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GEOPHOTO MINERALS REPORT 1972/16
PROGRESS REPORT ON MINERAL EXPLORATION
IN THE MATHINNA-TOWER HILL GOLDFIELD
E.L.6/68 - N.E. TASMANIA
TO 30TH SEPTEMBER, 1972.

PREPARED BY
GEOPHOTO RESOURCES CONSULTANTS
FOR
TEXINS DEVELOPMENT PTY. LTD.

W.S. TURNER
SEPTEMBER, 1972.

LIST OF MAPS ACCOMPANYING THIS REPORT

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ABSTRACT

The pelitic sediments and metasediments of the Mathinna Group are the host to structurally controlled hydrothermal gold deposits. The main fold structure in the area strikes NNW-SSE with a wave length of up to 3000m. Two directions of shearing have been recorded, one parallel to the major fold direction and the other trending ENE-WSW. Gold mineralization is best developed in and around the NNW-SSE shear which is thought to be a sinistral wrench fault. The gold occurs as free gold associated with minor (<1½%) sulphide mineralization in a vein quartz gangue.

Recorded production 1880-1932 is 270,895 oz, an average of 16 dwt.per ton. 1000 oz of alluvial gold was also won.

V.L.F. work completed to date indicates this to be a useful exploration tool. Geochemistry will probably be heavily relied on in choosing suitable drilling targets.

The gold producing potential of the wide alluvial plains is pointed out with suggested methods of exploration.

INTRODUCTION

The Mathinna-Tower Hill Field is contained in a 56 sq km area as part of E.L.6/68. Most of the area has been looked at and a map at scale of approximately 500' = 1" has been prepared from data collected during this work, Mines Department reports and a M. Sc. thesis by Threader. This map gives some direction as to where future exploration work should be concentrated.

Nine scout V.L.F. traverses totalling 15.3 km over various previously established faults and lines of mineralization indicated that V.L.F. may be a useful tool. V.L.F. traverse No. 1, in particular, gave a good response which could be correlated with a 500 m zone of close folding and shearing. 89 soil samples were taken along this traverse. As time was a limiting factor it was decided to cut the regional mapping before completion and concentrate the effort on detail work at the Jubilee-Mountaineer Mines area. This resulted in practically no work being done north of the South Esk River, an area of 16 sq km. Of this only the Dan Rivulet area is considered of interest. The Jubilee-Mountaineer Area was chosen because it was well documented in Mines Department Reports (Finucane 1933) and a map could be made and some thoughts generated within the time available. An area, 600 m by 390 m was gridded with lines at 75 m spacings. The lines were pegged at 15 m intervals at which V.L.F. readings and soil samples were taken. The lines were corrected for slope and a topographic map with a 10 m contour interval and a scale of 750:1 (15 m = 2 cm) prepared. The geologic map of the area is also at this scale.

In all, 313 soil samples were submitted for routine analysis.

CONCLUSIONS

The Mathinna-Tower Hill Gold Fields are part of a 90 km line of mineralization contained in a NNW trending wrench fault set. The vertical extent of this fault must be considerable as well in excess of the deepest workings (630 m) in the area. Throughout this fault plane should be scattered patches of gold mineralization, located in structurally favourable sites. Only those patches or lodes which, in the past, showed some surface expression, were prospected. Of the three main lodes at the New Golden Gate, only the most westerly one out-cropped, the others having no obvious surface expression though coming to within less than 30 m of the surface. The main difficulty in locating mineralization results from the NNW wrench fault set, favoured for gold mineralization, being parallel in strike to the bedding and cleavage of the host rocks.

Individual lodes are erratic and show considerable variation in attitude, though within restricted areas there may be some conformity related to the major faulting.

The area is obviously a difficult target to drill. Geochemistry and geophysics will probably be heavily relied upon.

If V.L.F. results are supported by geology and geochemistry, and V.L.F. is chosen as a prime indicator of targets, drilling should be aimed at intersecting the V.L.F. anomaly. In the first instance, where sharp geochemistry and V.L.F. anomalies indicate mineralization extending to the surface, target depths should be no deeper than 50 m. Only broader and more extensive anomalies may indicate deeper seated mineralization would warrant deeper drilling. Drill core should be analysed for elements commonly

found in primary dispersion halos associated with hydrothermal gold deposits, e.g. As, Sb, Hg, Cu etc. The elemental composition of these halos and the nature of the change in concentration of the elements with depth, can be used to direct further drilling.

The area is considered to hold reasonable potential for economic gold mineralization of both lode and alluvial types and thus warrants further detail work.

Proposal of drill targets at this stage is a little premature without geochemical results. The Jubilee-Mountaineer Mine area presents an excellent test area for geochemistry and geophysics. Something of the order of six test holes should be drilled. This would entail about 500 m of drilling at an approximate cost of \$15,000.

GEOLOGY

The Mathinna Group (Silurian) sediments strike NNW and dip generally to the east. They are overlain unconformably by horizontally bedded Permian glacials and intruded by an ill-defined basic dyke rock, which is thought by some to be genetically related to the gold mineralization (Finucane 1933). Jurassic dolerite sills typical of many parts of Tasmania overlie the glacials on Tower Hill and other prominent hills outside E.L.6/68.

Mathinna Group

The pelitic sediments of the Mathinna Group have been regionally metamorphosed to varying degrees up to a slate. Restricted areas contain phyllites and occasional phyllitic schists.

The predominant rock type is a slate with subordinate quartzite. The slate is usually grey in colour but is frequently green, blue and red and occasionally black though not rich in graphite. The quartzite is medium grained and usually light grey in colour and contains occasional fine mica. Most prominent ridges are composed of this quartzite, being a resistant barrier to erosion.

Faulting and lithology influence topography significantly and thus may be used to advantage in a photogeology interpretation of the area. On the regional scale of mapping it has not been possible to subdivide the Mathinna Group. The stability of the basin of deposition of these rocks is reflected in the great areal extent and the finely laminated sequences that exist. Therefore individual units should be extensive laterally and on a more detailed scale provide useful data.

Well developed sole markings were found in one locality 700 m south east of the Commercial Prospect; however, these were not in situ. The markings are at the base of a quartzite bed, revealed by weathering of the underlying slate. Some of the markings indicate scour and fill features. These markings may become useful in facing strata in areas complicated by faulting, and also from a more theoretical viewpoint, in determining palaeo-current directions.

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Permian Glacials

Most of the higher ridges have a thin cover of horizontally bedded sandstone, grit and conglomerate termed the Permian Glacials. The sandstone is medium to coarse grained, poorly consolidated and frequently contains rounded pebbles of quartz up to 1 cm in diameter.

On some of the lower ridges the only evidence of glacial cover is a few scattered boulders of fairly resistant conglomerate.

In the main part of the Mathinna Gold Field, the glacial cover does not hinder exploration work, except in the Tower Hill area, where this may present difficulties with soil sampling. Although the cover here is only thin care must be taken to ensure that the sample is from the underlying Mathinna Beds. This cover appears to have little affect on the V.L.F. response.

Basic Dyke Rock

Outcrop identified as this rock described by Finucane 1933, has been found in the Jubilee area. It is extremely weathered, friable and maroon coloured, and may possibly trend along a NE joint set. If this rock is related to mineralization and occurs along joint planes, then it becomes a very significant parameter in locating mineralization.

STRUCTUREMathinna Group

Within E.L.6/68 the sediments of the Mathinna Group have been regionally folded along 149° . The fold structures vary in wavelength up to 3000 m and commonly have gently curving axes. A slaty cleavage is developed parallel to the fold axes. Thresher suggests a wrench fault system to explain the fault tectonics of the area.

A stress analysis was attempted using joints and plotting them on a Lambert equal area stereographic net. It was thought that the wrench faulting should be reflected in the joint system. The poles to the joints were plotted in the Northern Hemisphere; a horizontal plane plotting at the centre of the net and a vertical plane plotting at the periphery. These points were then contoured as percentages of the total number of readings per 1% area of the net. Then the cyclographic projections (in Southern Hemisphere) of the more important sets were plotted and from this some interpretation was made. This net with mixed success. The data was treated in two sections, firstly as data collected from the regional mapping and secondly, as data collected from the detail work on the Jubilee-Mountaineer Mines Area. Data collected by Thresher and also some Mines Department data were used. 147 joints from the regional mapping revealed a joint system of four sets (Appendix A, Stereogram 1). They are, in order of significance:

- a. S 58 D76E
- b. S 26 D81E
- c. S146 D74W
- d. S173 D81E

The cyclographic projections of these planes are shown in Stereogram 2. The most obvious interpretation is for a maximum principal stress operating along joint set 'b', i.e. S26 D81E. This would produce shear joints represented by sets 'a' and 'd' whose dihedral angle of shear is 65° . The best developed joint is set 'a'. This should then reflect the best developed wrench fault; however, field evidence suggests the best developed wrench fault strikes NNW-SSE and dips west, and is here represented by joint set 'c'. Thus joint sets 'a' and 'c' reflect the major faulting as observed in the field; however, the direction for the maximum principal is still questionable.

Stereograms of bedding (135 recordings) and cleavage (140 recordings) reveal the following average readings (Stereograms 3 and 4).

Bedding	S146 D47E
Cleavage	S149 D79E

Joint set 'c' (S146 D74W) coincides well in strike with these two readings. This joint set reflects a wrench fault which has utilized the prominent NNW-SSE structural weakness. In this strongly folded fault zone, this is indicated by field observations of bedding and cleavage slip (shear folding).

The ideal wrench fault system was significantly affected by this regional structural weakness. This has resulted in the proposed dihedral angle of shear being 88° in the regional study and 95° in the detail study; as compared with the theoretical pattern for conjugate shearing where the dihedral angle is 60° (Stereograms 1, 2, 9, 10).

Kink planes were also plotted and treated similarly to the presentation of the joints. From the regional mapping the most common kink plane has a strike of 47° and a dip of 80° east (Stereogram 5). The detail work in the Jubilee-Mountaineer Area records the most common kink plane as S14 D80E (Stereogram 6). A comparison of the two contoured pole plots tends to suggest a sinistral rotation of the kink planes in this strongly faulted area. This implies that the NNW wrench fault is sinistral. The fold structures and one particularly well developed fault towards the west of the grid, also imply a sinistral movement. A comparison of the plots of the cleavage shows no disparity, e.g. S149 D79E and S151 D83E (Stereograms 4 and 11).

Threader suggests that "the final phase of the tectonic activity was dextral movement on a set of northeasterly striking shear planes". This is used to explain the displacement of the mineralized areas along the 90 km line of mineralization. There are several arcuate fold axes related to this northeasterly striking fault set which support this idea.

The data presented so far lends support to a wrench fault system with a maximum principal stress operating along $100-280^{\circ}$. The wrench fault set which is favoured for gold mineralization is thus sinistral and can be found to be displaced by the conjugate dextral wrench. Stereograms 7 and 8 show the plots of fold axes of both regional and detail data respectively. The data is plotted in the southern hemisphere, an axis plunging 5° in from the 180° on the periphery. The fold directions bear a close relationship with the NNW-SSE wrench fault set.

MINERALIZATION

The only mineralization found in the area came from mullock heaps at the New Golden Gate (quartz veining containing arsenopyrite and scorodite) and at the Twilight (quartz veining containing pyrite, galena, sphalerite and chalcopyrite). In areas known to be mineralized, quartz veined brecciated slate with strong Fe-Mn oxidation exists at the surface. Apart from this no evidence of mineralization was found. The following includes some of the more important points from the 1933 report on the area by Finucane.

The gold mineralization as free gold, is found in quartz veins containing arsenopyrite, pyrite, chalcopyrite, galena and sphalerite. The presence of sulphide mineralization is reflected in a bluish tinge and also a banding of the quartz. The Golden Gate ore contained about 1.5% sulphide mineralization, with arsenopyrite and pyrite being the more common. This sulphide mineralization carried 1 dwt to 3 dwt gold per ton of sulphide concentrate; however, this does not necessarily reflect the average gold content for sulphides throughout the field as pyrite and arsenopyrite samples from the 1600 ft level of the Golden Gate Mine have yielded 80 oz per ton. Some sulphides no doubt contain no gold.

The quartz veins show great variation both in size and attitude making early prospecting difficult. Stereogram 12 gives some indication of the random orientation of some of the more important lodes from different mines and also from within a single mine, e.g. Caledonian. The strike and dip of veins is likely to be consistent only within small areas so that for each individual prospect an attempt should be made to define the attitude of the more significant veins. This will probably be closely related to

the wrench fault system. For example the main veins on the Golden Gate Mine (Main, Loane's and East Reefs) strike in a general NNW direction whereas those of the Caledonian workings have a general ENE trend. From the present mapping it has been found that the former is located on the NNW wrench set whereas the latter is located on the ENE wrench set. This does not necessarily imply that mineralization in the Caledonian area has favoured the ENE wrench set. It may simply be caused by drag of the NNW structural sites resulting from movement about the ENE fault plane. However, in the Jubilee Mine, Mines Department reports indicate that the ENE wrench set does have some control on mineralization, that is (in this particular instance) it is a premineralization fault. Therefore at this stage, both possibilities exist.

The size of the veins varies considerably, in width from 5 cm up to 10 m or more and in length from 5 m to more than 300 m; however, the majority are rather short.

The gold mineralization occurs chiefly along and on either side of a zone of folding some 500 m wide and marked on the Geologic Map. This is a zone of intense shearing with maximum development of slate. It is not one single fault but a complex series of en echelon faults of varying magnitudes. The gold bearing solutions appear to have favoured major-joint planes, shear-zones and open space sites, developed as a result of the intense folding along this zone. Mineralized areas where quartzite is the dominant lithology, have proved to be of little value. This seems to be related to the physical properties of the rock (e.g. Pride of the Hills and Tower Hill).

More highly mineralized areas are likely to be found at the intersection of two reefs or at the intersection of a reef with some prominent joint or fault. This is a result of "the increase in freedom and volume of circulation of the auriferous

solutions which takes place in zones of greatest fracturing" (Finucane 1933). Open space filling is thus an important structural control.

The genesis of the auriferous quartz veins is generally accepted to be related to the nearby Devonian Granite. There are some indications however that basic dyke rocks may bear some relationship to the mineralization (Finucane 1933). At this stage it is adequate to state simply that the mineralization is of a hydrothermal nature with a strong structural control.

GEOPHYSICS

During the course of this work 15.3 km of reconnaissance and 3.5 km of detail V.L.F. work were completed using the transmitting station North West Cape. The reconnaissance V.L.F. consisted of nine scout lines from 1000-2000 m apart over areas previously established as mineralized or faulted, in order to determine the nature of the response. Readings were taken at either 15 m or 30 m intervals. This met with varying success. (See Geologic Map 500 ft = 1 inch for locations of traverses). The profiles for these traverses are not included in this report because of their size. The raw data can be found in Appendix C.

Numerous anomalies were indicated, some of them supporting geologic data. It must be kept in mind that these traverses were of a scout nature only and intended to indicate whether V.L.F. would have a response in the area, which it certainly does. However, the real significance of these responses is at present beyond the scope of this work. Areas we are attempting to delineate are faulted zones which have gold mineralization with some (~1.5%) Pz, Zn, Ag, Cu, As sulphides in a quartz gangue. The

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conductivity of this lode material will not be significantly higher than the enclosing country rocks unless there is a fair amount of sulphide mineralization or the fault zone passes through an area of black, possibly pyritic, slates. Both possibilities are equally remote. V.L.F. traverse No. 1 is probably the easiest at this stage to interpret. This traverse passes through the zone of close folding and tends to reflect the increasing intensity of folding towards the slide. This is especially so traversing from west to east, where the gently undulating In-Phase profile shows a gradual increase in amplitude. V.L.F. traverses No. 7 and No. 8, although 1200 m apart show a marked similarity of In-Phase wave form. From these traverses two faults have been inferred, one joining the Twilight and Sunbeam prospects and another 500 m to the west, trending in the same direction.

V.L.F. traverse No. 4 was intended to locate the main line of mineralization north of Mathinna beneath the alluvium of the South Esk River and also to give some indication on the thickness of alluvium. That is, a featureless profile would indicate alluvium greater than 30 m thick. Apart from the very sharp well defined anomaly at 615 m coinciding with a buried telephone cable, the nature of the rest of the profile indicates that bedrock may be at a depth not greater than 30 m. The other profiles indicate varying responses; however, the significance of these anomalies can be evaluated only by gridding if thought necessary.

Generally the Quadrature component parallels the In-Phase component and thus indicates a moderate to poor conductor without a significant thickness of conductive overburden. This is consistent with field observations. The area has a poorly developed soil profile generally only 30 cm thick.

At the Jubilee-Mountaineer Area, recordings were taken every 15 m along lines 390 m long and bearing 65° True. The lines were

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spaced 75 m apart. These recordings were plotted as profiles and also the In-Phase data was filtered and smoothed, plotted and then contoured at 10 unit intervals. (Map No. 1/174).

The most significant anomaly is that located in the central western portion of the grid (Anomaly 1). This anomaly is sharp and well defined, indicating a near surface affect, and continuous for a strike length of 375 m. It is located approximately midway between two fault zones. The fault zone to the east has been prospected to a depth of 90 m with reasonable success, while that to the west has been looked at only in shallow workings. It is possible that the V.L.F. response may indicate the middle of a wide zone of faulting and that mineralization exists at the margins of this zone (e.g. 'Main Slide' at New Golden Gate Mine). To the depth of effective V.L.F. response, mineralization has been found in lodes which generally dip east so that the displacement of the V.L.F. anomaly to the west is not likely to be due to the known eastern line of mineralization alone.

Anomaly No. 2 is broad and continuous and at this stage seems to indicate the eastern boundary of the zone of close folding. Geochemical results might upgrade this anomaly. Anomaly No. 3 at this stage is unsupported by geologic data.

The southern limit of Anomaly No. 1 terminates abruptly and may signify some east west trending cross faulting; however, further work to the south is necessary to prove or disprove this. The topography has some affect in producing large amplitude anomalies. This affect is removed by the contouring method used.

A more accurate evaluation of the V.L.F. data can be made when the results of the geochemical soil samples come to hand. It certainly shows good promise as an exploration tool.

GEOCHEMISTRY

The Mathinna area has a poorly developed residual soil profile rarely thicker than 30 cms. Vegetation is sparse, the ground is well drained and so an organic rich layer is only occasionally present. The bedrock soil is usually light tan coloured and rich in clay minerals.

Eleven random soil samples were collected from areas known to be mineralized and also areas thought not to be mineralized and submitted for analysis for GRC 1 (Cu, Ni, Co, Pb, Zn, Ag), GRC 3 (As) and GRC 9 (Mn) (Results Appendix B. Lab. Sheet 1078/1). Samples M4 and M8 showed a good contrast in all elements analysed, except for Ag and As for which both were 1 and 60 ppm respectively. Sample M8 was taken from within the Main Slide while sample M4 was taken from an unmineralized area approximately 1000 m to the south west. Both samples were taken on ridges. The results are tabulated below:

	Cu	Ni	Co	Pb	Zn	Ag	As	Mn
M4	BLD	5	BLD	15	15	1	60	2
M8	25	45	50	35	145	1	60	180

Although these two samples showed no contrast for As, others did, values varying from BLD to 80 ppm. These results indicated that geochemistry was useful, so further work was done.

V.L.F. traverse No. 1 showed what appeared to be a reasonable correlation with the established zone of close folding; soil samples (89 in all) were collected at 15 m intervals and submitted for analysis for GRC 1, GRC 3, GRC 9 and also GRC 108 (Sb) and GRC 13 (Hg) but the latter two only on alternative samples due firstly to the cost and secondly to the doubt that these analyses would prove useful.

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Similarly a total of 224 soil samples were taken from the Jubilee-Mountaineer Grid for analysis for the same group of elements. One gossan bearing sample from line 150N was split into its two components before sending for analysis.

Three gossanous samples from various parts of the area were submitted for analysis for GRC 1, GRC 3, GRC 9 and GRC 122 (Au). (Field sheet 006843, Appendix B).

The geochemical results should be looked at carefully. Obviously many of the elements will show similar dispersion patterns. The best two or three elements should be chosen as pathfinders for future work. Element ratios deserve some consideration to further subdivide anomalies.

ALLUVIAL GOLD

The history of alluvial gold mining has not been spectacular. The first discovery was in the Tower Rivulet, later work being done to shallow depths in Black Horse and Long Gully Creeks. In the New River Area a syndicate worked a shallow lead to 8 m (Twelvetrees, 1904) where about 1000 oz were won.

In the Mangana area, gold has been recorded from basal Permian beds (Twelvetrees, 1907) in river channels existing prior to the Permian Glaciation. Subsequent erosion of the Pre-Permian surface would have redistributed the gold into more recent river valleys.

Within E.L.6/68 alone there is of the order of 8 sq km of flood plain in the Dan and South Esk Valleys which has received alluvial gold from the Dan Rivulet and Mathinna Gold Fields. This is only part of a 130 sq km system of alluvial flood plains in

and around the goldfields. The flood plains are privately owned farm lands and this has no doubt deterred workers in the past.

Some systematic boring was carried out prior to 1906, at the mouth of Black Horse Gully, and is reported by Twelvetrees, 1906. It consisted of 87 holes at one chain intervals along lines eight to ten chains apart. The results are interesting and are tabulated below.

		Average depth		Gold per cu yd
		ft	in.	grains
1st line	7 holes	7	4	0.48
2nd line	10 holes	7	6	2.58
3rd line	13 holes	5	0	5.904
4th line	8 holes	5	5	6.43
5th line	10 holes	7	6	22.80
6th line	11 holes	7	0	11.88
7th line	10 holes	6	2	13.881
8th line	8 holes	7	4	10.101
9th line	5 holes	6	1	24.384
10th line	5 holes	6	11	26.782
Average yield $\frac{1}{2}$ dwt gold per cubic yard.				

Considering the average thickness of alluvium to be two yards, the spacing between holes 20 yards, and the lines 200 yards apart we arrive at a figure of 616,000 cubic yards. The average yield of $\frac{1}{2}$ dwt gold (\$1.50) per cubic yard, gives this small patch of alluvials a gross value in excess of \$900,000 at current prices, for an outside running cost of less than \$20,000 (at 30 cents per cubic yard).

Twelvetrees describes the deposit as consisting of "about three feet of clay and small drift covering quartz-wash mixed

with clay, and the whole lying on a layer of pipe-clay, which covers the bedrock". He states that the gold is found on and in the pipe clay. This may have deterred work in the past - however, it is not really certain that the gold was in the pipe-clay. Twelvetrees' description of the gold being "on and in the pipe-clay" might indicate a settling of the gold towards the bottom of the hole, from the quartz-wash, during drilling.

The mouth of Black Horse Gully presents an excellent alluvial testing ground.

The wider and deeper flood plains of the Dan and South Esk Rivers are more difficult to prospect. Any significant alluvial gold concentration on the Pre-Permian surface should now be found in channelways close to bedrock. It would be an obvious advantage to know where in the wide flood plain the oldest watercourse was. This could be found by seismic survey using a simple portable hammer, e.g. Terrascout.

Bends in the old watercourse would present excellent scout drilling targets. Reports indicate that the alluvium exceeds 70 m in places so that chasing these by wildcat drilling would be rather costly and most probably disappointing. The Dan Rivulet follows the NNW wrench fault set favoured for gold mineralization. Shallow prospects are scattered around the hills on either side of the flood plain. Also the possibility of there being lode material beneath this flood plain is far from remote. The oldest watercourse is likely to be directly along the fault, or along strike of the lodes being eroded. Thus the percentage of eroding rock which is actually lode material would have been high.

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It is also quite probable that other horizons within the alluvium contain gold. Post-mineralization faulting suggested by Threader as having some topographic expression may have elevated the lodes and increased the rate of erosion.

W.S. TURNER,
September, 1972.

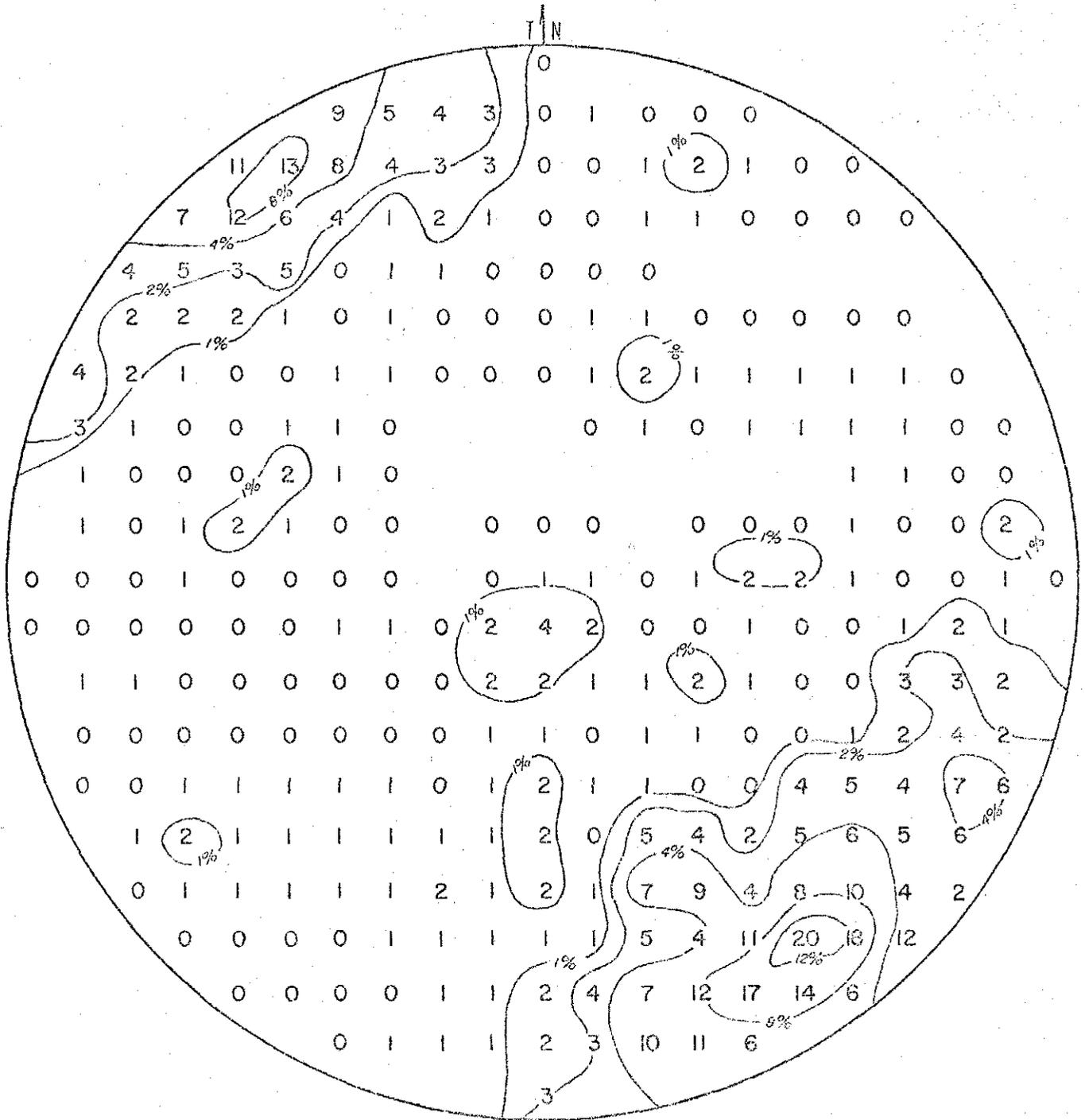
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APPENDIX A

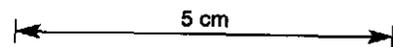
STEREOGRAMS 1 - 12

STEREOGRAM 1



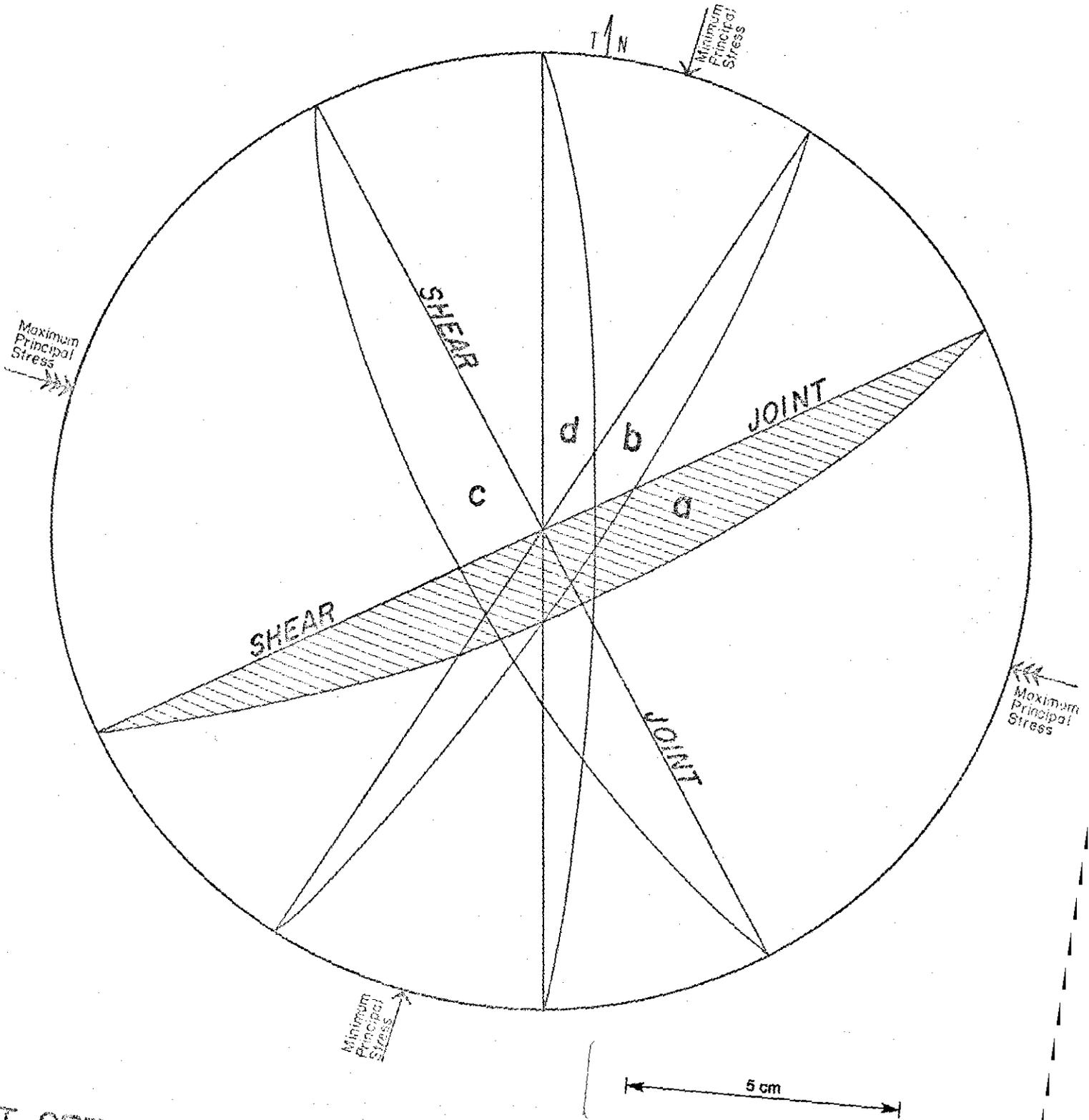
JOINT PLOT-REGIONAL DATA

(147 points)



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STEREOGRAM 2



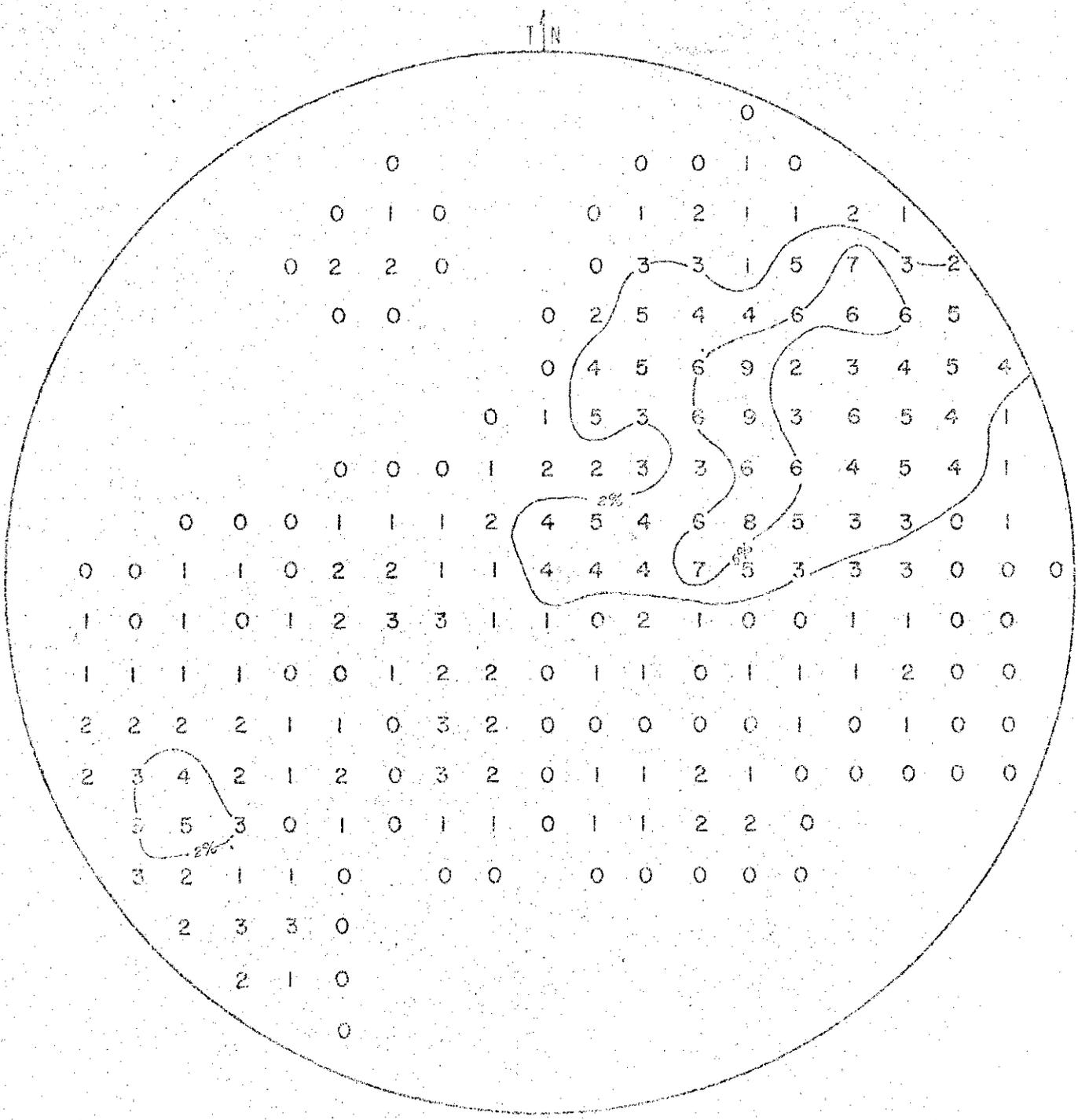
JOINT SETS, CYCLOGRAPHIC PROJECTION - REGIONAL DATA

TEXINS DEVELOPMENT PTY LTD.

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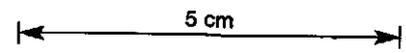
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STEREOGRAM 3



BEDDING - REGIONAL DATA

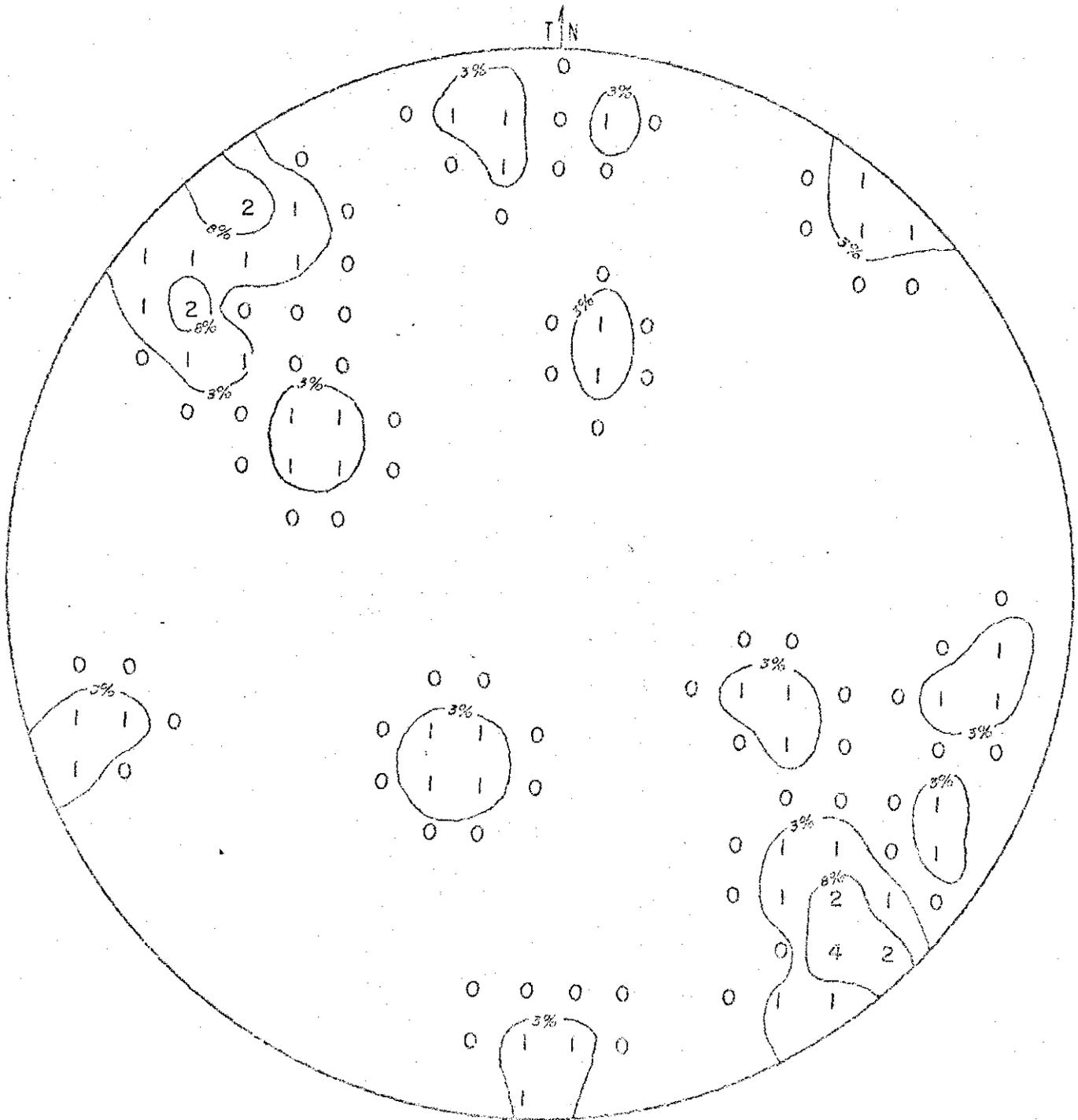
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STEREOGRAM 5



KINK PLANES - REGIONAL DATA

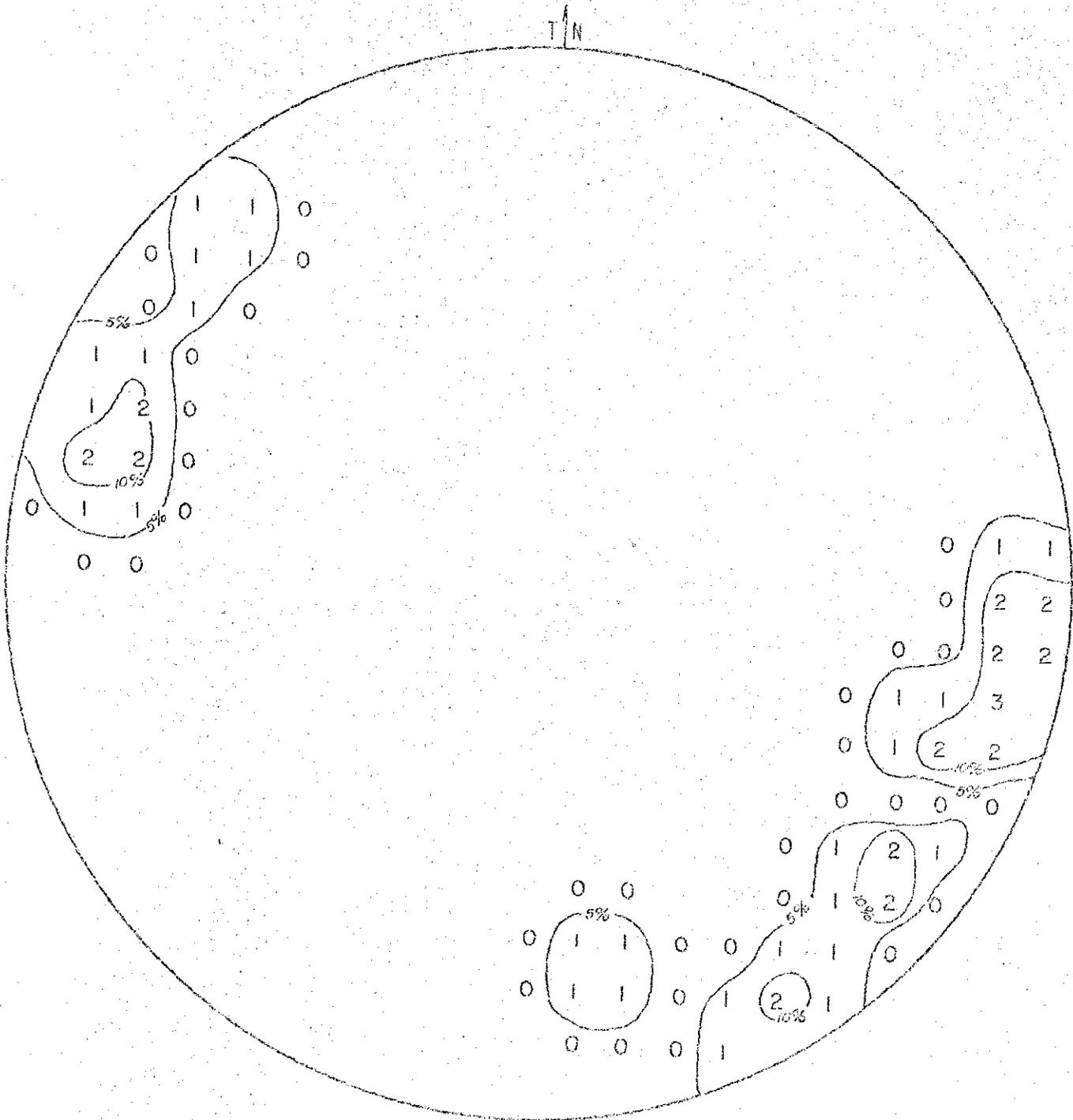
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5 cm

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STEREOGRAM 6



KINK PLANES - DETAIL DATA

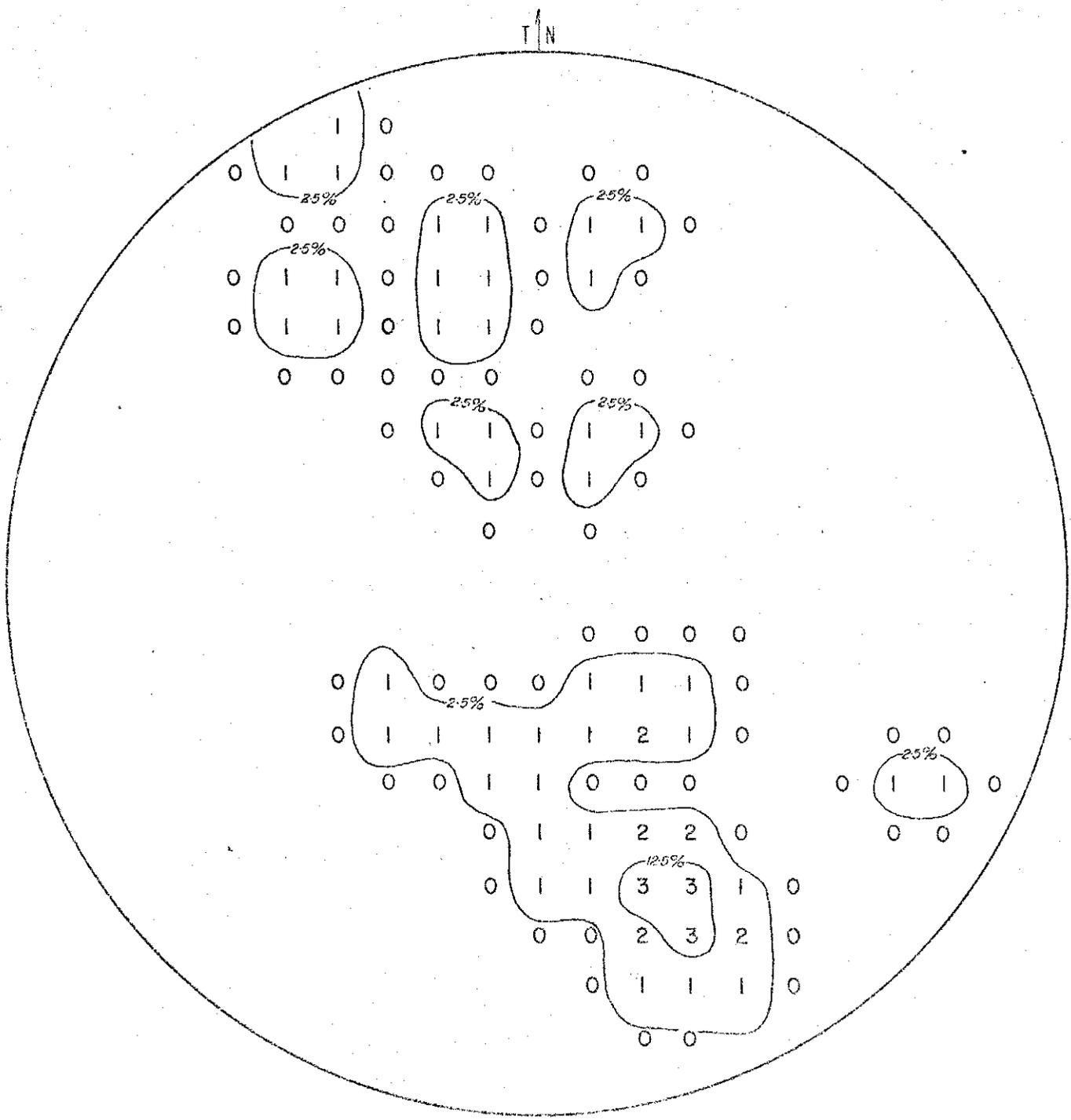
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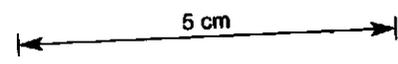
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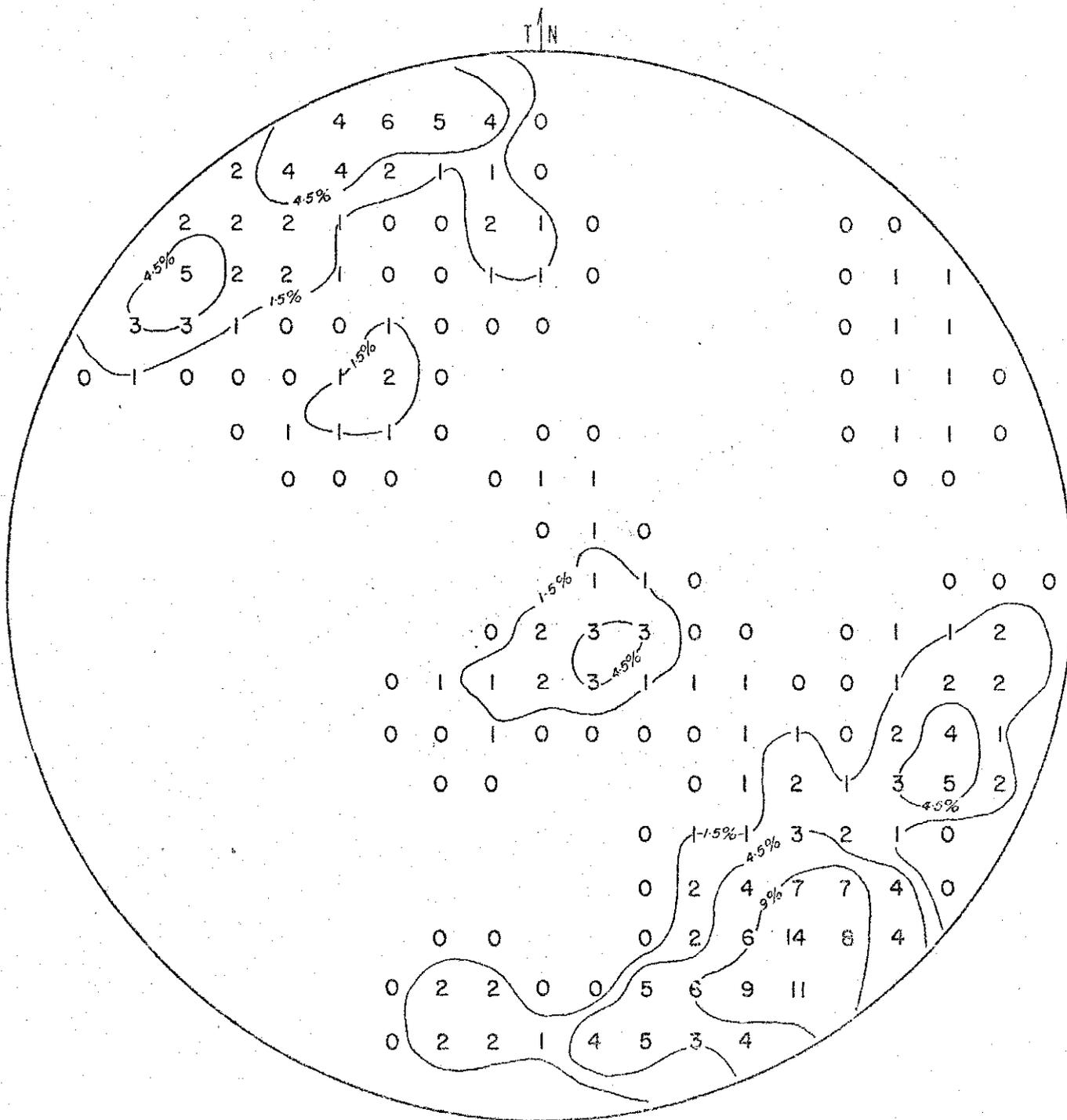
STEREOGRAM 7



FOLD AXES-REGIONAL DATA

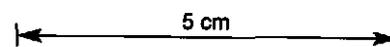
(18 points)





JOINT PLOT-DETAIL DATA

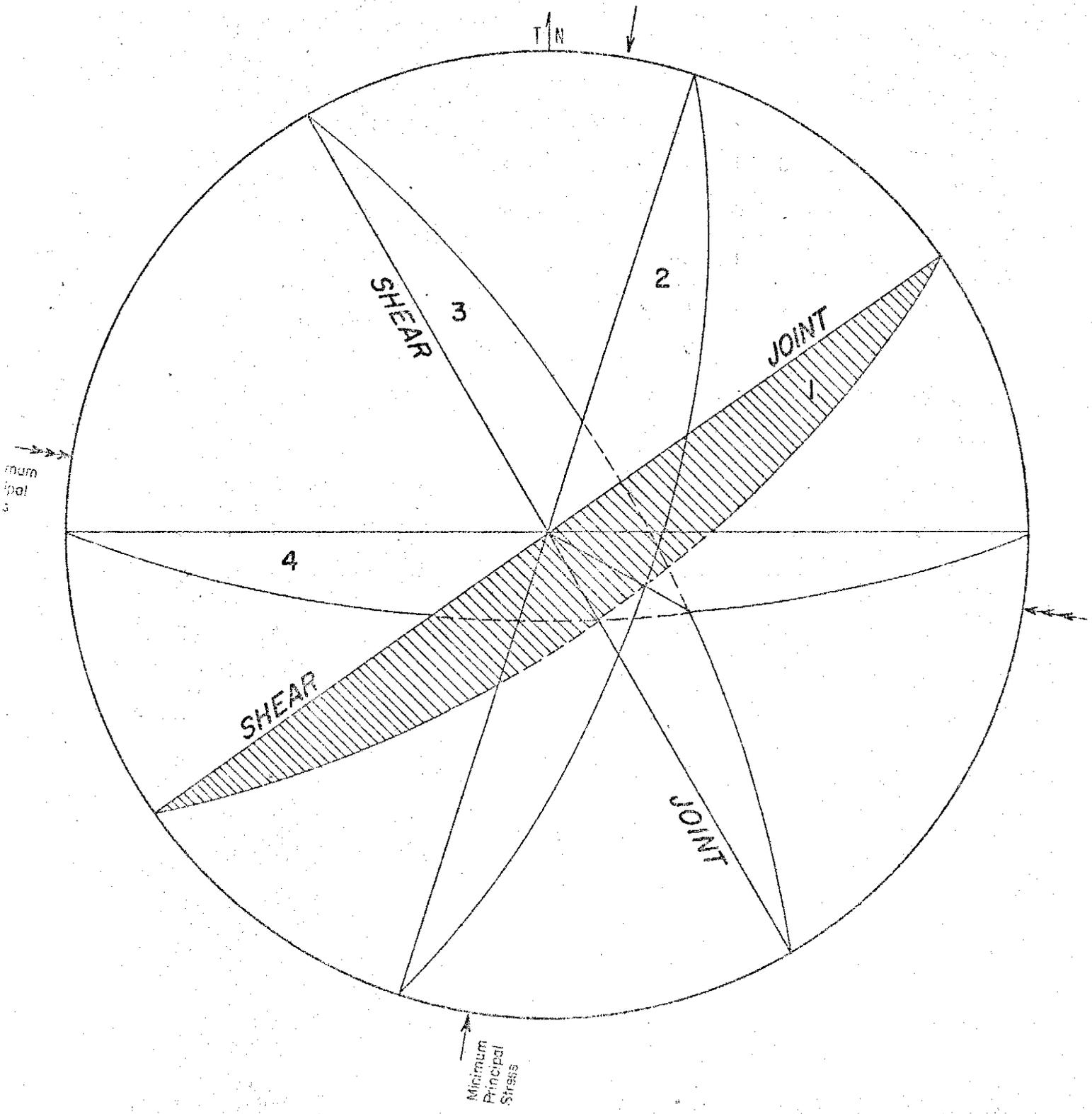
(94 points)



033

708034

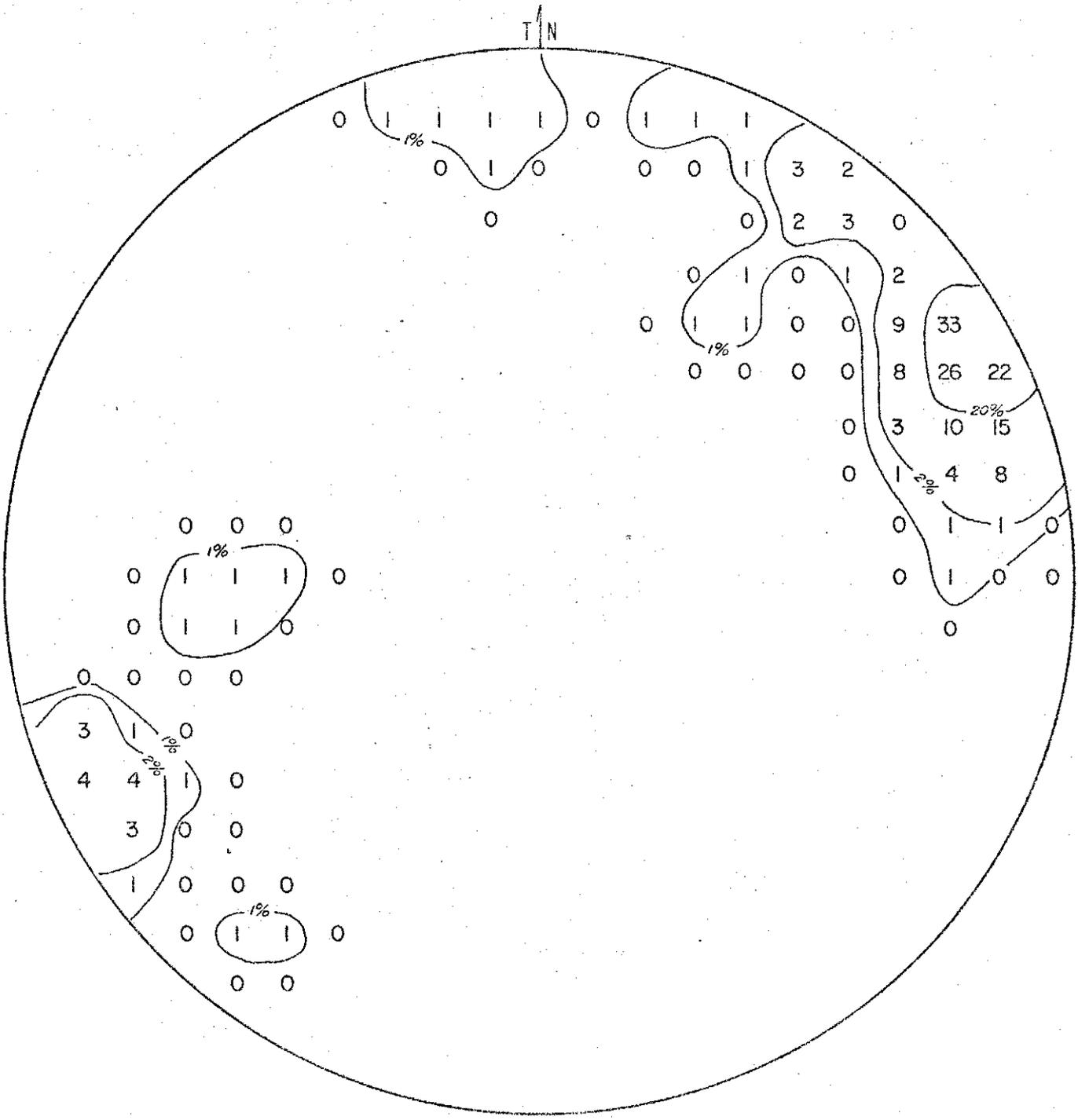
STEREOGRAM 10



JOINT SETS, CYCLOGRAPHIC PROJECTION - DETAIL DATA

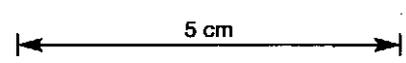
5 cm

STEREOGRAM II



CLEAVAGE - DETAIL DATA

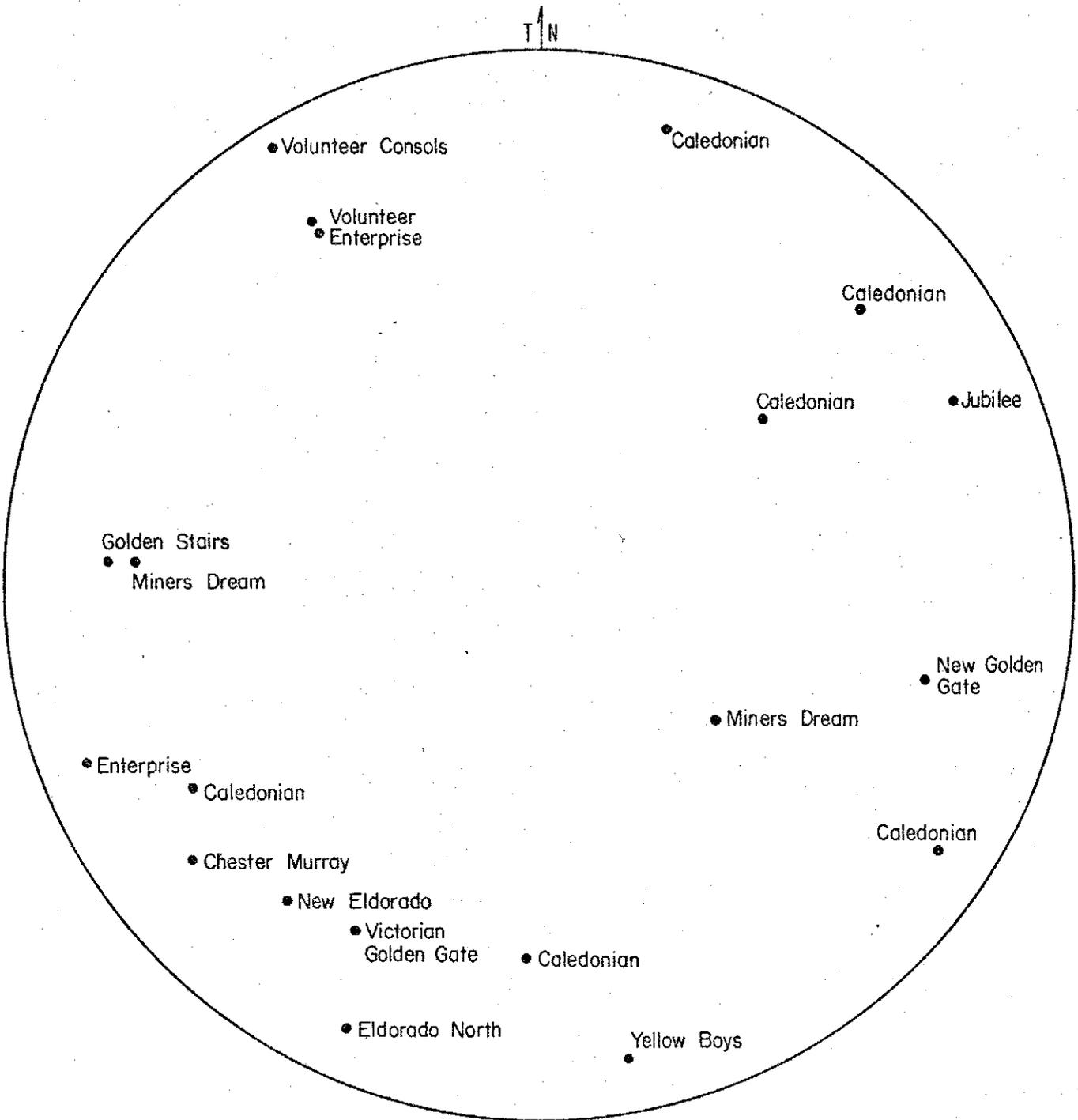
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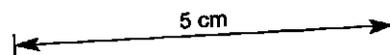
035

708036

STEREOGRAM 12



PRINCIPAL LODE ATTITUDES



036

708037

APPENDIX B

DETAILS OF SOIL SAMPLING

FIELD SHEET No.: 006839 PROJECT No.: EL. 6/68 - MATHINNA ORIENTATION SOIL SAM

LAB. SHEET No.: 1078/1 SAMPLE TYPE: SOIL DATE: 21st August, 1972.

037
708038

SAMPLE No.	LAB. No.	Cu ppm	Ni ppm	Co ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Mn ppm
M1	72-H-335	40	20	10	45	45	1	BLD	20
M2	72-H-336	40	10	5	45	20	1	70	10
M3	72-H-337	20	15	10	25	30	1	30	25
M4	72-H-338	BLD	5	BLD	15	15	1	60	2
M5	72-H-339	20	20	10	45	20	1	80	10
M6	72-H-340	15	15	10	20	40	1	BLD	30
M7	72-H-341	30	30	20	30	90	1	BLD	40
M8	72-H-342	25	45	50	35	145	1	60	180
M9	72-H-343	20	30	20	25	85	1	BLD	160
M10	72-H-344	10	20	10	15	50	1	BLD	35
M11	72-H-345	2	10	2	15	20	1	50	20

METHODS:

This laboratory is registered by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of registration.

Cu, Ni, Co, Pb, Zn, Ag by G.R.C. No. 1
As by G.R.C. No. 3
Mn by G.R.C. No. 9
B.L.D. = below Limit of detection



Chief Chemist

Ray
W. M. Leitch



708039 72-923

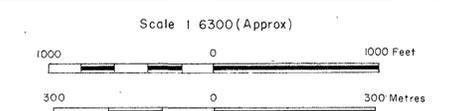
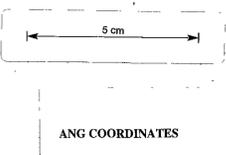
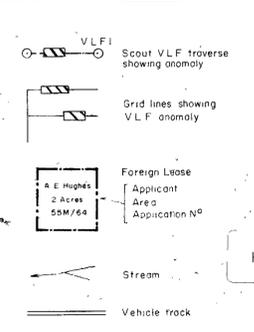
SHEET INDEX

1
2
3
4

QUATERNARY	Q Alluvium
PERMIAN	Ps Glacials - conglomerate and sandstone
SILURIAN	MATHINNA GROUP Sm Slate and quartzite

LEGEND

165	Field observed dip	Anticline	Arrow denotes plunge, dashed where indefinite, questioned where inferred
170	Field observed vertical bedding	Syncline	
170	Cleavage, inclined	Minor antiformal fold	
75	Cleavage, vertical	Minor synclinal fold	
75	Joint, inclined	Prospect	
75	Joint, vertical	Adit	
170	Shearing, inclined	Trench or costean	
75	Quartz vein	G.I.I.I.	Gossan sample location
---	Contact, dashed where indefinite	4 b	Brecciation
---	Fault, normal	Minor structures - scale variable	
---	Fault, indefinite	75N	Kink plane - direction of dip indicated
75	Lode attitude		
75	Dragfold indicating pitch & plunge		



TEXAS INSTRUMENTS INCORPORATED SERVICES GROUP

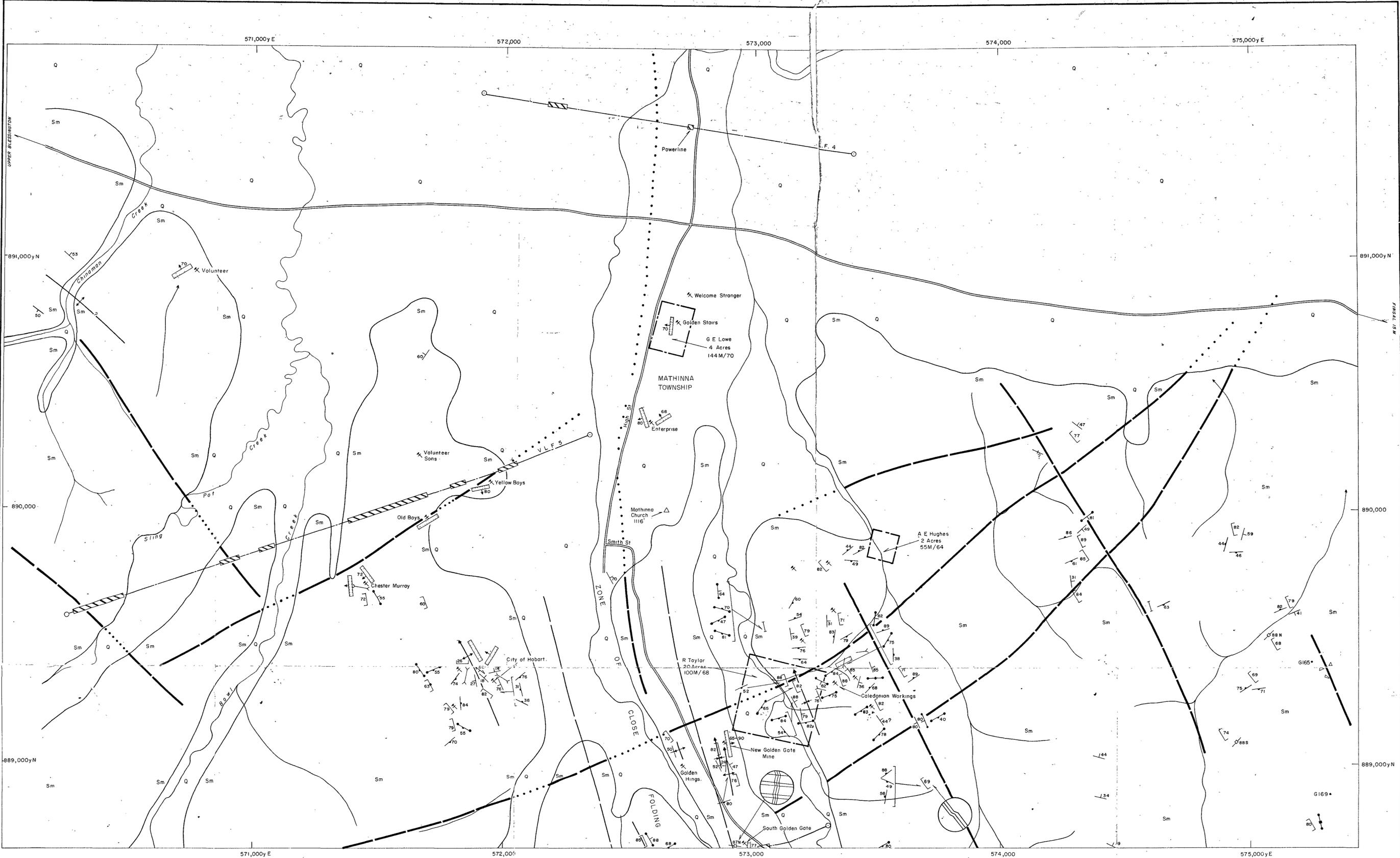
GEOPHOTO RESOURCES CONSULTANTS
BRISBANE AUSTRALIA

TEXINS DEVELOPMENT PTY LTD
E.L.6/68 NORTH EAST TASMANIA

**MATHINNA AREA
GEOLOGICAL MAP 1980**

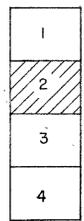
PROJECT	E.L.6/68	AUTHOR	W Turner	DATE	Oct.1972	DWG No	1/173
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SHEET 1 OF 4 SHEETS



708C40 72-923

SHEET INDEX

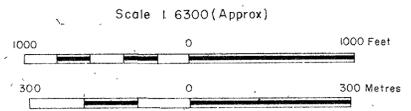
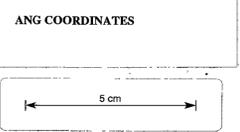


QUATERNARY	Q	Alluvium	
PERMIAN	Ps	Glacials - conglomerate and sandstone	
SILURIAN	Mathinna Group	Sm	Slate and quartzite

LEGEND

65	Field observed dip	Anticline	Arrow denotes plunge, dashed where indefinite, questioned where inferred
70	Field observed vertical bedding	Syncline	Arrow denotes plunge, dashed where indefinite, questioned where inferred
70	Cleavage, inclined	Minor anticlinal fold	
70	Cleavage, vertical	Minor synclinal fold	
75	Joint, inclined	Prospect	
75	Joint, vertical	Adit	
75	Shearing, inclined	Trench or costean	
75	Quartz vein	Gossan sample location	
---	Contact, dashed where indefinite	Brecciation	
---	Fault, normal	Minor structures - scale variable	
---	Fault, indefinite	Kink plane - direction of dip indicated	
4.75	Lode attitude		
75	Dragfold indicating pitch & plunge		

VLF 1	Scout VLF traverse showing anomaly
Grid lines	Grid lines showing VLF anomaly
A. E. Hughes	Foreign Lease
2 Acres	Applicant Area
55M/64	Application No
Stream	Stream
Vehicle track	Vehicle track

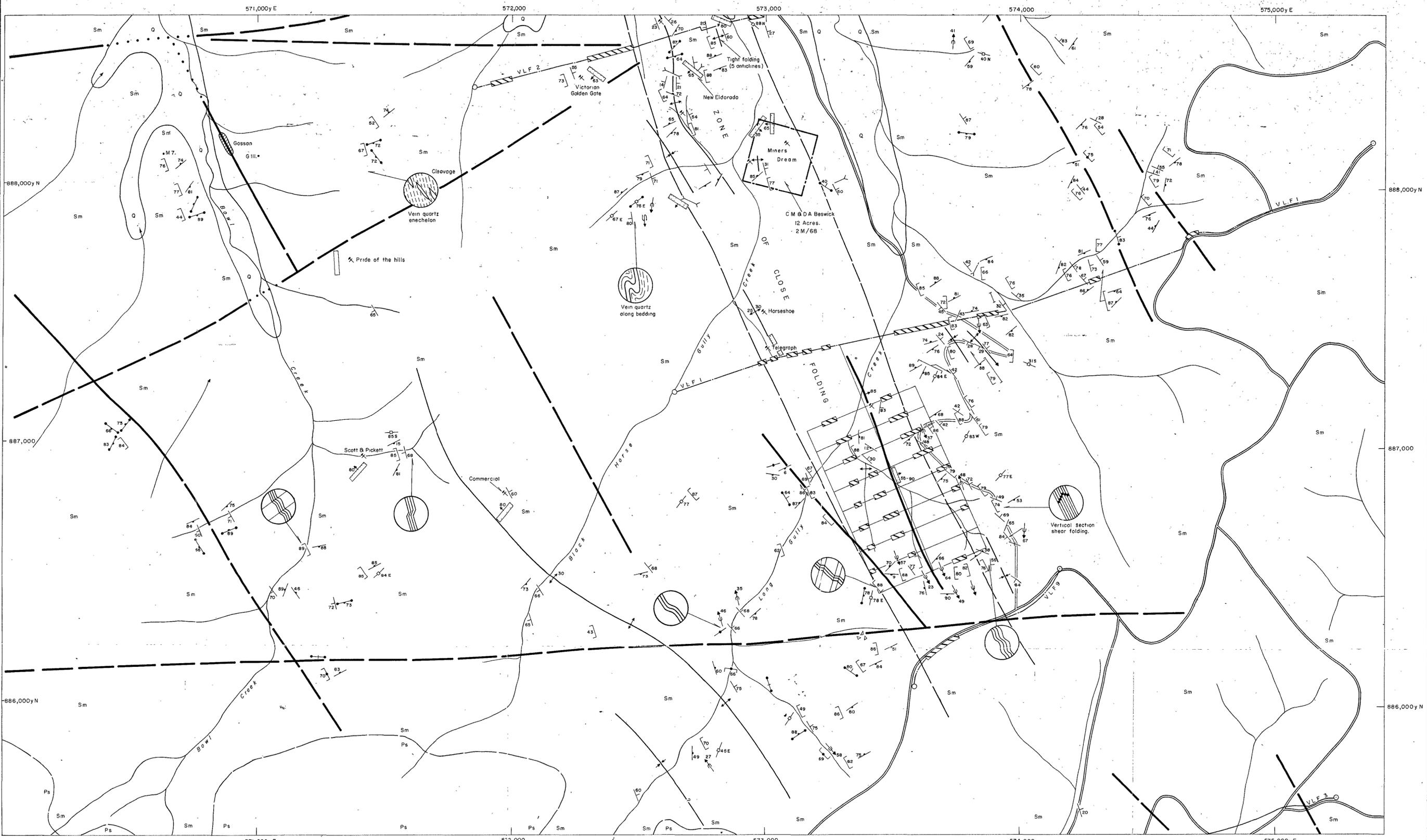


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TEXINS DEVELOPMENT PTY LTD
 E.L.6/68 NORTH EAST TASMANIA

MATHINNA AREA GEOLOGICAL MAP 1981

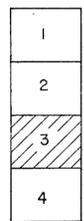
PROJECT	E.L. 6/68	AUTHOR	W Turner	DATE	Oct. 1972	DWG NO	1/173
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708041 72-923

LEGEND

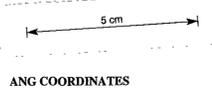
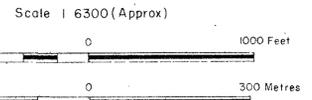
SHEET INDEX



- QUATERNARY
 - Q Alluvium
- PERMIAN
 - Ps Glacials - conglomerate and sandstone
- SILURIAN
 - MATHINNA GROUP
 - Sm Slate and quartzite

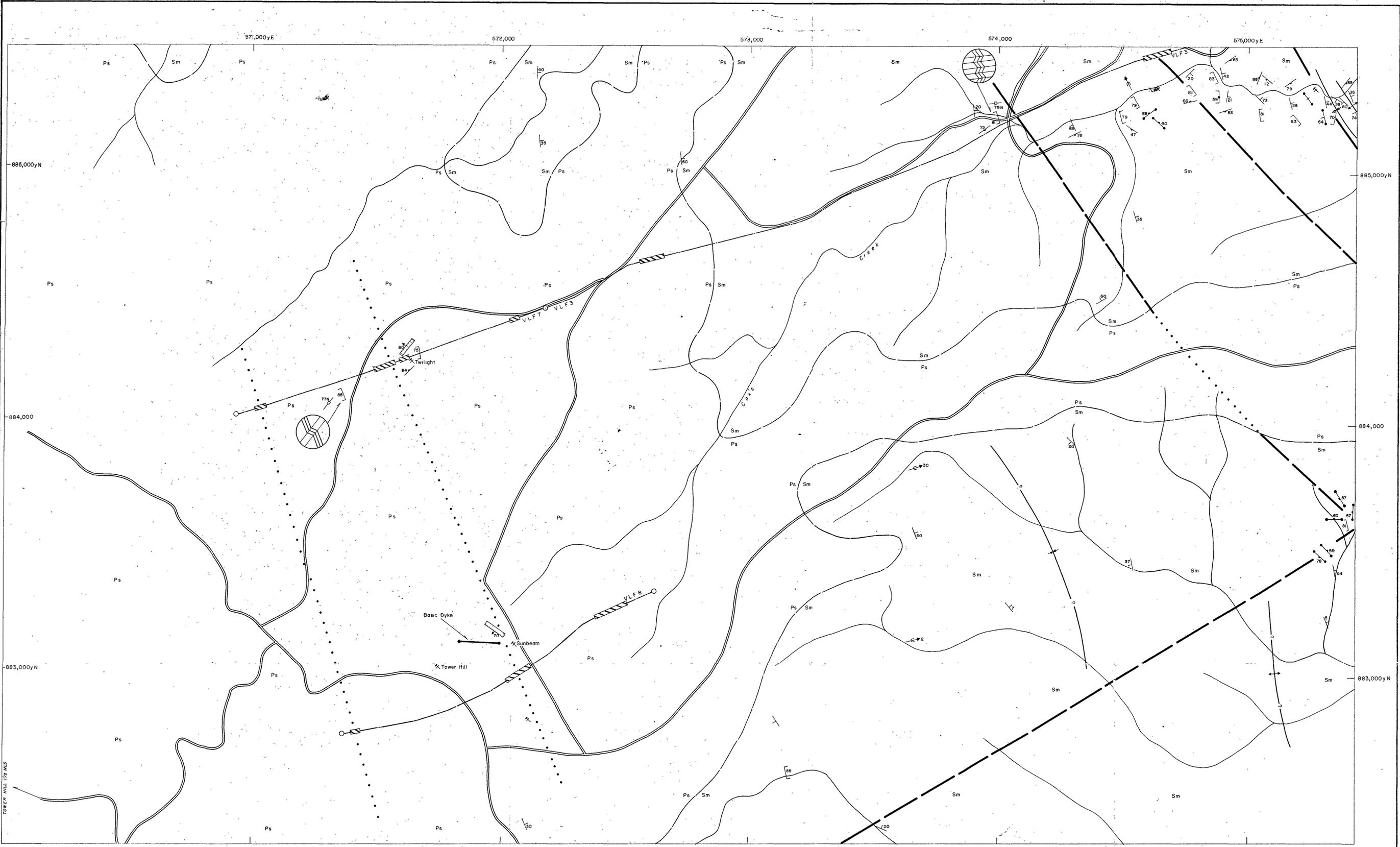
- 155 Field observed dip
- Field observed vertical bedding
- Cleavage, inclined
- Cleavage, vertical
- Joint, inclined
- Joint, vertical
- Shearing, inclined
- Quartz vein
- Contact, dashed where indefinite
- Fault, normal
- Fault, indefinite
- Lode attitude
- Dragfold indicating pitch & plunge
- Anticline
- Syncline
- Minor antinormal fold
- Minor synclinal fold
- Prospect
- Adit
- Trench or costean
- Gosson sample location
- Brecciation
- Minor structures - scale variable
- Kink plane - direction of dip indicated

- VLF1 Scout VLF traverse showing anomaly
- Grid lines showing VLF anomaly
- Foreign Lease
- Applicant Area Application No
- Stream
- Vehicle track



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 E.L.6/68 NORTH EAST TASMANIA
MATHINNA AREA GEOLOGICAL MAP 1982

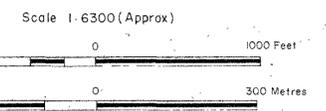
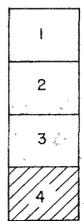


708042 72-923

LEGEND

- | | | | | |
|--|---|---|---|--|
| <p>QUATERNARY</p> <p>PERMIAN</p> <p>SILURIAN</p> | <p>Q Alluvium</p> <p>Ps Glacials - conglomerate and sandstone</p> <p>Sm Slate and quartzite</p> | <p>165 Field observed dip</p> <p>Field observed vertical bedding</p> <p>170 Cleavage, inclined</p> <p>Cleavage, vertical</p> <p>75 Joint, inclined</p> <p>Joint, vertical</p> <p>Shearing, inclined</p> <p>Quartz vein</p> <p>Contact, dashed where indefinite</p> <p>Fault, normal</p> <p>Fault, indefinite</p> <p>Lode attitude</p> <p>Dragfold indicating pitch & plunge</p> | <p>Anticline</p> <p>Syncline</p> <p>Minor anticlinal fold</p> <p>Minor synclinal fold</p> <p>Prospect</p> <p>Adit</p> <p>Trench or costean</p> <p>Gossan sample location</p> <p>Brecciation</p> <p>Minor structures - scale variable</p> <p>Kink plane - direction of dip indicated</p> | <p>Scout V.L.F. traverse showing anomaly</p> <p>Grid lines showing V.L.F. anomaly</p> <p>Foreign Lease Area</p> <p>Applicant Area</p> <p>Application No</p> <p>Stream</p> <p>Vehicle track</p> |
|--|---|---|---|--|

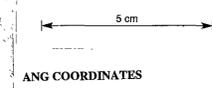
SHEET INDEX



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BRISBANE AUSTRALIA



TEXINS DEVELOPMENT PTY LTD
EL.6/68 NORTH EAST TASMANIA
MATHINNA AREA
GEOLOGICAL MAP
1983

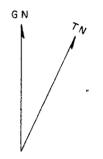
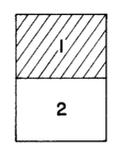


V.L.F. traverse N°1
(669m west of base
line 00 + 820N)



705010 72-923

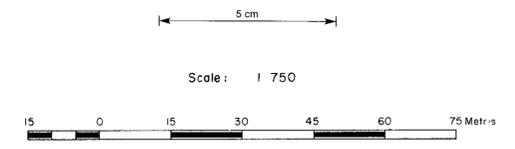
SHEET INDEX



QUARTERNARY	Q	Alluvium
SILURIAN	Sm	Slate and quartzite some phyllite
	—	Contact
	- - -	Fault, dashed where indefinite
	↗ 75°	Lode attitude
		Stoped to surface

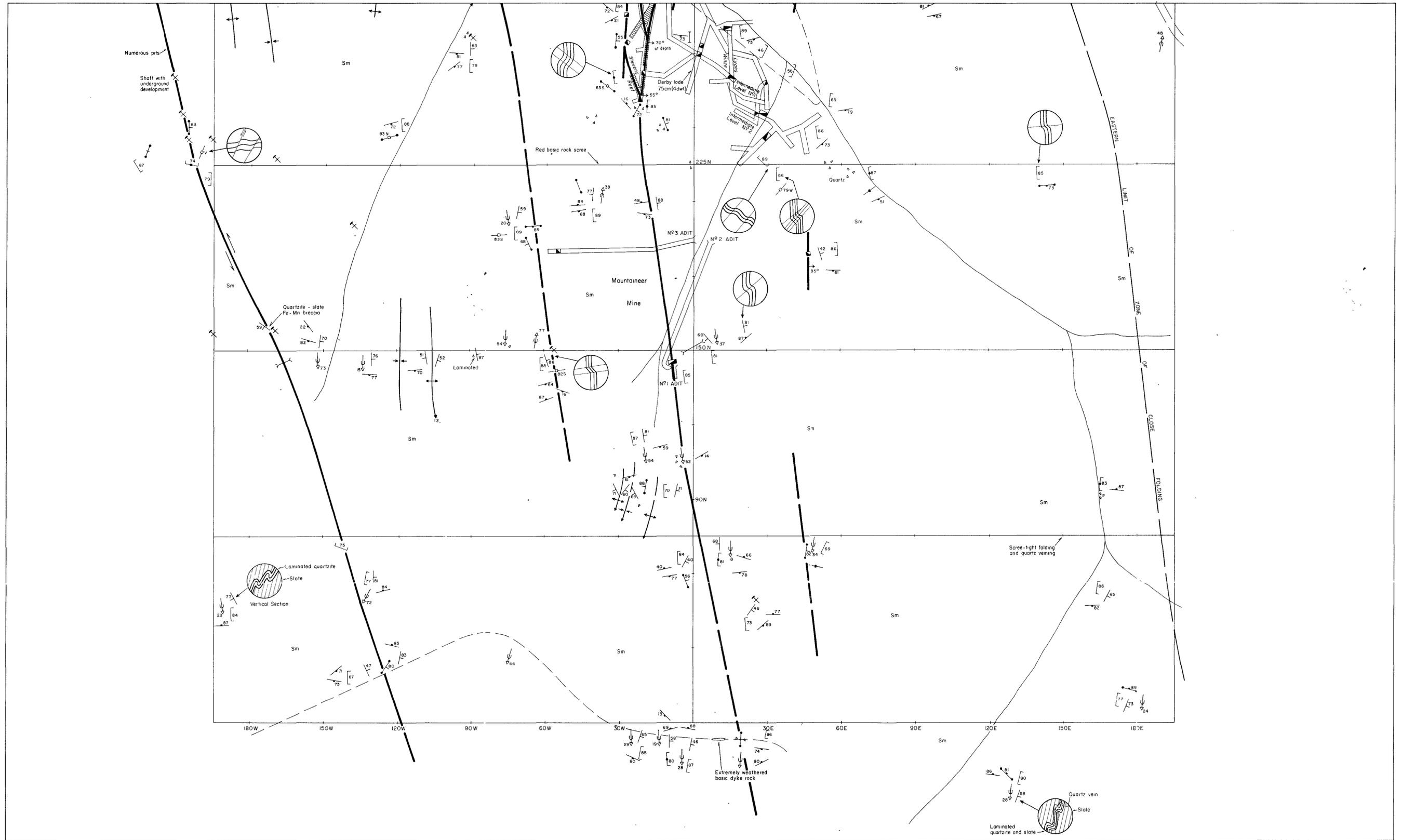
LEGEND

16C	Field observed dip	↕	Anticline, arrow denotes plunge	↗ 75°	Kink plane - direction of dip indicated
16V	Field observed vertical dip	↕	Syncline, arrow denotes plunge	⊗	Brecciation
16S	Cleavage, inclined	↔	Minor anticlinal fold	⊙	Minor structures - scale variable
16V	Cleavage, vertical	↔	Minor synclinal fold	—	Vehicular track
16Z	Joint, inclined	↔	Prospect, inactive	—	Track
16V	Joint, vertical	⊠	Shaft	—	Creek
16S	Shearing, inclined	—	Adit	—	Watercourse
16V	Quartz vein	—	Trench or costean		



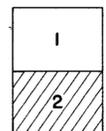
Note: Plan of workings taken from Mines Department Report by Nye 1933

TEXAS INSTRUMENTS INCORPORATED SERVICES GROUP	
GEOPHOTO RESOURCES CONSULTANTS BRISBANE AUSTRALIA	
TEXINS DEVELOPMENT PTY LTD E.L. 6/68 NORTH EAST TASMANIA MATHINNA AREA 1978 JUBILEE-MOUNTAINEER MINE GRID GEOLOGICAL MAP	
PROJECT	E.L. 6/68
AUTHOR	W. Turner
DATE	October 1972
DWG. N°	1/172



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SHEET INDEX

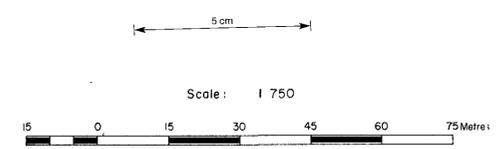


QUARternary	
	Alluvium
	MATHINNA GROUP
	Contact
	Fault, dashed where indefinite, showing relative movement
	Lode attitude
	Stopped to surface

LEGEND	
	Field observed dip
	Field observed vertical bedding
	Cleavage, inclined
	Cleavage, vertical
	Joint, inclined
	Joint, vertical
	Shearing, inclined
	Quartz vein

	Anticline, arrow denotes plunge
	Syncline, arrow denotes plunge
	Minor anticlinal fold
	Minor synclinal fold
	Prospect, inactive
	Shaft
	Adit
	Trench or costean

	Kink plane - direction of dip indicated
	Brecciation
	Minor structures - scale variable
	Vehicular track
	Track
	Creek
	Waterrace

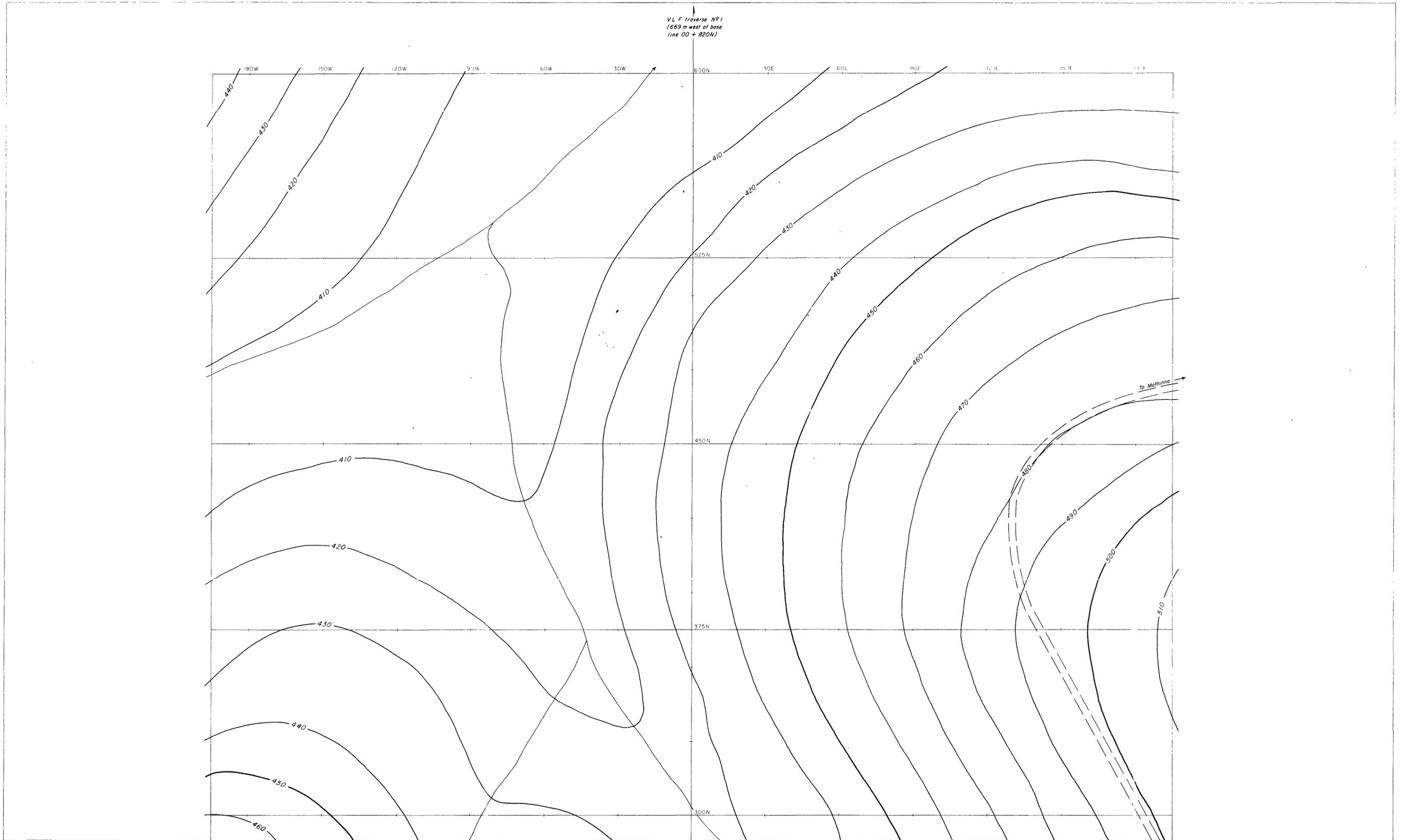


Note: Plan of workings taken from Mines Department Report by Nye 1933

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GEOPHOTO RESOURCES CONSULTANTS
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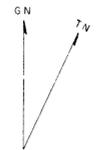
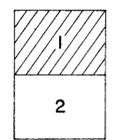
TEXINS DEVELOPMENT PTY LTD.
 E.L.6/68 NORTH EAST TASMANIA 1979
MATHINNA AREA
JUBILEE-MOUNTAINEER MINE GRID
GEOLOGICAL MAP

PROJECT	E.L.6/68	AUTHOR	W Turner	DATE	October 1972	DWG N°	1/172
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708010 72-923

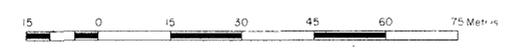
SHEET INDEX



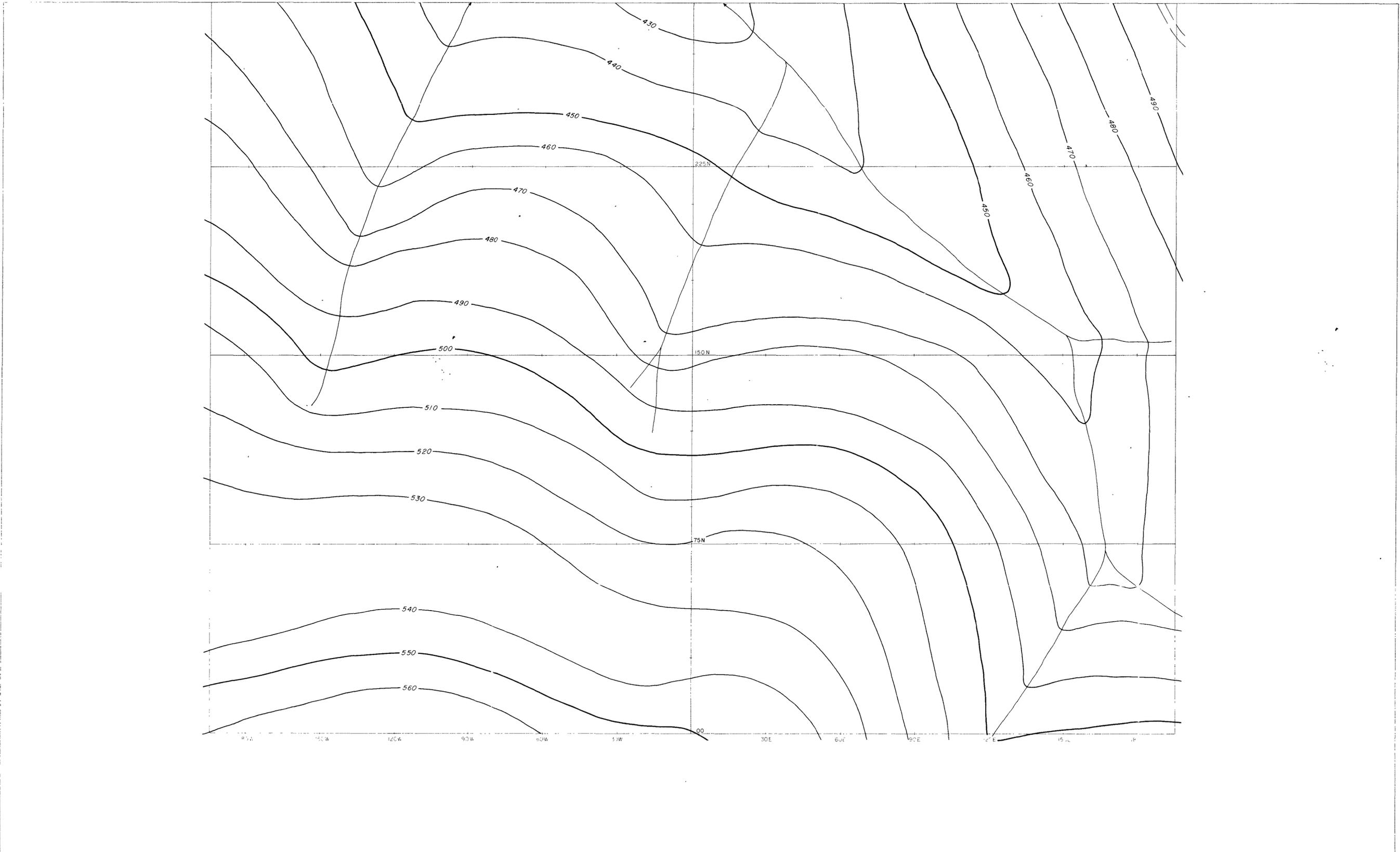
LEGEND

- Contours (10m interval)
- Creek
- Road

Scale: 1:750

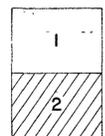


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GEOPHOTO RESOURCES CONSULTANTS BRISBANE AUSTRALIA	
	TEXINS DEVELOPMENT PTY LTD E.L. 6/68 NORTH EAST TASMANIA MATHINNA AREA 1976 JUBILEE-MOUNTAINEER MINE GRID TOPOGRAPHICAL MAP
PROJECT	E.L. 6/68
AUTHOR	W. Turner
DATE	October 1972
DWG. NO.	1/171



708016 72-923

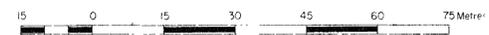
SHEET INDEX



LEGEND

- Contours (10m interval)
- Creek
- Road

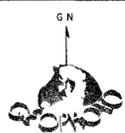
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5 cm

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SERVICES GROUP

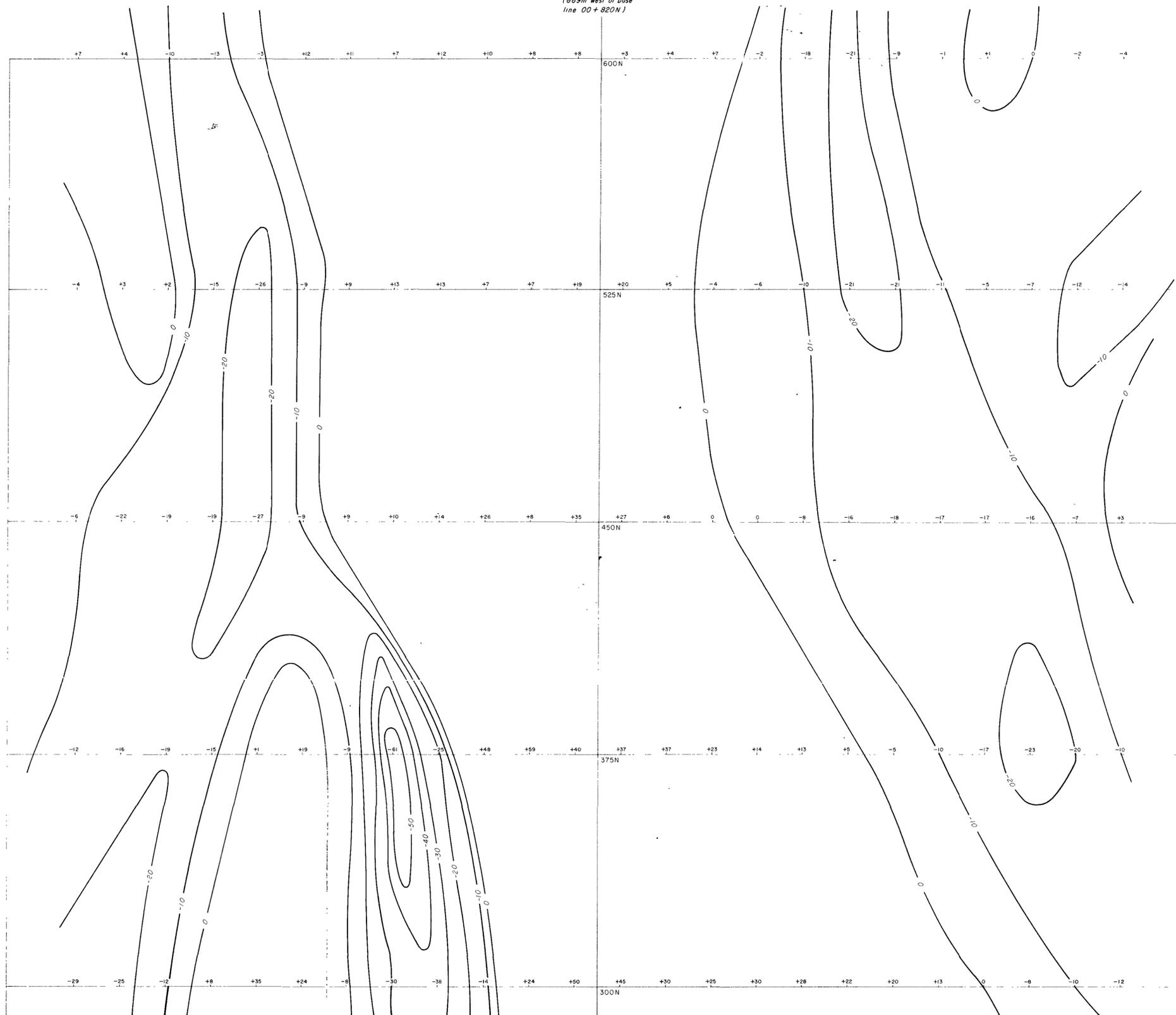
GEOPHOTO RESOURCES CONSULTANTS
BRISBANE AUSTRALIA



TEXINS DEVELOPMENT PTY LTD
E.L. 6/68 NORTH EAST TASMANIA
MATHINNA AREA 1977
JUBILEE-MOUNTAINEER MINE GRID
TOPOGRAPHICAL MAP

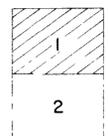
PROJECT E.L. 6/68 AUTHOR W. Turner DATE October 1972 DWG. N2 1/171

V.L.F. Traverse NR 1
 (569m west of base
 line 00+820N)



708017 72-923

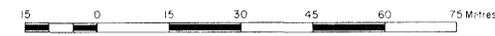
SHEET INDEX



LEGEND

+22 First derivative value

Scale 1:750



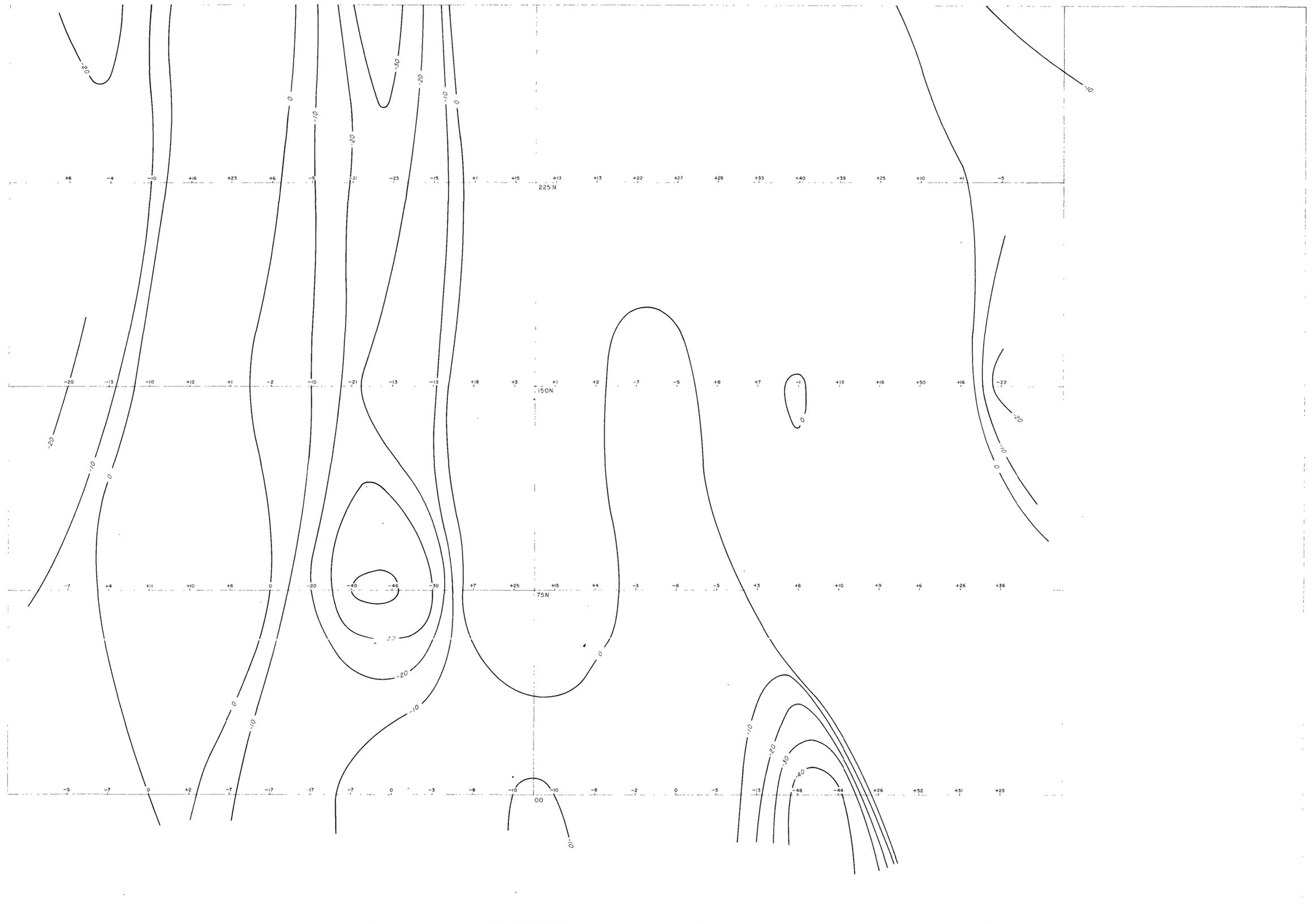
5 cm

TEXINS INSTRUMENTS GROUP
 GEOPHOTO RESOURCES CONSULTANTS
 BRISBANE AUSTRALIA



TEXINS DEVELOPMENT PTY LTD
 E.L. 6/68 NORTH EAST TASMANIA
MATHINNA AREA 1987
JUBILEE-MOUNTAINEER MINE GRID
V.L.F. FIRST DERIVATIVE CONTOURS

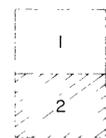
PROJECT	E.L. 6/68	AUTHOR	P. Mac Namara	DATE	Nov 1972	DWG. NO.	1/175
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708018

72-923

SHEET INDEX



LEGEND

+22 First derivative value

Scale 1:750



5 cm

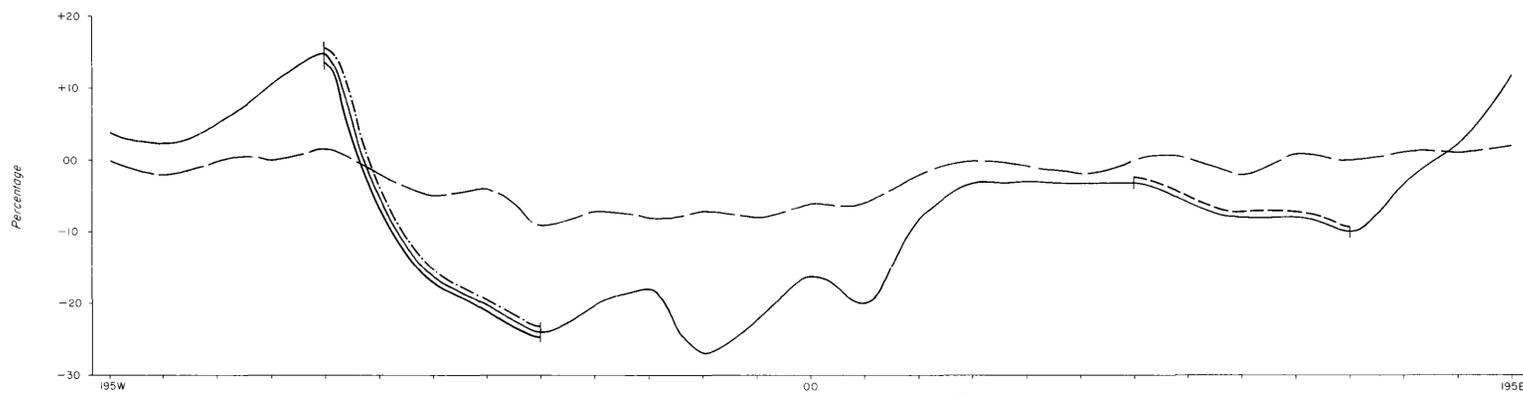
GEOPHYSICAL RESOURCES CONSULTANTS



EL 6/68 NORTH EAST TASMANIA

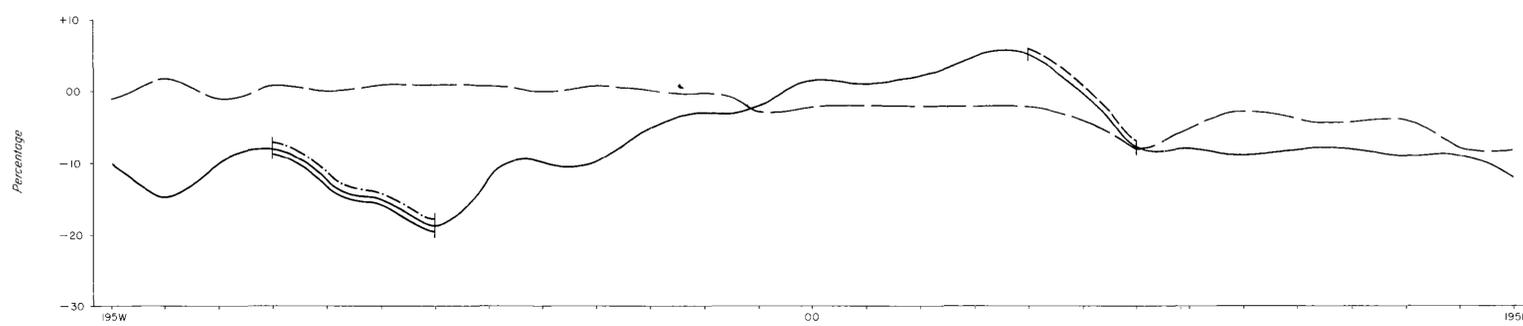
MATHINNA AREA 1988

JUBILEE - MOUNTAINEER MINE GRID
V.L.F. FIRST DERIVATIVE CONTOURS



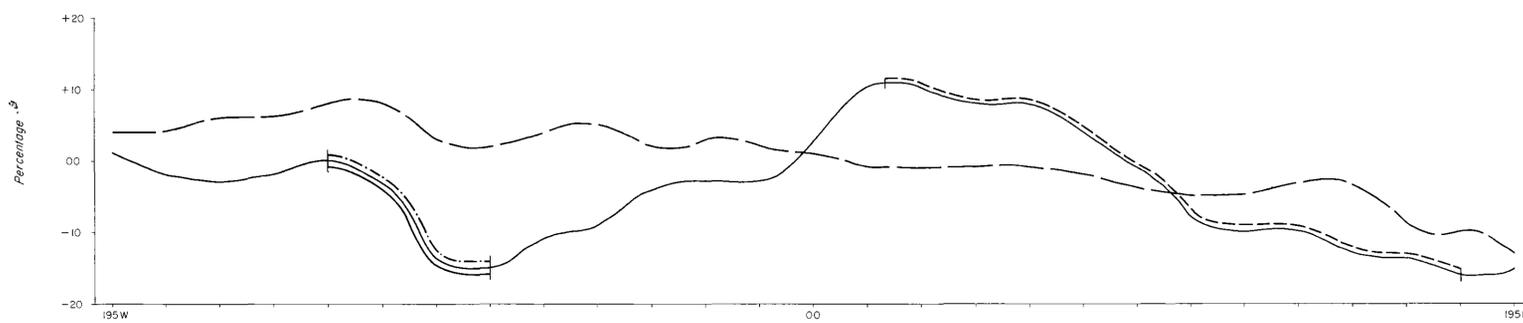
LINE 675N

Distance



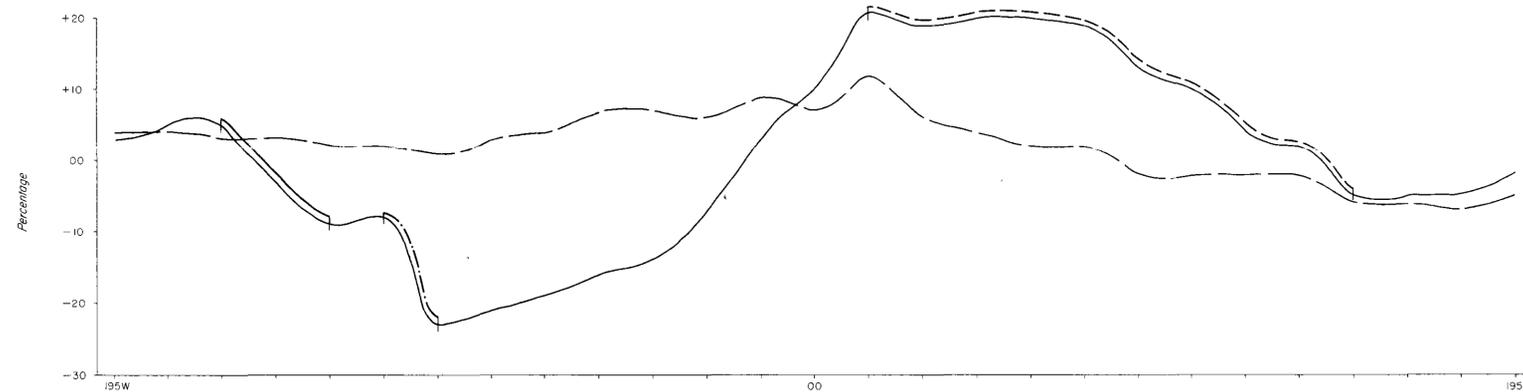
LINE 600N

Distance



LINE 525N

Distance



LINE 450N

Distance

LEGEND

- Anomaly 1
- - - Anomaly 2
- Anomaly 3
- Anomaly 4

Scale
Horizontal: 1:1000
Vertical: 2cm = 10%

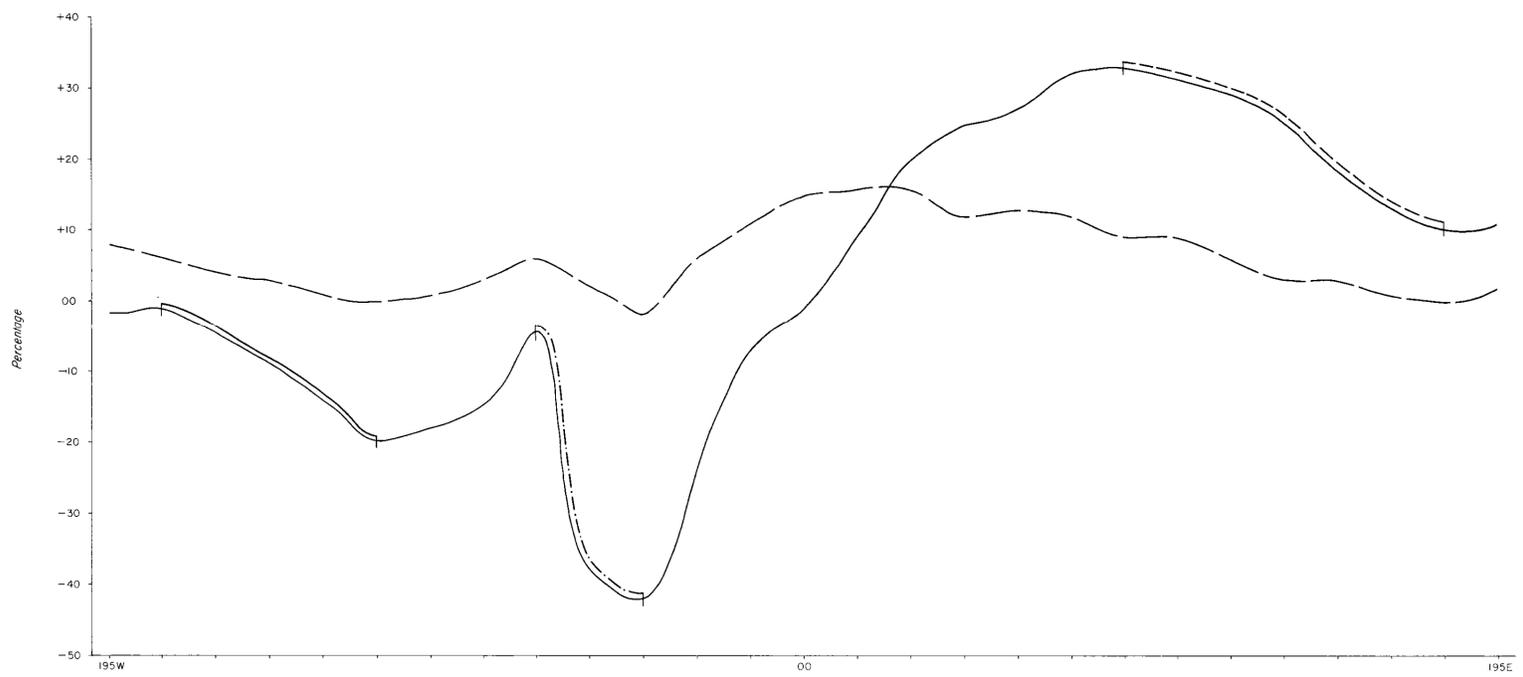
5cm

72-923

GEOPHOTO RESOURCES CONSULTANTS

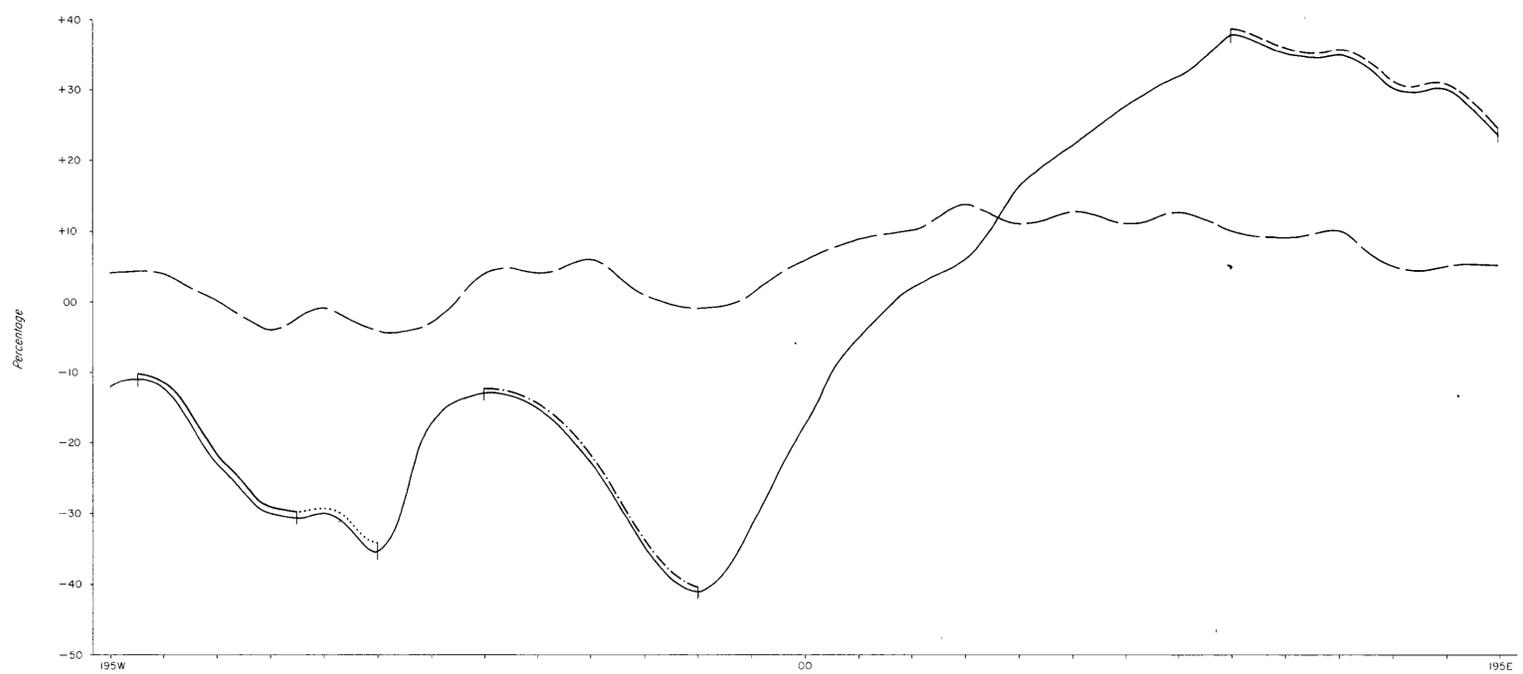


TEXINS DEVELOPMENT PTY LTD
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MATHINNA AREA
JUBILEE-MOUNTAINEER MINE GRID
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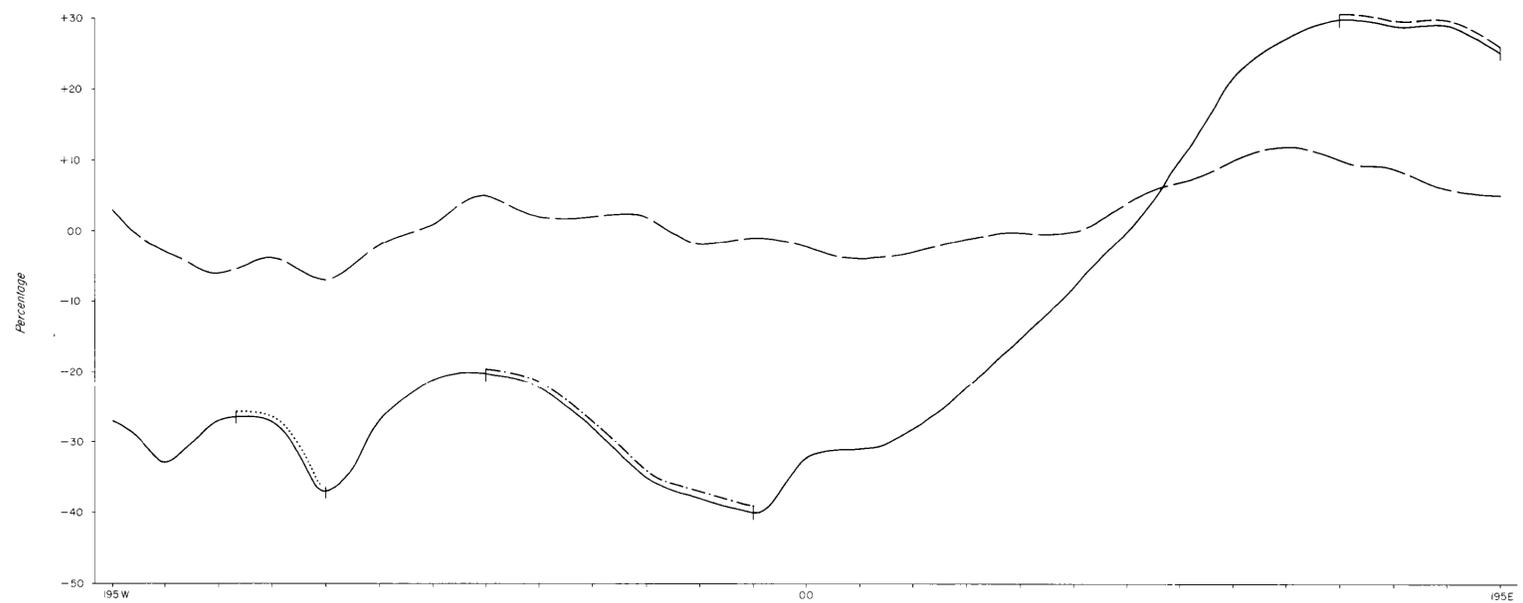
LINE 375N

Distance



LINE 300N

Distance



LINE 225N

Distance

LEGEND

- Anomaly 1
- - - Anomaly 2
- Anomaly 3
- Anomaly 4

70800.0

Scale
Horizontal: 1:1000
Vertical: 2cm = 10%

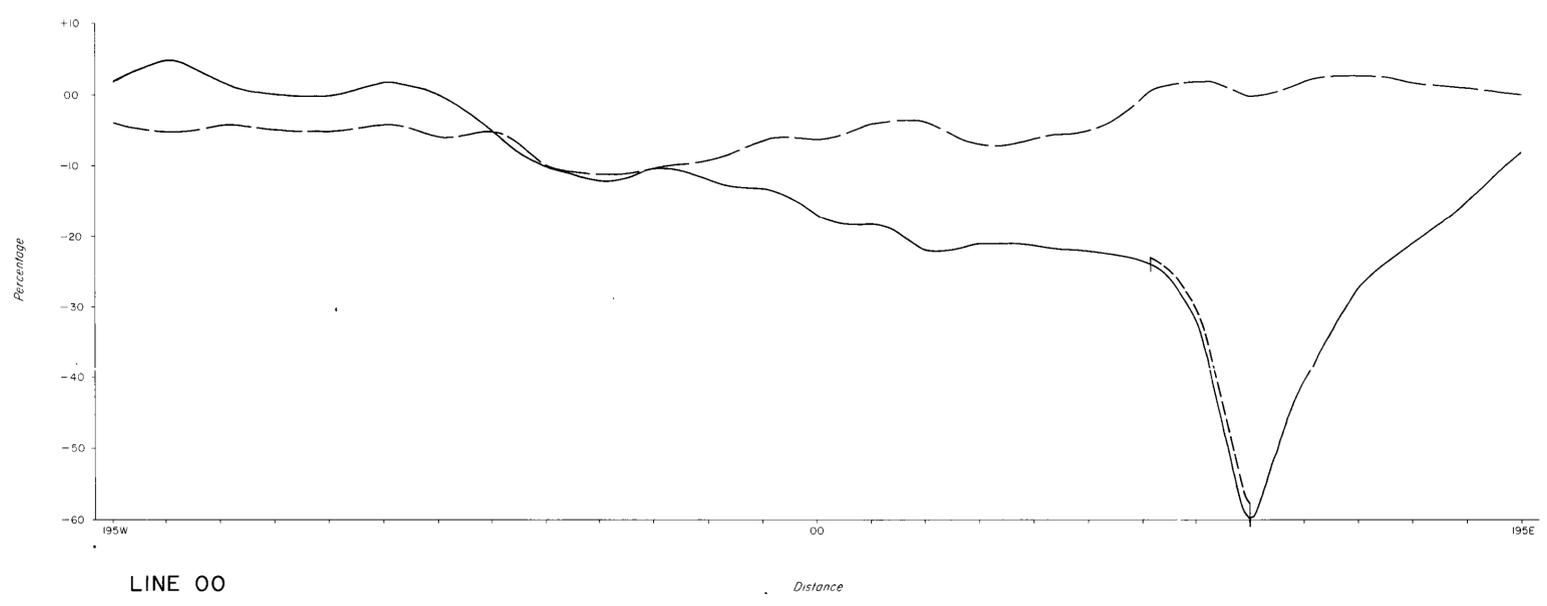
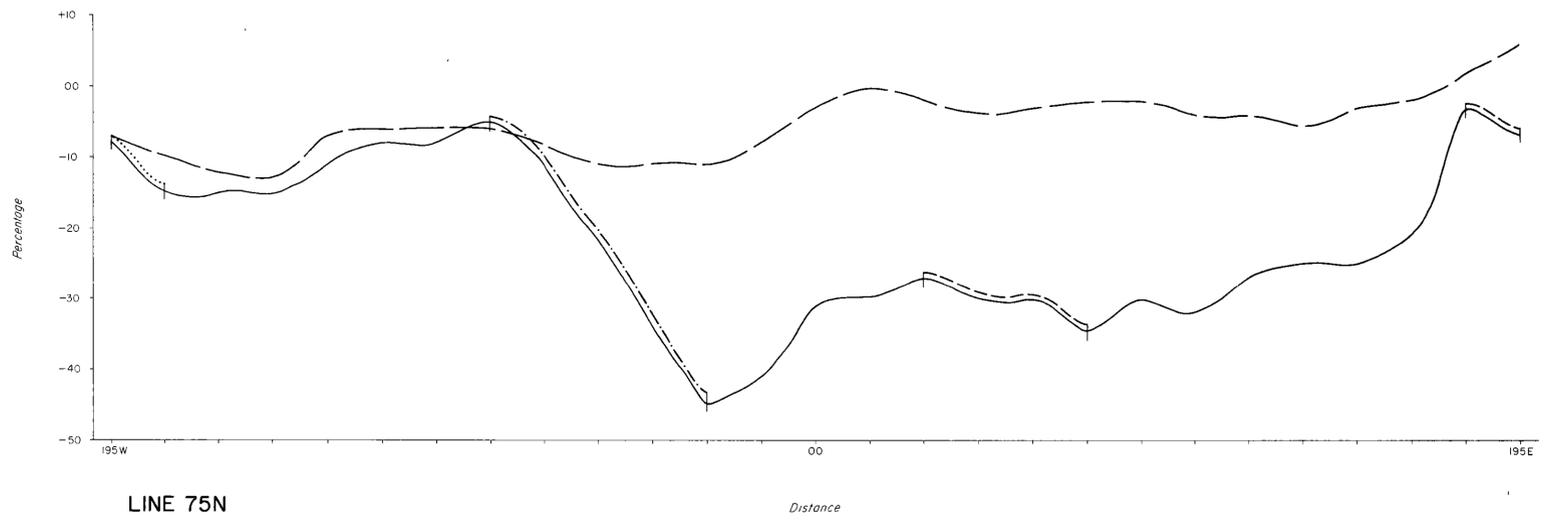
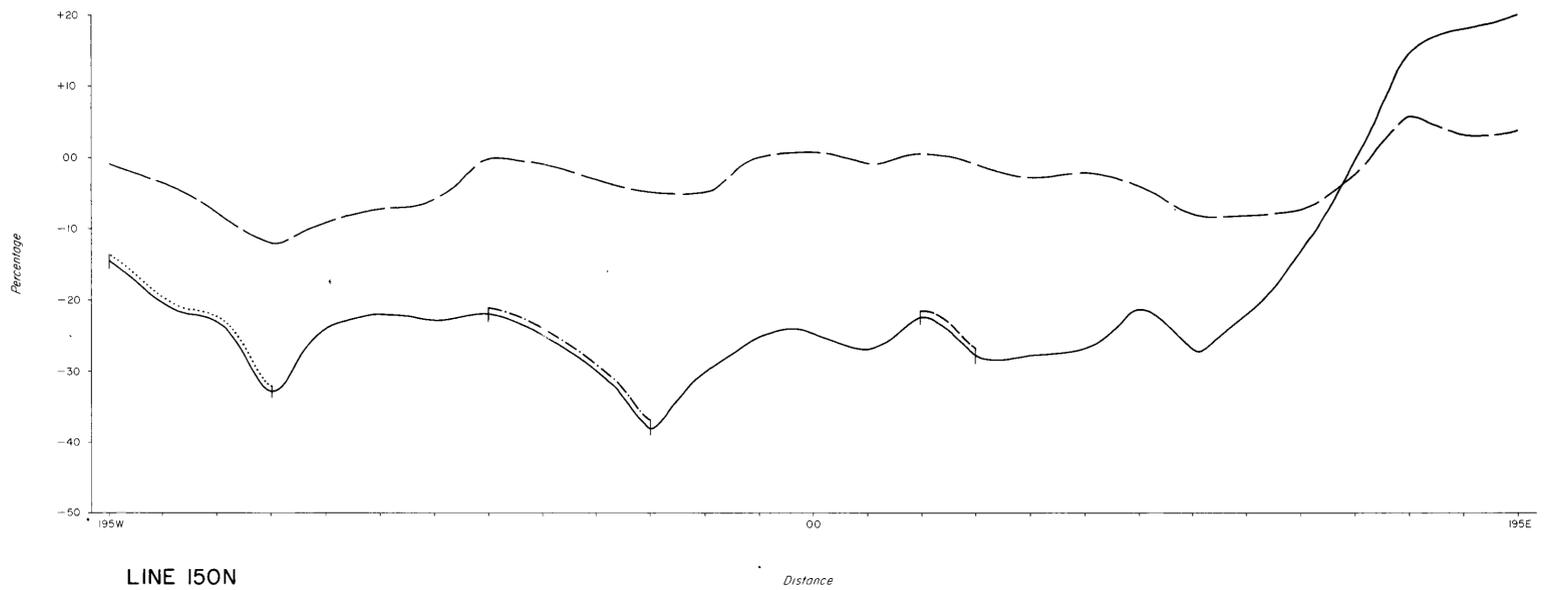


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- LEGEND
- Anomaly 1
 - Anomaly 2
 - Anomaly 3
 - .-.- Anomaly 4

708051

Scale
Horizontal: 1:1000
Vertical: 2cm = 10%

5 cm

72-923

708051

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708051 E.L. 6/68 AUSTRIAN P. Mac Namara DA November 1972 PAGE No. 1/174