

OPEN FILE

PROSPECTING AUTHORITY NO. 1965

MOUNT BONNER, NORTHERN TERRITORY

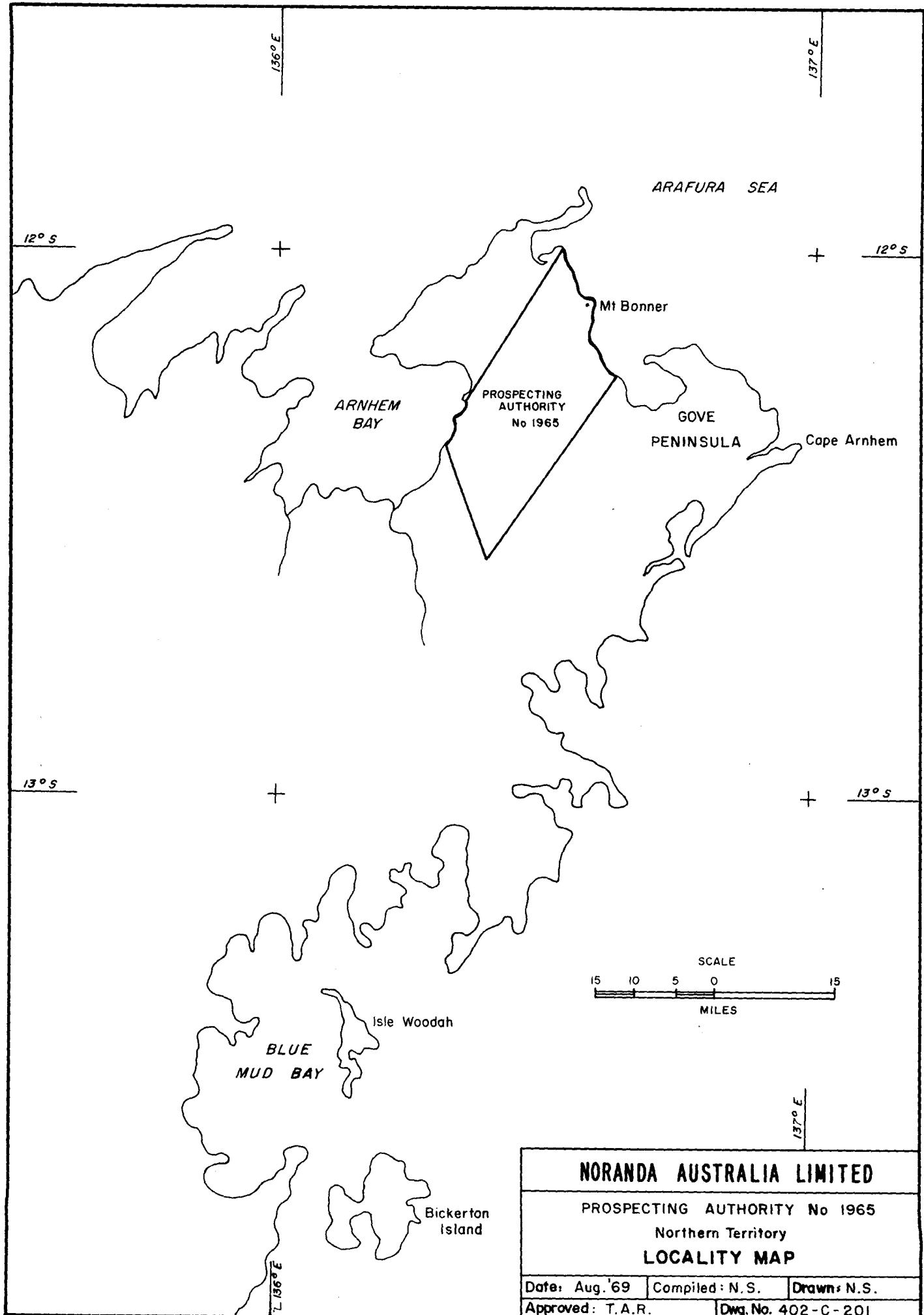
REPORT FOR YEAR ENDED JUNE 10, 1969

Report No. 121

August, 1969

Stamp: HONCH
By G. C. BATTEY
Melbourne, Australia

OPEN FILE



ARAFURA SEA

12° S

12° S

136° E

137° E

Mt Bonner

ARNHEM BAY

PROSPECTING AUTHORITY No 1965

GOVE PENINSULA

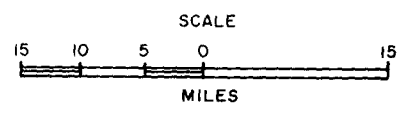
Cape Arnhem

13° S

13° S

Isle Woodah

BLUE MUD BAY



Bickerton Island

136° E

137° E

NORANDA AUSTRALIA LIMITED

PROSPECTING AUTHORITY No 1965

Northern Territory

LOCALITY MAP

Date: Aug. '69

Compiled: N.S.

Drawn: N.S.

Approved: T.A.R.

Dwg. No. 402-C-201

LIST OF PLATES

Locality Map	Frontispiece
Sheet No. 1 - Contour Map, Radiometric Survey	In Pocket
Sheet No. 2 - Contour Map, Radiometric Survey	" "
Sheet No. 3 - Contour Map, Radiometric Survey	" "

NORANDA AUSTRALIA LIMITED

PROSPECTING AUTHORITY NO. 1965 - MOUNT BONNER

REPORT FOR YEAR ENDED JUNE 10, 1969

1. INTRODUCTION

Noranda Australia Limited on February 19, 1968, applied for a Prospecting Authority in north-eastern Arnhem Land to the west of Gove. Prospecting Authority No. 1965 was granted for a period of 12 months commencing June 11, 1968. It covers an area of approximately 385 square miles. The term has since been extended for a further 12 months concluding June 10, 1970.

One of the conditions under which it was granted stipulated that "within three months of the end of the term of this Prospecting Authority a final report and plan is to be submitted to the Director of Mines". This report is for the 12 months ended June 10, 1969.

2. EXPLORATION

2.1 Objective

Late in 1967 geologists of Noranda Australia Limited carried out a study to select areas within Australia which could possibly contain uranium mineralisation. At that time most of the areas surrounding the known uranium occurrences were already held by other companies.

This area was selected after discussion with officers of the Bureau of Mineral Resources. The choice of this area is the result of the regional mapping programme which the Bureau of Mineral Resources has conducted in recent years.

The area was chosen because the arenaceous sediments of the Mount Bonner Sandstone are regarded as time equivalents of the uranium-bearing Westmoreland Conglomerate which outcrops some 300 miles to the south. Moreover, the presence of the Fagan Volcanics was considered important because of the association of uranium mineralisation with similar volcanics in other areas within the Carpentaria Province.

Work to date has established that the selection of this ground as a potential uranium-bearing area was a technical success but a great deal of work needs to be done to determine whether any commercial deposits of uranium exist.

2.2 Airborne Spectrometer Survey

All the contracting companies offering airborne spectrometer surveys were invited to tender for a survey of this area. The contract was awarded to Geophysical Resources Development Company of Sydney.

A total of 1,205 line miles were flown at a line spacing of 1,000 feet and a mean terrain clearance of 300 feet. The selected flight lines were marked out on a mosaic compiled from available air photographs and the actual track flown by the aircraft was recorded by a 35 mm. single frame camera.

The gamma ray spectrometer used was a Nuclear Enterprises Mark XII system incorporating a 6" x 4" thallium activated sodium iodide crystal and a 5" photomultiplier assembly. Four channels of radioactive data were recorded on two dual control 10" Mosely recorders.

Channel 1 - The integral or total channel counts all pulses above an energy level of 100 KeV.

Channel 2 - Has a differential discriminator which covers the energy band 1.3 to 1.6 MeV so that pulses from the 1.44 MeV potassium photo-electric lines are counted in this channel.

Channel 3 - Has a differential discriminator which allows pulses from the 1.76 MeV uranium photo-electric line to be counted. The lower and upper thresholds of this channel are set at 1.6 MeV and 2.0 MeV respectively.

Channel 4 - Has a differential discriminator which allows pulses from the 2.62 MeV thorium photo-electric line to be counted. The upper and lower boundaries are set at 2.0 MeV and 2.9 MeV respectively.

The results are presented on three sheets at a scale of 1 inch = 2000 feet compiled from a photo mosaic by Geophysical Resources Development Company. The Channel 3 (1.6 to 2.0 MeV) contours are presented on these plans at a contour interval of five counts per second.

2.3 Interpretation of the Results of the Airborne Spectrometer Survey

An interpretation of the results of the airborne spectrometer survey has been prepared by consulting geophysicist, Mr. P. Woyzbun. His report is presented herein as Appendix I.

2.4 Ground Investigation

During May 1969 a field party consisting of three geologists, Messrs. A. Thomas and A. Dunlop and Mrs. C. Dunlop, accompanied by two field assistants, established a field camp in the area. A landing barge was hired to transport the party and equipment from Darwin to Gove. Radioactive material was found in a conglomerate on the first of the anomalies located and samples have been despatched for analyses.

It is planned to conduct a field examination to assess all significant anomalies during the next four months.

3. EXPENDITURE

Expenditure to April 30, 1969, on this Prospecting Authority was \$19,893.00.

August 18, 1969.

G. C. Battey
G. C. Battey,
Chief Geologist.

APPENDIX I

REPORT ON THE INTERPRETATION OF THE RESULTS FROM THE AIRBORNE SPECTROMETER SURVEY OVER MT. BONNER AREA, NORTHERN TERRITORY

INTRODUCTION

The Airborne Spectrometer Survey over the Mt. Bonner area was conducted during November, 1968, on behalf of Noranda Australia Limited.

The specifications called for flying at approximately right angles to the geological strike with lines spaced at 1000 feet and at 300 feet mean terrain clearance.

The equipment used was Nuclear Enterprises Mark XII Spectrometer.

DESCRIPTION OF THE RESULTS

The results of this survey have been presented as contour maps of the "uranium" channel; the contour interval being five counts per second.

These contour maps have been examined in detail, i. e. anomaly by anomaly with subsequent thorough examination of the spectrometer recorder charts, as radiometric contour maps quite often tend to be misleading inasmuch as they do not really depict the sharpness nor the shape of the responses, which is one of the criteria of an anomaly's importance. In effect, the interpretive work was done from the recorder charts only. Contour maps were used for positioning of those anomalies which are considered worthy of further follow-up on the ground.

It is not proposed to discuss at this stage the exact methods used in the interpretation, and this report will be limited to the pinpointing of areas of interest.

The anomalies of interest have been selected by inspection, using the writer's experience over other known deposits, and based on a considerable number of tests flown throughout the country.

In all, 13 anomalies are thought to have been caused by varying concentration of uranium mineralisation. It must be understood at this stage that any number of these (if not all) might prove to be non-economic.

However, a number of the anomalies appear to the writer as being most promising. These have been allotted priority 1 in the list of anomalies at the end of this report. Anomalies L and S are considered to be particularly promising.

In all, there are four anomalies with 1 priority, four with 2 priority and five with priority 3.

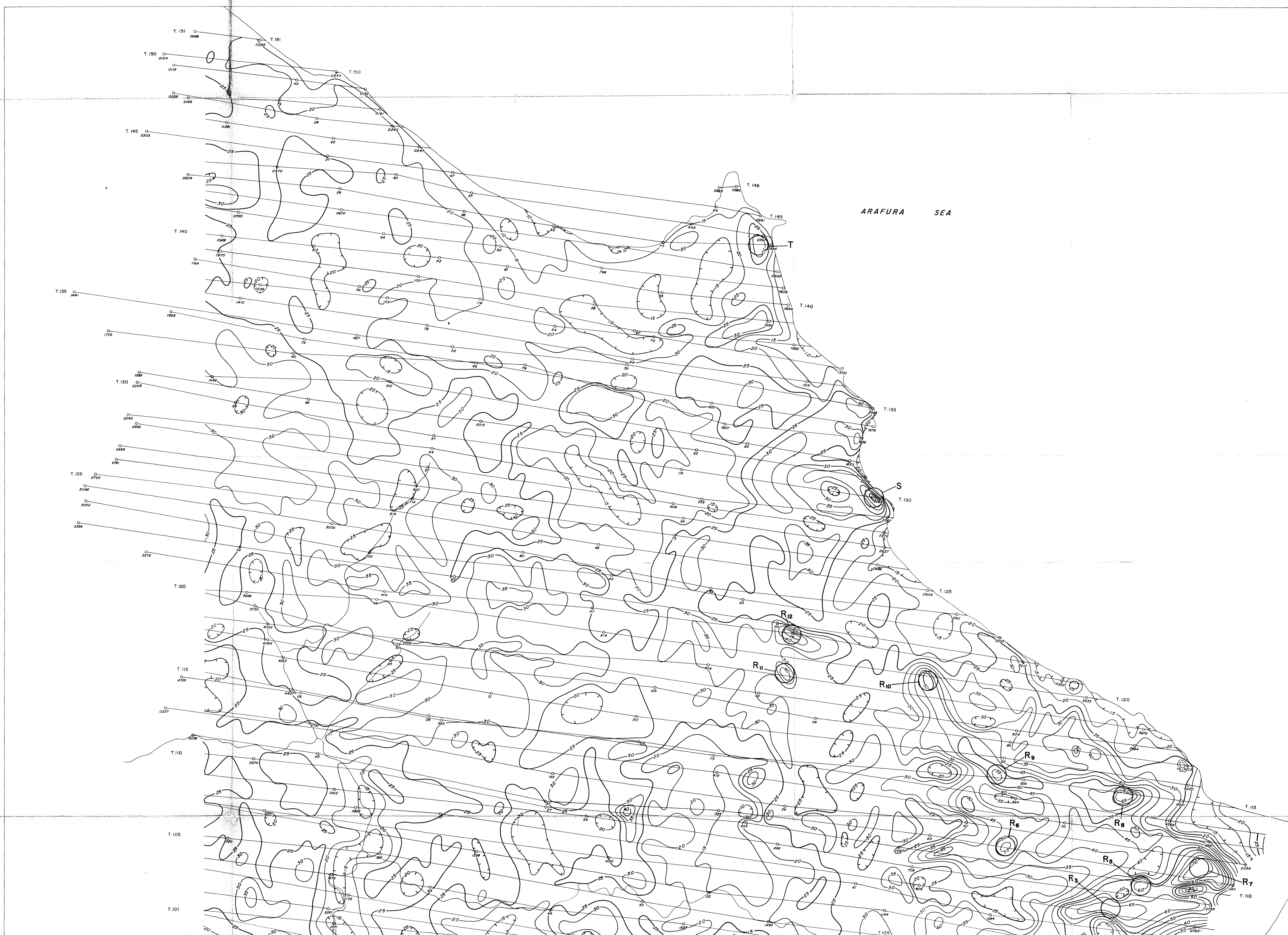
The remaining anomalies are thought to be due to the higher radioactivity of different rock types in the area, but it is strongly recommended that these, too, be looked at on the ground. The suspected rock types are indicated in the list wherever possible.

All the anomalies have been called by different letters and are shown on the accompanying maps.

P. Woyzbun,
Geophysicist.

LIST OF ANOMALIES SELECTED
FOR FURTHER FOLLOW-UP

<u>Anomaly</u>	<u>Order of Priority</u>	<u>Traverse</u>	<u>Suspected Rock Type</u>
A	1	13	Conglomerate
B	-	15	Laterite
C	-	21	"
D	3	29	Conglomerate
E1	3	31	Volcanics
E2	3	34	"
F1	-	34	Conglomerate
F2	-	35	"
F3	-	35	Volcanics
G	-	40	Volcanics
H1	2	41	?
H2	3	43/44	?
I1	-	43	Volcanics
I2	-	46	"
J	-	51	"
K1	-	55	"
K2	-	55	"
K3	-	55	"
K4	-	55	"
K5	1	56	"
K6	-	58	"
L1	1	69	?
M	-	74	?
N1	2	79	Laterite
N2	-	83	"
N3	-	83	Laterite
N4	-	84	"
P	-	85/86	?
Q	-	88	?
R1	-	100	?
R2	-	105	?
R3	-	108	?
R5	-	110	?
R6	-	110	?
R7	2	111	?
R8	-	115	?
R9	-	115	?
R10	2	120	?
R11	-	199	?
R12	-	121	?
S	1	130	?
T	-	143	?

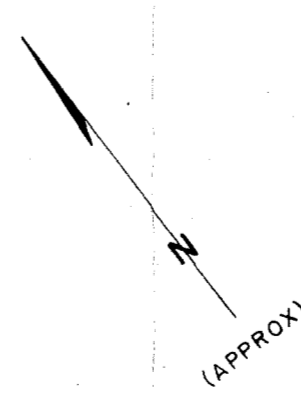


ARAFURA SEA

○-R₂ ANOMALIES OF INTEREST
DETAILS IN REPORT

FLIGHT LINE INTERVAL — 1000 FEET
FLIGHT ALTITUDE — 300 FEET MFC
CONTOUR INTERVAL — 5 COUNTS

HORIZONTAL CONTROL BASED ON PHOTO
ASSEMBLY COMPILED BY GEOPHYSICAL
RESOURCES DEVELOPMENT CO., RAMSGATE.



SHEET INDEX

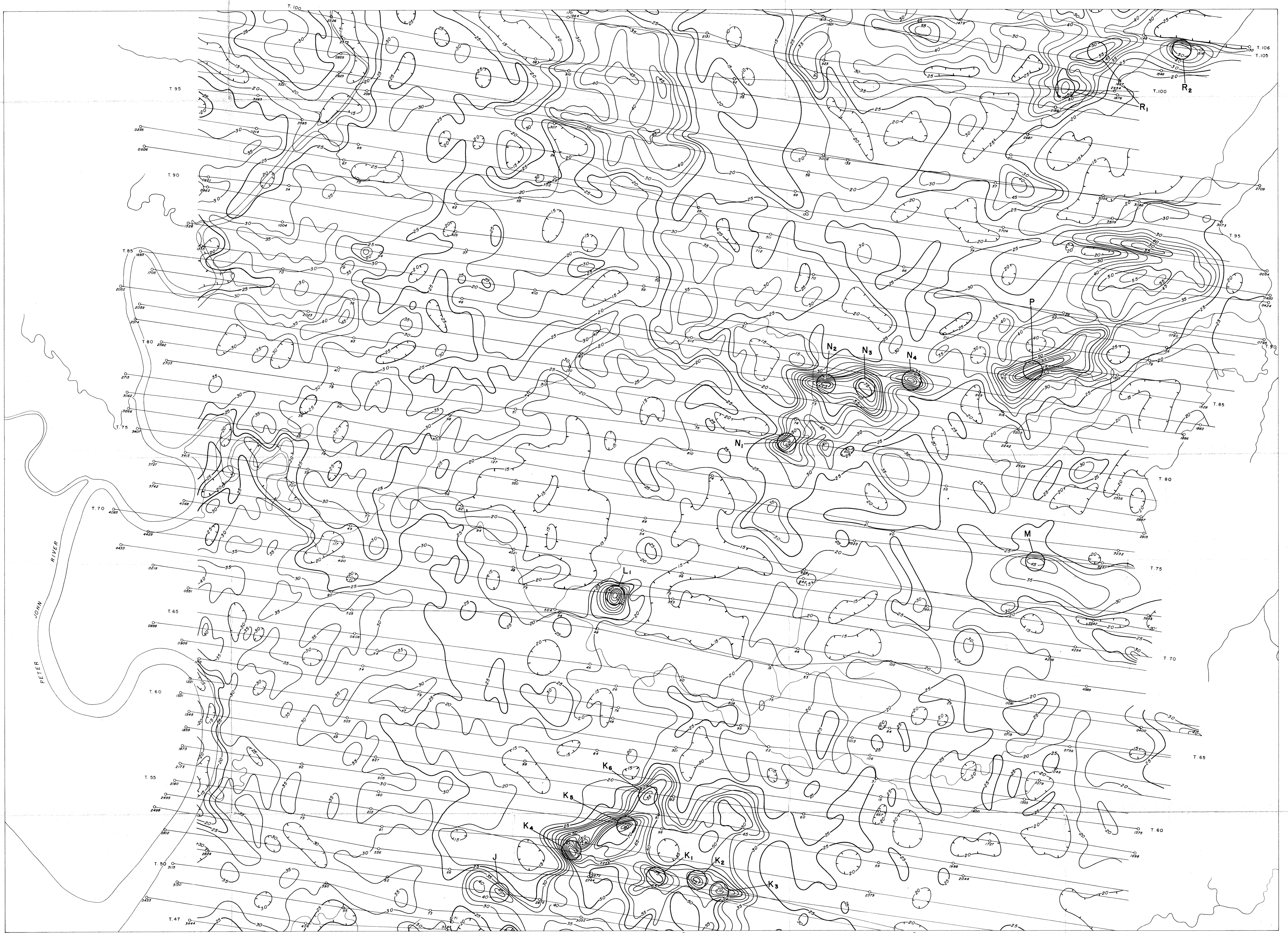
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CHANNEL 3 (1.6 TO 20 MeV) CONTOURS
AIRBORNE RADIOMETRIC SURVEY
MOUNT BONNER AREA - N.T.

NORANDA AUSTRALIA LIMITED

SCALE 1" = 2000' (APPROX)

SURVEYED AND COMPILED 1968 BY
GEOPHYSICAL RESOURCES DEVELOPMENT CO.
RAMSGATE, N.S.W.

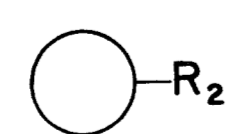


CHANNEL 3 (1.6 TO 2.0 MeV) CONTOURS

AIRBORNE RADIOMETRIC SURVEY
MOUNT BONNER AREA - N.T.

NORANDA AUSTRALIA LIMITED

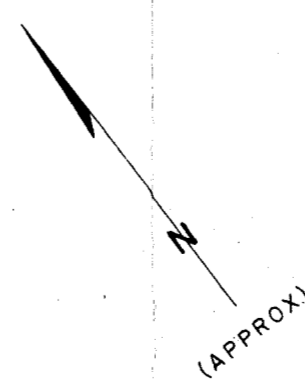
SCALE 1" = 2000' (APPROX.)



ANOMALIES OF INTEREST
DETAILS IN REPORT

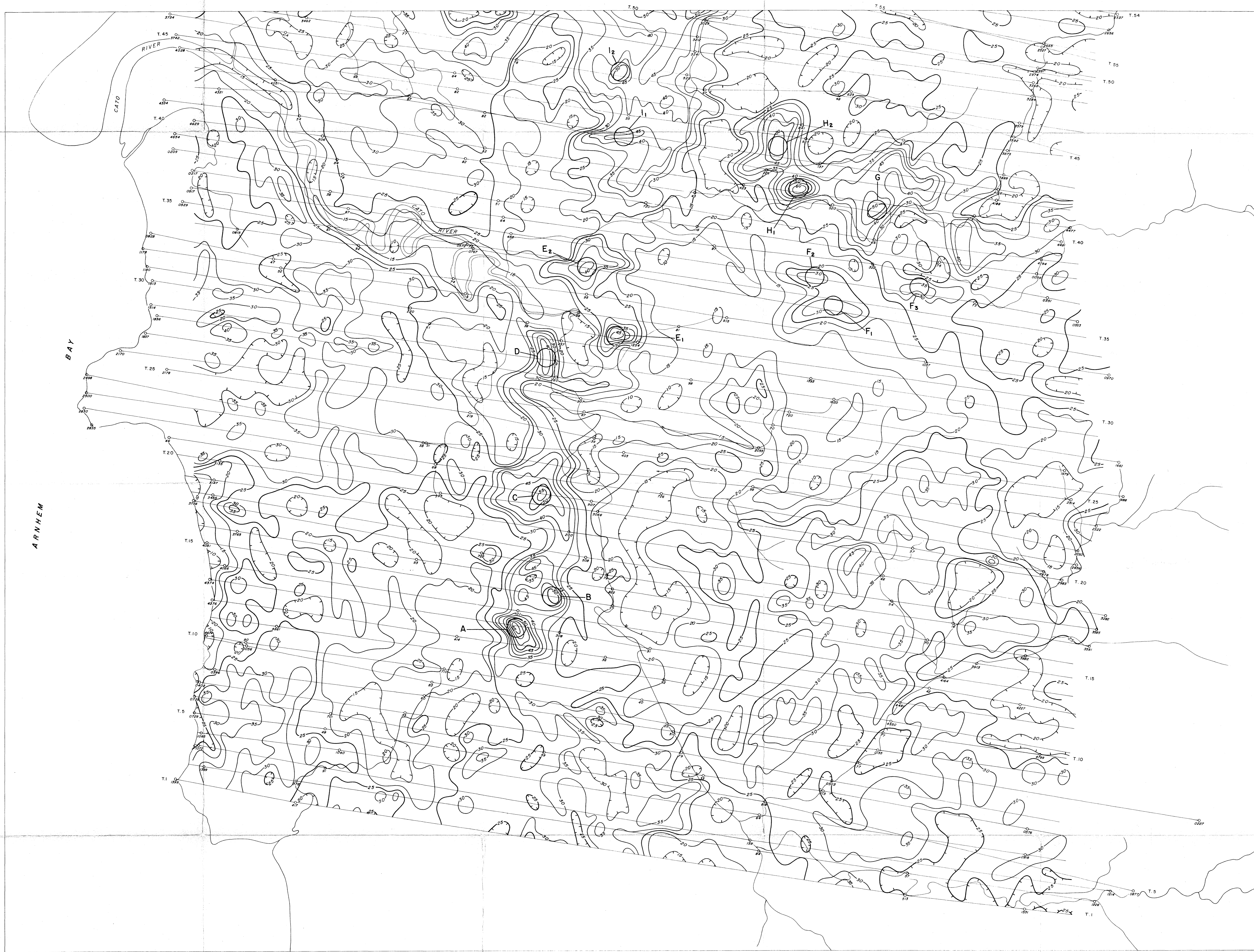
FLIGHT LINE INTERVAL - 1000 FEET
FLIGHT ALTITUDE - 300 FEET MTC
CONTOUR INTERVAL - 5 COUNTS

HORIZONTAL CONTROL BASED ON PHOTO
ASSEMBLY COMPILED BY GEOPHYSICAL
RESOURCES DEVELOPMENT CO., RAMSGATE

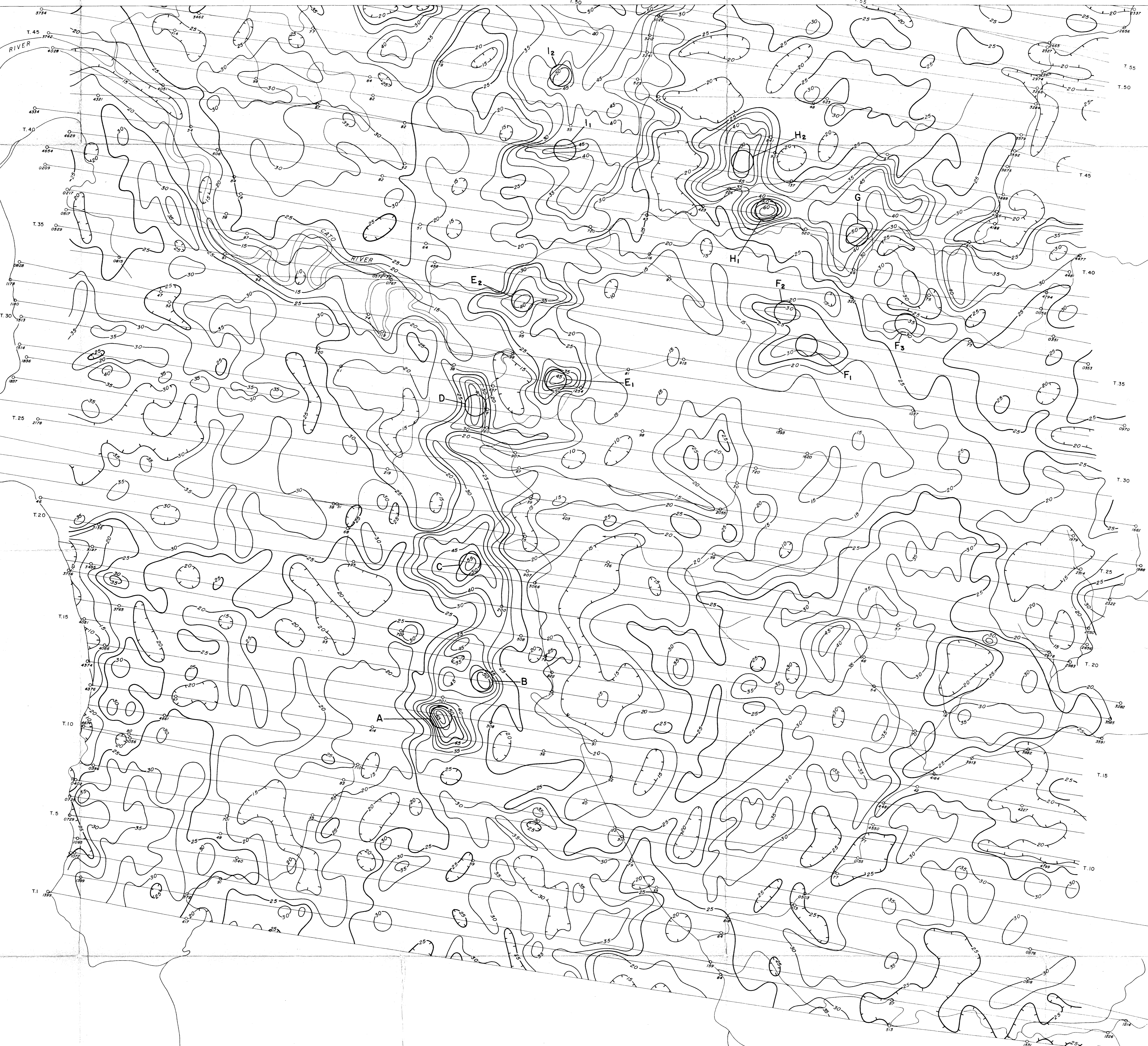


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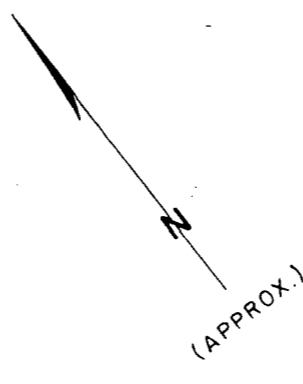
ARNHEM
BAY



○-R₂ ANOMALIES OF INTEREST
DETAILS IN REPORT

FLIGHT LINE INTERVAL - 1000 FEET
FLIGHT ALTITUDE - 300 FEET MTC
CONTOUR INTERVAL - 5 COUNTS

HORIZONTAL CONTROL BASED ON PHOTO
ASSEMBLY COMPILED BY GEOPHYSICAL
RESOURCES DEVELOPMENT CO., RAMSGATE.



SHEET INDEX

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3

CHANNEL 3 (1.6 TO 2.0 MeV) CONTOURS
AIRBORNE RADIOMETRIC SURVEY
MOUNT BONNER AREA - NT.

NORANDA AUSTRALIA LIMITED

SCALE 1" = 2000' (APPROX.)

SURVEYED AND COMPILED 1968 BY
GRD GEOPHYSICAL RESOURCES DEVELOPMENT CO.,
RAMSGATE, N.S.W.