708001

GEOPEKO - KING ISLAND

REPORT NO. K1/82/2

ANNUAL REPORT, EL 15/66, TWELVE MONTHS TO 24TH OCTOBER 1982

S.G. BROWN

King Island

August, 1982

708002

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INTRODUCTION

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

Mineral Lease 17M/79, with an area of 22.98 square kilometres and covering the Dolphin and Bold Head Mine areas, is to a large extent included within the boundaries of EL 15/66. Work carried out on ML 17M/79 for primary exploration purposes has been costed against EL 15/66. The work so classified excludes normal oreblocking diamond drilling in the mines but includes any holes drilled to test for major extensions to the mine series sequence.

Due to the fact that Exploration Licences 15/66 and 21/78 are contiguous, and that in the area of Dolphin Mine the mine series extends continuously from one licence to the other, in some cases expenditure has been split between the two licences. Work carried out close to the boundary will have relevance to further work programmes in both EL's.

The purpose of this report is to compile and record all exploration work carried out within the licence area since the last report in October, 1981. The report will not cover a full 12 months due to Mines Department requirements for reports to be submitted one month in advance of mineral data. Since the last report (Brown, October 1981) the following exploration work has been carried out.

- Transfer of all regional geological and geophysical data to the base scale of 1:10,000.
- Establishment of a major grid from the area of Bold Head Mine to the coast. A total of 26 line kilometres of gridding was required.
- Completion of the initial ground Gravity and V.L.F. surveys over the area from Bold Head to the coast.
- Completion of a core susceptibility study carried out to define the magnetic character of the various rock types in the area.
- Processing and assessment of the results of the Gravity and V.L.F. surveys and reassessment of previously available geophysical data in the light of the results of this study.
- Reassessment of the geological structures present in the Bold Head and Dolphin Mine areas.
- Four diamond drill holes were completed from the southern limits of Bold Head Mine for structural data.

In addition, one surface diamond drill hole was completed in the Southern Orebody area of Dolphin Mine for structural information.

SUMMARY

1. The results of the exploration carried out over the past twelve months have been encouraging in both the search for additional orebodies and in the overall understanding of the geology of the licence.

2. Compilation of all data onto 1:10,000 scale plans has allowed an overall view of the situation to be obtained and, with the results of the new geophysical data being presented at the same scale, the relationships between the various geophysical and geological results can be more easily assessed.

3. The diamond drilling carried out at the southern limits of Bold Head Mine has delineated a major east-west fault, the Grahams Road Fault. Drilling to the west has indicated that the Bold Head granite contact is further west than previously interpreted and that this contact may be fault controlled.

4. The results of the V.L.F. survey were discouraging in that a number of suspected and known faults were not detected. It is considered probable that the poor results were due mainly to the orientation of the grid which was primarily designed for the Gravity Survey.

5. The Gravity Survey results were encouraging with a number of anomalous areas being located. A number of these anomalies correlate with some of the highs and lows recorded by the airborne magnetic survey. The combination of results recorded in the area 566500N 220500E tends to suggest the possibility of a ridge of granite occurring at a relatively shallow depth. The presence of such a ridge would considerably enhance the potential of the area south of the Grahams Road Fault, both the east and west of the ridge.

6. The core susceptibility study was completed and the results showed that it is possible to discriminate between the various rock units based on their susceptibility. The results of this study will be used in assessing the currently available aeromagnetic data and the results of the proposed ground magnetic survey.

7. The diamond drill hole completed south of Dolphin Mine confirmed the continuity of the mines series to the south but intersected granite at a higher level than expected. This work has implications on the interpretation of the overall structure in the Dolphin area.

WORK CARRIED OUT, OCTOBER 1981 TO OCTOBER, 1982

Due to the necessity to submit this report at least one month in advance of the renewal date of October 1982, the last month of the 12 month period is not included. Work prior to October, 1981 has been reported previously (Brown, 1981).

A Gridding

A large, 26 line kilometres, grid was established over the area from Bold Head to the coast. The grid was established on the Integrated Survey Grid System and consisted of eight north-south lines, 250 metres apart. Pegs were placed every 100m and levelled to an accuracy of greater than 0.1 metres.

B Geophysics

An in-house report on the geophysical surveys carried out over the past year was prepared by John Sumpton (July, 1982). The results obtained from this work are quoted here but details of the methods and equipment are not included.

Susceptibility Study

The susceptibility study of diamond drill cores obtained from exploration holes located around the Grassy and Bold Head granites was completed. The results obtained are shown on the attached histograms. It is apparent from these results that the magnetic susceptibilities of each of the rock types are sufficiently distinct to allow use of this data in interpreting the causes of anomalies recorded on the airborne magnetic survey.

Very Low-Frequency Survey

This survey carried out over the initial north-south survey grid did not produce encouraging results. The survey was designed to pick up the major shear zones which are known in the area, as well as to test for the presence of faults inferred from the geological data.

The Progress Report on Geophysics by John Sumpton (July, 1981) states: "The data obtained was generally noisy, but there is a conductor usually coincident with and clearly related to the contact between the volcanics or mine series rocks and the overlying quartzites. This, however, is not the case for the response on line 220000E, 567325N, though this may relate to the Grassy River Fault or granite contact. The strong response on line 219750E is most likely cultural."

Unfortunately a number of known and inferred faults, including the Grahams Road Fault, were not detected. It is considered that this is in part attributable to the orientation of the structures (strike approximately 270°), compared to that of the North-West Cape transmitter (being 303°).

Gravity

A total of 260 stations were occupied during the survey. Stations were levelled to an accuracy of better than 0.1m, giving an error in Bouguer anomaly of less than 0.2 μms^{-2}. No terrain corrections were applied since the only area where topography may have a significant effect is in the southernmost part of the grid where the land drops sharply away to the coast.

Inspection of Bouguer anomaly profiles showed that total errors due to reading errors, instrument instability, inadequate drift corrections, elevation errors and local terrain effects, are unlikely to exceed 2.5 μms^{-2} for 90% of the readings.

The regional gravity field was computed by two different methods, with the results shown on plans T.S. 15/66 PH-3 and PH-4. The regional gravity field slopes steeply towards the centre of the island.

The residual Bouguer anomaly map is apparently dominated by the Grassy River Fault and the location of the bulk of the Bold Head granite. Figure A shows the residual anomalies obtained.

Line A-B is the Grassy River Fault which can be seen truncating the gravity high over the volcanics marked as area C. Anomaly D in the north is also truncated against the fault. The gravity trough marked E is undoubtedly reflecting the fault line, but gravity may also be depressed in this area due to terrain effects from the Grassy River valley.

The elongate low, marked area F, correlates with magnetic low and is thought to be less dense, non-magnetic sediment within the volcanic pile.

The fault/contact between the underlying quartzites and the overlying volcanics, though more clearly seen on the magnetics, is evident in the gravity data along line H-I, especially in the truncation of the sharp gravity high marked area K.

The large low designated G lies over the Bold Head Granite, which is less dense than any of the other rock types in the area.

Perhaps the most significant anomaly is the sharp low marked on the map as area J. There are two likely explanations for this feature. The first is that it reflects a similar, less dense (and non-magnetic) sedimentary unit similar to that considered to be responsible for anomaly F. The second is that it reflects a granite high or granite ridge extending down from the main body of the Bold Head Granite. The latter explanation is most important in terms of potential occurrences of mine series rocks adjacent to such a granite ridge.

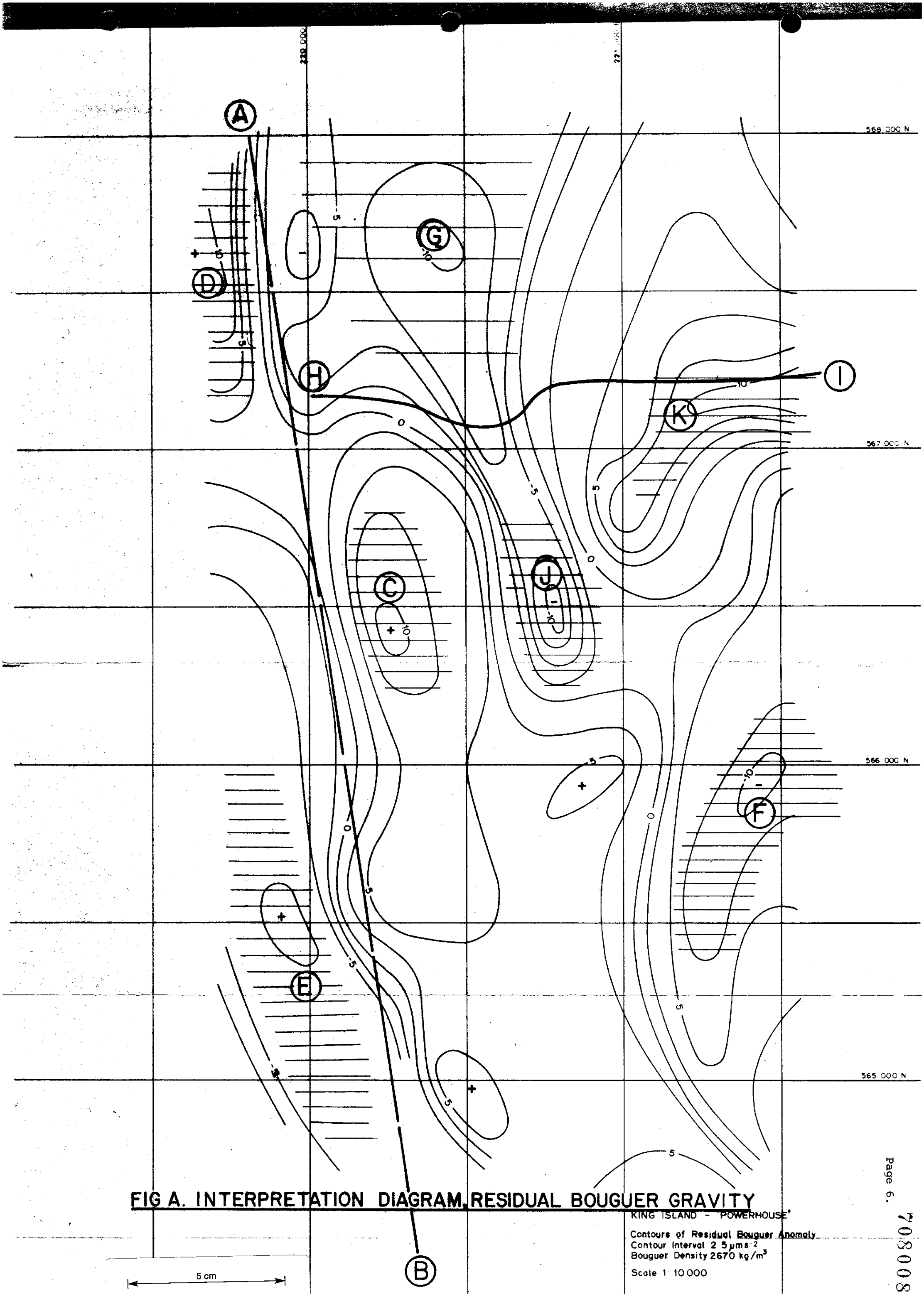

FIG A. INTERPRETATION DIAGRAM, RESIDUAL BOUGUER GRAVITY

KING ISLAND - "POWERHOUSE"

Contours of Residual Bouguer Anomaly
Contour Interval 2.5 μms^{-2}
Bouguer Density 2670 kg/m^3

Scale 1: 10 000

C Diamond Drilling

Four holes, BH 300/6, 300/7, 300/8 and 350/13, were drilled at the southern end of the Bold Head Mine to test the structure in this area.

The three 300 series holes were drilled south from the 10300N (BHMG) section to test the location and dip of the Grahams Road Fault. These holes defined an east-west fault with an interpreted dip of -80° south. The fact that volcanics were encountered south of this fault indicates that there must be a throw in excess of 200m south-side down.

Diamond drill hole 350/13 drilled to the west showed that the granite contact was much flatter, in the south-west of the mine area, than was originally thought. It is possible that the position has been reached where the granite contact has changed in trend from north-south to east-west. This would allow considerable extension of the C lens orebodies to the west (Figure B).

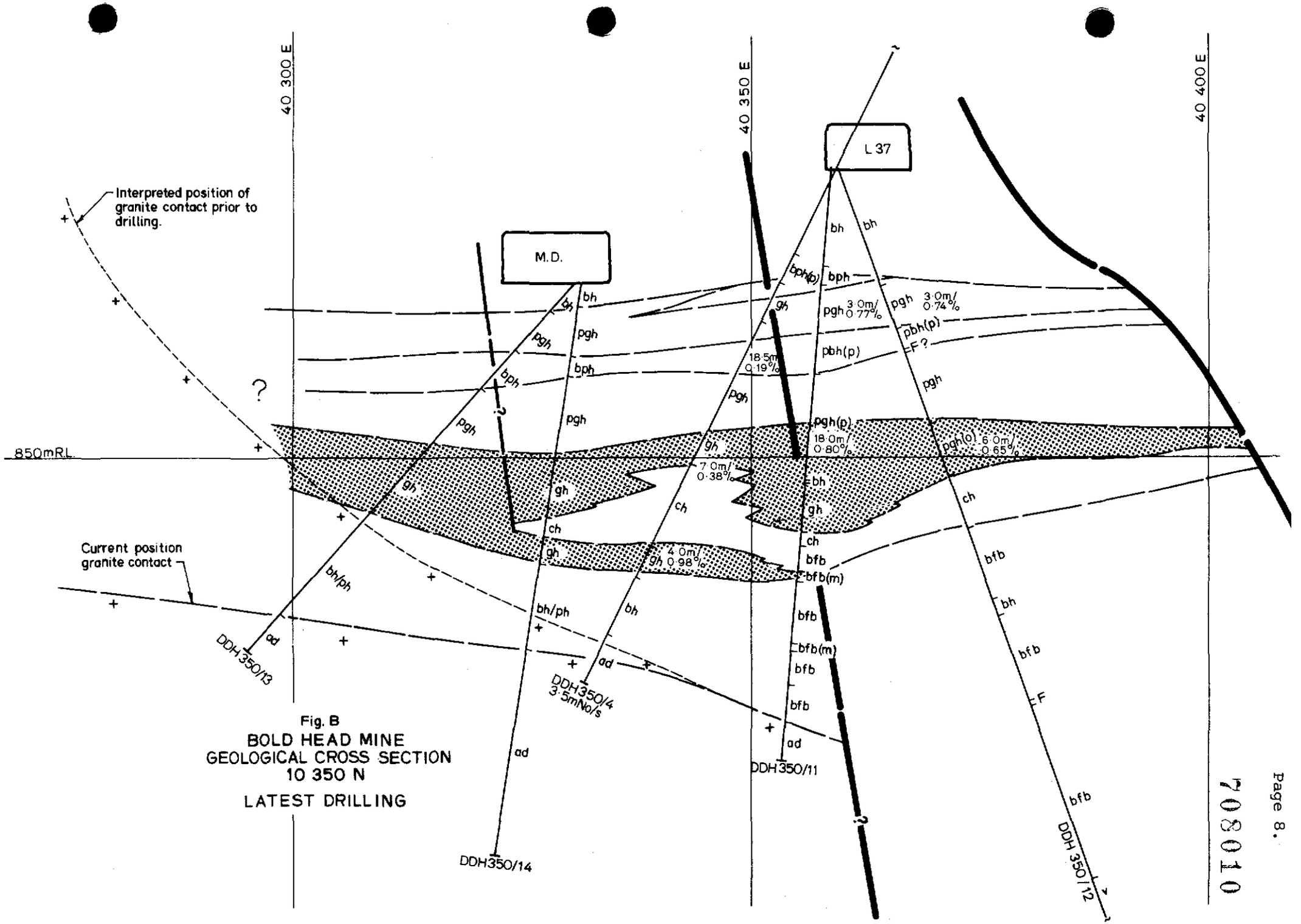

Fig. B
BOLD HEAD MINE
GEOLOGICAL CROSS SECTION
10 350 N
LATEST DRILLING

DISCUSSION

The major results of the work carried out over the past twelve months have been a) the delineation of the Grahams Road Fault which terminates the Bold Head Mine Block to the south, and b) the location of a possible ridge of granite lying east of the Bold Head Mine and possibly extending south to about 566250N.

a) The Grahams Road Fault, which has a throw in excess of 200m south-side down, effectively truncates the current Bold Head Mining Block to the south. There is however the possibility of a down-thrown block of mine series rocks occurring at depth south of this fault. Should the Bold Head Granite exist in this area at a suitable depth, then the presence of an orebody similar to Bold Head is possible. Diamond drilling from the surface immediately south of the Grahams Road Fault confirms the presence of granite but at a level above that of the anticipated mine series position. It is possible that the Grahams Road Fault post dates the major north-south trending faults in the Bold Head area and therefore offsets them. Since the north-south faults dip to the east, they would be offset to the west, south of the Grahams Road Fault, and it is therefore possible that the three deep surface holes drilled in this area lie to the east of the Boundary Fault (Figure C). If this were the case then they would not have tested the area of primary potential which is interpreted to lie in the zone between the Grassy River Fault and the Boundary Fault. A schematic long-section through this area, showing two possible situations with ore potential, is attached (Figure D).

b) The location of the possible ridge of granite lying to the east of the Bold Head Mine area has suggested that the Bold Head orebody lies in fact within an embayment in the granite contact, open effectively only to the south.

Since this possible ridge is interpreted as extending south of the Grahams Road Fault, the potential of this area for mineralization must be enhanced, should this in fact occur.

The presence of a granite ridge in the location shown on Figure C would considerably up-grade the potential of the area to the east of its inferred position. Only minor diamond drilling has been carried out to date in this area, all of it located north of the interpreted position of the Grahams Road Fault. Further work, including possible stratigraphic diamond drilling, is planned.

The future work programme scheduled for the next twelve months is aimed at obtaining as much structural data as possible. Initially this will be done using geophysics, with the ground magnetics being interpreted using the new susceptibility data and allowing a depth to the base of the volcanics to be estimated. The Gravity survey is aimed at assessing the depth to granite contact throughout the area, while the V.L.F. will hopefully identify and locate the major faults.

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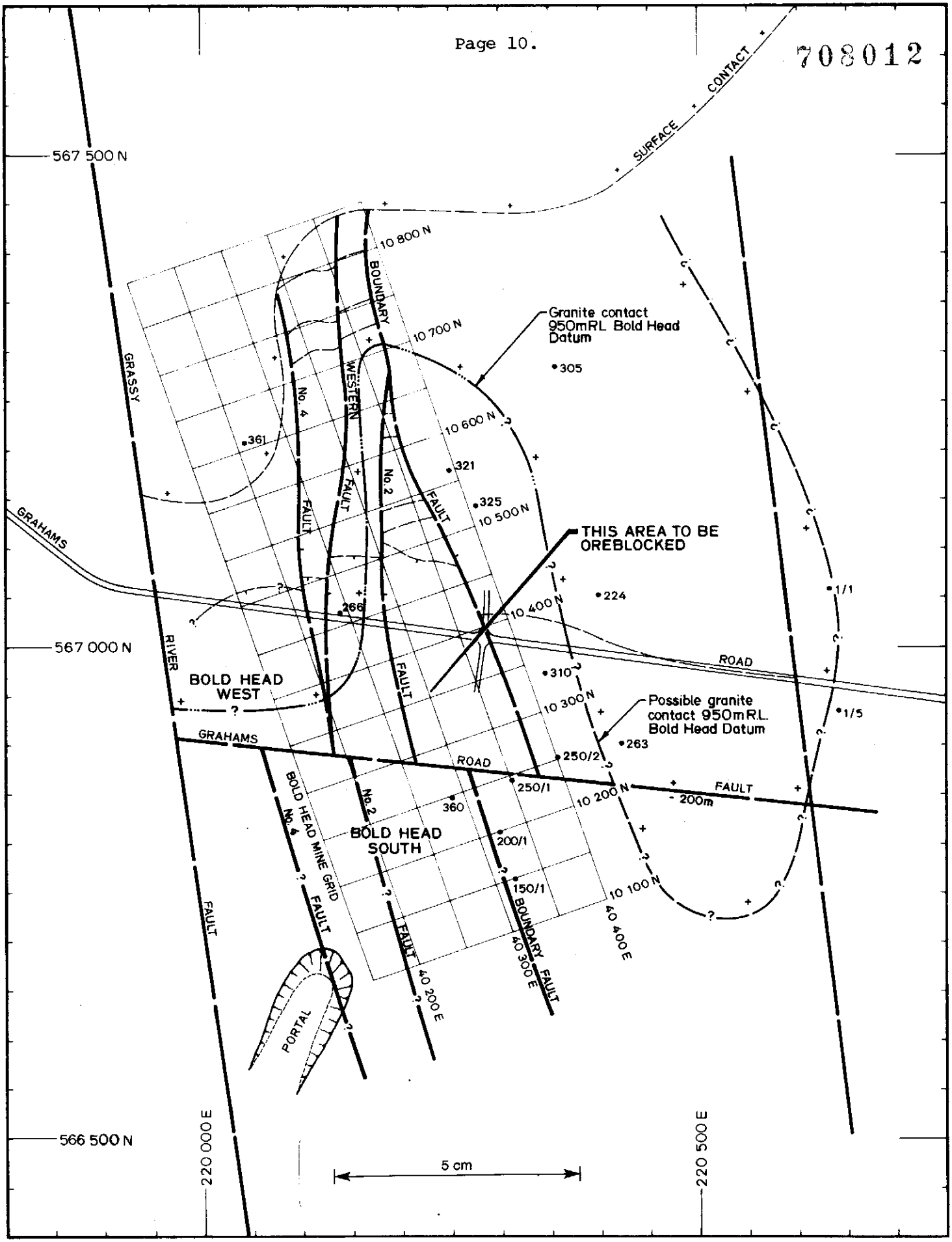

REF PLAN	GEOLOGY			1 : 5000 SCALE	KING ISLAND SCHEELITE GRASSY KING ISLAND
LEGEND:	SURVEY				
Upper volcanics	PLANNING			BOLD HEAD AREA	
Mine series	ROCK MEC			SHOWING ZONES OF EXPLORATION POTENTIAL	
Quartzites and siltstones	GRADE CON.				
Adamellite	DRAFTING			DRAWING NUMBER	Fig. C
	T.S.S.				

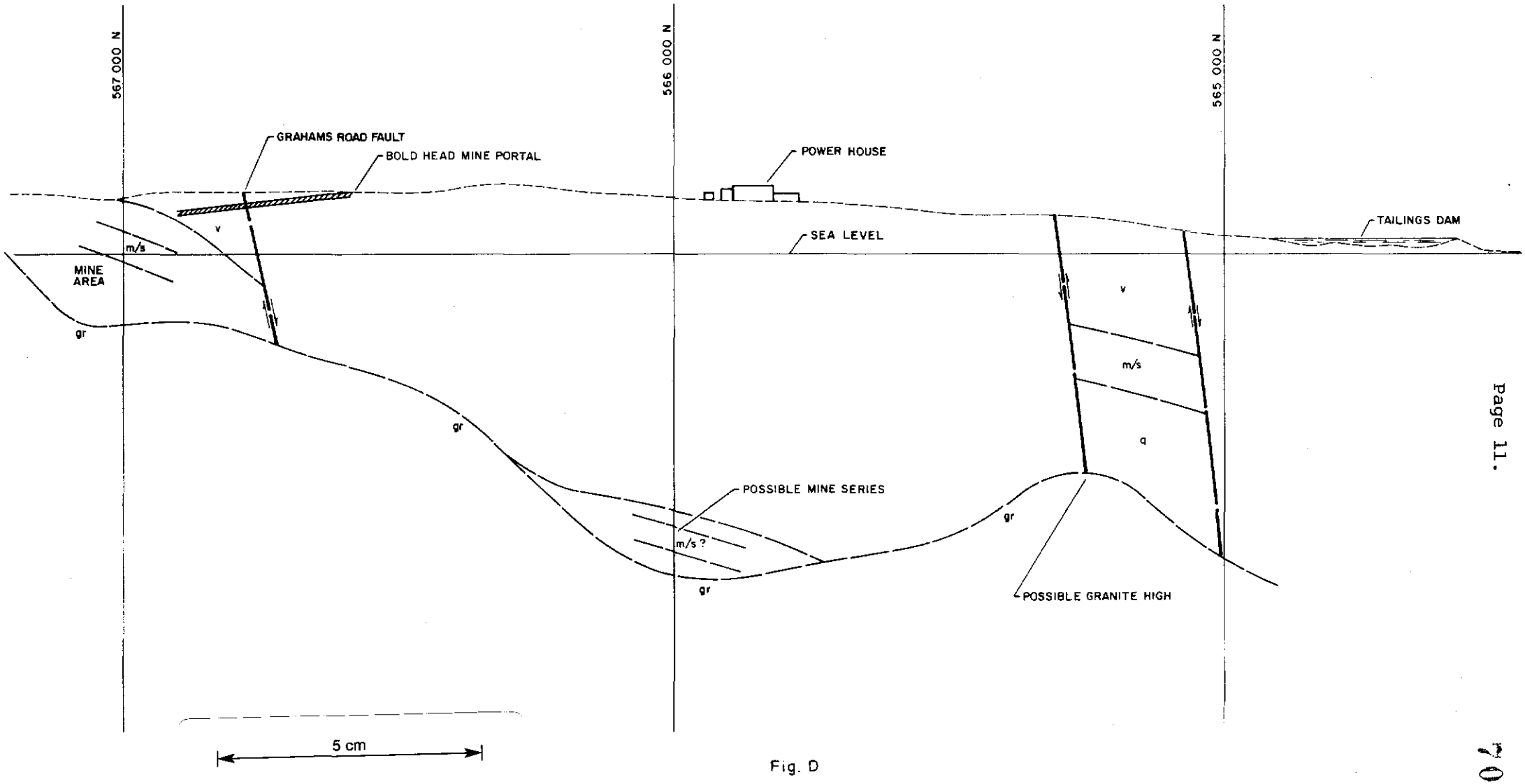

Fig. D

BOLD HEAD AREA SCHEMATIC SECTION
SHOWING POSSIBLE SITUATIONS WITH ORE POTENTIAL

SCALE 1:10000

It is hoped that, by comparing the contours derived for the base of the volcanics and those derived for the granite contact, areas of non-coincidence will be apparent. Assessment of these areas for the presence of mine series rocks will be the major priority and future diamond drilling will be aimed to test those areas in which it is considered that the mine series rocks, if present, have the best potential for ore deposition. The distribution of faulting will play a major part in this assessment since it has been determined that in the Bold Head area faults have provided the major channel-ways for the introduction of mineralization into the mine series rocks.

FUTURE WORK PROGRAMME

During the next twelve months the following work programme is planned.

1. Complete the pegging of the closer-spaced east-west geophysical grid over the Bold Head area.

2. Carry out V.L.F., Gravity and Ground Magnetic surveys over the new grid to further define the sub-surface geometry of the granite contact.

3. Interpret the results of the geophysical surveys in the light of existing data.

4. Continue exploration diamond drilling for the southern and western areas of Bold Head Mine from underground.

5. Subject to the economic situation, drill at least two surface holes south of the Bold Head Mine to test the geophysical interpretation and the stratigraphy south of the Grahams Road Fault.

ACKNOWLEDGEMENT

The geophysical results given in this report are from an unpublished company report titled:

Progress Report on Geophysics, Powerhouse, King Island, Tasmania.

Sumpton, J., 1982.

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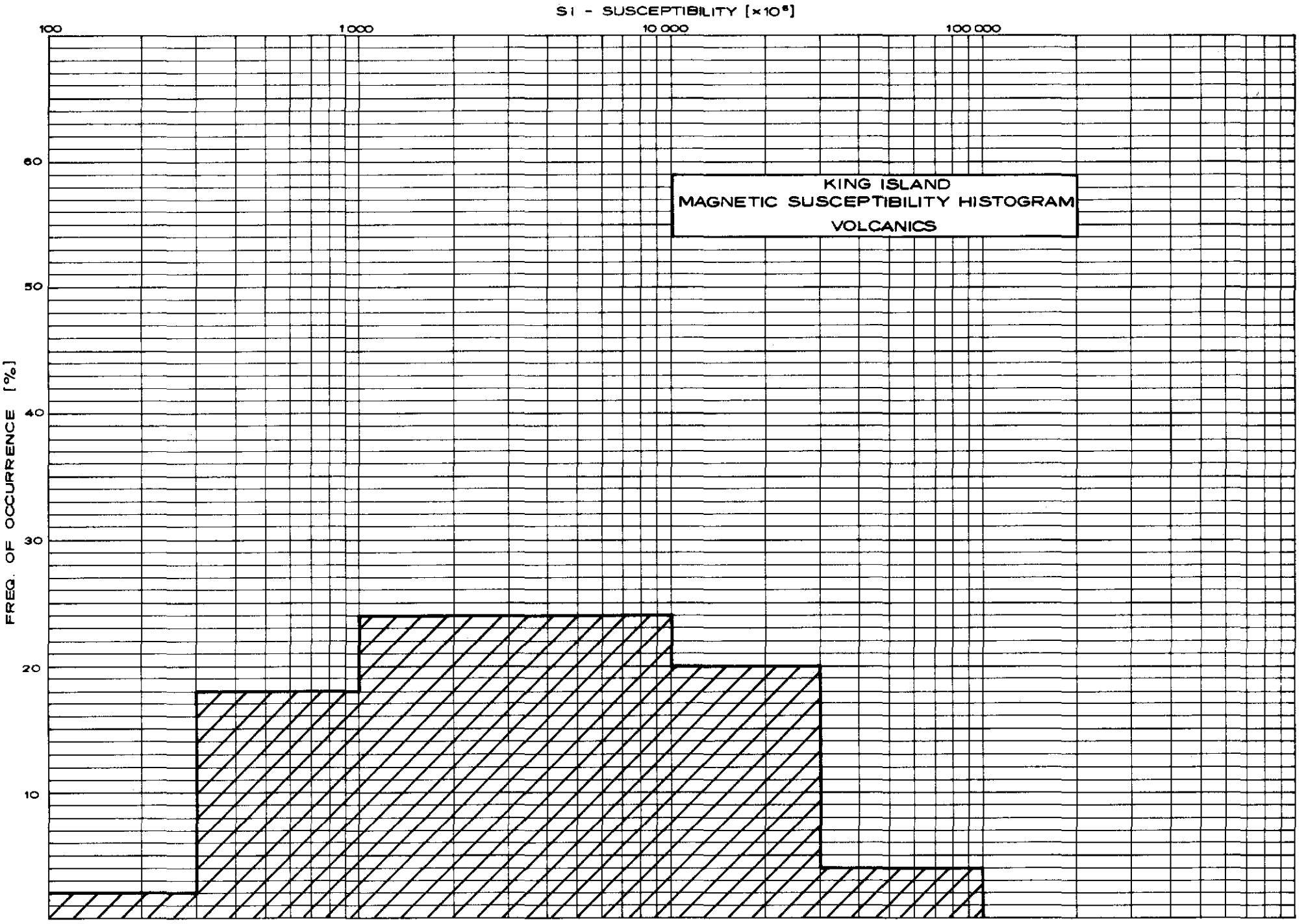
SI - SUSCEPTIBILITY [×10⁶]
100
1000
10 000
100 000
KING ISLAND
MAGNETIC SUSCEPTIBILITY HISTOGRAM
VOLCANICS
FREQ. OF OCCURRENCE [%]
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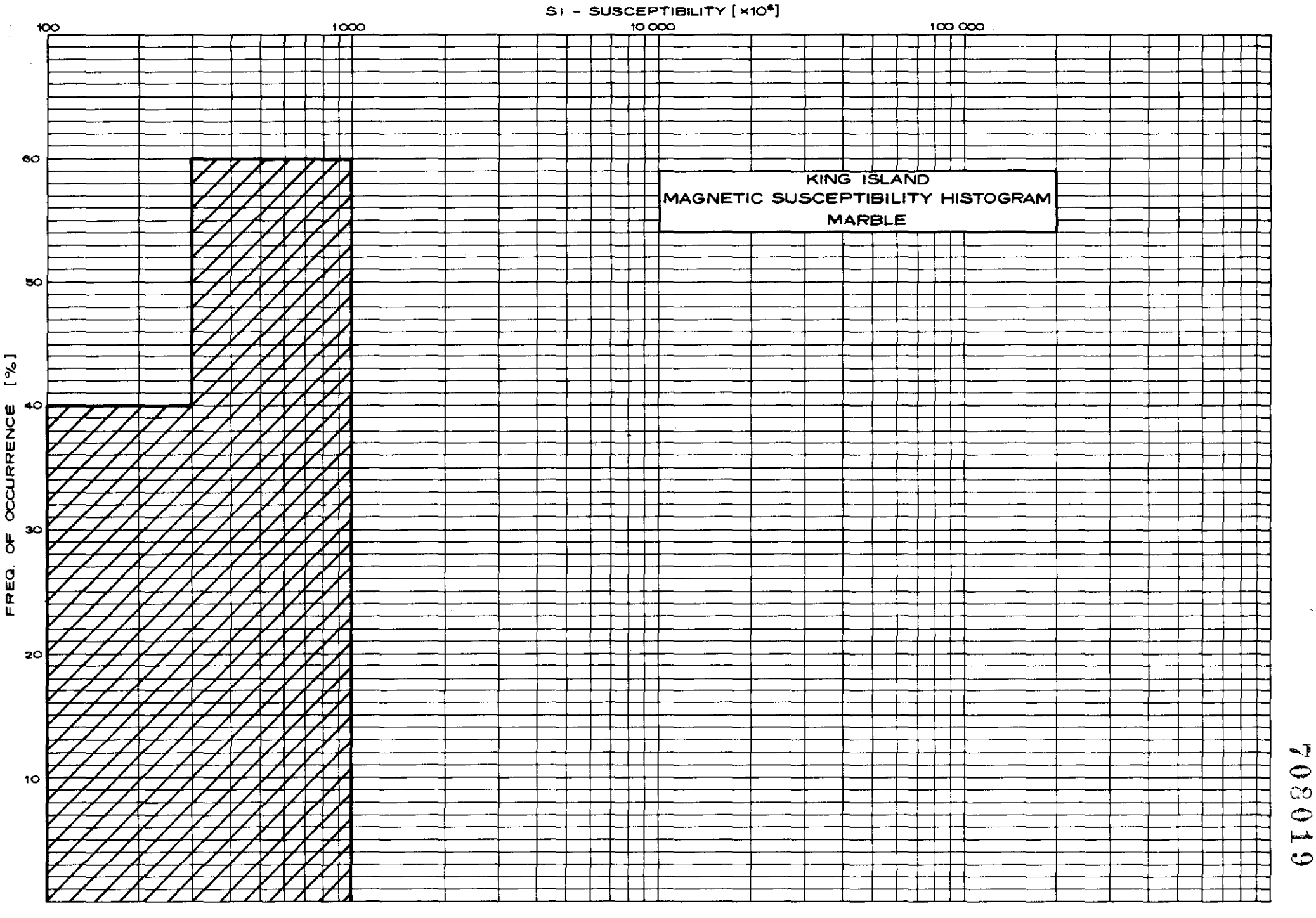
50
40
30
20
10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KING ISLAND
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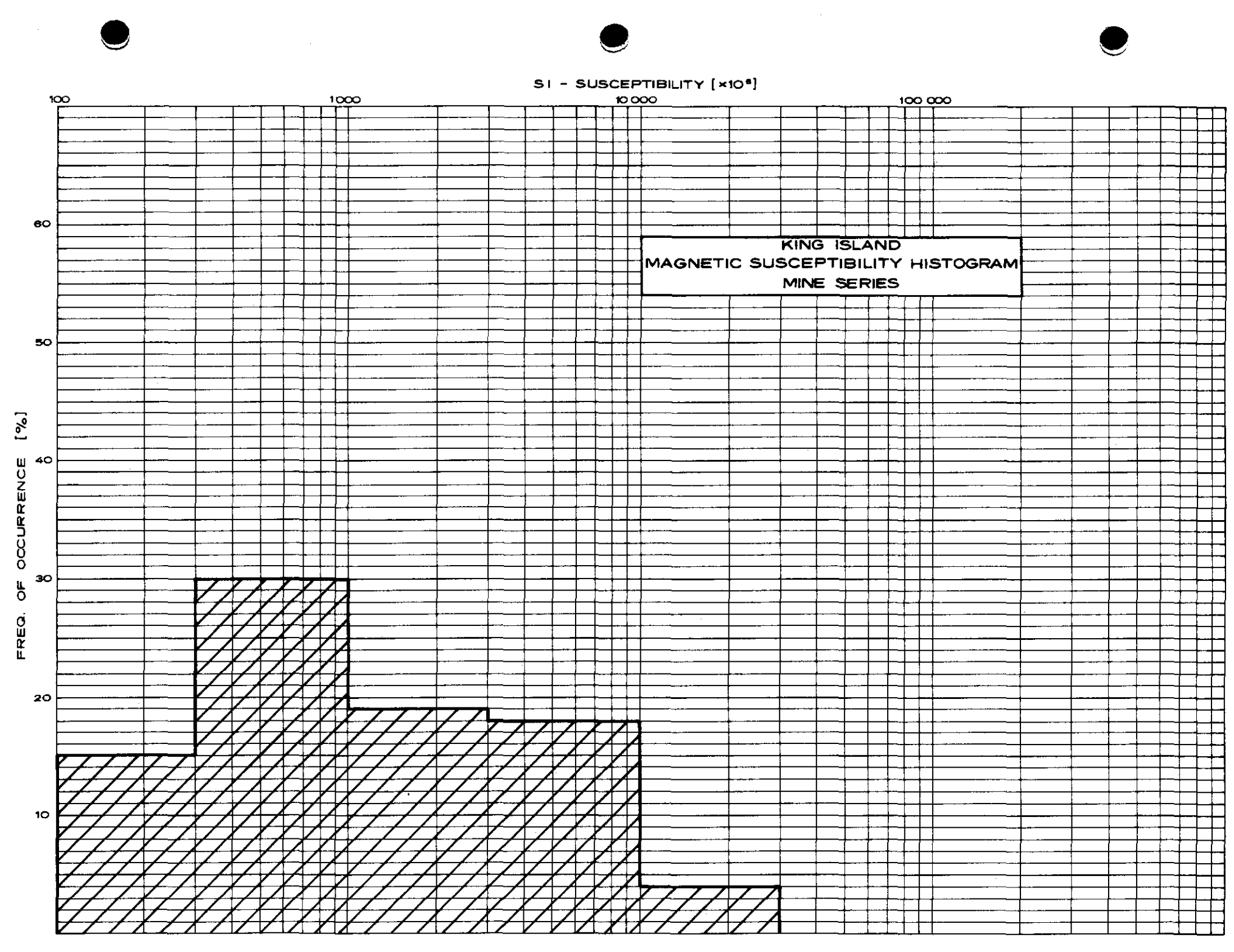
MARBLE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10 000
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FREQ. OF OCCURRENCE [%]
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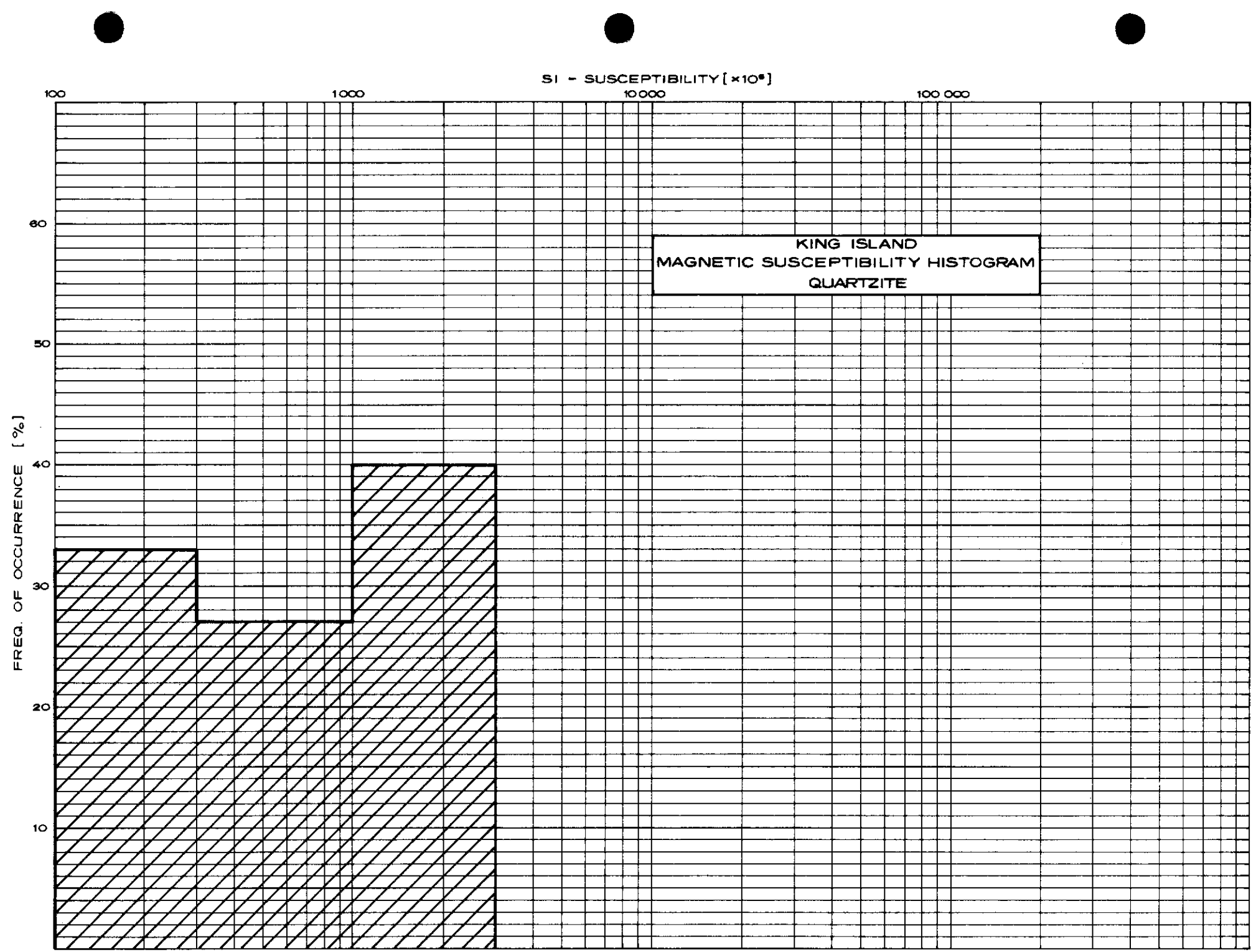
50
40
30
20
10
KING ISLAND
MAGNETIC SUSCEPTIBILITY HISTOGRAM
MINE SERIES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1000
10000
100 000
KING ISLAND
MAGNETIC SUSCEPTIBILITY HISTOGRAM
QUARTZITE
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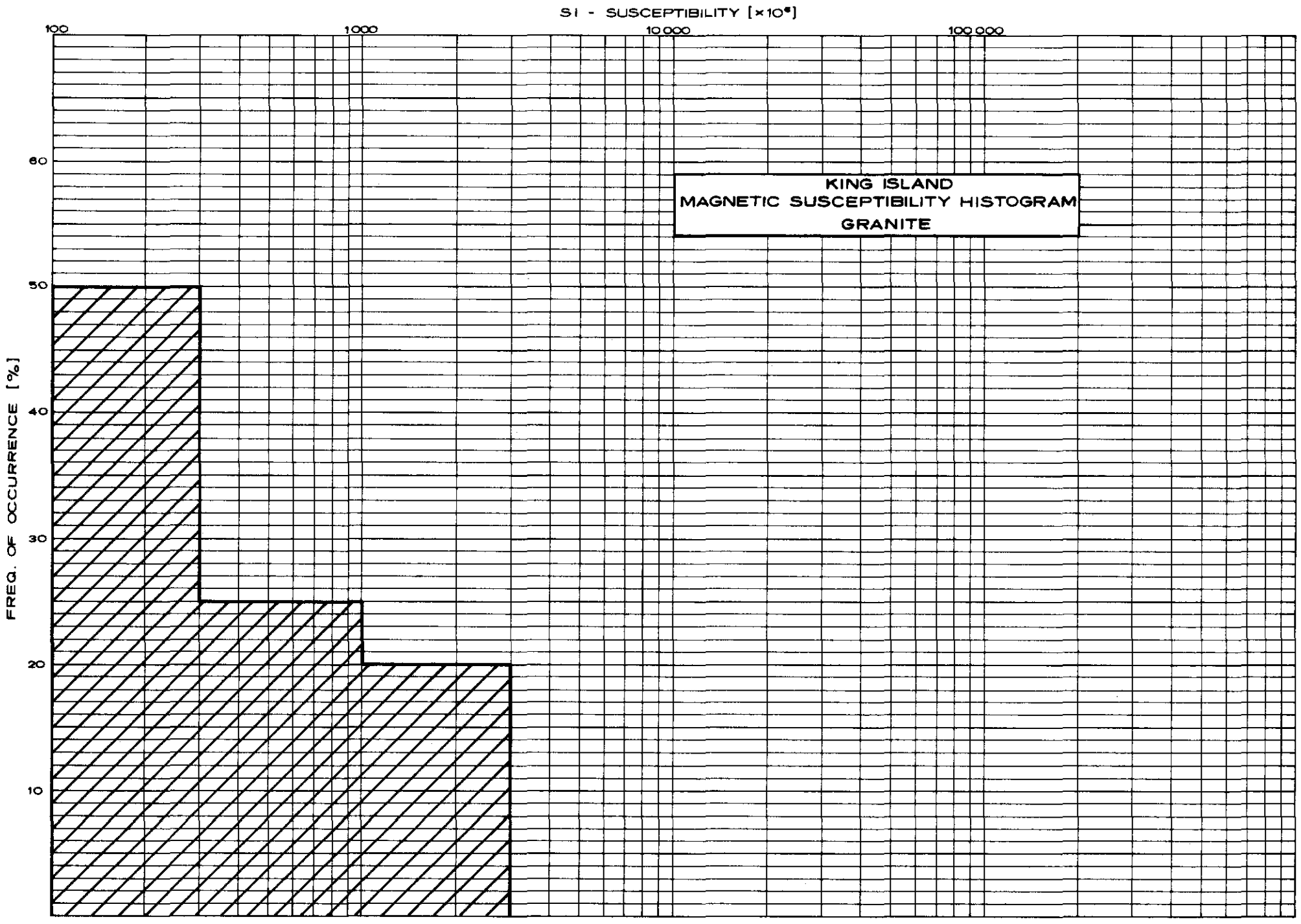
20
10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1000
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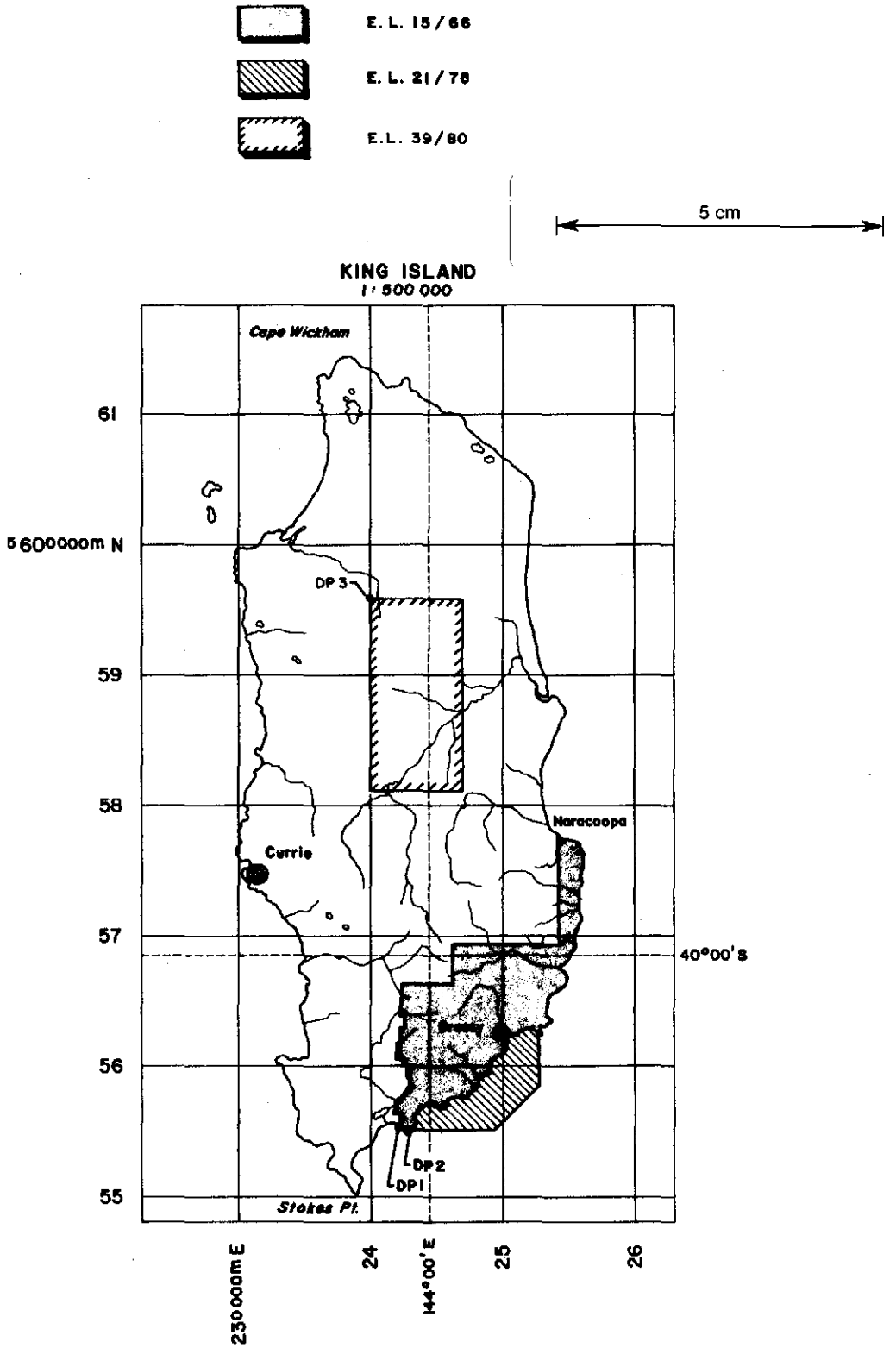
FREQ. OF OCCURRENCE [%]
KING ISLAND
MAGNETIC SUSCEPTIBILITY HISTOGRAM
GRANITE



DATA POINTS (DP) CO-ORDINATES

DP1 - E.L.15/66:	5 555 260m	N
	241 330m	E
DP2 - E.L.21/78:	5 555 000m	N
	242 000m	E
DP3 - E.L. 39/80:	5 596 000m	N
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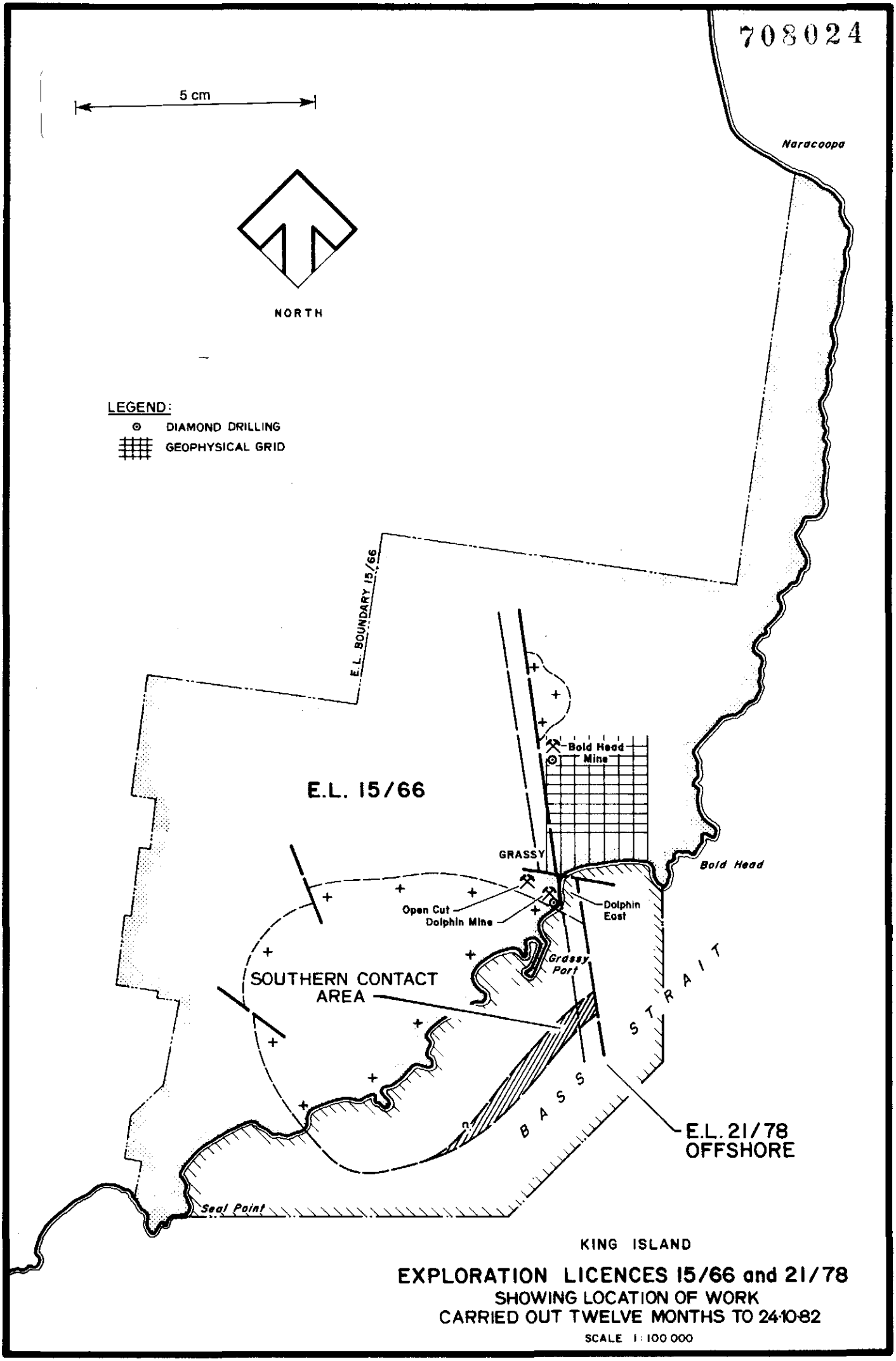
Australian Map Grid Zone 55 (AMG)

RF130279-KIS

708024



KING ISLAND

EXPLORATION LICENCES 15/66 and 21/78

SHOWING LOCATION OF WORK
CARRIED OUT TWELVE MONTHS TO 24-10-82

SCALE 1:100 000

219000 E
220000 E
221000 E
222000 E
570000 N
569000 N
568000 N
567000 N
566000 N
YARRA CREEK ROAD
GRAHAMS ROAD
MILLWOOD ROAD
305
361
321
325
251
224
310
311
308
263
250/2
360
250/1
200/1
150/1
359
356
1/4
245
257
256
242
233
1/1
267
1/5
MS 1
MS 2
MS 3
MS 4
MS 5
MS 6
MS 7
NOTE:
1. Co-ordinate system is the integrated co-ordinate system based on Australian Geodetic Datum.
2. Level Datum is mean low water ordinary spring (R.A.N.) as established by H.M.A.S. Tallarook, 1949.
3. Compiled from aerial photographs, Tasmanian Lands Dept.
5 cm
DATE: JUNE, 1974
GEOLOGIST: S.G.B.
DRAWN: R.F.
CHECKED: M.C.R.
GEOPEKO LIMITED
KING ISLAND GROUP
SCALE: 1 10 000
No. KF 3
TOPOGRAPHICAL BASE MAP
SHOWING
DRILL HOLE LOCATIONS
AND
INTERPRETED GEOLOGY
KF1 KF2 KF3
KF4 KF5 KF6
KF7 KF8 KF9
708025

216 000 E
217 000 E
218 000 E
219 000 E
220 000 E
221 000 E
222 000 E
223 000 E
224 000 E
566 000 N
565 000 N
564 000 N
563 000 N
562 000 N
561 000 N

POWER HOUSE
Township Dam
Tailings Dam
BBQ Point
Single Mens Quarters
Mine Works Area
GRASSY BAY
BOLD HEAD
Township Magazine
DOLPHIN MINE MAIN DECLINE
Administration Building
Sea Dump
GOLF COURSE
CONTACT - Surface
CONTACT - 350m R.L.
D.F.Z. Surface
D.F.Z. - 300m R.L.
Marine Board Office
GRASSY PORT
G.R.F. - 300m R.L.
Sandblow Magazine
LITTLE GRASSY BAY
Frog Rocks
Possible Mine Series
Sandblow Beach
SANDBLOW POINT
Broken Arm Beach

5 cm

SCALE 1:10 000

north

LOCATION
TOPOGRAPHICAL SERIES

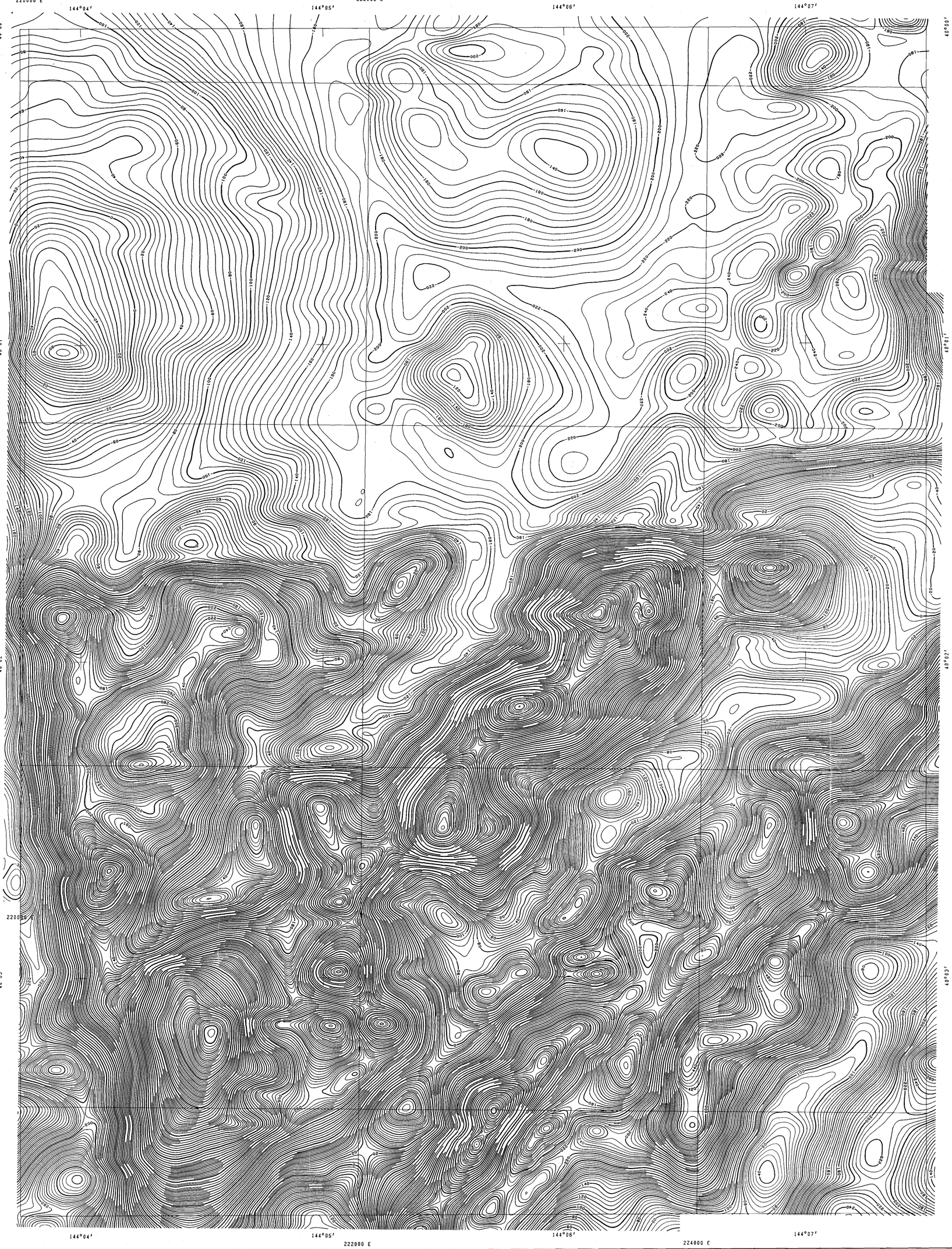
SUBJECT
GRASSY & ENVIRONS

KING ISLAND SCHEELITE
A DIVISION OF WARMAN INTERNATIONAL

GRASSY KING ISLAND

PLAN NUMBER
04K107 - 1545

708026



KING ISLAND SPECIAL

GRASSY 7717-IV-NW-1

GEOPEKO

SCALE 1:10 000

200 0 200 400 600 800 1000 metres

5 cm

LOCATION INDEX

7717-IV-NW

7717 -IV-NW-4	7717 -IV-NW-1
7717 -IV-NW-3	7717 -IV-NW-2

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
Aircraft: Australex Nomad N 22 B - Reg No: VH-FZP
Magnetometer Type: Sonotek 6039 in stinger

Survey Date: August 1980

MAP DATA

Contour Interval: 5nT
IGRF subtracted prior to contouring

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

708027

DRAWING NO: 6226 S/B

220 000

221 000

568 000 N

567 000 N

566 000 N

565 000 N

480

490

500

510

520

530

540

550

560

570

580

590

600

610

620

630

640

5 cm

DEC , 1981

KING ISLAND – "POWERHOUSE"

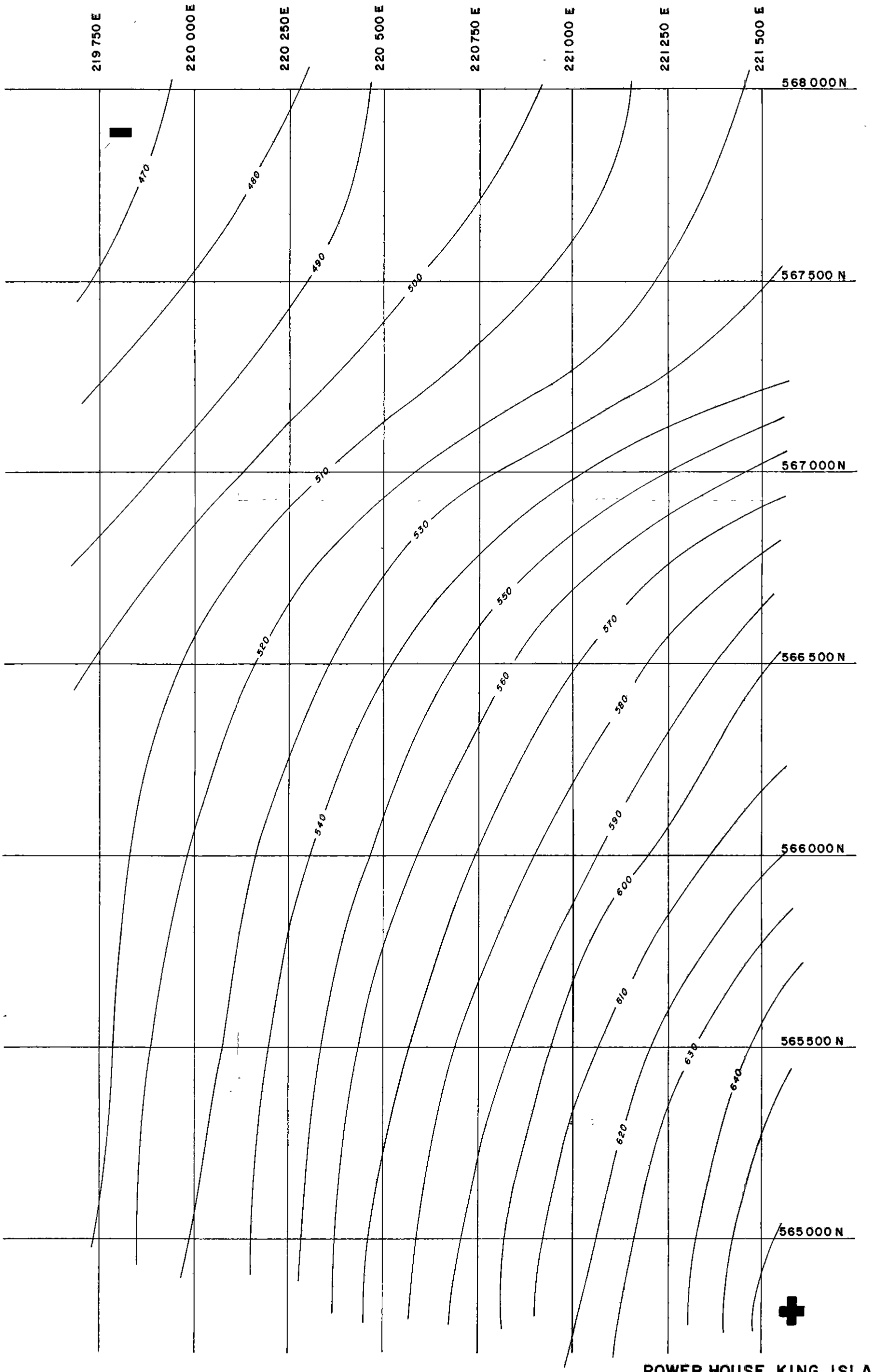
708028

Contours of Bouguer Anomaly
Contour Interval 10 μms^{-2}

Scale 1 10000

Bouguer Density 2670 kg/m^3

Drg. No. TS 15/66 – PH-2

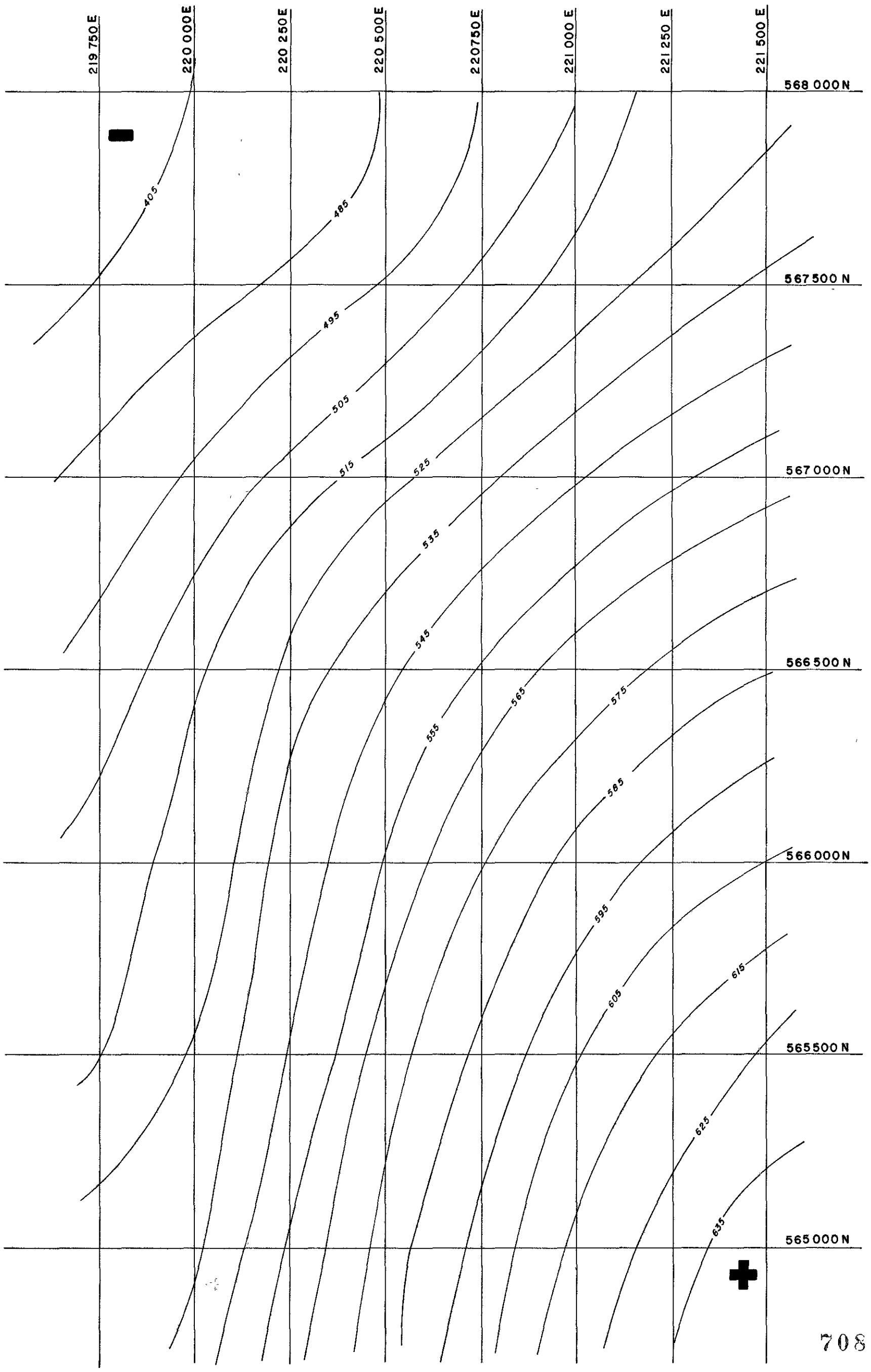


708029

5 cm

POWER HOUSE KING ISLAND
REGIONAL BOUGUER ANOMALY
Scale 1 10 000
BOUGUER DENSITY 2670 kg/m^3
Cont Int 10 μms^{-2}

Drg No. TS 15/66–PH–3



Cont Int 10ums^{-2}
Bouguer Density 2670 kg/m^3
Regional determined using
900m x 900m cell

5 cm

708030

POWER HOUSE KING ISLAND
CONTOURS OF REGIONAL BOUGUER ANOMALY

Scale, 1 10 000

Date, Dec 1981

Drg.No. TS 15/66 – PH-4

220 000

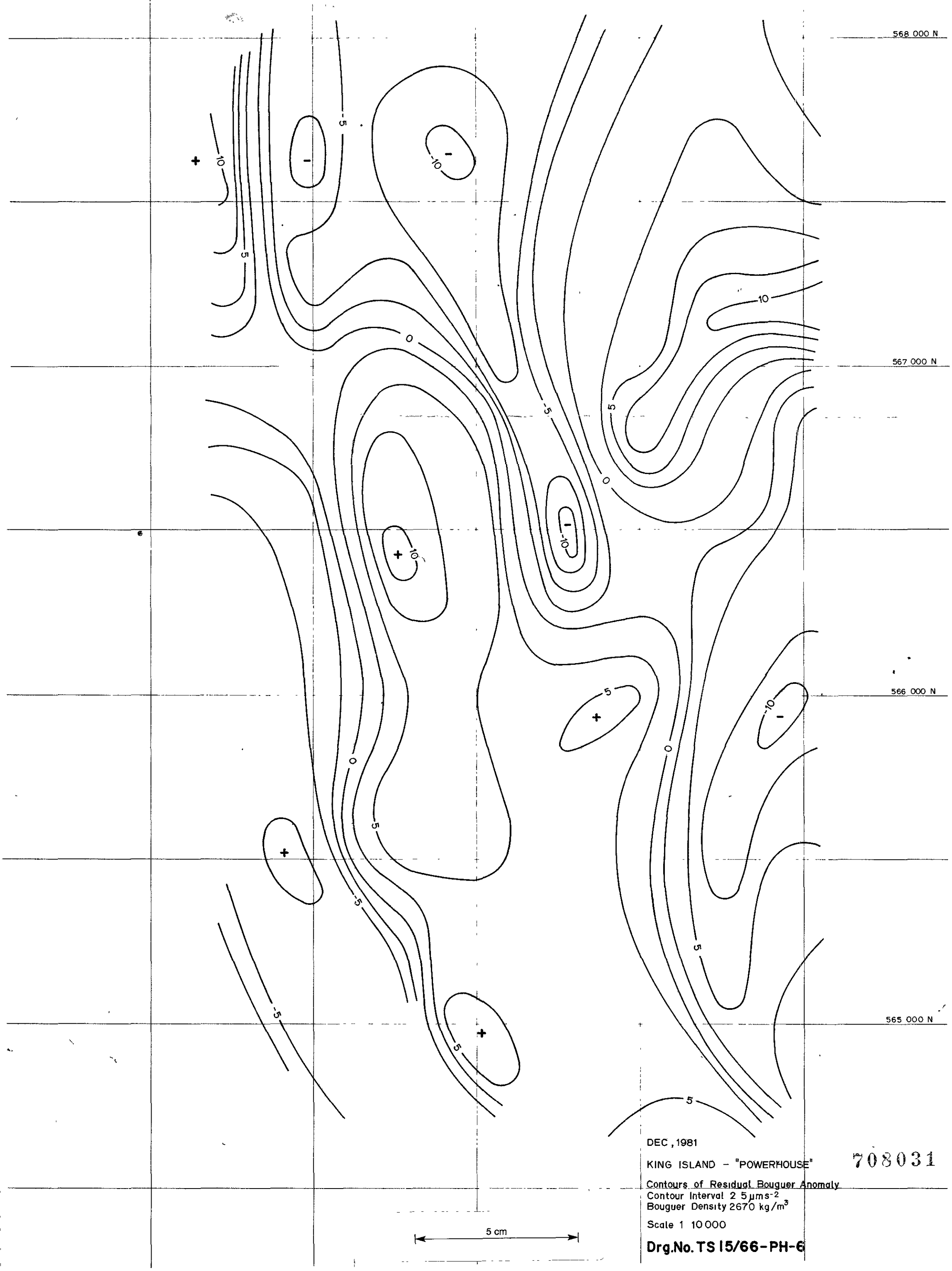
221 000

568 000 N

567 000 N

566 000 N

565 000 N



5 cm

DEC, 1981

KING ISLAND - "POWERHOUSE"

708031

Contours of Residual Bouguer Anomaly
Contour Interval 2 5 μms^{-2}
Bouguer Density 2670 kg/m^3

Scale 1 10 000

Drg.No. TS 15/66-PH-6

Notes:

Horz. Scale.	1:5000
Vert. Scale	1cm = 10%
Datum	0%
In Phase	———
Quadrature	.....
Filtered in Phase	- - - - -
Instrument	Geonics EM-16

Fence
Road
Power line
Pipe line

5 cm

N
NWC
DIRECTION OF READINGS

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

SCALE 1:	No. TS 15/66-PH-8	PLAN

E.L. 15/66 KING ISLAND, TAS.
POWER HOUSE
PROFILES OF VLF-EM

DATE:
GEOLOGIST:
DRAWN:
CHECKED:

708032