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76-1176

ANNUAL REPORT

E.L. 41/71

(HENTY-YOLANDE)

1975-76

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DRAUGHTING: R. Wilson

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June, 1976

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MAPS

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APPENDICES

1. INTRODUCTION

Soil sampling of geophysical anomalies on the north and south-west extensions of the West Sedgwick grid and Madame Howard Plains grid was completed during 1975. Sampling has also commenced on the Basin Lake grid but data, at present, is only available for one anomaly in the south-east corner of the area. This sampling should be completed before the start of the 1976-77 field season. In addition to sampling geophysical anomalies an orientation programme was carried out over a part of the West Sedgwick grid to determine variations in soil values over different rock types.

Rock chip samples collected in field mapping programmes since 1971 have been categorized, assayed and the results used to try to identify specific areas of anomalous base metal values.

Expenditure on E.L. 41/71 up to 19th May, 1976 was $8,450 bringing the total expenditure since 1971 to $95,656.

2. WORK COMPLETED

2.1 WEST SEDGWICK GRID - SOIL SAMPLING

2.1.1 Orientation Sampling Programme

During November, 1975 line 84S. (West Sedgwick grid) was soil sampled at 100 ft. spacings over a total length of 10 000 ft. The purpose of this sampling was to determine the background and threshold values within different types of volcanic rocks, so that some additional information was available for screening the geophysical anomalies.

The samples were separated into three major rock types :

Type I Acid Volcanics - dominantly acid pyroclastics including fine grained tuffs to agglomerates, minor acid lavas and minor argillaceous sediments. (51 samples).

Type II Intermediate Intrusives and Volcanics - dominantly felspar-hornblende porphyry intrusions with minor andesitic lavas. (41 samples).

Type III Tyndall Group - including crystal, crystal-lithic and lapilli tuffs with minor sediments. (10 samples).

Glacial moraine is distributed irregularly over the area sampled but since they represent only 5%, approximately, of the total samples taken, they have been included in the statistical treatment.

A visual inspection of the results shows clearly that Type I gave considerably lower values than the other two groups. Log-probability data (Appendix I) show that copper and zinc distributions give two distinct populations, one which can be equated with Type I and the other with Type II and III. The lines representing the two population distributions are only approximate since detailed analysis is not valid on such a restricted number of samples. However, they do show that the threshold values for Type I (29 ppm Cu, 29 ppm Zn) were well below the background values for Type II and III (54 ppm Cu, 40 ppm Zn). Two populations were not distinguishable from the lead data and so background and threshold values were not calculated. (Table 1).

TABLE 1 BACKGROUND - THRESHOLD VALUES : LINE 84S. WEST SEDGWICK GRID

	Background			Threshold			Arithmetic Mean		
	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn
Total (102 Samples)	38	48	29	180	235	230			
Type I (51 Samples)	13	-	10	29	-	29	20	32	14
Type II (41 Samples)	54	-	40	210	-	270	48	52	48
Type III (10 Samples)							50	85	72

Arithmetic means, although of little statistical value, reflect similar variations for the different rock types. A distinctive feature is the high values for Type III (Tyndall Group) rocks, although this may result from the close proximity of the faulted Owen Conglomerate and the area of known mineralisation at the west end of the Comstock Valley.

Major conclusion reached from this programme was the necessity of knowing background variations in different rock types if soil sampling is to be confined only to specific geophysical anomalous areas. Sampling over distance of only a few hundred metres either side of a geophysical anomaly rarely gives a satisfactory, or reliable, background value.

The results shown in Table 1 do not seriously effect the drilling recommendations suggested in the Annual Report E.L. 41/71, 1974-75, although the proposed target on line 84S., 1050E.-1200E. should be partially down-graded since it is close to a masked contact of an intermediate porphyry body.

2.1.2 South-West Extension Grid

Soil sampling was carried out over 16 geophysical anomalies on the south-west extension grid during September, 1975. Geologically the anomalies fall into three major groups :

Group A - Associated with 3-4 shale horizons within a sequence of coarse to fine grained acid tuffs.

Group B - Associated within fairly massive sequences of ignimbrites.

Group C - Associated with the contacts of intermediate porphyry intrusives and lavas.

Only two of the eight primary geophysical responses were not in Group A, and of these two, only one (line 96S.,850W.) had any geochemical response.

Further geochemical work is required to check the high values on line 96S., 600E.-1100E. north-east of No. 3 Dam, since these results appear to be suspect.

Isolated high values have been recorded throughout the area unrelated to any geophysical response, and these have been interpreted as reflecting rock type changes.

The Lake Margaret Tram pyrite occurrence showed no geochemical value on the nearest line - line 96S., 50 metres to the north. However, fairly significant responses were recorded 150 metres to the south on line 102S., 850W. and 250 metres to the north on line 90S., 1050W. and 850W. This pyrite occurrence close to the contact of the shale/tuff and ignimbrite sequences remains the best drilling target on the south-west extension grid. If further drilling is warranted then targets in a similar geological setting with the best geophysical/geochemical response should have priority, e.g. line 114S., 1050W.

All relevant data has been tabulated in Appendix II.

2.1.3 Northern Extension Grid

Soil sampling of geophysical anomalies on the northern extension grid was completed during December, 1975. The only primary E.I.P. response was on line 6N., 150W. which is an extension of a minor response on the original West Sedgwick grid, line 00, 2850E. Soil sampling of this anomaly gave no significant values even though high Pb and minor peaks in Cu and Zn had been previously recorded on line 00, 2800E. and 2900E. Minor pyrite within a sequence of altered, foliated acid lavas (up to 2% Fe_2S) has also been recorded on line 00, 3200E. and 150 metres south-east of the Upper Haulage Station.

A minor geophysical response on line 6N., 2550E. of 13 milliseconds chargeability is also an extension of a major anomalous zone detected on line 00 to line 18S. Soil sampling of the glacials gave peaks at 2400E. (106 ppm Cu, 155 ppm Pb, 89 ppm Zn) and at 2750E. (98 ppm Cu, 150 ppm Pb, 25 ppm Zn) which are significant in that no previous values above a general background of 10 ppm Cu, 15 ppm Pb and 5 ppm Zn have been recorded in that area.

Soil sampling west of the sub-baseline was partly hindered by the Lake Margaret pipeline and township, and no geochemical values reflected the geophysical responses either on line 6N., 2200W.-2900W. or line 12N., 1800W.-3000W.

In general the soil sampling results confirm that the anomalous zone close to the Owen Conglomerate contact is a major drilling priority. This anomalous zone is now fairly well delineated and has a strike length of 800-900 metres. A low priority is attached to a target on line 6N., 150W.

Geological, geophysical and geochemical results have been tabulated in Appendix II.

2.2 MADAME HOWARD PLAINS GRID

During December, 1974 an E.I.P. survey over the Madame Howard Plains grid outlined one moderate and seven minor anomalies (Annual Report E.L. 41/71, 1974-75).

Only six anomalies, in the north west and central area of the grid, were considered to be worth soil sampling, since the remaining two were close to the road and had disturbed soil profiles.

Geological, geophysical and soil geochemical data is shown in Appendix II. In general the geochemical response was not significant, apart from an isolated high Pb value of 200 ppm on line 24S., 1250W. The only moderate E.I.P. anomaly gave no geochemical response.

The available data from the Madame Howard Plains grid indicates that no further work is warranted in this area at present.

Associated with the programme at Madame Howard Plains was an appraisal of various methods of treating soil samples in terms of size fractions, laboratory procedures and costs. The report on this work is given in Appendix IV.

2.3 BASIN LAKE GRID

Soil sampling of geophysical anomalies on the Basin Lake grid was commenced during the 1975-76 field season but is still to be completed. Only one anomaly (line 72S., 5600E.; line 78S., 5470E. and line 84S., 5200E.) has been sampled and this covers the anomalous zone tested by Pickands Mather Int. Co. Ltd. in 1970. Results were encouraging although poor drainage and heavy rainfall in the area, when added to variable glacial moraines, tend to complicate the interpretation of hydromorphic anomalies.

Samples were taken from the 'A' Horizon, since there was little chance of penetrating the moraines. Both -80# and -10/+80# fractions were assayed.

In general only on line 78S., 5500E. was there a direct correlation between the geophysics and a geochemical peak of 222 ppm Pb. On the other lines high values were recorded but displaced from the measured chargeability centre (Map) and further sampling will be required downslope.

When all sampling is completed a detailed appraisal of the soil geochemistry of the area will be compiled and appended to this annual report.

2.4 ROCK GEOCHEMISTRY

Appendix V lists all rock samples collected and assayed on the Exploration Licence since 1971. The assay data together with assay data for E.L. 9/66 has been analysed using log-probability techniques to set threshold values for Cu, Pb and Zn in different rock types. The method used is described in the 1974-75 Annual Report for E.L. 9/66. The log-probability technique of analysis is preferred to the use of histograms, because it allows a smaller number of samples to be handled within set confidence limits; also it is not so dependent, in the case of a strongly skewed distribution, upon the class interval choosen. Appendix VI, Figures 6 to 14 show the probability curves for Cu, Pb and Zn in acid pyroclastics, acid extrusives and intrusives and in intermediate volcanics. Subdivision of the intermediate volcanics was not possible due to the limited number of samples available.

The threshold values are listed below :

		Threshold	Geometric Mean	Arithmetic Mean
Acid Pyroclastics	Cu	110 ppm	35 ppm	40 ppm
	Pb	85	28	31
	Zn	250	58	60
Acid Extrusives and Intrusives	Cu	1000	27	62
	Pb	80	25	34
	Zn	-	60	73
Intermediate Volcanics	Cu	-	60	58
	Pb	120	25	31
	Zn	-	120	115

It will be noted that in some cases thresholds have not been set, this is because within the 95% confidence limits the populations concerned are distributed log-normally. Also of note is the high threshold value for Cu in acid extrusives and intrusives, this is a reflection of high value of the co-efficient of deviation, i.e. the large range involved. Range is defined as plus and minus one deviation, σ , from the geometric mean, $\bar{x}$; the range in a logarithmic distribution encompasses 68% of the samples in the population. The ranges for Figures 6 to 14 and the co-eficients of deviation are listed below :

		$\bar{x} - \sigma$	$\bar{x}$	$\bar{x} + \sigma$	Co-ef. of Deviation
Acid Pyroclastics	Cu	19	35	100	0.46
	Pb	18	28	62	0.33
	Zn	25	58	100	0.24
Acid Extrusives and Intrusives	Cu	5	27	130	0.68
	Pb	18	25	48	0.28
	Zn	25	60	140	0.37
Intermediate Volcanics	Cu	19	60	180	0.47
	Pb	7	25	80	0.51
	Zn	30	120	300	0.40

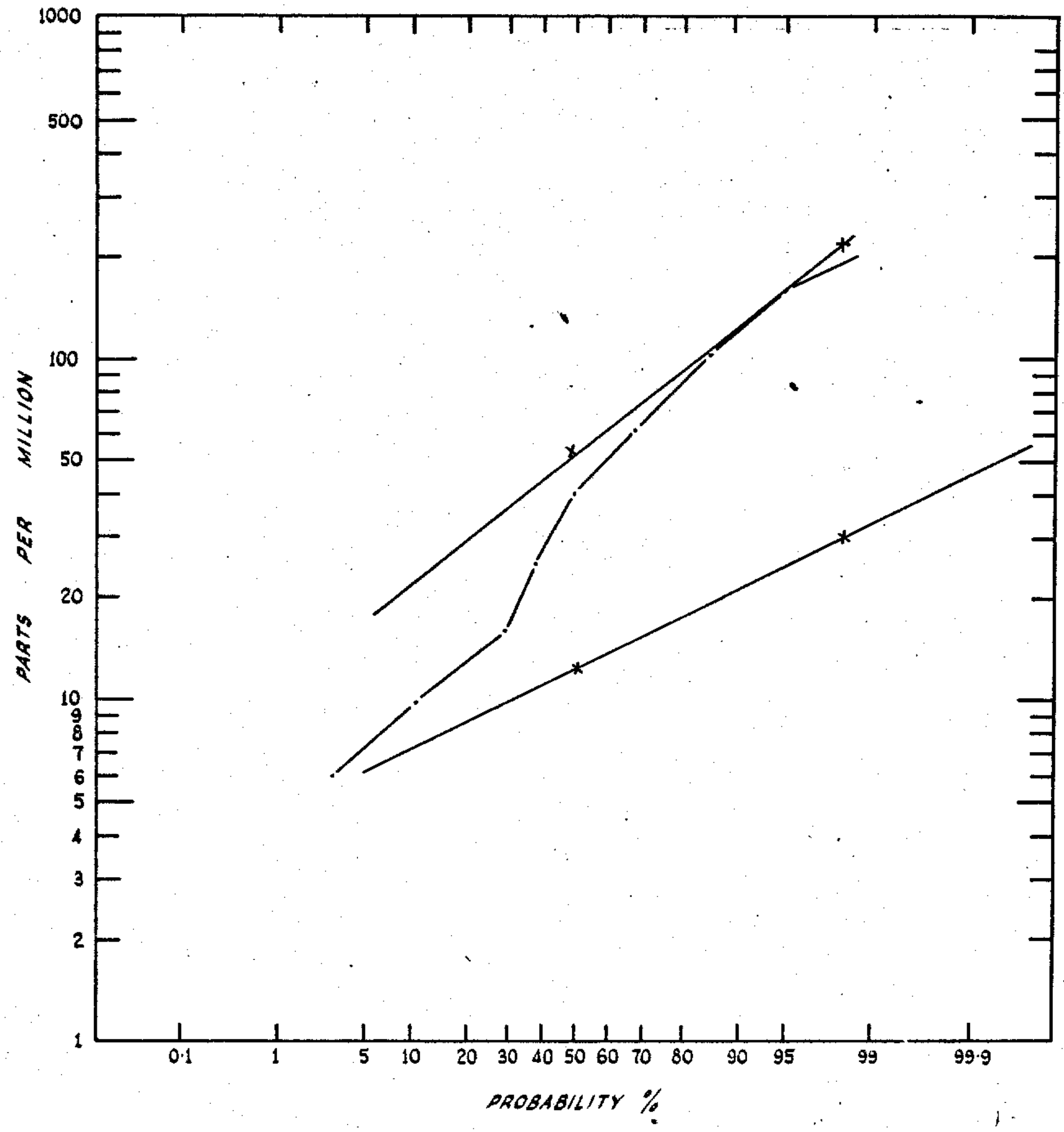
The locations of samples with above threshold values are plotted on Map 7. No firm conclusions can be drawn at this stage, but any area with 'anomalous' samples will require further investigations. The main problem inherent in the data used, is that although statistically valid conclusions may be drawn for the sampled populations, these conclusions are not necessarily true for the 'target' populations. The technique appears to have validity but it is necessary to sample in a statistically valid manner the 'target' populations, and it is recommended that this be done in future.

3. PROPOSED EXPLORATION PROGRAMME 1976-77

The proposed programme for 1976-77 essentially involves further exploration in the West Sedgwick area to enable three targets to be identified and drilled. This will include extension of lines 78S., 72S. and 66S. westwards to the Lake Margaret road plus further E.I.P. and soil geochemical surveys. Drilling is scheduled to commence during Period 7.

Soil sampling of the Basin Lake geophysical anomalies should continue allowing identification of further drilling targets before the end of 1976-77.

APP. 1 FIG 1



(TOTAL SOILS)

Nº OF SAMPLES n = 102

METAL ················ Cu

SAMPLE TYPE ······· SOIL SAMPLE

HORIZON ·············· C

FRACTION ············· -80 #

1ST ORDER THRESHOLD ······ 180 p.p.m.

2ND ORDER THRESHOLD ······ p.p.m.

3RD ORDER THRESHOLD ······ p.p.m.

BACKGROUD MEDIAN ······ 38

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

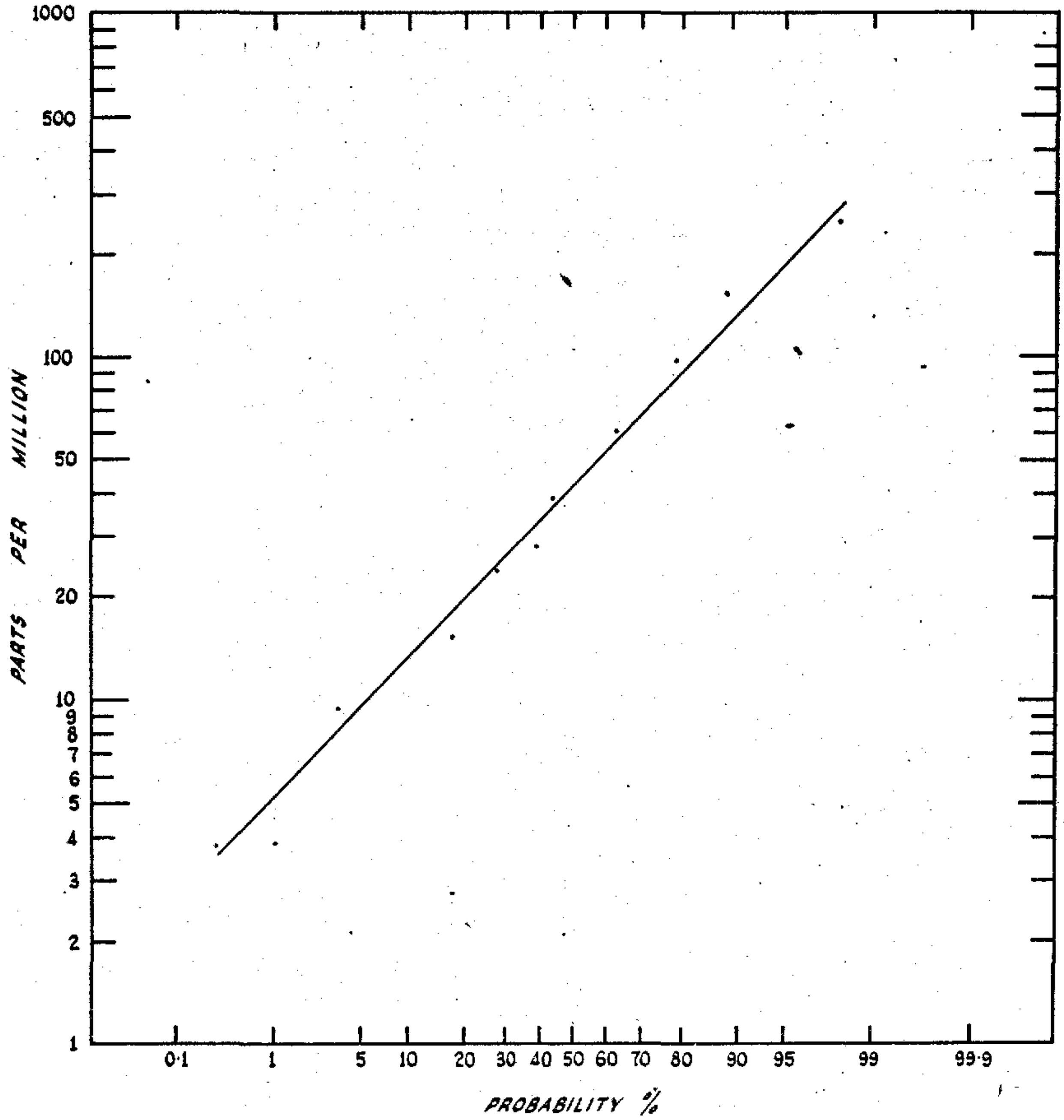
C – POPULATION C

95% CONFIDENCE LIMIT

5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 WEST SEDGWICK AREA SOIL ORIENTATION PROGRAMME	CHECKED. N.S-H. DATE. JUNE '76

APP. 1 FIG. 2



(TOTAL SOILS)

Nº OF SAMPLES n = 102

METAL ················ Pb

SAMPLE TYPE ······· SOIL SAMPLE

HORIZON ·············· C

FRACTION ············ -80 #

1ST ORDER THRESHOLD ······ 235 p.p.m.

2ND ORDER THRESHOLD ······ p.p.m.

3RD ORDER THRESHOLD ······ p.p.m.

BACKGROUD MEDIAN ······ 48

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

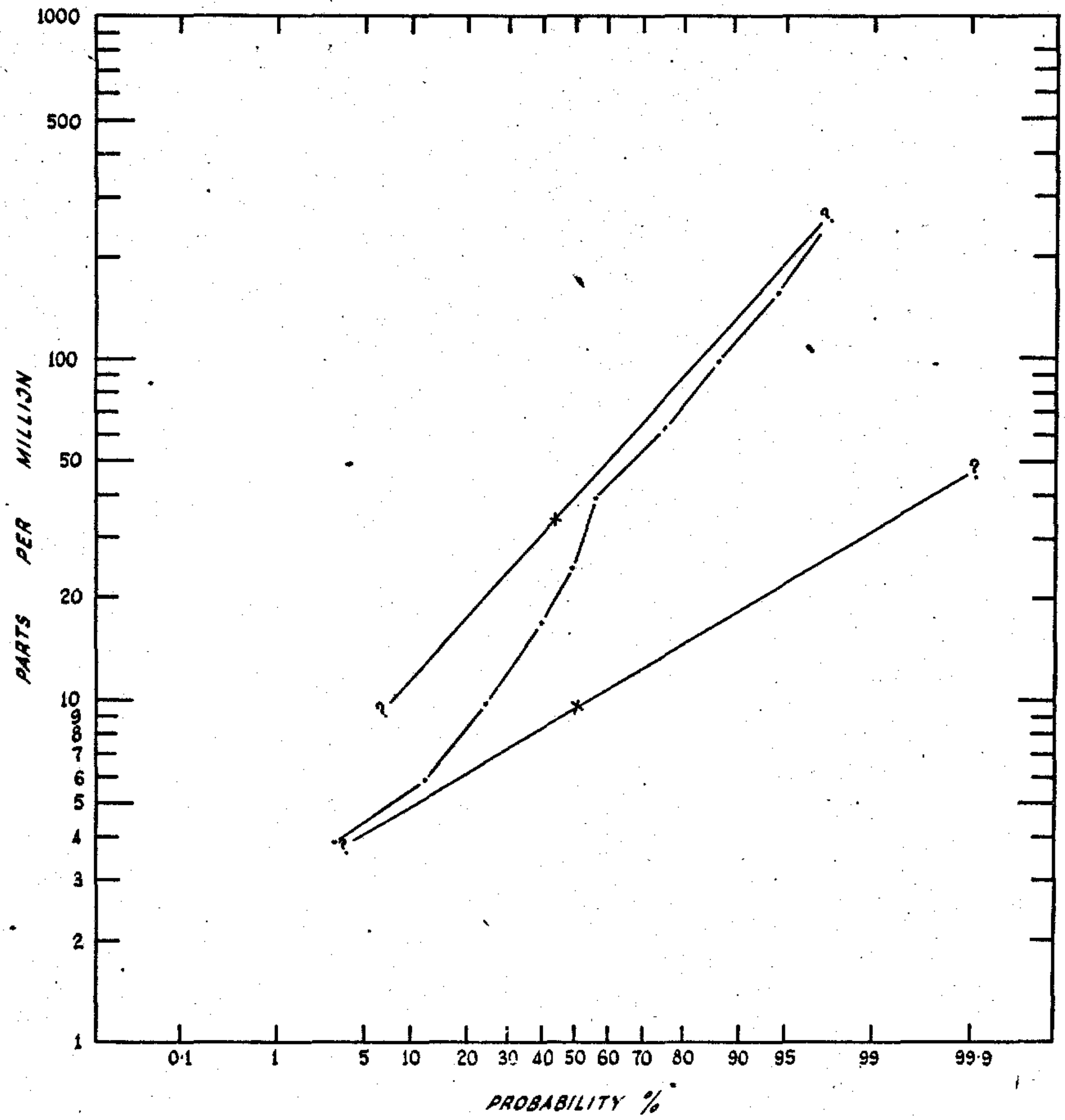
C – POPULATION C

95% CONFIDENCE LIMIT

5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 WEST SEDGWICK AREA SOIL ORIENTATION PROGRAMME	CHECKED. H.S-H.
	DATE. JUNE '76

APP. 1 FIG. 3



(TOTAL SOILS)

Nº OF SAMPLES n = 102

METAL .... Zn

SAMPLE TYPE .... SOIL SAMPLE

HORIZON C

FRACTION .... -80 #

1ST ORDER THRESHOLD ...... 250 p.p.m.

2ND ORDER THRESHOLD ...... p.p.m.

3RD ORDER THRESHOLD ...... p.p.m.

BACKGROUD MEDIAN 29

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

C – POPULATION C

95% CONFIDENCE LIMIT

5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 WEST SEDGWICK AREA SOIL ORIENTATION PROGRAMME	CHECKED. N.S-H.
	DATE. JUNE '76

APPENDIX II

S.W. & N. EXTENSIONS TO WEST SEDGWICK GRID

C.A.B. = Chargeability Above Background   W = Width
A.R. = Apparent Resistivity   D = Depth

ANOMALY	GEOLOGY	GEOPHYSICS		GEOCHEMISTRY
S.W. EXTENSION				
GROUP 1				
		Primary		
Line 84S. 400E. - 500E.	Within tuff-shale sequence 100' from contact of intermediate porphyry body.	C.A.B. : 30 msecs A.R. : 60% decrease	W : 50 ft. D : 25 ft.	Minor peak at 450E. : 44 ppm Cu, 192 ppm Pb, 22 ppm Zn
		Primary		
Line 84S. 300E.	Shale horizon within intermediate tuff sequence.	C.A.B. : 20 msecs A.R. : No decrease	W : 50 ft. D : ?	Minor peak at 200E. : 101 ppm Cu, 32 ppm Pb, 38 ppm Zn
		Primary		
Line 90S. 050W. - 250W.	Shale and tuff sequence.	C.A.B. : 25 msecs A.R. : 60% decrease	W : 200 ft. D : 50 ft. with sharp contacts	No significant response.
		Primary		
Line 96S. 200W. - 600W.	Shale and tuff sequence.	C.A.B. : 25 msecs A.R. : Weak decrease	W : 400 ft. D : 60 ft. (200W.) 200 ft. (600W.)	No significant response.

ANOMALY	GEOLOGY	GEOPHYSICS		GEOCHEMISTRY
		Primary		
Line 102S. 660W.	Shale horizon within dominantly tuff sequence - possibly silicified.	C.A.B. : 30 msecs A.R. : 100% increase	W : 50 ft. D : 100 ft.	No significant response but peak 200 ft. to west at 850W. : 66 ppm Cu, 174 ppm Pb, 364 ppm Zn
		Secondary		
Line 108S. 800W. - 1200W.	Two narrow shale horizons in a tuffaceous sequence which is possibly intermediate.	C.A.B. : 8 msecs A.R. : No decrease	W : 400 ft.? D : 100 ft.	No significant response.
		Primary		
Line 114S. 1050W.	Shale and tuff sequence.	C.A.B. : 30 msecs A.R. : No decrease	W : 50 ft. D : 100 ft.	No significant response.
		Secondary		
Line 120S. 1400W.	Shale horizon close to faulted contact with agglomerates and lapilli tuffs. Anomaly in river flat.	C.A.B. : 10 msecs A.R. : 60% decrease	W : ? D : 100 - 150 ft.	Minor peak at 1250W. : 38 ppm Cu, 172 ppm Pb, 82 ppm Zn
GROUP 2				
		Secondary		
Line 90S. 1200W.	Thick sequence of ignimbrites.	C.A.B. : 12 msecs A.R. : No decrease	W : ? D : ?	Minor peak at 1200W. : 133 ppm Cu, 4 ppm Pb, 71 ppm Zn
		Secondary		
Line 96S. 1200W.	As above.	C.A.B. : 5 msecs A.R. : No decrease	W : ? D : ?	No significant response.

ANOMALY	GEOLOGY	GEOPHYSICS	GEOCHEMISTRY
Line 108S. 550E.	Sequence of ignimbrite and intermediate tuff.	**Primary** C.A.B. : 20 msecs W : 25 ft. A.R. : 40% decrease D : 50 ft. east dip	No significant response.
GROUP 3			
Line 90S. 700W.	Along contact of intermediate intrusive and tuff-shale sequence.	**Secondary** C.A.B. : 20 msecs W : 150 ft. A.R. : No decrease D : 100 ft.	Major peak between 700W. - 900W. : Max. Cu - 131 ppm Max. Pb - 104 ppm Max. Zn - 69 ppm
Line 96S. 850W.	Shale and tuff sequence close to contact with minor andesitic lavas and ignimbrites. Lake Margaret Tram pyrite body 150 ft. to south of Line 96S. 1000W.	**Primary** C.A.B. : 20 msecs W : 25 ft. A.R. : No decrease D : 100 ft.	Minor peal at 750W. : 96 ppm Cu, 44 ppm Pb, 7 ppm Zn
Line 96S. 850E.	100 ft. from contact of acid tuff and intermediate porphyry north of No. 3 Dam.	**Secondary** C.A.B. : 10 msecs W : ? A.R. : Minor decrease D : ?	Initially a very major Pb and Zn response but data needs re-checking.
Line 114S. 1250W.	Andesitic lava sequence. Anomaly in creek flat.	**Secondary** C.A.B. : 8 msecs W : ? A.R. : No decrease D : ?	No significant response.

ANOMALY	GEOLOGY	GEOPHYSICS		GEOCHEMISTRY
		Secondary		
Line 120S. 2200W.	Sequence of andesitic lavas and lapilli tuffs.	C.A.B. : 10 msecs A.R. : 60% decrease	W : ? D : 100 - 150 ft.	Minor peak at 2200W. : 38 ppm Cu, 34 ppm Pb, 68 ppm Zn
N. EXTENSION				
		Primary		
Line 6N. 150W.	Within sequence of altered, foliated lavas and coarse pyroclastics.	C.A.B. : 18 - 20 msecs A.R. : No decrease	W : 50 - 70 ft. D : 100 ft. dip east	No significant response.
		Secondary		
Line 6W. 2550E.	Glacial moraine.	C.A.B. : 13 msecs A.R. : No decrease	W : ? D : ?	Major peaks at 2400E. and 2850E. : 2400E. - 106 ppm Cu, 155 ppm Pb, 89 ppm Zn 2850E. - 96 ppm Cu, 150 ppm Pb, 25 ppm Zn
		Secondary		
Line 6N. 2200W. - 2900W.	Shallow moraine overlying altered foliated lavas and pyroclastics.	C.A.B. : 10 msecs A.R. : No decrease	W : 700 ft. D : 100 ft.	No significant response.
		Secondary		
Line 12N. 1800W. - 3000W. (1900W., 2950W.)	As above.	C.A.B. : 20 msecs A.R. : 1900W. - Weak decrease 2950W. - No decrease	W : 50 - 80 ft.? D : 100 ft.	No significant response.

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APP. III FIG 1

Appendix 3

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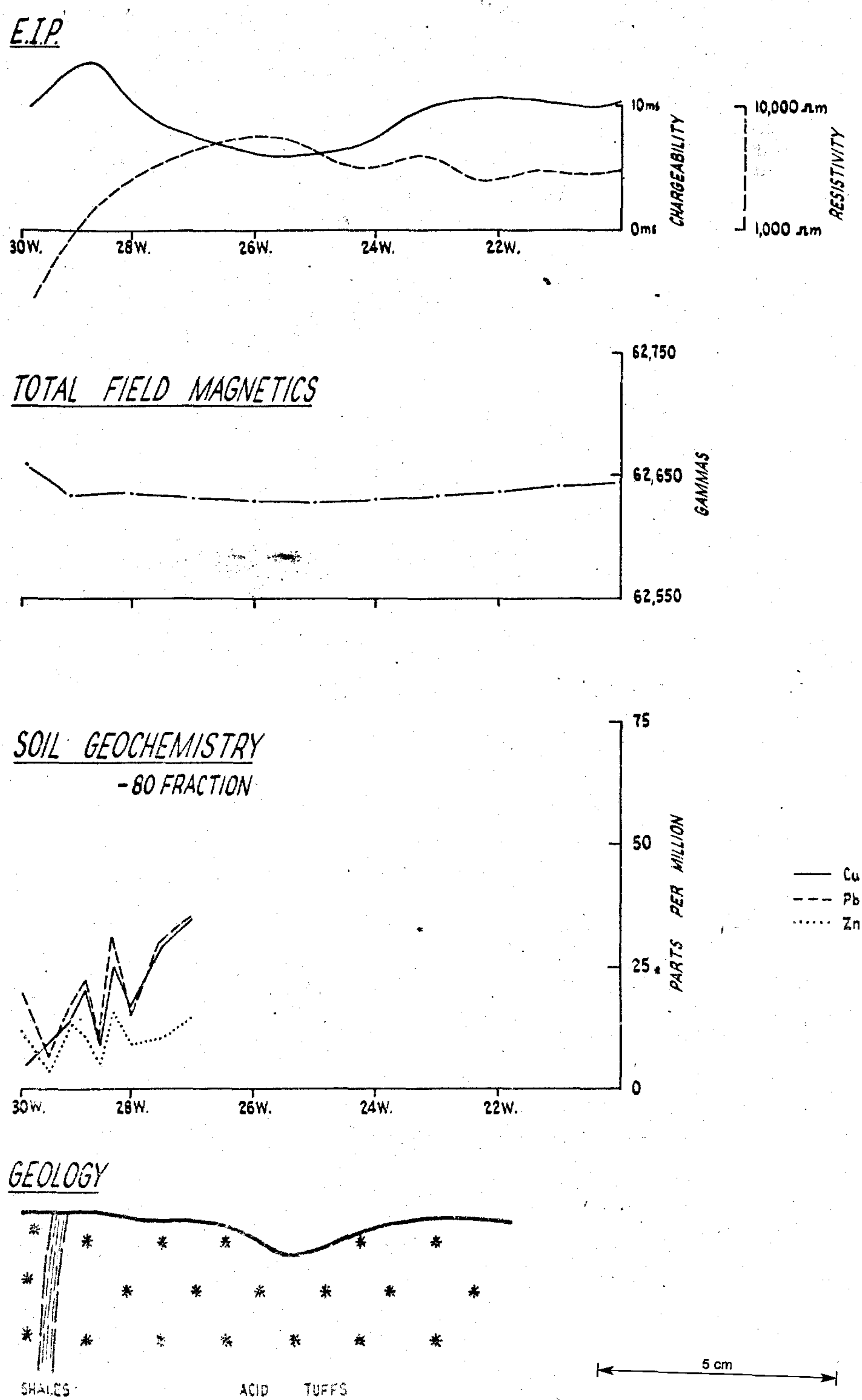
MADAM HOWARD PLAINS GRID. LINE 00S.



018

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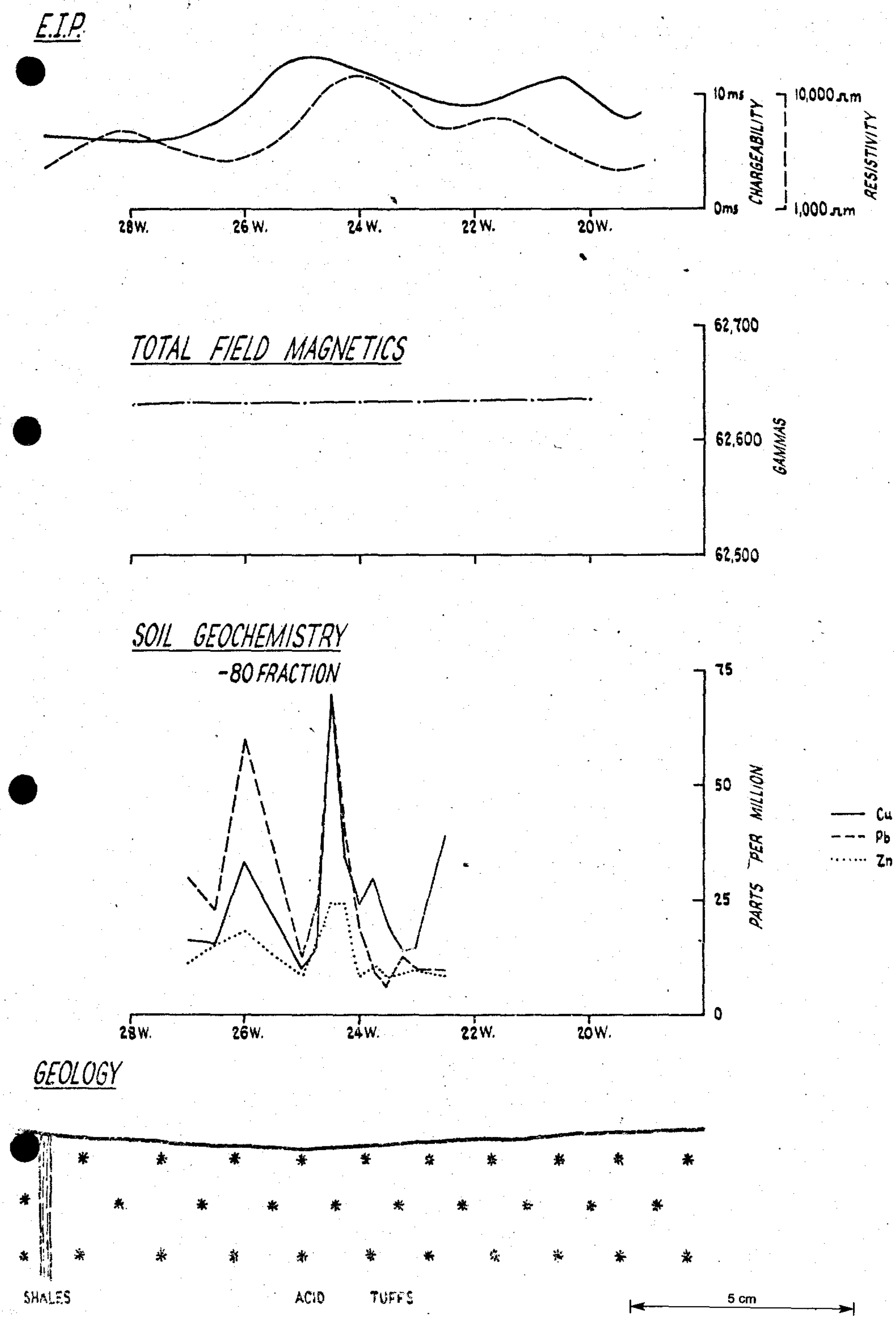
APP. III FIG. 2

MADAM HOWARD PLAINS GRID. LINE 06S.



019

APP. III FIG. 3

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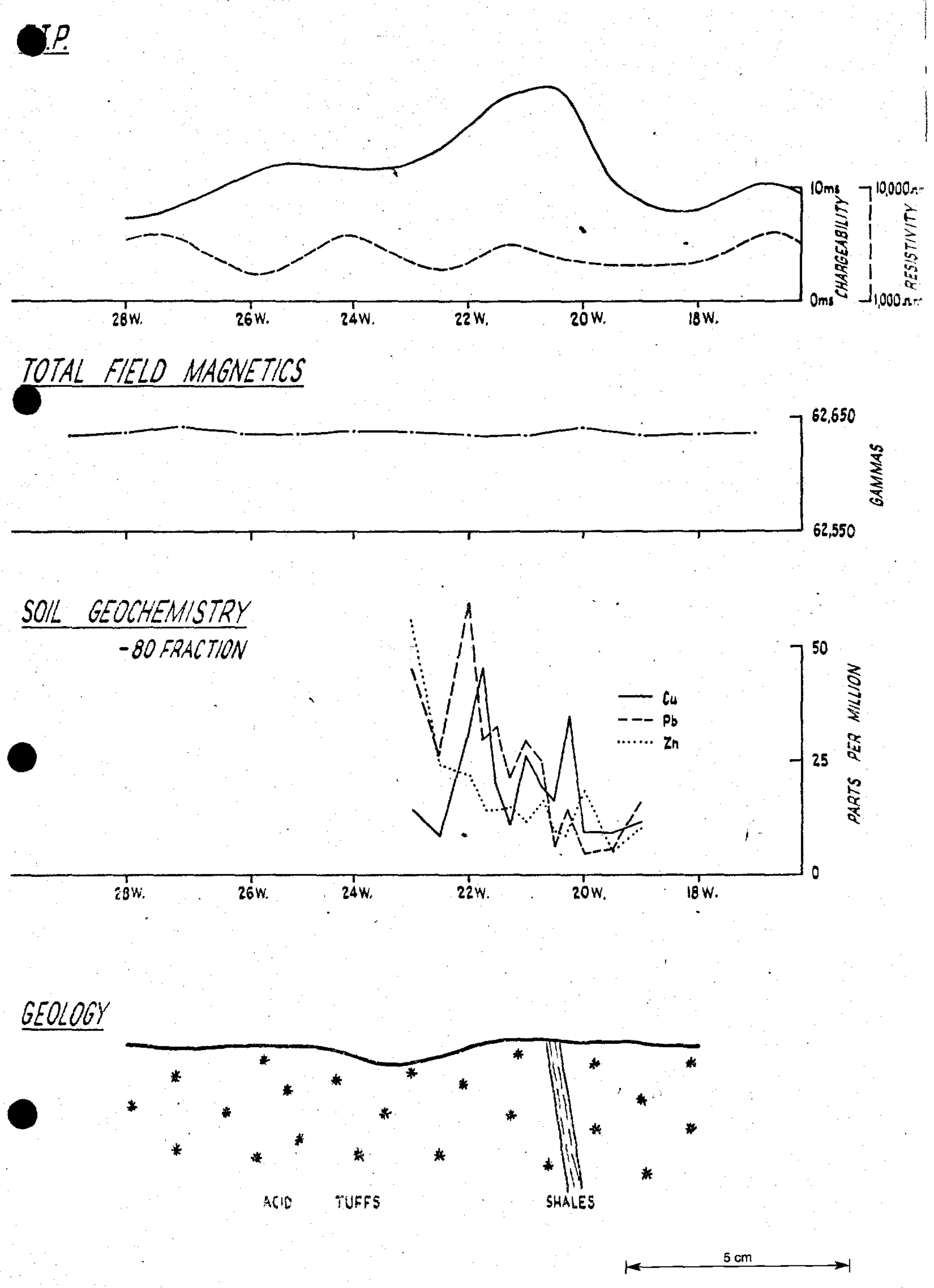
MADAM HOWARD PLAINS GRID. LINE 12S.

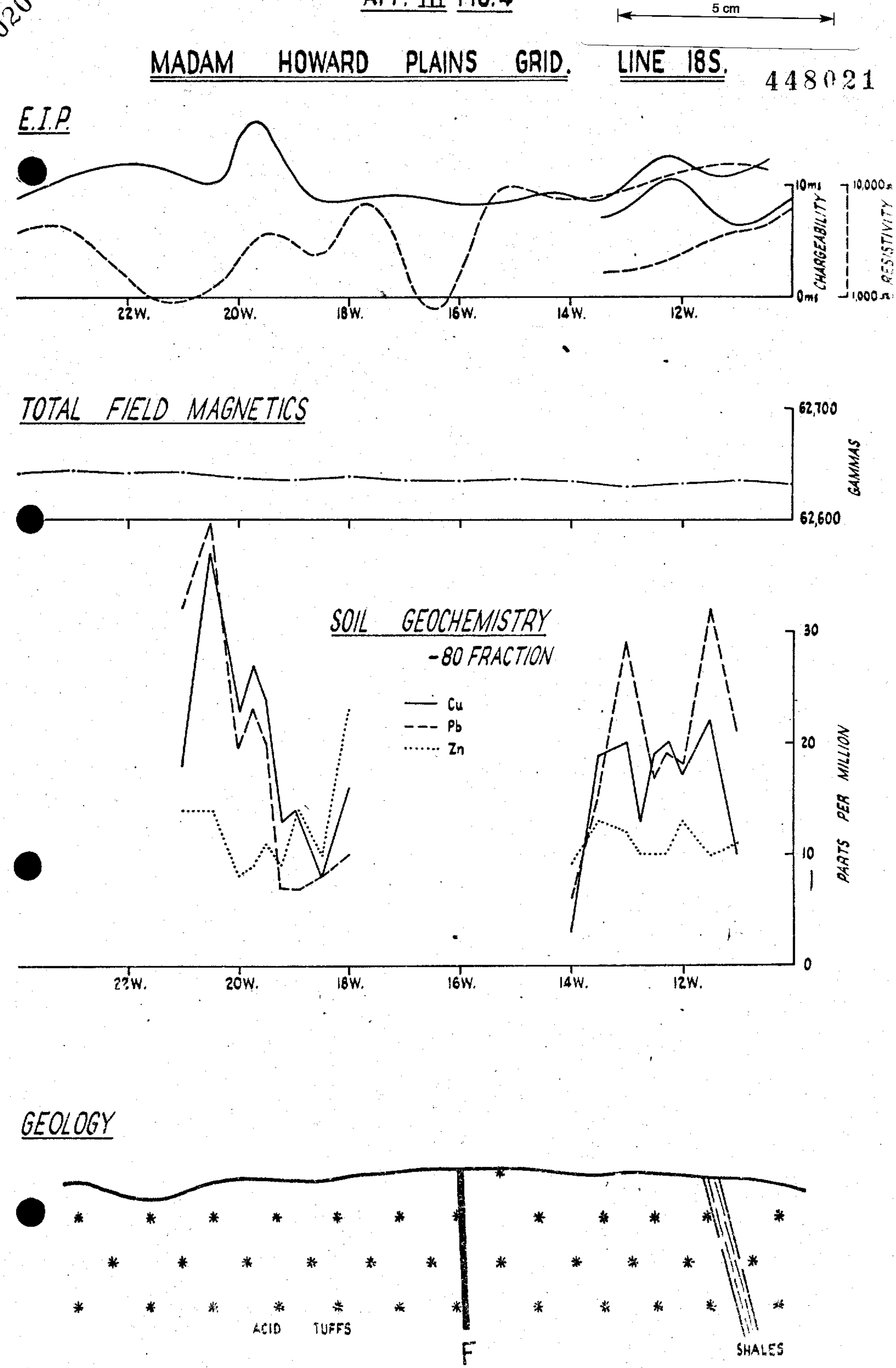


020

APP. III FIG. 4

MADAM HOWARD PLAINS GRID. LINE 18S.

448021

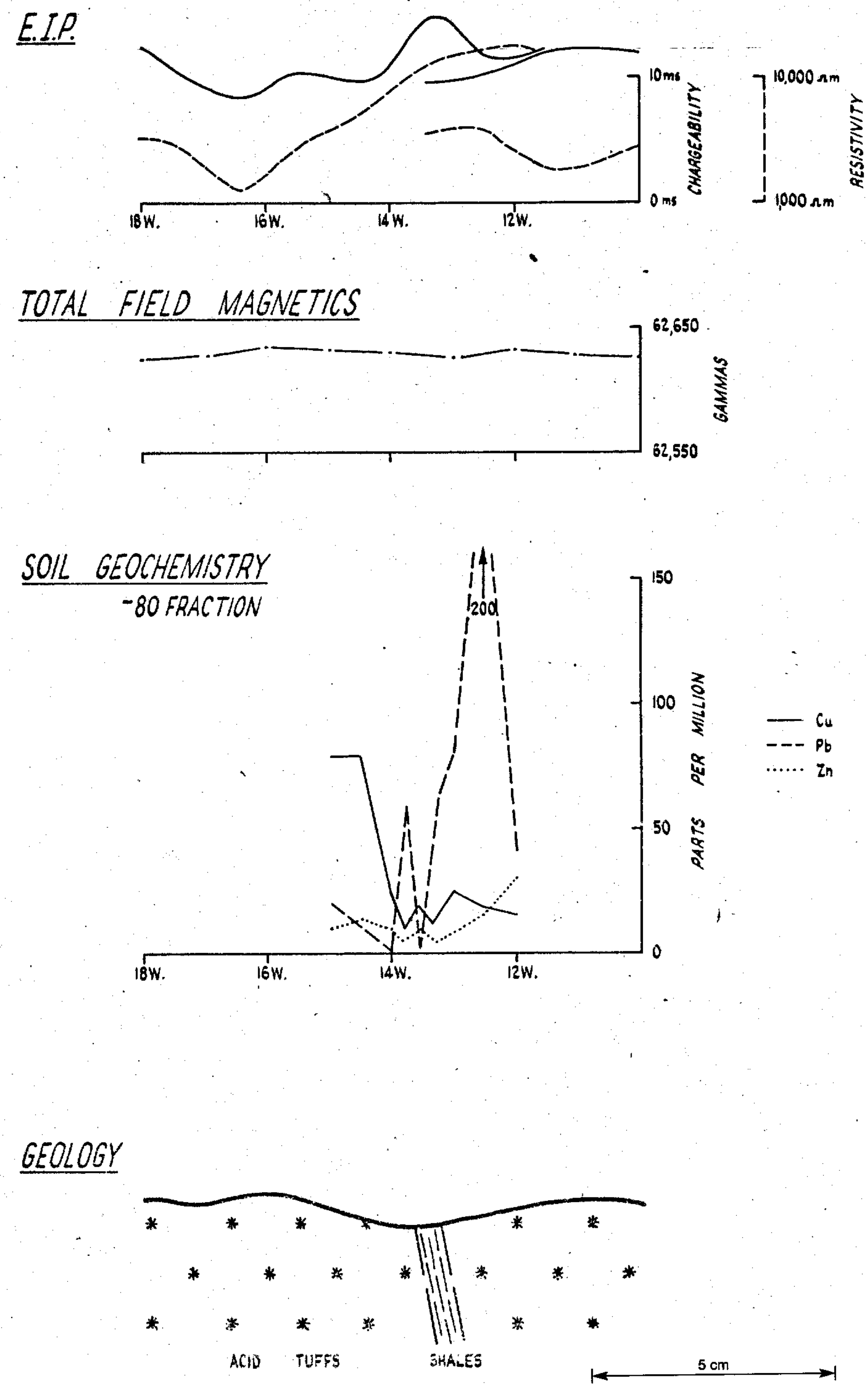


021

448022

APP. III FIG.5

MADAM HOWARD PLAINS GRID. LINE 24S.



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448023

GEOCHEMICAL ASSAY DATA

MADAME HOWARD GRID : LINE 00 2700W - 3000W

LINE 06S 2250W - 2450W

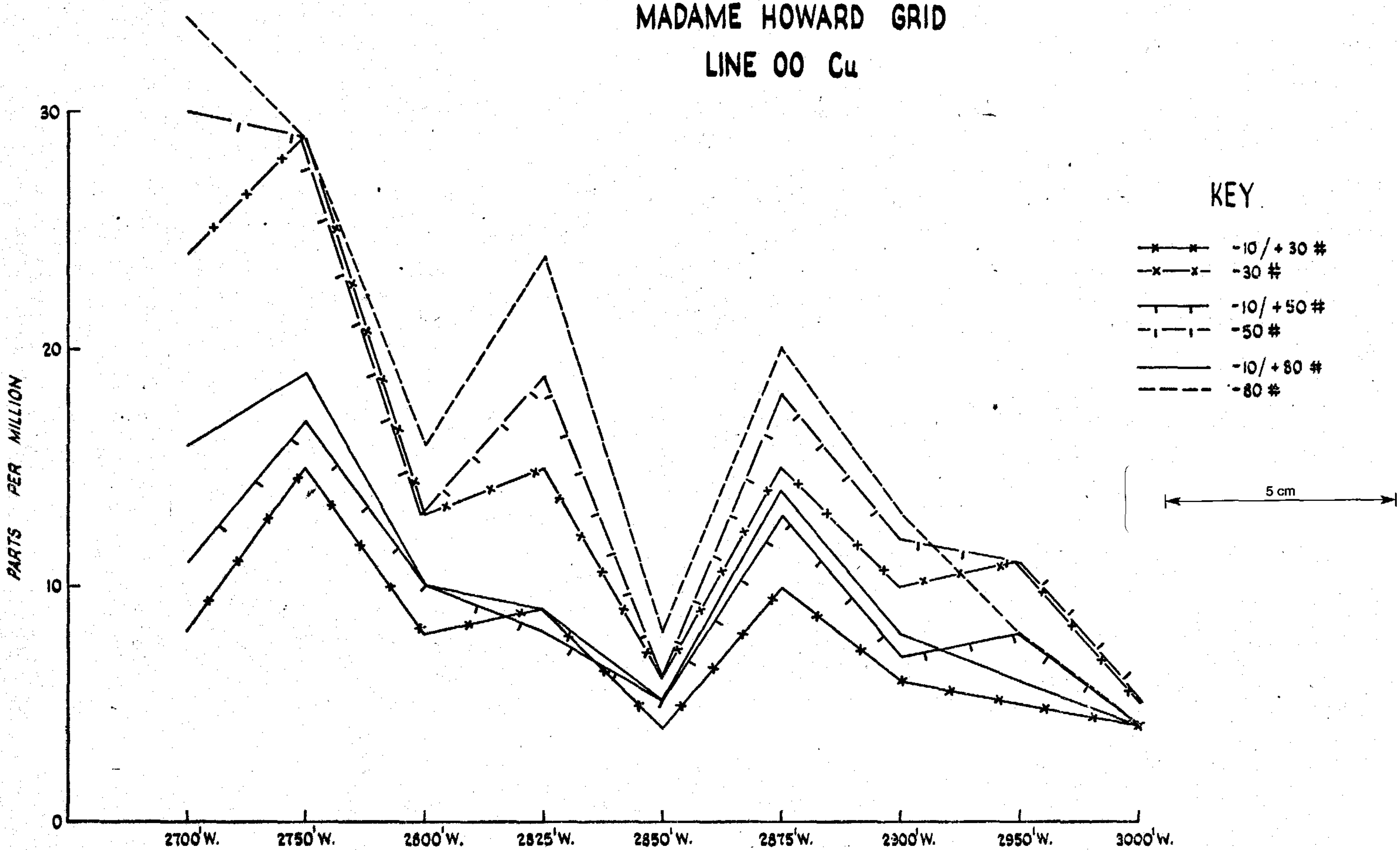
LINE 24S 1200W - 1500W

GRAPHS 1 - 3 : COPPER

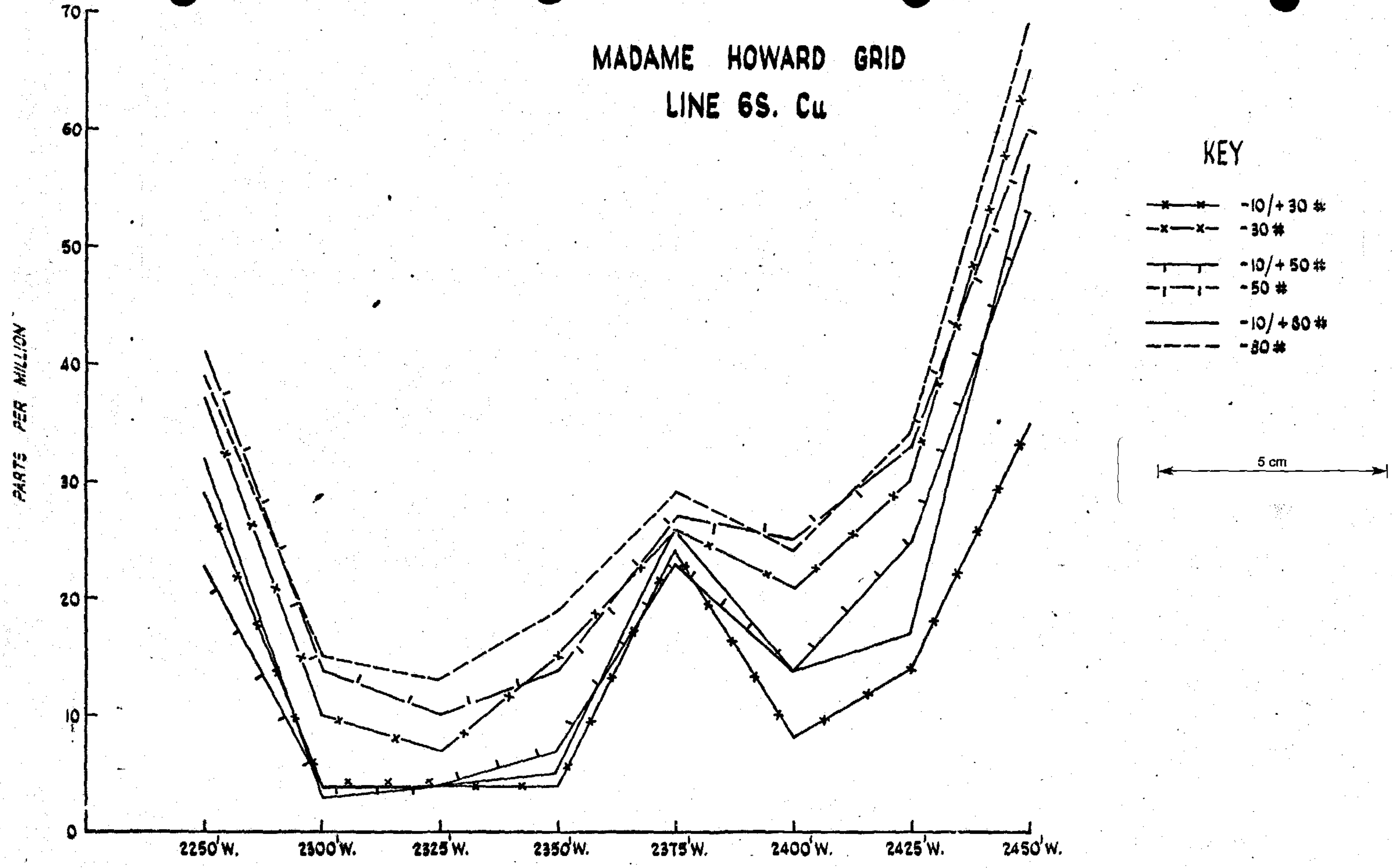
GRAPHS 4 - 6 : LEAD

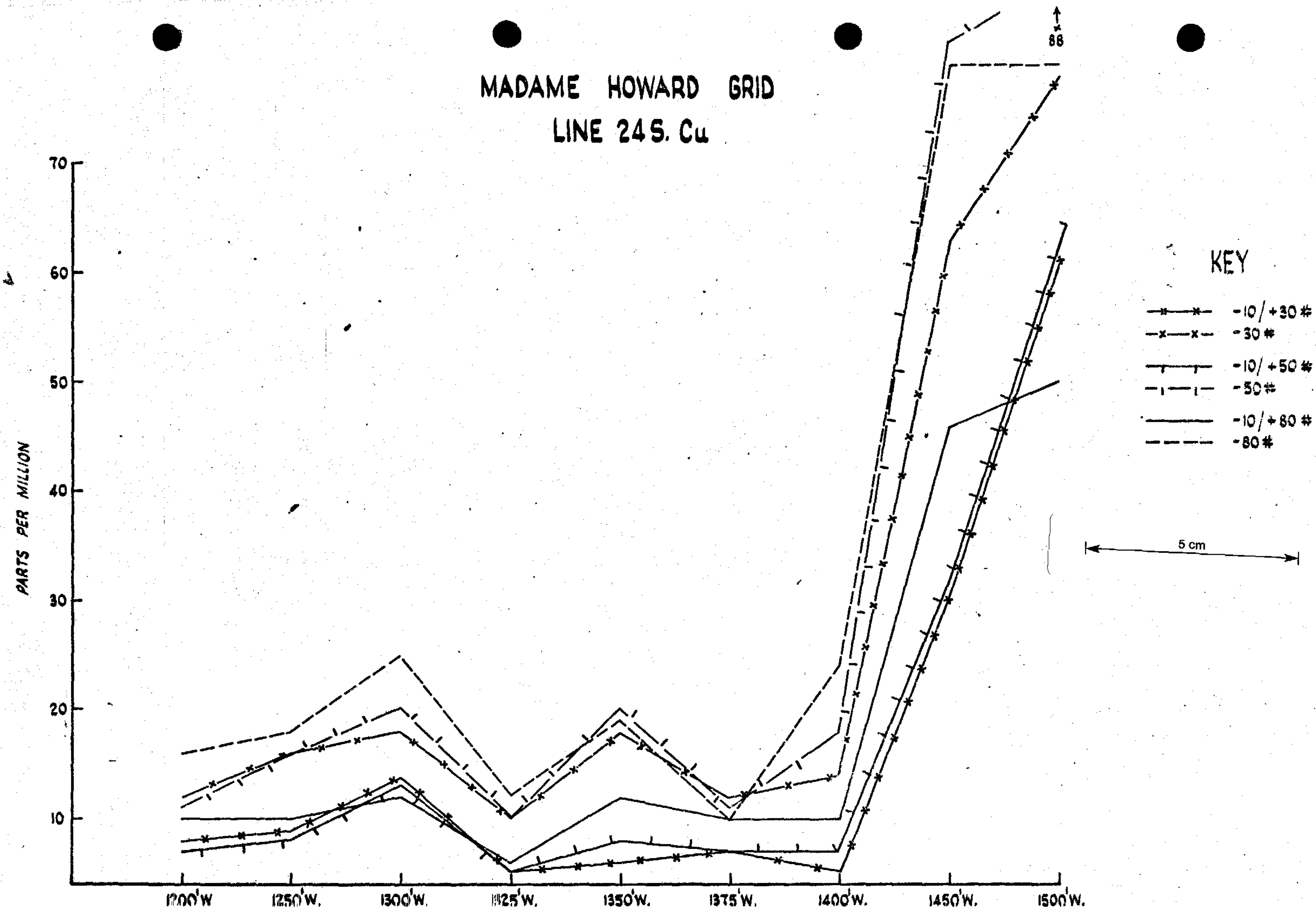
N.B. Zinc data not plotted as majority of values were below 20 ppm.

MADAME HOWARD GRID
LINE 00 Cu

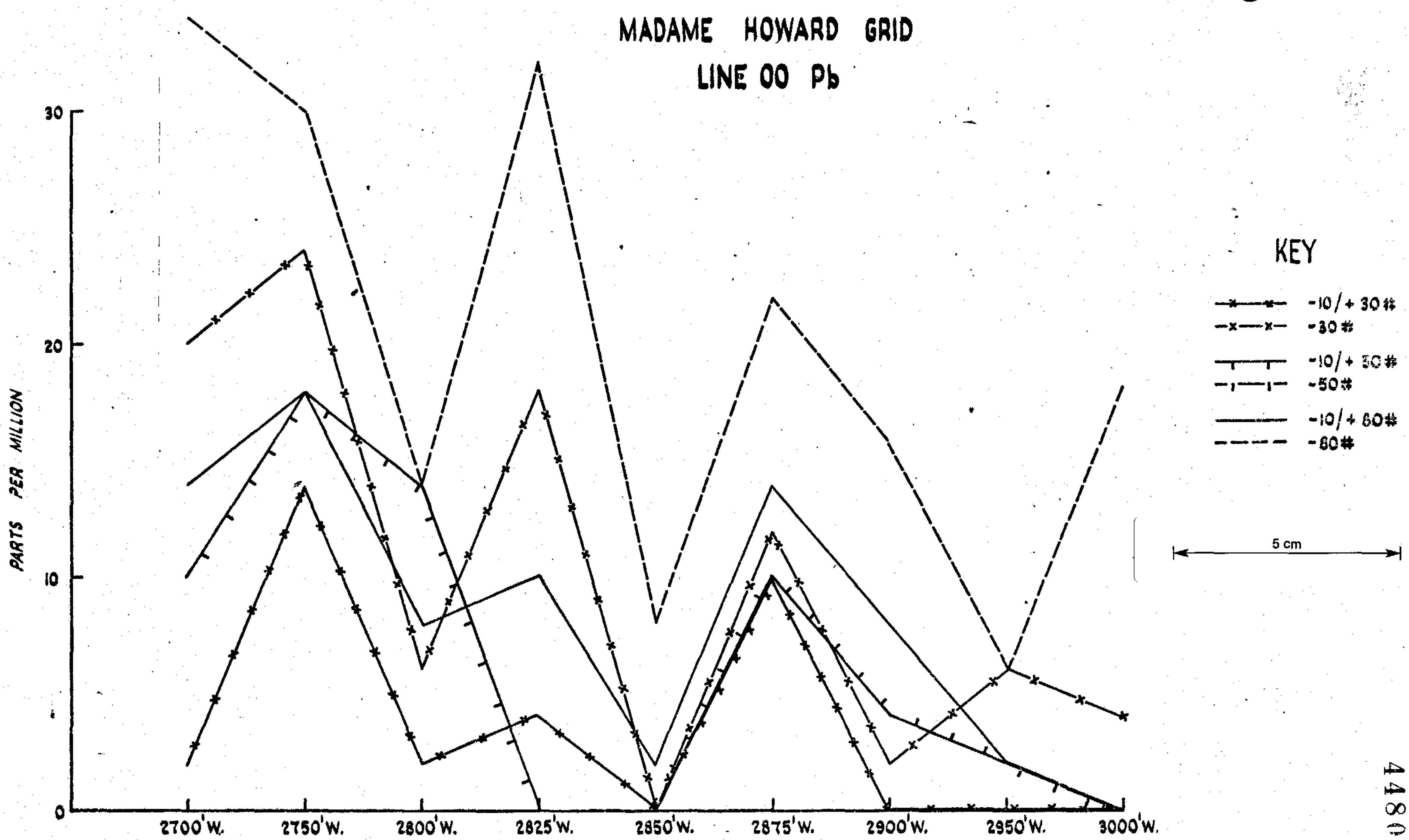


448024


MADAME HOWARD GRID
LINE 6S. Cu
KEY
-10/+30 #
-30 #
-10/+50 #
-50 #
-10/+80 #
-80 #
5 cm
PARTS PER MILLION
70
60
50
40
30
20
10
0
2250'W.
2300'W.
2325'W.
2350'W.
2375'W.
2400'W.
2425'W.
2450'W.

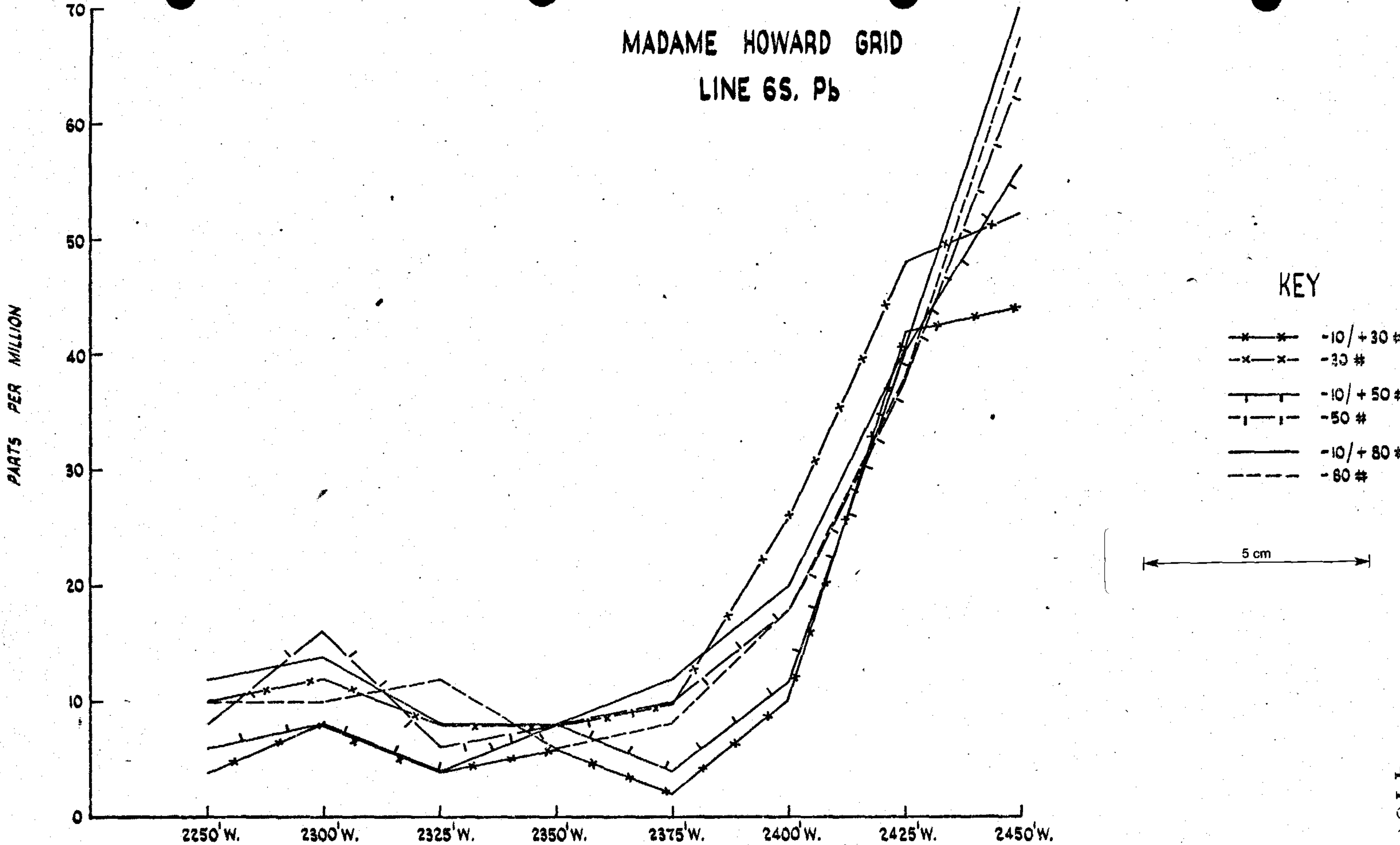

MADAME HOWARD GRID
LINE 24S. Cu
PARTS PER MILLION
70
60
50
40
30
20
10
1200'W
1250'W.
1300'W.
1325'W.
1350'W.
1375'W.
1400'W.
1450'W.
1500'W.
88
KEY
-10/+30 #
-30 #
-10/+50 #
-50 #
-10/+80 #
-80 #
5 cm

448026

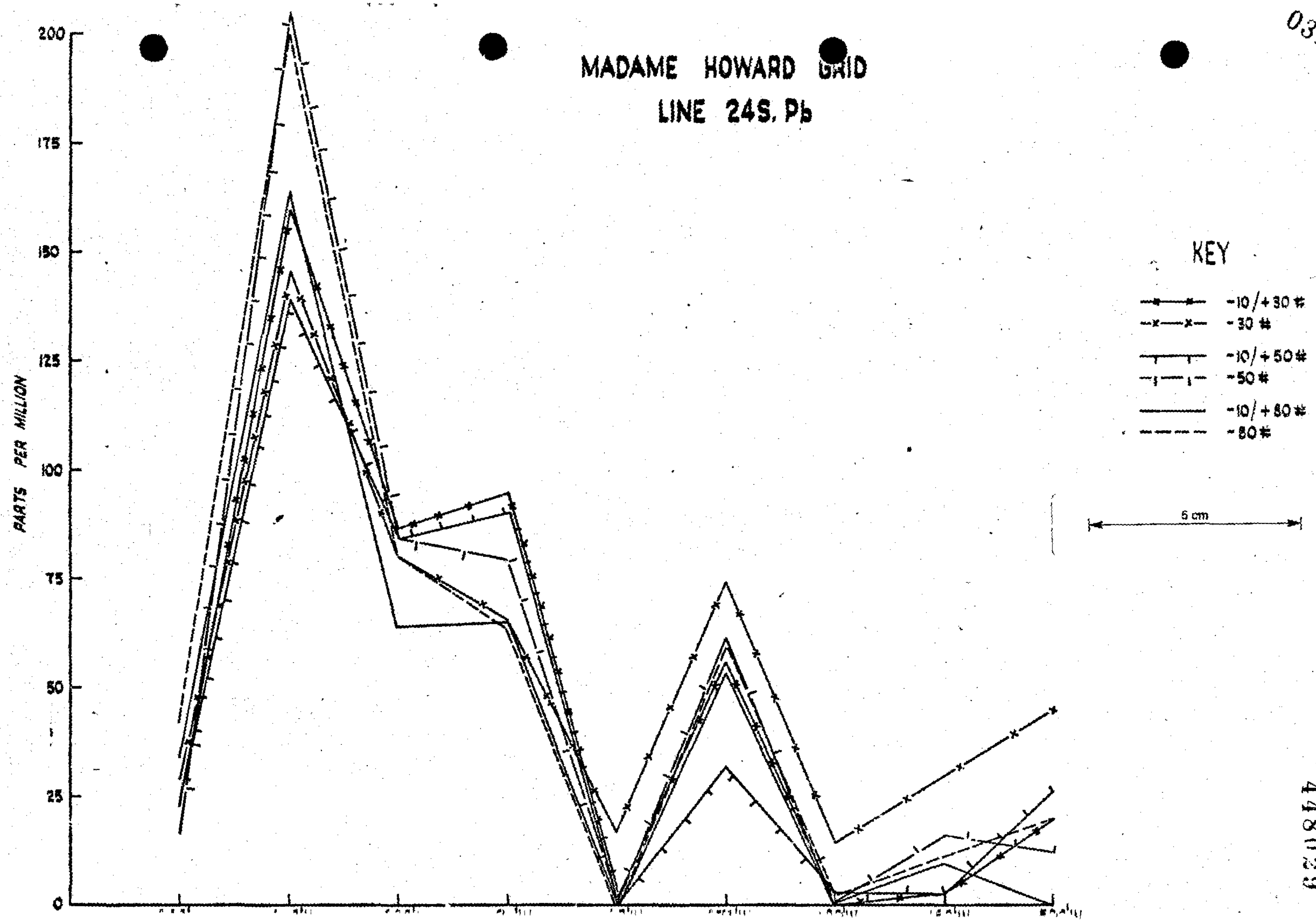

MADAME HOWARD GRID
LINE 00 Pb
PARTS PER MILLION
30
20
10
0
2700' W.
2750' W.
2800' W.
2825' W.
2850' W.
2875' W.
2900' W.
2950' W.
3000' W.
KEY
-10/+30#
-30#
-10/+50#
-50#
-10/+80#
-80#
5 cm

129

448027


MADAME HOWARD GRID
LINE 6S. Pb
PARTS PER MILLION
0
10
20
30
40
50
60
70
2250' W.
2300' W.
2325' W.
2350' W.
2375' W.
2400' W.
2425' W.
2450' W.
KEY
-10/+30 #
-30 #
-10/+50 #
-50 #
-10/+80 #
-80 #
5 cm

448028


MADAME HOWARD GRID
LINE 24S, Pb
PARTS PER MILLION
200
175
150
125
100
75
50
25
0
KEY
-10/+30 #
-30 #
-10/+50 #
-50 #
-10/+80 #
-80 #
5 cm

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A GENERALISED APPROACH FOR TREATMENT OF SOIL GEOCHEMICAL DATA

1. INTRODUCTION

Over the past five years there has been a rapid increase in the use of soil geochemistry as (i) a primary exploration tool, and (ii) as a technique for priority rating of geophysical anomalies.

In line with common practice elsewhere, the -80# fraction has been used to delineate areas of high base metal values in soils. However, during the 1974-75 field season the -10/+80# fraction was also analysed and has shown that certain isolated anomalous values are detected only in this coarser size range. E.g. Howard's Anomaly L.23N 1700W, White Spur L.32N 2700E and Huxley Grid L.64S 800W. A major problem arose with the accuracy and repeatability of the -10/+80# fraction, since the sample had to be pulverised in the Mount Lyell mill preparation laboratories. This has resulted in suspected contamination, as both mine and mill feed samples are processed through the same pulverising equipment. In order to eliminate this possible source of contamination and to determine the effect of various coarser size fractions, 26 samples from the Madame Howard Grid were tested. Each sample was divided into three, sieved and sent directly to the assay laboratories. The three size fractions sieved were:

(i) -10/+30#, -30#
(ii) -10/+50#, -50#
(iii) -10/+80#, -80#

Samples were taken from Line 00 2700W - 3000W, Line 06S 2250W - 2450W and Line 24S 1200W - 1500W, and results have been plotted on Graphs 1 - 6.

2. ANALYTICAL PROCEDURE

Each individual fraction was treated in the same manner as previously used for the -80# fraction. A 4 gram sample was digested in an acid solution containing 3 mils. HNO_3 and 10 mils. HCl for approximately one hour. No problems were encountered with digestion of the coarser fraction and the only minor difficulty was with accurate weighing of the sample. Element analysis was carried out using the atomic absorption spectrometer.

3. DISCUSSION OF RESULTS

The graphs show fairly clearly that above the 20 ppm level there is very little difference between the various size fractions and that all major peaks and lows are distinguishable in both coarse and finer fractions. However, from the available data, it appears that the finer fractions show the greatest range of values and give a slightly better definition over anomalous areas.

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Although sampling was not carried out in any areas of known mineralisation, data from the S.W. extension of the West Sedgwick Grid, over the Lake Margaret pyrite body, indicated that both the -10/+80# and -80# fractions gave similar results.

Analytical procedures used also show clearly that any possible contamination can be eliminated by not pulverising the coarser fractions.

4. COSTS

4.1 Assay Costs

Cost of assay per element (labour and materials)	40¢ - 45¢
Approx. cost of 1 sample (three elements - Cu, Pb, Zn) + 20% overheads (assuming 500 - 1 000 samples/year)	$1.50 per sample

4.2 Collection Costs

1 geologist + 1 field assistant (average 50 samples/day)	$2.00 approx.
+ overheads (vehicle maintenance, materials, etc.)	$0.75 approx.
Total	$2.75

4.3 Preparation Costs

1 field assistant (30 - 40 samples/day)	$1.00 approx.
+ overheads	$0.20 approx.
Total	$1.20

Total Cost : 1 sample - 1 size fraction - 3 elements	$5.45
1 sample - 2 size fractions - 6 elements	$6.95

5. CONCLUSIONS

Nearly all previous soil geochemical analyses have been carried out on the -80# fraction. It is recommended that all future surveys use this fraction both for reconnaissance exploration and for detailing of geophysical anomalous zones, since it would provide a basis for any future regional synthesis of geochemical data. However, as there is a definite need to be certain that no isolated anomalous values are missed in the coarser fraction, it is suggested that the -10/+80# fraction also be assayed as a routine procedure. Furthermore the -10/+80# fraction can now be sent direct to the assay laboratory with no further need for pulverising. The additional cost of $1.50 per sample is not excessive when considering the overall costs of data collection/preparation and the additional information this fraction can provide.

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Although no data is presented in this report, there is good evidence to indicate that if this analysis procedure is adopted, then it best used in conjunction with soil sampling from the C Horizon.

<u>P. Brophy</u>

5th November, 1975

c.c. Mr. K. O. Reid
K. Wells
N. P. Stevens-Hoare

APPENDIX V

Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
81	352.6	829.7	Fine tuff	20	43	13	
86	352.7	830.0	Andesite	42	33	70	
92/3	353.2	830.0	Andesite	65	263	670	
95	353.6	830.0	Gabbro	163	6	86	
101	354.2	829.4	Shale	11	390	12	
109	354.6	828.8	Shale	8	11	30	
118	355.9	826.2	Coarse tuff	16	40	68	F284
123	356.2	825.9	Quartz keratophyre	10	11	127	
132	356.2	825.8	Quartz keratophyre	27	7	126	
137	356.1	825.4	Shale	11	75	322	
140	356.3	824.9	Ignimbrite?	10	8	109	
144	357.2	824.6	Micrographophyre	30	27	59	
151	356.7	823.8	Quartz keratophyre	9	197	500	
152	356.7	823.8	Quartz keratophyre	11	20	90	
159	357.3	825.3	Pyritic tuff				
164	357.7	823.0	Coarse tuff	21	11	65	
168	357.4	822.4	Baryte	8	10 Ba 55.1%	4	
170/3	358.1	823.0	Shale	14	21	10	
209	358.4	823.6	Andesite	380	3	68	
224	357.6	826.9	Medium tuff	28	4	80	
225	357.4	826.9	Medium tuff	9	8	71	
226	357.8	827.1	Quartz keratophyre	15	2	49	
231/3	358.3	827.4	Ignimbrite	89	11	47	
233	358.2	827.4	Medium tuff	33	124	160	F289
238/1	358.5	828.2	Lapilli tuff	260	144	175	
244	357.0	825.7	Micrographophyre	24	15	52	
255	358.4	828.3	Lapilli tuff	51	15	52	F276
262	359.1	829.2	Ignimbrite	15	1051	258	
263/2	359.4	829.5	Dacite	37	19	29	
274/1	358.4	827.7	Lapilli tuff	31	79	80	F270
275/3	358.4	827.7	Shale	2130	119	112	
276/2	358.4	827.7	Shale				
277	357.4	827.6	Quartz keratophyre				F213
282/2	357.8	827.6	Quartz keratophyre	15	8	50	F217
286	359.5	828.6	Dacite pyritic	37	159	435	
302	359.4	825.4	Coarse tuff	59	4	64	
305	359.7	825.6	Quartz keratophyre	25	31	59	F252
306	358.5	826.5	Quartz keratophyre	90	7	263	F240
308/2	358.3	826.5	Arkose	19	17	38	F251
313	359.8	827.4	Ignimbrite	15	17	63	
317	359.6	827.8	Ignimbrite	7	7	25	F250
327	356.2	827.0	Ignimbrite	15	6	22	

Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
332	358.6	827.2	Ignimbrite	11	21	40	
337	358.8	826.3	Hornblende feldspar porphyry	99	28	49	
340	359.5	826.4	Hornblende feldspar porphyry	45	14	120	
345	358.5	826.1	Andesitic ignimbrite	16	14	52	
350/2	356.9	826.6	Microgranophyre	53	7	88	
367	358.9	826.7	Intermediate coarse tuff	27	23	58	
369	352.3	830.3	Rhyolite	37	26	78	
370/2	352.4	830.3	Coarse tuff	110	56	69	
372	352.6	830.5	Basic	213	28	103	
376/1	352.9	830.9	Basic	285	26	195	
376/9	352.9	830.9	Basic/intermediate volcanic	25	7	14	P17
376/5	352.9	830.9	Basic/intermediate volcanic	23	262	393	
377/3	353.0	830.9	Basic/intermediate volcanic				
379	353.2	831.1	Basic/intermediate volcanic	57	70	165	
379/2	353.2	831.1	Basic/intermediate volcanic	37	7	179	
379/3	353.2	831.1	Basic/intermediate volcanic	77	21	306	
380	353.7	831.0	Basic/intermediate volcanic	160	40	275	
381/3	353.8	830.9	Basic/intermediate volcanic	40	30	152	
381/4	353.8	830.9	Basic/intermediate volcanic	63	112	296	
382/2	353.9	830.9	Medium tuff	20	24	44	
383/2	353.9	831.0	Medium tuff	59	44	11200	
388	357.5	834.4	Quartz keratophyre	10	16	38	
394	356.9	834.5	Intermediate/basic volcanic	60	28	172	
398	356.6	833.9	Breccia	1050	50	135	
401/1	356.2	833.4	Fine tuff	15	20	12	
403	355.7	832.9	Fine tuff	16	18	36	
404/2	355.5	832.3	Microgranophyre	41	22	103	
406/3	355.0	831.9	Fine tuff	24	10	16	
408	354.7	831.3	Acid/intermediate medium tuff	21	138	51	
412	354.3	831.1	Intermediate/basic volcanic	86	44	156	
416	359.1	828.6	Medium tuff	8	50	10	
418	359.4	827.5	Fine tuff	6	20	4	
426/1	360.0	827.6	Dacite/andesite	53	16	65	
430	354.7	828.5	Basic				F262

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Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
444	355.5	826.2	Lapilli tuff	16	126	68	F314
452	359.0	828.4	Ignimbrite	11	20	31	F321
458	359.5	822.4	Quartz keratophyre				
459	357.8	822.7	Quartz keratophyre	14	24	6	
501	358.2	821.3	Basalt	225	22	65	
502	358.2	821.9	Intermediate/basic tuff	14	30	20	
503	358.3	822.9	Andesite	127	430	201	
504	358.4	822.9	Andesite				
505	358.3	822.7	Lapilli tuff/ agglomerate	18	46	93	
508	358.5	823.3	Microdiorite	97	14	51	
509	358.8	822.9	Quartz keratophyre	89	24	10	
512	358.8	823.2	Lapilli tuff	11	94	65	
515	358.8	823.6	Medium tuff	10	90	4	
520	358.1	823.6	Fine tuff	8	12	6	
522	356.7	822.5	Quartz keratophyre	18	84	7	
524	356.8	822.7	Coarse tuff	47	106	182	
530	354.9	827.2	Coarse tuff	308	48	27	
532	354.4	827.0	Quartz keratophyre	17	4	34	
533	354.0	826.1	Coarse tuff				
534	353.8	825.7	Coarse tuff	12	20	20	
535	353.3	825.9	Medium tuff	12	20	25	
537	351.9	824.2	Lapilli tuff	21	20	43	
542	356.2	821.9	Coarse tuff				
545	335.9	821.7	Medium tuff				
550	354.5	828.2	Medium tuff	24	28	271	
551	354.4	828.2	Coarse tuff	19	66	153	
554	354.6	823.2	Rhyolite	16	12	17	
555	354.7	823.3	Rhyolite	23	12	28	
556	354.6	823.5	Lapilli tuff	36	32	20	
557	355.5	826.0	Ignimbirte	22	22	51	
558	355.5	826.0	Ignimbrite	16	342	88	
560	359.4	825.3	Coarse tuff	39	22	111	
561	359.4	825.4	Hornblende feldspar porphyry	57	14	81	
562	359.4	825.4	Dacite?	128	28	113	
570	360.2	826.2	Coarse tuff	26	8	113	
571	360.7	826.2	Dacite	63	16	74	
572	359.7	825.6	Quartz keratophyre	29	24	85	
580	356.2	825.4	Fine tuff	128	10	18	
581	356.1	825.4	Medium tuff	28	68	96	
590	355.3	829.8	Medium tuff	18	14	32	
591	355.3	829.9	Fine tuff	5	56	8	

Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
594	355.5	829.9	Coarse tuff	72	-	52	
595	355.6	829.8	Quartz keratophyre	14	6	93	
596	356.1	831.7	Microgranophyre	6	4	14	
597	356.2	831.9	Microgranophyre	10	8	19	
601	358.0	833.8	Medium tuff?				
602	358.6	834.8	Intermediate?, pyritic	278	174	1270	
73/3	357.4	824.4	Microgranophyre	13	-	60	F402
73/4	358.1	821.9	Medium tuff	29	14	31	
73/5	357.6	822.9	Quartz keratophyre	119	26	97	
73/6	355.4	826.3	Ignimbrite	10	10	12	F399
73/7	355.2	826.9	Medium tuff	13	56	137	
73/8	358.3	822.0	Basic volcanic	139	16	267	F400
73/9	358.3	821.6	Andesitic lava	50	12	100	F401
73/10	358.8	823.3	Dacite	9	16	24	F397
73/11	358.8	826.9	Dacite	24	10	50	F398
73/12	358.3	825.2	Ignimbrite	39	12	50	F403
73/13	358.8	823.6	Andesite	34	26	159	F406
73/14	358.3	821.6	Andesite?	42	4	80	
73/17	358.1	821.3	Coarse tuff	25	32	42	
73/18	357.8	821.3	Medium tuff	64	14	26	
73/19	358.2	822.0	Medium tuff	20	98	40	
73/20	358.3	821.8	Ignimbrite?	12	21	25	
73/21	358.4	823.0	Lamprophyre	35	11	125	
73/22	358.7	823.9	Coarse tuff	53	38	62	
73/24	359.2	833.8	Andesite pyritic	66	45	275	
73/25	358.4	833.1	Hornblende feldspar porphyry	125	23	260	
73/26	358.7	833.6	Dacite	28	30	40	
73/27	358.6	833.6	Intermediate lapilli tuff	18	12	62	
73/28	358.9	824.1	Coarse tuff	18	20	12	
73/29	359.2	824.4	Ignimbrite	77	29	24	
73/30	359.4	824.4	Ignimbrite	10	11	34	
73/31	358.7	824.9	Coarse tuff	21	22	9	F407
73/32	358.6	826.1	Andesitic tuff	92	36	145	
73/33	358.6	826.0	Ignimbrite?	26	9	16	
73/34	358.6	826.0	Lapilli tuff	33	19	140	
73/35	358.6	825.9	Quartz keratophyre	17	28	118	
73/36	358.6	826.1	Andesite	44	26	80	
73/37	358.6	825.4	Hornblende feldspar porphyry	29	6	41	
73/38	359.6	824.8	Dacite	96	183	29	
73/39	360.4	828.2	Dacite	900	11	61	F408
73/41	360.0	826.5	Hornblende feldspar porphyry	20	10	32	

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Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
73/42	360.3	828.2	Dacite	38	16	87	F409
73/43	360.1	828.3	Dacite				F410
73/43	360.1	828.3	Dacite?				
73/44	360.6	828.3	Dacite				
73/45	360.9	826.8	Coarse tuff	59	4	120	F411
73/46	358.6	827.1	Dacite	13	1	138	
73/47	358.9	827.5	Dacite	14	18	79	
73/48	359.8	827.4	Ignimbrite	6	6	27	
73/49	359.2	827.2	Dacite	50	18	52	
73/50	359.6	827.3	Ignimbrite	8	14	5	
73/51	359.4	828.1	Dacite	33	35	130	
73/52	358.9	827.3	Andesitic tuff				F412
73/53	358.9	826.9	Medium tuff	68	7	86	
73/54	359.9	827.4	Ignimbrite	25	18	64	
73/55	358.7	826.8	Dacite	35	14	48	F413
73/56	359.3	828.3	Dacite	22	9	57	
73/57	359.5	827.3	Ignimbrite	17	18	35	
73/58	360.3	827.2	Ignimbrite?	11	11	69	
73/59	360.7	826.9	Dacite				
73/60	360.1	826.9	Lapilli tuff	16	22	69	
73/61	359.3	826.8	Ignimbrite				
73/62	360.0	827.1	Lapilli tuff	33	16	47	
73/63	359.4	826.7	Dacite	36	14	104	
73/64	360.6	826.7	Andesitic tuff	24	12	95	
73/65	359.2	826.8		13	13	22	
73/66	359.2	825.4	Dacite	80	12	10	
73/67	359.7	825.6	Quartz keratophyre	470	41	73	
73/68	361.1	826.1	Lapilli tuff	38	33	58	
73/69	359.6	825.7	Medium tuff	15	45	50	
73/70	360.3	827.7	Dacite	22	9	42	
74/1	361.3	825.9	Lapilli tuff	24	12	95	
74/2	361.2	825.9	Lapilli tuff	142	16	81	F414
74/3	360.1	825.4	Andesite?	9	20	65	
74/4	360.3	825.5	Dacite	5	20	4	F415
74/5	359.4	825.9	Andesite	51	20	88	
74/6	359.8	828.0	Acid	43	112	50	
74/7	358.5	826.5	Ignimbrite	213	24	32	
74/8	360.2	824.7	Ignimbrite	40	20	104	
74/9	360.3	824.8	Ignimbrite	28	24	46	F416
74/10	360.3	824.9		107	14	63	F417
74/11	360.3	825.0	Dacite	20	14	100	
74/12	359.8	828.0	Dacite	32	16	67	
74/13	359.7	827.8	Ignimbrite	31	30	29	
74/14	359.7	827.7	Ignimbrite				

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Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
74/15	359.1	824.9	Lapilli tuff	23	24	88	
74/17	359.7	825.2	Basic volcanic	52	16	127	
74/18	360.0	825.2	Dacite/andesite	160	16	134	
74/19	360.4	825.4	Dacite	11	18	44	
74/20	360.7	825.5	Andesitic tuff	36	16	272	F418
74/21	358.1	825.4	Ignimbrite	8	22	19	
74/22	361.1	825.3	Coarse tuff				
74/23	358.5	826.5	Lapilli tuff	45	22	74	
74/24	358.1	827.0	Coarse tuff	12	26	44	
74/25	357.8	826.9	Quartz keratophyre				
74/26	357.4	826.9	Coarse tuff	13	12	75	F419
74/27	359.8	824.8	Dacite	9	8	35	
74/28	360.4	825.2	Andesite	66	12	126	F420
74/29	360.6	825.6	Andesitic tuff	117	4	94	
74/30	360.7	825.3	Andesite	115	16	39	F421
74/31	360.8	825.3	Andesite	155	38	113	F422
74/32	360.9	825.6	Acid? tuff	15	12	30	
74/33	358.6	828.0	Dacite	10	6	30	
74/34	358.5	827.8	Ignimbrite	177	20	63	
74/35	358.5	828.2	Ignimbrite	20	16	49	
74/36	358.4	828.1	Dacite	23	20	40	
74/37	358.5	828.1	Lapilli tuff	22	26	75	
74/38	358.7	828.2	Dacite	29	16	44	
74/39	358.6	828.4	Dacite	92	30	33	
74/40	358.7	828.4	Dacite	11	20	53	
74/41	358.7	828.5	Dacite	15	98	310	
74/42	358.9	828.5	Ignimbrite	113	16	39	
74/43	358.9	828.4	Ignimbrite	11	26	47	
74/44	359.0	828.4	Ignimbrite	18	40	30	
74/45	359.1	828.6	Lapilli tuff	23	150	280	
74/46	359.1	828.6	Acid	23	80	27	
74/47	359.2	828.6	Medium tuff	15	44	59	F423
74/48	358.7	827.4	Coarse tuff	20	18	73	
74/49	358.9	827.6	Fine tuff	469	20	23	F424
74/50	359.6	827.8	Dacite	29	28	204	
74/51	359.4	827.8	Dacite				
74/52	359.7	827.8	Ignimbrite	24	30	49	
74/53	359.7	827.8	Ignimbrite	8	8	30	
74/54	359.7	827.9	Ignimbrite/andesitic	51	32	79	F425
74/55	358.4	828.3	Lapilli tuff	14	54	60	
74/56	358.4	828.3	Ignimbrite	12	20	13	
74/57	358.4	828.4	Ignimbrite				
74/58	358.4	828.4	Ignimbrite				F426
74/59	358.5	828.4	Ignimbrite	78	18	54	

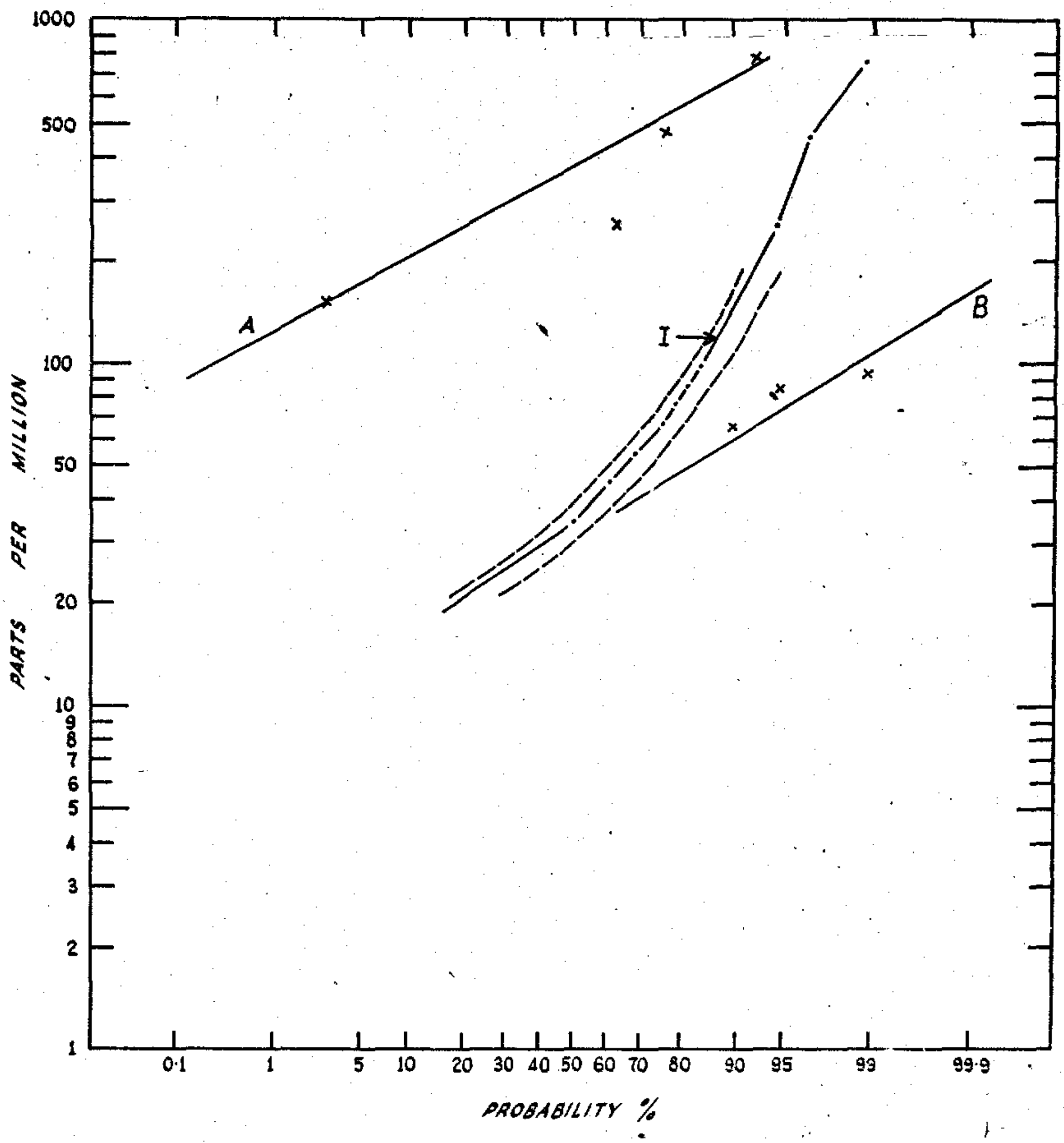
Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
74/60	358.5		Ignimbrite	18	24	67	
74/61	358.6	828.5	Acid	28	24	142	
74/62	358.9	828.8	Ignimbrite	8	20	116	
74/63	358.9	828.9	Dacite?	13	28	99	
74/64	359.0	828.9	Dacite	7	22	57	
74/65	359.0	829.0	Ignimbrite?	21	16	99	
74/66	359.1	829.1	Medium tuff	59	32	97	
74/67	359.9	828.1	Dacite?	40	12	53	
74/68	359.9	828.1	Dacite?				
74/69	360.1	828.3	Acid volcanic	8	14	168	
74/70	359.2	829.4	Lapilli tuff	28	22	102	
74/71	359.3	828.6	Coarse tuff				
74/72	359.3	828.5	Dacite	184	10	12	
74/73	359.8	829.5	Quartz keratophyre	7	16	213	
74/74	359.7	829.4	Quartz keratophyre	7	18	225	
74/75	359.4	829.5	Dacite	33	34	96	
74/76	359.3	829.4	Lapilli tuff	30	14	109	
74/77	357.0	826.8	Medium tuff	7	6	26	
74/78	357.1	826.8	Coarse tuff	39	60	890	
74/79	357.1	826.8	Fine tuff	58	14	46	
74/80	357.3	826.6	Coarse tuff	14	10	55	
74/81	357.4	826.6	Hornblende feldspar porphyry	7	20	131	
74/82	357.5	826.5	Coarse tuff	10	12	111	
74/83	357.6	826.6	Fine tuff	38	4	90	
74/84	359.2	829.3	Dacite	6	6	95	
74/86	358.4	827.7	Black pyritic shale	37	34	70	
74/87	358.4	827.6	Coarse tuff	90	18	41	
74/88	358.4	827.6	Quartz keratophyre	33	24	95	
74/89	358.2	827.5	Coarse tuff	54	144	213	
74/90	358.0	827.6	Coarse tuff	7	12	60	
74/91	357.9	827.6	Fine tuff	9	8	16	
74/92	361.1	824.9	Andesite	58	18	53	
74/93	357.7	827.4	Quartz keratophyre	6	5	47	
74/94	357.6	827.5	Quartz keratophyre	18	11	25	
74/95	357.4	827.2	Coarse tuff	16	9	85	
74/96	357.2	827.2	Hornblende feldspar porphyry	21	30	290	
74/97	357.2	827.1	Coarse tuff	11	15	38	
74/98	356.9	826.7	Microgranophyre	13	5	44	
74/99	356.9	826.6	Microgranophyre	106	17	50	
74/100	358.9	826.6	Quartz keratophyre	33	8	30	
74/101	358.2	826.2	Porphyry andesite	151	20	77	
74/102	358.2		Porphyry andesite sill	72	24	171	

Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
74/103	358.7	826.5	Dacite	9	12	80	
74/104	358.8	826.5	Coarse tuff				
74/105	358.8	826.6	Ignimbrite?	49	104	143	
74/107	357.2	827.1	Coarse tuff	7	6	80	
74/108	357.1	877.1	Coarse tuff	5	12	47	
74/109	357.0	826.7	Coarse tuff	39	20	118	
74/110	356.9	826.7	Micrographophyre	6	12	37	
74/111	356.9	826.7	Micrographophyre	19	8	32	
74/112	356.2	827.2	Andesite	41	4	162	
74/113	356.9	827.4	Quartz keratophyre?	7	4	51	
74/114	358.9	826.7	Andesitic tuff	9	152	153	
74/115	359.0	826.7	Lapilli tuff	27	52	124	
74/116	359.1	826.8	Ignimbrite	17	8	222	
74/117	359.2	826.8	Dacite	9	12	63	
74/118	354.9	827.3	Medium tuff	20	24	53	
74/119	354.6	826.7	Ignimbrite	15	12	3	
74/120	354.5	828.4	Medium tuff	7	12	10	
74/121	354.5	828.7	Coarse tuff	7	68	38	
74/123	354.5	829.3	Dolerite	70	12	54	
74/124	356.7	826.7	Micrographophyre				
74/126	356.5	827.0	Coarse tuff	21	16	68	
74/127	356.9	827.2	Micrographophyre	37	24	24	
74/128	356.2	827.2	Acid	53	28	23	
74/129	356.2	827.2	Lapilli tuff	21	20	90	
74/130	356.5	826.9	Fine tuff	11	16	9	
74/131	356.4	826.8	Medium tuff	10	16	28	F427
74/132	356.4	826.8	Micrographophyre	81	12	44	
74/133	356.4	826.8	Medium tuff banded				
74/134	356.7	826.2	Micrographophyre	27	20	30	
74/135	356.8	826.3	Micrographophyre	9	24	125	
74/136	356.8	826.2	Medium tuff	35	20	30	
74/137	356.4	828.1	Medium tuff	25	24	108	
74/138	356.6	828.7	Fine tuff	73	20	7	
74/139	356.0	821.8	Siltstone	8	52	95	
74/140	356.2	821.9	Coarse tuff	111	48	255	
74/141	356.0	830.1	Fine tuff	15	116	136	
74/142	356.0		Coarse tuff	23	12	19	
74/143	356.4	829.8	Medium tuff	11	20	140	
74/144	356.5	829.4	Coarse tuff	38	28	60	
74/145	354.5	828.5	Medium tuff	9	56	12	
74/146	354.6	828.5	Coarse tuff	19	20	15	
74/147	354.7	828.5	Dolerite	107	20	50	
74/148	355.0	828.5	Andesitic pyroclastic	61	32	75	

Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
74/149	355.2	828.7	Andesite? basic	22	24	90	
74/150	355.4	828.9	Medium tuff	5	16	18	
74/151	354.3	829.3	Coarse tuff	25	56	13	
74/152	357.7	827.4	Andesitic tuff?	11	12	72	
75/1	360.1	833.6	Andesite				
75/2	360.0	833.4	Andesite				
75/3	358.6	832.0	Crystal lithic tuff				
75/4	358.7	832.1	Ignimbrite				
75/5	358.9	832.2	Volcanic breccia				
75/6	359.2	832.2	Andesite				
75/7	358.9	832.3	Crystal tuff				
75/8	358.6	832.2	Shale				
75/9	358.5	832.2	Pyritic shale				
75/10	358.6	832.5	Siltstone				
75/11	358.6	832.5	Andesite				
75/12	358.5	832.6	Siltstone				
75/13	359.9	831.9	Ignimbrite				
75/14	359.9	831.9	Acid lava				
75/21	357.8	822.3					
75/22	357.6	822.1					
75/23	357.8	821.7					
75/24	357.7	821.9	Crystal tuff				
75/25	357.5	821.6	Crystal lithic tuff				
75/26	358.0	821.5	Basic lava?				
75/27	357.9	821.7	Dolerite				
75/28	357.3	822.6	Quartz, feldspar, porphyry				
75/29	357.6	822.7	Baryte				
75/30	357.6	822.3	Baryte				
75/41	359.2	832.2	Andesite				
75/42	359.2	832.1	Acid? intermediate lava				
75/43	359.3	832.1	Acid? intermediate lava				
75/44	359.3	832.1	Ignimbrite				
75/45	358.8	828.4	Acid lava				
75/46	358.9	828.5	Lapilli tuff				
75/47	359.2	828.5	Acid lava				
75/48	359.4	828.7	Lapilli tuff				
75/50	358.4	825.1	Crystal lithic tuff				
75/51	359.9	825.1	Lapilli tuff				
75/52	359.0	824.7	Intermediate ignimbrite				
75/53	359.1	824.7	Ignimbrite				
75/54	359.0	825.1	Intermediate porphyry				

Sample No.	Co-ordinates		Rock Type	Cu	Pb	Zn	Thin Sect. No.
75/55	359.2	824.7					
75/56	358.8	824.2	Tuff/siltstone				
75/57	358.6	823.9	Crystal tuff	—	—	—	
75/58	358.7	832.3					
75/61	359.4	832.0	Hornblende feldspar porphyry				
75/62	359.4	832.1	Andesite				
75/63	359.1	832.3	Hornblende feldspar porphyry				
75/64	359.2	832.2	Andesite				
75/65	358.7	832.3	Intermediate ignimbrite				
75/66	358.6	832.2	Crystal lithic tuff				
75/67	358.7	832.5	Ignimbrite				
75/68	358.9	832.4	Acid lava				
75/69	358.3	831.9	Crystal lithic tuff				
75/70	358.2	831.8	Acid lava?				
75/71	358.0	831.9	Crystal lithic tuff				
75/72	357.9	831.9	Intermediate lava				
75/74	357.6	831.7					
75/75	357.8	831.8					
75/76	357.6	831.5	Quartz feldspar porphyry				
75/77	357.7	831.7	Acid lava				
75/78	357.1	830.3	Crystal lithic tuff				

APP. VIII FIG. 1



(TOTAL SOILS)

Nº OF SAMPLES n = 250

METAL ··············· Cu

SAMPLE TYPE ······· ROCK CHIP

HORIZON ············· B

FRACTION ··········· -80 #

ACID PYROCLASTICS

1ST ORDER THRESHOLD ······ 110 p.p.m.

2ND ORDER THRESHOLD ······ p.p.m.

3RD ORDER THRESHOLD ······ p.p.m.

BACKGROUD MEDIAN ······ 35

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

C – POPULATION C

95% CONFIDENCE LIMIT

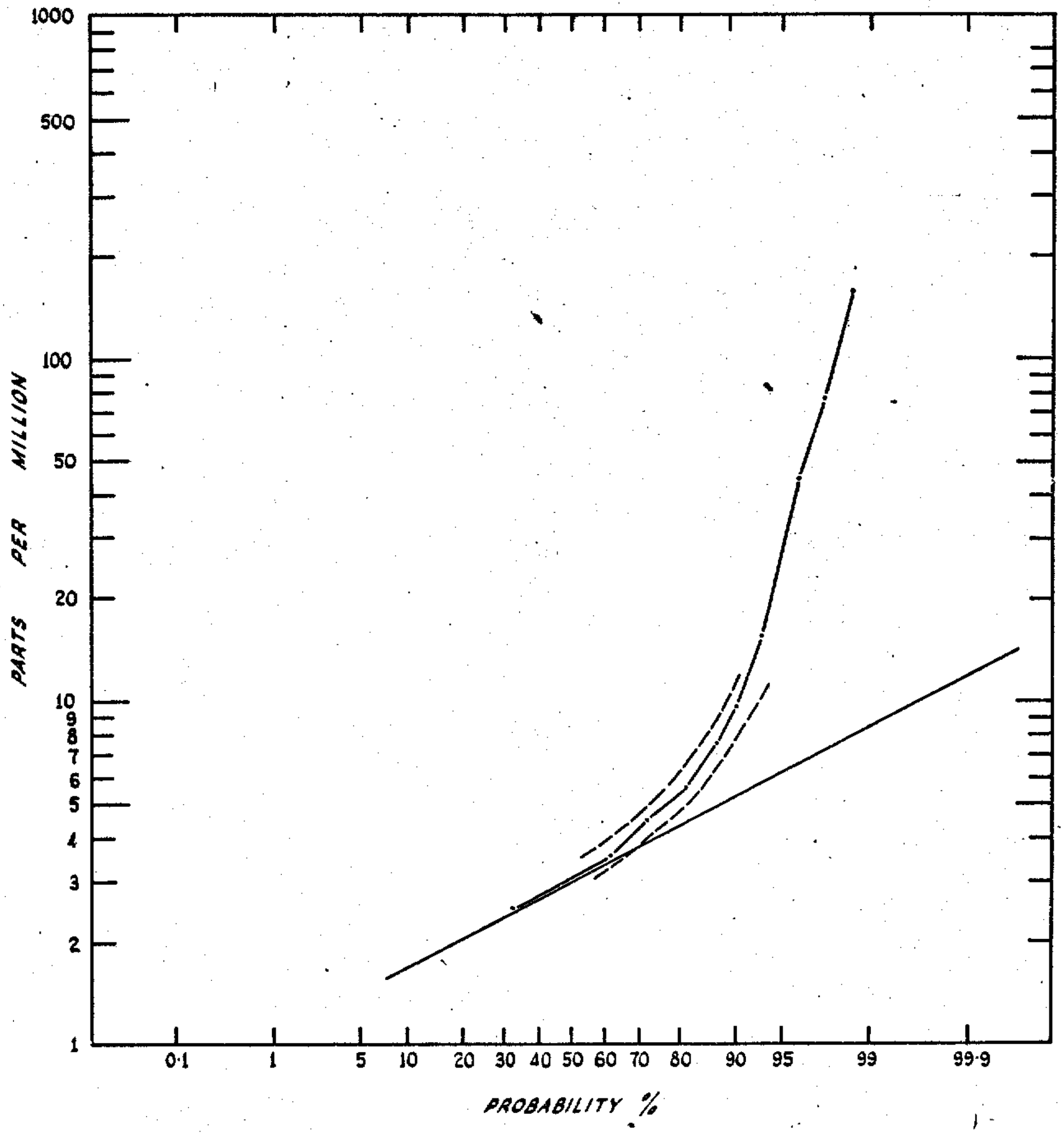
5 cm

THE MT. LYELL M. & R. Coy. LTD.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H. DATE. JUNE '75

043

448044

APP. VI FIG. 2



(TOTAL SOILS)

Nº OF SAMPLES n = 250

METAL .... Pb

SAMPLE TYPE .... ROCK CHIP

HORIZON .... B

FRACTION .... -80 #

ACID PYROCLASTICS

1ST ORDER THRESHOLD ...... 85 p.p.m.

2ND ORDER THRESHOLD ...... p.p.m.

3RD ORDER THRESHOLD ...... p.p.m.

BACKGROUD MEDIAN 28

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

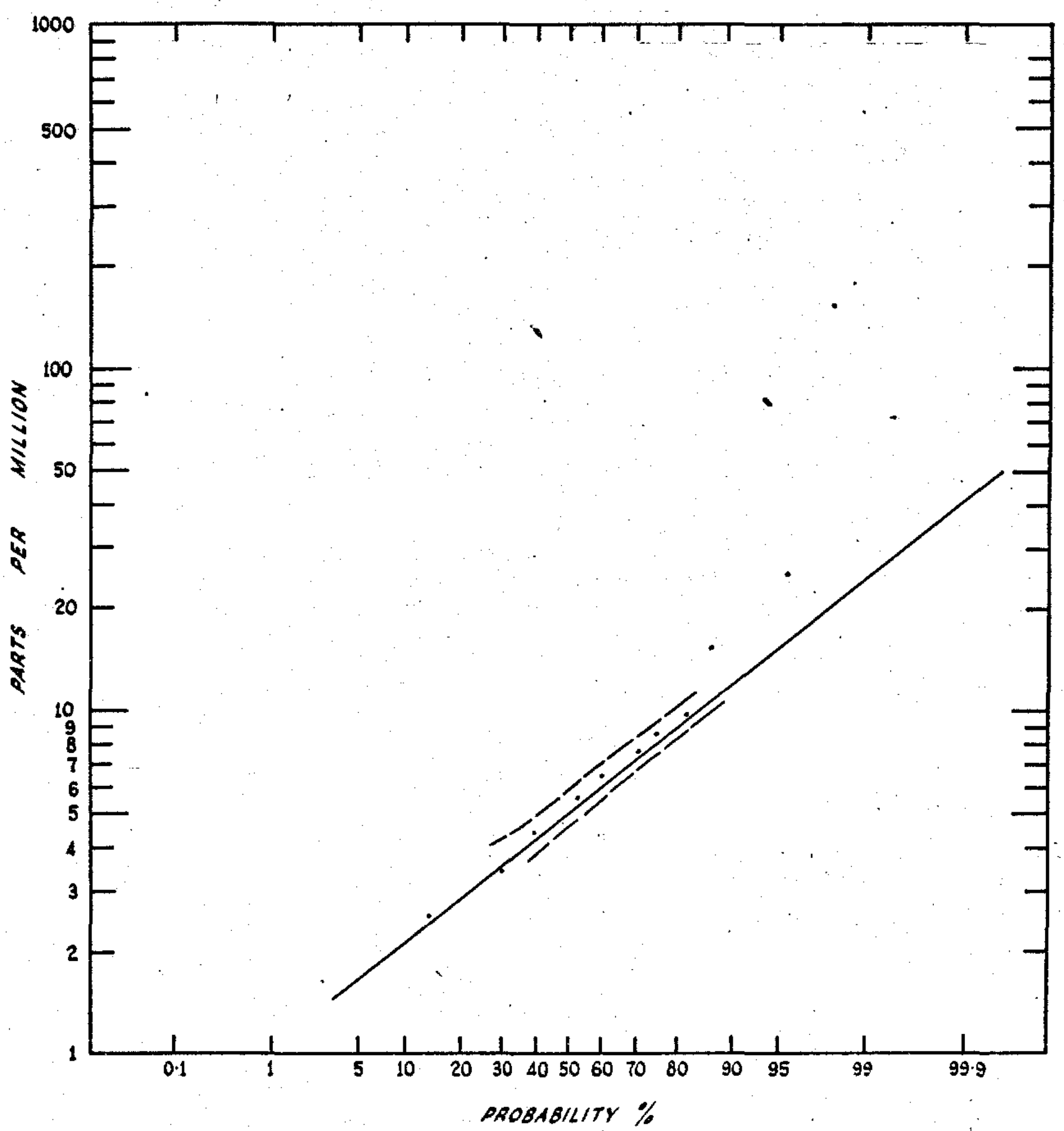
C – POPULATION C

95% CONFIDENCE LIMIT

5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY – YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H. DATE. JUNE '76

APP. VI FIG.3



(TOTAL SOILS)

Nº OF SAMPLES n = 250

METAL .... Zn

SAMPLE TYPE .... ROCK CHIP

HORIZON .... B

FRACTION .... -80

ACID PYROCLASTICS

1ST ORDER THRESHOLD ...... 250 p.p.m.

2ND ORDER THRESHOLD ...... p.p.m.

3RD ORDER THRESHOLD ...... p.p.m.

BACKGROUD MEDIAN 58

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

C – POPULATION C

95% CONFIDENCE LIMIT

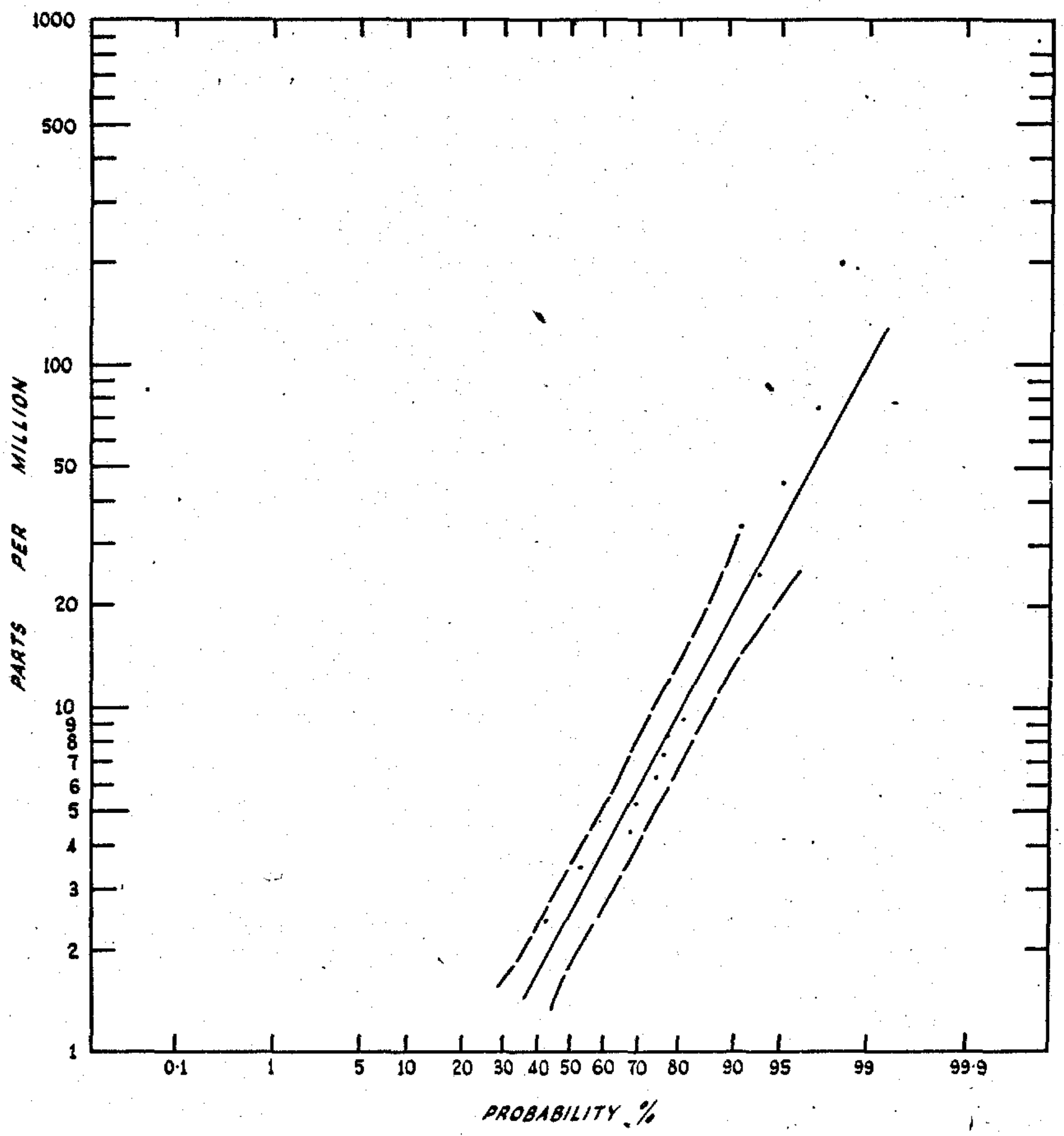
5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY – YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H.
	DATE. JUNE '76

045

448046

APP. VI FIG.4



(TOTAL SOILS)

Nº OF SAMPLES n = 130

METAL .... Cu

SAMPLE TYPE .... ROCK CHIP

HORIZON .... B

FRACTION .... -80 #

ACID INTRUSIVES AND EXTRUSIVES

1ST ORDER THRESHOLD ...... 1000 p.p.m.

2ND ORDER THRESHOLD ...... p.p.m.

3RD ORDER THRESHOLD ...... p.p.m.

BACKGROUD MEDIAN 27

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

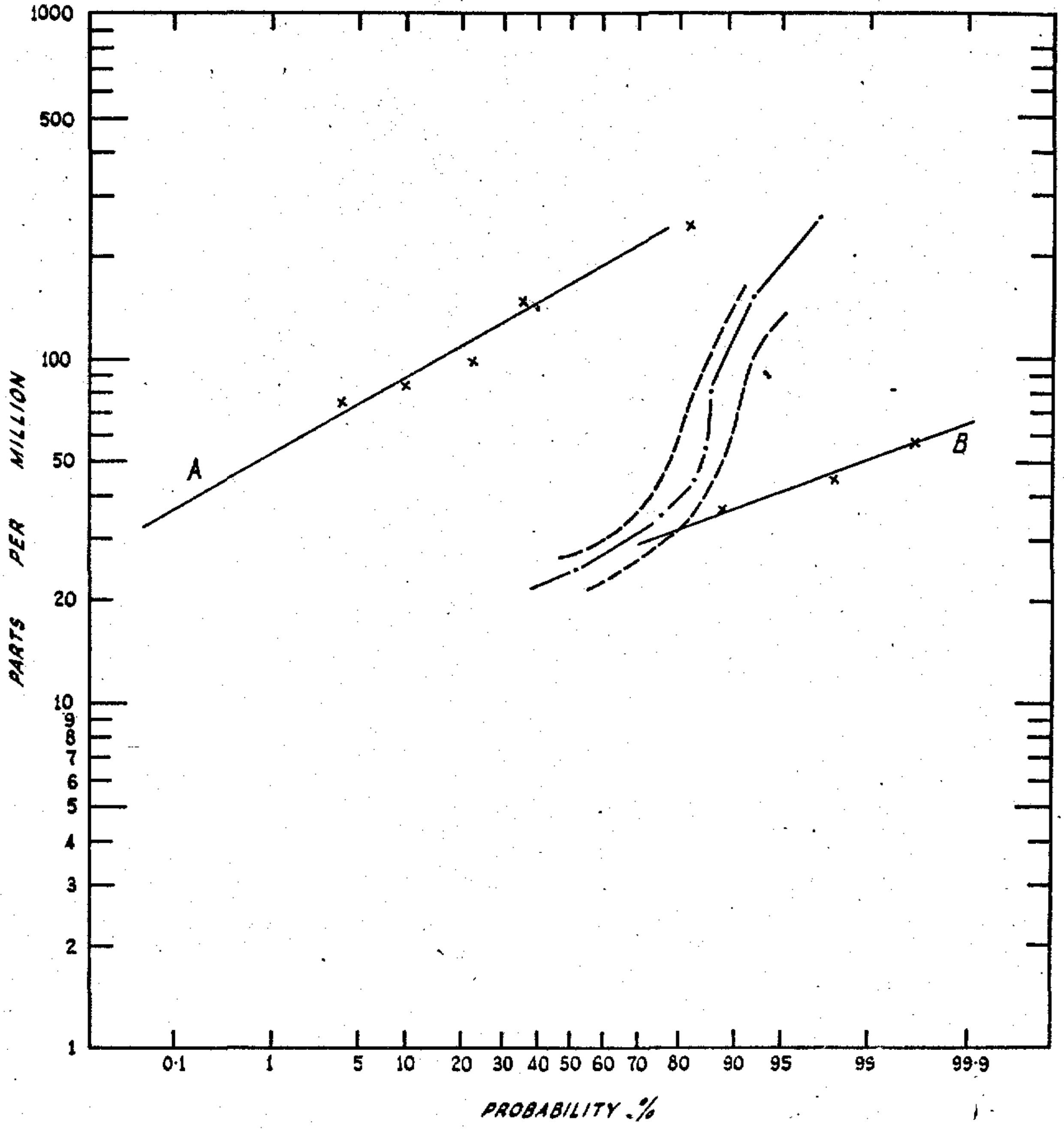
C – POPULATION C

95% CONFIDENCE LIMIT

5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H.
	DATE. JUNE '76

APP. VI FIG.5



(TOTAL SOILS)

Nº OF SAMPLES n = 130

METAL .... Pb

SAMPLE TYPE .... ROCK CHIP

HORIZON .... B

FRACTION .... -80 #

1ST ORDER THRESHOLD ...... 80 p.p.m.

2ND ORDER THRESHOLD ...... p.p.m.

3RD ORDER THRESHOLD ...... p.p.m.

BACKGROUD MEDIAN 25

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

C – POPULATION C

95% CONFIDENCE LIMIT

ACID INTRUSIVES AND EXTRUSIVES

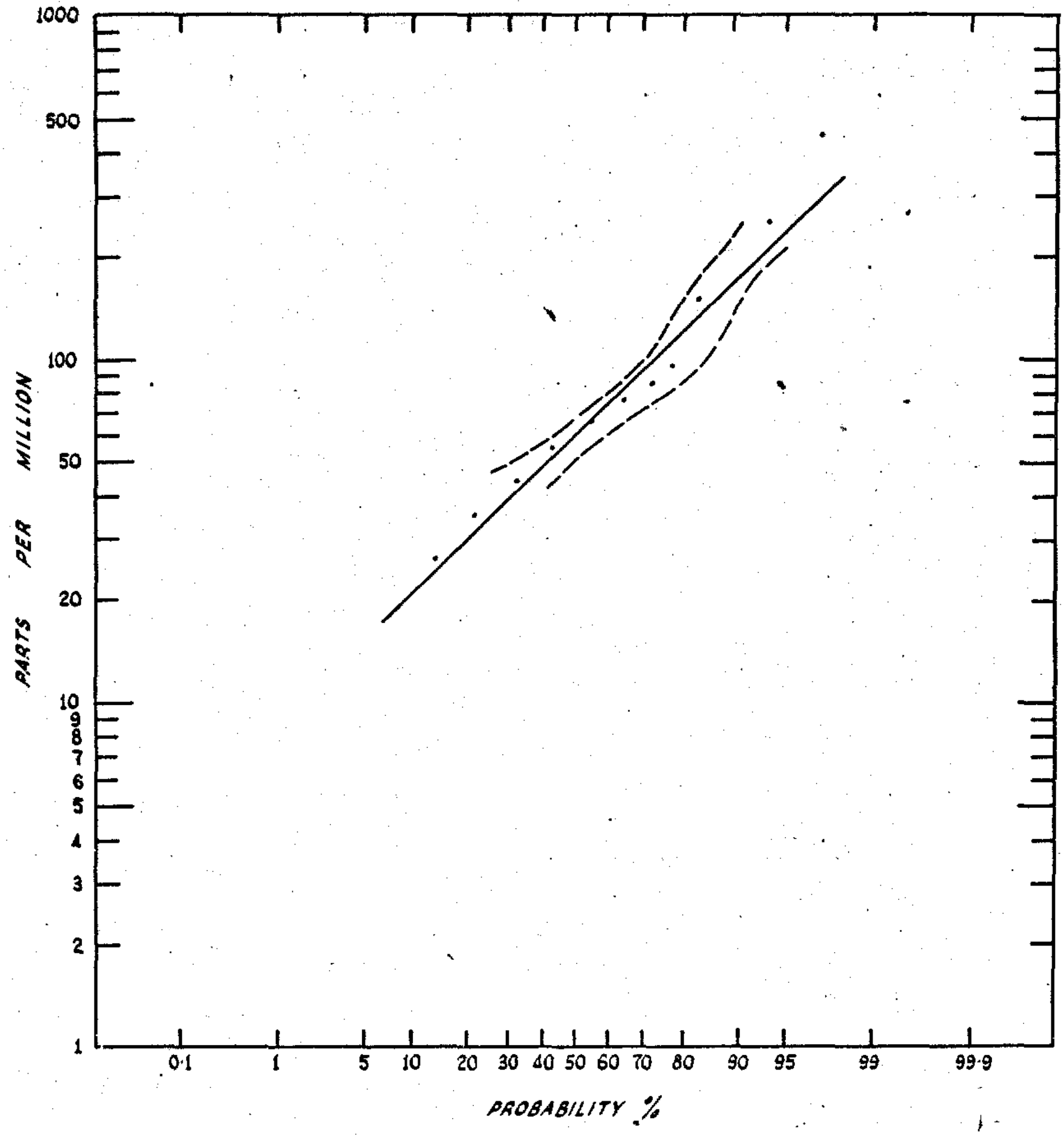
5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W
HENTY - YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H.
	DATE. JUNE '76

047

448048

APP. VI FIG.6



(TOTAL SOILS)

Nº OF SAMPLES n = 130

METAL .... Zn

SAMPLE TYPE .... ROCK CHIP

HORIZON .... B

FRACTION .... -80 #

ACID INTRUSIVES AND EXTRUSIVES

1ST ORDER THRESHOLD ...... p.p.m.

2ND ORDER THRESHOLD ...... p.p.m.

3RD ORDER THRESHOLD ...... p.p.m.

BACKGROUD MEDIAN 60

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

C – POPULATION C

95% CONFIDENCE LIMIT ---

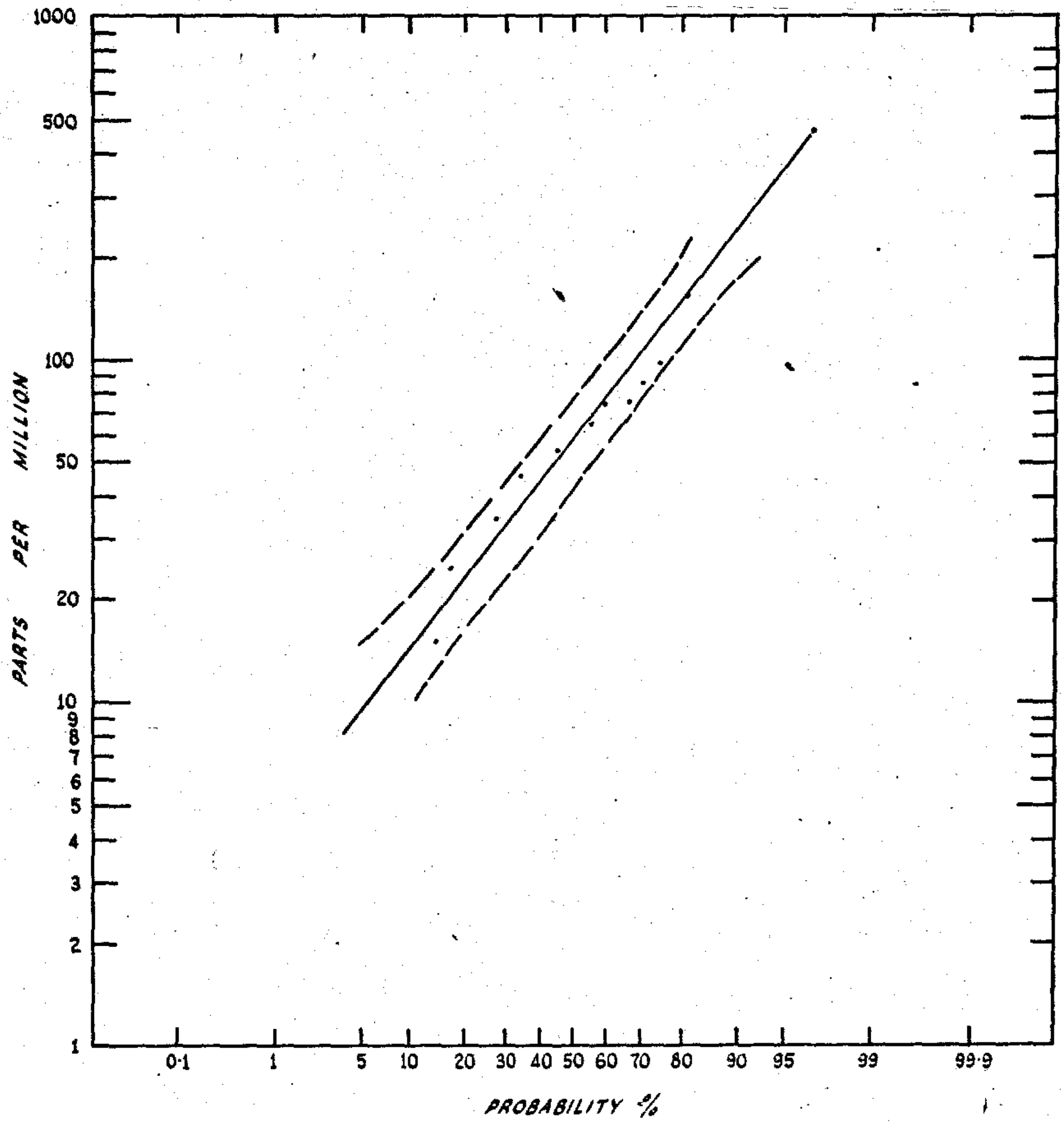
5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H.
	DATE. JUNE '76

048

448049

APP. V|FIG. 7



(TOTAL SOILS)

Nº OF SAMPLES n = 77	1ST ORDER THRESHOLD ······ p.p.m.	I – POINT OF INFLECTION
METAL ················ Cu	2ND ORDER THRESHOLD ······ p.p.m.	A – POPULATION A
SAMPLE TYPE······· ROCK CHIP	3RD ORDER THRESHOLD ······ p.p.m.	B – POPULATION B
HORIZON ·············· B	BACKGROUD MEDIAN ······ 60	C – POPULATION C
FRACTION ············ -80 #		95% CONFIDENCE LIMIT

INTERMEDIATE VOLCANICS

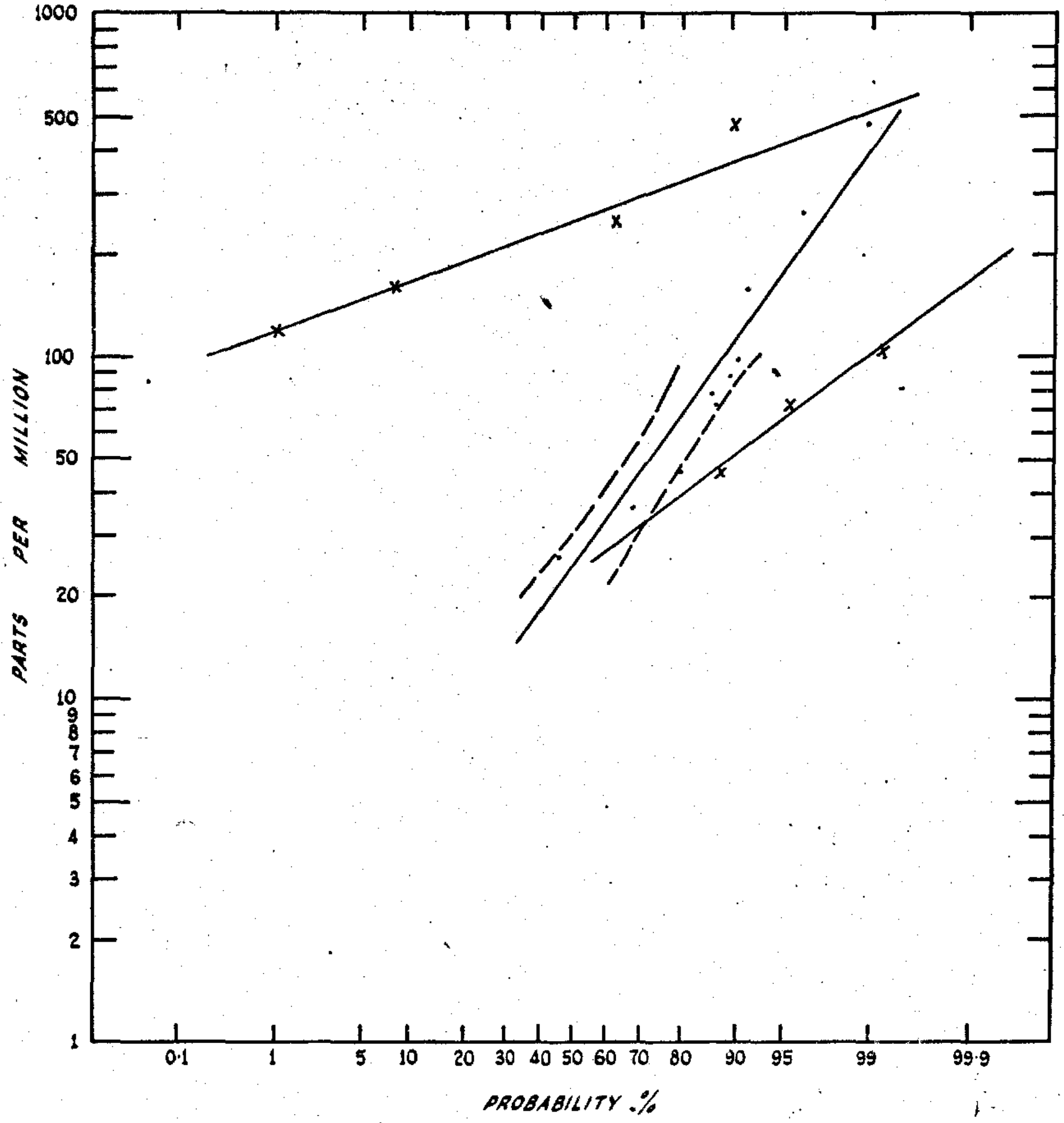
5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H.
	DATE. JUNE '76

040

448050

APP.VI FIG. 8



(TOTAL SOILS)

Nº OF SAMPLES n = 77

METAL ·················· Pb

SAMPLE TYPE ········ ROCK CHIP

HORIZON ················ B

FRACTION ·············· -80 #

INTERMEDIATE VOLCANICS

1ST ORDER THRESHOLD ······ p.p.m.

2ND ORDER THRESHOLD ······ p.p.m.

3RD ORDER THRESHOLD ······ p.p.m.

BACKGROUD MEDIAN 25...

I – POINT OF INFLECTION

A – POPULATION A

B – POPULATION B

C – POPULATION C

95% CONFIDENCE LIMIT - - -

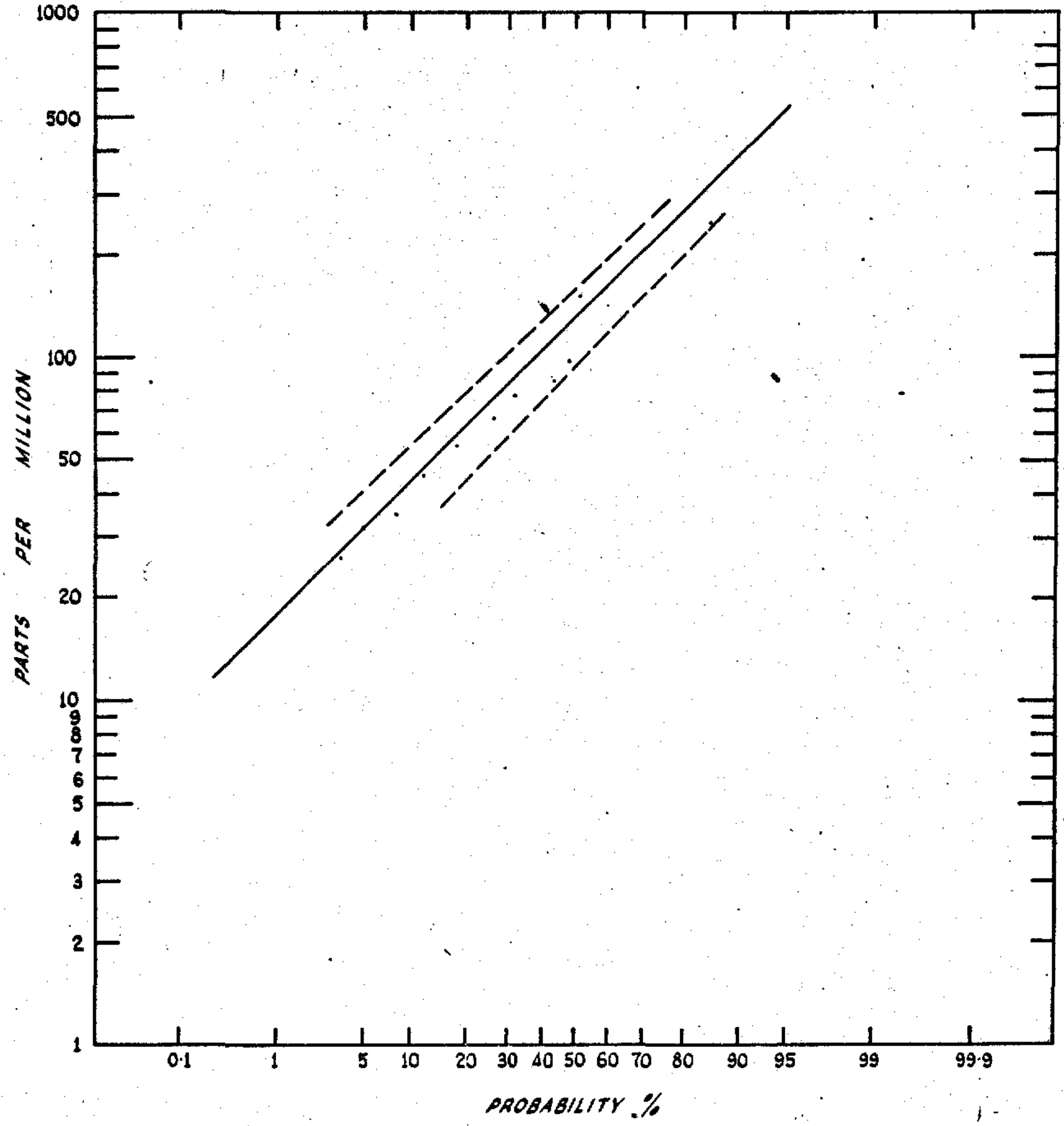
5 cm

THE MT. LYELL M. & R. Coy. LTD.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H.
	DATE. JUNE '76

050

448051

APP. V.1 FIG. 9



(TOTAL SOILS)

N° OF SAMPLES n = 77

METAL ·················· Zn

SAMPLE TYPE ········ ROCK CHIP

HORIZON ················ B

FRACTION ············· -80 #

INTERMEDIATE VOLCANICS

1ST ORDER THRESHOLD ······ p.p.m.

2ND ORDER THRESHOLD ······ p.p.m.

3RD ORDER THRESHOLD ······ p.p.m.

BACKGROUD MEDIAN 120.

I – POINT OF INFLECTION

A – POPULATION A

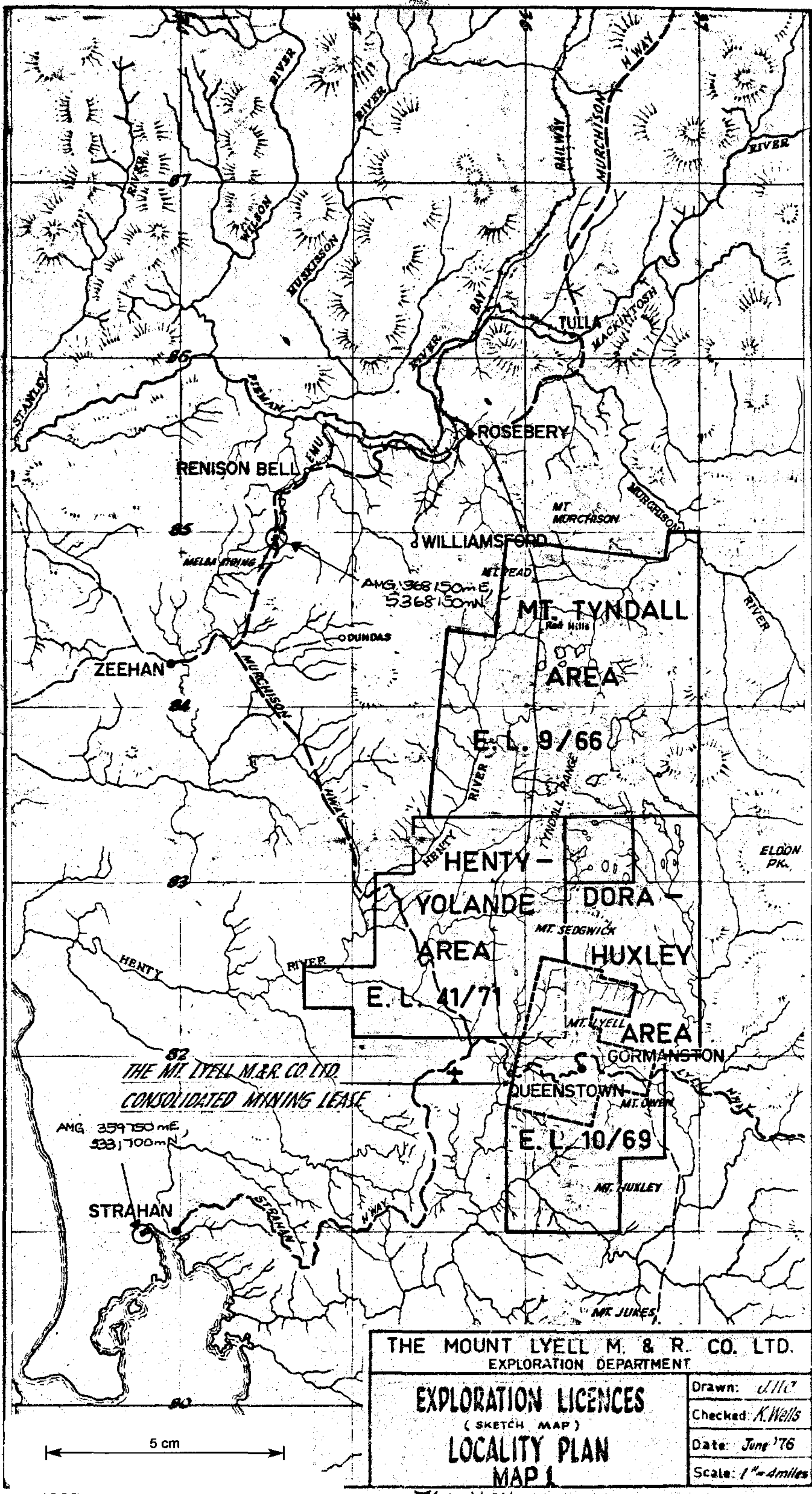
B – POPULATION B

C – POPULATION C

95% CONFIDENCE LIMIT – – –

5 cm

THE MT. LYELL M. & R. Coy. Ltd.	TRACED. R.G.W.
HENTY - YOLANDE E.L. 41/71 STATISTICAL ANALYSIS OF ROCK CHIP DATA	CHECKED. N.S-H.
	DATE. JUNE '76

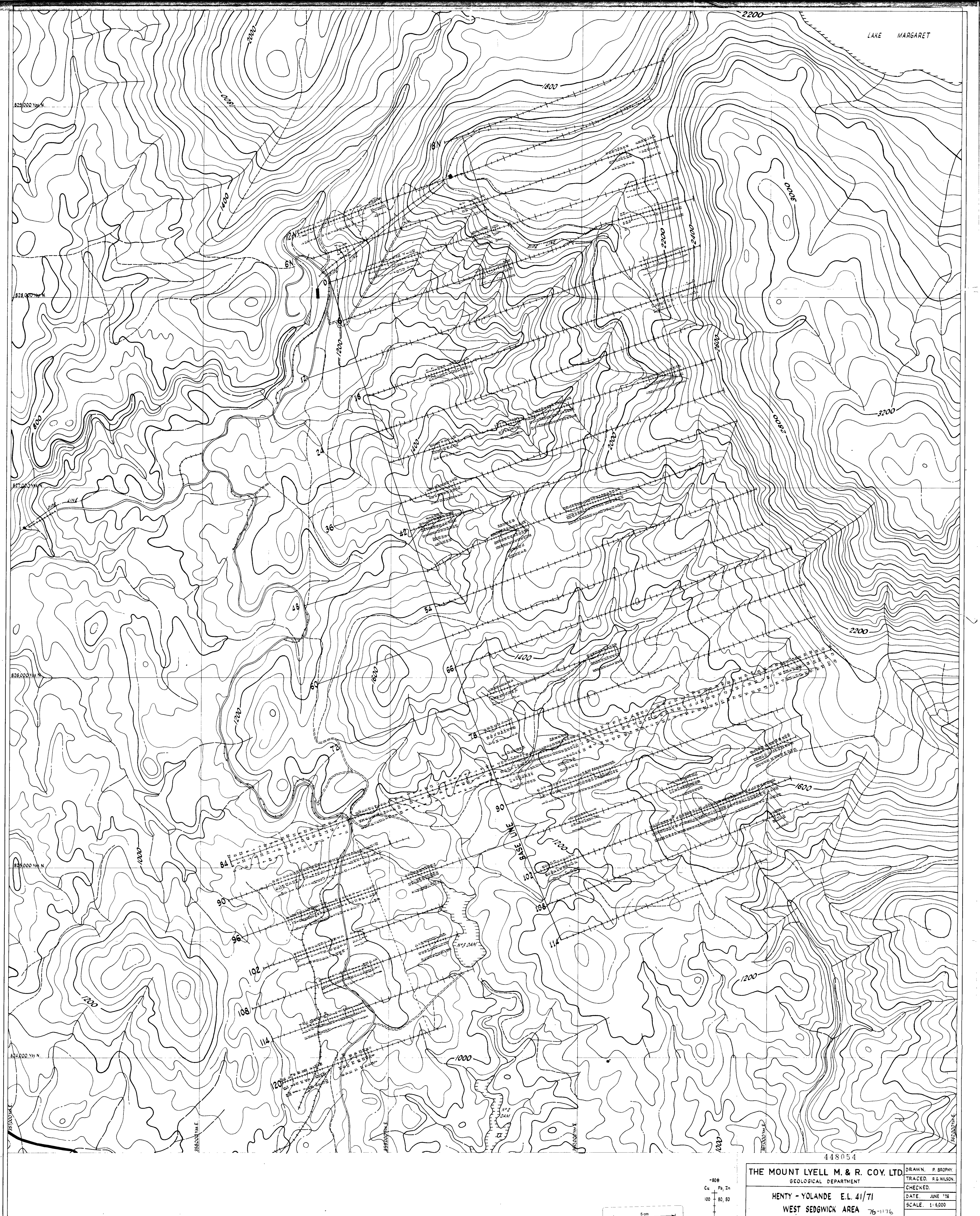


AMG REFERENCE POINTS ADDED

76-11 76

448052


001
835,000 YDS.N.
350,000 Y.E.
355,000 Y.E.
360,000 Y.E.
T.N. MN.
LEGEND
QUATERNARY
ALLUVIUM/ MORAINE AND/OR CONGLOMERATE SCREE.
SILURO - DEVONIAN (ELDON GROUP)
BELL SHALE - BLUE/BLACK SHALES AND SILTSTONES.
QUARTZITE, SANDSTONE, MINOR SANDY SHALES AND SILTSTONES.
ORDOVICIAN
OWEN CONGLOMERATE AND CORRELATES.
CAMBRIAN
TYNDALL GROUP
Ɛt
JUKES FORMATION - SANDSTONES, SHALES, VOLCANIC BRECCIAS, IGNIMBRITE, VOLCANICLASTIC CONGLOMERATE.
COMSTOCK TUFF - MOTTLED PINK/DARK GREEN CRYSTAL TUFFS, VOLCANIC BRECCIAS, SANDSTONES AND SHALES AND AN ACID LAVA?
UNCONFORMITY
MOUNT READ VOLCANICS
CENTRAL LAVA / IGNIMBRITE BELT
ACID Ɛc SEQUENCE
1Ec
MASSIVE / FOLIATED / ALTERED LAVAS, IGNIMBRITES AND AGGLOMERATES? MINOR OR ABSENT, ARGILLACEOUS SEDIMENTS RARE OR ABSENT.
1E/e
LAVAS, OCCASIONALLY BRECCIATED OR FOLIATED, IN APPROXIMATELY EQUAL PROPORTIONS WITH IGNIMBRITES.
1e
IGNIMBRITES, MINOR LAVAS.
MINOR ARGILLACEOUS SEDIMENTS
ANDESITIC Ɛc SEQUENCE
2Ec
LAVAS, MINOR TUFFS AND IGNIMBRITES.
2py
MEDIUM GRAINED - LAPILLI TUFFS.
2py
COARSE PYROCLASTICS.
2Hc
HORNBLENDE / PYROXENE - FELDSPAR PORPHYRY, HIGH LEVEL INTRUSIVE, MINOR LAVAS AND PYROCLASTICS MAY ALSO BE PRESENT.
QUEENSTOWN PYROCLASTICS
Ɛq
"U.HAULAGE STATION FORMATION" VITRIC MEDIUM - COARSE GRAINED TUFFS AND LITHIC CRYSTAL LAPILLI TUFFS.
1py
ACID TUFFS MOSTLY COARSE - FINE GRAINED WITH MINOR AGGLOMERATES, TUFFACEOUS SANDSTONES AND ARGILLACEOUS SEDIMENTS.
1e
IGNIMBRITES.
2/3 E/H
INTERMEDIATE AND BASIC LAVAS, MINOR INTRUSIVES? AND MINOR PYROCLASTICS?
3Eb
SPILITES?
1Ha/c
GRANOPHYRIC MICROGRANITE / MICROGRANODIORITE (DEVITRIFIED RHYODACITE) "FELDSPAR PORPHYRY", HIGH LEVEL INTRUSIVE.
1Hd
QUARTZ KERATOPHYRE "QUARTZ AND QUARTZ - FELDSPAR PORPHYRY", HIGH LEVEL INTRUSIVE, SOME ARE PARTLY EXTRUSIVE.
DUNDAS GROUP
Ɛd
INTERMEDIATE AND BASIC TUFFS, LAVAS AND MINOR INTRUSIVES, ARGILLACEOUS SEDIMENTS AND MINOR BANDED CHERTS.
HENTY - YOLANDE GREYWACKE FORMATION - GREYWACKES ALTERNATING WITH ARGILLACEOUS SEDIMENTS AND MINOR ACID PYROCLASTICS.
1E/Ha
RHYOLITE - EXTRUSIVE OR HIGH LEVEL INTRUSIVE.
DOLERITE.
GABBRO.
LAKE MARGARET TRAM PYRITE BODY. (NOT TO SCALE)
DEFINITE GEOLOGICAL BOUNDARY WITHIN 100' MAPPED ON GROUND
APPROXIMATE GEOLOGICAL BOUNDARY WITHIN 500' MOSTLY WITHIN 200'.
INFERRED GEOLOGICAL BOUNDARY.
FAULT, WITH DIRECTION OF THROW AND/OR HORIZONTAL MOVEMENT.
FAULT INFERRED.
UNCONFORMITY.
ANTICLINE WITH DIRECTION OF PLUNGE.
ANTICLINE INFERRED.
SYNCLINE.
SYNCLINE INFERRED.
TREND LINE.
FeS_2, Cu, Pb, Zn, Ba. LOCALITIES OF SIGNIFICANT MINERALISATION. (>1% FeS_2, >0·1% Cu, Pb, Zn.)
GOSSAN - NOT TO SCALE, DIMENSIONS MOSTLY UNKNOWN.
OLD WORKINGS.
5 cm
Henty Fault ?
Henty River
Tyndall Road
Basin Lake
Mt. Geikie
Approximate Volcanics / Conglomerate Contact
830,000 YDS.N.
Lake Margaret
Zeehan Highway
Henty Fault
Ewart
River
LINE OF SECTION
Swan
Creek
East Sister
West Sister
Sisters Hills
825,000 YDS.N.
UNDIFFERENTIATED
BUT PROBABLY ACIDIC LAVAS AND
IGNIMBRITES WITH
ANDESITIC VOLCANICS
AGGLOMERATES
Davies Hill
Henty River
Sisters Hills Fault
Yolande River
Diamond Hill
822,000 YDS.N.
West Lyell Open Cut
THE MOUNT LYELL M. & R. COY. LTD.
EXPLORATION DEPARTMENT
HENTY - YOLANDE AREA
E.L. 41/71
GEOLOGY MAP
001
76-1176
DRAWN. N.W. Sheppard.
TRACED. R.G. WILSON.
CHECKED. N.W.S
DATE. JUNE '76
SCALE. 1:15840.
MAP 2
448053

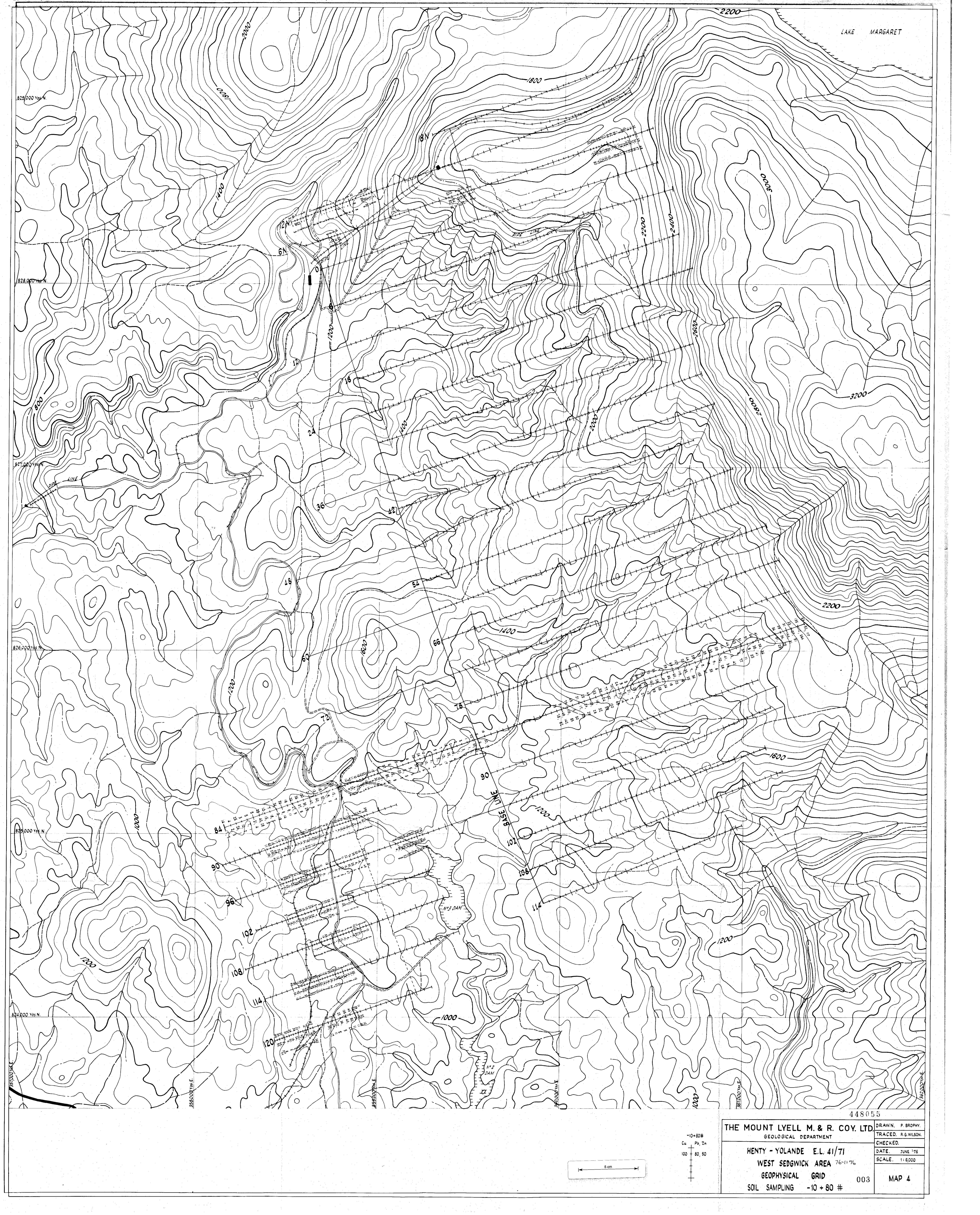


448054

-80#
Cu Pb, Zn
100 80, 50

5 cm

THE MOUNT LYELL M. & R. COY. LTD. GEOLOGICAL DEPARTMENT	DRAWN. P. BROPHY.
	TRACED. R.G. WILSON.
	CHECKED.
HENTY - YOLANDE E.L. 41/71	DATE. JUNE '76
WEST SEDGWICK AREA 76-1176	SCALE. 1:6,000
GEOPHYSICAL GRID 002	MAP 3
SOIL SAMPLING -80 #	



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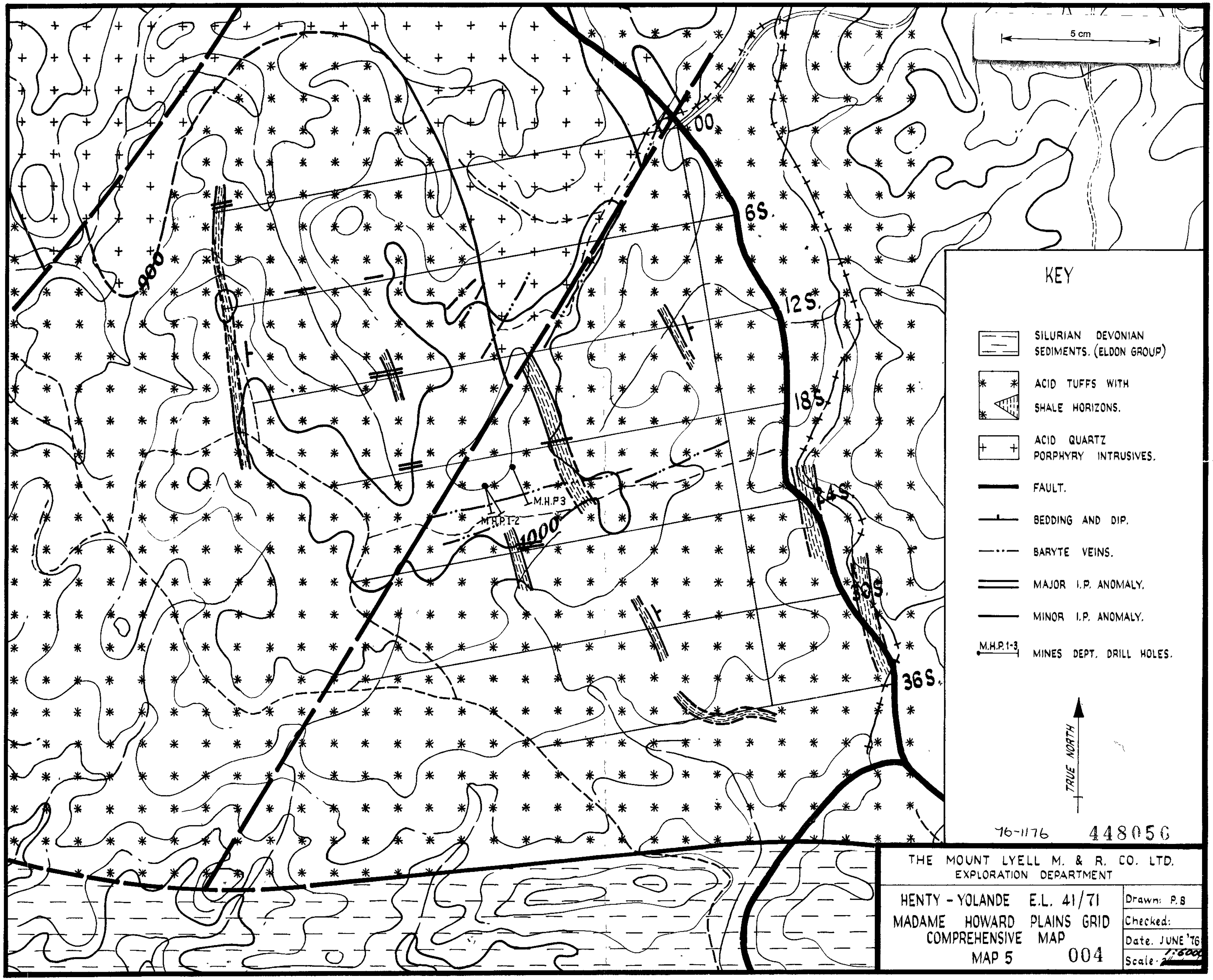
WEST SEDGWICK AREA 76-11-76
GEOPHYSICAL GRID
SOIL SAMPLING -10 + 80 #

003

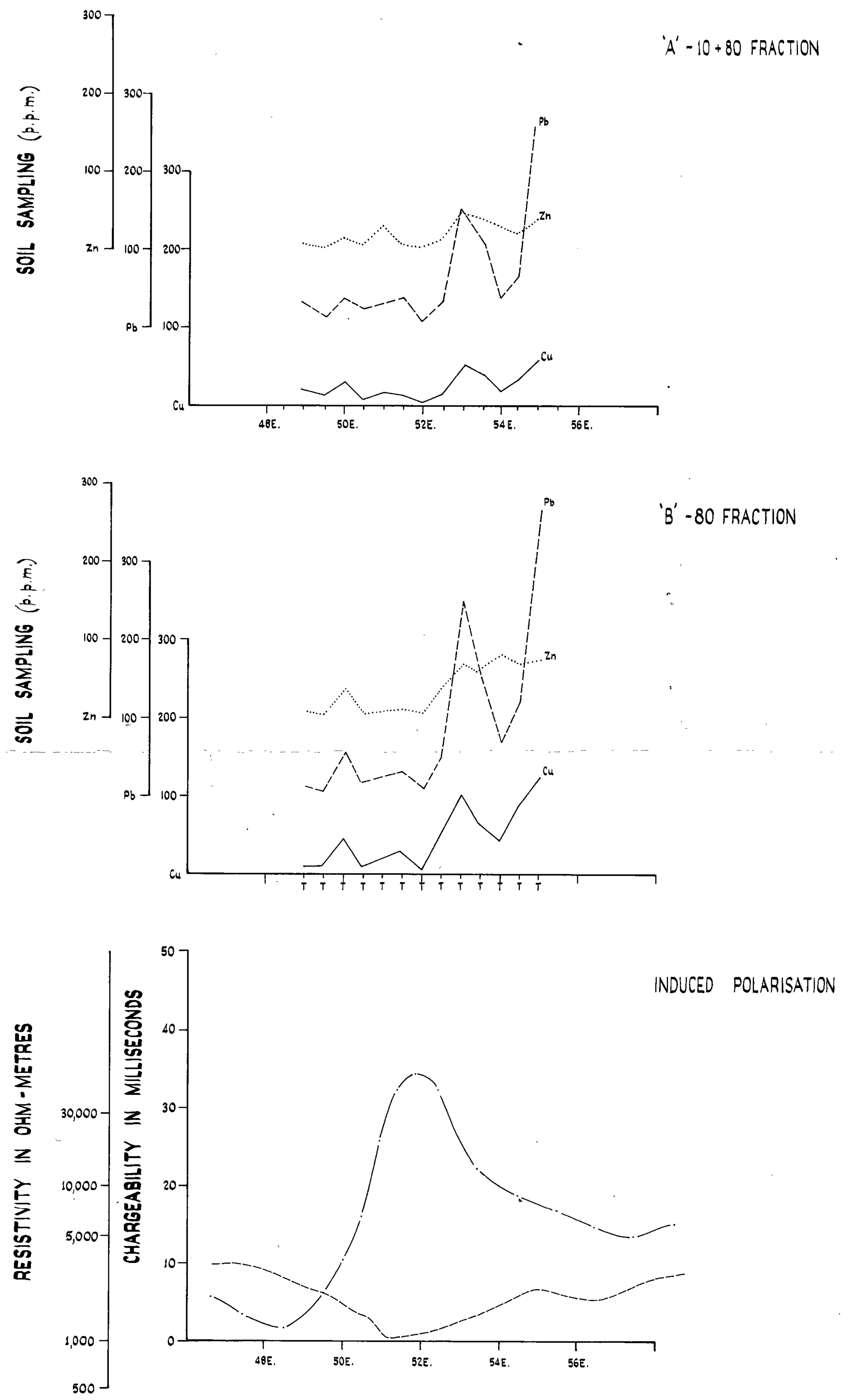
DRAWN.	P. BROPHY.
TRACED.	R.G. WILSON.
CHECKED.	
DATE.	JUNE '76
SCALE.	1:6,000

MAP 4

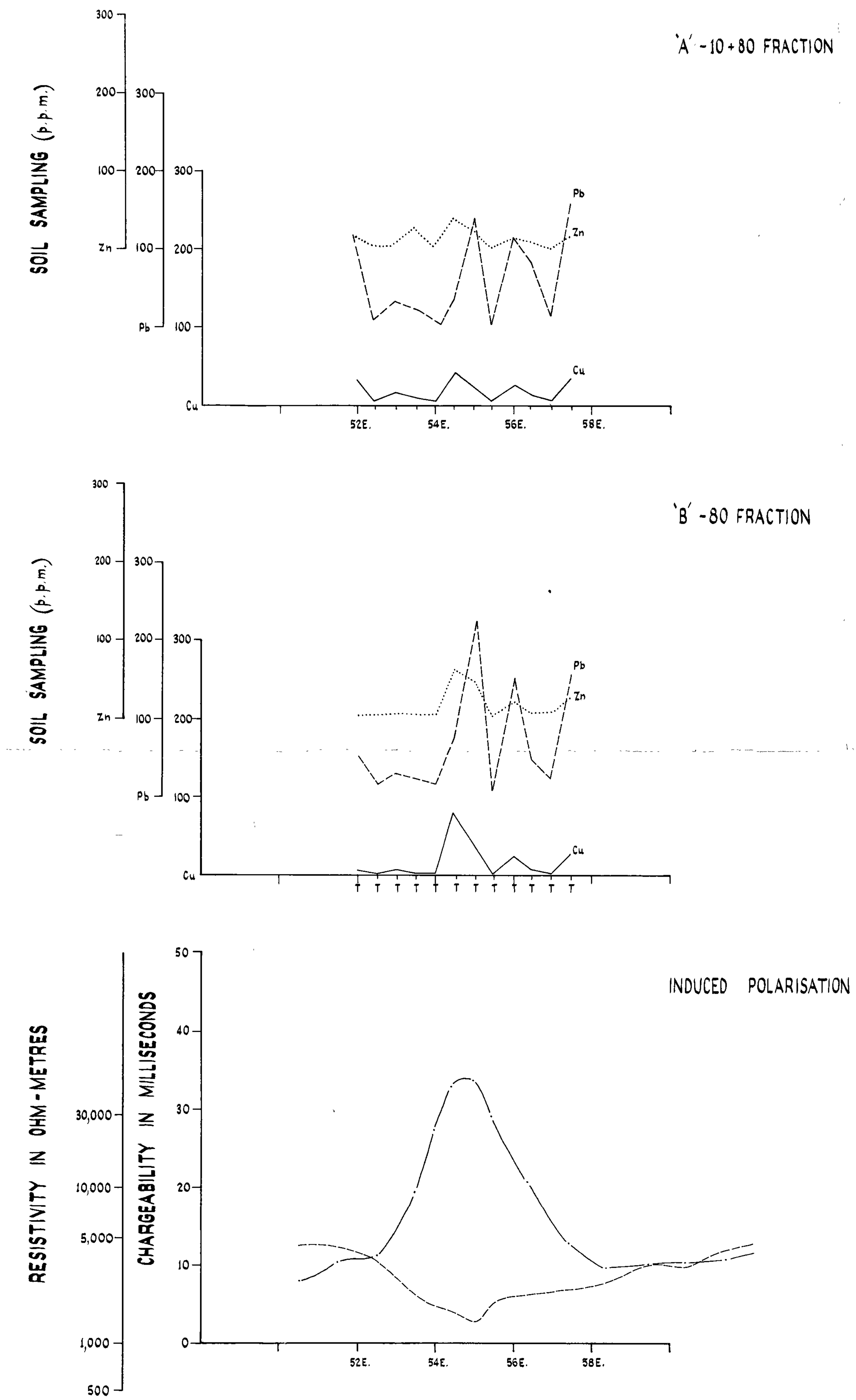


5 cm
00
6S.
12S.
18S.
24S.
30S.
36S.
900
1000
M.H.P.3
M.H.P.1-2
KEY
SILURIAN DEVONIAN SEDIMENTS. (ELDON GROUP)
ACID TUFFS WITH SHALE HORIZONS.
ACID QUARTZ PORPHYRY INTRUSIVES.
FAULT.
BEDDING AND DIP.
BARYTE VEINS.
MAJOR I.P. ANOMALY.
MINOR I.P. ANOMALY.
M.H.P.1-3
MINES DEPT. DRILL HOLES.
TRUE NORTH
76-1176
448056
THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT
HENTY - YOLANDE E.L. 41/71
MADAME HOWARD PLAINS GRID
COMPREHENSIVE MAP
MAP 5
004
Drawn: P.B
Checked:
Date. JUNE '76
Scale 1:6000

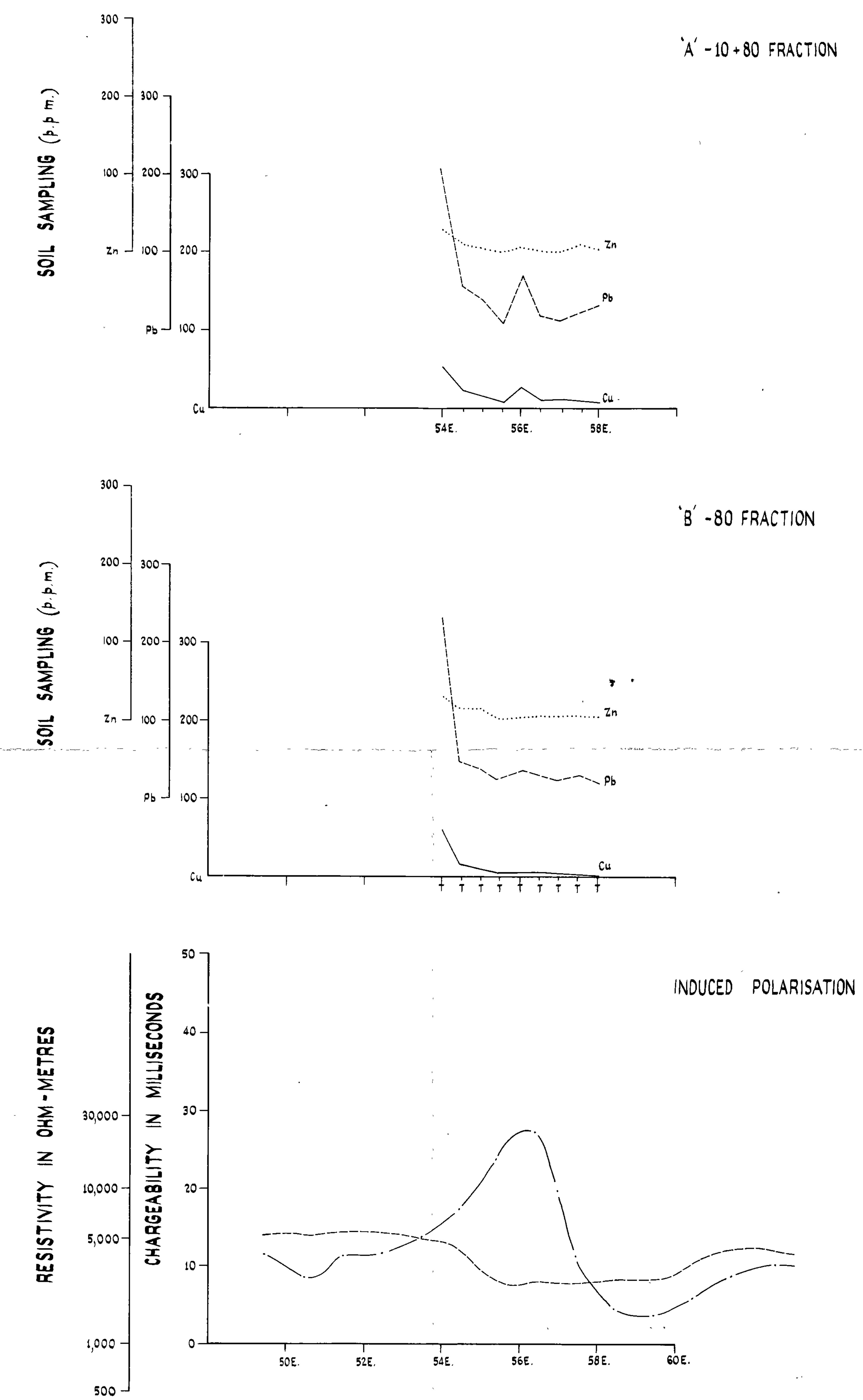
AREA. BASIN LAKE LINE No. 84S.



AREA. BASIN LAKE LINE No. 78S.



AREA. BASIN LAKE LINE No. 72S.



5 cm

RESISTIVITY ----- ---1---1--- RECEIVER 1
---2---2--- RECEIVER 2

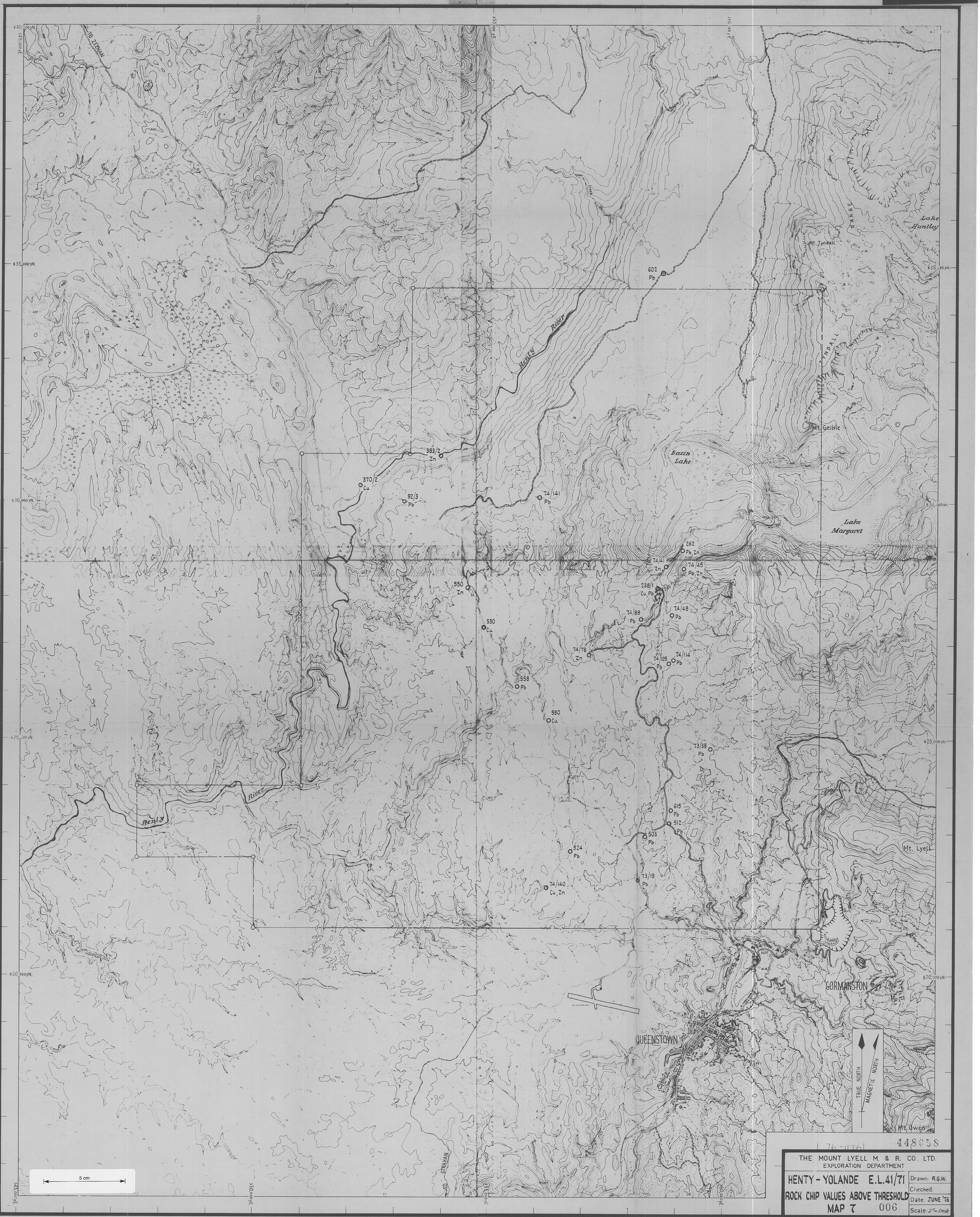
CHARGEABILITY — — —1—1— RECEIVER 1
—2—2— RECEIVER 2

RESIDUAL SOILS A A HORIZON
B B HORIZON
C C HORIZON

NON RESIDUAL SOILS T

76-1176 448057

THE MT. LYELL M. & R. CO. LTD.	DRAWN. N. S-H.
	TRACED. R. G. W.
HENTY - YOLANDE E.L. 41/71	CHECKED.
INDUCED POLARISATION AND	DATE. JUNE '76
	SCALE. 1 : 2400
GEOCHEMICAL PROFILES 005	MAP 6



Base map by Lands and Surveys Department, Hobart. 40 chains to 1 inch sheets.

Co-ordinates on State Grid.