

CONTENTS ENVELOPE 6615

Transparencies in
Cylinder 6615/1.

TENEMENT: Not Related.

TENEMENT HOLDER: Mt Gunson Mines Pty. Ltd.

PLANS: Mt Gunson Location Diagram 1:5,000 Sheets.

Pg. 3

REPORTS: Geochemical Test Survey - Gunyah Lake.

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PLANS: Gunyah Lake Area - Geochem Mud Sampling.

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Gunyah Lake Area - Drillhole Locations and I.P. Traverses.

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Gunyah Lake Area - Drillhole Locations and I.P. Traverses.

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Gunyah Lake Area - Drillhole Locations and I.P. Traverses

(Revised).

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Induced Polarization Surveys - Proposed Programme,

(Drg. No. 241A).

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Induced Polarization Surveys - Proposed Programme,

(Drg. No. 241B).

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Gunyah Lake Area - Bedrock Lithology compiled from

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Gunyah Lake - Drillhole Locations Jan. 1966 to June 1975.

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West Lagoon Orebody - Structure Contours - top of
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6615-2(T)

West Lagoon Orebody - Bedrock Lithology (First intersected
Lithology).

6615-3(T)

West Lagoon Orebody - Eastern Area - Structure Contours -
Top of Pandurra Formation.

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West Lagoon Orebody - Eastern Area Structure Contours - Top
of Pandurra Formation with Basement Highs Emphasised.

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East Lagoon Orebody - Drillhole Locations and Grade Control.

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West Lagoon Orebody - Eastern Area - Drillhole Locations.

6615-15(T)

Gunyah Lake Area - Drillhole Locations.

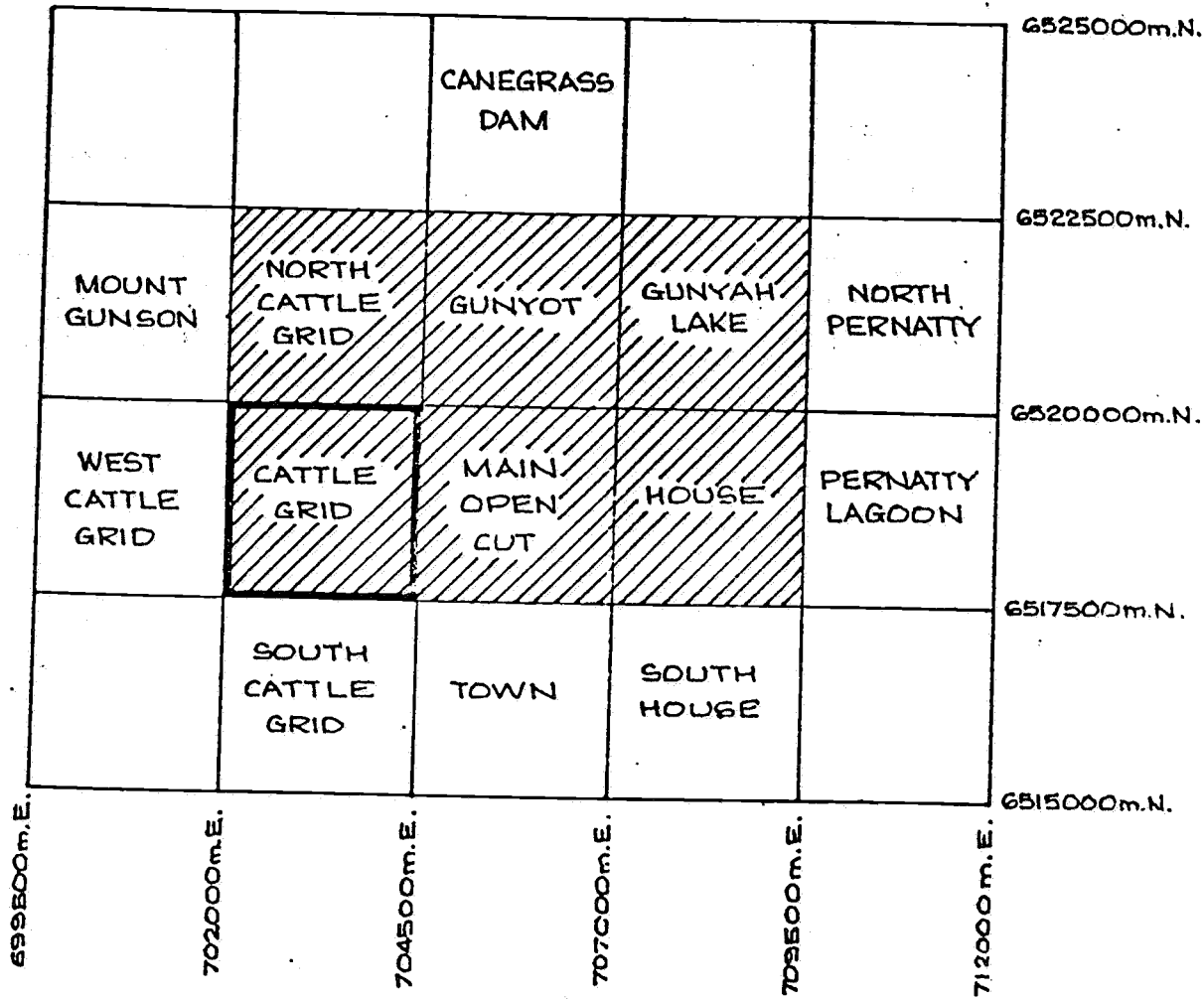
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Gunyah Lake Area - Structure Contours - Top Pandurra Fmtn.

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PLANS: Cont.

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East Lagoon Orebody - Contours of Top of Red Quartzite.	6615-22(T)



REFERENCE



EXISTING SHEET



SHEETS COMPLETED, JAN. '75



PROPOSED SHEETS

000004

PACMINEX PTY. LIMITED

GEOCHEMICAL TEST SURVEY
GUNYAH LAKE

SYDNEY
January, 1973

K. J. MAIDEN

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1. INTRODUCTION

The Mount Gunson exploration leases include large areas of salt lakes where a cover of mud and salt make mineral exploration difficult. A major tool in the exploration of these areas has been the sampling of the mud at the bottom of the lakes using a hand auger, then analysing the samples for the trace elements Cu, Pb, Zn and Co. A considerable effort has gone into this work, but few significant geochemical anomalies have resulted. Drilling of several anomalies (as reported in PMR 192/72) found no underlying mineralisation to account for the anomalies.

Following the failure of this drilling programme, it was decided to test the mud geochemical method over an area of known low grade copper mineralisation located in Gunyah Lake. By analysing the samples for a variety of elements, it was hoped to find the element which best reflected the underlying mineralisation.

2. SUMMARY

In order to test which element would be best to use as a geochemical indicator of copper mineralisation in the mud sampling procedure, an area of known mineralisation beneath Gunyah Lake was selected as a survey area. Preliminary analysis of a variety of ores and unmineralised rocks showed that the elements Cu, Pb, Zn, Co, Ni, Cr, Mo, Cd, Bi, Ga and As have relatively high concentrations in the ore, so might be useful in geochemical surveys. The element As was discarded because of the high cost of analysis. The other elements were determined in mud samples taken at 50 metre intervals over the mineralised zone.

Plotting of analytical results on geochemical plans showed that none of the elements indicated the presence of mineralisation. It is considered that the failure of the method is due to the impermeable nature of the Tregolana Shale which prevents migration of trace elements from the underlying mineralisation upwards into the lake mud. It is concluded that the mud geochemical method is of little use as a prospecting tool in areas where the bedrock beneath the lakes is Tregolana Shale. However, mud augering is still useful in determining the geology beneath salt lakes.

3. ANALYSIS OF ROCKS AND ORES

As a preliminary to the mud sampling survey, it was necessary to determine which elements are associated with the copper mineralisation and could be used for geochemical purposes. A number of ore samples from the known orebodies (including the Cattle Grid mineralisation) and samples of the major rock types were analysed by emission spectroscopy for a number of minor elements - Ni, Cr, V, Mo, Sn, Cd, Bi, Ga, Ge, As, Sb. The following is a summary of these results:-

- Nickel - good correlation with copper mineralisation; up to 800 ppm in ores and less than 100 ppm in unmineralised rocks.
- Chromium - values generally higher in ores than in unmineralised rock, but not always so.
- Vanadium - low and constant values (10-40 ppm) in both ores and unmineralised rocks; values are higher (approximately 100 ppm) in dolomite and Monalena Shale; not suitable as a geochemical indicator.
- Molybdenum - good correlation with copper mineralisation (up to 150 ppm Mo); values generally below the limit of detection (3 ppm) for unmineralised rocks.
- Tin - low values (less than 3 ppm) for both ores and unmineralised rocks; not suitable as a geochemical indicator.
- Cadmium - moderate correlation with copper mineralisation (up to 80 ppm Cd); values below the limit of detection (3 ppm) for unmineralised rock.
- Bismuth - good correlation with copper mineralisation; values up to 500 ppm in ores and less than 5 ppm in unmineralised rocks.
- Gallium - all values low (< 30 ppm); moderate correlation with copper mineralisation.

- Germanium - all values for ores and rocks below the limit of detection (1 ppm), except for dolomite (3 ppm); not suitable as a geochemical indicator.
- Arsenic - good correlation with copper mineralisation (up to 300 ppm As in ores); however, limit of detection is too high (50 ppm) using emission spectroscopy; analysis by AAS is too expensive for geochemical surveys.
- Antimony - all values for ores and rocks below the limit of detection (30 ppm).

Based on these results, the elements Ni, Cd, Bi, Mo, Cr and Ga, in addition to Cu, Pb, Zn and Co, were selected for analysis in the mud geochemical survey.

4. MUD GEOCHEMICAL SURVEY

A considerable amount of data has been collected about the geochemistry of Gunyah Lake. A mud sampling survey has been carried out around the northern shore of the lake, with samples taken at 30 metre intervals along lines spaced 100 metres apart (see Fig. 1). As well as close-spaced drilling in the vicinity of the East Lagoon and West Lagoon orebodies, a number of lines of percussion holes have been drilled across the middle of the lake, with holes spaced 100 metres apart along these lines. Two percussion holes intersected copper mineralisation assaying more than 0.5% and this was confirmed by two diamond drill holes. The mineralisation occurs in Whyalla Sandstone beneath a thin capping of Tregolana Shale.

The area selected for the geochemical survey is a block, measuring 500 metres x 600 metres, including the zone of mineralisation determined by drilling. Samples were taken at 50 metre intervals, using the same grid system as used in the previous mud geochemical survey around the northern edge of the lake. 137 samples were taken and analysed by emission spectroscopy. Analytical results were plotted on geochemical plans at a scale of 1:2,500, and the values contoured.

5. GEOCHEMICAL RESULTS

Copper: The geochemical plan shows a low order (see Fig. 2) anomaly trending SW-NE in the north-east corner of the survey area, and one high value on the western edge of the area. No anomalous values occur in the area of mineralisation.

Zinc: Zinc concentration is fairly uniform over (see Fig. 3) the survey area, with slightly higher values occurring in the north-east and south-east corners. There are no anomalous high values and no indication of the underlying mineralisation.

Lead: The plan shows one small low order anomaly (see Fig. 4) in the north-east corner of the area and another on the western edge. No high values occur in the area of mineralisation.

Cobalt: One small low order anomaly occurs in the (see Fig. 5) north-east corner of the area. No high values were recorded in the mineralised zone.

Nickel: Two high values were recorded - one in the (see Fig. 6) north-east corner and one in the area of mineralisation. Neither high point is supported by values from adjacent samples.

Chromium: Chromium concentration is fairly uniform (see Fig. 7) over the survey area, with the higher values generally in the centre and north-east. There are no anomalous high values, and no indication of the mineralisation.

Cadmium: Cadmium concentration for all samples is below the limit of detection (3 ppm).

Bismuth: Bismuth concentrations are very low (less than 5 ppm) and uniform over the survey area.

Molybdenum: Only six values are above the limit of (see Fig. 8) detection (3 ppm) and none of these was recorded from the zone of mineralisation.

Gallium: Values are low (less than 10 ppm) and (see Fig. 9) uniform over the survey area.

6. DISCUSSION OF RESULTS

With the exception of nickel, no element shows anomalous values over the zone of mineralisation. In the case of nickel, only one value is anomalously high and is unsupported by values from surrounding samples. Based on this data, the copper mineralisation would not be detected. The reason for the failure of the mud geochemical method almost certainly lies in the fact that the Tregolana Shale forms an impermeable barrier to trace elements migrating upwards from the mineralisation

in the underlying Whyalla Sandstone.

The elements Cu, Pb, Zn, Co and Ni all show low order anomalies in the north-east corner of the survey area. The significance of this anomalous area is not clear, since there is no drill hole information in the area. However, drilling of much larger order anomalies in Pernatty Lagoon (as reported in PMR 192/72) failed to find any mineralisation related to the anomalies. It is probable that the low order anomaly in Gunyah Lake has no significance in terms of underlying mineralisation.

7. CONCLUSION

None of the 10 elements tested gave geochemical anomalies over the area of known mineralisation in Gunyah Lake. This throws considerable doubt on the usefulness of the mud sampling method as a prospecting tool, especially where the bedrock is Tregolana Shale. It is possible that the method could work over areas of more permeable rock, such as the Whyalla Sandstone and Pandurra Formation.

It is not suggested that mud augering be abandoned altogether, since it is still the only method available for determining rock type beneath the salt lakes.

K. J. MAIDEN
(DLG)

FIG. 2 : COPPER GEOCHEMICAL PLAN

SCALE 1 : 2500

DRILL HOLES

- ⊕ < 0.2 % Cu
 ● 0.2 - 0.5 % Cu
 ● 0.5 - 1.0 % Cu

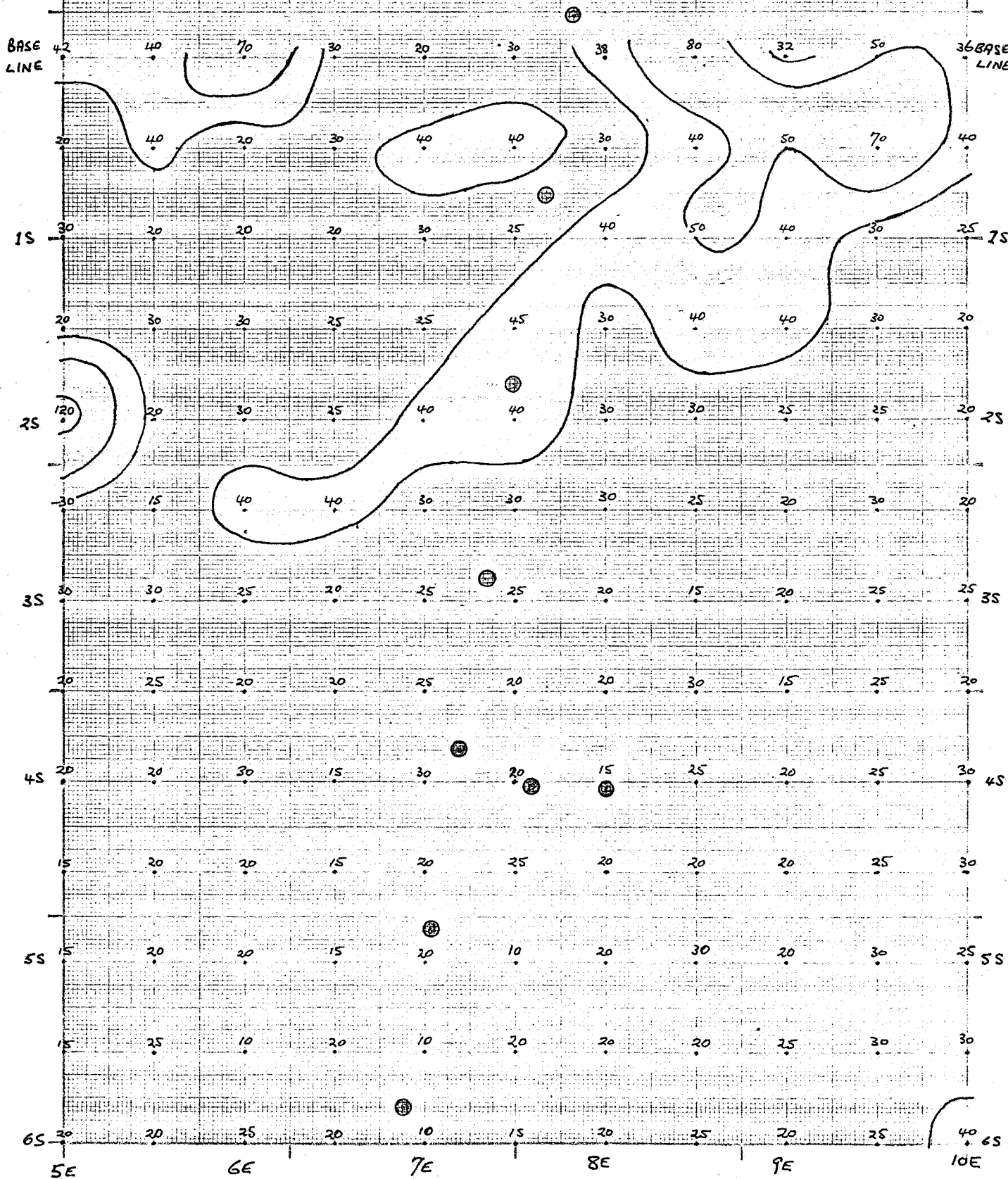
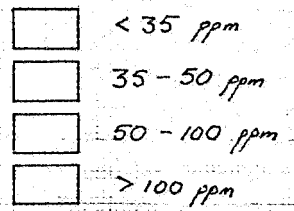


FIG. 3 : ZINC GEOCHEMICAL PLAN

SCALE 1 : 2500

DRILL HOLES

- ⊕ < 0.2 % Cu
- ⊙ 0.2 - 0.5 % Cu
- 0.5 - 1.0 % Cu

□ < 55 ppm
 □ > 55 ppm

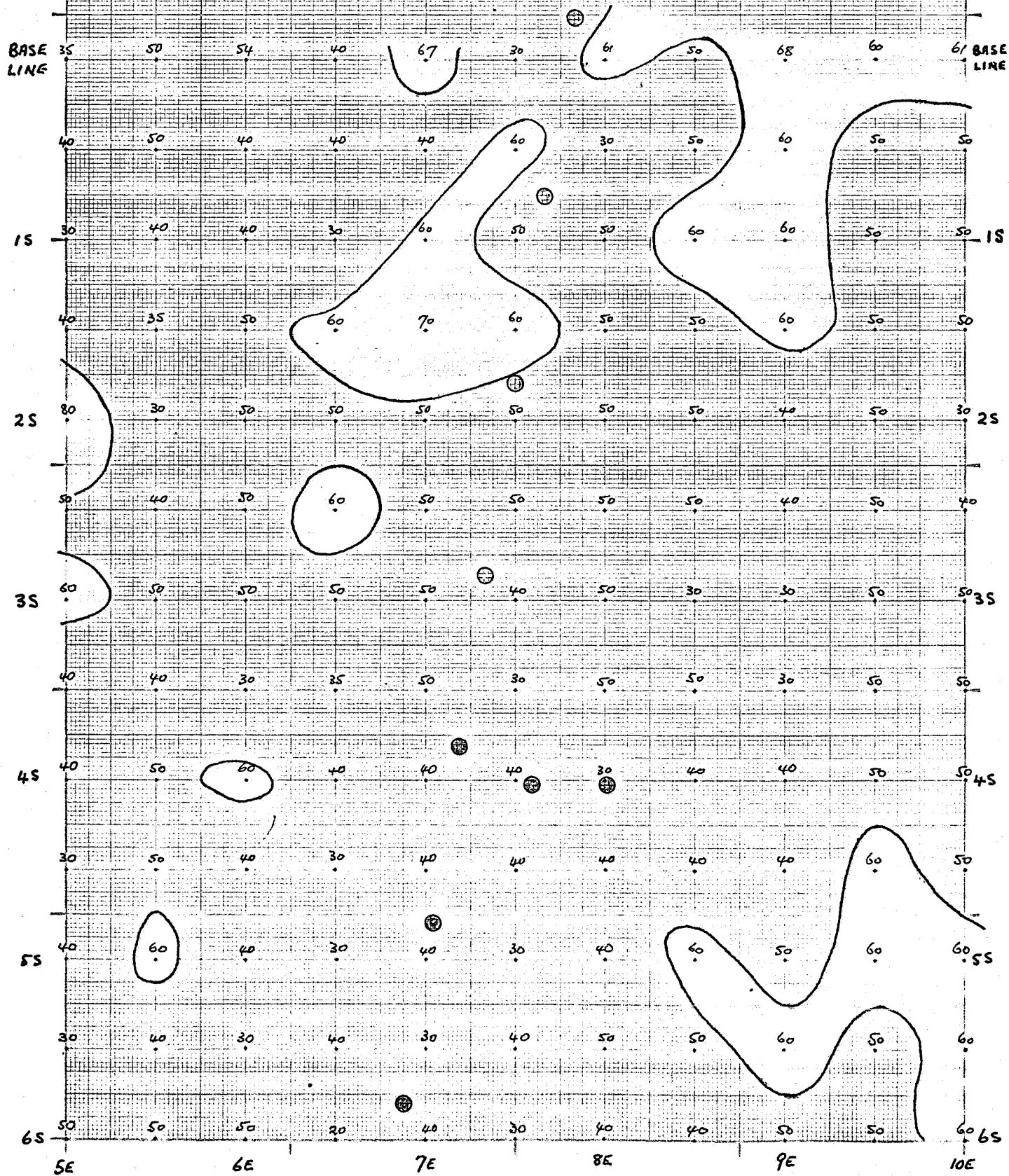


FIG. 4: LEAD GEOCHEMICAL PLAN

SCALE 1 : 2500

DRILL HOLES

-  < 0.2 % Cu
 0.2 - 0.5 % Cu
 0.5 - 1.0 % Cu

-  < 25 ppm
 25 - 50 ppm
 > 50 ppm

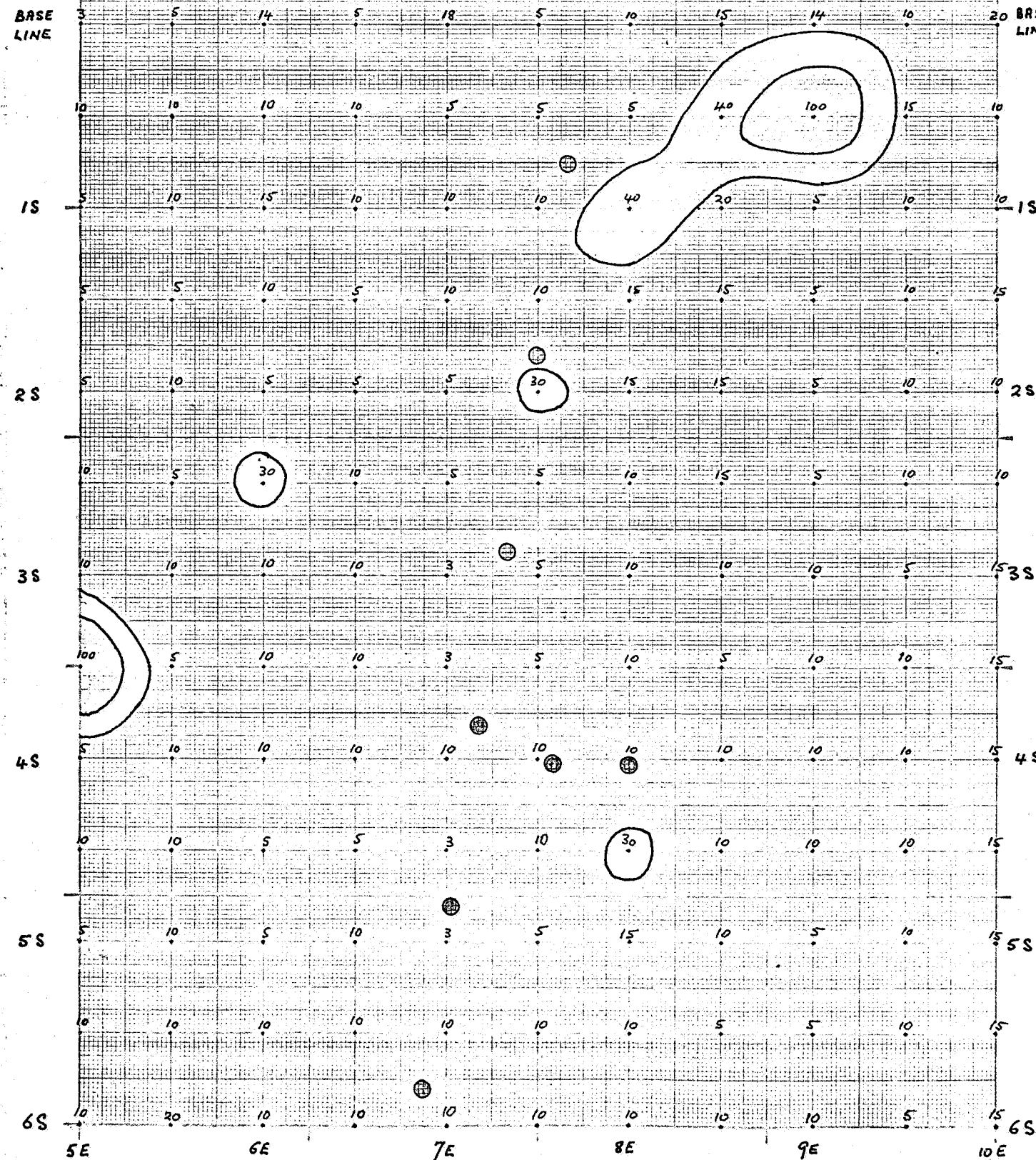
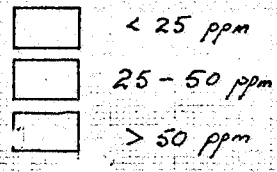


FIG. 5 : COBALT GEOCHEMICAL PLAN

SCALE 1 : 2500

DRILL HOLES

- ⊕ < 0.2 % Cu
- ⊗ 0.2 - 0.5 % Cu
- ⊙ 0.5 - 1.0 % Cu



BASE
LINE

1S

2S

3S

4S

5S

6S

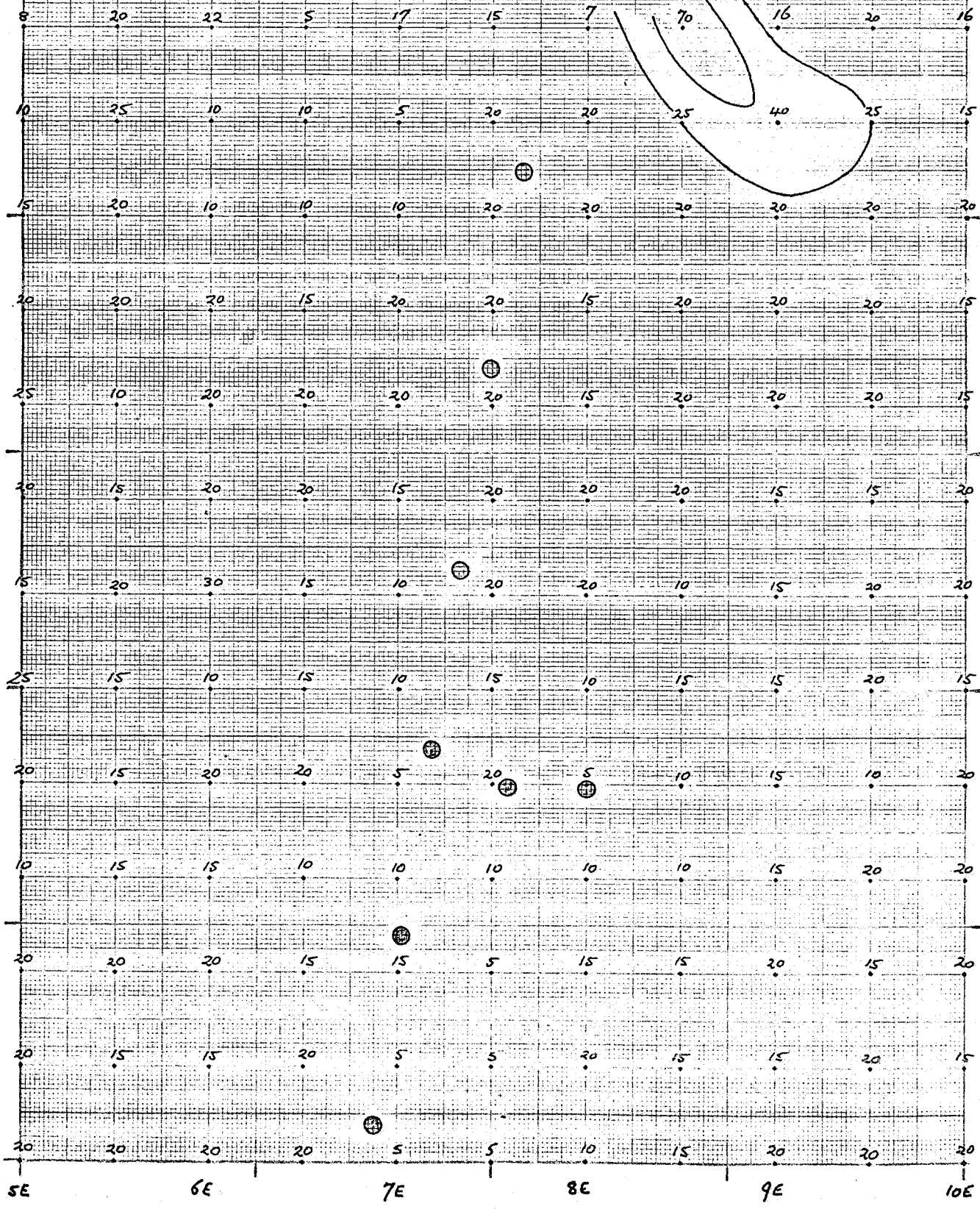
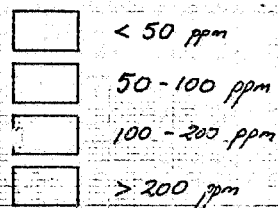


FIG. 6 : NICKEL GEOCHEMICAL PLAN

SCALE 1 : 2500

DRILL HOLES

- ⊕ < 0.2 % Cu
 ⊗ 0.2 - 0.5 % Cu
 ⊙ 0.5 - 1.0 % Cu

BASE
LINE

1S

2S

3S

4S

5S

6S

5E

6E

7E

8E

9E

10E

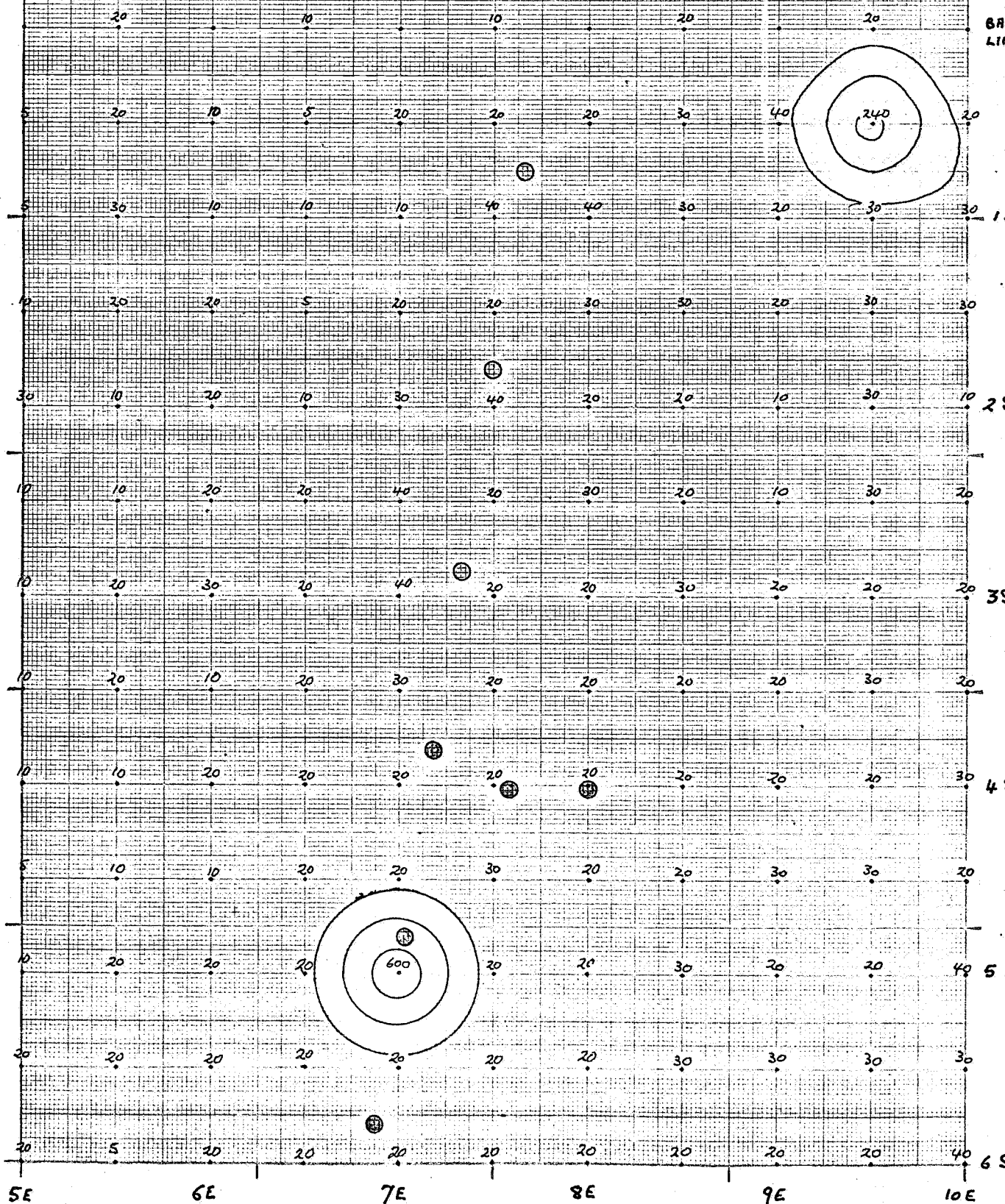


FIG. 7: CHROMIUM GEOCHEMICAL PLAN

SCALE 1:2500

DRILL HOLES

- ⊕ < 0.2 % Cu
- ⊗ 0.2 - 0.5 % Cu
- ⊙ 0.5 - 1.0 % Cu

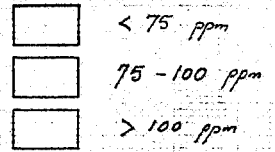
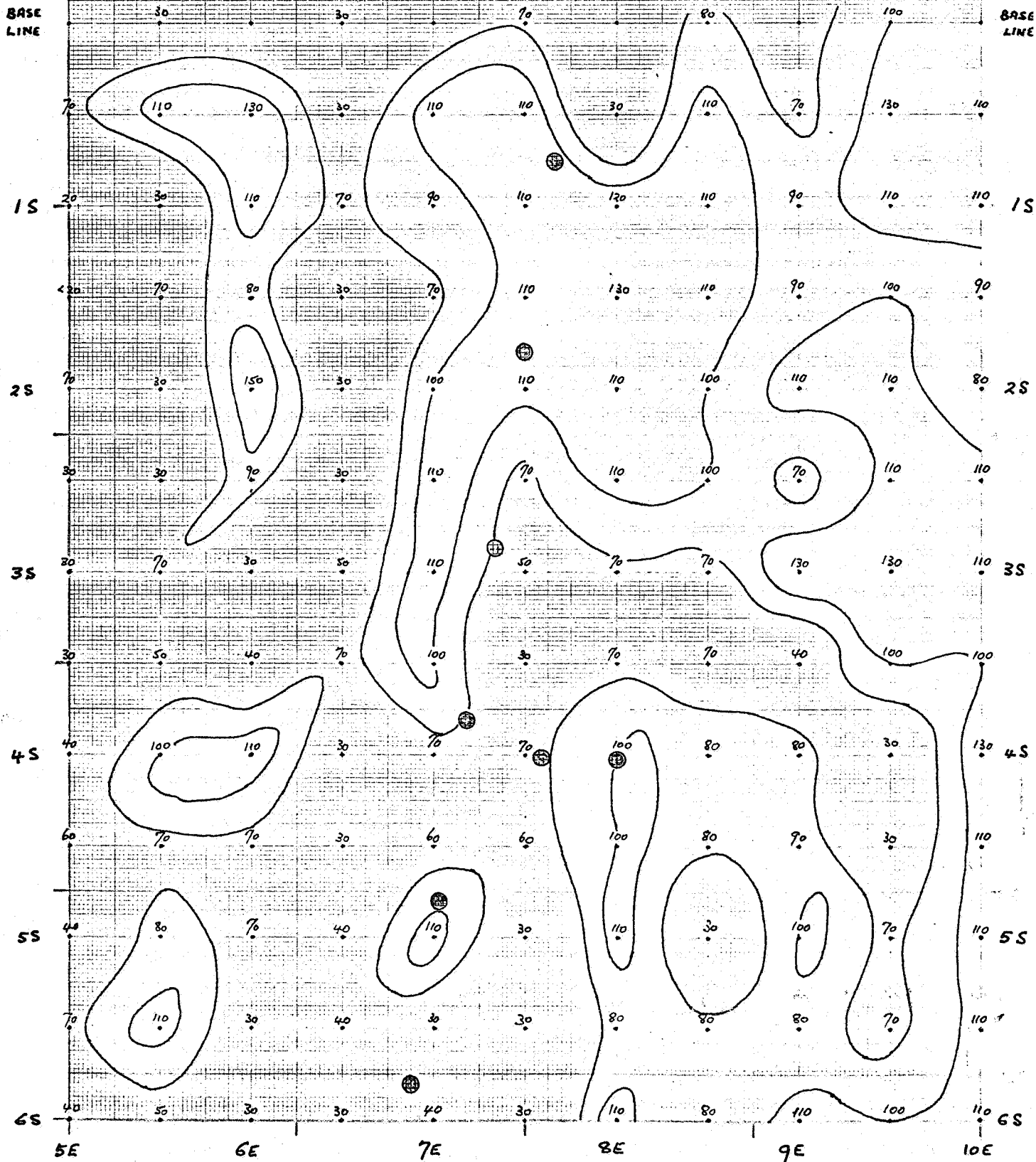
BASE
LINEBASE
LINE

FIG. 8: MOLYBDENUM GEOCHEMICAL PLAN

SCALE 1 : 2500

DRILL HOLES

- ⊕ < 0.2 % Cu
- ⊗ 0.2 - 0.5 % Cu
- ⊙ 0.5 - 1.0 % Cu

BASE
LINE

BASE
LINE

1S

1S

2S

2S

3S

3S

4S

4S

5S

5S

6S

6S

5E 6E 7E 8E 9E 10E

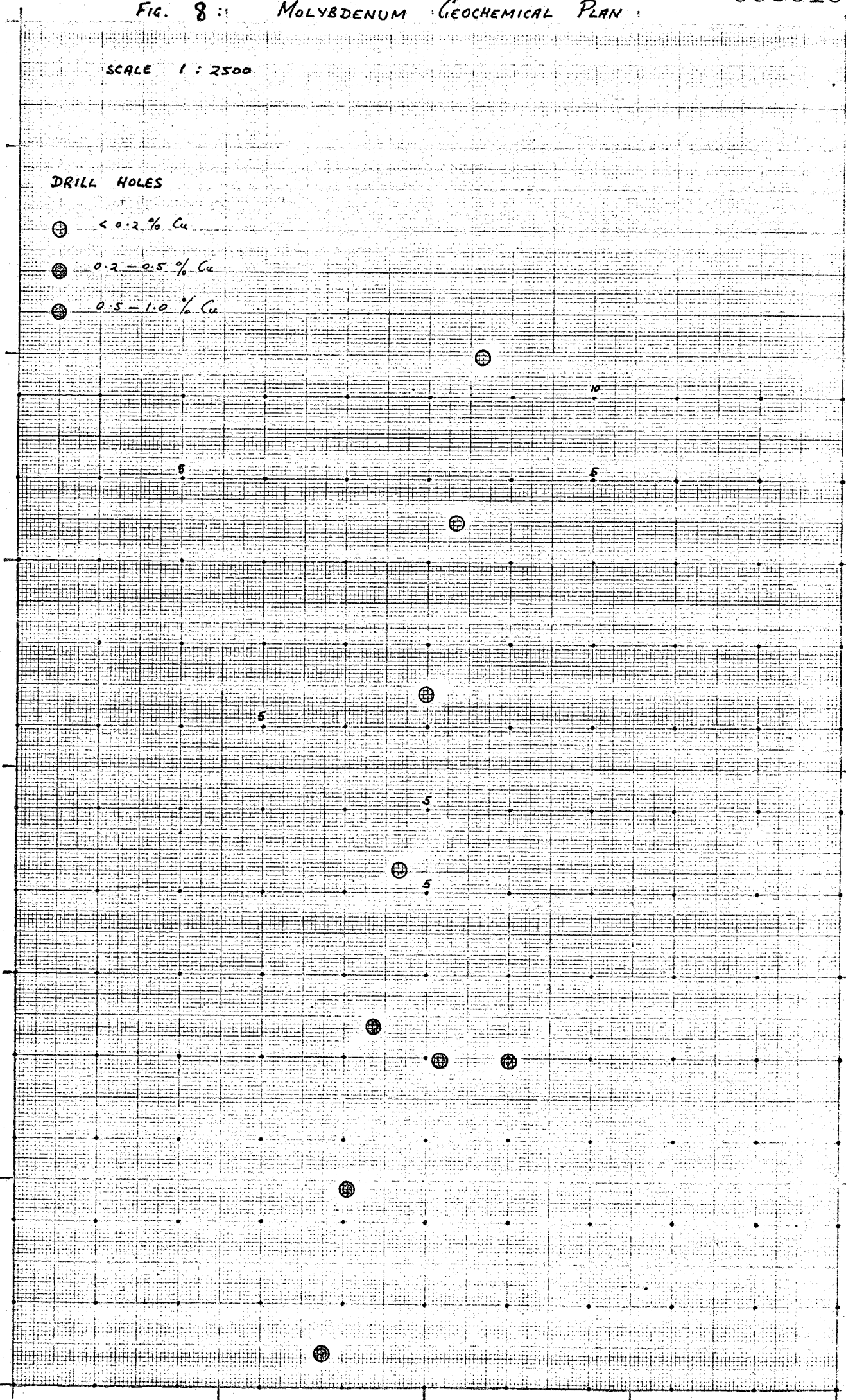


FIG. 9: GALLIUM GEOCHEMICAL PLAN

SCALE 1:2500

DRILL HOLES

- ⊕ < 0.2 % Cu
- 0.2 - 0.5 % Cu
- 0.5 - 1.0 % Cu

BASE
LINEBASE
LINE

1S

1S

2S

2S

3S

3S

4S

4S

5S

5S

6S

6S

5E

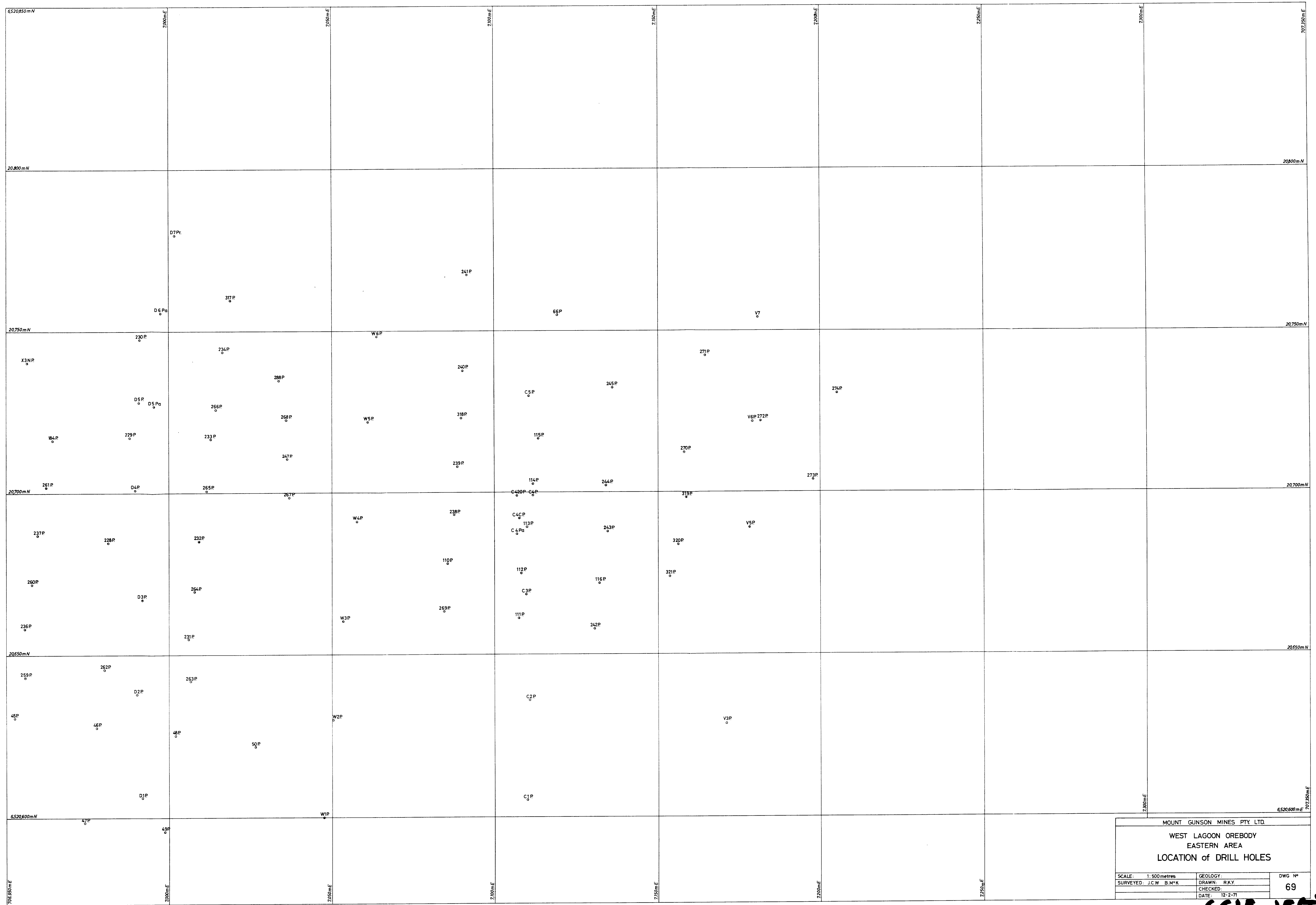
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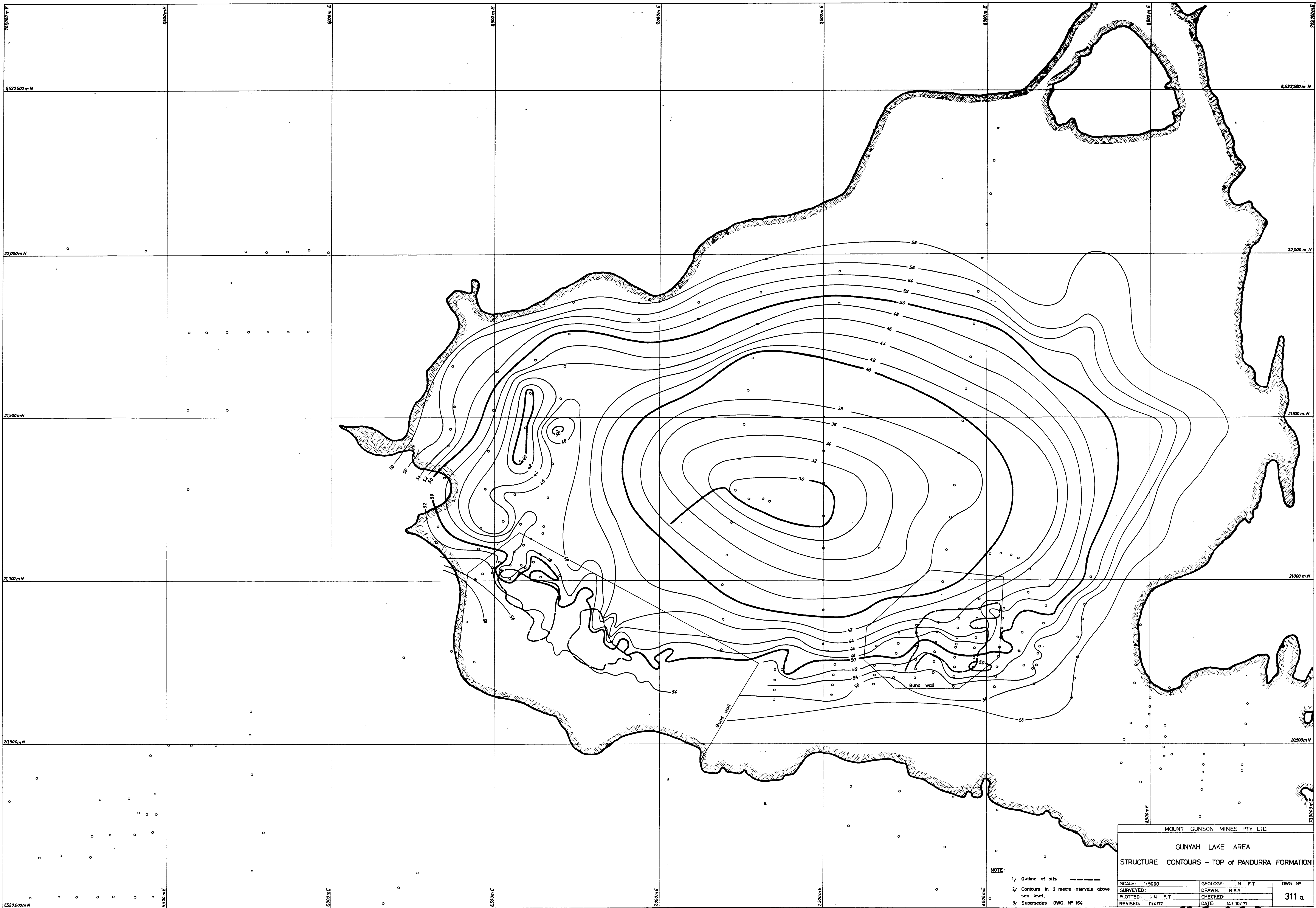
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8E

9E

10E

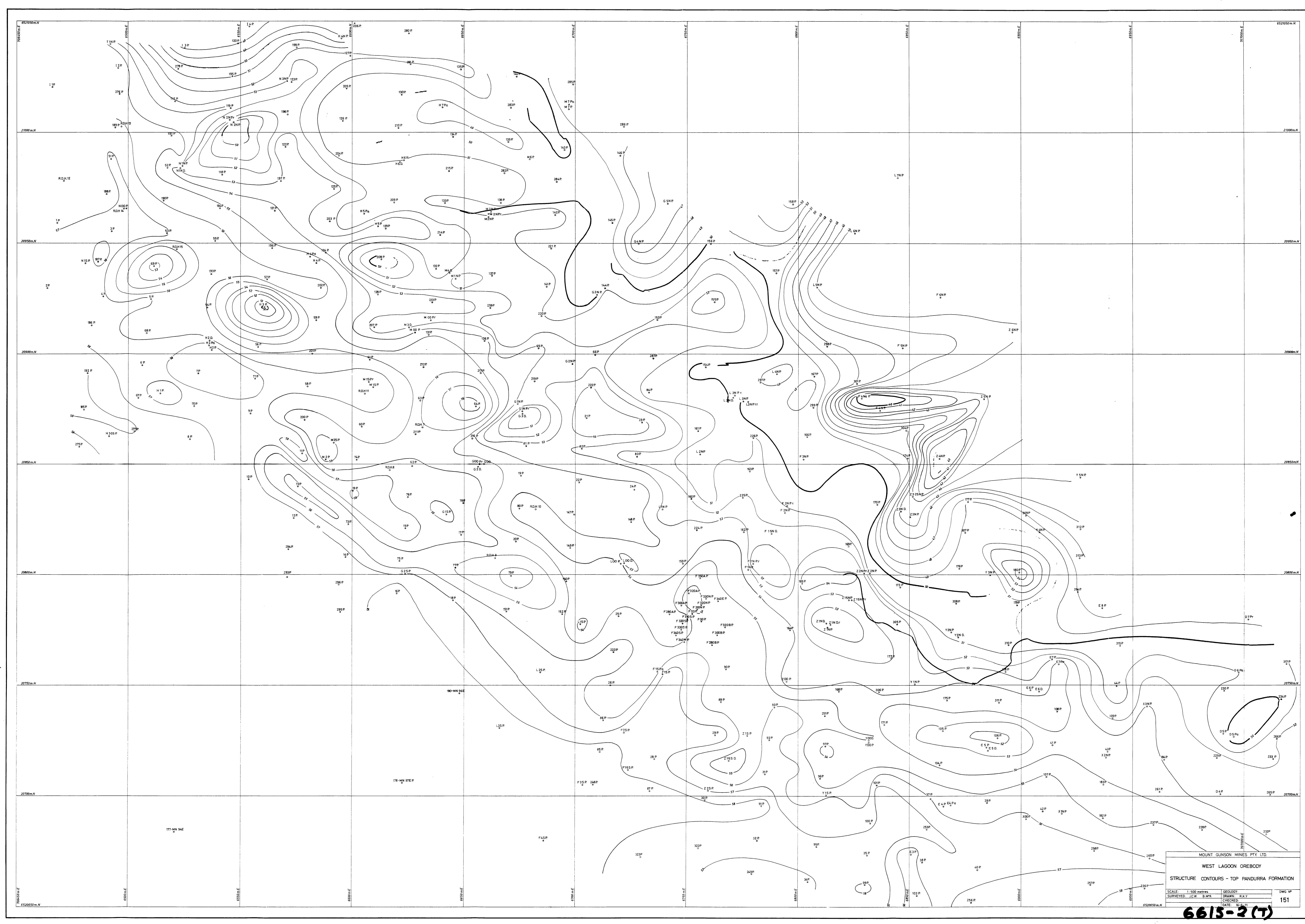


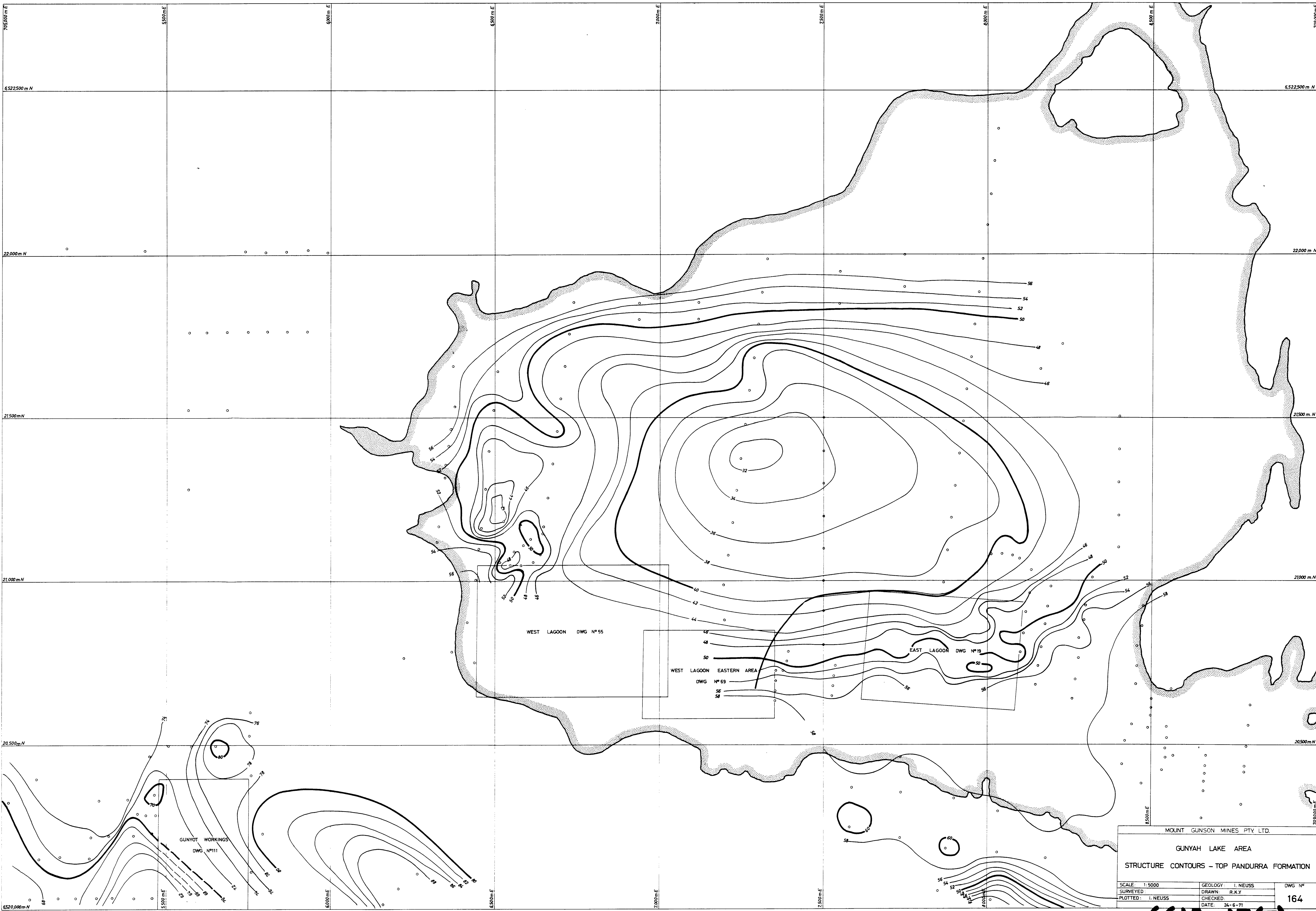


- NOTE:
- 1/ Outline of pits ———
 - 2/ Contours in 2 metre intervals above sea level.
 - 3/ Supersedes DWG. Nº 164

MOUNT GUNSON MINES PTY. LTD.		
GUNYAH LAKE AREA		
STRUCTURE CONTOURS - TOP of PANDURRA FORMATION		
SCALE: 1:5000	GEOLOGY: I.N.F.T.	DWG Nº
SURVEYED:	DRAWN: R.K.Y.	311 a
PLOTTED: I.N.F.T.	CHECKED:	
REVISED: 11/4/72	DATE: 14/10/71	

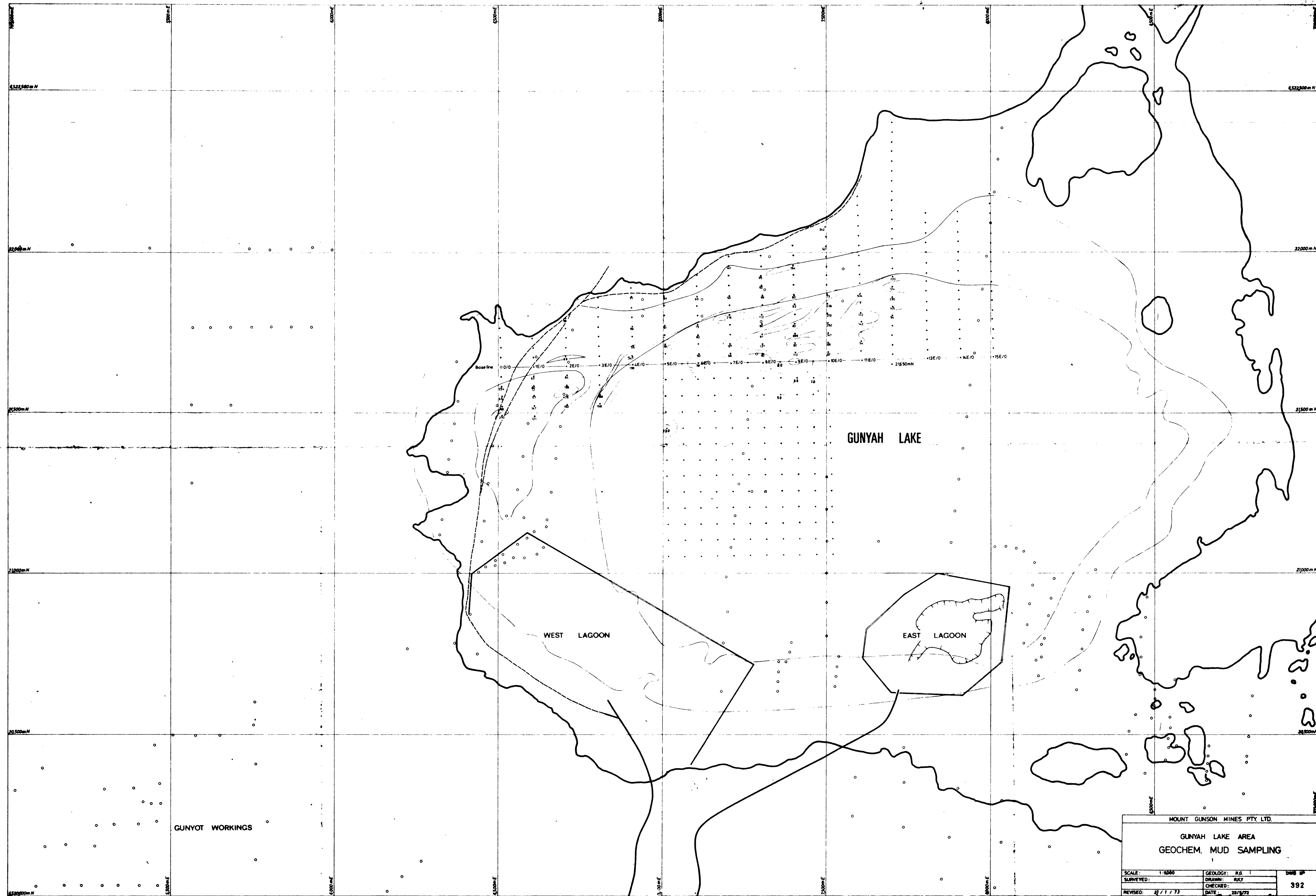
6615-6(T)





MOUNT GUNSON MINES PTY. LTD.		
GUNYAH LAKE AREA		
STRUCTURE CONTOURS - TOP PANDURRA FORMATION		
SCALE: 1:5000	GEOLOGY: I. NEUSS	DWG N° 164
SURVEYED:	DRAWN: R.K.Y.	
PLOTTED: I. NEUSS	CHECKED:	
DATE: 24-6-71		

6615-17(T)



MOUNT GUNSON MINES PTY. LTD.		
GUNYAH LAKE AREA		
GEOCHEM. MUD SAMPLING		
SCALE: 1:5000	GEOLOGY: R.B.	DWG NO: 392
SURVEYED:	DRAWN: R.J.V.	
REVISED: 22/1/73	CHECKED:	
	DATE: 29/1/72	

6615-1



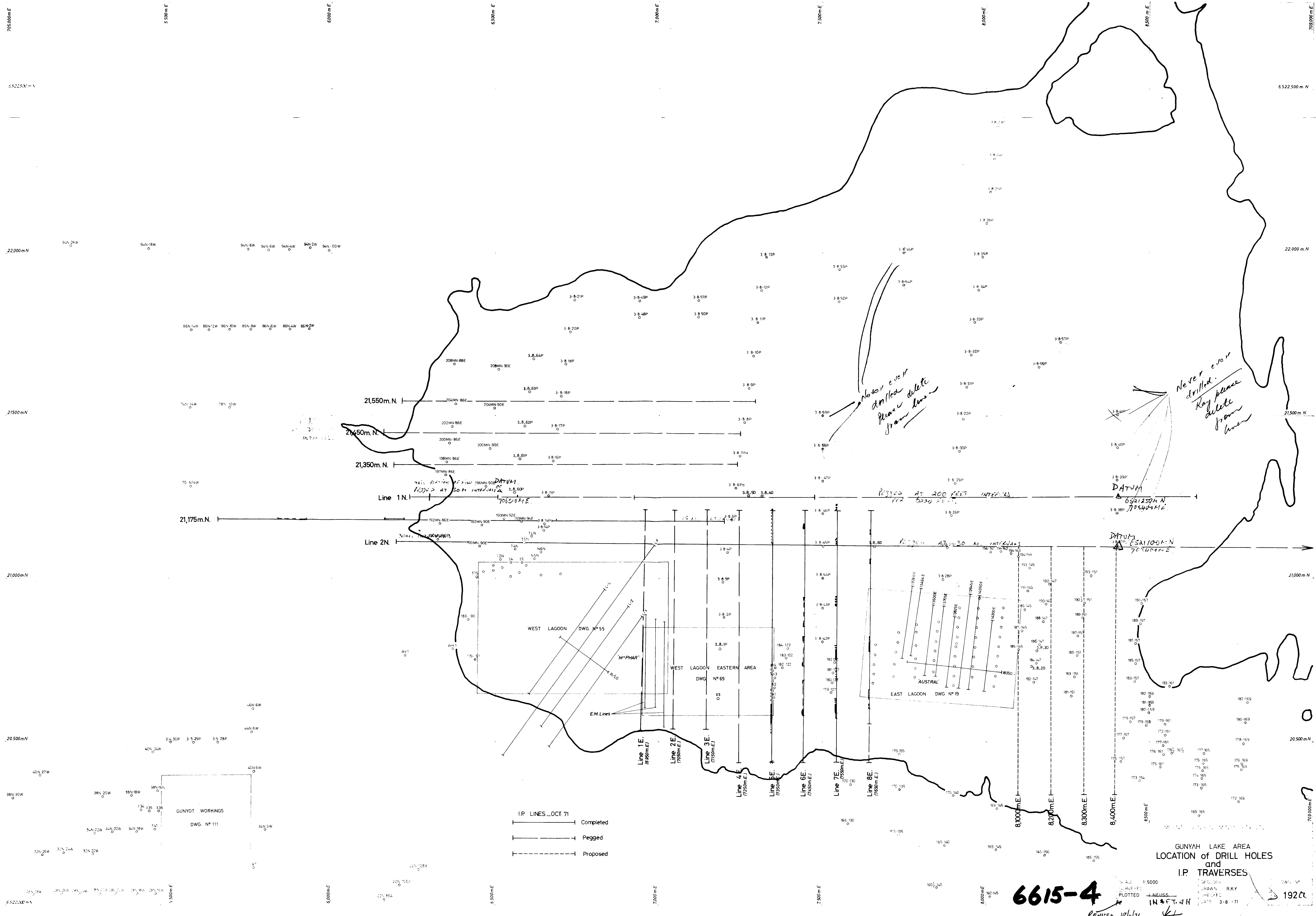


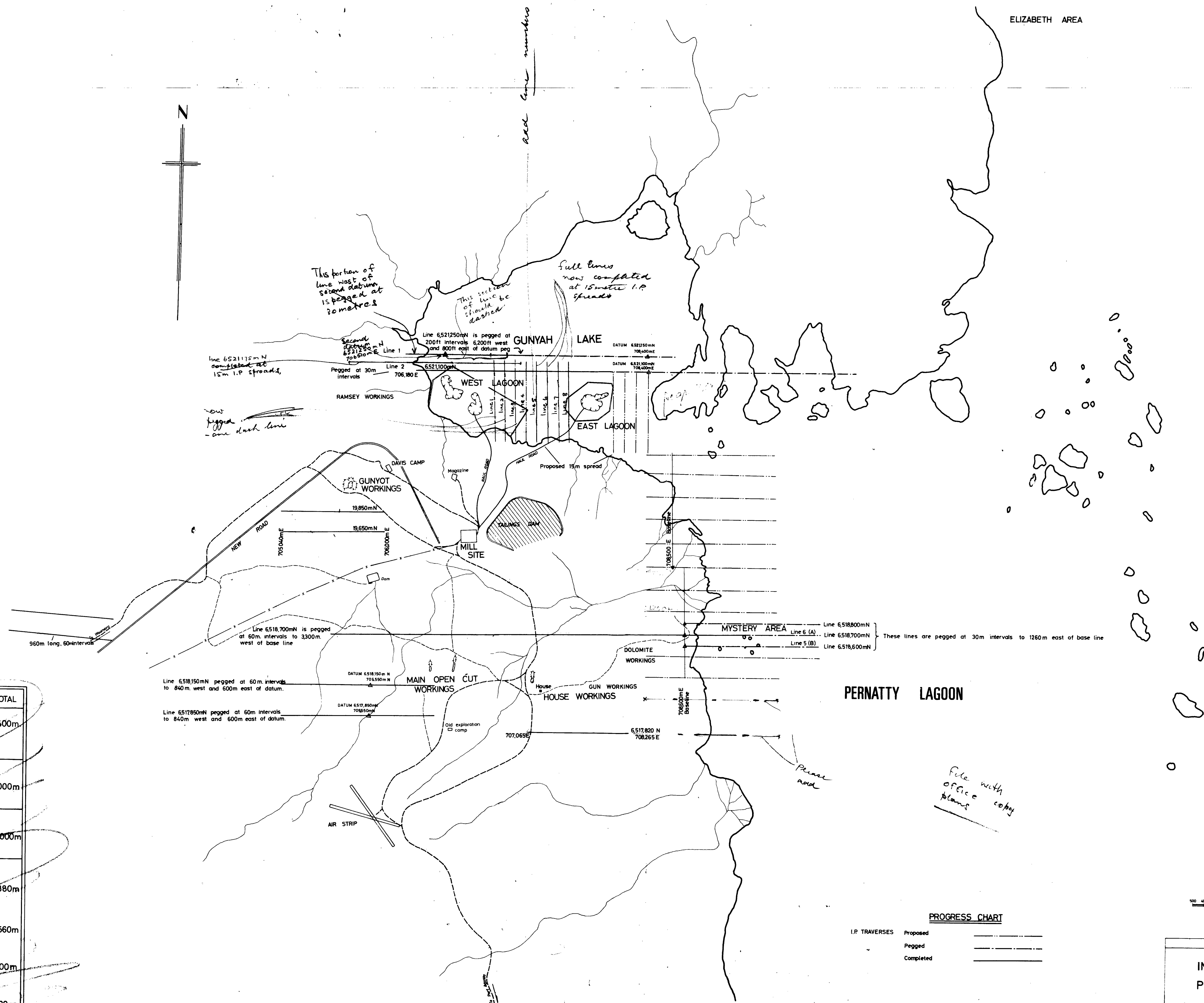
MOUNT GUNSON MINES PTY LTD.

**GUNYAH LAKE AREA
LOCATION OF DRILL HOLES
and
I.P. TRAVERSES**

SCALE: 1:5000	GEOLOGY:	DWG. NO.
SURVEYED:	DRAWN R.K.Y. DCB.	192a
PLOTTED: I. NEUSS	CHECKED:	
REVISED: 18 JUL 71 F.T.B.H.	DATE: 3-8-71	

6615-3





AREA	SPREAD	N ^o LINES	LENGTH	TOTAL
'A' (between E&W Lagoon)	15m.	8	800m.	6400m.
'B' (East of E. Lagoon)	15m	4	750m	3000m
'C' MYSTERY NORTHWARD	30m	12	1250m	15000m
'D' W - SW Main Open Cut	60m	2	1440m	2880m
Gully - Mystery	60m	1	4560m	4560m
Ganyah Lake North	100ft	1	2100m	2100m
Ganyah Lake South	30m	1	4100m	4100m

TOTAL 38,040m (24 miles)

File with
office plans copy

PROGRESS CHART

I.P. TRAVERSES

Proposed	_____
Pegged	_____
Completed	_____

[illegible]

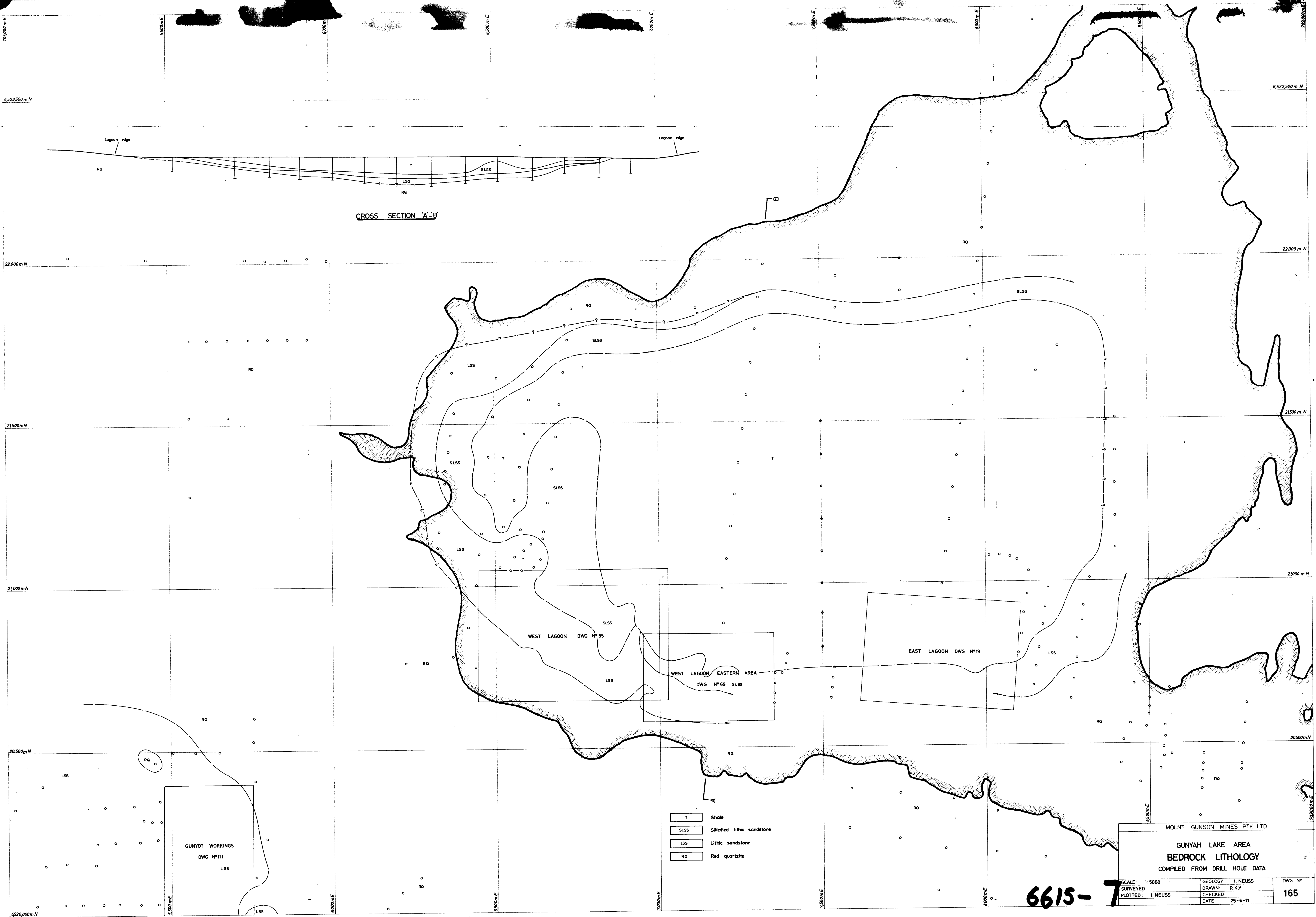
6615-5

MOUNT GUNSON MINES PTY. LTD.

INDUCED POLARIZATION SURVEYS
PROPOSED PROGRAMME

SCALE: 1:17,000 Approx.	DRAWN: D.C.B. R.K.Y.	DWG. NO.
SURVEYED: B.M.W.	CHECKED: J.H.	241A
PLOTTED: J.T. J.H.		
REVISED: 20-0-11	DATE: 8-9-71	

241A



CROSS SECTION 'A-B'

- T Shale
- SLSS Silicified lithic sandstone
- LSS Lithic sandstone
- RQ Red quartzite

MOUNT GUNSON MINES PTY. LTD.			
GUNYAH LAKE AREA			
BEDROCK LITHOLOGY			
COMPILED FROM DRILL HOLE DATA			
SCALE 1:5000	GEOLOGY I. NEUSS	DWG N°	
SURVEYED	DRAWN R.K.Y.	165	
PLOTTED: I. NEUSS	CHECKED	DATE 25-6-71	

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