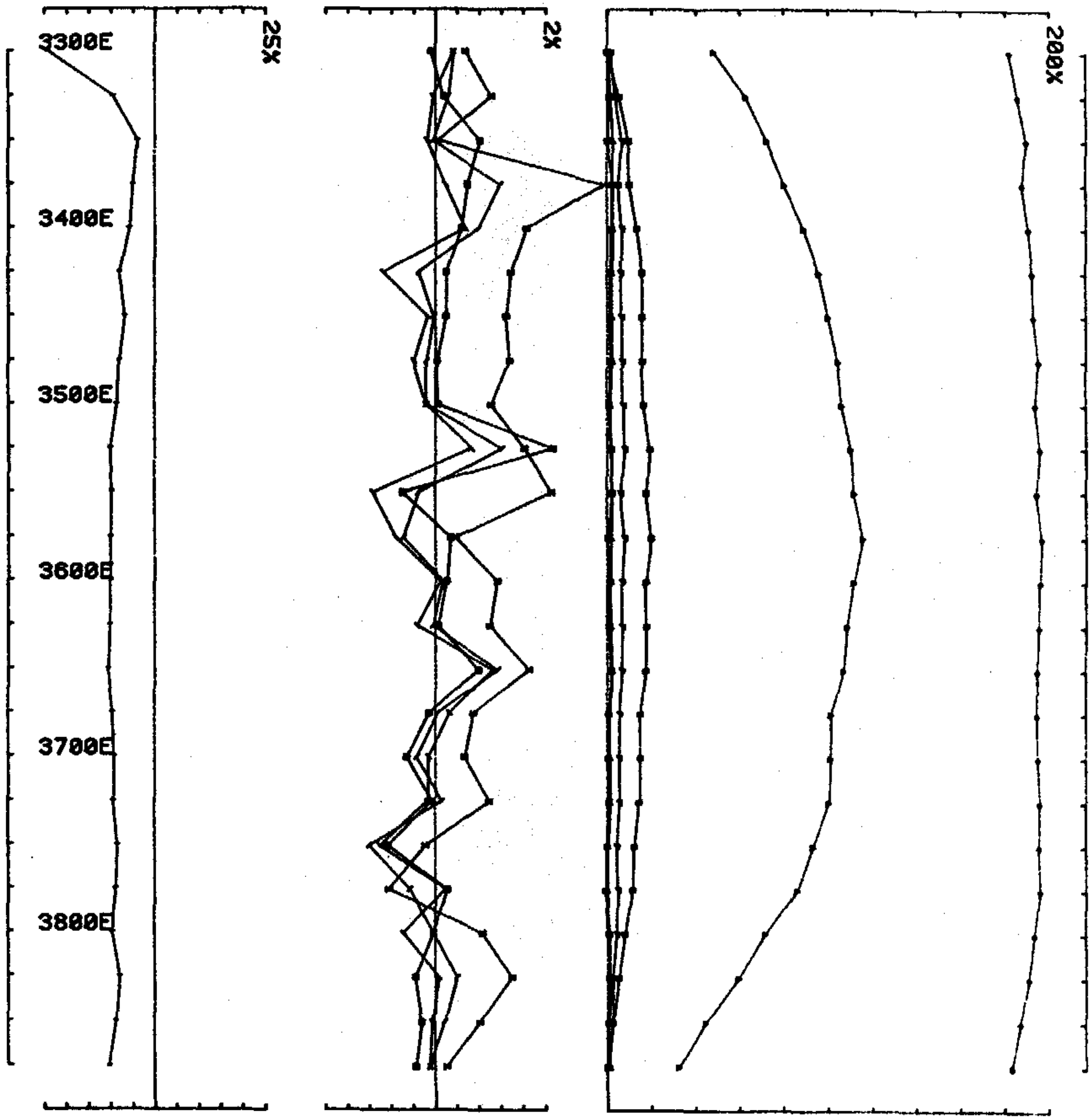
Project Area Mt. Charter Survey for Aberfoyle Exploration freq(hz) 26.230
Loopno 0017 Line 3700N component Hz secondary Ch I .

057

024059



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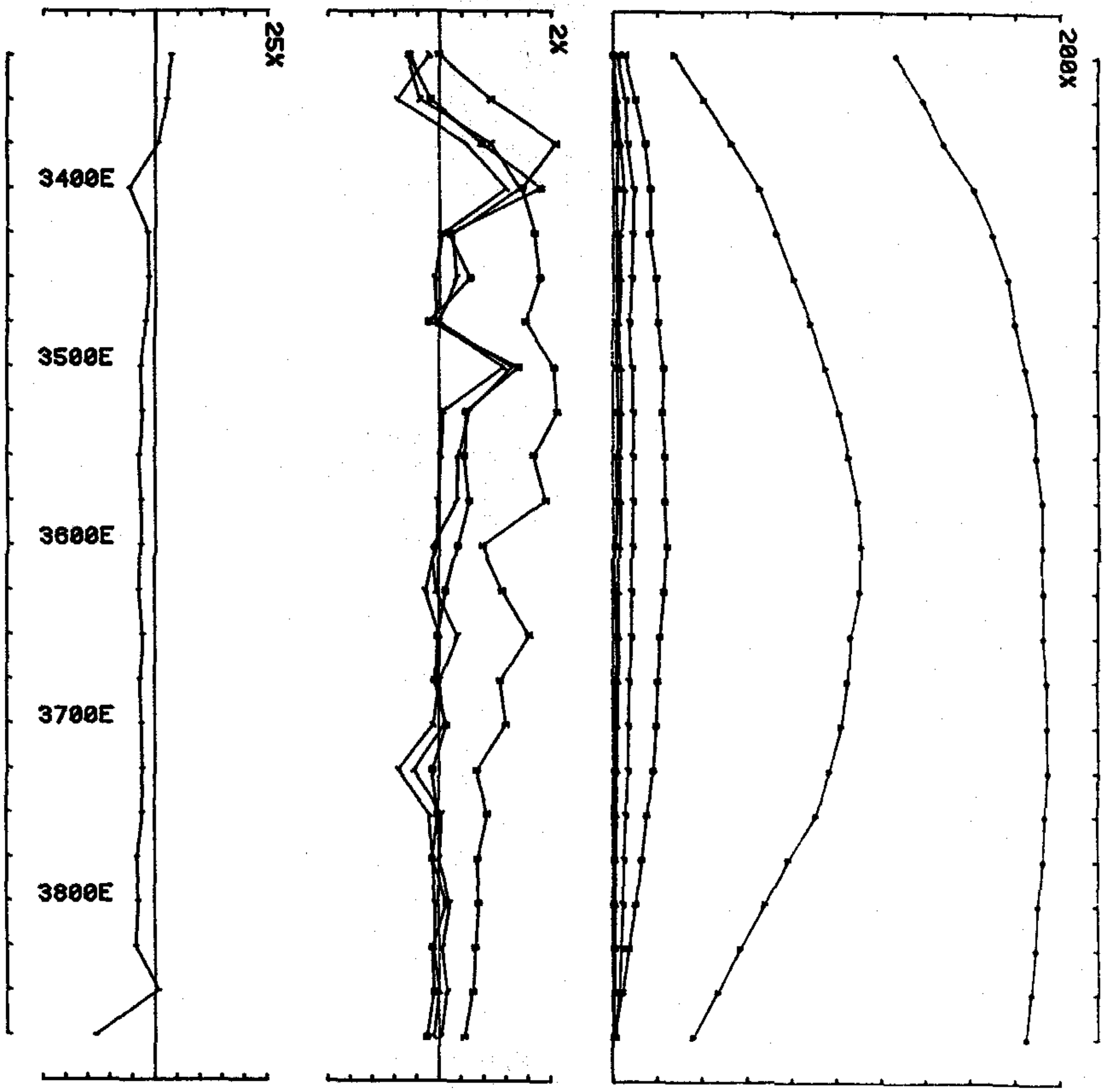
Project Area Mt. Charter Survey for Aberfoyle Exploration freq(hz) 26.230
Loopno 0017 Line 3800N component Hz secondary Ch 1 .

058



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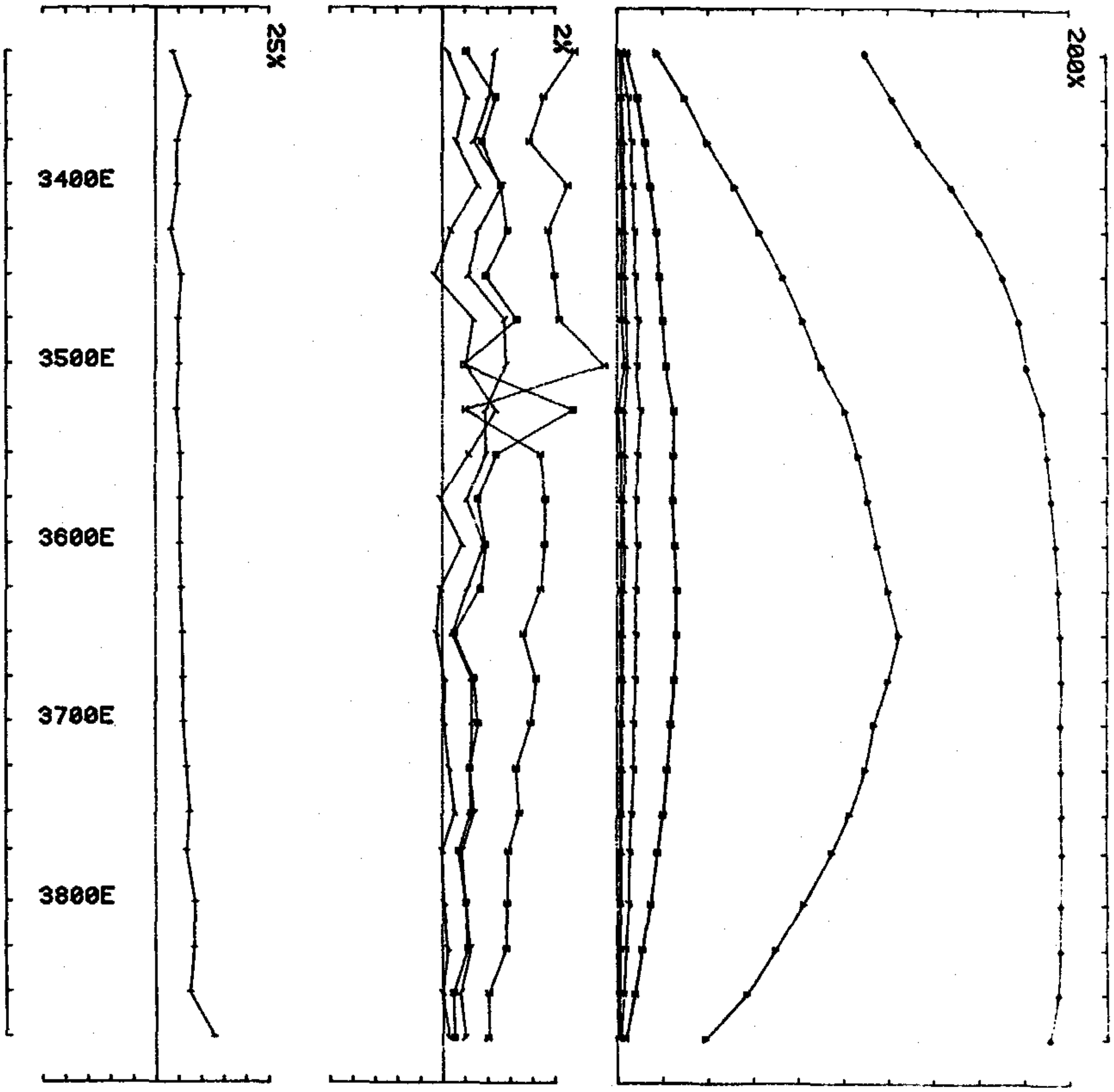
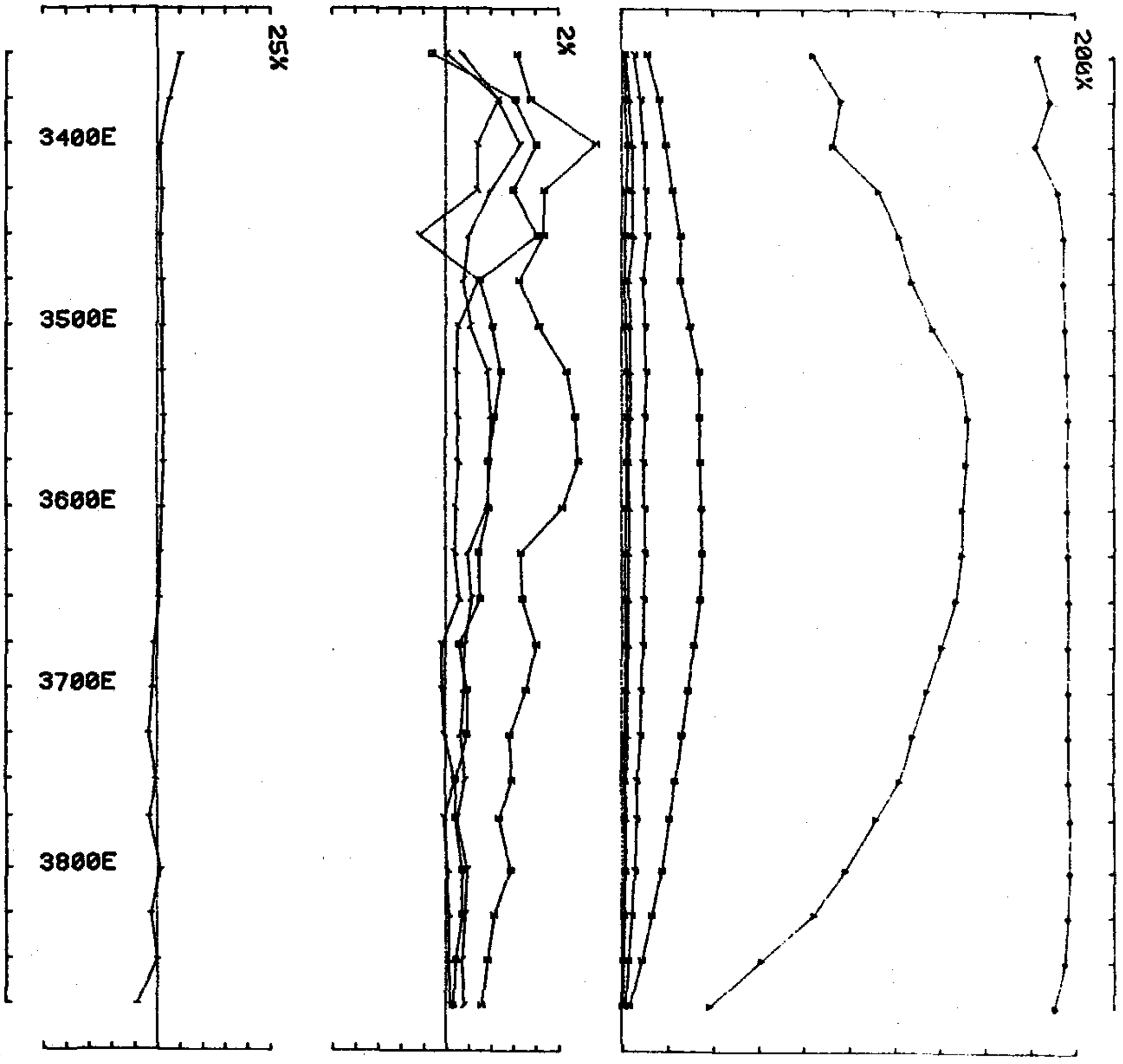
Project Area Mt. Charter Survey for Aberfoyle Exploration freq(hz) 26.230
Loopno 0017 Line 3900N component Hz secondary Ch 1 .



UTEM SURVEY conducted by PM GM Job 8449
Project Area Mt. Charter Survey for Aberfoyle Exploration freq(hz) 26.230
Loopno 0017 Line 4000N component Hz secondary Ch 1 ,

024062

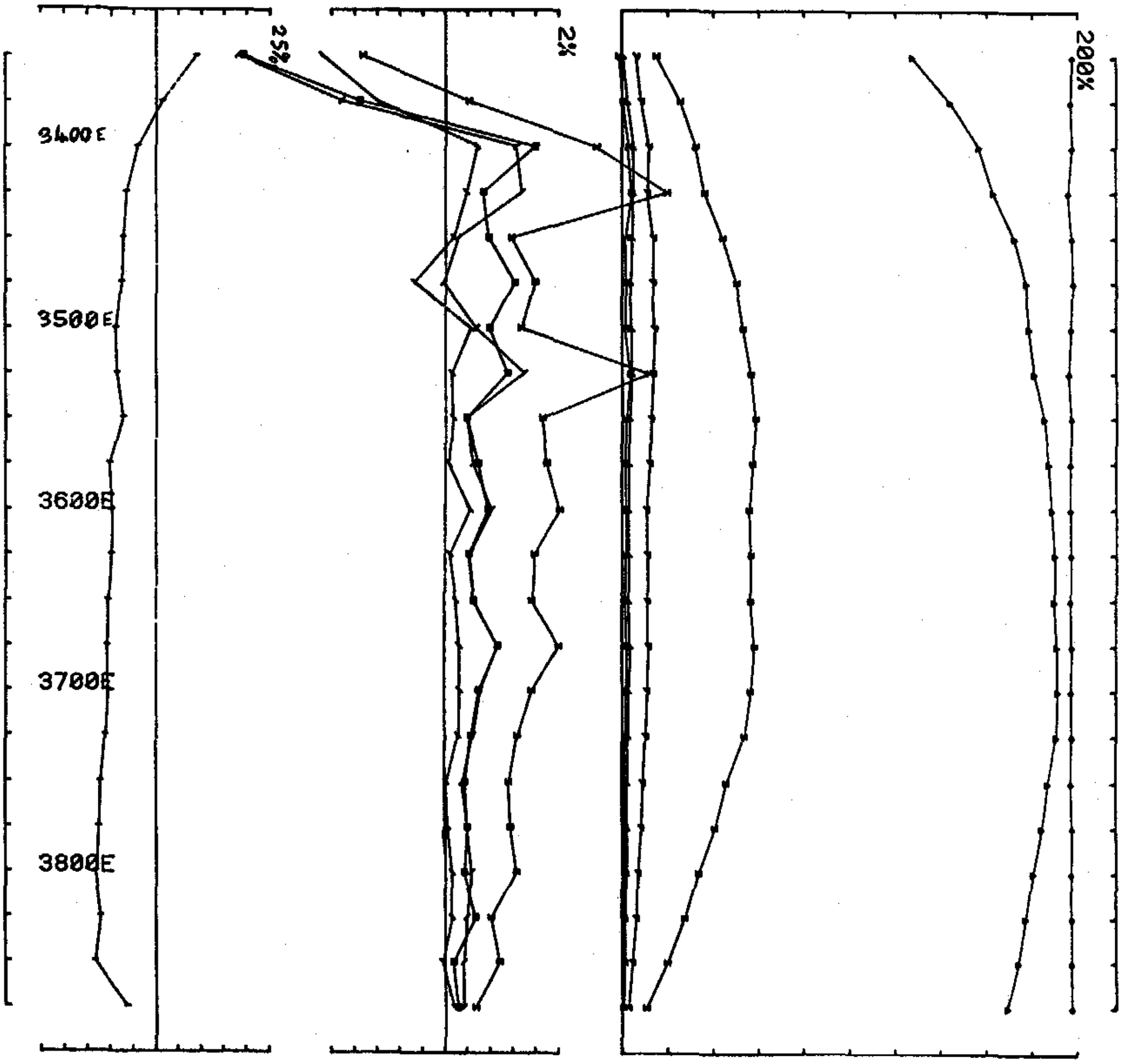
060



UTEM SURVEY conducted by PM GM Job 8449
Project Area Mt. Charter Survey for Aberfoyle Exploration freq(hz) 26.230
Loopno 0017 Line 4100N component Hz secondary Ch 1

024063

061



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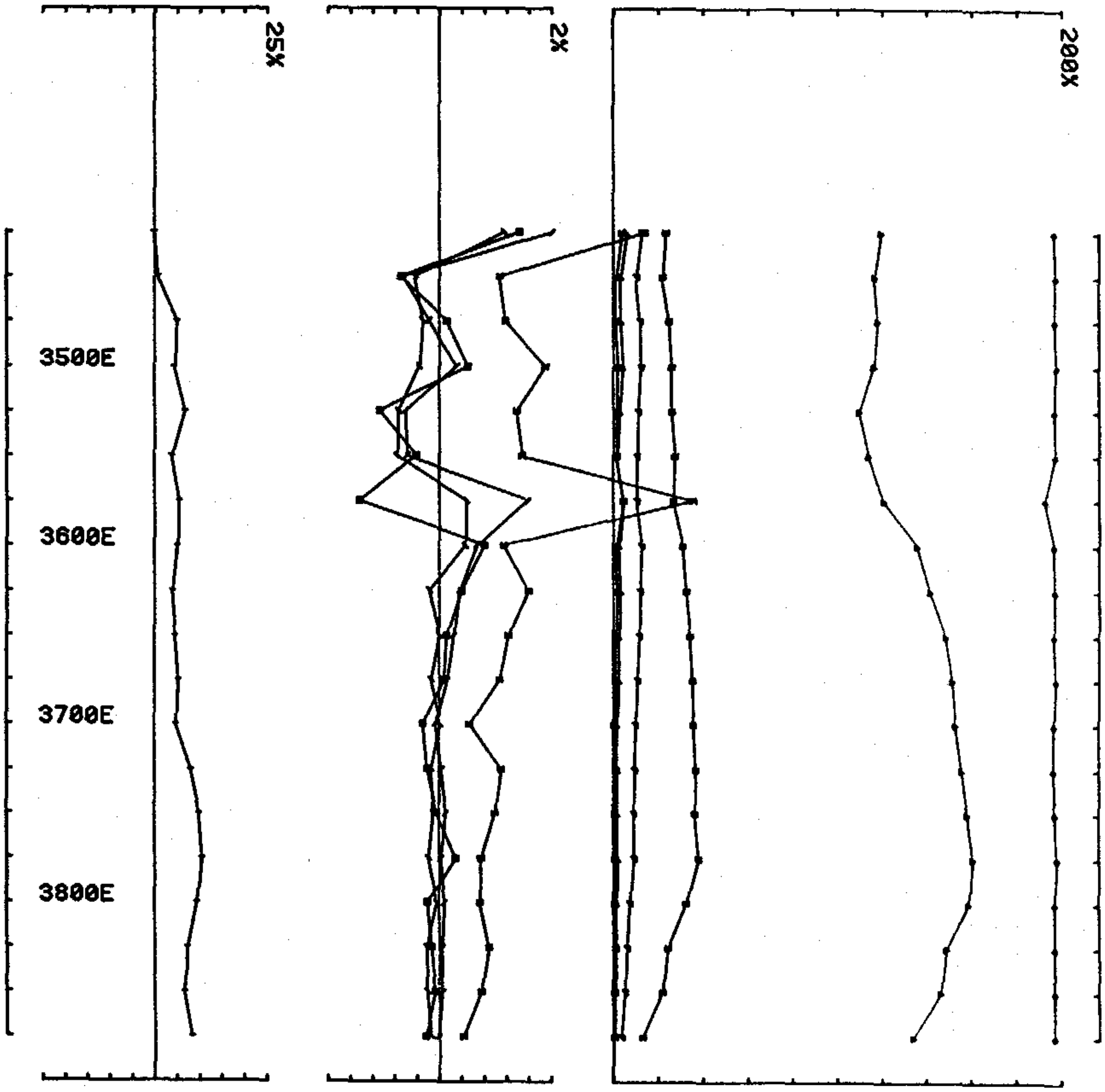

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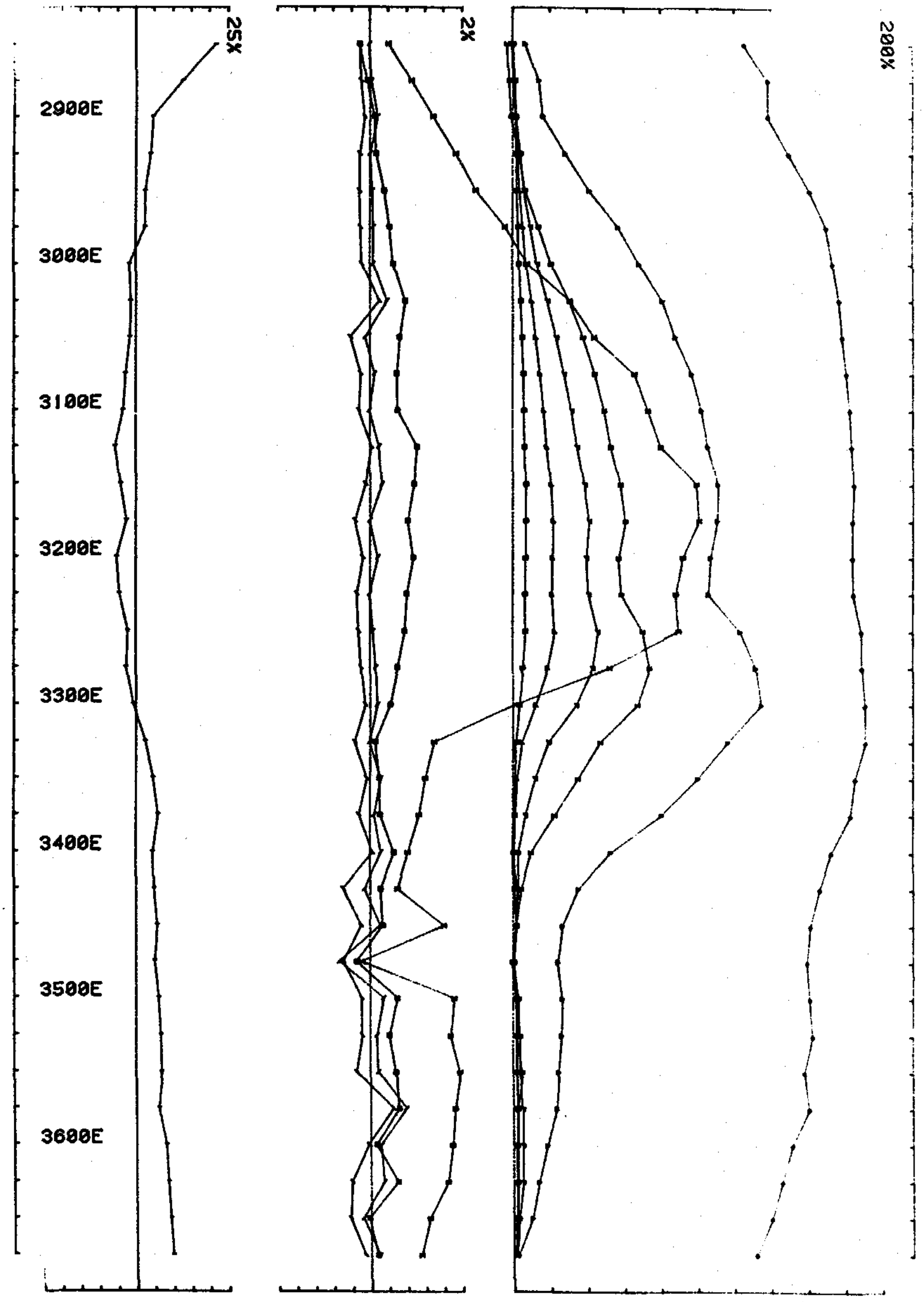

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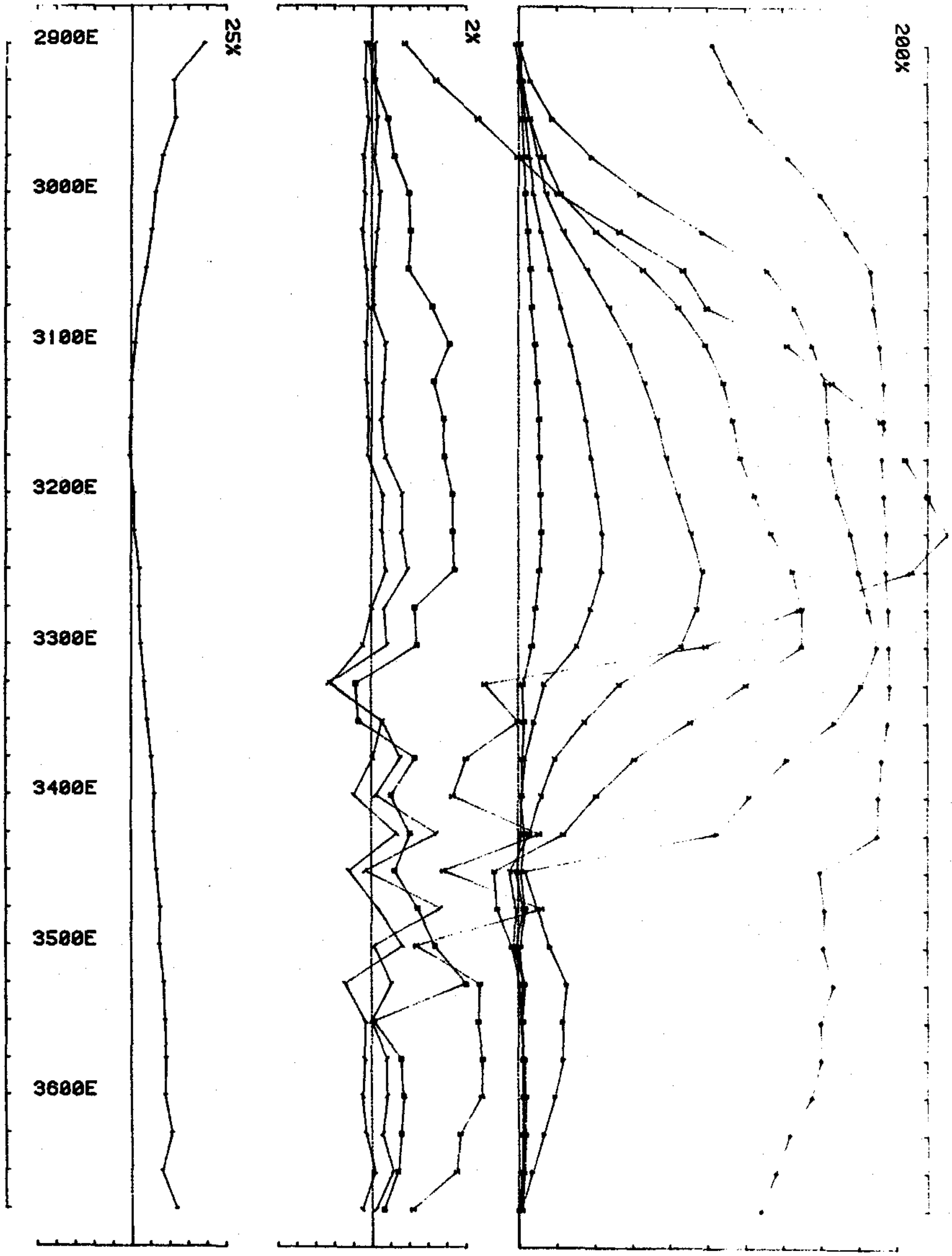

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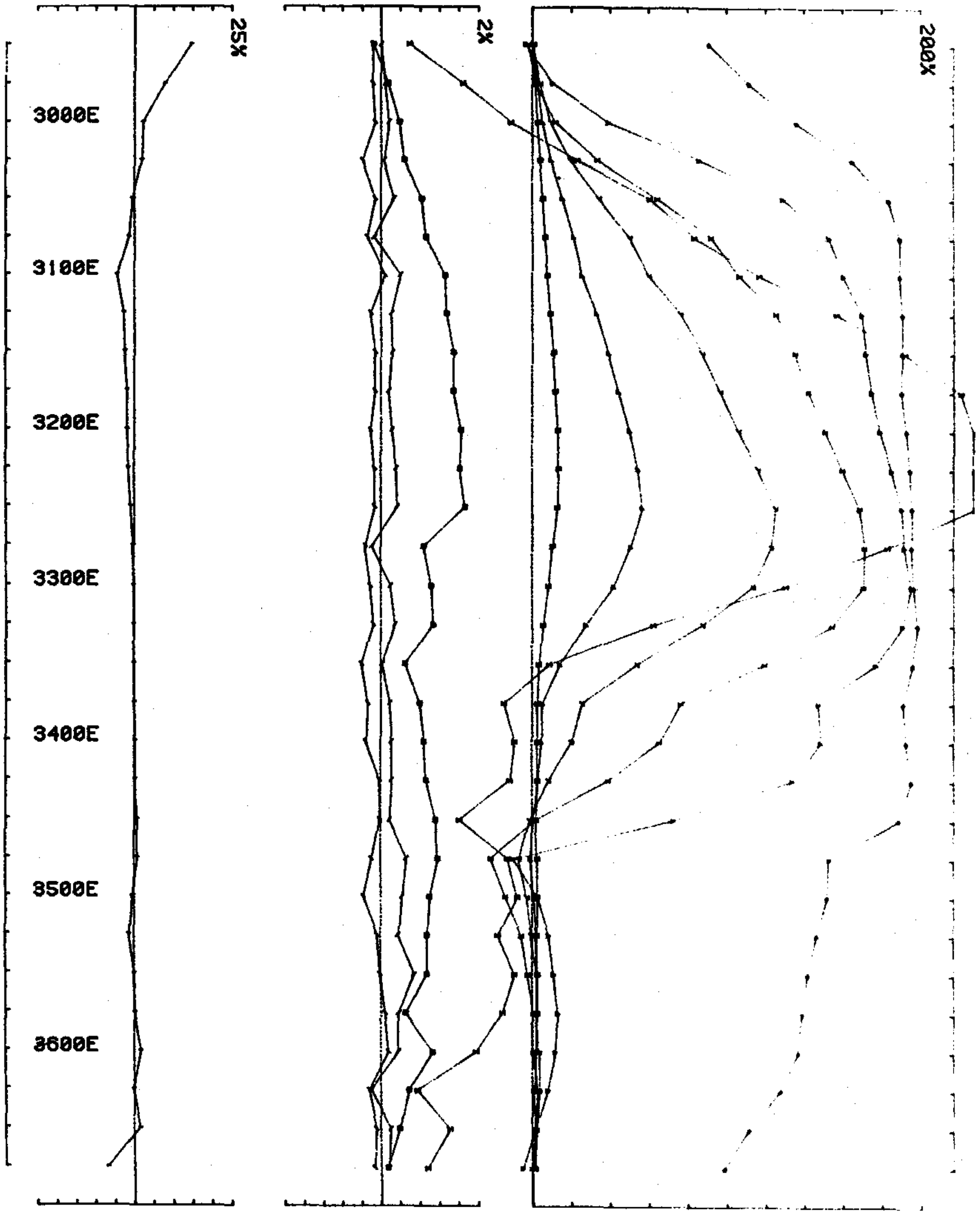

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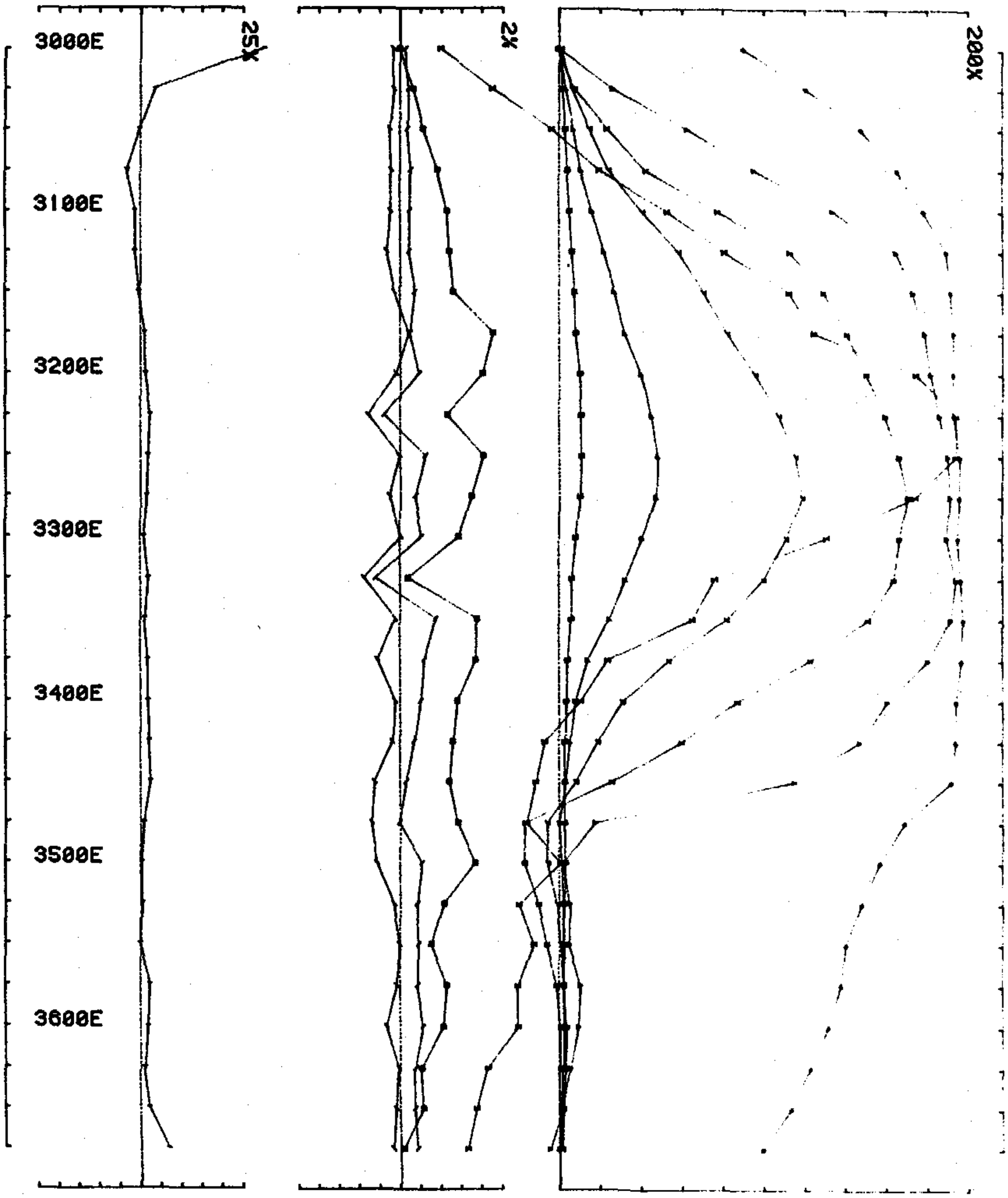

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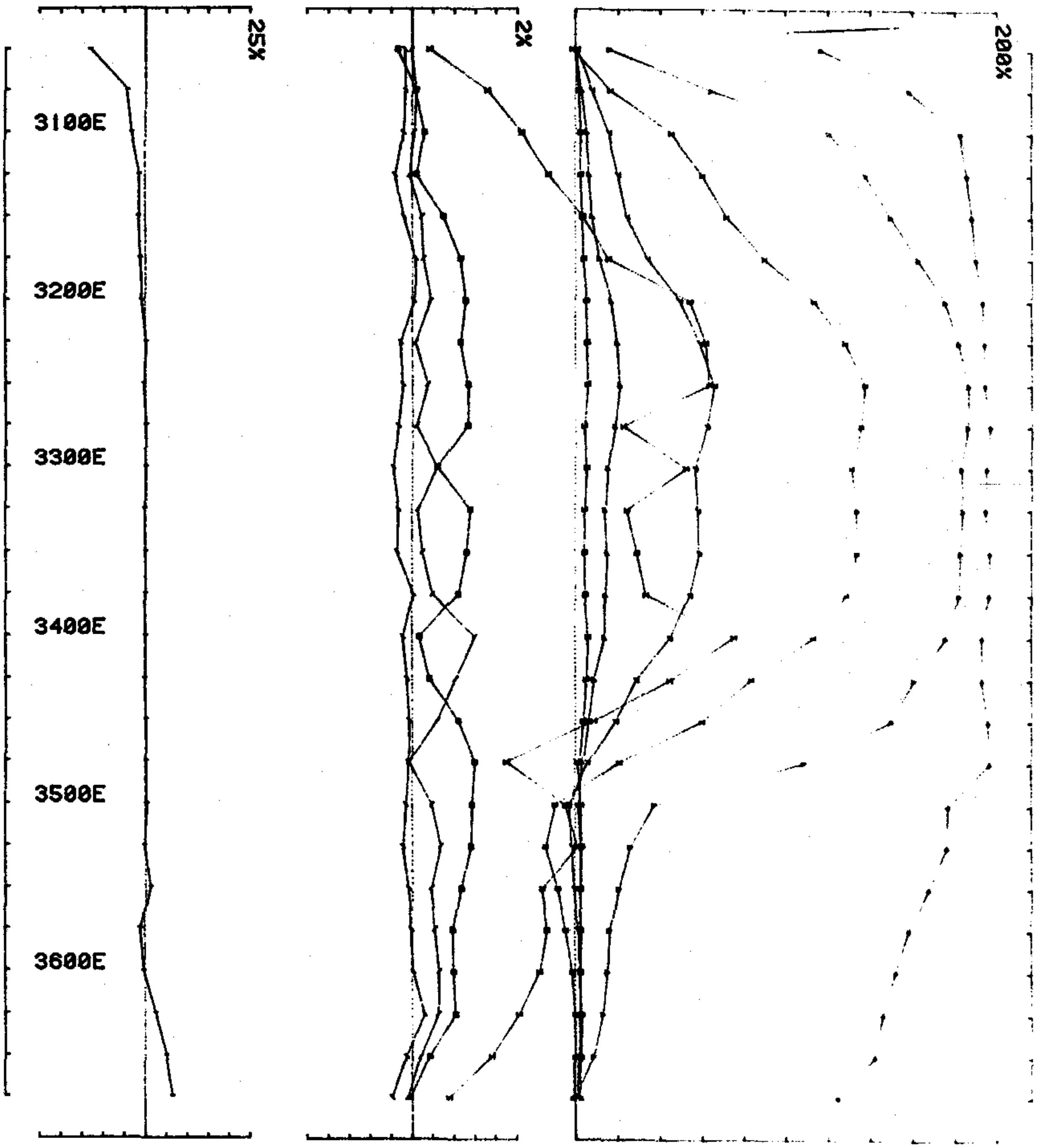

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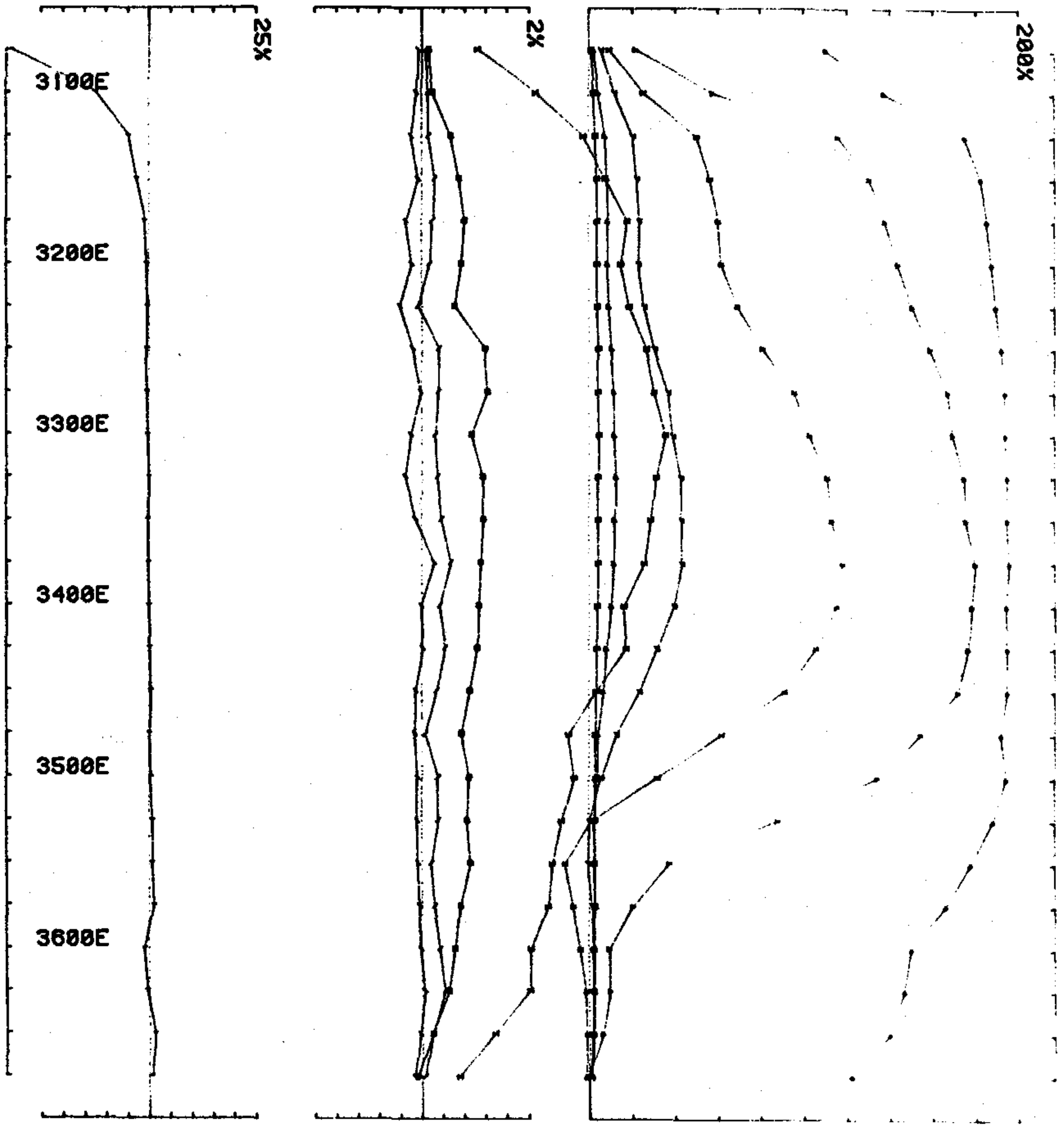

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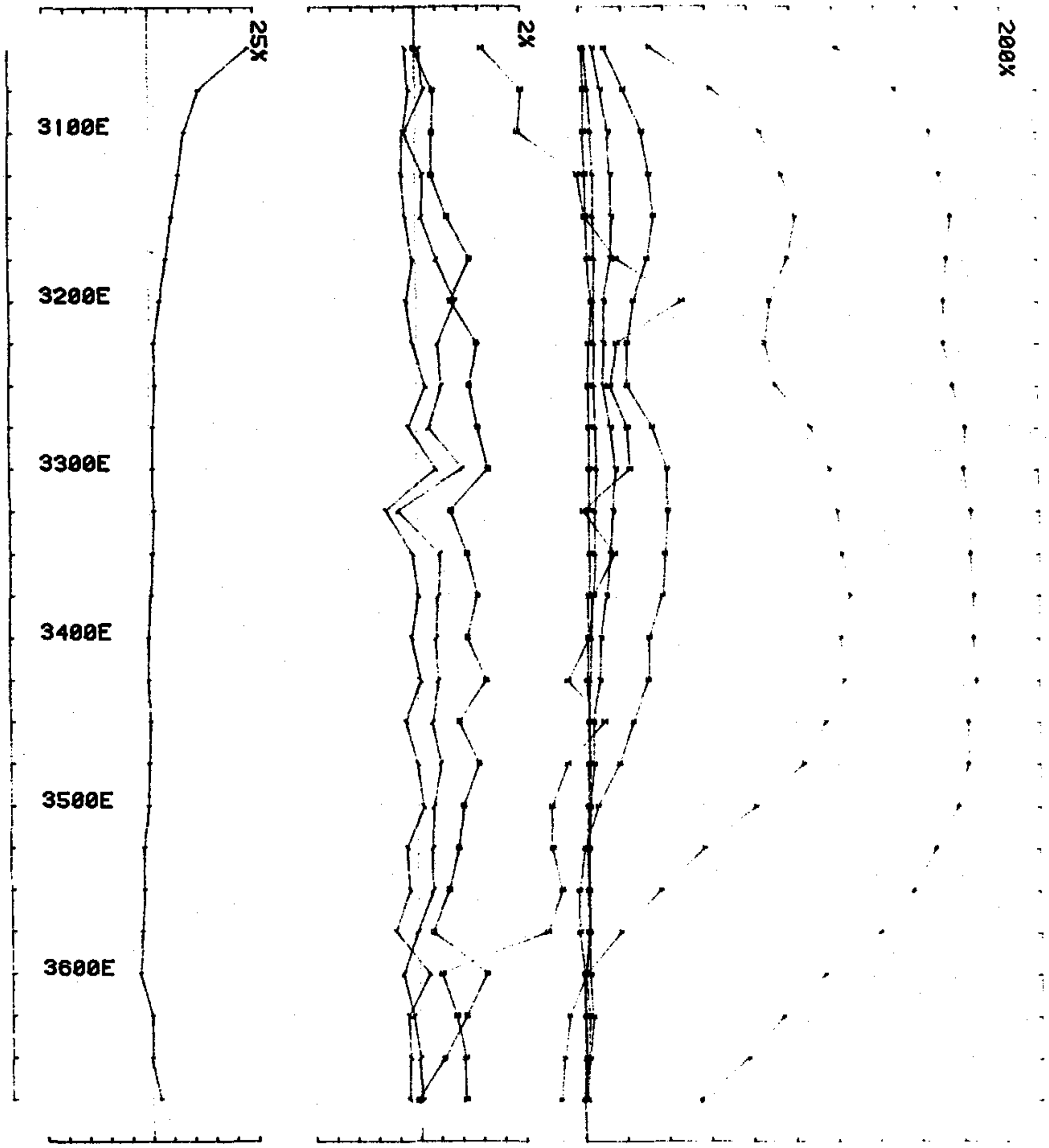

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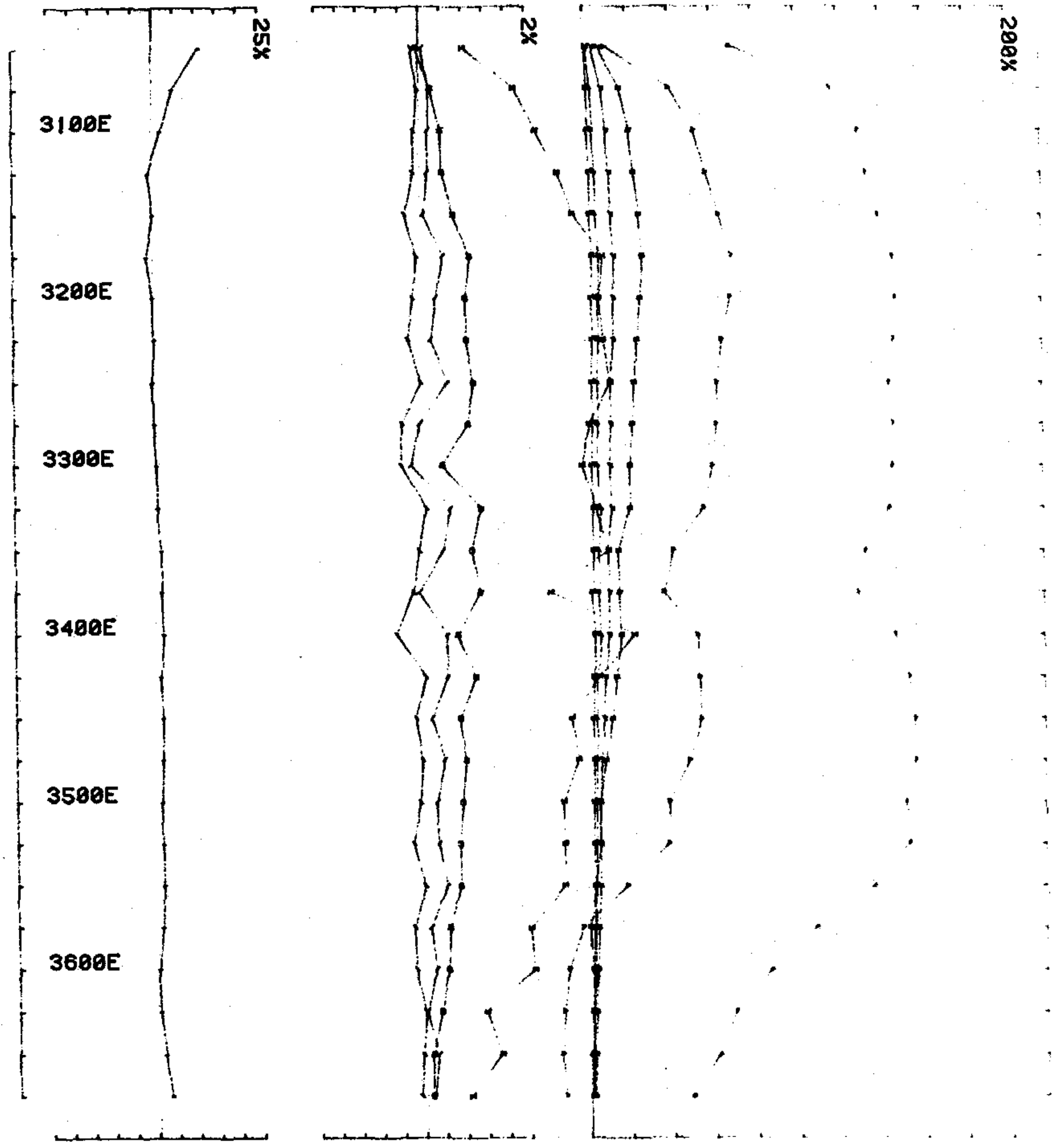

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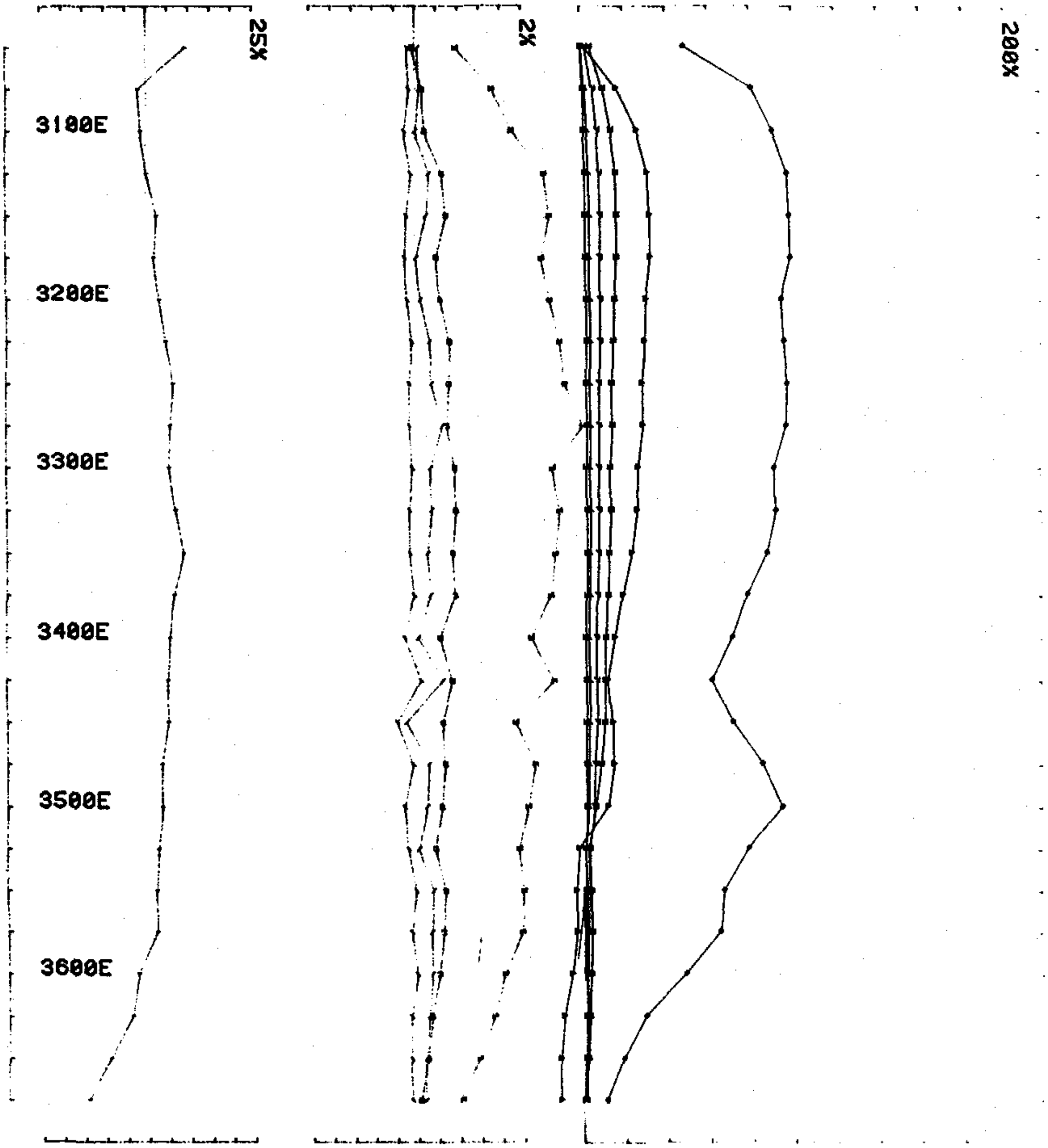

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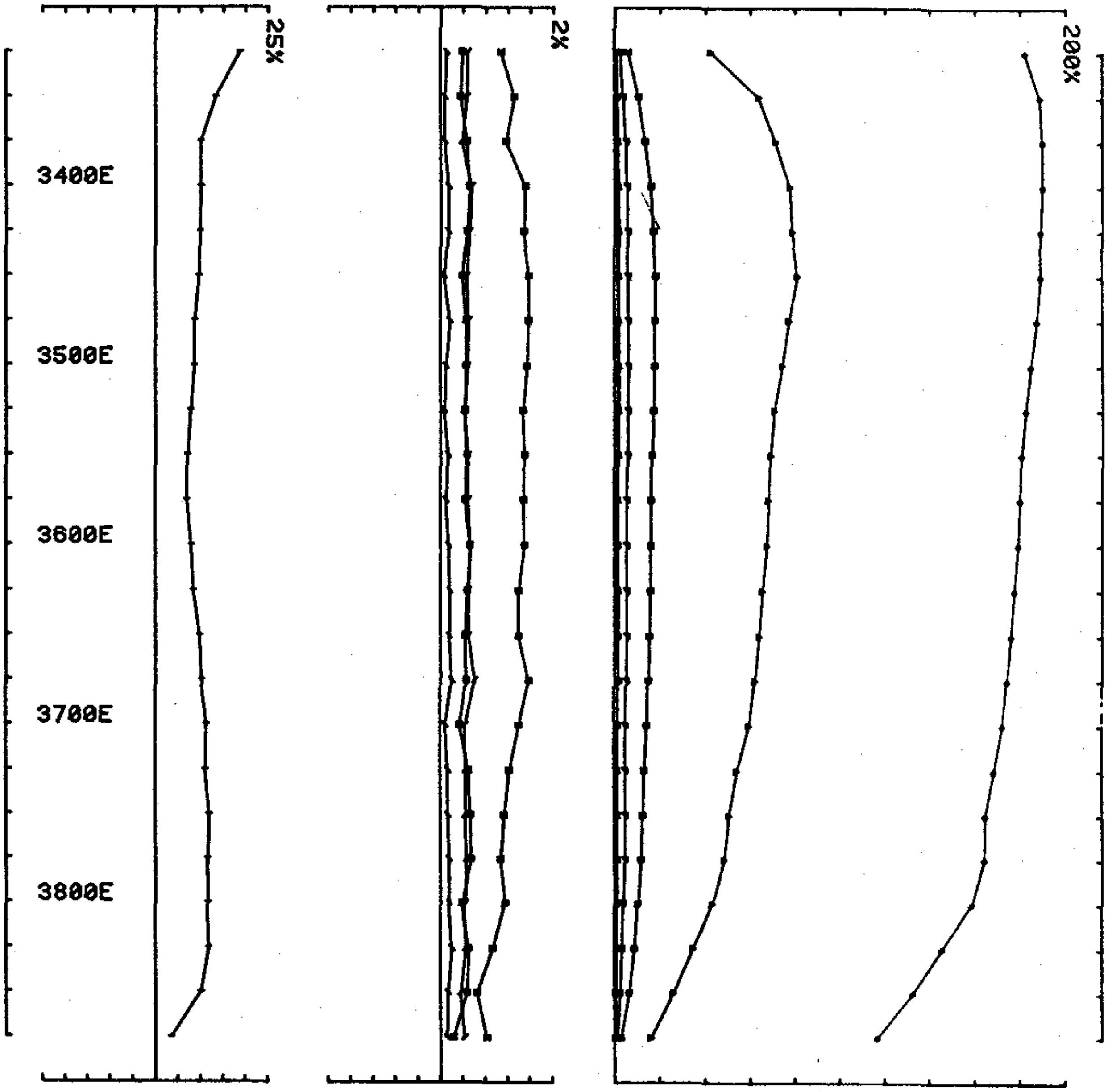

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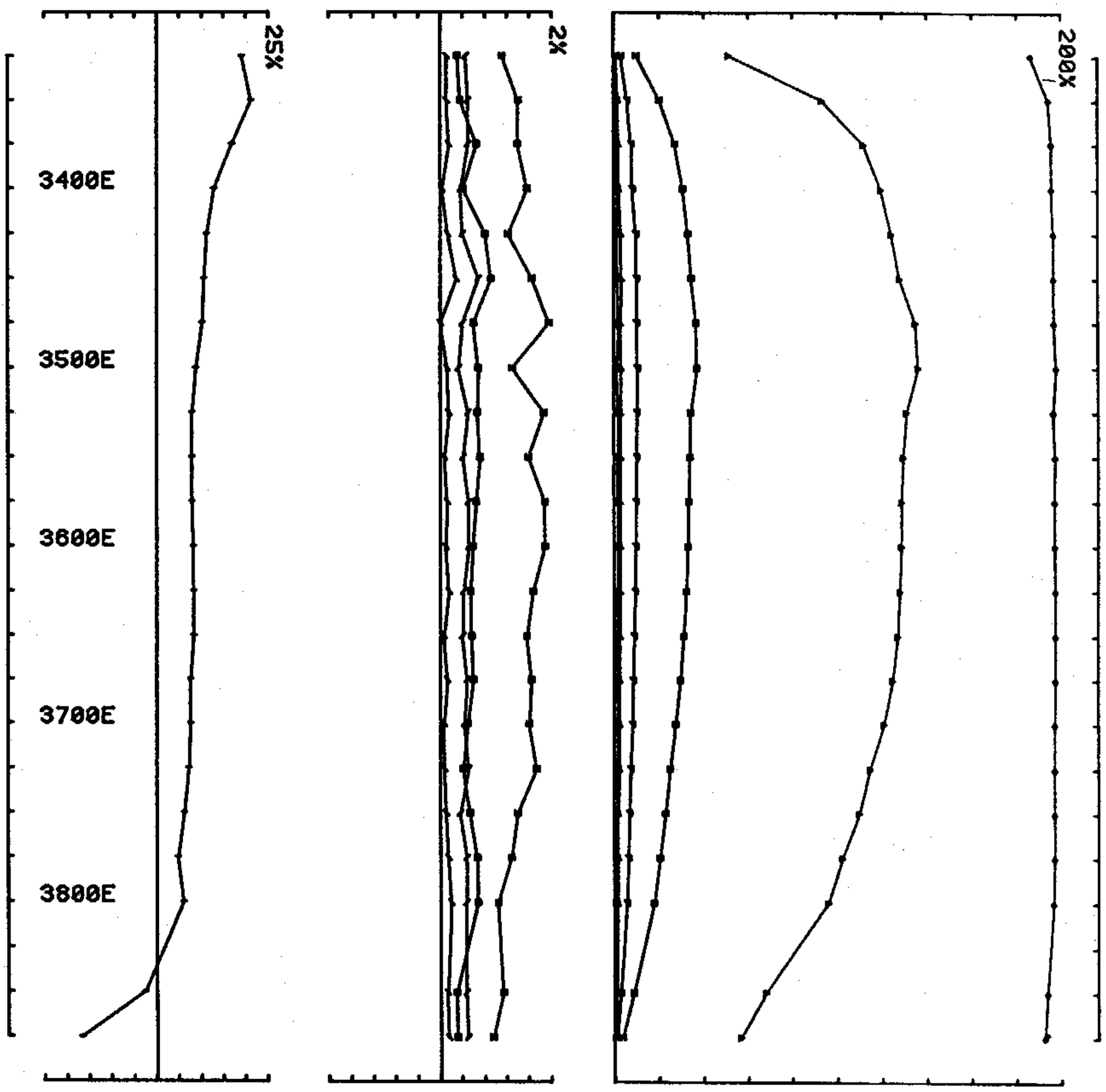

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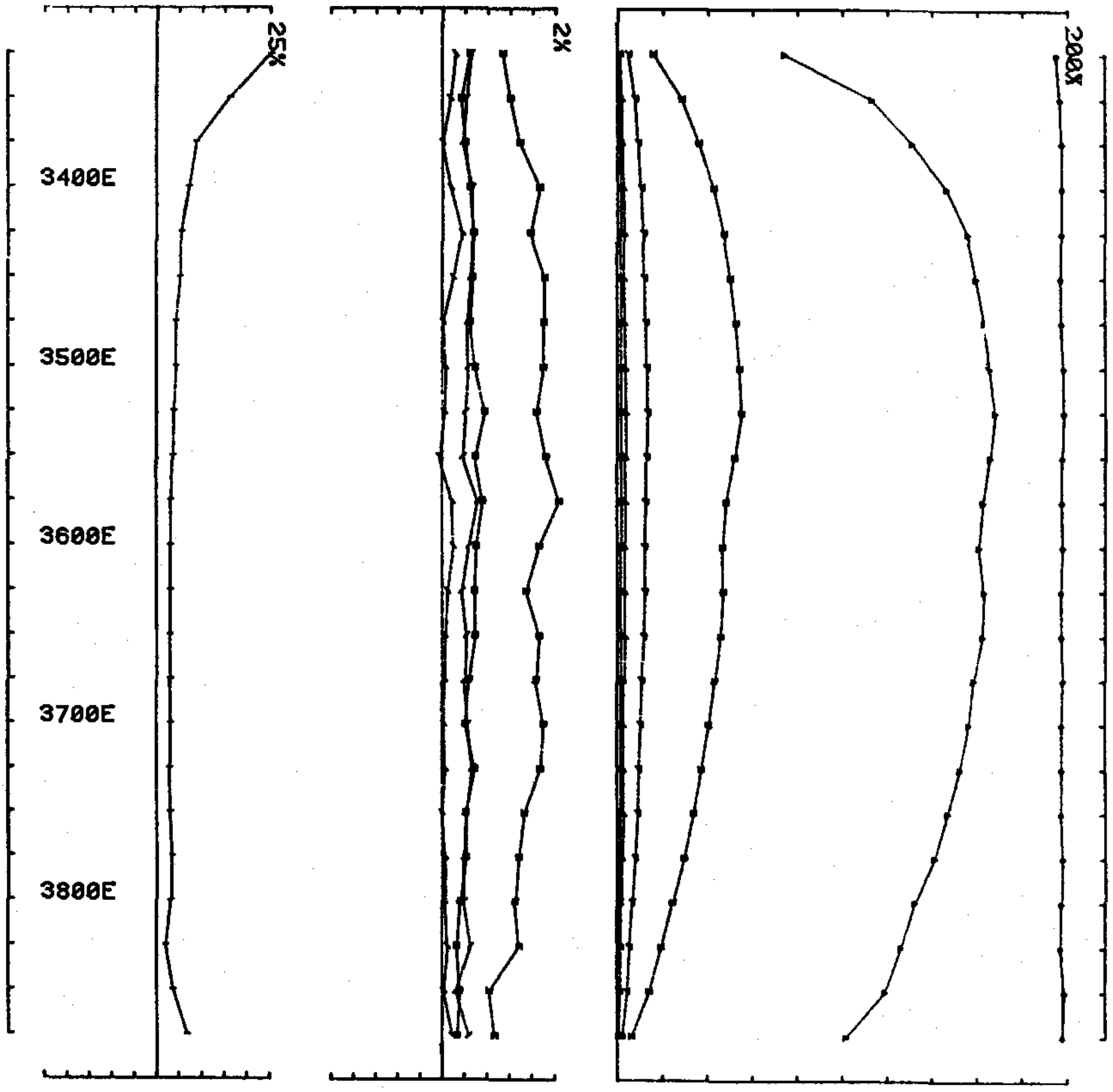

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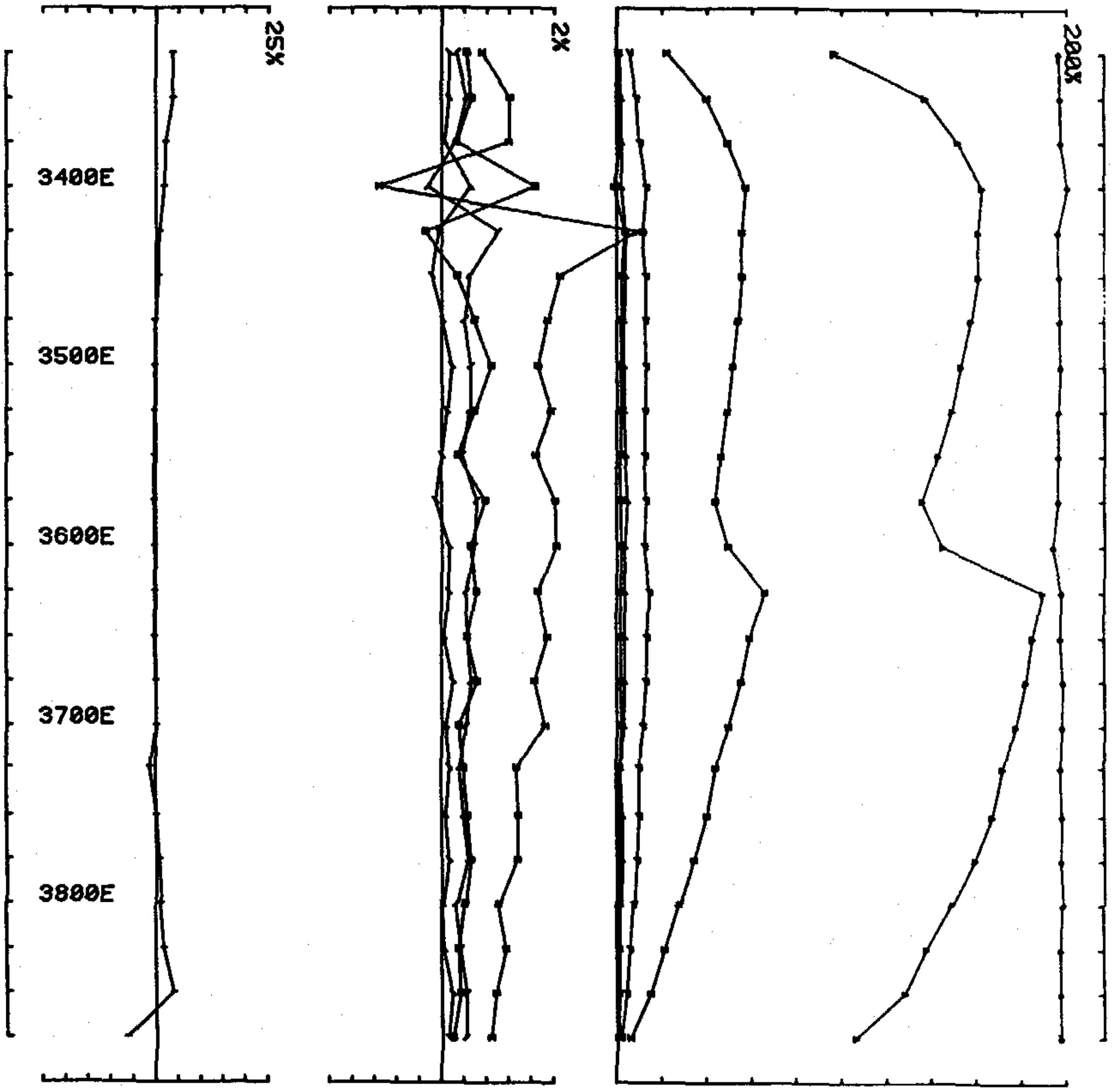

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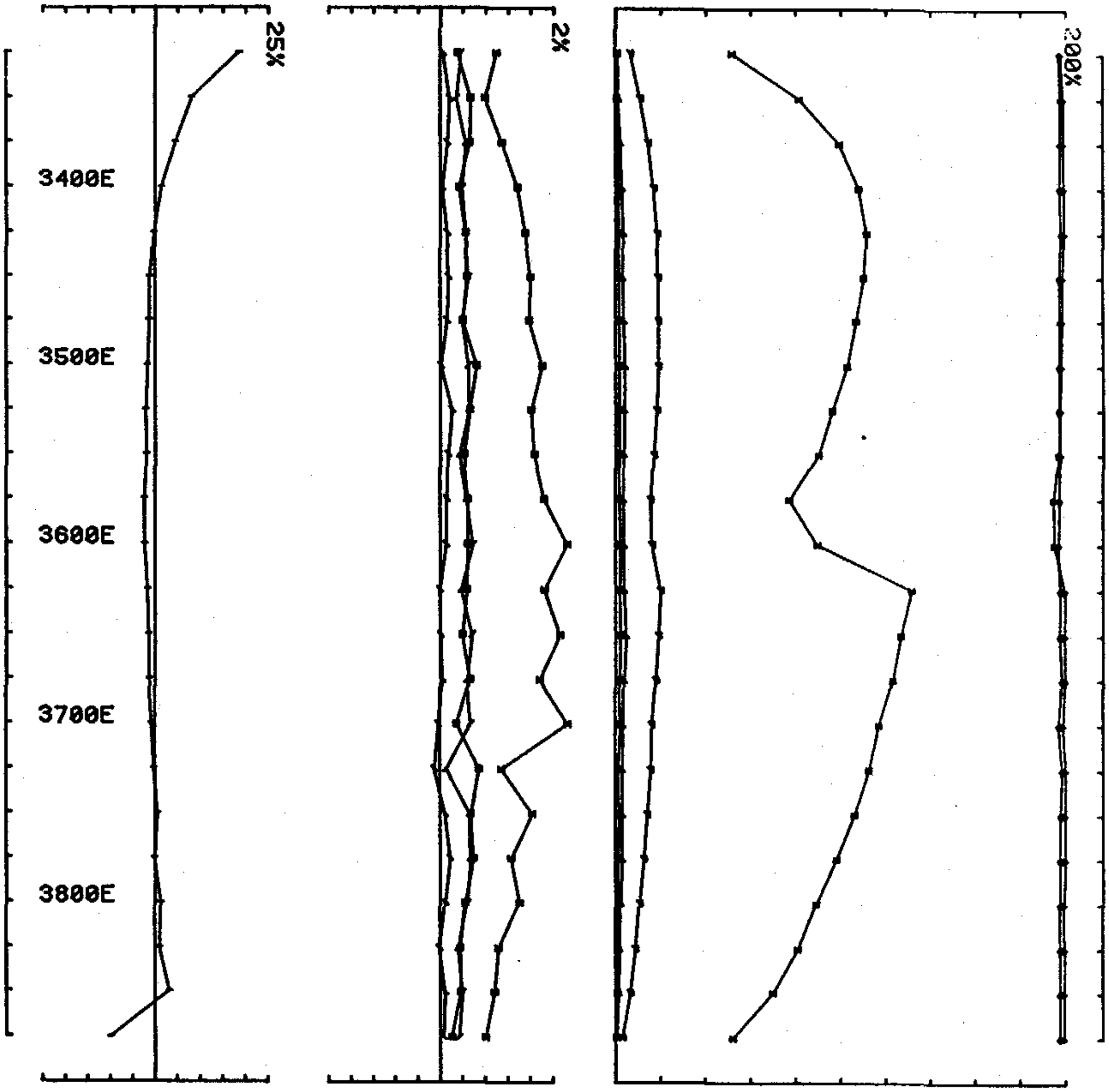

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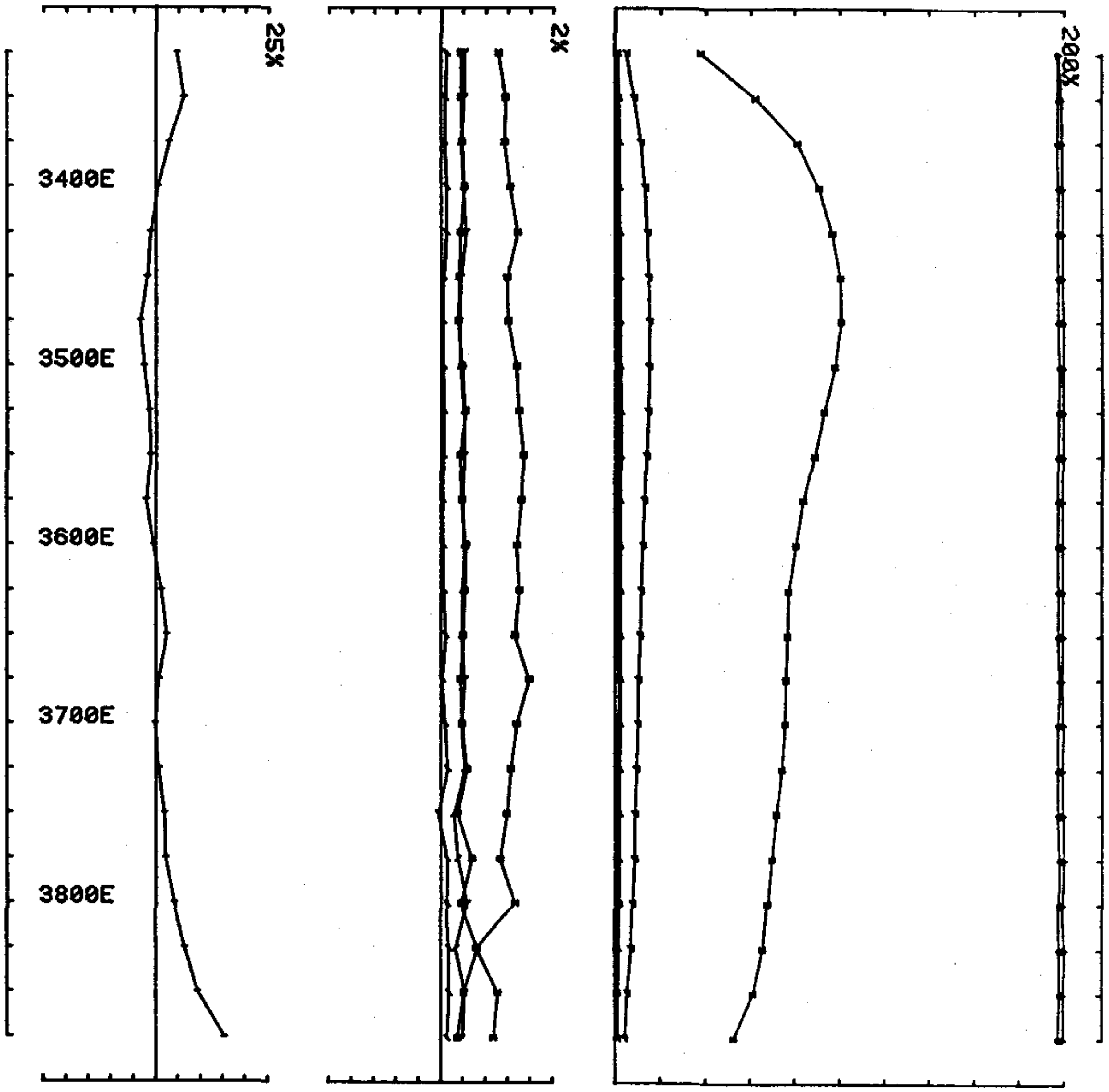

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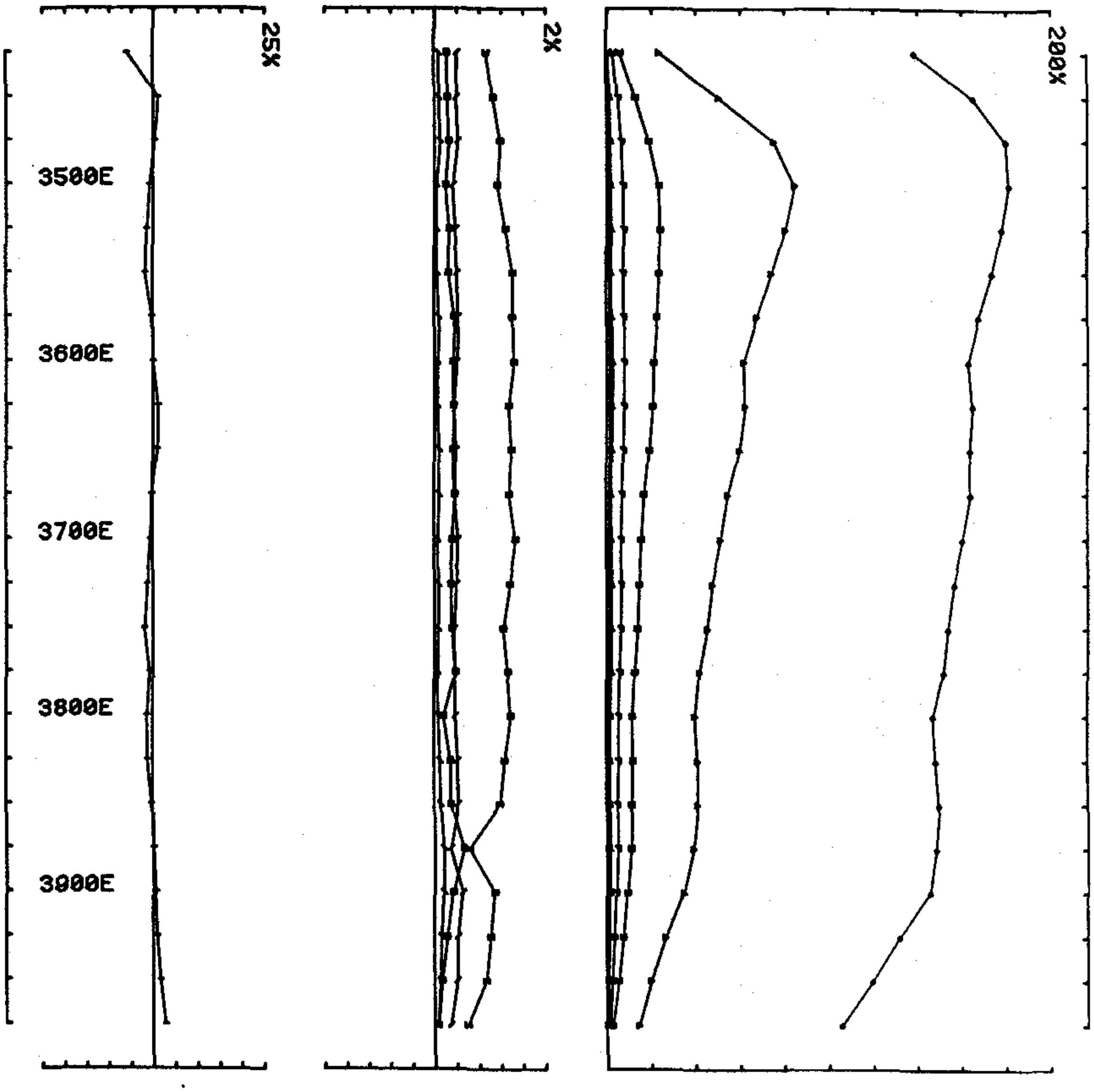

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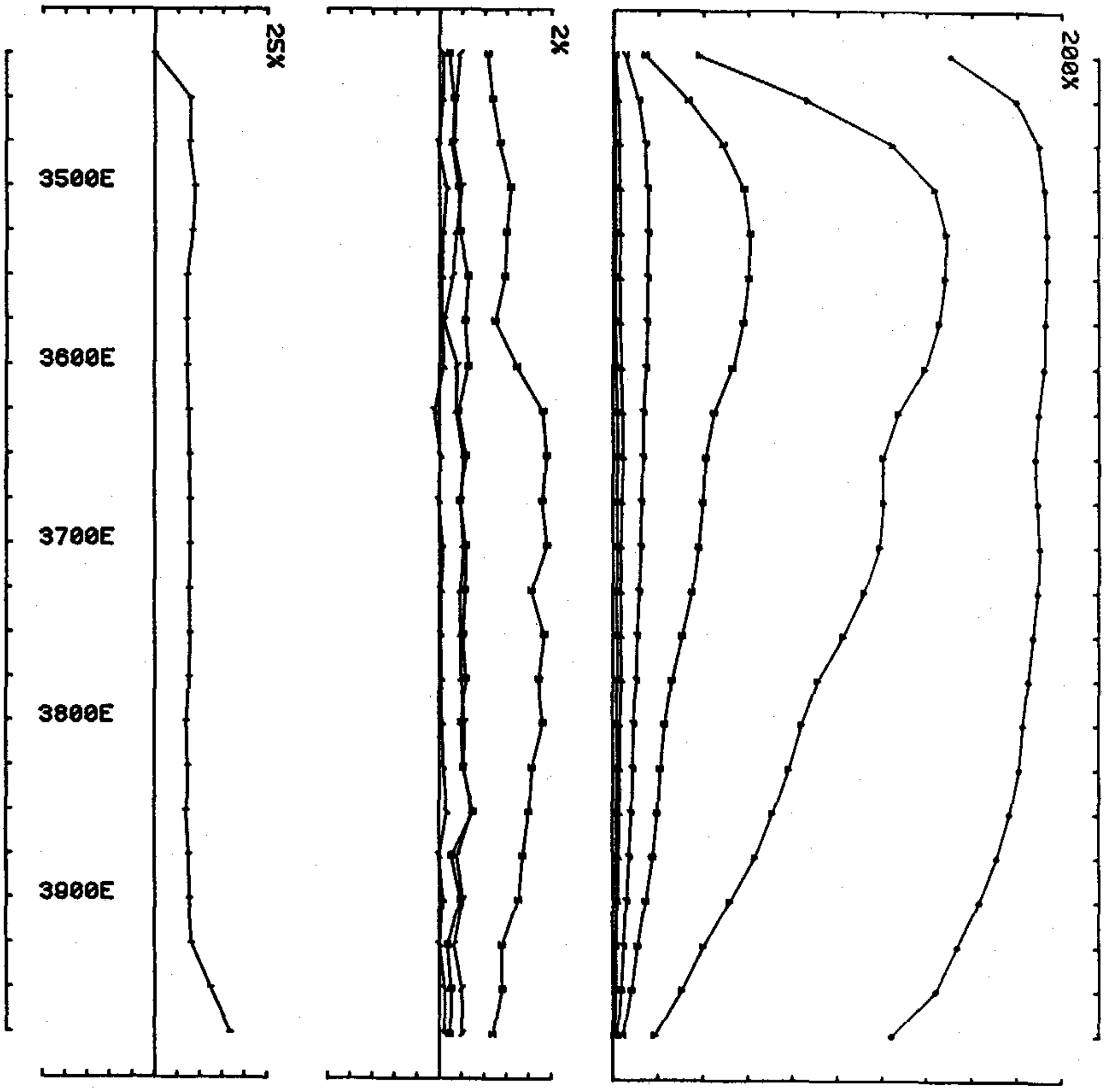

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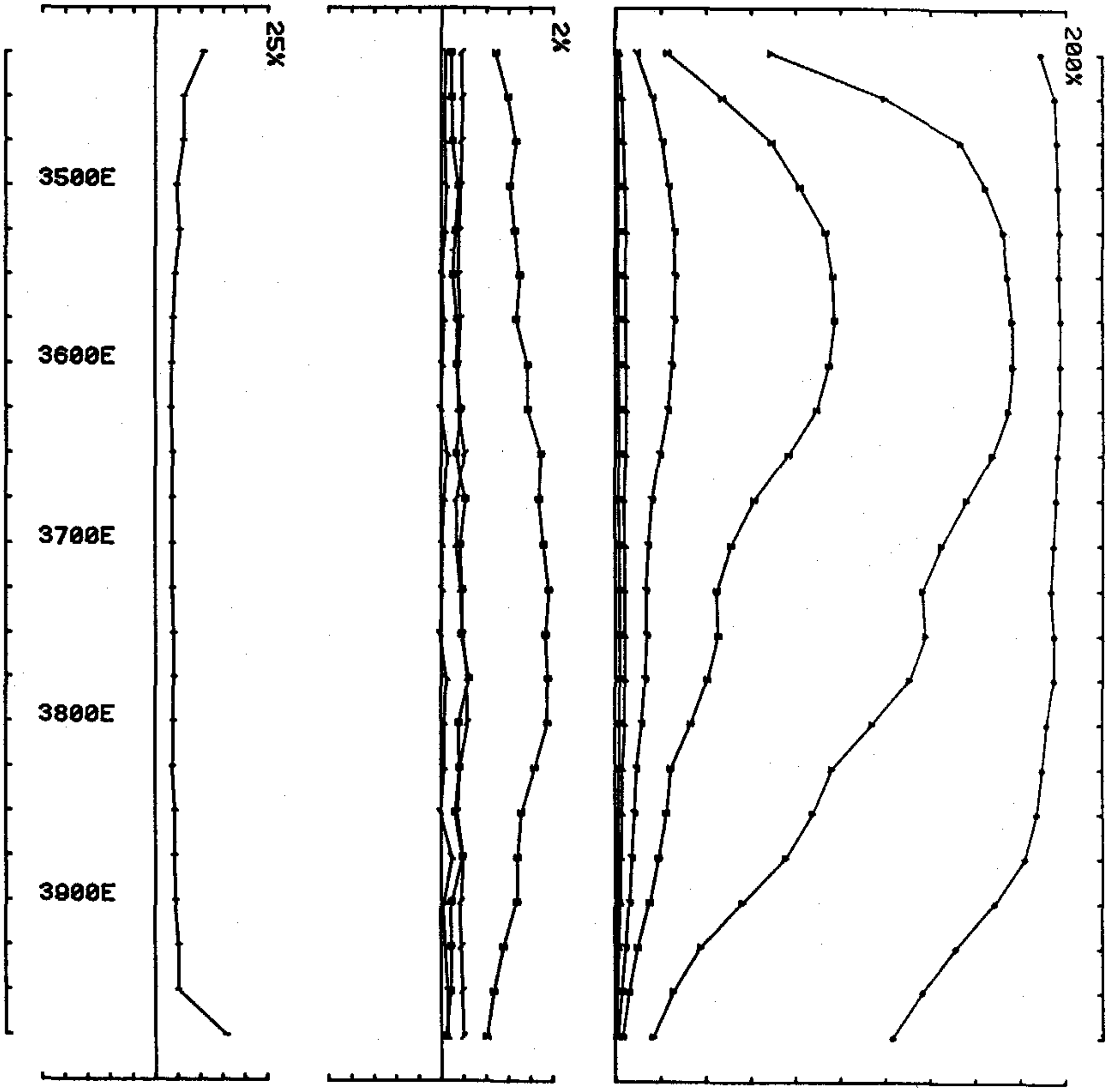

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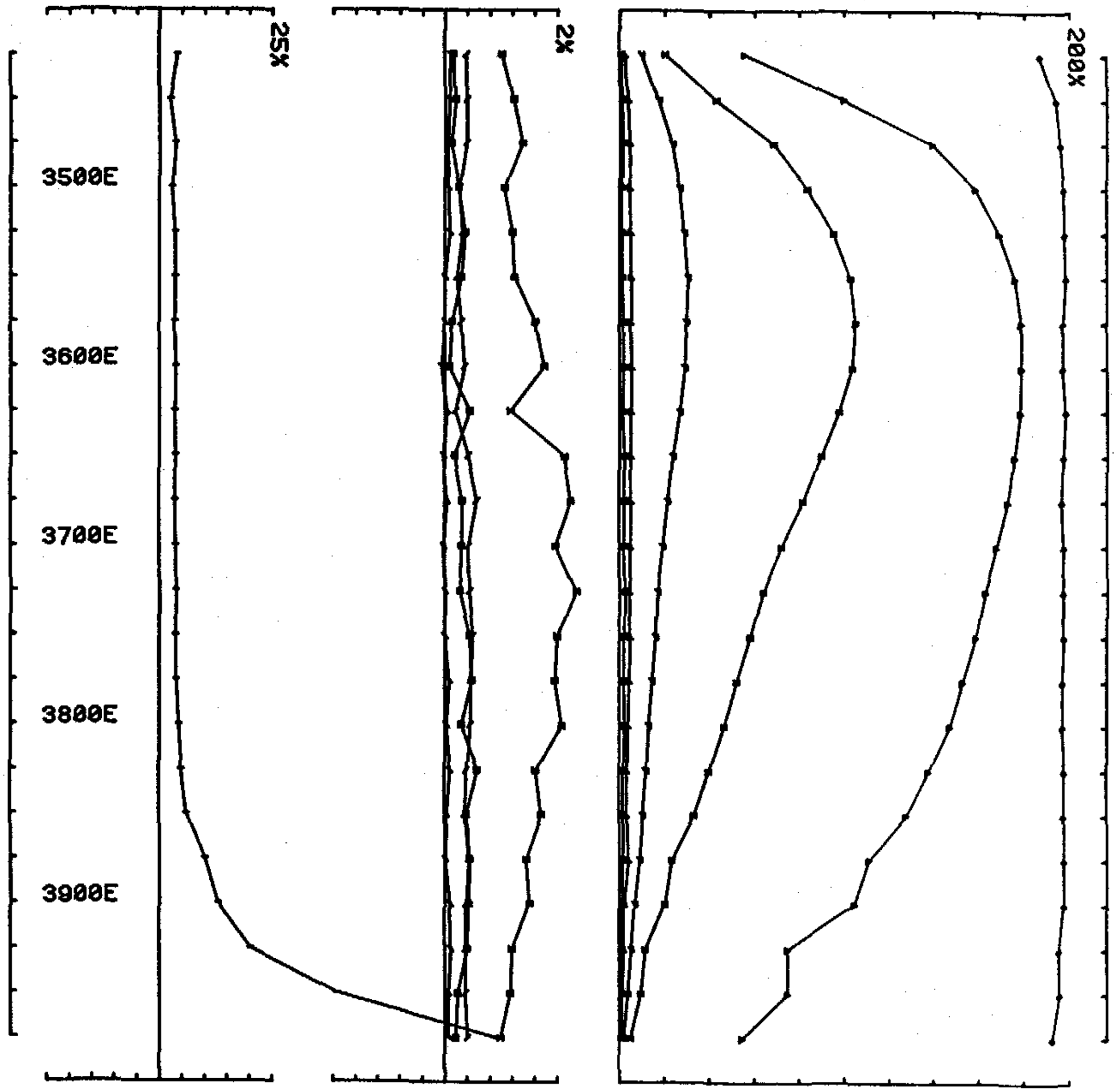

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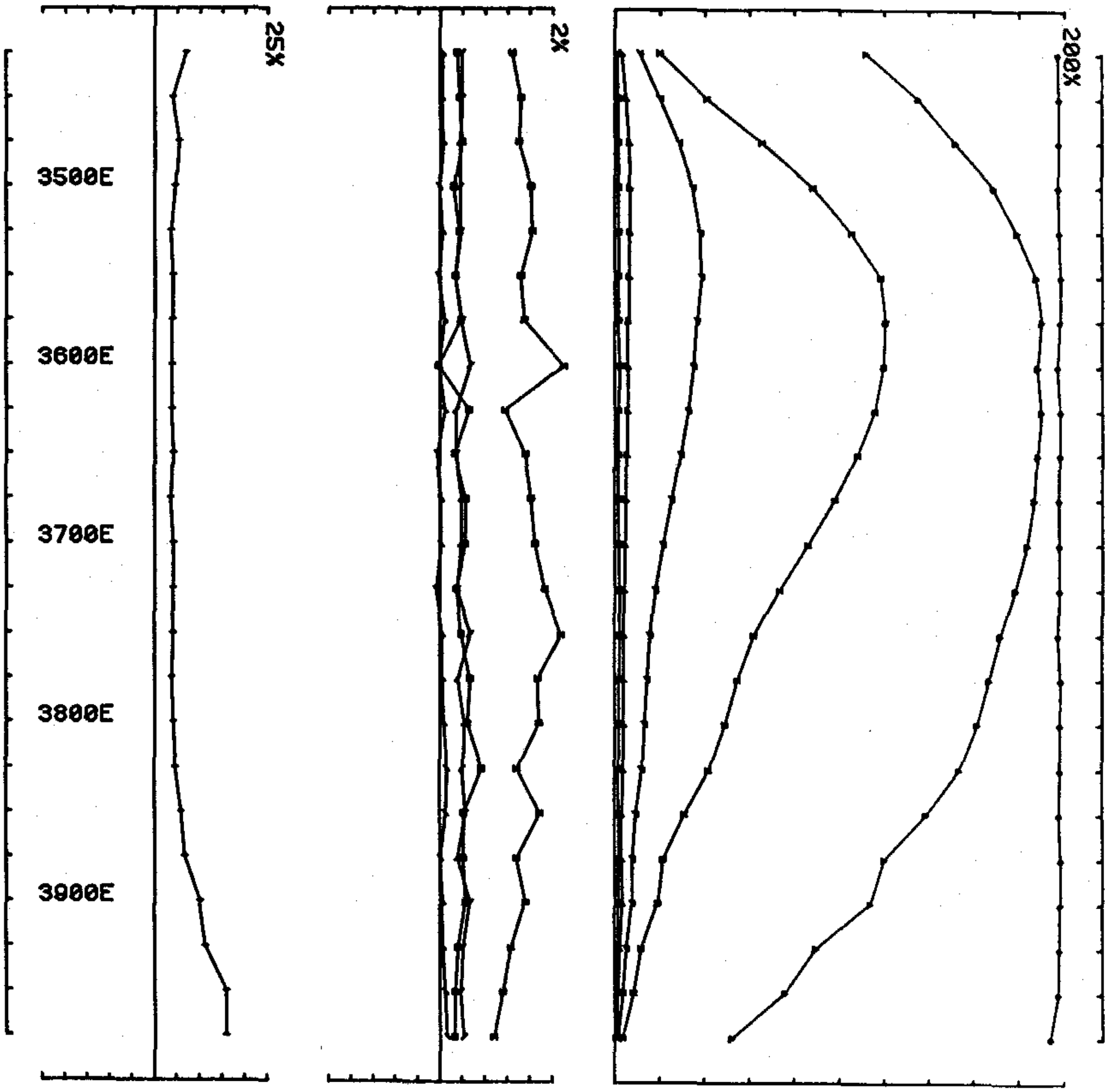

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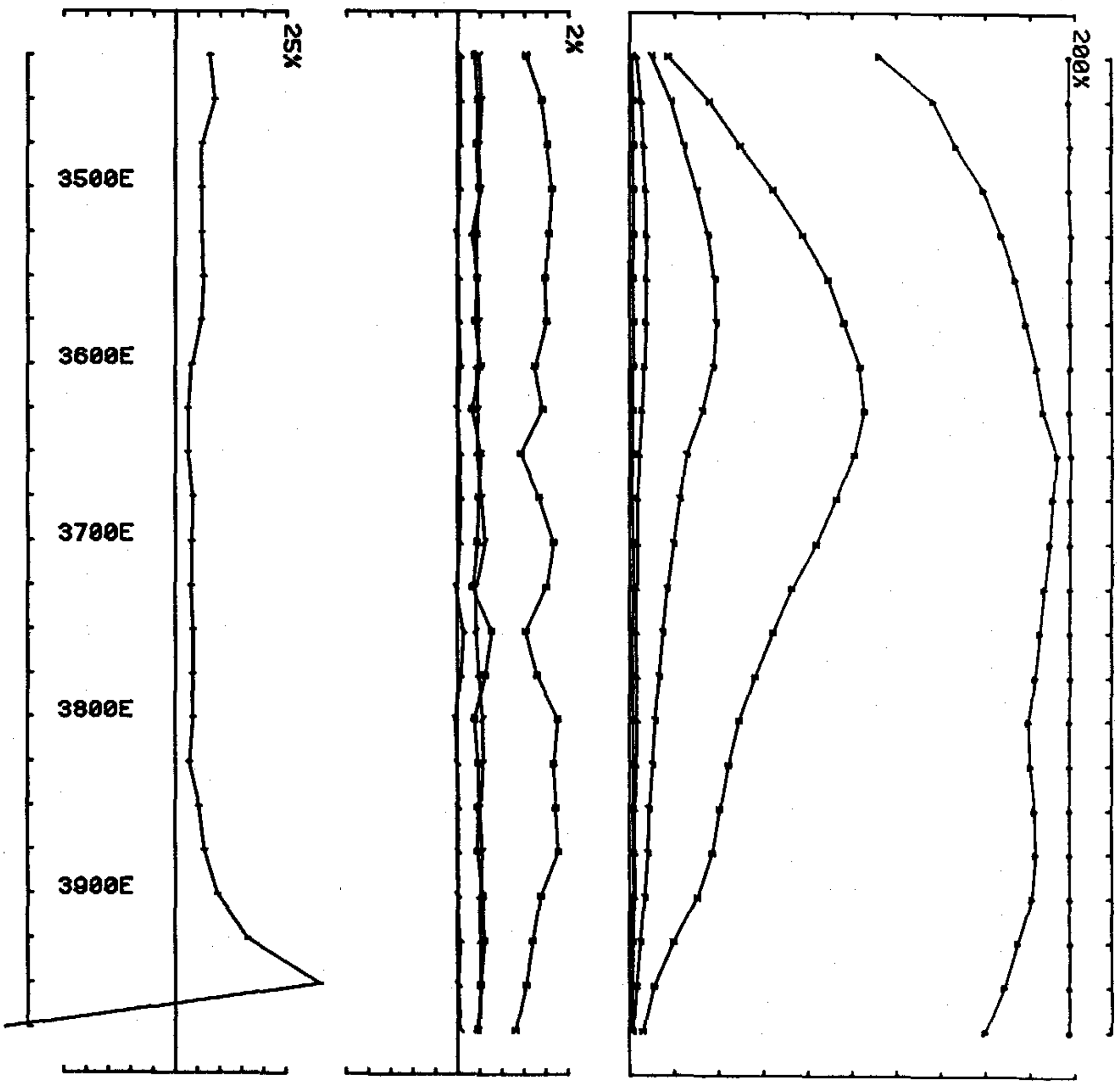

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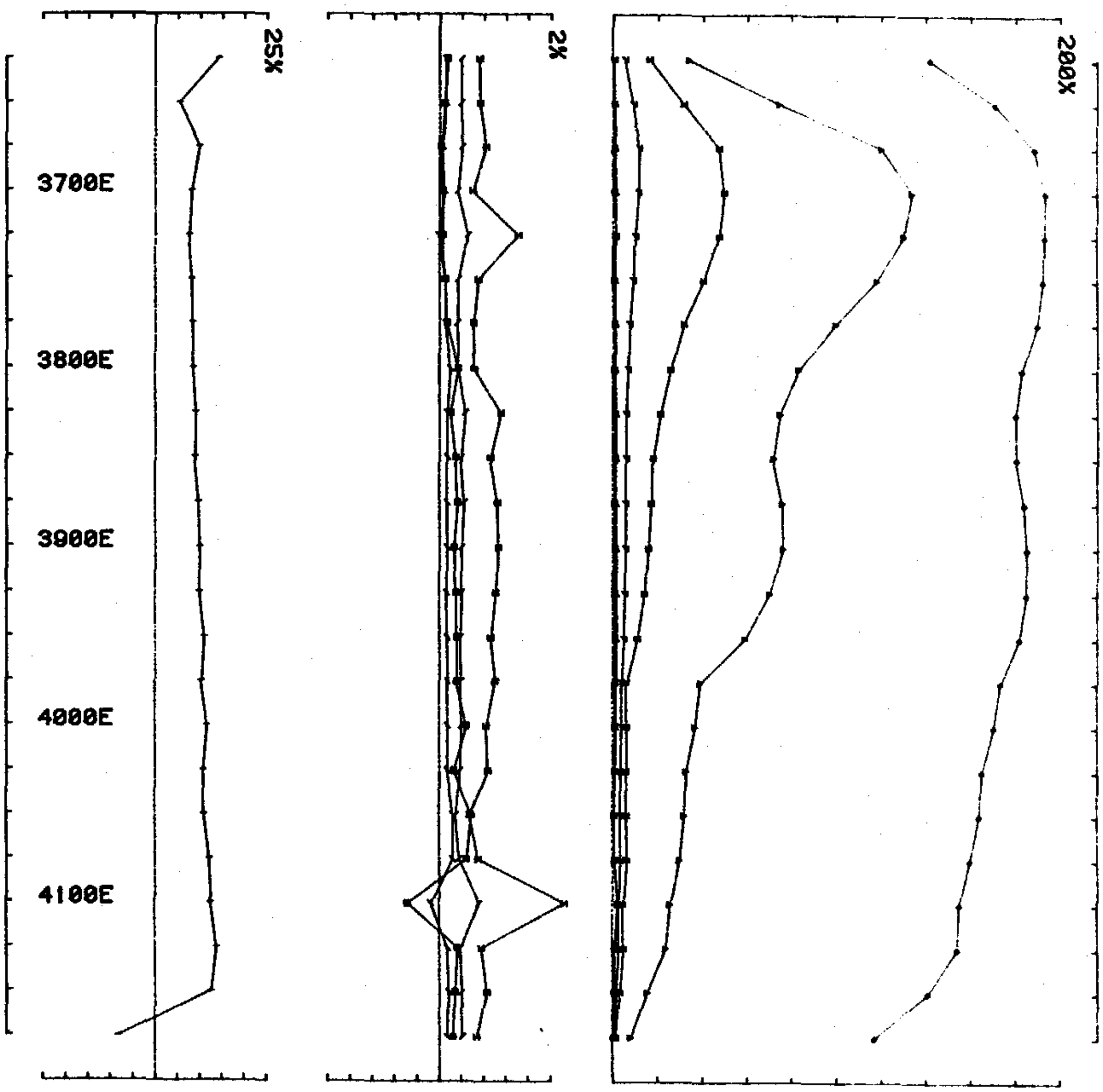

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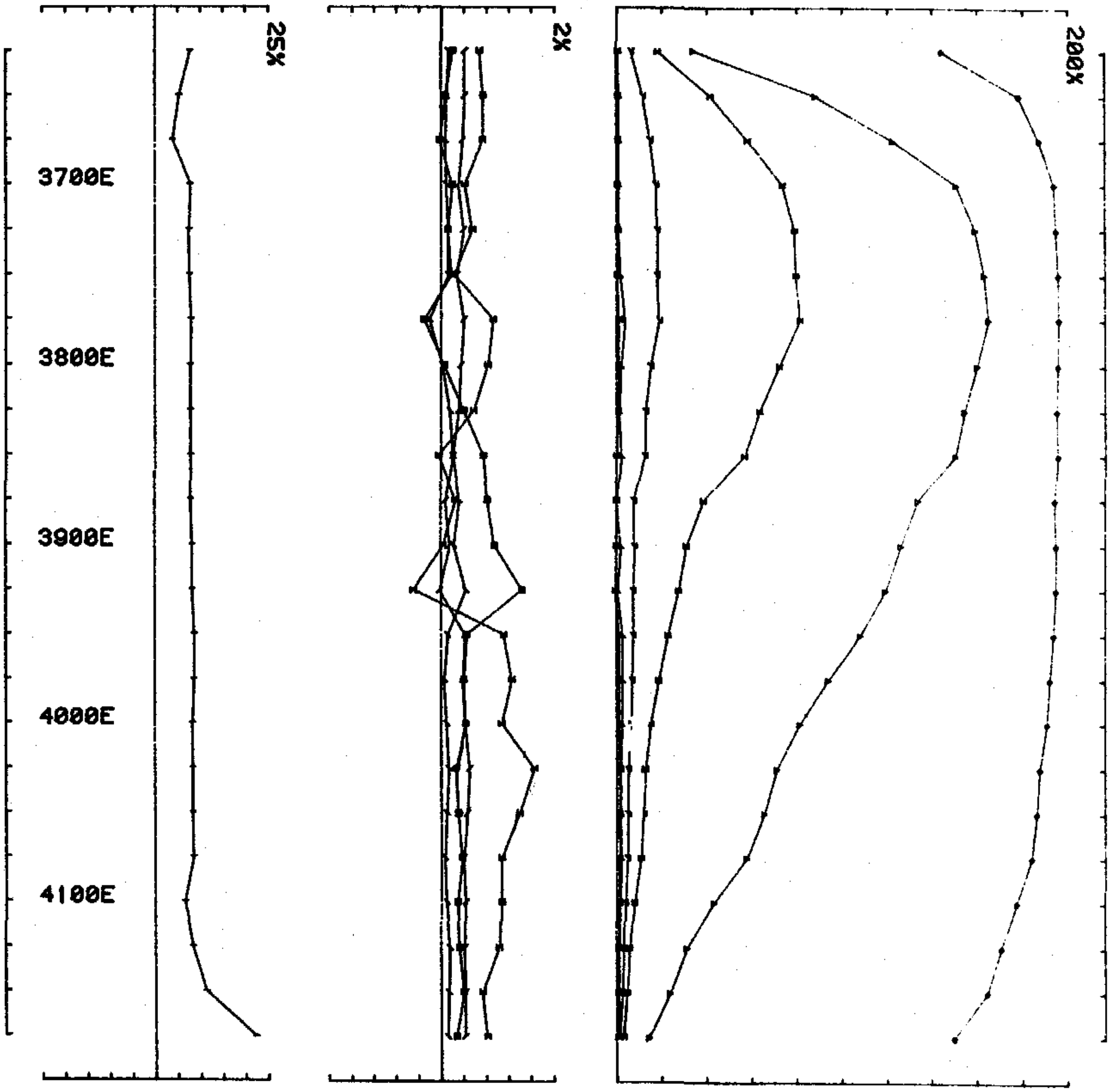

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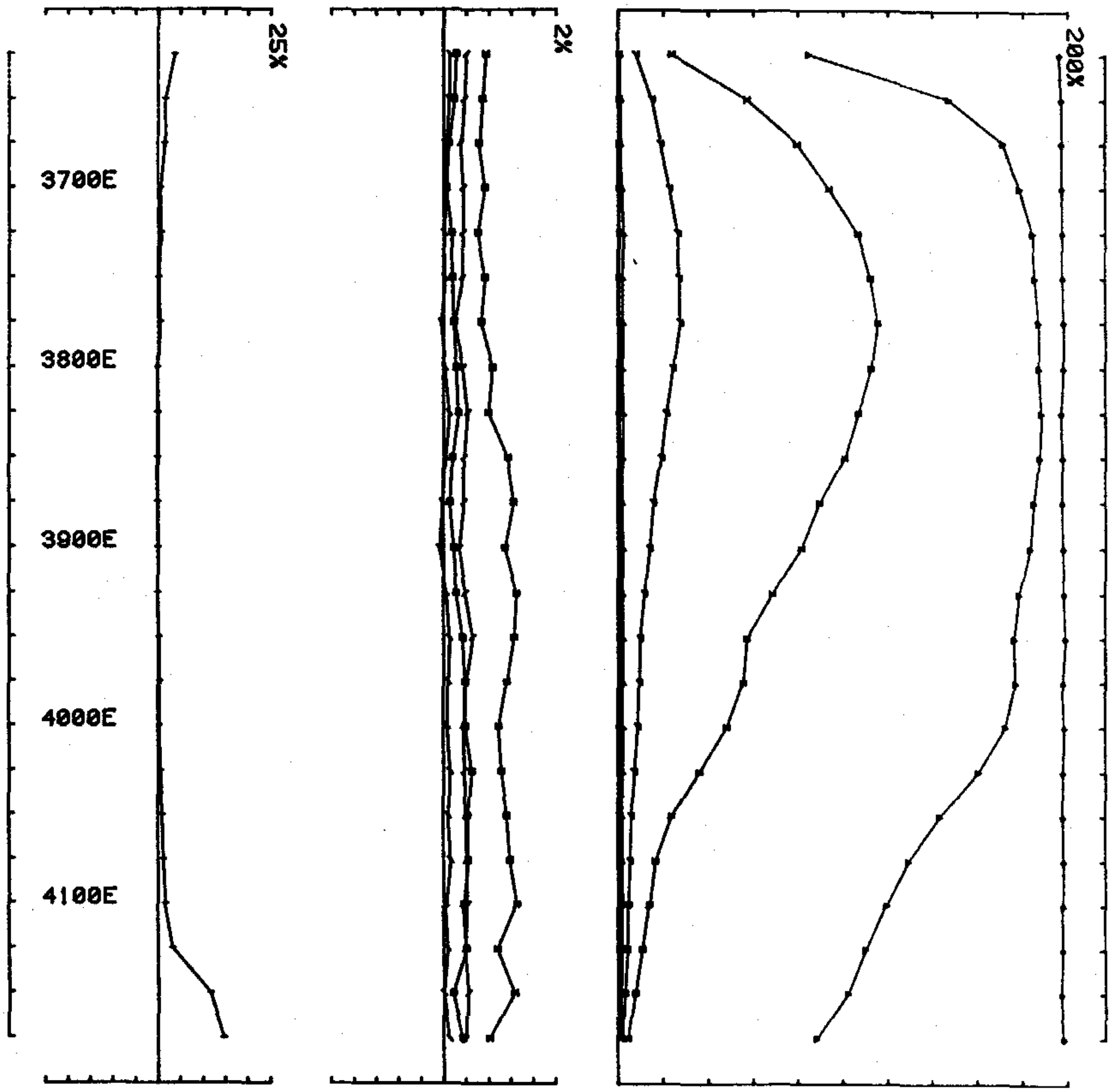

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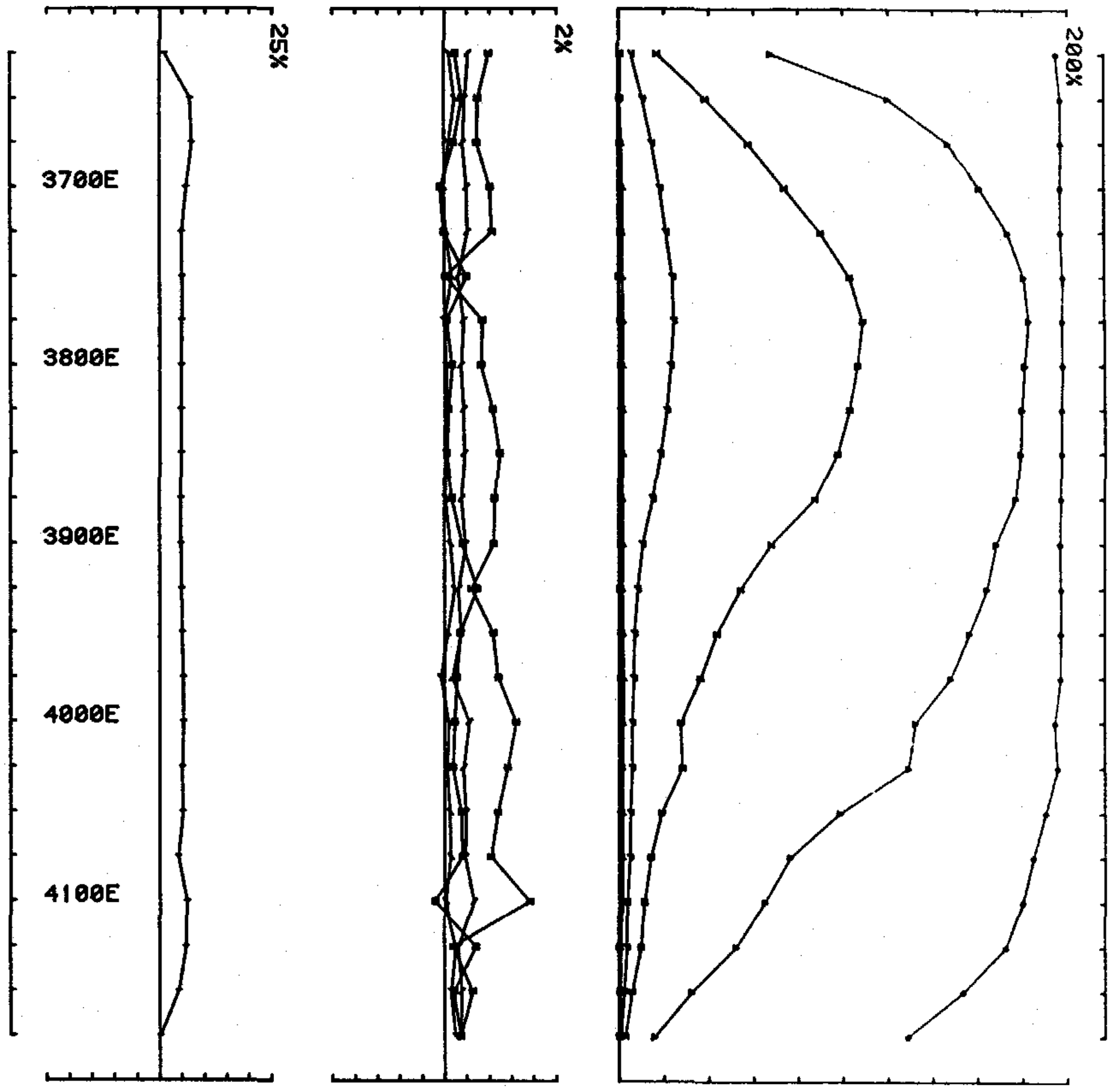

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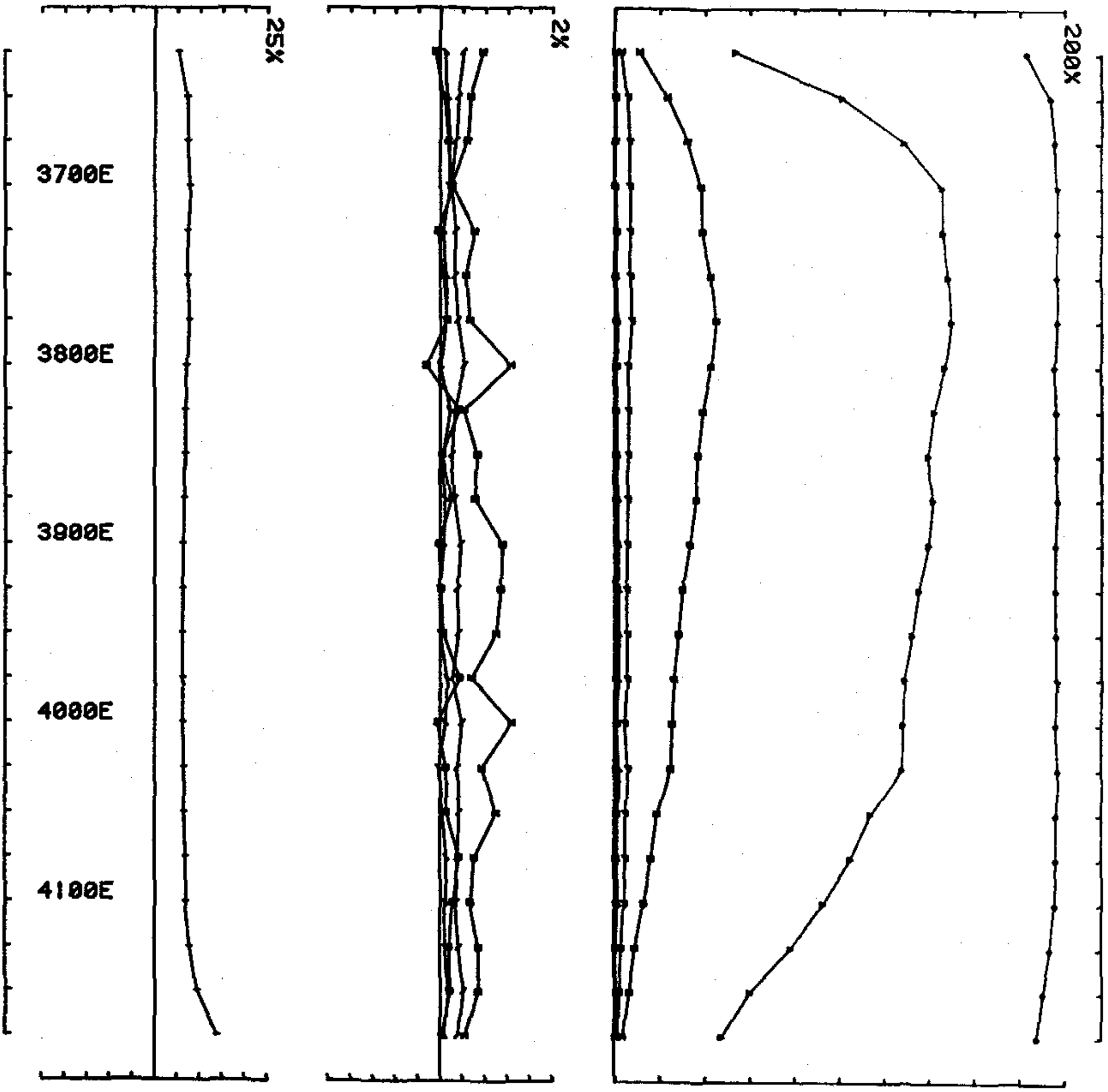

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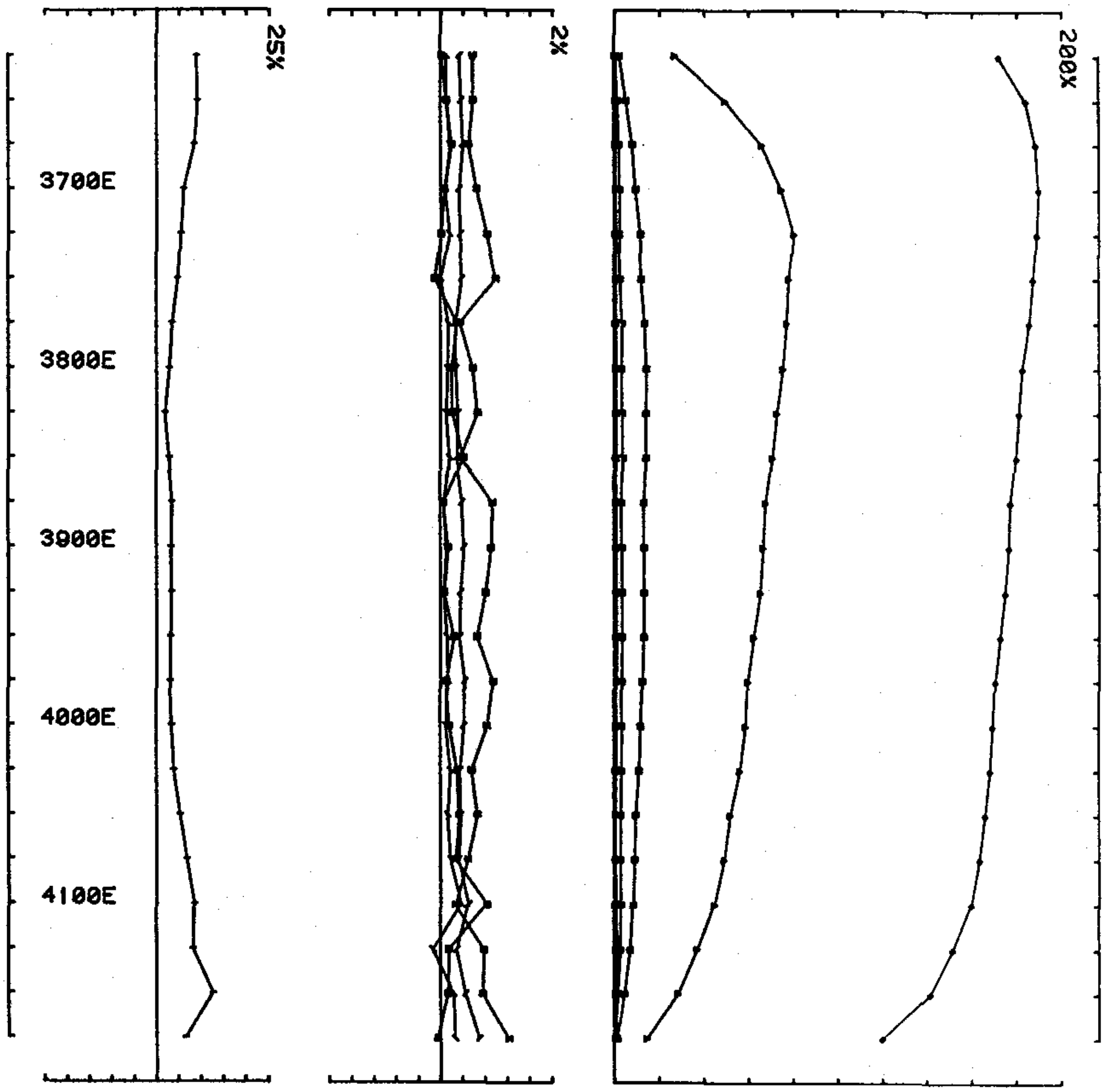

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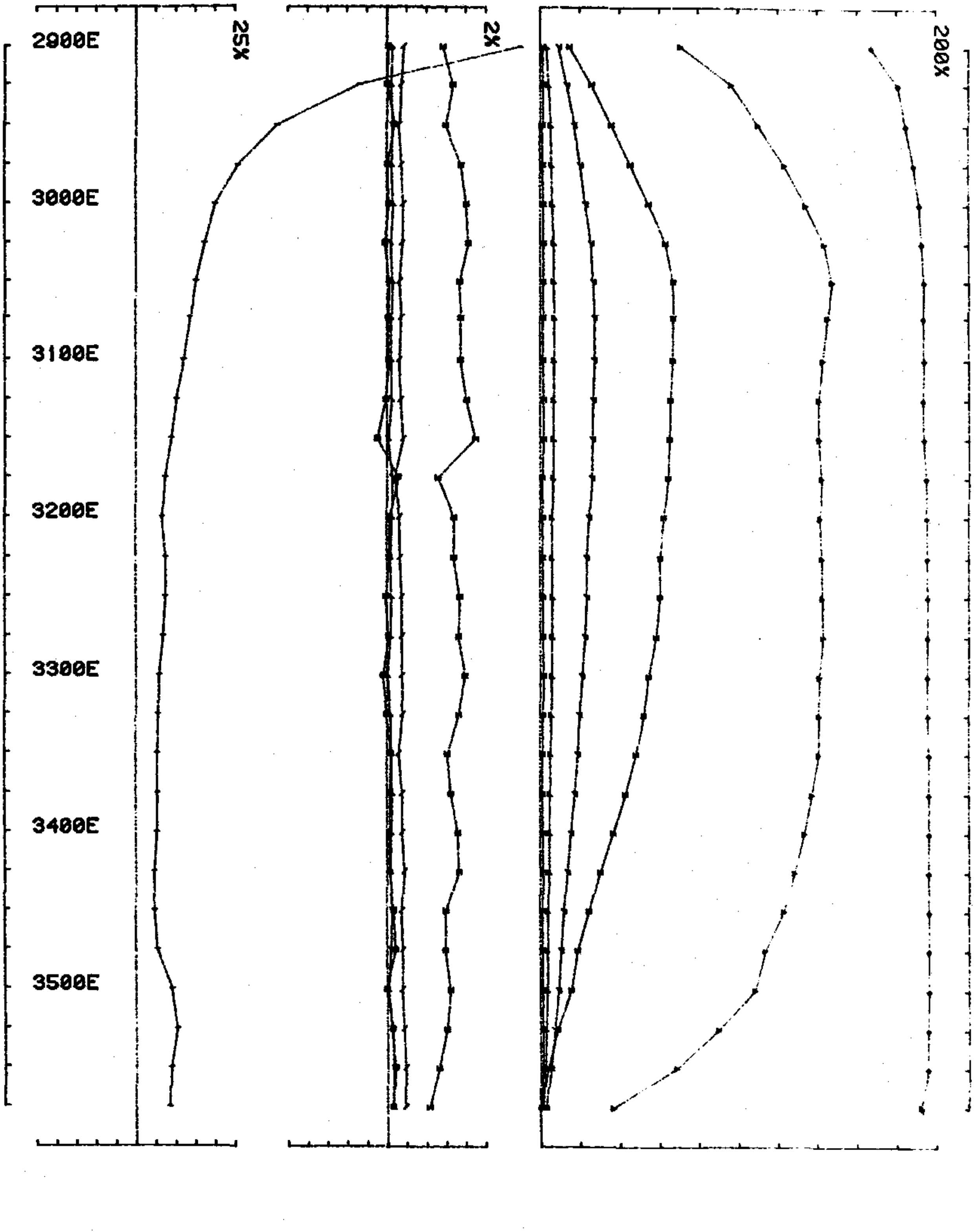

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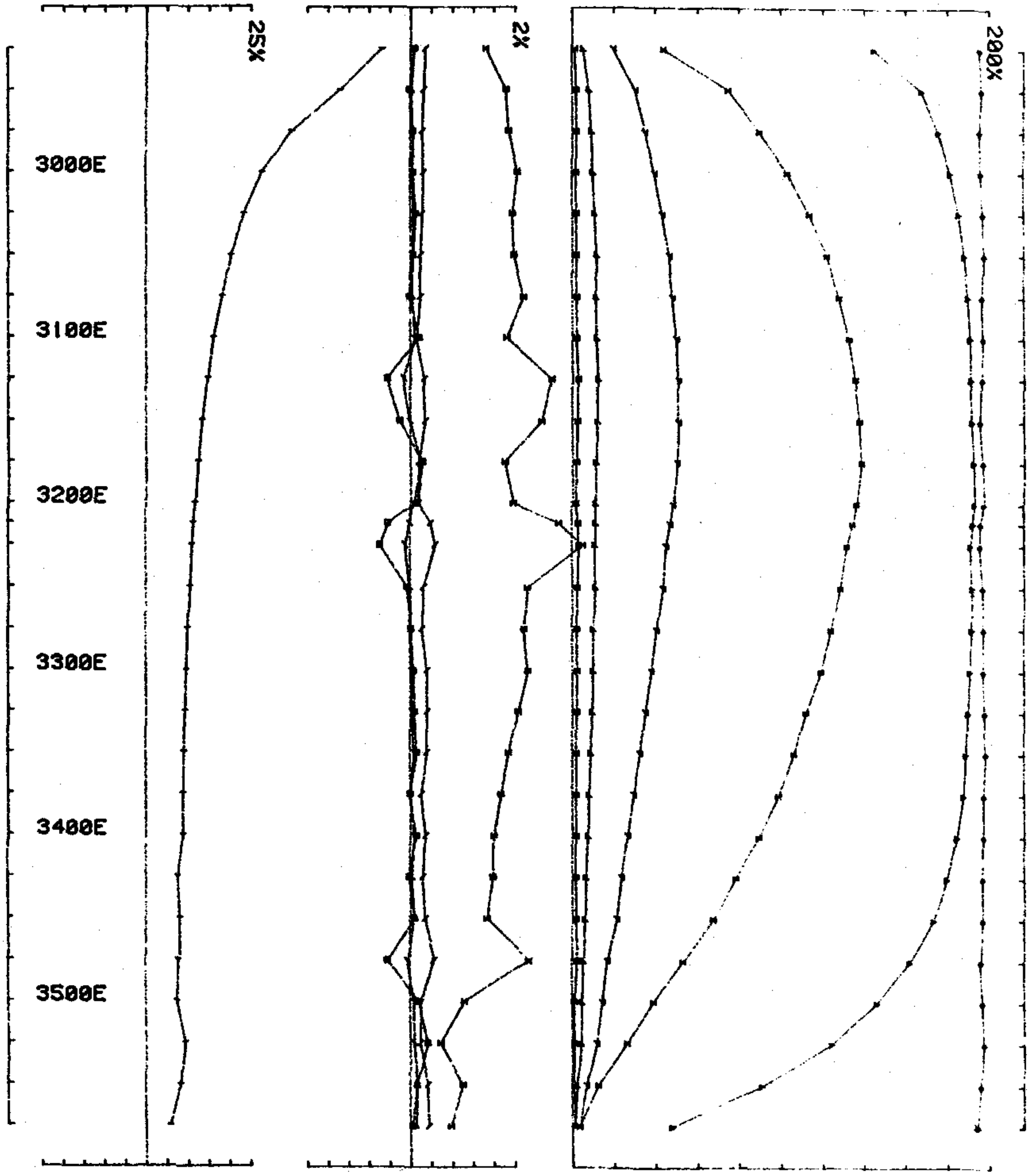

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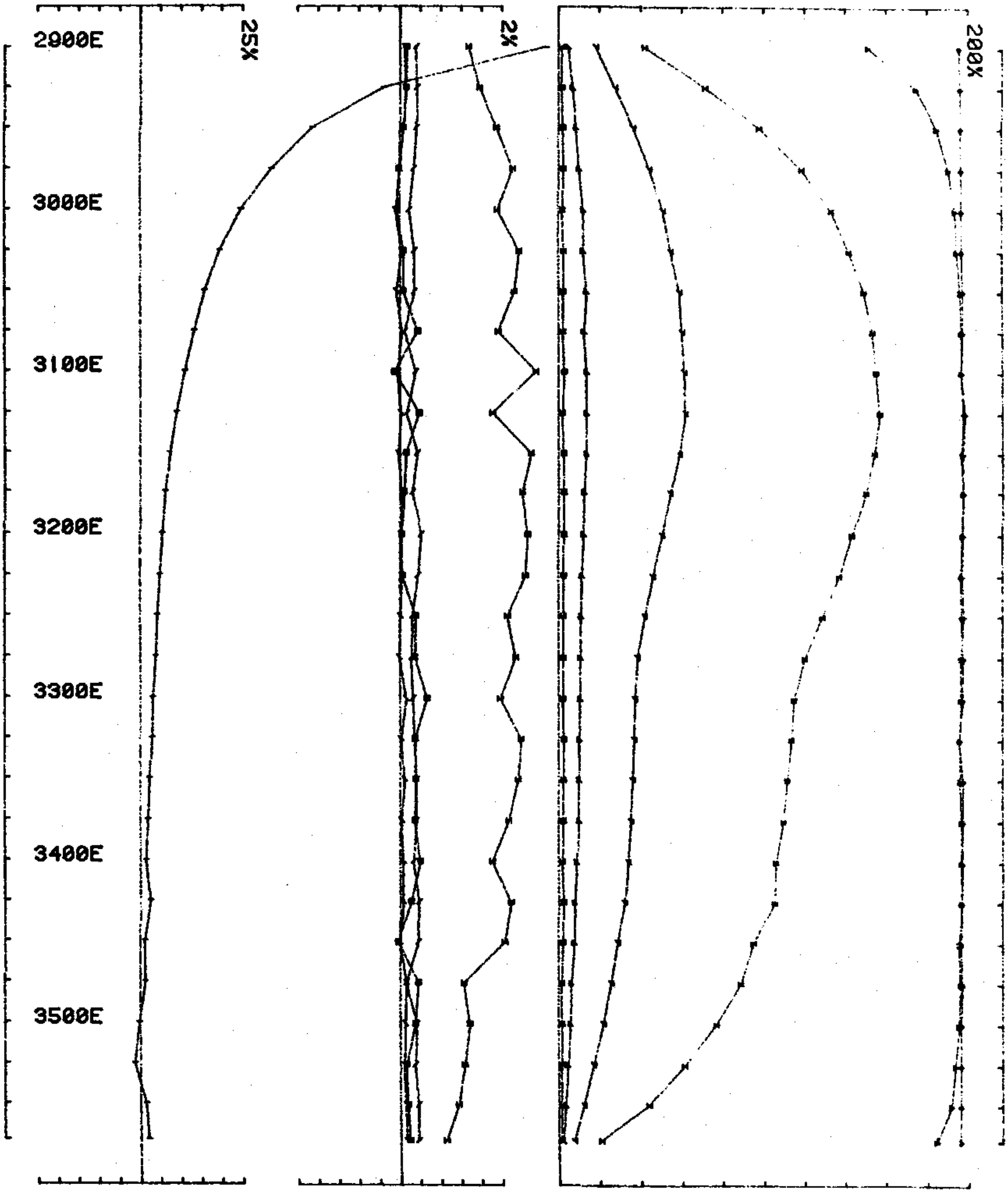

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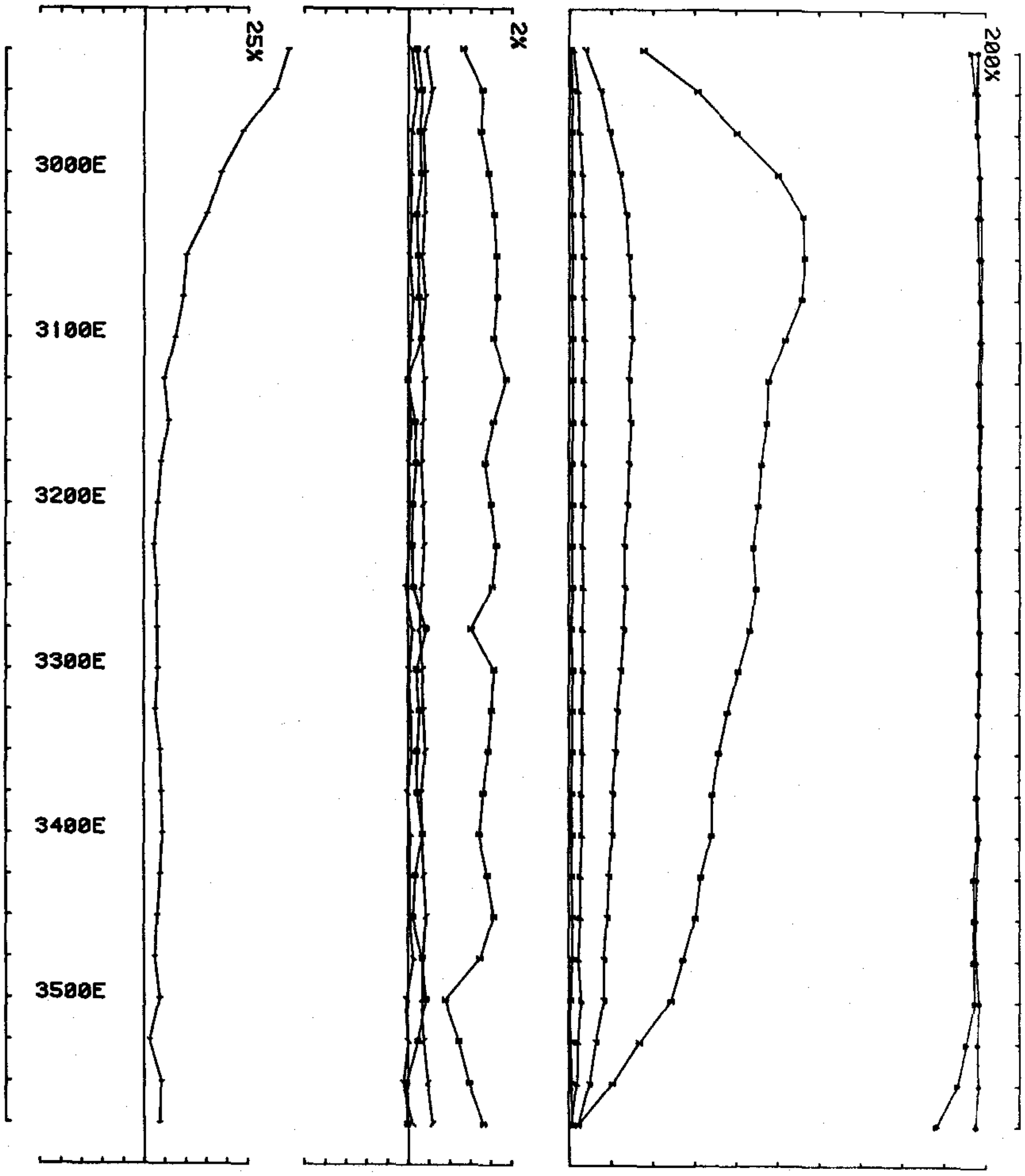

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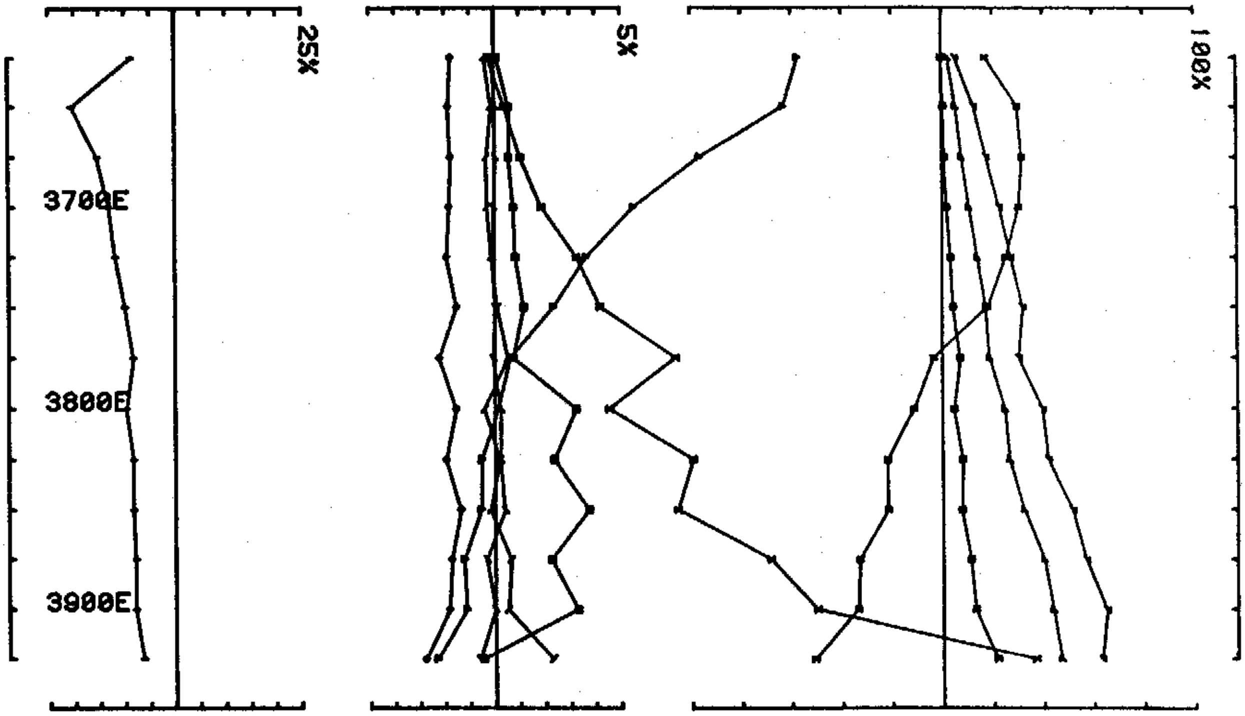

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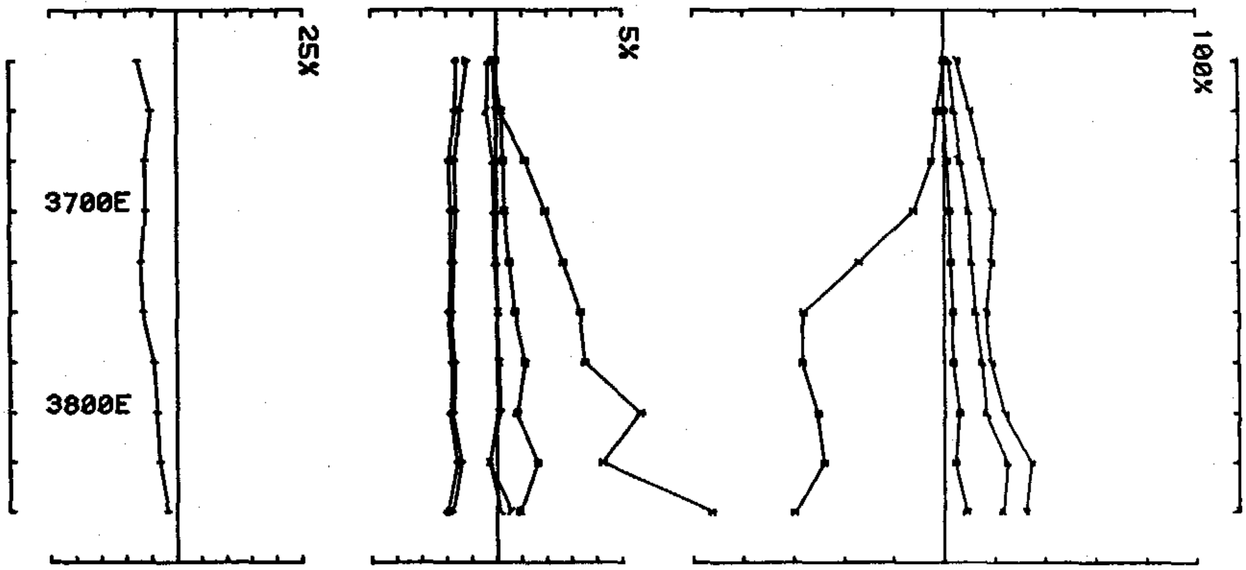

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APPENDIX II

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SIROTOPE

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CONFIDENTIAL

INTERIM REPORT
TO
ABERFOYLE EXPLORATION PTY LTD
ON
THE SIGNIFICANCE OF LEAD ISOTOPIC COMPOSITIONS
OF
SAMPLES FROM THE MT CHARTER AREA, WESTERN TASMANIA

GRAHAM R. CARR
BRIAN L. GULSON
28/5/85

1.AIM OF STUDY

The aim of this study was to determine whether geochemically anomalous zones in the Mt Charter area are related to massive sulfide mineralization of the Hellyer type or to post Cambrian vein-style mineralization. This is only an interim report as additional, and probably more appropriate samples, were to be forwarded.

2.SAMPLES

The samples were collected by the authors in November 1984 with the help of Errol Smith of Aberfoyle. Three samples (S30 - S32) were collected on Line 3900N near DDH MC9 at Southwest Mt Charter and a further sample (S33) from 4100N, 4150E near DDH MC10. In all samples, one or more of the sulfides pyrite, sphalerite and galena occur associated with carbonate vugs and veins in tuffaceous siliceous rocks. At Mt Charter, surface barite samples were collected from two locations adjacent to and about 20mN of DDH MC2.

Two samples of drill core from Southwest Mt Charter (DDH MC9) were also collected. Sample S36 represents minor sphalerite and pyrite mineralization occurring as schlieren-like aggregates in a tuff unit and sample S37 is a quartz carbonate vein containing sulfides similar to the surface material sampled. Both samples were taken at 159.5m depth.

3. METHODS

Galena samples were dissolved in concentrated nitric acid and Pb was electroplated onto Pt electrodes. The whole-rock samples were digested in a 7N nitric + 7N hydrochloric solution prior to ion exchange and electroplating as above. The digestion of the barite-rich samples involved dissolution of Pb in such

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phases as sulfides and iron oxides. No Pb from the barite crystal structure was analysed. The samples were analysed on an ISOMASS 54E solid source thermal ionization mass spectrometer in fully automated mode. Precision estimates representing 2 standard deviations about the mean of over 700 analyses of standards are shown in the top left hand corner of the figures presented below.

4. RESULTS

The results are presented in Table 1 and Figures 1 and 2. The data fall into three groups: 1) the Southwest Mt Charter samples S30 - S32 are homogeneous and fall into the Que River signature, 2) the Mt Charter samples fall into both the Hellyer and the Que River signatures and 3) the drill core samples and the surface sample from near DDH MC 10 (S33) are more radiogenic than any of the reference fields.

5. DISCUSSION

The Pb isotopic composition of sulfides in the Mt Charter and Southwest Mt Charter samples fall within the reference fields for massive sulfide mineralization in the region and can thus be all considered co-genetic. There is some distinction between the two groups of samples, Southwest Mt Charter being more closely associated with Que River and Mt Charter with Hellyer.

The data are inconsistent with an origin related to the post-Cambrian veining common in the area. Samples S33, S36 and S37 are more radiogenic than any of the reference fields, probably due to the low Pb contents and the addition of radiogenic Pb since the Cambrian.

6.FOLLOW UP AND CONSTRAINTS ON INTERPRETATION

The diamond drill holes were drilled partly on the basis of anomalous geochmistry in soils and weathered bedrock and these

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anomalies were thought to have their source in galena/carbonate veins.

The Southwest Mt Charter samples analysed were sulfides from vugs rather than veins and would be interpreted as an inherent part of the rock system as is also indicated by their Pb isotopic composition. Because of this, Tony Hesp (December, 1984) suggested our samples may have been inappropriate and he was going to supply us with an additional suite. Also, it is critical to determine the affiliation of the anomalous soil geochemistry and 3 or 4 analyses of high Pb soils should be undertaken.

Table 1

Sample	$\frac{208\ Pb}{206\ Pb}$	$\frac{207\ Pb}{206\ Pb}$	$\frac{206\ Pb}{204\ Pb}$	$\frac{207\ Pb}{204\ Pb}$	$\frac{208\ Pb}{204\ Pb}$	Pb(ppm)
MT CHARTER AND SOUTHWEST MT CHARTER						
S30	2.0835	0.8526	18.292	15.596	38.113	
S31	2.0838	0.8529	18.296	15.605	38.125	
S32	2.0831	0.8529	18.295	15.604	38.111	
S33	2.0778	0.8471	18.431	15.612	38.295	
S34	2.0818	0.8512	18.353	15.622	38.207	
S35/1	2.0813	0.8516	18.334	15.613	38.158	
S35/2	2.0801	0.8510	18.347	15.613	38.164	
S35/3	2.0799	0.8509	18.348	15.612	38.162	
S36	2.0732	0.8472	18.419	15.604	38.186	
S37	2.0759	0.8486	18.400	15.614	38.198	

Figure 1

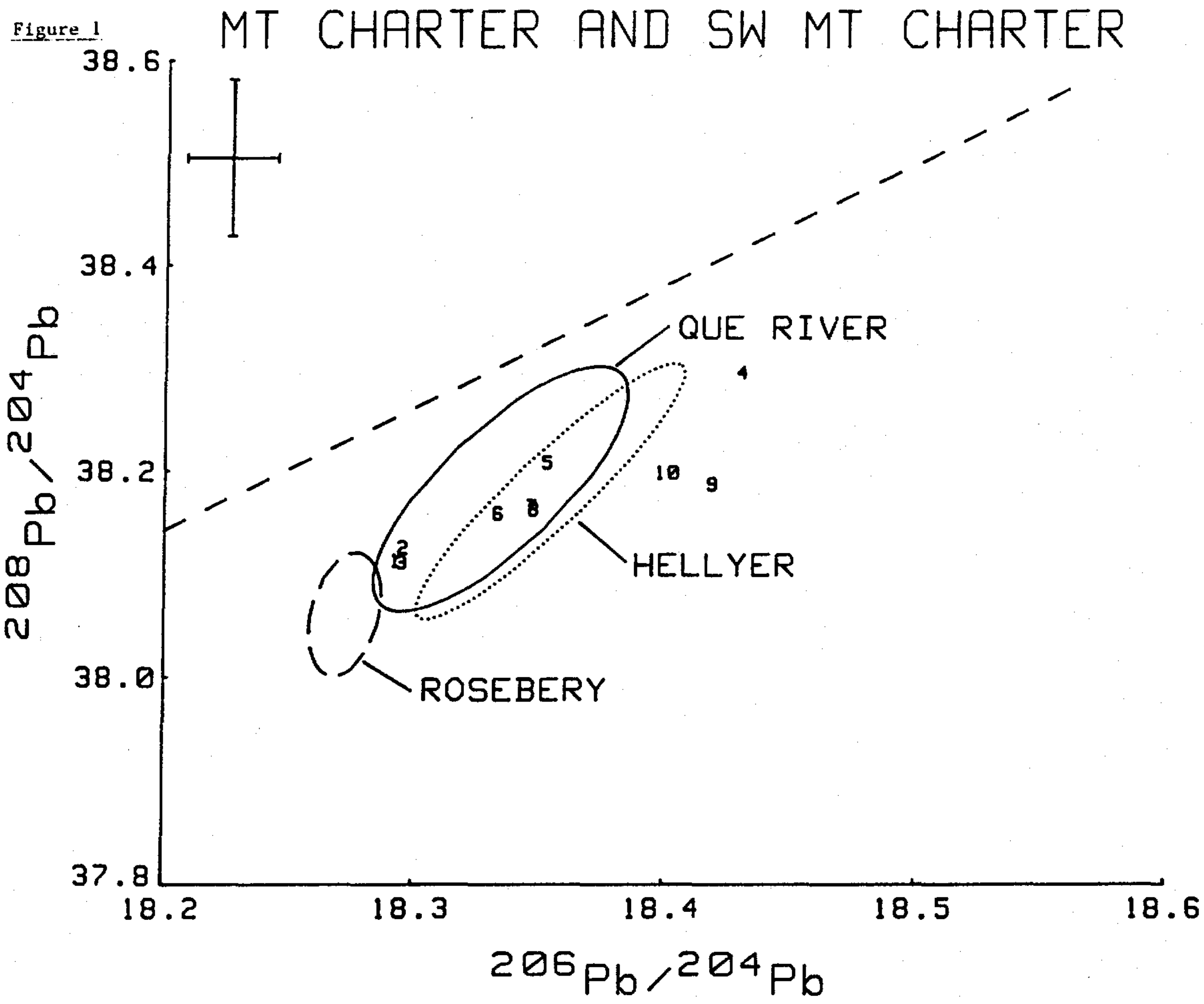

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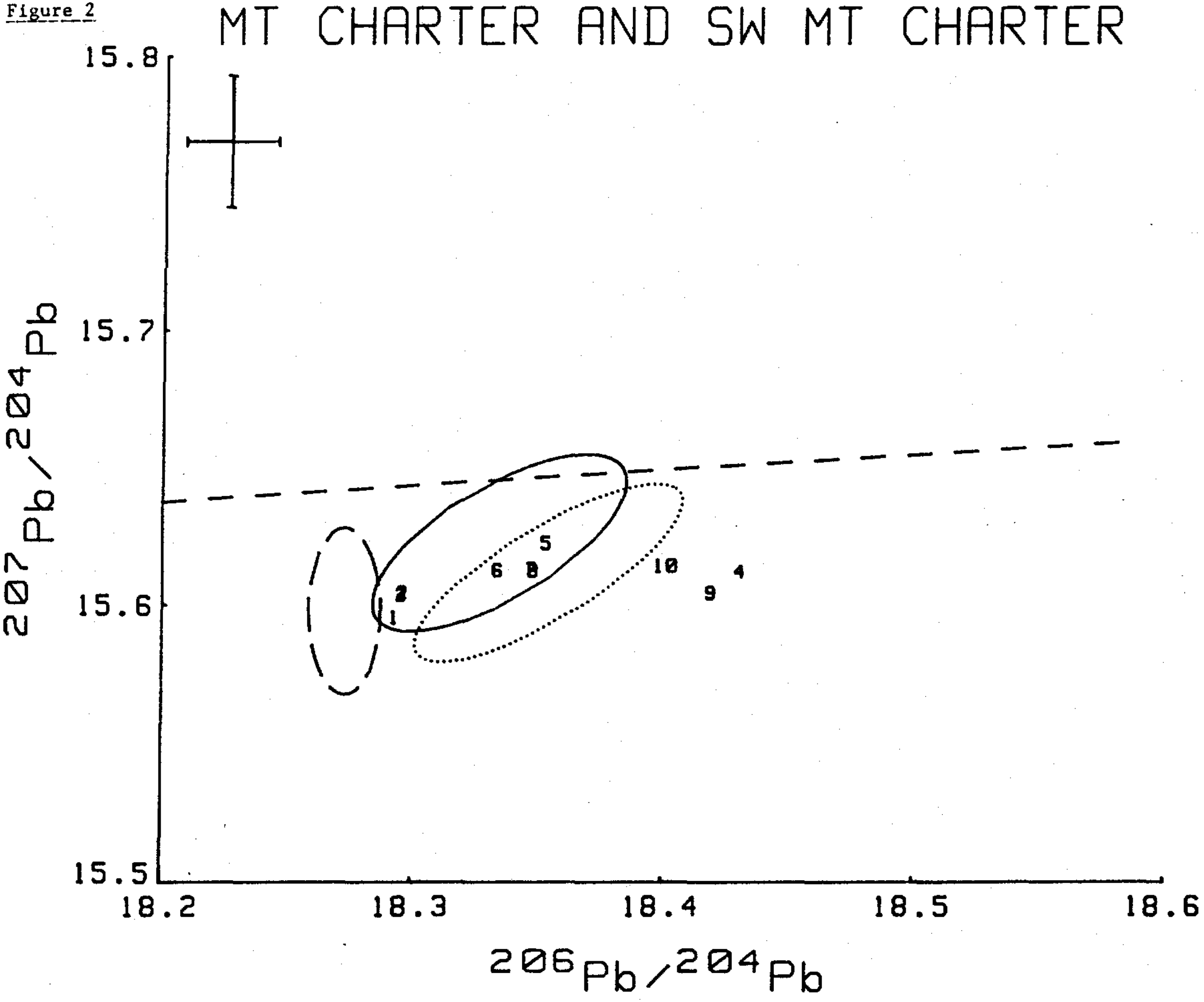
Figure 2


MT CHARTER AND SW MT CHARTER
15.8
15.7
15.6
15.5
18.2
18.3
18.4
18.5
18.6
$^{207}Pb/^{204}Pb$
$^{206}Pb/^{204}Pb$
1
2
5
6
8
10
9
4

APPENDIX III

SUPPLEMENTARY REPORT ON Mt CHARTER DDH SAMPLES

INTRODUCTION

At the request of Tony Hespe samples S36 and S37 from DDH MC 9 were reanalysed to verify the original results which indicated that the lead isotopic compositions were significantly different from the Hellyer reference. This was considered important because of the interpreted stratigraphic correlation between these samples and the Hellyer ore horizon. In addition, both Pb and U were analysed by isotopic dilution to help understand the possible causes of this variation. In S36 sulfides occur disseminated or strung out along a tectonic foliation, and in S37 sphalerite and minor galena are concentrated in carbonate veins up to about 7mm in width.

RESULTS

Table 1 and Figure 1 reproduce the original results and incorporate the re-analyses of samples S36 and S37. The results reproduce to within experimental error, although the effects of fractionation error are more obvious in sample S37.

The Pb and U contents of the two samples are also shown in Table 1. Note that S36 with 200ppm Pb contains relatively high U (2.4ppm) and that S37 with 860ppm Pb contains low U (1.0ppm).

DISCUSSION

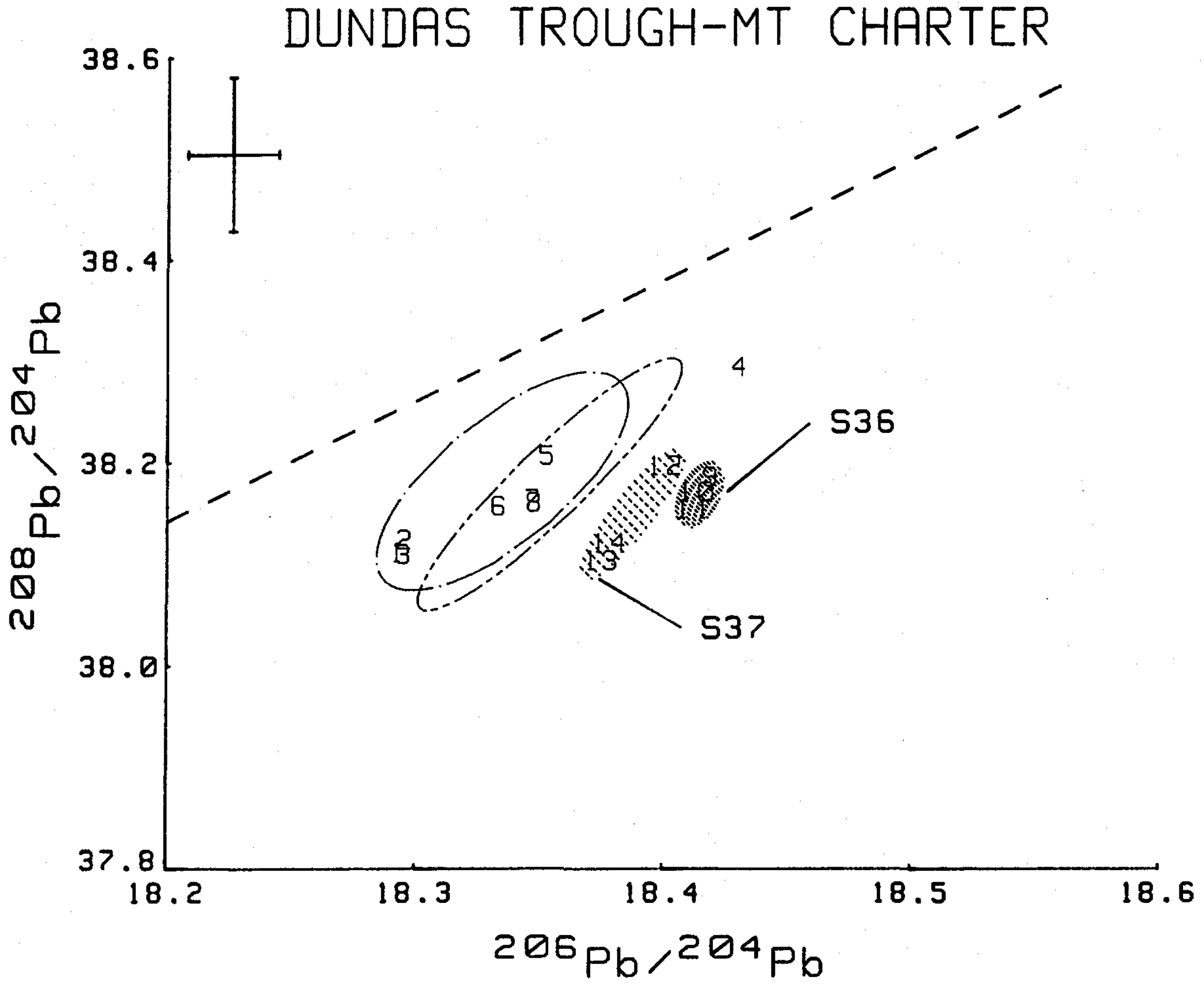
When the Pb isotopic compositions of the two samples are recalculated to take into account the addition of 206Pb and 207Pb since the Cambrian, the high U and low Pb content of S36 results in a significant change, but the low U and high Pb content of S37 indicates that there has been no significant change. These recalculated values are plotted in Figure 2.

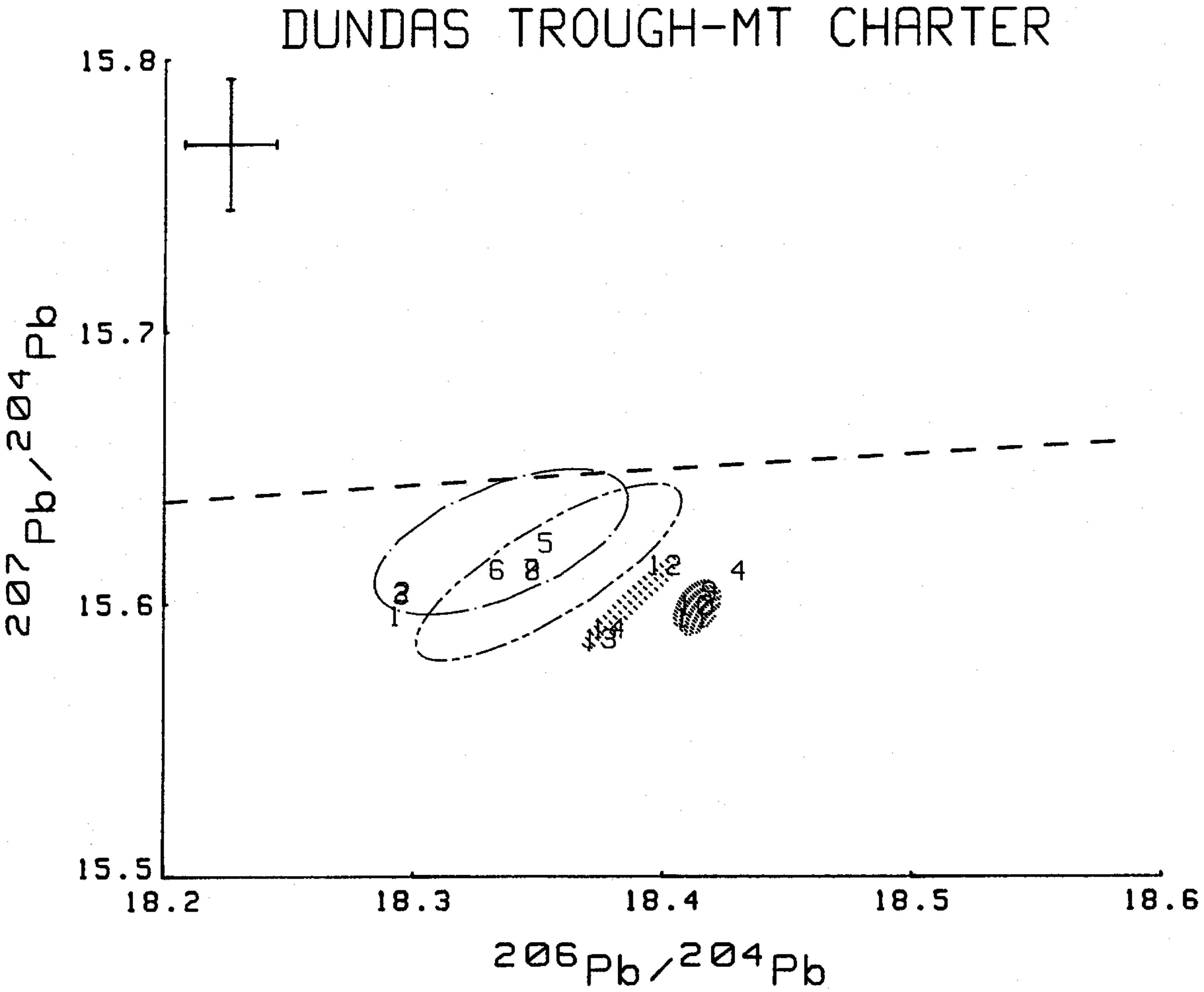
In this Figure, S36 plots back into the Hellyer field indicating a probable common origin with the massives sulfide deposit. However S37 does not change, confirming its distinction from the Hellyer sulfides and suggesting a possible association with the post-Cambrian veining common in the area.

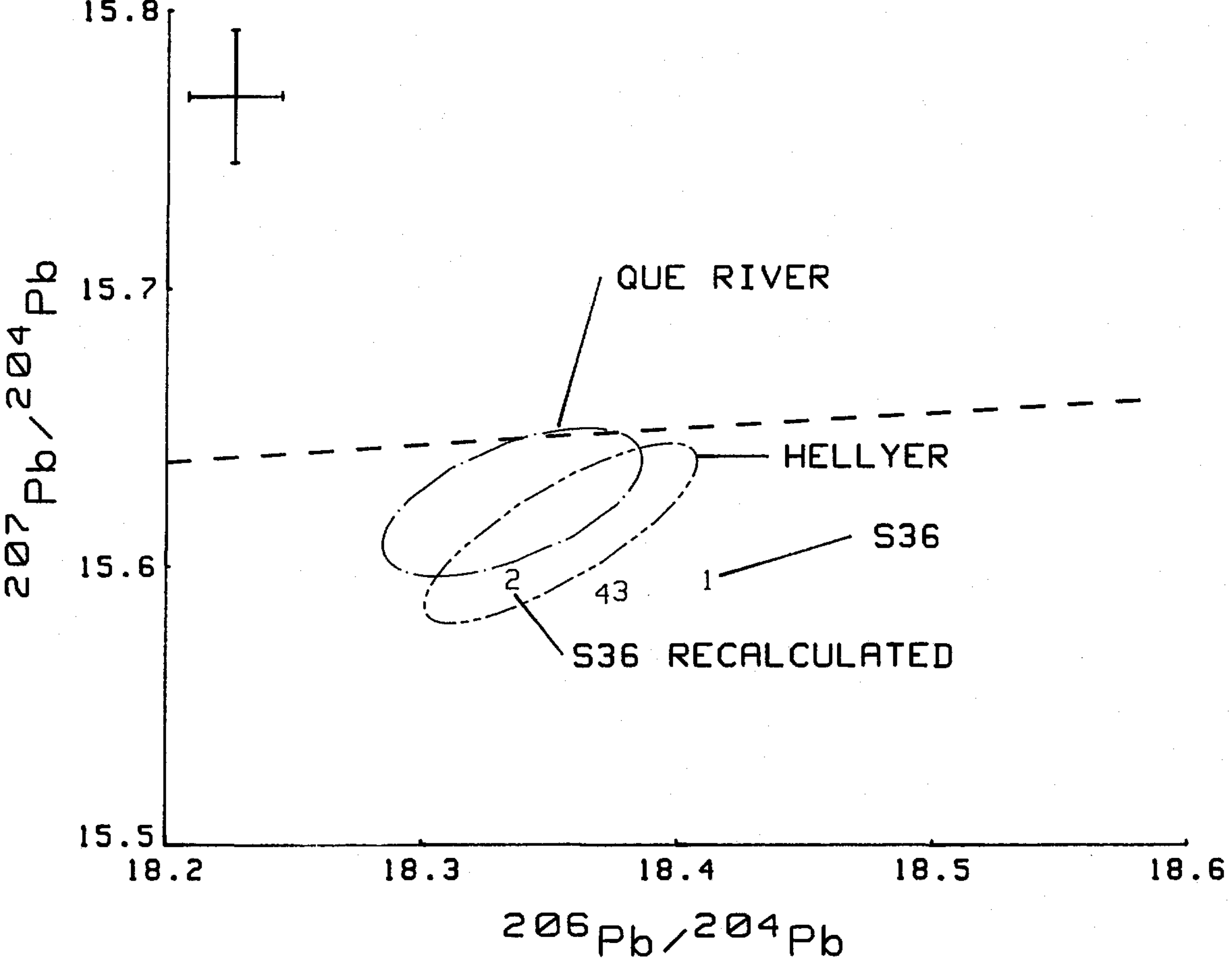
Graham R. Carr
4/7/85

ISOTOPIC LEAD DATA FOR Mt CHARTER INCLUDING RE-ANALYSES OF S36 AND S37

Sample	208 Pb / 206 Pb	207 Pb / 206 Pb	206 Pb / 204 Pb	207 Pb / 204 Pb	208 Pb / 204 Pb	Pb(ppm)	U(ppm)
S30	2.0835	0.8526	18.292	15.596	38.113		
S31	2.0838	0.8529	18.296	15.605	38.125		
S32	2.0831	0.8529	18.295	15.604	38.111		
S33	2.0778	0.8471	18.431	15.612	38.295		
S34	2.0818	0.8512	18.353	15.622	38.207		
S35/1	2.0813	0.8516	18.334	15.613	38.158		
S35/2	2.0801	0.8510	18.347	15.613	38.164		
S35/3	2.0799	0.8509	18.348	15.612	38.162		
S36	2.0732	0.8472	18.419	15.604	38.186	200	2.4
S36 IC	2.0731	0.8472	18.413	15.599	38.172	200	2.4
S36 ReED	2.0723	0.8470	18.412	15.595	38.155	200	2.4
S37	2.0759	0.8486	18.400	15.614	38.198	860	1.0
S37 IC	2.0738	0.8483	18.375	15.587	38.105	860	1.0
S37 ReED	2.0743	0.8483	18.378	15.591	38.122	860	1.0


DUNDAS TROUGH-MT CHARTER
38.6
38.4
38.2
38.0
37.8
18.2
18.3
18.4
18.5
18.6
$^{208}Pb/^{204}Pb$
$^{206}Pb/^{204}Pb$
4
S36
5
6
7
8
2
3
12
14
13
S37


DUNDAS TROUGH-MT CHARTER
15.8
15.7
15.6
15.5
18.2
18.3
18.4
18.5
18.6
$^{207}Pb/^{204}Pb$
$^{206}Pb/^{204}Pb$
1
2
3
5
6
7
8
12
4
14
3



MtCHARTER-RECALCULATED VALUES

APPENDIX IV

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024114

PROJECT : HATFIELD

PROSPECT : N.W. MT. CHARTER

HOLE NO : MC-12

PAGE : 1 of 10

LOGGED : AMN

DATE : MAY 1986

DRILL RUNS	CORE LOSS
1.0	0.65
1.5	1.19
1.7	0.5
2.0	0.61
[illegible]	[illegible]
0.6	0.11
0.6	0.18
1.0	0
0.4	0.2
0.6	0.27
1.0	0
0.5	0
0.9	0.15
[illegible]	0
0.7	0
1.0	0.1
0.8	0
0.7	0.43
0.8	0.28
[illegible]	[illegible]
1.1	0.64
0.4	0
0.4	0
[illegible]	0
1.1	0
0.5	0
0.3	0
0.4	0
0.5	0.13
0.5	0
0.6	0.18
1.5	0.16
1.5	0
[illegible]	0
0.6	0
0.7	0.26
0.5	0
0.6	0
1.6	0
1.4	0
0.9	0
0.6	0
1.0	0.1
1.6	0
0.9	0
1.5	0.18
0.6	0
2.0	0.16

LITHOLOGY

ROCK NAME	DESCRIPTION
BLACK SHALE	MASSIVE BLACK SHALE. GRAPHITE(?) SHEEN ON MANY BROKEN SURFACES NOTEABLY MASSIVE, NON-LAYERED
	22.6 STRONGLY GRAPHITIC 27.2

ALTERATION

VEINING

MINERALISATION

STRUCTURE

0-27.3 VERY BROKEN

37.7
37.4 REVERSED FAULT?

WEATHERING

15.4
FOX
19.9

/FR

VISUAL LOG

REMARKS

CORED FROM SURFACE

FOX → TRACE FEOX ON BROKEN SURFACES - AFTER PYRITE?

DEPTH

112

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024115

PROJECT : HATFIELD
PROSPECT : N.W. MT. CHARTER

HOLE NO : MC-12
PAGE : 2 of n
LOGGED : AMN
DATE : MAY 1985

DEPTH	DRILL RUNS	CORE LOSS
	3·1	1·1
44	0·7	0·08
	1·2	0·18
46	1·8	0
	0·8	0·2
48	0·6	0
50	2·0	0·
	0·7	0
52	1·5	0
54	2·0	0·18
	0·7	0·27
56	1·4	0
58	1·5	0
	1·6	0
60	0·7	0·2
	1·6	0
62	1·3	0
64	1·3	0
	1·6	0·1
66	1·5	0
68	1·6	0
70	1·5	0
72	1·5	0
	1·5	0
74	1·3	0·2
76	1·6	0
78	3·0	0·11
80 82	3·0	0·07
84	3·0	0

LITHOLOGY

ROCK NAME

BLACK SHALE

HQ
75·0
NQ

DESCRIPTION

61·0 BAND OF LAYERED PYRITE, 2CM THICK TOP (UPHOLE) 10CM INTERMIXED WITH SHALE. ∢80°

ALTERATION

VEINING

TYPE	INTENSITY
55·6 <1mm TO 5mm WISPY QUARTZ CARBONATE VEINS WITH TRACE BROWN GRANULAR SPHALERITE AND CHALCOPYRITE. 61·0	2
70·7 <1mm WHITE QUARTZ CARBONATE VEINS, SUB-PARALLEL TO CORE AXIS	1

MINERALISATION

55·6
TRACE BROWN GRANULAR SPHALERITE, CHALCOPYRITE IN VEINS.
61·0

STRUCTURE

46·0
VERY BROKEN ALONG PYRITIC JOINTS
49·5

WEATHERING

FeOx
1

VISUAL LOG

REMARKS

DEPTH

113

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024116

PROJECT : HATFIELD

PROSPECT: N.W. MT CHARTER

HOLE NO: MC-12

PAGE: 3 of 10

LOGGED: AMH

DATE: MAY 1985

DEPTH	DRILL RUNS	CORE LOSS
86	3.0	0
88		
90	2.2	0.12
92	1.5	0
	1.1	0.21
94	0.9	0.07
	0.7	0
	1.1	0.1
96	0.6	0
	1.1	0
98	1.1	0.15
100	1.4	0.06
102	2.4	0
104	3.1	0
106	1.0	0.06
108	3.0	0
110	2.0	0.05
112	2.9	0.2
114		
116	1.8	0.6
	0.6	0.1
118	1.2	0
	2.1	0.13
120		
122	2.5	0.55
	0.6	0.15
124	1.4	0.4
126	3.6	0.3

LITHOLOGY

ROCK NAME	DESCRIPTION
BLACK SHALE	

ALTERATION

VEINING

Type	Intensity
"	1
"	
"	1
102.5	
109.0	
6 mm WISPY QUARTZ CARBONATE VEIN	1.
"	1
"	1

MINERALISATION

STRUCTURE

WEATHERING

VISUAL LOG

REMARKS

TS. 35528; 99.1m; RFB 0 - 130.5

ARGILLACEOUS SILTSTONE/SHALE. CONTAINS SERICITIC WHITE MICA, CARBONACEOUS MATTER, DETRITAL MUSCOVITE FLAKES, MINOR QUARTZ, SYNGENETIC PYRITE.

(DETRITAL MUSCOVITE FLAKES - HINTS CHANGE TO MICACEOUS GREYWACKE FURTHER SOUTH)

DEPTH

114

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024117

PROJECT : HATFIELD

PROSPECT: N.W. MT CHARTER

HOLE NO: MC-12

PAGE: 4 of 10

LOGGED: AMH

DATE: MAY 1985

DEPTH	DRILL RUNS	CORE LOSS
128	0.8	0.34
130	0.8	0.2
132	1.3	0
134	2.9	0
136	2.9	0
138	1.2	0
140	2.6	0.1
144	3.1	0.1
146	3.1	0.1
150	3.1	0.1
152	3.0	0
156	3.1	0.1
158	1.0	0
160	3.1	0.1
164	3.1	0.1
166	1.8	0.1
168	3.0	0

LITHOLOGY

ROCK NAME	DESCRIPTION
BLACK SHALE (Mr. Sl)	CONFORMABLE CONTACT INTERLAYERED OVER 10mm @ 45°
130.5	
LAPILLI VOLCANICLASTIC (A. mlv.)	GREY GREEN FRAGMENTS (COMPOSITION UNKNOWN) IN SERICITIC MATRIX RARE PYRITE FRAGMENTS STRONGLY ALIGNED FABRIC @ 45°
134.7	DIFFUSE CONTACT OVER 10cm
ANDESITE LAVA BRECCIA (A. Lb.)	<10mm TO 30mm GREY, ANGULAR FRAGMENTS OF WEAKLY PORPHYRITIC ANDESITE IN LIGHT GREY MATRIX. PART OF MATRIX IS COMPOSED OF ? SERICITISED ANDESITE FRAGMENTS. RARE MASSIVE SECTIONS INTERPRETED TO BE AN AUTOBRECCIATED LAVA.

ALTERATION

TYPE	INTENSITY
130.5	
PERVASIVE, SELECTED FRAGMENT SERICITE, PYRITE	4
134.7	
142.2	
MINOR [illegible] AS PART OF BRECCIA MATRIX	2
143.0	

VEINING

TYPE	INTENSITY
140.6	
PREDOMINANTLY < 5mm QUARTZ/CREAMY CARBONATE VEINS AND BRECCIA MATRIX FILLING. SPARSE 1-20mm VEINS.	2
"	2
"	2
"	2

MINERALISATION

139.5/1/SPH
159.7/1/SPH
140.1/2/SPH
140.5/10/SPH
140.9/10/SPH
142.6/14/SPH
144.1/20/SPH, GAL, CPY
152.7/1/GAL
152.7/1/SPH
154.0/1/SPH
156.1/2/SPH
156.5/2/SPH
157.0/8/SPH - BROWN + YELLOW
158.0/5/PY, SPH, GAL
159.4/6/GAL, SPH
161.5/2/GAL, SPH
162.6/1/SPH
162.7/3/SPH, GAL
162.9/4/GAL, SPH
163.1/20/GAL, SPH 163.9/2/SPH
165.8/14/SPH, GAL
166.1/6/GAL, SPH
166.6/12/SPH, GAL
168.2/8/SPH, GAL
168.6/20/

STRUCTURE

128.0
VERY BROKEN ON CONTACT.

131.0
131.8 5.0mm, GREY TUF

REMARKS

TK. 356(to; 1327). RER 130.5 - 134.7

GLASSY, CLASTIC, ANDESITIC LAVA QUARTZ, PYRITE, SERICITE ALTERED.

BROWN GRANULAR SPHALERITE, TRACE GALENA, CHALCOPYRITE ASSOCIATED WITH QUARTZ/CARBONATE ?FELDSPAR VEINS AND BRECCIA MATRIX INFILLING

LOCATION, NUMBER OF SULPHIDE AGGREGATES IN 10cm INTERVAL AND COMPOSITION MARKED IN "MINERALIZATION" COLUMN

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024118

PROJECT : HATFIELD

PROSPECT: N.W. MT CHARTER

HOLE NO: MC-12

PAGE: 5 of 10

LOGGED: AMH

DATE: MAY 1985

DEPTH	DRILL RUNS	CORE LOSS
170–172	3.0	0.1
174	2.8	0.1
176–178	3.1	0.1
178–180	1.1	0
180–182	2.5	0.2
182–184	2.6	0
186	3.0	0.1
188	1.7	0
190–192	3.1	0
194	3.1	0
196–198	3.1	0
200	2.5	0.1
202–204	3.1	0.1
206	2.9	0
208	1.5	0
210	2.5	0

LITHOLOGY

ROCK NAME: ANDESITE LAVA BRECCIA

DESCRIPTION:

ALTERATION

TYPE / INTENSITY

196.0

PINK, BUFF FELDSPAR / SILICA ALTERATION; PATCHY THROUGH MATRIX AND OF SOME FRAGMENTS. SOME PINK FELD./SILICA MATERIAL IN BRECCIA MATRIX CARBONATE MATERIAL. — 2

"

VEINING

TYPE	INTENSITY
"	2
"	2
"	2
"	2
"	2

MINERALISATION

172.5/3/CPY, GAL.

173.9/3/SPH.GAL

174.4/3/CPY

176.5/1/GAL

179.2/1/SPH

186.2/1/CPY

197.4/1/GAL

199.7/5/SPH

200.3/1/SPH

201.3/1/GAL

201.6/1/SPH

203.7/5/SPH.

204.3/1/SPH

206.1/2/SPH

207.5/5/SPH

210.0/8/SPH

STRUCTURE

F • 180.8, 20cm, RUBBLE PUG.

WEATHERING

VISUAL LOG

REMARKS

VEINING:
INCREASE IN PROPORTION OF BRECCIA MATRIX FILLING → DECREASE IN NUMBER OF VEINS.

PDT. 306131, 190.4, REP. 1347– [illegible]

ANDESITIC LAVA CLASTS, CHLORITE (SERICITE, EPIDOTE) ALTERED, IN SPARSE MATRIX OF QTZ, ALB, ADULARIA, CALCITE. LATTER IS AN ALTERATION PHASE, PARTLY VEINLET RELATED.

DEPTH

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

PROJECT : Hatfield

PROSPECT: N.W. Mt Charter

024119

HOLE NO: MC-12

PAGE: 6 of 10

LOGGED: KMH

DATE: MAY 1985

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY ROCK NAME	LITHOLOGY DESCRIPTION	ALTERATION TYPE	ALTERATION INTENSITY	VEINING TYPE	VEINING INTENSITY	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
	0.5	0.2	Andesite Lava Breccia		"	2			210.7/20/SPH 211.1/3/SPH 211.2/2/SPH					
212							"	2						
214	3.0	0							213.9/1/SPH					
							215.0		214.9/2/SPH 215.1/3/SPH					
216	2.9	0					"	3	216.0/3/SPH 216.7/3/SPH					
					"	2				217.5 to 218.2 BROKEN.				
218	0.4	0												
	[illegible]	[illegible]												
	0.9	0												
220	1.6	0												
222	1.6	0								221.0 to 224.0 BROKEN				
224	2.8	2.1			"	2			224.3/1/SPH					
226	2.4	0					"	3	226.3/2/SPH 226.5/7/SPH 227.4/1/SPH					
228	1.8	0												
230	3.0	0.4							229.4/2/SPH, GAL 230.0/2/GAL, SPH					
232					"	2								
	1.8	0.2							233.9/2/CPY					
234	1.3	0.1			234.0									
236	2.2	0.1			"	3	"	3						
238	2.3	0.2												
240	2.1	0			"	3			239.3/1/CPY 240.0/1/GAL					
242	3.1	0.4							243.6/1/GAL					
244														
246	2.2	0			"	3	"	3	246.3/1/GAL					
					247.0				247.4/1/GAL					
248	3.0	0			STRONG ASSOCIATION OF PINK FELDSPAR/SILICA ALTERATION WITH VEINING PHASE · ALTERATION PROCEEDS OUTWARDS FROM VEINS	4	248.5						CONNECTION BETWEEN pink ALTERATION AND VEINING	
							LARGE (5-70cm) OF PREDOMINANTLY MILKY QUARTZ AND DARK GREEN CHLORITE WITH MINOR CARBONATE AND PINK FELDSPAR.	3						
250	3.0	0.1								↑ 251.7, 10, RUBBLE				
252														

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ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

PROJECT : HATFIELD
PROSPECT : N.W. MT CHARTER

HOLE NO : MC-12
PAGE : 7 of 10
LOGGED : RMN
DATE : MAY 1985

DEPTH	DRILL RUNS	CORE LOSS
254	3.0	0.2
256	1.9	0
	0.5	0
258	1.0	0
260	1.4	0
	1.4	0
262	2.0	0
264	1.8	0.2
266	3.0	0
268		
270	3.0	0
272	2.0	0.1
274		
276	3.0	0
278		
280	3.7	0.1
282	2.0	0.4
284	2.9	0
286	0.7	0
288	2.7	0.1
290	3.0	0.1
292	0.6	0
294	2.4	0

LITHOLOGY

ROCK NAME	DESCRIPTION
ANDESITE LAVA BRECCIA	

ALTERATION

TYPE	INTENSITY
"	4
"	4
"	4
277.5	
PINK FELDSPAR/SILICA ALTERATION AS ABOVE BUT OF DIFFERENT TEXTURE I.E. OF SELECTED ANDESITE FRAGMENTS RATHER THAN PROCEEDING OUTWARDS FROM VEIN (I.E. SAME TEXTURE AS 160 - 247m)	3
"	3

VEINING

TYPE	INTENSITY
NO SULPHIDES WITH THIS TYPE OF VEINING	3
"	3
"	3
265.0	
"	2
277.5	
SIMILAR VEIN PHASE WITH PREDOMINANT MILKY QUARTZ, MINOR CARBONATE, ONLY OCCASIONAL CHLORITE. VEINS MORE REGULAR, PARALLEL WALLED AND SMALLER (<6mm) CHLORITE, WHERE IT OCCURS, IS USUALLY WITH THE LARGER IRREGULAR PATCHY VEINS. NO SULPHIDE EXCEPT FOR VERY RARE PYRITE.	2

MINERALISATION

STRUCTURE

WEATHERING

VISUAL LOG

REMARKS

PET. 355132, 289.4, REF [illegible]

ANDESITIC LAVA BRECCIA VERY SIMILAR TO 355131.
CHLORITISED ANDESITIC LAVA CLASTS IN SPARSE MATRIX OF TUFFACEOUS, DOLOMITIC CHERT, AND SILICA/ALBITE ALTERATION OVERPRINT
TRACE SULPHIDES AGAIN WITH [illegible]

DEPTH

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024121

PROJECT : HATFIELD

PROSPECT: N.W. MT CHARTER

HOLE NO: MC-12

PAGE: 8 of 10

LOGGED: AMH

DATE: MAY 1986

DEPTH	DRILL RUNS	CORE LOSS	LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION		VEINING: TYPE	VEINING: INTENSITY	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
296	3.0	0.1	ANDESITE LAVA BRECCIA				"	2						
298					"	3								
300	3.0	0												
302														
304	3.8	1.6			"	3	"	2						
306														
308	3.1	0.1												
310	2.45	0		310.0 100mm PATCH OF KHAKI FELDSP ALT										
312	2.45	0.45			"	3	"	2						
314	3.0	0												
316														
318	3.0	0												
320	2.7	0			"	3	"	2						
322														
324	2.45	0												
326	2.85	0												
328	1.2	0			"	3	"	2						
330	3.1	0.1		FROM APPROX 329.0 RARE FRAGMENTS OF PINK DACITE IN BRECCIA - RIP UP CLAST?										
332														
334	2.9	0.1			"	3	"	2						
336														

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ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024122

PROJECT : Hatfield
PROSPECT : N.W. Mt Charter

HOLE NO : MC-12
PAGE : 9 of 10
LOGGED : [illegible]
DATE : May 1985

DEPTH	DRILL RUNS	CORE LOSS
338	2.4	0
340	2.7	0
342	3.0	0.1
344–346	3.0	0.1
348	1.4	0
	1.5	0
350–352	3.0	0
354	3.0	0
356–358	3.4	0.1
360	2.7	0
362	2.9	0
364–366	2.4	0
368	2.4	0
370–372	3.2	0
374	2.4	0.2
376	2.0	1.2
378	1.2	0.2

LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION: TYPE	ALTERATION: INTENSITY	VEINING: TYPE	VEINING: INTENSITY	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS
Andesite Lava Breccia 340.2	Sharp contact	"	3	"	2					
340.2 Polymict Lapilli volcaniclastic (V.W.) 343.0	Dark green (chloritic), highly angular and irregular fragments of basalt + 5% pink altered [illegible]	340.2 Pink K feldspar alt. of some fragments 343.0	2							343.0 – 344.3 PET. 355133; 343.2, REP. 340.1 – 344.3
Basalt Lava Breccia (B.Lb) 349.3	Dacitic or andesitic fragments in a matrix composed partly of light grey chert. Dark green chloritic weakly vesicular massive basalt (344.3 – 348.0) with marginal zones of highly angular aligned basalt fragments in a	(Gradational contact [illegible]) 30cm Pink Kfld/Si alt of quartz carbonate patches in massive zone. 349.3	3	"	2					Basalt breccia. 1mm to 110mm clasts scoriaceous to porphyritic basaltic lava in dolomitic/[illegible] chloritic/impure chert matrix. Primary chromite. PET. 355134; 346.9, REP 344.3 – 348.1
Dacite Lava (D.L.)	Partly cherty matrix (interp. to be hyaloclastite) ↑ Sharp intervening contact - over 2cm Mottled pink and dark grey green brecciated dacite lava. Non-porphyritic. Breccia texture is not distinct - occaisional angular fragments. - mottled colour gives breccia appearance. 364.5 - 364.8 porphyritic	Patchy pervasive pink feldspar/silica alt. throughout. Probably overprinting a previous phase of chloritization. " " 374.0 (Intense pink alt. in broken zone around fault)	4 4 4 5	" " " "	2 2 2 2		F • 350.5, 20cm, breccia rubble, rehealed with chlorite + illite. Minor pug ∠45° 374.0 Rubbly and broken to fault at 376.6.			Basalt breccia. Basalt clasts (augite porphyritic, trace chromite) with sparse [illegible] matrix of recrystallized calcite. Chlorite/calcite altered, chlorite/qtz/adularia vesicle fillings. PET. 355136, 370.7, 349.3 – 379.7. Leuco-andesitic to dacitic weakly flow banded massive lava. Chlorite/sericite and albite/silica altered.

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ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

PROJECT : Hatfield

PROSPECT : N.W. Mt Charter

024123

HOLE NO : MC-12

PAGE : 10 of 10

LOGGED : AMH

DATE : May 1985

DEPTH	DRILL RUNS	CORE LOSS	ROCK NAME	DESCRIPTION	ALTERATION TYPE	ALTERATION INTENSITY	VEINING TYPE	VEINING INTENSITY	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS	DEPTH
			Dacite lava											
380	2.9	0					"	2		• 380.6, 10cm CARBONATE V/Z [illegible] to C.A.				
382	1.9	0												
	1.6	0												
384	1.2	0												
	1.0	0												
386	1.2	0												
	0.5	0	387.9 EOH.				"	2						
388														
390														
392														
394														
396														
398														
400														

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APPENDIX V

024125

24 JUN REC'D

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Central Mineralogical Services

CMS

39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5659

Mr. A.M. Hespe
Project Geologist
Aberfoyle Exploration Pty. Ltd.
P.O. Box 952
BURNIE / TAS. 7320

19th June, 1985

REPORT CMS 85/6/9

YOUR REFERENCE:	Letter dated 30.5.1985
DATE RECEIVED:	7th June, 1985
SAMPLE NOS.:	355129 - 355135
SUBMITTED BY:	A.M. Hespe
WORK REQUESTED:	Petrology

for

H.W. Fander, M. Sc.

Copy to:
The Chief Geologist
Aberfoyle Exploration Pty. Ltd.
144, Camberwell Road
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MC-12

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REPORT CMS 85/6/9

Seven drill core samples from DDH-MC 12 in the Mt. Charter area were received for petrological examination. Representative thin-sections were prepared and examined together with their respective offcuts, with carbonate stain tests performed as warranted. Attached tabulated descriptions summarise the microscopic data and include interpretative comments.

Summary

This suite comprises altered basaltic to andesitic and leuco-andesitic/dacitic volcanics with subordinate sediments.

Volcanics are variously massive to flow-brecciated and subaqueously brecciated/sediment-matrixed types, typically chlorite-sericite-altered with patchy quartzofeldspathic alteration overprints, partly vein-controlled, resulting in mottled grey to pinkish mesoscopic colour variations.

Relict features are consistent with a variation from chromiferous basaltic to non-chromiferous pyroxene-porphyritic andesitic and relatively ferromag-deficient (leuco-)andesitic facies typical of the Que River/Hellyer volcanic complex. The intercalated pelite (355129) is carbonaceous, syngenetic-pyritic and probably reworked-tuffaceous in part, although finer details are obscured by low-grade regional metamorphic effects.

D. Cowan, B. Sc.

Sample No.	Classification - Composition	Fabric	Accessories	Comments
355-129 (T.S. 53632)	Carbonaceous Pelite. Semi-sericitic white mica with pervasive ultrafine carbonaceous matter, abundant silt-sized relict detrital muscovite flakes, subordinate to minor quartz, sericitised feldspar grains. Disseminated pyrite.	Silty clastic, banded on sub- to fine millimetric scale. Weakly concordantly cleaved, high-angle microcrenulated.	Minor clastic leucoxenic semi-opaques. Minor clots, late veinlets of cloudy calcite, chlorite.	Incipiently sheared/microcrenulated argillaceous siltstone/silty shale, carbonaceous and syngenetic-pyritic. No tangible facing criteria.
355-130	Perlitic Pitchstone. Semi- to sericitic white mica aggregates with sporadic interspersed films, foliae of calcite, minor microcrystalline quartz. Conspicuous leucoxenised opaques. Disseminated fine pyrite.	Phyllitic. Relict coarsely lithic fragmental with perlitic felsitic clasts, matrix.	Sporadic sericitised/leucoxene-stained ferromag, silicified-sericitised feldspar phenocrysts in clasts, matrix.	Thoroughly sericitised vitric clastic lava ("tuff lava"), "andesitic" characteristics. Quartz, calcite, pyrite as accessory alteration phases.
355-131	Andesitic Breccia. Clasts of chloritic/epidote-stained to silicified-feldspathised, porphyritic/variably felsitic andesitic lava. Sparse interclast matrix, minor veinlets of quartz, albite, adularia, calcite.	Random millimetric to centimetric, moulded to quartz-feldspar-calcite-matrixed, andesitic-textured clasts.	Pervasively disseminated fine to ultrafine pyrite, rare pale sphalerite (in interclast vugs).	Chlorite(-sericite-epidote)-altered andesitic lava breccia with a quartz-feldspar-carbonate alteration overprint, partly veinlet-related.
355-132	Andesitic Breccia. Clasts of variably chloritic to silicified-albitised, porphyritic/variably perlitic andesitic lava. Sparse tuffaceous dolomitic impure chert matrix. Minor vugs of quartz, late calcite veinlets.	Analogous to 355131.	Minor pyrite disseminations, minor traces galena, pale sphalerite in silicified zones, matrix.	Close affinities with 355131, with relatively pervasive silicified-feldspathised zones; faintly Fe-pigmented and mesoscopically pinkish.
355-133	Basalt Breccia. Clasts of sericitised/calcitised, variously (altered) feldspar-pyroxene-porphyritic to amygdaloidal scoriaceous lava. Matrix of weakly dolomitic chloritic impure chert/cherty argillite.	Pelite-matrixed breccia with slaty to phyllitic overprint. Random orientated clasts (<1 mm - 1cm+).	Fine pyrite in clasts, ultrafine pyrite in matrix. Relict primary leucoxenised opaques and chromite in clasts.	Variably "scoriaceous" to andesitic-textured altered basaltic clasts, pyritic pelite/impure chert matrix. Subaqueous basaltic breccia characteristics.
355-134	Basalt Breccia. Clasts of variously strongly augite-porphyritic to strongly chlorite-quartz-adularia-amygdaloidal, chlorite-carbonate-stained lava with a sparse interclast matrix of recrystallized calcite.	Random angular to irregular semi-moulded to calcite-matrixed clasts.	Minor sheared-recrystallized calcite veinlets. Disseminated fine to ultrafine pyrite, chromite, traces of epidote.	"Andesitic"-basaltic, chromiferous, flow-marginal breccia characteristics. Chlorite-calcite-altered with chloritic quartz-adularia vesicle infillings.
355-35 (T.S. 53638)	Leuco-andesitic Breccia. Zones of chloritic-sericitic to sericitic/partly silicified, albitised plagioclase-porphyritic, leuco-andesitic lava with ill-defined displacive cherty quartz-healed fractures.	Flow-banded, weakly perlitic; fractured, mildly sheared.	Leucoxenised opaques, rare quartz phenocrysts, sporadic sheared, variably chloritic calcite veinlets.	Fractured, altered, weakly veined and sheared, but primarily a relatively massive lava. Leuco-andesitic/dacitic in contrast to 355131, 355132; similarly altered.

APPENDIX VI

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024129

PROJECT : HATFIELD
PROSPECT: MURCHISON HIGHWAY ZONE

HOLE NO: MC-13
PAGE: 1 of 9
LOGGED: AMH
DATE: May 1985

DEPTH	DRILL RUNS	CORE LOSS
2	3.4	2.8
4	1.5	0.3
	0.7	0.3
6	0.6	0.5
	1.1	0.1
8	1.1	0
	0.5	0.1
	1.1	0.1
10	0.5	0.1
	1.1	0.2
12	1.3	0.2
14	1.3	0
	1.1	0.1
	0.5	0.1
16	1.0	0.4
	1.0	0
18	0.3	0.1
	1.1	0.1
20	1.6	0.2
22	1.5	0
	0.7	0.1
24	1.3	0.6
	0.7	0.1
	0.6	0.1
26	0.7	0.2
	0.8	0.25
28	0.7	0.2
	1.3	1.0
30	0.9	0.9
	0.6	0.1
	0.7	0.3
	0.7	0.2
32	1.5	0
34	0.9	0.2
	1.3	0
36	1.7	0.2
38	1.3	0
	1.1	0.6
40	0.7	0.2
42	1.7	0.3

LITHOLOGY

ROCK NAME: BLACK SHALE

DESCRIPTION: MASSIVE FEATURELESS BLACK SHALE. LUSTROUS SURFACES ON BROKEN PIECES IN SOME ZONES - AFTER GRAPHITE?
NO INDICATION OF BEDDING.

127

ALTERATION

VEINING

TYPE	INTENSITY
<1mm TO 5mm WHITE CARBONATE QUARTZ VEINS WITH A TRACE OF PYRITE. CONSISTENTLY AT 20°-30° TO CORE AXIS.	1
"	1
"	1
"	1

MINERALISATION

STRUCTURE

BROKEN 5.
5.6
BROKEN 2
8.6
BROKEN 3
11.5
BROKEN 2
15.7
4
16.7
BROKEN 3
23.0
BROKEN 5
32.0
BROKEN 2
39.8
BROKEN 5
40.8

WEATHERING: FRESH AT SURFACE

VISUAL LOG

REMARKS

"BROKENESS" IN SHALE ON A SCALE OF 1 (LOW) TO 5 (HIGH)

30.2 - BLACK PUG - FAULT?

0-32.0 MAJOR BROKEN ZONE

ONLY OCCASIONAL BROKEN ZONES FROM 40.8 ON

DEPTH
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024130

PROJECT : Hatfield

PROSPECT: Murchison Hwy. Zone

HOLE NO : MC-13

PAGE: 2 of 9

LOGGED: AMK

DATE : May 1985

DEPTH	DRILL RUNS	CORE LOSS
	1.5	0
44	1.5	0.2
46	1.5	0.1
	1.5	0.2
48	1.5	0
50	1.2	0.5
52	1.4	0
	1.6	0.1
54	1.6	0
56	2.0	0
58	1.9	0
60	1.5	0
62	1.4	0
	0.7	0.5
64	0.9	0.2
	1.0	0.4
66	1.0	0
	1.5	0
68	2.9	0
70		
72	2.1	0
	1.6	0.1
74	2.2	0
76	1.6	0
78	1.5	0
80	1.6	0.1
82	1.6	0
84	1.5	0

LITHOLOGY

ROCK NAME	DESCRIPTION
BLACK SHALE	

ALTERATION

VEINING

	TYPE	INTENSITY
	"	1
49.0 49.2	"	3
		1
		1
73.6		3
80.0		2

MINERALISATION

76.8 SPOT OF GRANULAR BROWN SPHALERITE IN QTZ/CARB VEIN

STRUCTURE

WEATHERING

VISUAL LOG

REMARKS

76.8

128

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024131

PROJECT : HATFIELD

PROSPECT: MURCHISON HAY ZONE

HOLE NO: MC-13

PAGE: 3 of 9

LOGGED: Amh

DATE: May 1985

DEPTH: 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126

DRILL RUNS	CORE LOSS	LITHOLOGY ROCK NAME	LITHOLOGY DESCRIPTION	ALTERATION	VEINING TYPE	VEINING INTENSITY	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS
1.5	0	BLACK SHALE									
1.5	0.1				"	2					
2.9	0.1										
1.6	0										
3.0	0.1										
1.5	0.1										
1.5	0				"	2					
1.5	0.1										
1.5	0										
2.4	0.2				102.0						
4.8	0.1				"	1					
3.2	0.1										
1.5	0.1				112.0 112.6 "	5					
2.2	0										
1.6	0.4				"	1					
1.6	0										
1.4	0										
1.6	0										
1.6	0.1										
1.4	0				"	1					
1.6	0.1										

129

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024132

PROJECT : HATFIELD

PROSPECT: MURCHISON HWY. ZONE

HOLE NO: MC-13

PAGE: 4 of 9

LOGGED: AMH

DATE: May 1985

DEPTH	DRILL RUNS	CORE LOSS
128	3.1	0
130	1.6	0.1
	1.5	0
132		
134	3.2	0
136	1.5	0
138	3.0	0
140		
142	3.0	0.1
144	3.0	0
146		
	2.1	0.1
148		
	2.2	0
150		
	1.6	0.2
152		
	2.6	0
154		
	1.1	0.1
156	0.7	0
	1.0	0
158	1.6	0.3
	1.0	0
160	1.0	0.1
162	3.0	0.1
164		
166	3.0	0.1
168	3.0	0.1

LITHOLOGY

ROCK NAME: BLACK SHALE

HQ / NQ 150.0

130

ALTERATION

VEINING

Depth	Type	Intensity
	"	1
130.0		
	"	3
(134.2 BROWN GRANULAR (sph.)		
(137.0 SOFT DARK GREEN min)		
	"	3
141.2		
	"	5
	"	5
147.4		3
	"	3
155.2		
	"	2
	"	2

MINERALISATION

STRUCTURE

154.9 – 159.0 BROKEN, GRAPHITE SEEN ON BROKEN SURFACES.

WEATHERING

VISUAL LOG

REMARKS

CHECK CORE GRIND RESULTS FOR BARITE IN THESE VEINS.

DEPTH: 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024133

PROJECT : HATFIELD

PROSPECT: MURCHISON Hwy ZONE

HOLE NO: MC-13

PAGE: 6 of 9

LOGGED: BMH

DATE: MAY 1985

DEPTH	DRILL RUNS	CORE LOSS	ROCK NAME	DESCRIPTION	VEINING Type	VEINING Intensity
170–172	3.0	0	BLACK SHALE		"	2
172–174	1.4	0.1				
174–176	2.4	0.1				
176–178	1.8	0				
178–182	3.1	0.1		178·4 FROM 178·4 TO 204·0 FAINT LAMINATION AT A CONSISTENT 56° TO CORE AXIS IS VISIBLE. SOME LAMINATION BEYOND 204·0 [illegible] VISIBLE.		
182–184	2.9	0			"	2
184–186	2.4	0.9				
186–190	3.0	0				
190–191	1.8	0				
191–192	1.2	0				
192–195	3.1	0				
195–199	3.1	0.1				
199–201	2.2	0.2			"	2
201–204	2.5	0.1		204·0		
204–206	2.0	0				
206–208	2.9	0.1				
208–210	2.1	0.6				

ALTERATION

MINERALISATION

STRUCTURE

WEATHERING

VISUAL LOG

REMARKS

131

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024134

PROJECT : HATFIELD

PROSPECT: MURCHISON Any. ZONE

HOLE NO: MC-13

PAGE: 6 of 9

LOGGED: AMH

DATE: MAY 1985

DEPTH	DRILL RUNS	CORE LOSS
212	3.0	0
214–216	3.0	0.1
218	1.9	0.1
220	1.6	0
222	3.0	0
224	0.6	0
	0.7	0.1
	0.7	0
226	0.6	0.1
	0.9	0
	0.5	0
228	0.9	0.1
	0.5	0
	0.8	0.1
230	0.5	0
	1.1	0
232	1.4	0
	1.5	0
234	1.7	0
236	2.5	0
238–240	2.3	0
	1.0	0.1
242–244	3.0	0.1
246	2.9	0
248–250	3.0	0
252	3.1	0

LITHOLOGY: ROCK NAME	LITHOLOGY: DESCRIPTION	ALTERATION	VEINING: TYPE	VEINING: INTENSITY	MINERALISATION	STRUCTURE	WEATHERING	VISUAL LOG	REMARKS
BLACK SHALE	(SHALE PALER GREY, DISTINCT LAMINAE OF ULTRAFINE PYRITE AT 58° TO CORE AXIS 240.0 400mm TRANSITION ZONE ON CONTACT – HEAVILY VEINED, FRAGMENTS OF SHALE AND BASALT 242.0		" (212.0. 200mm QTZ/CARB VEIN WITH GREEN MINERAL) " " 242.0	2 2 2					BARITE ON CONTACT? Minor pyrite in contact vein. PET. 355126: 242.9. REP. 242.0–252.4
VESICULAR BASALT LAVA. 252.4	Typical GREY/GREEN NON-PORPHYRITIC VESICULAR BASALT LAVA. LARGER VESICLES (TO 30mm) FILLED WITH QTZ/CARB, SMALLER VESICLES (AV. 3mm) CHLORITE FILLED SHARP IRREGULAR CONTACT	242.0 PALER GREEN FOR 3m BELOW SHALE CONTACT – WEAK FUCH./CARB. ALT? 245.0	1–10mm, PARALLEL WAVY VEINS MILKY QTZ PLUS CREAM CARBONATE. 252.4	3	249.6 BROWN GRANULAR SPHALERITE IN VEIN				AMYGDALOIDAL BASALT LAVA. QUARTZ/SERICITE ALTERED, CALCITE VEINED. Minor CHLORITE.

132

265.4
262.5
3.1

2268
3.0

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024135

PROJECT : HATFIELD
PROSPECT : MURCHISON HWY ZONE

HOLE NO : MC-13
PAGE : 7 of 9
LOGGED : AMH
DATE : MAY 1985

DEPTH	DRILL RUNS	CORE LOSS
254	1.2	0
256	1.8	0
258	3.0	0
260	2.2	0.1
262	2.1	0.2
264	0.7	0
	0.8	0
266	3.1	0
268		
270	3.1	0
272		
274	3.0	0
276	2.1	0.1
278	1.8	0
280	2.1	0
282	3.0	0
284	2.3	0.1
286	0.9	0
288	3.0	0.2
290	2.4	0.3
292		
294	3.1	0.1

LITHOLOGY

ROCK NAME	DESCRIPTION
252.7 GREY SILTSTONE	60% WEAKLY PYRITIC SILTSTONE
GREY SANDSTONE 254.5	COARSELY BANDED LIGHT TO DARK GREY SANDSTONE. 55° ǂ
FINE GRAINED SANDSTONE 255.7	PALE GREY/GREEN STRONGLY SERICITISED FINE SANDSTONE - PROBABLY ALTERED VERSION OF PREVIOUS UNIT.
SILTSTONE?/ SHALE 257.3	
ANDESITE LAVA/ SEDIMENTARY BRECCIA	TEPERITIC CONTACT OVER 1m ↑ GREY/GREEN, PATCHY PORPHYRITIC ANDESITE LAVA WITH BRECCIA ZONE OF CRYSTAL LAVA FRAGMENTS IN BLACK SHALY MATRIX. GRADATIONAL CONTACT OVER 1.5m ↓
269.0 BASALT LAVA BRECCIA	FRAGMENTS - LIGHT GREY TO DARK GREY GREEN, WEAKLY VESICULAR, VERY ANGULAR. NON-ROTATED. IN MATRIX OF SMALLER FRAGMENTS, OFTEN SERICITISED, AND WHITE QUARTZ CARBONATE. 274.4 SIMILAR TO ABOVE BUT WITHOUT QUARTZ/CARB. IN MATRIX AND NO DISTINCTIVE WELL ROUNDED LAPILLI FRAGMENTS. PATCHES OF INTENSE GREY/PURPLE SILICIFICATION (FELDSPATHIZATION) AT 278.5, 281.6.
283.3 ANDESITE LAVA	LIGHT TO DARK GREY LAVA, WITH RARE WHITE (QUARTZ?) 1-2mm SPOTS AFTER FELDSPAR PHENOCRYSTS. NO VESICLES. GHOSTLY 1-5mm CLASTS - AFTER LAVA BRECCIA?
288.4 SCORIACEOUS BASALT. (ANDESITIC?) VOLCANICLASTIC (LAVA?)	FRAGMENTS OF SCORIA - (PALE GREY) GREEN, 1-50cm, DIFFUSE ROUNDED OUTLINES, 20-40% VOLUME CIRCULAR AMYGDALES <1 TO 5mm, FILLED PREDOMINANTLY WITH CHLORITE AND CALCITE WITH LESSER PY, SPH, CPY

ALTERATION

TYPE	INTENSITY
264.5 STRONG PERVASIVE SERICITISATION 265.2	4
278.5 INTENSE, PERVASIVE, BUT PATCHY GREY/PURPLE SILICIFICATION (FELDSPATHIZATION). 281.4	

VEINING

TYPE	INTENSITY
1-10mm QUARTZ/CARB VEINS AND PATCHES.	2
"	2
"	1
269.0 IRREGULAR AND WISPY 1-5mm VEINLETS OF QUARTZ AND CARBONATE	3
283.3 PREDOMINANTLY 1-3mm WISPY IRREGULAR VEINLETS OF QUARTZ/CARBONATE/FELDSPAR? PLUS QUARTZ/CARBONATE IN BRECCIA MATRIX AND OCCASIONAL LARGER (100m) PATCHES TOWARDS BOTTOM OF HOLE. MAJORITY OF QUARTZ/CARBONATE (90%) IS IN BRECCIA MATRIX.	2

MINERALISATION

256.0 ABUNDANT BROWN GRANULAR SPHALERITE IN QTZ/CARB VEIN (≤50cm LONG ∥ CORE AXIS.

269.6 PALE YELLOW SPHALERITE IN QTZ/CARB VEINS AND IMPREGNATING BRECCIA MATRIX

276.9

STRUCTURE

F 261.8 50cm, RUBBLE

F 265.4 3.1m, RUBBLE. CARBONATE VEINING, MINOR SERICITE

F 278.0 2.0m, RUBBLE

F 284.7 200mm RUBBLE, PW, QTZ/CARB VEINING. 45° ǂ

REMARKS

255.8 - 257.3 ALTERNATING BANDS (0.5 - 100mm) OF DARK GREY SHALE AND POORLY SORTED SANDSTONE WITH SHALE PREDOMINANT DOWNHOLE
PET. 355137, 252.6, REP. 253.9 - 257.7

IMPURE LIMESTONE. LOWER GREENSCHIST FACIES. MICROCRYSTALLINE CALCITE, INTERSTITIAL SERICITE, CARBONACEOUS MATTER, FINE PYRITE. POSSIBLE FOSSIL REMNANTS.
PET. 355138, 253.5m. REP 252.7 - 254.5

TUFFACEOUS SANDSTONE. DACITE TO RHYOLITE CHARACTER. SERICITISED. RADIOLARIAN FOSSILS. SPORADIC PYRITE
PET. 355139, 254.6m, REP. 254.5 - 255.8

TUFFACEOUS SILTSTONE. WHITE MICA FLAKES, QUARTZ GRAINS, SERICITISED FELDSPAR GRAINS, LITHIC CLASTS, CARBONACEOUS MATTER. MINOR DISSEMINATED PYRITE AND RADIOLARIA.
PET. 355140; 256.1, REP. 255.8 - 257.3

TUFFACEOUS SILTSTONE/SANDSTONE. COMPOSITE OF 355138, 355139.
PET. 355141; 266.7, REP. 257.3 - 269.0

ANDESITIC BRECCIA; ALBITE/CHLORITE/SERICITE/KAOLIN ALTERED AMYGDALOIDAL ANDESITE CLASTS IN CARBONACEOUS PELITE MATRIX.
PET. 355142; 275.0; REP. 269.0 - 283.3

ANDESITIC BRECCIA. CHLORITIC AMYGDALOIDAL ANDESITIC LAVA CLASTS IN QUARTZ/CHLORITE/CALCITE MATRIX STRONGLY IMPREGNATED WITH YELLOW SPHALERITE.
PET. 355143, 281.2, 283.3 - 288.4.

ANDESITIC BRECCIA. CLASTS OF CHLORITISED, ALBITIC, TRACHYTE TEXTURED LAVA, CHLORITISED/ALBITISED PERLITIC LAVA IN SPARSE MATRIX OF QUARTZ, CALCITE, RED SPHALERITE.

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024136

PROJECT: Hatfield

PROSPECT: Murchison Hwy Zone

HOLE NO: MC-13

PAGE: 8 of 9

LOGGED: AMH

DATE: May 1985

DEPTH	DRILL RUNS	CORE LOSS
296	3.0	0
298–300	3.2	0.1
302	3.1	0
304–306	2.9	0.1
308	3.0	0
310–312	3.0	0.3
314	29	0
316–318	30	0
320	3.1	0
322–324	28	0
326	3.0	0
328–330	31	0
332	31	0
334–336	31	0

LITHOLOGY

ROCK NAME

DESCRIPTION

Yellow ?prehnite/pumpellyite

Matrix of finer fragments of similar composition and overall dark green/grey andesitic matrix. In several zones matrix is flooded with white quartz/carbonate/feldspar giving a brecciated appearance.

ALTERATION

VEINING TYPE INTENSITY

″ 3 (296)

(302.7 – pink feldspar in vein)

″ 3 (306)

″ 3 (320)

″ 3 (334)

MINERALISATION

301.1 – 301.4
Brown sphalerite in vein ∥ to core axis

329.7 – 330.0
Pyrite rimming quartz/carb/feldspar matrix fill

STRUCTURE

WEATHERING

VISUAL LOG

REMARKS

PES 355mm: 324.6, Rep 330.4 – 333.7

Sericiteous basaltic breccia. Traces chlorite. Random blebs sph, cpy, py in matrix, amygdules. Clasts - pyrox(stic), andesite (green) phenocrysts + albite microlites

DEPTH: 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336

ABERFOYLE EXPLORATION

DIAMOND DRILL LOG

024137

PROJECT: Hatfield

PROSPECT: Murchison Hwy Zone

HOLE NO: MC-13

PAGE: 9 of 9

LOGGED: AMH

DATE: May 1985

DEPTH	DRILL RUNS	CORE LOSS
338	3·1	0
342	3·1	0
344	3·0	0
348	3·0	0
350	3·0	0
354	3·1	0
356	3·0	0
360	3·1	0
362	3·1	0
366	3·1	0
368	3·1	0
372	3·1	0

LITHOLOGY — ROCK NAME / DESCRIPTION

373·7 EOH.

ALTERATION

VEINING — TYPE / INTENSITY

3

(348·2 - FIBROUS WHITE MIN - CHRYSOTILE - ASSOC. WITH CALCITE IN 5CM VEIN)

(350·4 - AS FOR 348·2)

3

(364·3 THIN PHLOGOPITE VEIN)

2

MINERALISATION

STRUCTURE

WEATHERING

VISUAL LOG

REMARKS

PET. 355NS , ESP. 281·9 – 373·7

SCORIACEOUS BRECCIA; SILICIFIED SIDERITE STAINED LAVA IN MATRIX OF FINE GRAINED QUARTZ CALCITE VUGS. TRACES CHROMITE

DEPTH: 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378

133

APPENDIX VII

137

024139 15 JUL REC'D

Central Mineralogical Services

CMS

39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5659

Mr. A.M. Hespe
Project Geologist
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12th July, 1985

REPORT CMS 85/7/7

YOUR REFERENCE: Letter dated 1.7.1985

DATE RECEIVED: 3rd July, 1985

SAMPLE NOS.: 355136 - 355145

SUBMITTED BY: A.M. Hespe

WORK REQUESTED: Petrology

for

H.W. Fander, M. Sc.

Copy to:
The Chief Geologist
Aberfoyle Exploration Pty. Ltd.
144, Camberwell Road
HAWTHORN EAST / VIC. 3123

MC-13

138

REPORT CMS 85/7/7

Ten drill core samples, from DDH-MC 13 at Mount Charter, were received for petrological examination. Representative thin-sections were prepared and examined together with the respective offcuts, with stain tests performed as warranted. Attached tabulated descriptions summarise the microscopic data and include interpretative comments.

Summary

As sampled, the drilled sequence may be divided into four units, with an altered chromiferous basalt overlying impure limey and tuffaceous psammopelitic sediments, and altered "leuco-andesitic" breccia unit and a basal chromiferous basalt breccia unit. The "upper" and "lower" basalt units are petrologically similar and conceivably represent a structural repetition, although interpretation will be dependent on field evidence.

Sediments are dominantly carbonaceous-pyritic tuffaceous psammopelitic types, with "dacitic" components partly obscured by marked sericitic alteration and high-angle shearing effects.These rocks are weakly microfossiliferous (in chalcedonic radiolaria and locally ?sponge spicules) as is similarly the overlying impure limestone (355137). Pyritic to locally weakly sphalerite-mineralised carbonaceous pelites are a matrix component in underlying leuco-andesitic breccias.

Volcanics, in general, exhibit quartz-sericite-calcite, or chloritic, or more typically composite alteration assemblages. Breccias tend to be quartz-matrixed, with calcitic vugs and veinlets predating incipient shearing effects. The lower (leuco-andesitic, basaltic) volcanics exhibit matrix-and veinlet-hosted sphalerite disseminations and impregnations, with locally associated chalcopyrite supplementing more or less ubiquitous pyrite disseminations.

The "lower" basalt breccias carry sporadic vugs, amygdale-fillings and replacive impregnations of a "zeolite facies" prehnite-pumpellyite-zoisite assemblage overprinted on the "pervasive" (quartz-sericite-calcite-chlorite) assemblage.

D. Cowan, B. Sc.

Sample No.	Classification - Composition	Fabric	Accessories	Comments
355-136 (T.S. 53851)	<u>Amygdaloidal Basalt</u>. Sericite-calcite-pseudomorphed feldspar and microcrystalline quartz-calcite-pseudomorphed pyroxene phenocrysts, quartz-calcite-chlorite amygdales; groundmass of sericitised plagioclase microlaths, quartz-calcite mesostasis.	Finely porphyritic, amygdaloidal, "basaltic".	Minor cherty quartz-, sporadic crosscutting calcite veinlets. Leucoxenised opaques, fine chromite. Traces of pyrite, chlorite.	Quartz-sericite-altered/calcite-veined-impregnated, chromiferous, amygdaloidal basic lava. Includes isolated corroded quartz phenocrysts.
355-137	<u>Impure Limestone</u>. Fine to microcrystalline calcite with minor intergrown sericite, carbonaceous matter, fine "syngenetic" pyrite. Disseminated clots of lustre-mottled calcite.	Phyllitic; pressure-shadowed pyrite, calcite clots.	Minor traces of quartz, chlorite.	Sub- to low-greenschist facies alteration effects. No exhalative characteristics. Lustre-mottled calcite appears to represent a minor fossil (?echinoderm) component.
355-138	<u>Tuffaceous Psammopelite</u>. Framework of silt- to medium sand-sized, angular to subround sericitised feldspar, subordinate quartz grains, sericitic pelite, sericitised felsite clasts. Carbonaceous calcite-stained sericitic-chloritic pelite matrix, partings.	Silty shale-parted, poorly sorted sandy clastic, with a high-angle discordant slaty cleavage.	Chalcedonic simple radiolaria, clastic mica flakes, leucoxenic semi-opaques. Disseminated syngenetic pyrite	Mildly reworked acid (dacitic-rhyolitic) tuffaceous characteristics. Finer detail obscured by sericitic alteration, shearing effects.
355-139	<u>Tuffaceous Siltstone</u>. Semi-sericitic white mica with disseminated splintery to subangular silt- to fine sand-sized quartz grains, sericitised feldspar grains, minor sericitised lithic clasts, carbonaceous matter.	Angular silty clastic, banded on sub- to fine millimetric scale, with a high-angle phyllitic overprint.	, Conspicuous silt-sized clastic leucoxenic semi-opaques,spare mica flakes, minor syngenetic pyrite,calcite-quartz veinlets.	Exhibits vague relict "vitroclastic" (sericitised shard fragments) features. Weakly radiolarian. "Feathery" bedding structures result from high-angle shearing.
355-140	<u>Tuffaceous Psammopelite</u>. Semi-sericitic white mica and pale chlorite with a clastic component of extensively sericitised plagioclase, splintery to subangular quartz, sericitised shard fragments. Semi-pervasive carbonaceous matter.	Carbonaceous pelite-parted, poorly sorted (silty fine to medium), angular, sandy, clastic; high-angle phyllitic/microcrenulated	Leucoxenic semi-opaques, white mica flakes, chalcedonic radiolaria spicule fragments, pyrite.Calcite-chlorite-sphalerite veinlets.	Composite of 355138, 355139 characteristics, similarly sericite-chlorite-altered/high-angle sheared.Sphaleritic calcite veinlets carry traces of albite.
355-141	<u>Andesitic Breccia</u>. Clasts of albite-chlorite-sericite-kaolin-altered, weakly quartz-chlorite-amygdaloidal leuco-andesitic lava. Matrix of carbonaceous pelite with irregular quartz veinlets, vugs; sporadic crosscutting calcite veinlets.	Millimetric to centimetric-scale clasts, displacive quartz and (late) calcite veinlets. Mildly sheared.	Conspicuous leucoxenised opaques, sparse quartz silicified pyroxene phenocrysts in clasts. Minor fine to ultrafine pyrite,traces sphalerite.	Carbonaceous pyritic/weakly sphaleritic pelite-matrixed "leuco-andesitic-dacitic" breccia. Mildly rebrecciated/quartz-healed; refractured/calcite-veined, sheared.
355-142	<u>Andesitic Breccia</u>. Clasts of chloritic/variably calcite-stained/calcite-chlorite-amygdaloidal lava with relatively fine silicified perlitic lava clasts; matrix of fine-grained quartz with vugs,films of chlorite,calcite.Disseminated fine sphalerite.	Random, sub-millimetric to centimetric-scale flow-orientated clasts. Interclast cavity-filling matrix.	Conspicuous leucoxenised opaques, minor silicified pyroxene phenocrysts, minor traces of pyrite.	Quartz-calcite-chlorite-matrixed/altered leuco-andesitic breccia. Pale (yellow) sphalerite impregnations in clasts, relatively conspicuous in siliceous matrix, replacements.
355-143	<u>Andesitic Breccia</u>. Interspersed clasts of chloritised-albitic, trachytic-textured and *albitised-chloritic perlitic lava. Sparse* interclast matrix, interspersed veinlets, "stringers" of quartz, calcite,red sphalerite	Variably moulded to quartz-calcite-sphalerite-matrixed, randomly sorted clasts.	Minor fine pyrite impregnations. Leucoxenised opaques.	Flow-marginal leuco-andesitic breccia characteristics. Alteration/mineralisation similar to 355142, but with sphalerite concentrated in veinlets, vugs.

Sample No.	Classification - Composition	Fabric	Accessories	Comments
355-144	<u>Scoriaceous Breccia</u>. Silicified orthopyroxene-/fresh augite-porphyritic, albite-microlitic lava clasts. Matrix, abundant amygdales of quartz, calcite, with interspersed clots of prehnite, pumpellyite, zoisite.	Random millimetric to centimetric, strongly amygdaloidal clasts. Interclast cavity-filling matrix.	Traces of chromite. Sporadic blebs of sphalerite, chalcopyrite, minor traces of pyrite in matrix, amygdales.	Weakly chromiferous "andesitic basalt" characteristics. The prehnite-pumpellyite-zoisite assemblage partly postdates quartz-calcite-albite alteration. Sulphide randomly distributed.
355-145 (T.S. 53860)	<u>Scoriaceous Breccia</u>. Clasts of partly silicified/variably cloudy Fe-calcite-stained lava (similar to 355144). Matrix of fine-grained quartz, sporadic vugs of calcite. Interspersed replacive films, amygdales of pumpellyite, minor zoisite.	Similar to 355144.	Traces of chromite. Minor secondary clots, films of albite, disseminated pyrite, traces chalcopyrite, chlorite in amygdales, matrix.	Close affinities with 355144. Similarly altered/mineralised, with sporadic late clast-corrosive patches of pumpellyite, amygdales of zoisite.

APPENDIX VIII

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024144

Report on CSAMT Measurements
Hatfield Project
Waratah, Tasmania
For Aberfoyle Exploration Pty., Ltd.

143

024145

Report on CSAMT Measurements
Hatfield Project
Waratah, Tasmania
For Aberfoyle Exploration Pty., Ltd.

July 9, 1985

INTRODUCTION

During the period of February 22 to 26, 1985, controlled source audio-magnetotelluric (CSAMT) measurements were made by Zonge Engineering and Research Organization (Z.E.R.O.) Australia, Pty., Ltd. for Aberfoyle Exploration Pty., Ltd. at the Hatfield Project area, Waratah, Tasmania. Production was hindered by high noise levels from a major powerline and by fairly continual rain throughout the survey.

Data were taken along two lines, 4000mN and 5800mN, using a transmitting dipole 1000 meters in length, bearing N90E, located approximately eight kilometers to the north of line 5800mN and ten kilometers to the north of line 4000mN. CSAMT data were taken at nine stations on line 5800mN using a 50 meter grounded dipole for measurement of the primary horizontal component of the electric field (E-field) and a ferrite-core coil oriented perpendicular to the E-field for measurement of the primary horizontal component of the magnetic field (H-field). Six stations of data were taken along line 4000mN using a 100 meter grounded dipole for the E-field measurement. Data were read in binary increments of frequencies from 16 Hz to 4096 Hz for station 1 through station 6 on line 5800mN. Stations 7, 8, and 9 on line 5800mN and all stations on line 4000mN were read in binary increments from 32 Hz to 4096 Hz.

Low signal strengths due to low transmitted currents and a large separation between transmitter and receiver lines, in addition to the powerline noise, intensified problems with data acquisition. In spite of these hindrances, the data were fairly repeatable in the frequency range of 16 Hz to 128 Hz. Higher frequency data were noisy, with frequencies of 256 Hz and 2048 Hz being unusable. As 256 Hz is very close to the fifth harmonic of the 50 Hz powerline, the extreme variability of signal magnitudes within a series of stacks is understandable. Explaining the poor repeatability of the 2048 Hz data is not so straightforward. It may be possible that the powerline has a two KHz carrier frequency to control switching. Both E-field and H-field components at these two frequencies were affected. The other high frequencies, i.e. 512 Hz, 1024, and 4096 Hz were slightly noisy, but sufficiently repeatable within a series of stacks.

Tests were conducted to verify the level of noise and to attempt to minimize noise pick-up. At station 1 on line 5800mN, data were collected with the transmitter turned off. A comparison of these measured signal magnitudes with those taken where current was transmitted, indicate that magnitudes from noise at 256 Hz and 2048 Hz could be from 25% to 100% of the signal magnitudes from transmitted current. For other frequencies, noise signal magnitudes were usually much less than 10% of signal magnitudes from transmitted current.

DATA REVIEW

The Cagniard resistivity plots indicate that the overall resistivity along line 4000mN is considerably higher than along line 5800mN. This high resistivity on 4000mN could be partly an artifact from the powerline crossing diagonally in front of the line between it and the transmitter dipole.

Line 4000mN Cagniard resistivity plots generally give a high-over-higher-over-moderately-high resistivity layering picture. (See also the log-log plots.) This contrasts sharply with the resistivity section derived from the H-field component only, which shows a high-over-low-over-high resistivity layering somewhat similar to line 5800mN but with lower resistivities. The absolute value of the apparent resistivities calculated from the H-field data are probably not very accurate, since we did not have accurate geometry on this survey, but rather had to scale dimensions and angles from a rough field map. However, the relative changes are considered significant.

The main item of interest on line 4000mN is the moderately low resistivity feature beneath stations 2 and 3. This can be seen best on the log-log plots as a shift in the transition zone from 128 to 64 Hz. More data would have to be acquired before much significance would be attributed to this feature, (i.e. is this an artifact of the powerline crossing near station 2?), or for depths to be determined. Phase data also indicate this could be the result of a near-vertical contact or fault near station 4, with lower resistivity material (or a thicker moderately-low resistivity layer) to the west of station 4.

Line 5800mN shows a lot of lateral variation which one may think at first glance is a result of static offset (near-surface effects). But, the phase data also vary considerably across the line, indicating that the variations are probably associated with outcropping or subcropping geologic changes and contacts. The very low resistivity feature beneath station 8 (bordering on a contact beneath station 9) appears to be about 70 meters deep.

The H-field derived resistivities for line 5800mN show a high-over-moderately-low-over-very-high resistivity layering environment. The horizontal H-field is insensitive to lateral features, and as such provides a smoothed, layered picture.

The log-log apparent resistivity plots for line 5800mN graphically show changes in near-surface resistivities, with the area beneath station 8 showing the lowest resistivities of anything found on this survey.

A low resistivity anomaly beneath station 1 is interesting in that both the log-log curves and phase values show it to be something at depth--possibly at 75 to 100 meters. But this single station anomaly needs to be better defined with additional data before being considered significant.

SUMMARY

Line 5800mN displayed the most variation with a very low resistivity anomaly beneath station 8 at about 70 meters. Also a singular, relatively low resistivity feature is observed beneath station 1 at about 75 to 100 meters.

Line 4000mN shows much more homogeneous electrical characteristics. Log-log plots show a marked change in character between stations 2 and 3, and the rest of the line. This change tends to indicate a weakly conductive layer at depth beneath stations 2 and 3, with a fault or contact between stations 3 and 4.

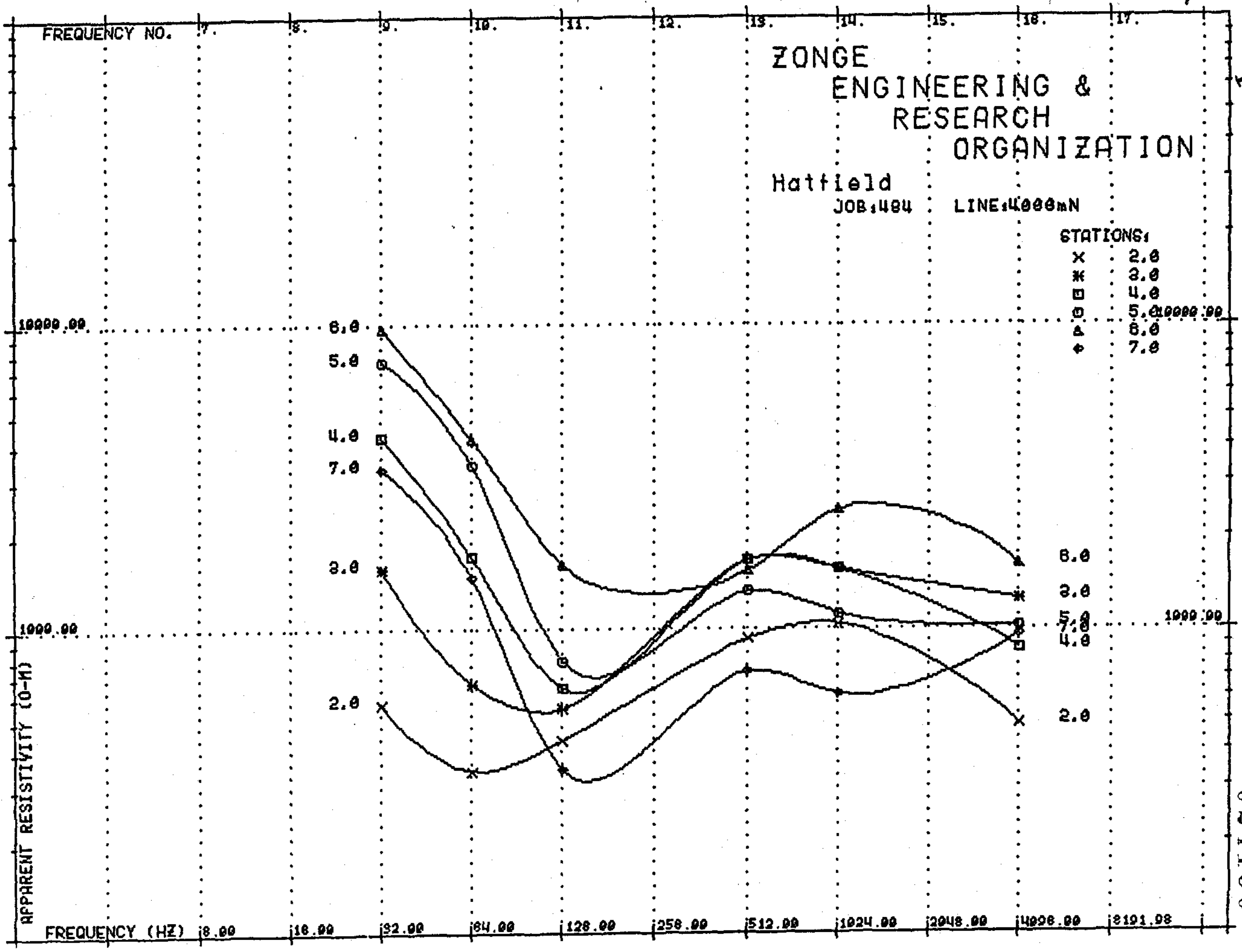
Geologic information must be coupled with this data set to enable accurate interpretation and to further evaluate conductive features observed on these lines.

Kenneth L Zonge

Kenneth Zonge

Mark Thoman

Mark Thoman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ENGINEERING &
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STATIONS:
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7.0
4.0
2.0
APPARENT RESISTIVITY (O-M)
FREQUENCY (HZ)
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32.00
64.00
128.00
256.00
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1024.00
2048.00
4096.00
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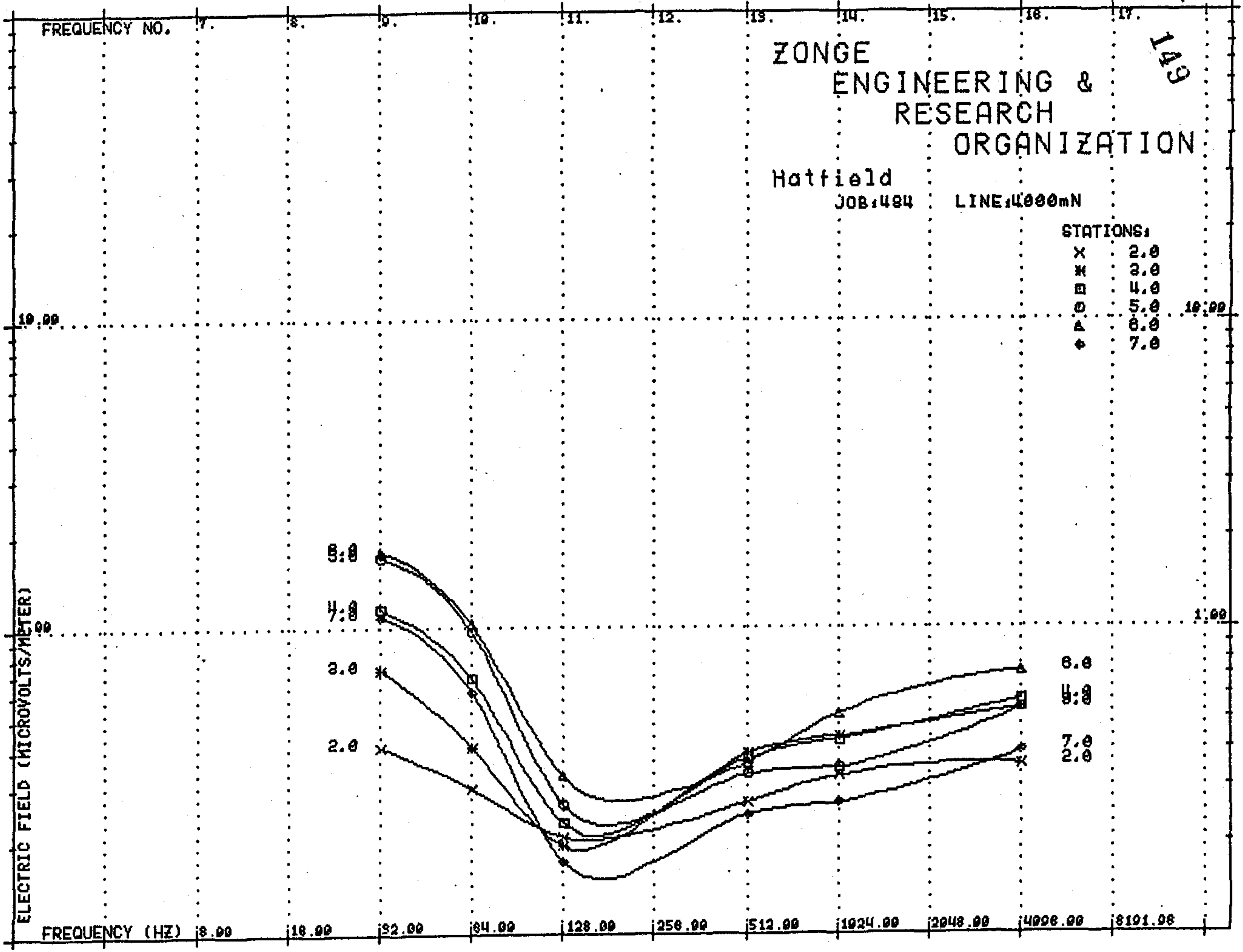
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ORGANIZATION
Hatfield
JOB:484
LINE:4000mN
STATIONS:
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FREQUENCY (HZ)
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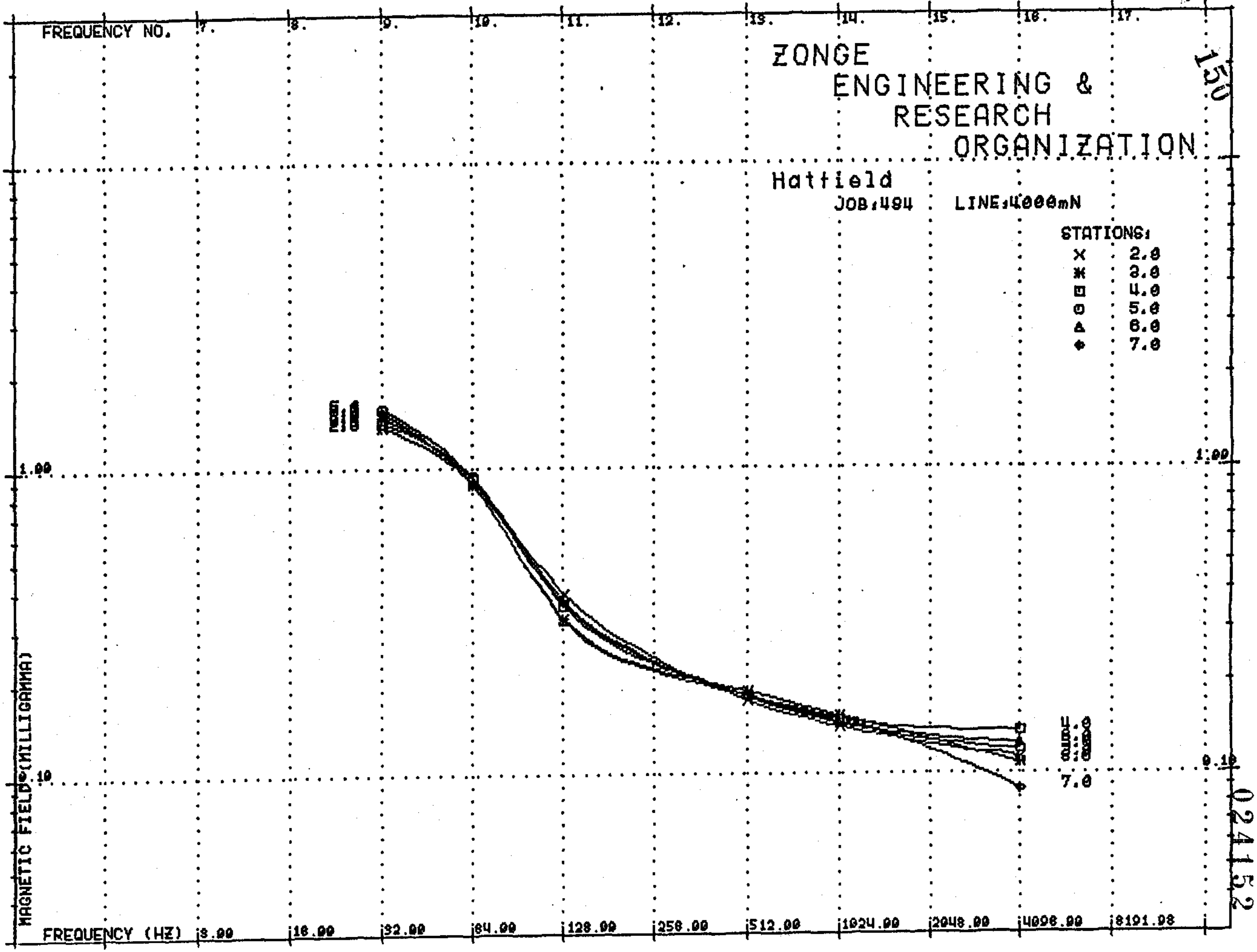
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RESEARCH
ORGANIZATION
Hatfield
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△ 6.0
◆ 7.0
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4.0
7.0
MAGNETIC FIELD*(MILLIGAMMA)
FREQUENCY (HZ)
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1024.00
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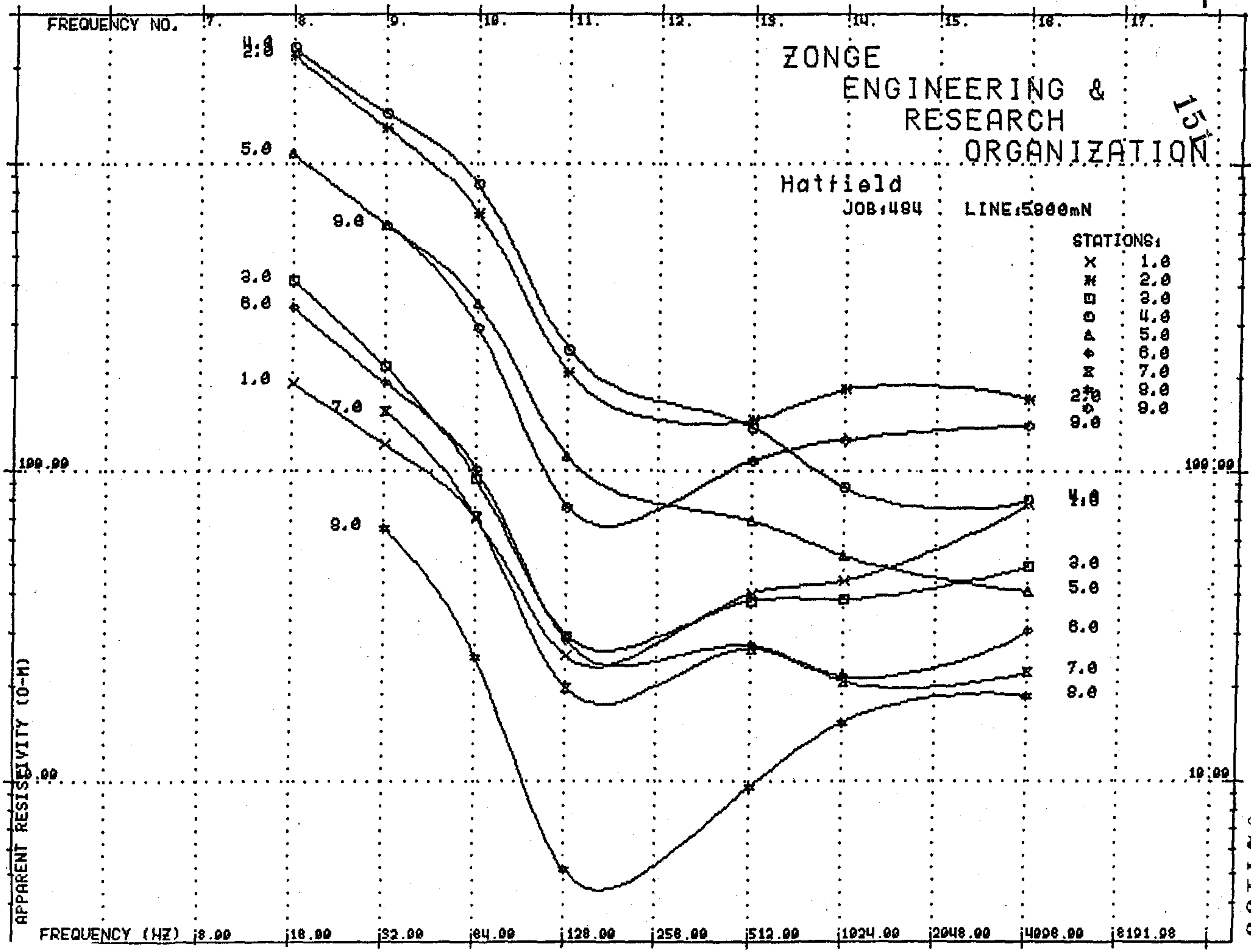
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ORGANIZATION
Hatfield
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8.0
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10.00
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APPARENT RESISTIVITY (O-M)
FREQUENCY (HZ)
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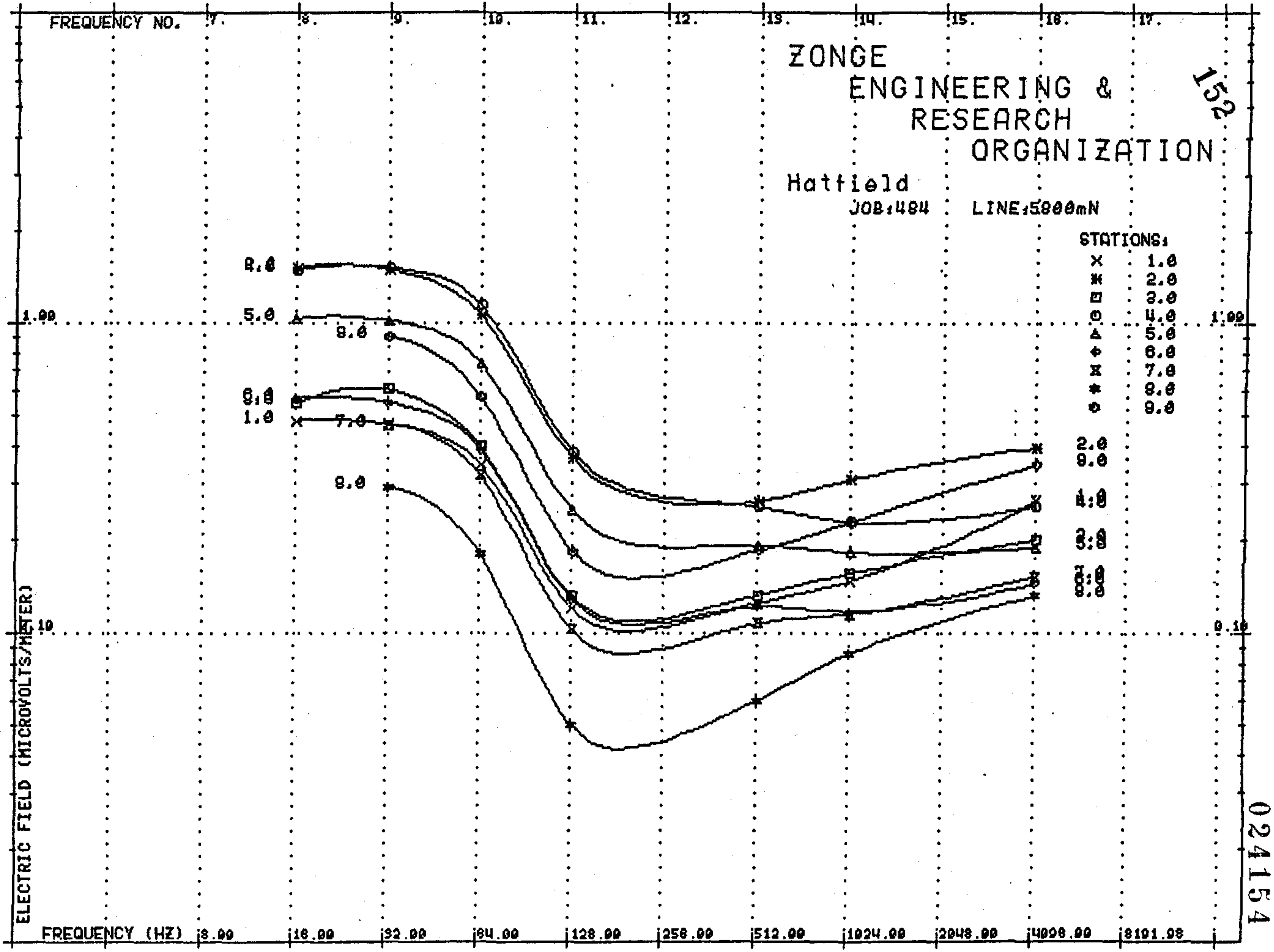
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Hatfield
JOB:484
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⊖ 4.0
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7.0 6.0 8.0
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FREQUENCY (HZ)
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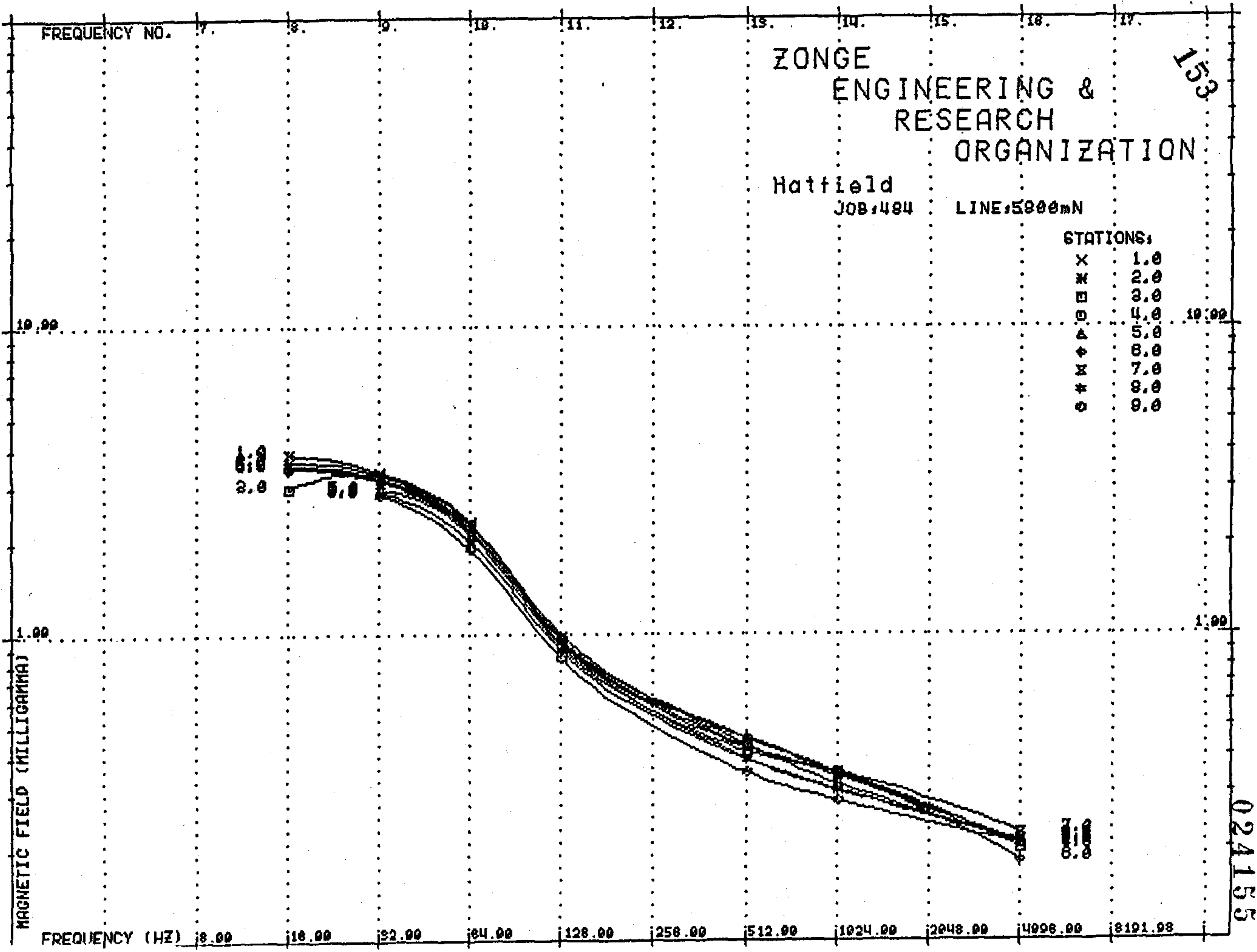
152

024154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RESEARCH
ORGANIZATION
Hatfield
JOB:484
LINE:5800mN
STATIONS:
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MAGNETIC FIELD (MILLIGAMMA)
FREQUENCY (HZ)
8.00
16.00
32.00
64.00
128.00
256.00
512.00
1024.00
2048.00
4096.00
8191.98

Line 4000mN
Hatfield
for
ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 31
Plotted WED, JUN 26 1985

ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY
values in ohm-meters

RECEIVER DATA
Dipole Length: 100.m
Stn. Spacing : 100.m

Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 10 km
Rx to Tx: NORTH

[Plot limits] and LOGARITHMIC CONTOURS (Interval: 0.20

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2512.
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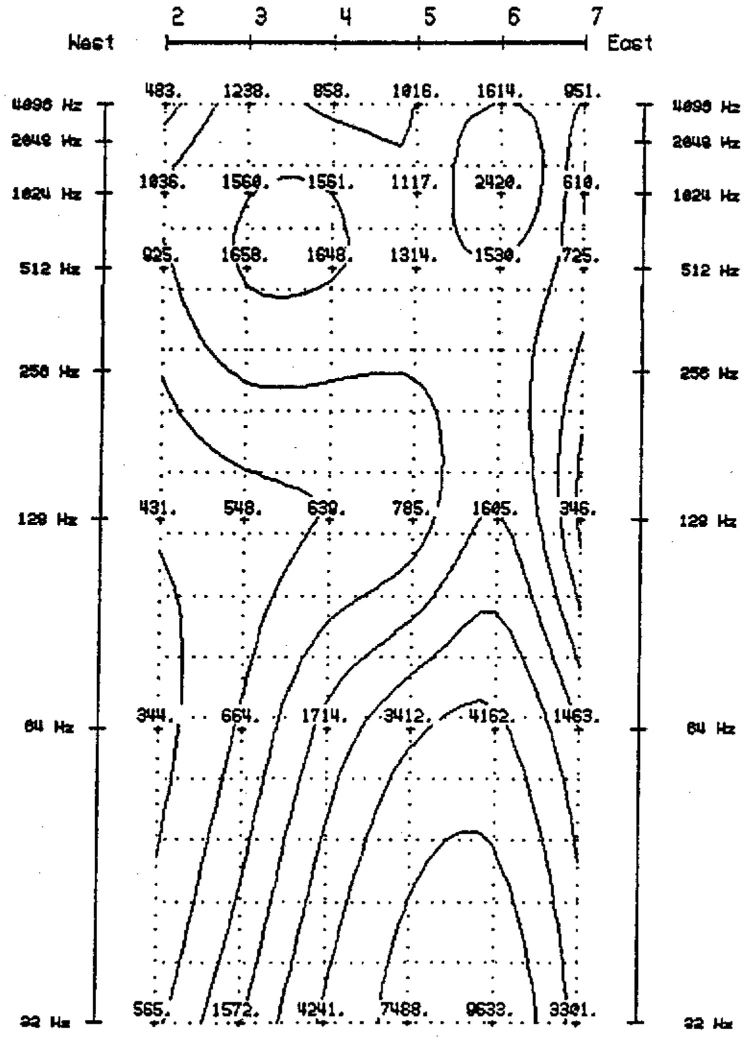

Line 4000mN

Hatfield

for

ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 3:
Plotted WED, JUN 26 1985

ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA
PHASE DIFFERENCE (E phase - H phase)

values in milli-radians

RECEIVER DATA
Dipole Length: 100.m
Stn. Spacing : 100.m

Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 10 km
Rx to Tx: NORTH

[Plot limits] and ARITHMETIC CONTOURS (Interval: 100.00

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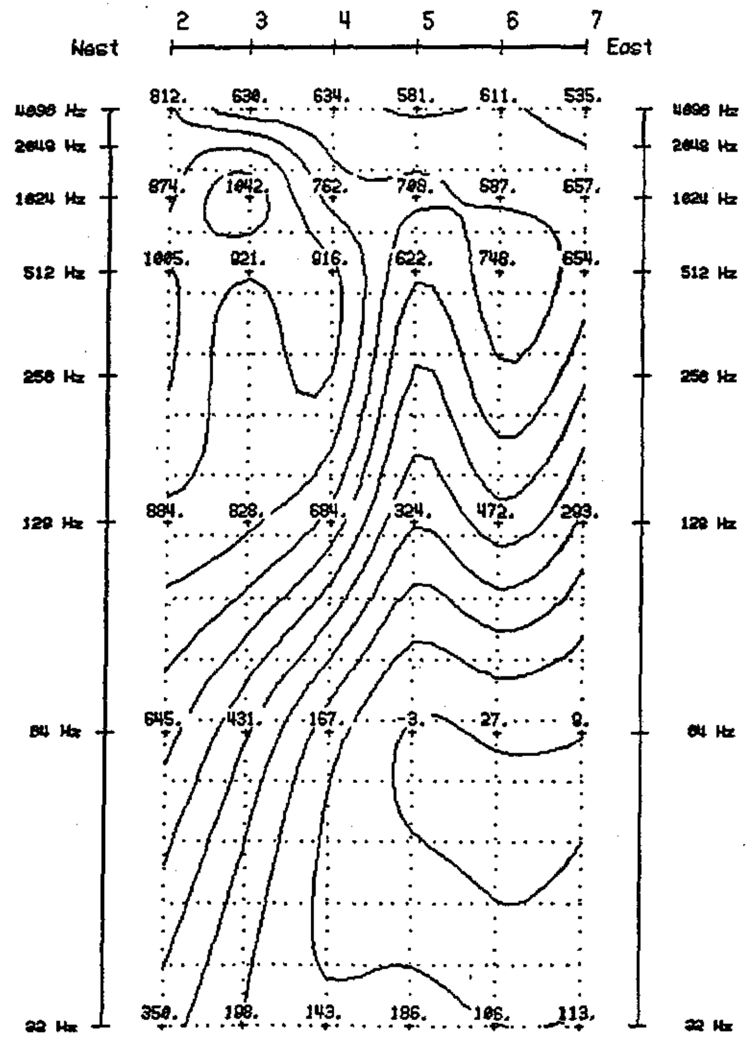

Line 4000mN
Hatfield
for
ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 3i
Plotted TUE, JUN 25 1985

ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY
values in ohm-meters

RECEIVER DATA
Dipole Length: 100.m
Stn. Spacing : 100.m

Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 10 km
Rx to Tx: NORTH

(Plot limits) and LOGARITHMIC CONTOURS (Interval: 0.2

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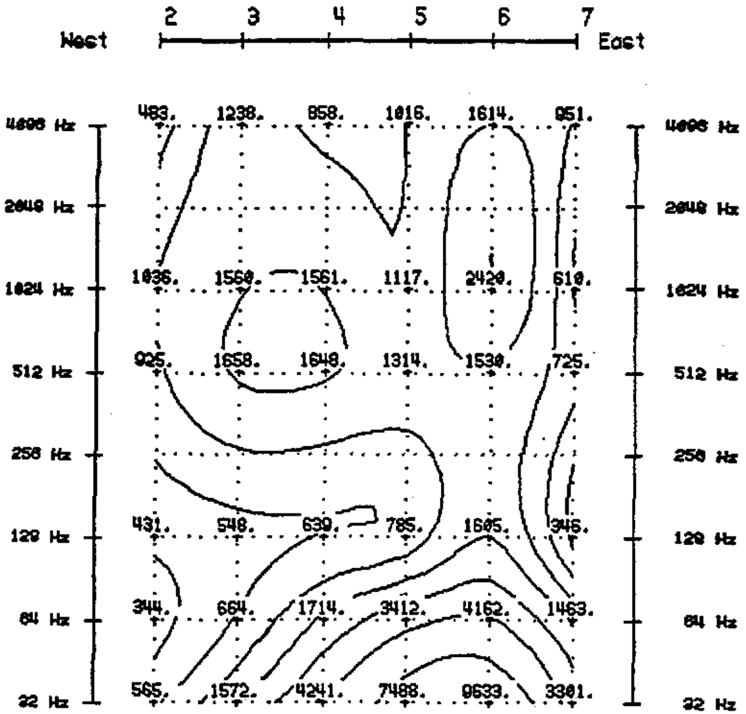
1000.
1585.
2512.
3981.
6310.
(9867.)

156



024158

Line 4000mN
Hatfield
for
ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 3:
Plotted TUE, JUN 25 1985

CO

ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA
PHASE DIFFERENCE (E phase - H phase)
values in milli-radians

RECEIVER DATA
Dipole Length: 100.m
Stn. Spacing : 100.m

Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 10 km
Rx to Tx: NORTH

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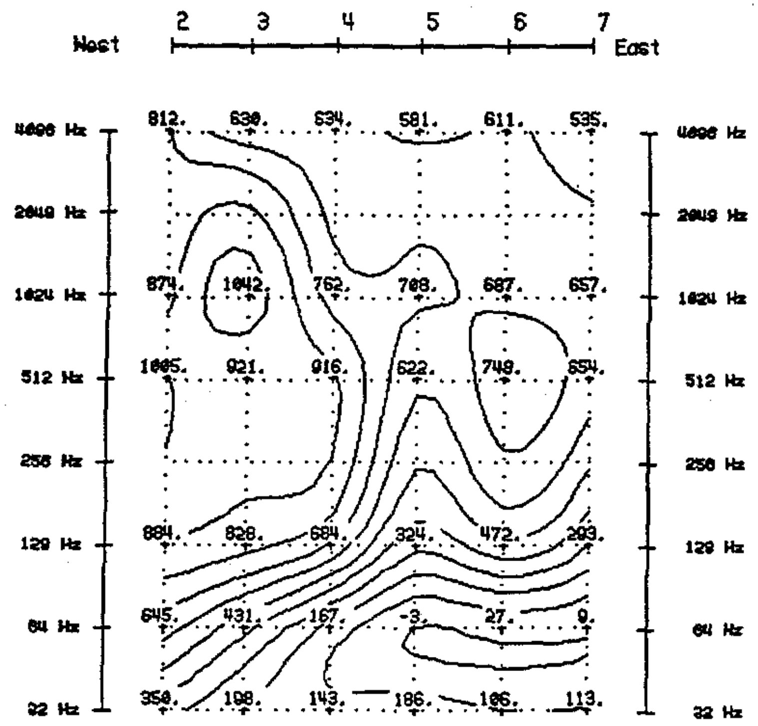

024159

Line 4000mN
Hatfield
for
ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 3i
Plotted TUE, JUN 25 1985

ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA
MAGNETIC FIELD APPARENT RESISTIVITY

based on matching observed H-fields
with analytical half-space H-fields.
Values in ohm-meters

RECEIVER DATA
Dipole Length: 100.m
Stn. Spacing : 100.m

Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
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Orient. : East
Distance: 10 km
Rx to Tx: NORTH

[Plot limits] and LOGARITHMIC CONTOURS (Interval: 0.20)
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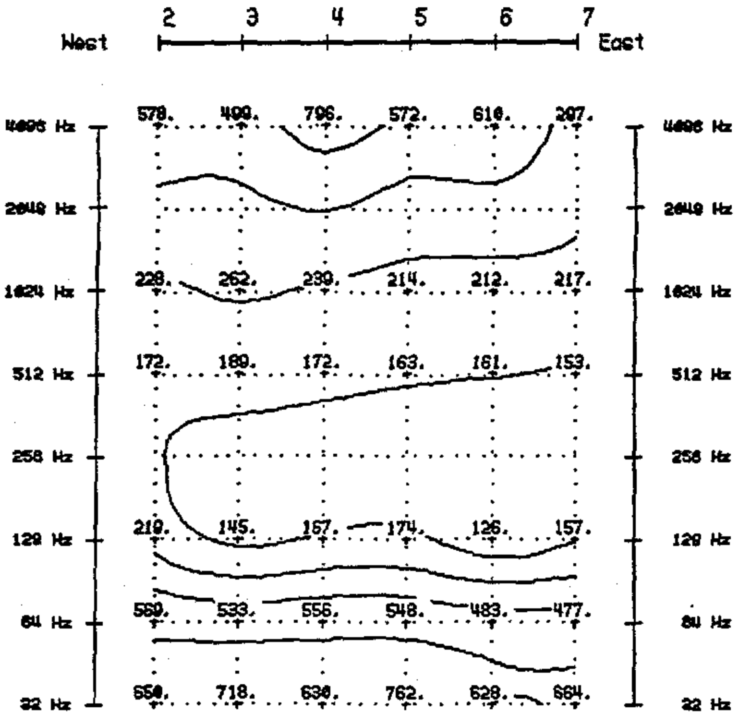
398.
631.
[795.]



Line 5800mN
Hatfield
for
ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 3i
Plotted WED, JUN 26 1985

ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY
values in ohm-meters

RECEIVER DATA
Dipole Length: 50.m
Stn. Spacing : 50.m

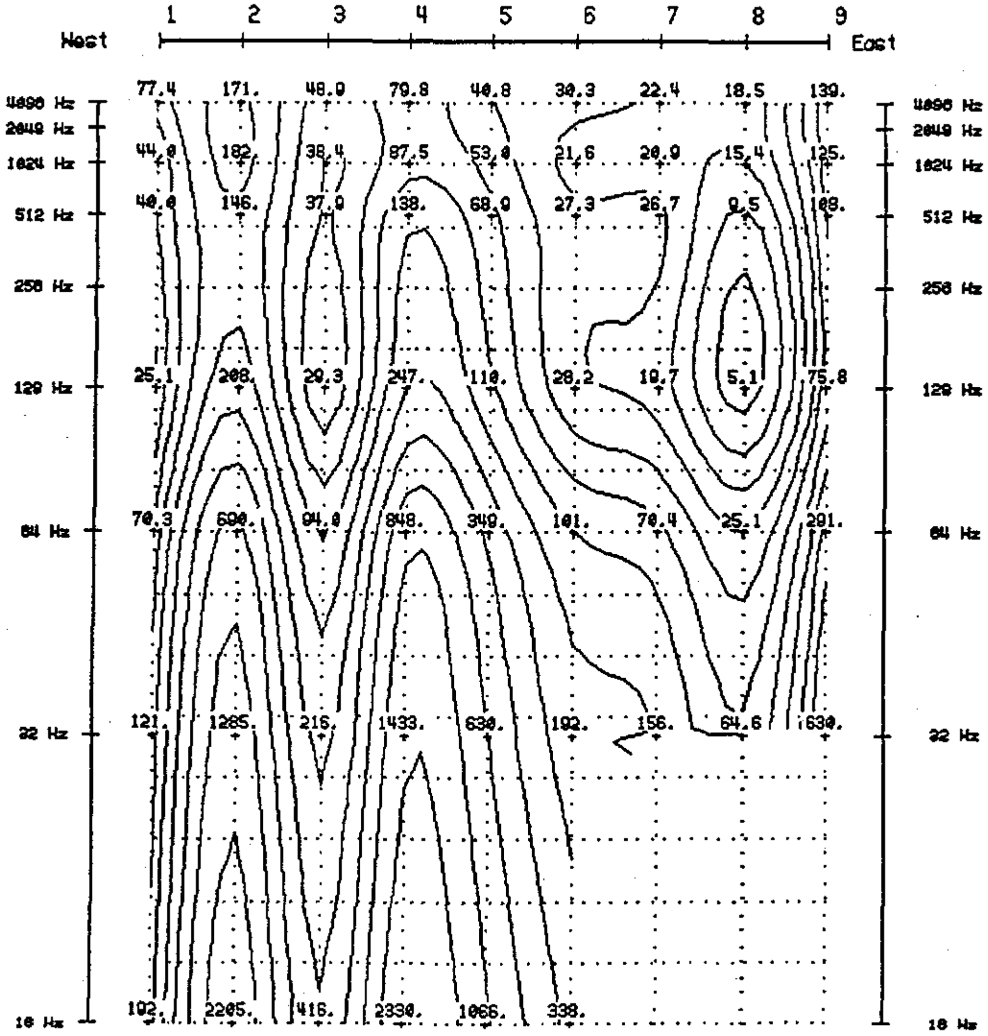
Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 8.5 km
Rx to Tx: North

[Plot limits] and LOGARITHMIC CONTOURS (Interval: 0.20

[4.80]	158.
6.31	251.
10.0	398.
15.8	631.
25.1	1000.
39.8	1585.
63.1	[2442.]
100.	



Line 5800mN
Hatfield
for
ABERFOYLE EXPLORATION PTY.,LTD

onge # 484
lot by CPLOT 3i
lotted TUE, JUN 25 1985

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ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY

values in ohm-meters

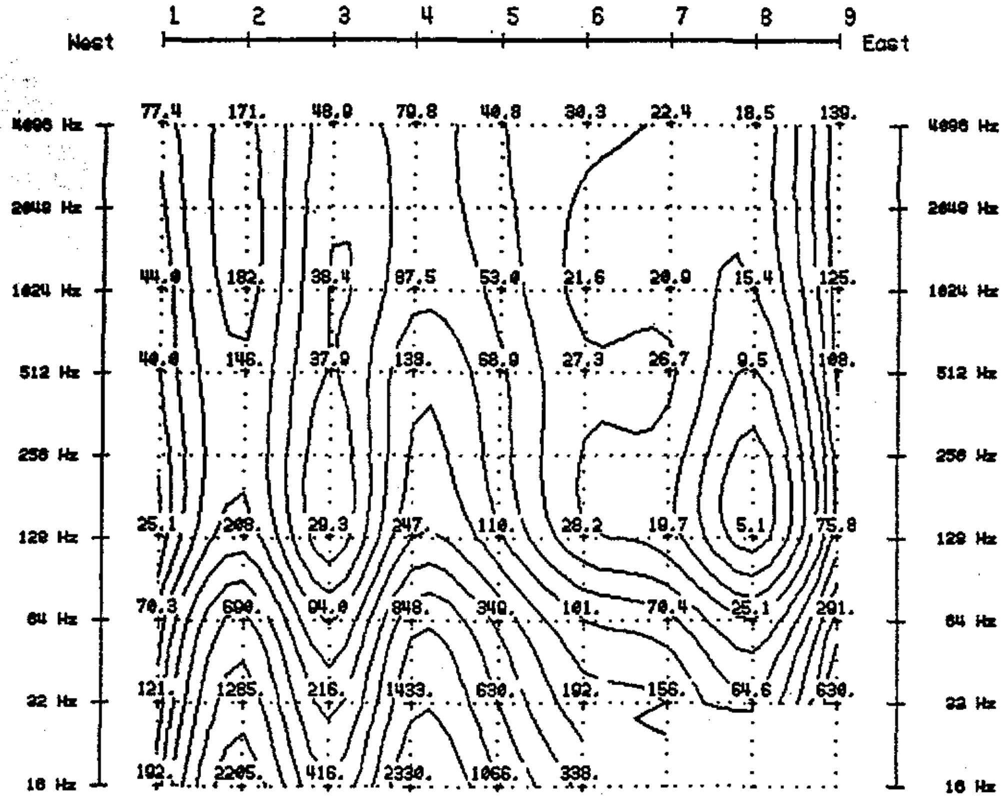
RECEIVER DATA
Dipole Length: 50.m
Stn. Spacing : 50.m
Line Orient: East
Dipole Orient: East
Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 8.5 km
Rx to Tx: North

[Plot limits] and LOGARITHMIC CONTOURS (Interval: 0.20)

[4.40]	158.
6.31	251.
10.0	398.
15.8	631.
25.1	1000.
39.8	1585.
63.1	[2442.]
100.	

160



024162

Line 5800mN
Hatfield
for
ABERFOYLE EXPLORATION PTY.,LTD

nge # 484
ot by CPLOT 3i
otted TUE, JUN 25 1985

ZONGE ENGINEERING &
RESEARCH ORGANIZATION

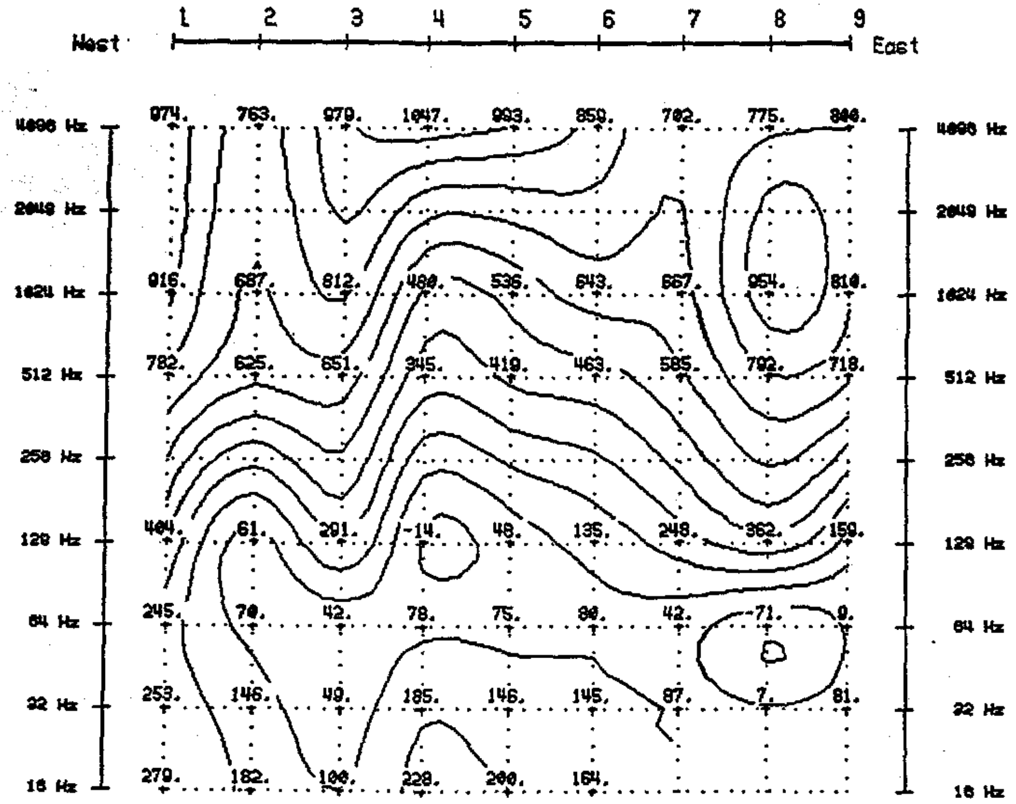
CSAMT SURVEY DATA
PHASE DIFFERENCE (E phase - H phase)
values in milli-radians

RECEIVER DATA
Dipole Length: 50.m
Stn. Spacing : 50.m
Line Orient: East
Dipole Orient: East
Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 8.5 km
Rx to Tx: North

(Plot limits) and ARITHMETIC CONTOURS (Interval: 100.00)

[-104.]	500.
-100.	600.
0.00	700.
100.	800.
200.	900.
300.	1000.
400.	[1047.]



Line 5800mN

Hatfield

for

ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 31
Plotted TUE, JUN 25 1985

ZONGE ENGINEERING &
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CSAMT SURVEY DATA
MAGNETIC FIELD APPARENT RESISTIVITY

based on matching observed H-fields
with analytical half-space H-fields.
Values in ohm-meters

RECEIVER DATA
Dipole Length: 50.m
Stn. Spacing : 50.m

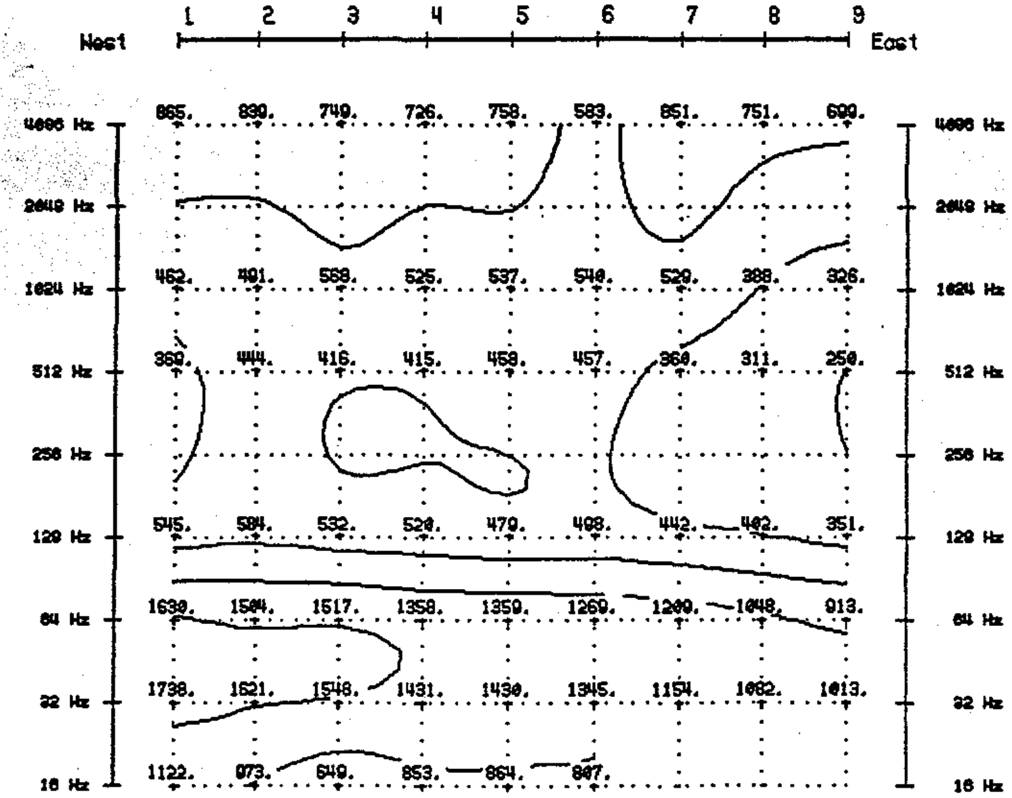
Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 8.5 km
Rx to Tx: North

[Plot limits] and LOGARITHMIC CONTOURS (Interval: 0.20)

[244.]
251.
398.
631.
1000.
1585.
[1869.]



Line 5800mN

Hatfield

for

ABERFOYLE EXPLORATION PTY.,LTD

Zonge # 484
Plot by CPLOT 31
Plotted WED, JUN 26 1985

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ZONGE ENGINEERING &
RESEARCH ORGANIZATION

CSAMT SURVEY DATA

PHASE DIFFERENCE (E phase - H phase)

values in milli-radians

RECEIVER DATA
Dipole Length: 50.m
Stn. Spacing : 50.m

Line Orient: East
Dipole Orient: East

Date of survey: Feb 85

TRANSMITTER DATA
Length : 1000 m
Orient. : East
Distance: 8.5 km
Rx to Tx: North

[Plot limits] and ARITHMETIC CONTOURS (Interval: 100.00

[-100.]	500.
-100.	600.
0.00	700.
100.	800.
200.	900.
300.	1000.
400.	[1047.]