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Geopako Ltd.

KING ISLAND

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Report No. KI/81/4

81-1628 (ORIGINAL)

PROGRESS REPORT ON EXPLORATION LICENCE 15/66

FOR THE SIX MONTHS ENDED 24TH OCTOBER 1981

by

S. Grieve Brown

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King Island Project Photogeological Fracture Analysis	Scale 1.40 000

INTRODUCTION

Exploration Licence 15/66 is held by Warman Services Limited and covers an area of 123 square kilometers in south east King Island. This Licence is contiguous with EL 21/78 and covers the onshore portions of the Grassy Granite Contact Zone and the Bold Head Adamellite Contact Zone.

Enclused within the area of 123 square kilometers is the majority of Mineral Lease 17M/79 which covers an area of 22.98 square kilometers including Bold Head and Dolphin Mine areas. Only work carried out on Mineral Lease 17M/79 for exploration purposes has been costed against EL 15/66. This excludes normal oreblocking diamond drilling in the mines but includes any holes drilled to test for major extensions to the mine series sequence.

EL's 15/66 and 21/78 are contiguous and it is now thought that, in the Dolphin area, the mine series rocks extend continuously from EL 15/66 into EL 21/78. It therefore becomes difficult to separate work programmes and expenditure. For this reason in some cases the expenditure is split between the two licences as work carried out close to the boundary will have relevance to further work programmes in both EL's.

Over the total period of the licence considerable work has been carried out on both the onshore portion of the Grassy Granite Contact and the Bold Head Adamellite Contact. This work consisted of geological mapping, geophysics, geochemistry and auger, percussion and diamond drilling.

During this work it was shown that, although suitable host rocks (mine series) occur over a large proportion of the Grassy Granite Contact, and to the south and east of the Bold Head Adamellite, only six areas of minor scheelite mineralisation have been located outside of the Bold Head and Dolphin/No. 1 orebody areas. The majority of this work is reported in detail in Report No. KI/75/3 (Brown 1975). Until mid 1980 the only major additional work carried out was follow up diamond drilling on the areas of scheelite mineralisation and stratigraphic drill holes designed to test for the presence of mine series rocks underlying the volcanics in the north central portion of the Grassy Granite Contact.

In early 1980 the decision was taken to carry out a new airborne magnetic survey over both EL 15/66 and EL 21/78.

Although it is not possible to distinguish mine series rocks by their magnetic character, it is a fact, that at both the Bold Head and Grassy Granite Contacts the mine series rocks are overlain by volcanics which do produce magnetic anomalies.

Both the Bold Head Orebody and the Dolphin/No. 1 Orebody exist in mine series rocks overlain by volcanics adjacent to the contacts of a Devonian Carboniferous Granite body and in close proximity to a major fault zone, the Grassy River Fault.

The previous 1973 aeromagnetic survey was considered to be lacking in detail and it was felt that a new survey using modern equipment would, not only give better detail, but could also be much more closely controlled as to positioning of the aircraft. The results of this survey led to a reassessment of the potential of both EL 15/66 and EL 21/78 and to the initiation of further work programmes on these Exploration Licences.

During the past six months the work carried out on EL 15/66 consisted of:

- Reduction of the results of the August 1980 aeromagnetic survey and preparation of computer produced contour plots.
- Examination of the analogue records of the radiometrics.
- The examination of the 1976 Photogeological Fracture Analysis.
- The examination of some of the diamond drill cores from both the Bold Head and Grassy Granite Contacts with subsequent reinterpretation of the geological structures in some areas.
- Commencement of a magnetic susceptibility study of diamond drill cores.
- Commencement of the establishment of a 30 line kilometre ground gravity survey grid south of Bold Head.

Neither recommendations nor conclusions are given in this report as assessment and interpretation of the results of the airborne survey are still being carried out.

SUMMARY

The work carried out during the past six months consisted of:

- Reduction of the results of the aeromagnetic survey and production of 25 000 scale computer produced contour plots. These plots showed major variations from the less well controlled 1973 survey as well as much greater detail. The main difference appears to be due to the much better positional control of the aircraft due to the use of range/range equipment rather than photo point recognition.
- Examination of the analogue records of the radiometrics. These were uniformly low and it was decided not to process ~~esa~~ this data to produce contour plots as no additional useful information would be likely to be obtained.
- The examination of the 1976 Photogeological Fracture Analysis. Some of the more minor structures apparent on this analysis appear to conform to fault and lineation directions inferred from the airborne magnetic survey.
- Commencement of a magnetic susceptibility study of diamond drill cores from all rock type around both granite contacts. To date this is about 20% complete. The results of this study will allow a better interpretation of the airborne magnetic survey results to be made.
- Reexamination of some of the diamond drill cores from both granite contact areas. This confirmed the overall interpretation of the structure of the Grassy Granite area but helped to delineate the major fault which forms the southern limit of the Bold Head Mine area.
- Commencement of the establishment of a 30 line kilometre gravity survey grid south of Bold Head.

Work is slowly building up as encouraging results have been obtained from a number of the above studies. Considerable effort will be put into this area during the next six months both in the Southern Orebody area of Dolphin Mine, and at Bold Head to try to locate a target for a stratigraphic drill hole.

WORK CARRIED OUT APRIL TO OCTOBER 1981

Reduction of the results of aeromagnetic survey carried out in August 1980 and production of 1:25 000 scale contour plots was completed.

Comparison of these results with the results of the 1973 survey showed that, not only was the 1973 survey lacking in detail, but there was considerable misplacement of some of the major magnetic features due to the low standards of control employed in the earlier survey. Variations of up to 500 metres were noted in some cases.

The greater detail available highlighted two major features in the Bold Head area:

- a. A series of magnetic highs and lows trending north east/south west within the area covered by Upper Volcanics rocks. This trend is parallel to the strike of the thin, probably sedimentary, bands which are mapped within the volcanic pile at Bold Head Point. This trend is therefore thought to reflect internal variation within the volcanic pile and possibly the presence of interbedded sediments with low magnetic character.
- b. An abrupt east - west termination to the above mentioned trend within the magnetics. This is currently interpreted as a major fault with a down throw to the south. Study of the results of the diamond drill holes located at the southern end of Bold Head Mine provides corroborating evidence and suggests that the throw must be in excess of 300 metres.

In the Dolphin area the location of the Grassy River Fault has been shown to be coincident with the fault located in diamond drill hole D360/12 and therefore occurs about 450 metres further west than was interpreted from the older survey results. Even with the results of the new airborne survey it is still not possible to say if the Grassy Granite extends east as far as the Grassy River Fault or if a window of mine series/volcanics exists between them. This possibility is currently being tested by drilling in the Southern Orebody area of Dolphin Mine.

Examination of the 1976 Photogeological Fracture Analysis results showed secondary linears parallel to the inferred strike of the volcanics south and east of Bold Head Mine. In addition one east/west linear is parallel and possibly coincident with the major east/west fault now considered to exist at the southern end of Bold Head mine. This photolinar has its surface expression in a small gully located just south of Grahams Road.

This location for such a major fault is confirmed by the diamond drill results which suggest that such a major fault would be located between 10200N and 10250N B.H.M.G. Such a fault would have a throw in excess of 300 metres south side down. From the results of the diamond drilling it would appear that the major movement on this fault predates the granite intrusion since there is no major displacement of this contact on either side of the fault.

Since the mine series rocks are down thrown south of this major fault then, should the granite contact have a suitable shape, there are two possibilities for the occurrence of suitable structures for locating mineralisation and the formation of orebodies. These are shown in schematic long section B-B'.

The first and most likely case (X) is that in which there is a major down warp in the granite contact such that the mine series rocks again occur overlying a shelf in the granite contact. This would be a similar situation to that occurring at Bold Head Mine.

The second case is that of an upfaulted block of mine series associated with a granite high. While possible, this is considered unlikely to occur.

In either case the first priority will be to obtain additional data on the location of the granite contact at depth. To this end a ground gravity survey will be carried out over a wide spaced grid covering some 30 line kilometres, and located from Bold Head Mine south to the coast.

Should this survey delineate any abrupt change in shape of the granite contact and, if after considering all the available data, it is thought that there is a potential for mine series to again exist in contact with the granite at this point a stratigraphic hole will be diamond drilled to test the zone of interest.

The study of the magnetic susceptibility of the rocks present in the cores of exploration holes drilled around the Grassy and Bold Head Granite contacts is currently in progress. This study is designed to provide sufficient data on the magnetic character of the major rock types, and variations within these, to enable a more detailed interpretation of the 1980 airborne data to be made. When this magnetic susceptibility data is available a set of theoretical sections will be produced across the granite contacts and these will be correlated with the known geology. From this a better overall interpretation should be derived for the areas with a low density of diamond drill holes and hopefully further diamond drill targets will be suggested.

Examination of the analogue records of the radiometric survey carried out in conjunction with the airborne magnetic survey showed little character and it was decided that the production of contour plots of this data would not be necessary.

In the area south of Dolphin Mine exploration diamond drilling commenced on the Southern Orebody. One hole D160/22 located the Dolphin C Lens sequence at about 563 750N at -300 metres R.L. This intersection is 100 metres south of the most southerly mine openings and must be regarded as an encouraging indication for additional potential south of this area in EL 21/78. The exploration philosophy currently being used as a basis for exploration in this area was detailed in Report No. KI/81/1. An Interim Progress Report on Exploration Licence 21/78 - (Brown S. G., February 1981).

FUTURE WORK PROGRAMME

During the next six months the following work programme is planned:

1. Completion of the core susceptibility study. This is designed to obtain an understanding of the magnetic character of the various rock types as an aid to interpretation of the aeromagnetic survey results.
2. Carry out a ground gravity survey over the area south from Bold Head to the Coast to determine the subsurface geometry of the granite contact.
3. Reassessment of the Investigator 1 area east of the fault block containing Bold Head Mine.
4. Reexamination and reassessment of the Grassy Granite Contact in the light of 1 above.
5. Diamond drill one stratigraphic hole to test any areas of suitable structure outlined by 2 above.
6. Diamond drill 3 surface holes 250 m south of current limit of Dolphin mine to test for possible mine series.

EXPENDITURE ON EL 15/66

Six months to 24th October 1981.

Interpretation of results of Airborne survey	\$3414
Susceptibility study of diamond drill cores	1866
50% of cost of exploration drill hole D160/22	<u>4205</u>
Total expenditure for six months	<u>\$9485</u>

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Naracoopa

E.L. BOUNDARY 15/66

E.L. 15/66

Bold Head Mine

GRASSY

Bold Head

INV. 21

Open Cut and Dolphin Mine

Grassy Port

AREA OF PRIMARY POTENTIAL

STRAIT

E.L. 21/78 OFFSHORE

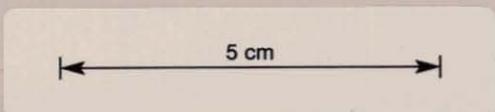
BASS

Seal Point

KING ISLAND

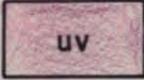
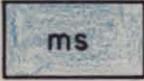
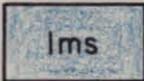
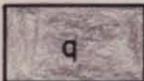
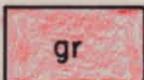
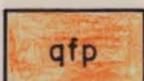
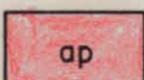
EXPLORATION LICENCES 15/66 and 21/78

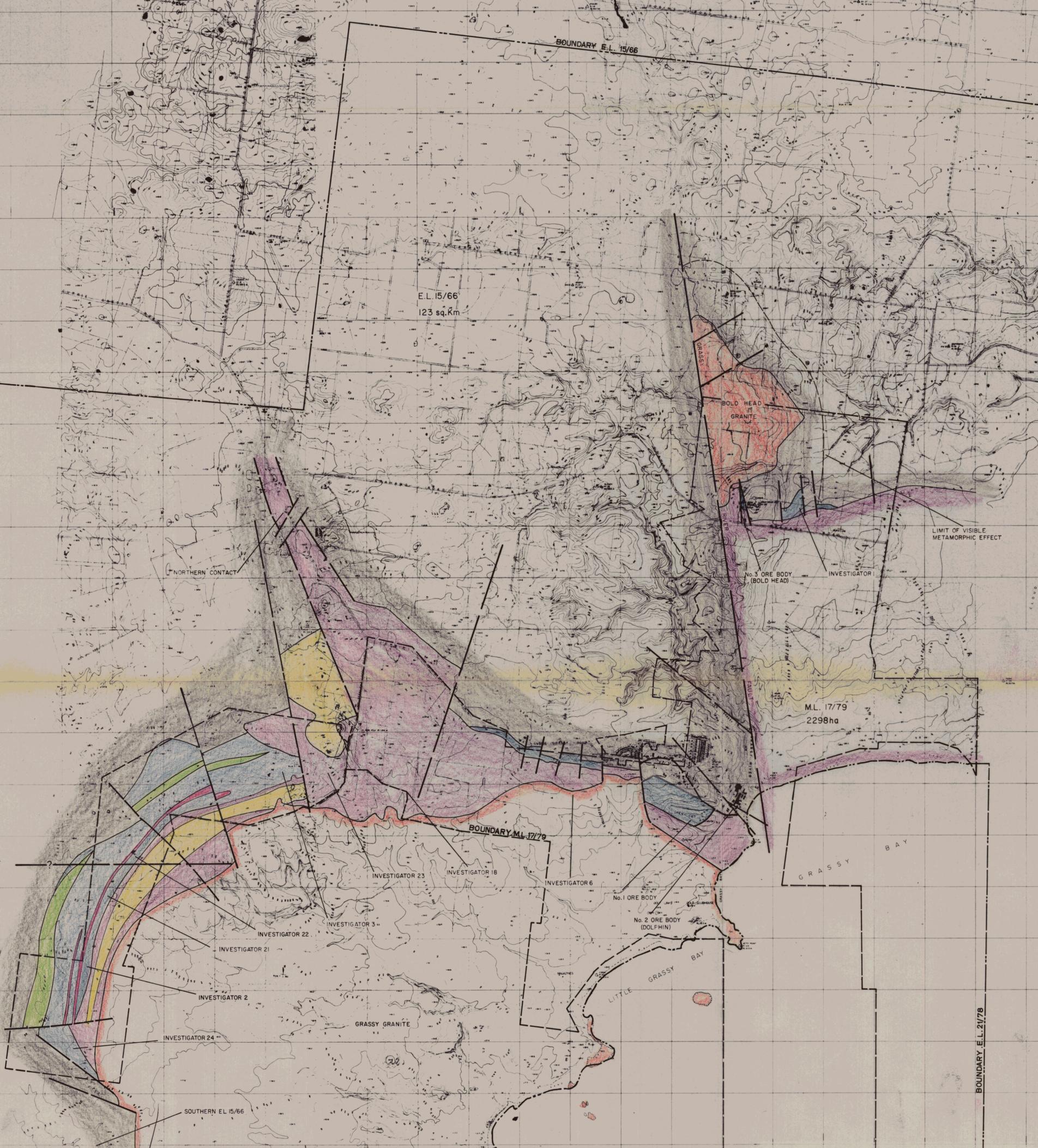
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GRASSY GRANITE AREA

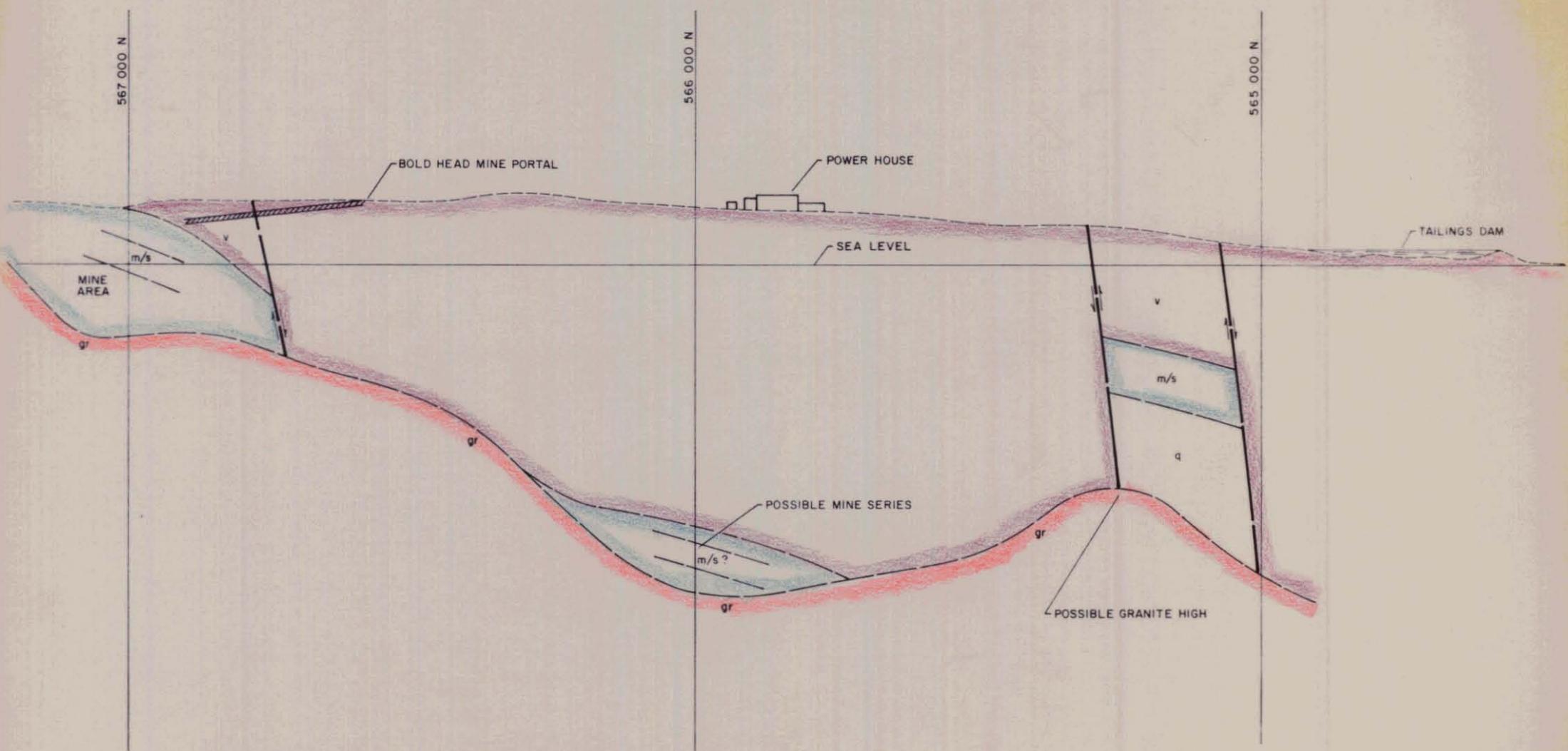
-GEOLOGICAL LEGEND-

	Upper pelitic sediments
	Upper volcanics
	Upper mine series
	Middle volcanics
	Lower mine series
	Quartzites and siltstones
	Grassy granite
	Quartz feldspar porphyry
	Aplite
	Geological boundary
	Fault
	Limit of metamorphic effect (Bold Head granite)

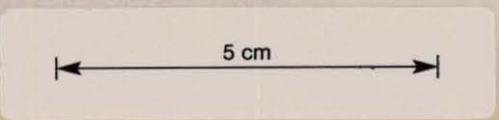


	GEOPEKO LIMITED KING ISLAND GROUP	
		No. K
	921013	
	REGIONAL GEOLOGICAL MAP SHOWING LOCATION OF PROSPECTS	

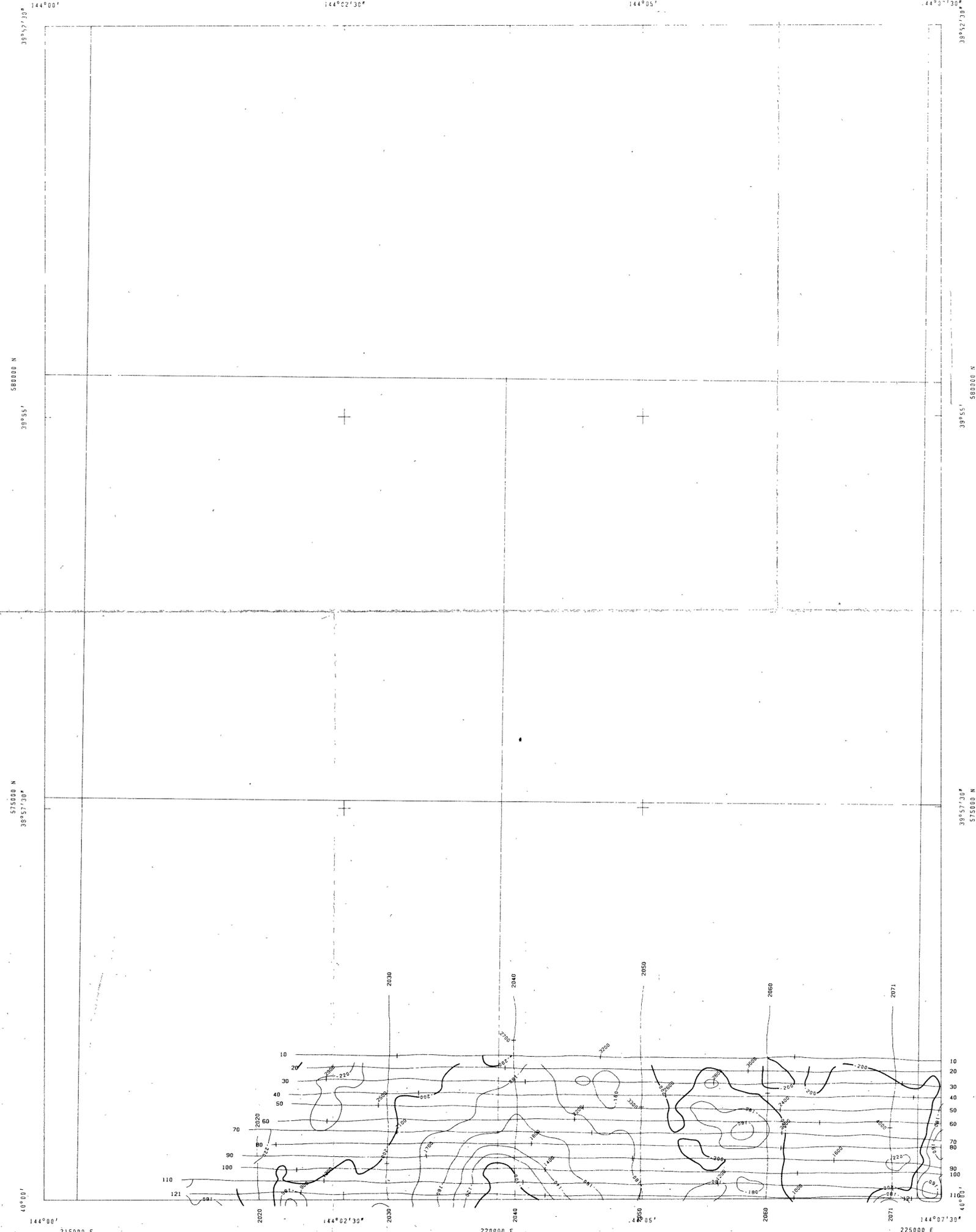
5 cm



BOLD HEAD AREA SCHEMATIC SECTION
 SHOWING POSSIBLE SITUATIONS WITH ORE POTENTIAL
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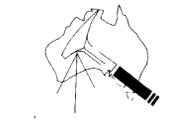


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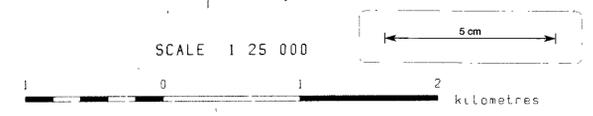


KING ISLAND SPECIAL NARACOOPA 7718-III-SW

GEOPEKO



SCALE 1 25 000



LOCATION INDEX

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7618 -II-SE	7718 -III-SW	7718 -III-SE
7617 -I-NE	7717 -IV-NW	7717 -IV-NE



INTEGRATED SURVEY GRID
ZONE 55/1

GRASSY

AIRBORNE GEOPHYSICAL SURVEY

Total Magnetic Intensity

FLIGHT DATA

- Nominal traverse line separation: 150m
- Nominal tieline separation: 1.5km
- Nominal data spacing along flight lines: 70m
- Nominal terrain clearance: 50m onshore - 15 m offshore
- Navigation and recovery using Motorola Mini-Ranger MRS-3
- Aircraft: Austirex Nomad N 22 B
- Magnetometer Type: Varian V-85 in stinger

Survey Date: August 1980

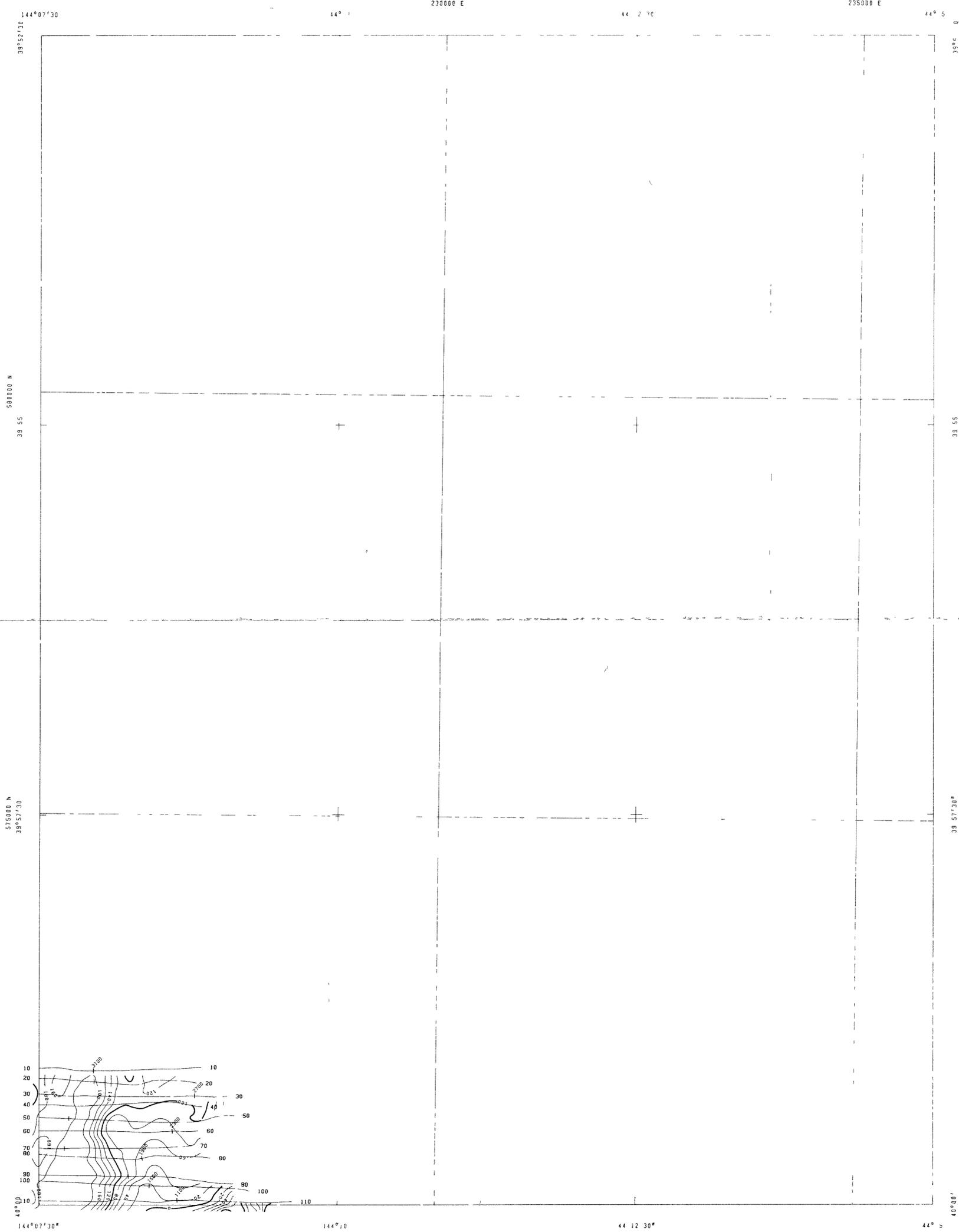
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- IGRF subtracted prior to contouring

Survey data flown and compiled by Austirex International Ltd
Project management by Geopeko geophysical group

DRAWING NO: 5893 S/B

921015



KING ISLAND SPECIAL NARACOOPA 7718-111-SE

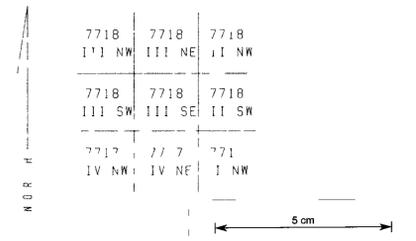
GEOPEKO



SCALE 1:25 000



LOCATION INDEX



INTEGRATED SURVEY GRID
ZONE 55/1

GRASSY

AIRBORNE GEOPHYSICAL SURVEY

Total Magnetic Intensity

FLIGHT DATA

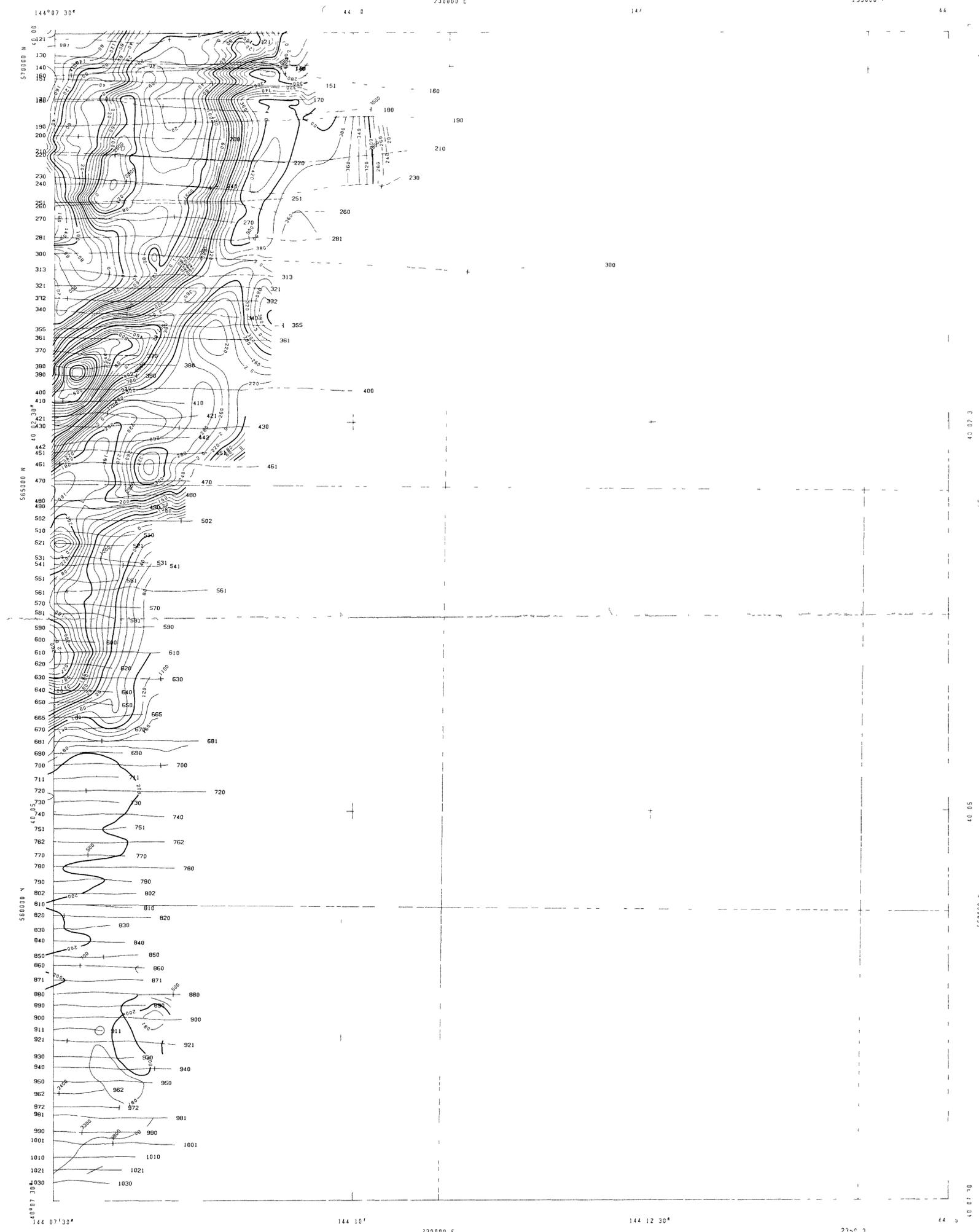
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- Nominal terrain clearance 50m onshore - 15 m offshore
- Navigation and recovery using Motorola Mini-Ranger MRS-3
- Aircraft Austrex Nomad N 22 B
- Magnetometer Type Varian V-85 in stinger

Survey Date August 1980

MAP DATA

- Contour Interval 20nT
- IGRF subtracted prior to contouring

Survey data flown and compiled by Austrex International Ltd
Project management by Geopeko geophysical group



KING ISLAND SPECIAL GRASSY 7717-IV-NE

GEOPEKO



SCALE 1:25 000



LOCATION INDEX

	7718	7718	7718
I	I SW	I SE	I SW
	7717	7717	7717
IV	IV NW	IV NE	IV NW
NORTH	7717	7717	7717
	I SW	I SE	I SW

INTEGRATED SURVEY GRID
ZONE 55/1

GRASSY

AIRBORNE GEOPHYSICAL SURVEY

Total Magnetic Intensity

FLIGHT DATA

Nominal traverse line separation 150m
 Nominal tie-line separation 1.5km
 Nominal data spacing along flight lines 70m
 Nominal terrain clearance 50m onshore - 15 m offshore
 Navigation and recovery using Motorola Mini-Ranger MRS-3
 Aircraft Austrex Nomad N 22 B
 Magnetometer Type Varian V-85 in stinger

Survey Date August 1980

MAP DATA

Contour Interval 20nT
 IGRF subtracted prior to contouring

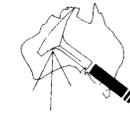
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 Project management by Geopeko geophysical group

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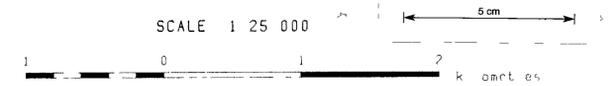
921017

KING ISLAND SPECIAL PEAR SHAPE 7617-1-NE

GEOPEKO



SCALE 1:25 000



LOCATION INDEX

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7617 I NW	7617 I NE	7717 IV NW
7617 I SW	7617 I SE	7717 IV SW

NORTH ↑

INTEGRATED SURVEY GRID
ZONE 55/1

GRASSY

AIRBORNE GEOPHYSICAL SURVEY

Total Magnetic Intensity

FLIGHT DATA

Nominal traverse line separation 150m
 Nominal tie-line separation 1.5km
 Nominal data spacing along flight lines 70m
 Nominal terrain clearance 50m onshore - 15 m offshore
 Navigation and recovery using Motorola Mini-Ranger MRS-3
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Survey Date August 1980

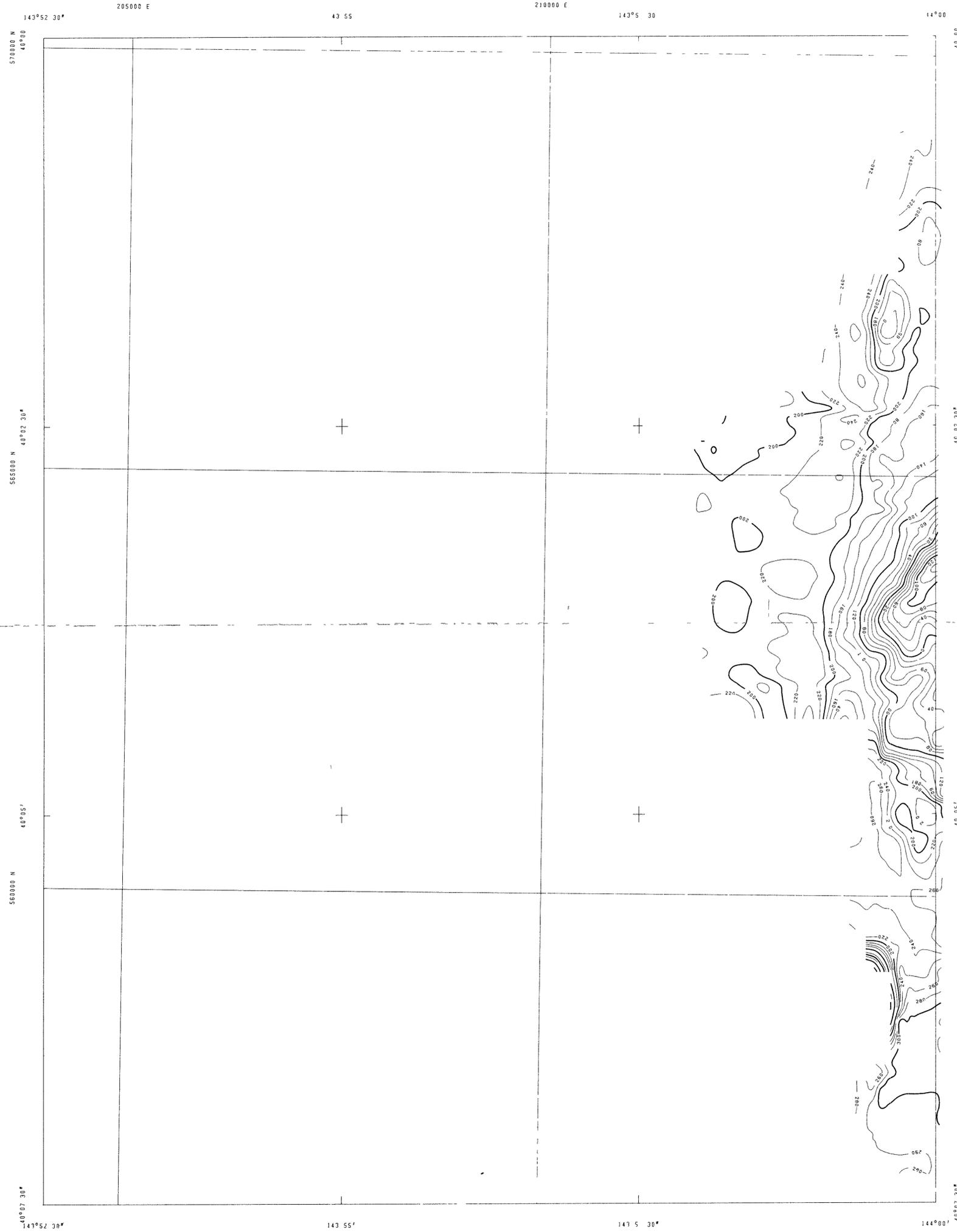
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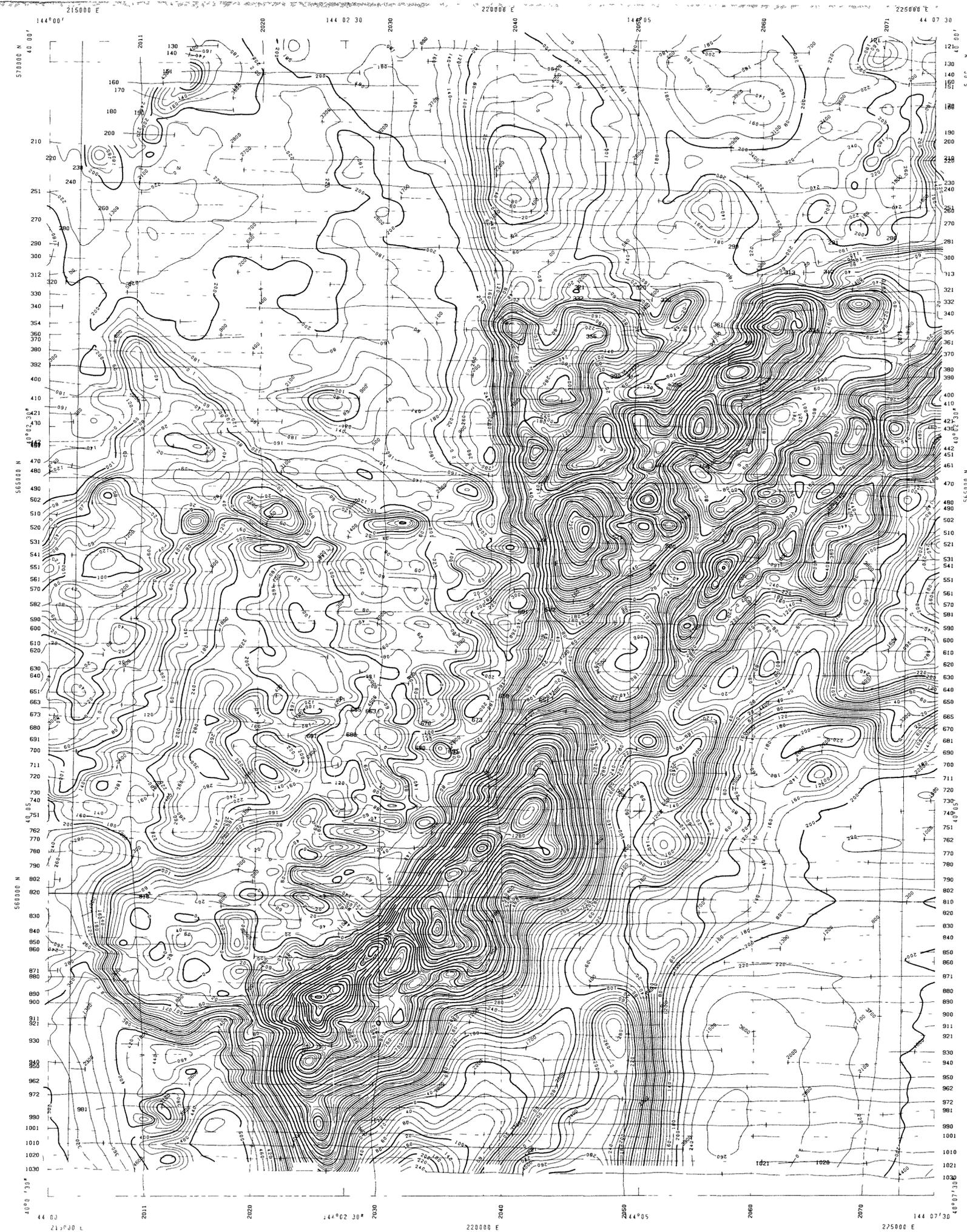
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Survey data flown and compiled by Austrex International Ltd
 Project management by Geopeko geophysical group

DRAWING NO 5 897 S/B

921018





KING ISLAND SPECIAL GRASSY 7717-IV-NW

GEOPEKO



SCALE 1 25 000



LOCATION INDEX

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7617 1 NE	7717 1V NW	7717 1V NE
7617 1 SE	7717 1V SW	7717 1V SE

INTEGRATED SURVEY GRID
ZONE 55/1

GRASSY

AIRBORNE GEOPHYSICAL SURVEY

Total Magnetic Intensity

FLIGHT DATA

Nominal traverse line separation 150m
 Nominal tie line separation 1 5km
 Nominal data spacing along flight lines 70m
 Nominal terrain clearance 50m onshore - 15 m offshore
 Navigation and recovery using Motorola Mini-Ranger MRS-3
 Aircraft Austrex Nomad N 22 B
 Magnetometer Type Varian V-85 in stinger

Survey Date August 1980

MAP DATA

Contour Interval 20nT
 IGRF subtracted prior to contouring

Survey data flown and compiled by Austrex International Ltd
 Project management by Geopeko geophysical group



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 KING ISLAND PROJECT - PHOTOGEOLOGICAL FRACTURE ANALYSIS

SCALE 1:40000



REFERENCE

- DEVONIAN Da Bold Head and Grassy Adamellite
- LOWER-MIDDLE CAMBRIAN Volcanics and lavas with interbedded hornfelsed sediments. "Mine Series" (near orebodies and in the SW) - contact hornfels
- LOWER CAMBRIAN - UPPER PROTEROZOIC Sandstone, siltstone, quartzite

SYMBOLS

- Geological boundary
- Geological boundary, inferred
- Fault
- Possible fault
- Other lineament (jointing, fracturing)
- Possible dyke (basic)
- Road
- Fence
- Township
- Photo centre point, run & photo number
- Beach
- Creek