

PROSPECTING AUTHORITY NO. 1966

BLUE MUD BAY, NORTHERN TERRITORY

REPORT FOR YEAR ENDED JUNE 10, 1969

**OPEN FILE**

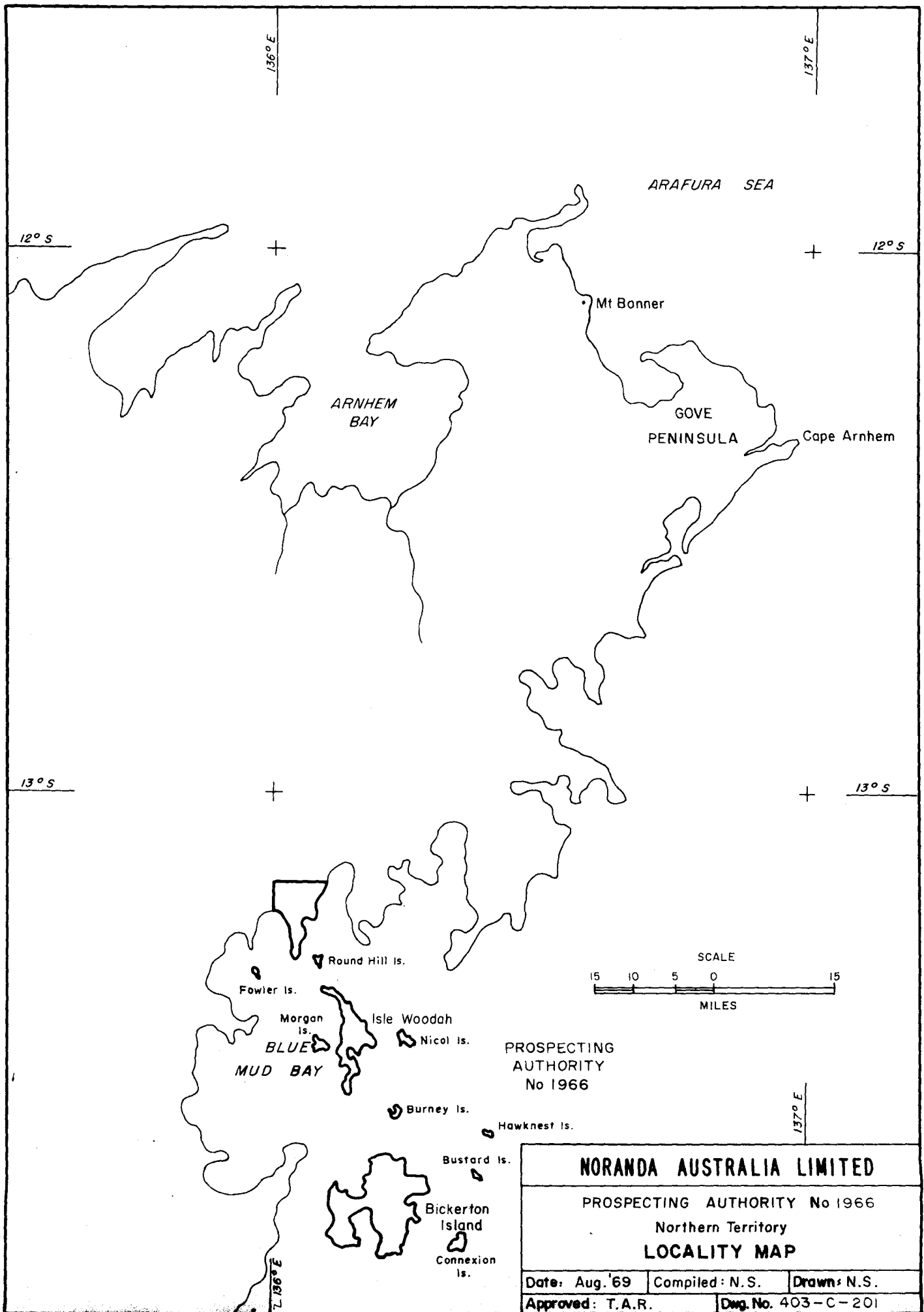
Report No. 124

August, 1969.

By

G. C. BATTEY

Melbourne, Australia



ARAFURA SEA

12° S

12° S

136° E

137° E

Mt Bonner

ARNHEM BAY

GOVE PENINSULA

Cape Arnhem

13° S

13° S

Round Hill Is.

Fowler Is.

Morgan Is.

BLUE MUD BAY

Isle Woodah

Nicol Is.

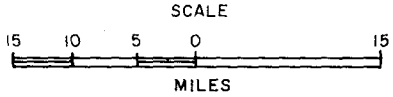
Burney Is.

Hawknest Is.

Bustard Is.

Bickerton Island

Connexion Is.



PROSPECTING AUTHORITY No 1966

137° E

136° E

<b>NORANDA AUSTRALIA LIMITED</b>		
PROSPECTING AUTHORITY No 1966		
Northern Territory		
<b>LOCALITY MAP</b>		
Date: Aug. '69	Compiled: N.S.	Drawn: N.S.
Approved: T.A.R.	Dwg. No. 403-C-201	

LIST OF PLATES

Locality Map		Frontispiece ✓
<u>Plate No.</u>		
1	Blue Mud Bay - Contour Map - Radiometric Survey	In Pocket
✓ 2	Isle Woodah - Sheet 1 - Contour Map - Radiometric Survey	" "
✓ 3	" " - Sheet 2 - Contour Map - Radiometric Survey	" "
✓ 4	Bickerton Island - Sheet 1 - Contour Map - Radiometric Survey	" "
✓ 5	" " - Sheet 2 - Contour Map - Radiometric Survey	" "

NORANDA AUSTRALIA LIMITED

PROSPECTING AUTHORITY NO. 1966 - BLUE MUD BAY

REPORT FOR YEAR ENDED JUNE 10, 1969

1. INTRODUCTION

Noranda Australia Limited on February 19, 1968, applied for a Prospecting Authority covering a portion of eastern Arnhem Land and a number of adjacent islands in the vicinity of Blue Mud Bay. Prospecting Authority No. 1966 was granted for a period of 12 months commencing June 11, 1968. It covers an area of approximately 160 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 Groote Eylandt Beds are regarded as time equivalents of the uranium-bearing Westmoreland Conglomerate which outcrops some 200 miles to the south. Moreover, the presence of the Bickerton Volcanics was considered important because of the association of uranium mineralisation with similar volcanics in other areas within the Carpentaria Province.

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.

The contract for the airborne spectrometer survey covered Prospecting Authorities Nos. 1966 (Blue Mud Bay) and 1967 (Walker River), and totalled 1,334 line miles at a line spacing of 1000 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 five plates 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

Arrangements have been made to conduct a field examination of all anomalies during 1969. It will prove necessary to use a helicopter as access is difficult in many cases.

3. EXPENDITURE

Expenditure to May 31, 1969, on this Prospecting Authority was \$7,981.00.

August 22, 1969.

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

APPENDIX I

REPORT ON THE INTERPRETATION OF THE RESULTS  
OF THE AIRBORNE SPECTROMETER SURVEY OVER  
THE BLUE MUD BAY AND IMMEDIATE ISLANDS AREA,  
NORTHERN TERRITORY

INTRODUCTION

The airborne spectrometer survey over Blue Mud Bay and the following islands:-

- Bickerton
- Bustard
- Roundhill
- Morgan
- Woodah
- Burney
- Nicol

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 the Nuclear Enterprises Mark XII Spectrometer.

DESCRIPTION OF THE RESULTS

The results of this survey have been presented as Uranium Channel contour maps, the contour interval being five counts per second.

These Uranium contour maps have been examined in detail. Every anomaly or anomalous area having been studied with subsequent thorough examination of the spectrometer recorder charts on all channels, since radiometric contour maps can quite often be misleading insofar as they do not completely express the shape or sharpness of the responses, which are valuable criteria of an anomaly's importance.

The contour maps were used for the positioning of those anomalies which are considered worthy of ground follow-up.

It is not the author's intention to discuss the methods used in interpretation at this stage, and the report will be limited to pin-pointing areas of interest.

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

Altogether, anomalies are thought to have been caused by varying concentration of Uranium mineralisation. It must, however, be understood at this stage that any number (if not all) of these may prove to be uneconomic.

However, a number of these anomalies appear as being most promising and, as such, have been allotted a priority 1 in the list of anomalies attached to the back of this report. Only anomalies which are thought to be of interest have been listed. They include three anomalies of priority 1, four with priority 2 and two with priority 3. The remaining anomalies are thought to be due to the higher radio-activity of different rock types in the area but it is strongly recommended that these, too, be examined on the ground. The suspected rock types are indicated in the list of anomalies attached.

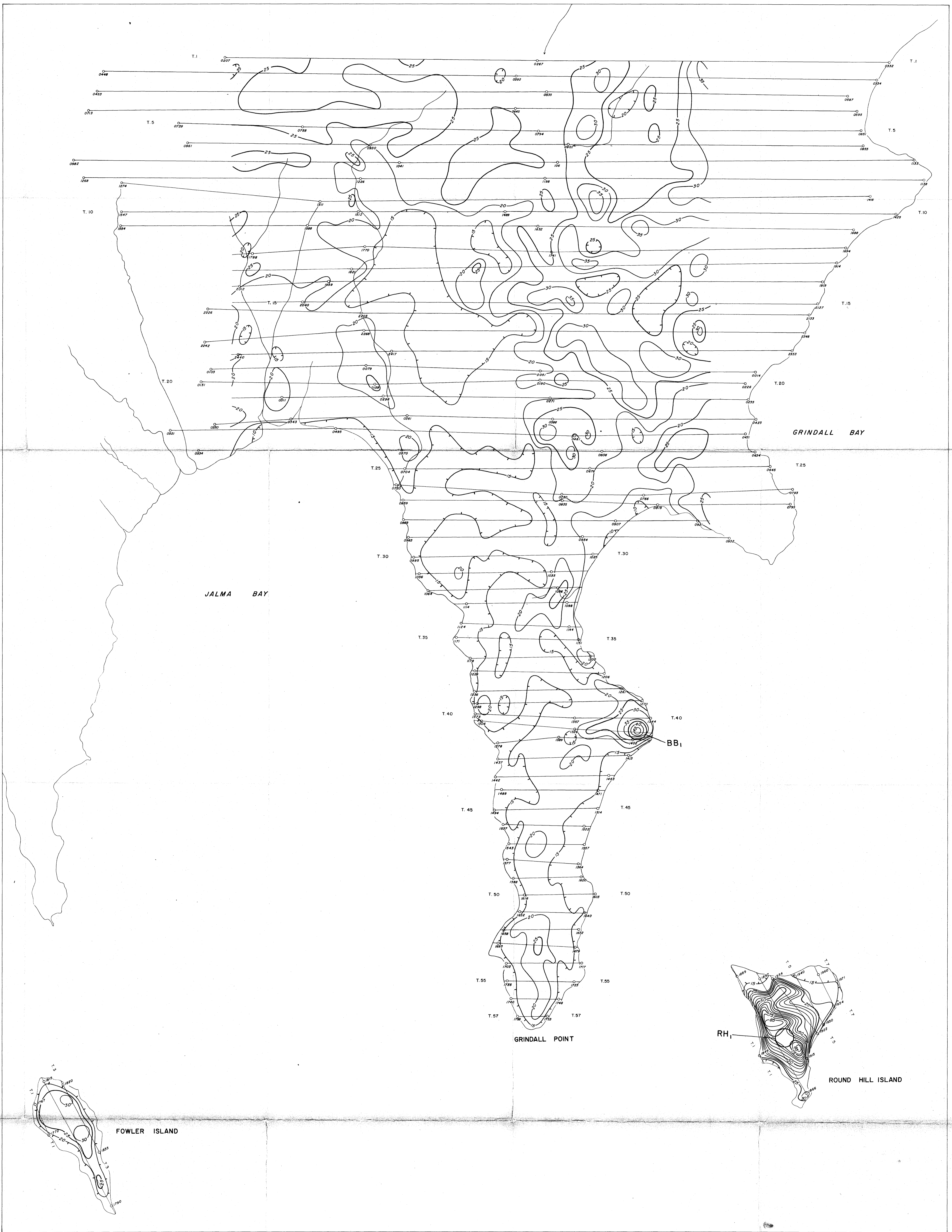
All the anomalies have been identified with letters and numerals and are shown on the accompanying maps.

P. Woyzbun,  
Geophysicist.



<u>Anomaly</u>	<u>Priority</u>	<u>Location</u>	<u>Traverse</u>	<u>Suspect Rock Type</u>
BB1	2	Blue Mud Bay	T40A	Grindall Metamorphics
RH1	1	Round Hill Is.	2-3	Bickerton Volcanics - Grindall Metamorphics
D1	3	Woodah Island	36	Groote Eylandt Beds
D2	3	" "	2-3	" " "
C1	2	Morgan Island	33	" " "
C2	2	" "	39 & 41	Grindall Metamorphics
H1	1	Buštard Island	3	Bickerton Volcanics
J1	1	Bickerton Island	39-40	Bickerton Volcanics
J2	2	" "	42	Bickerton Volcanics

---

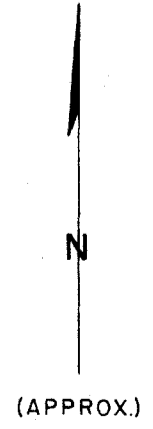


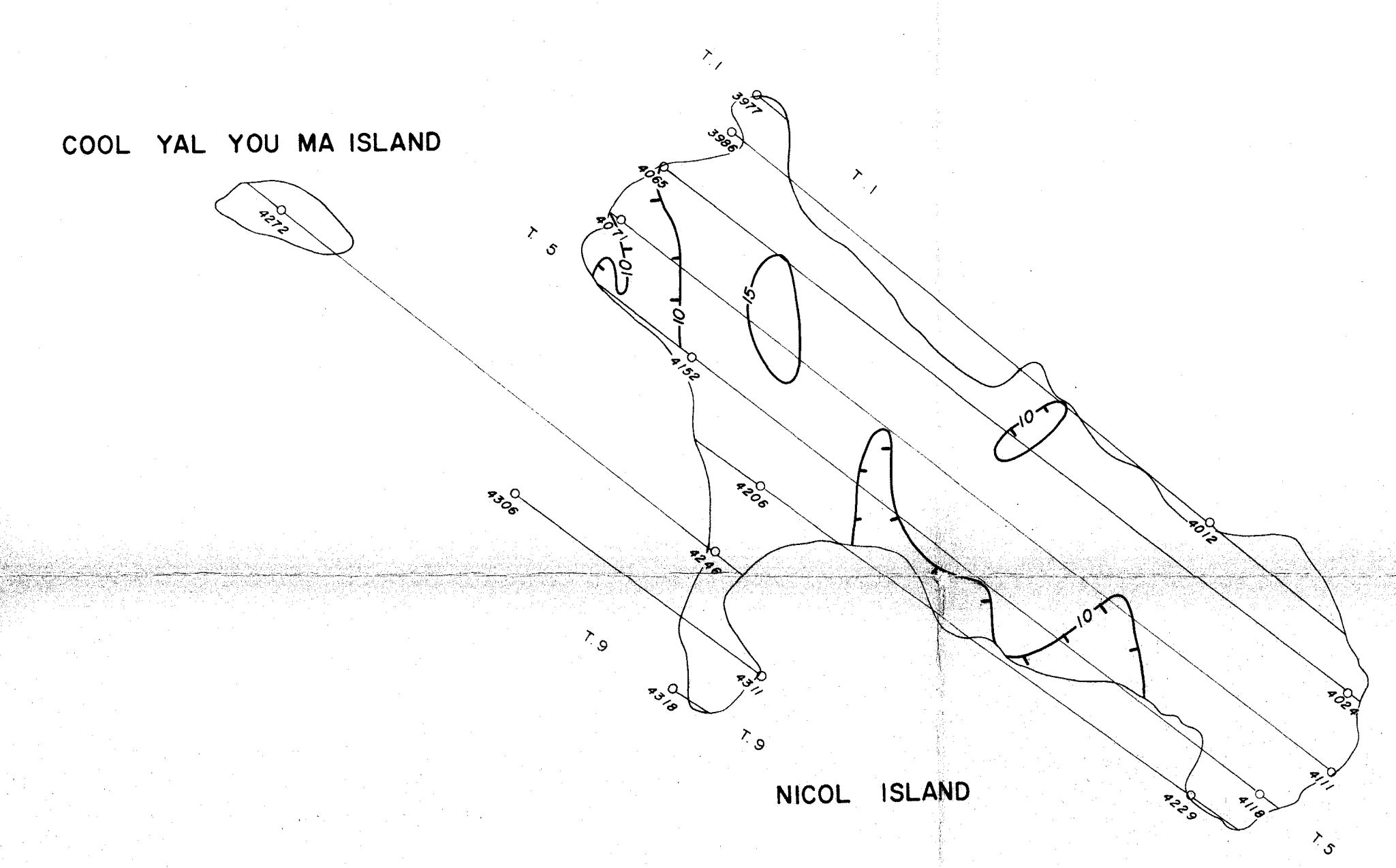
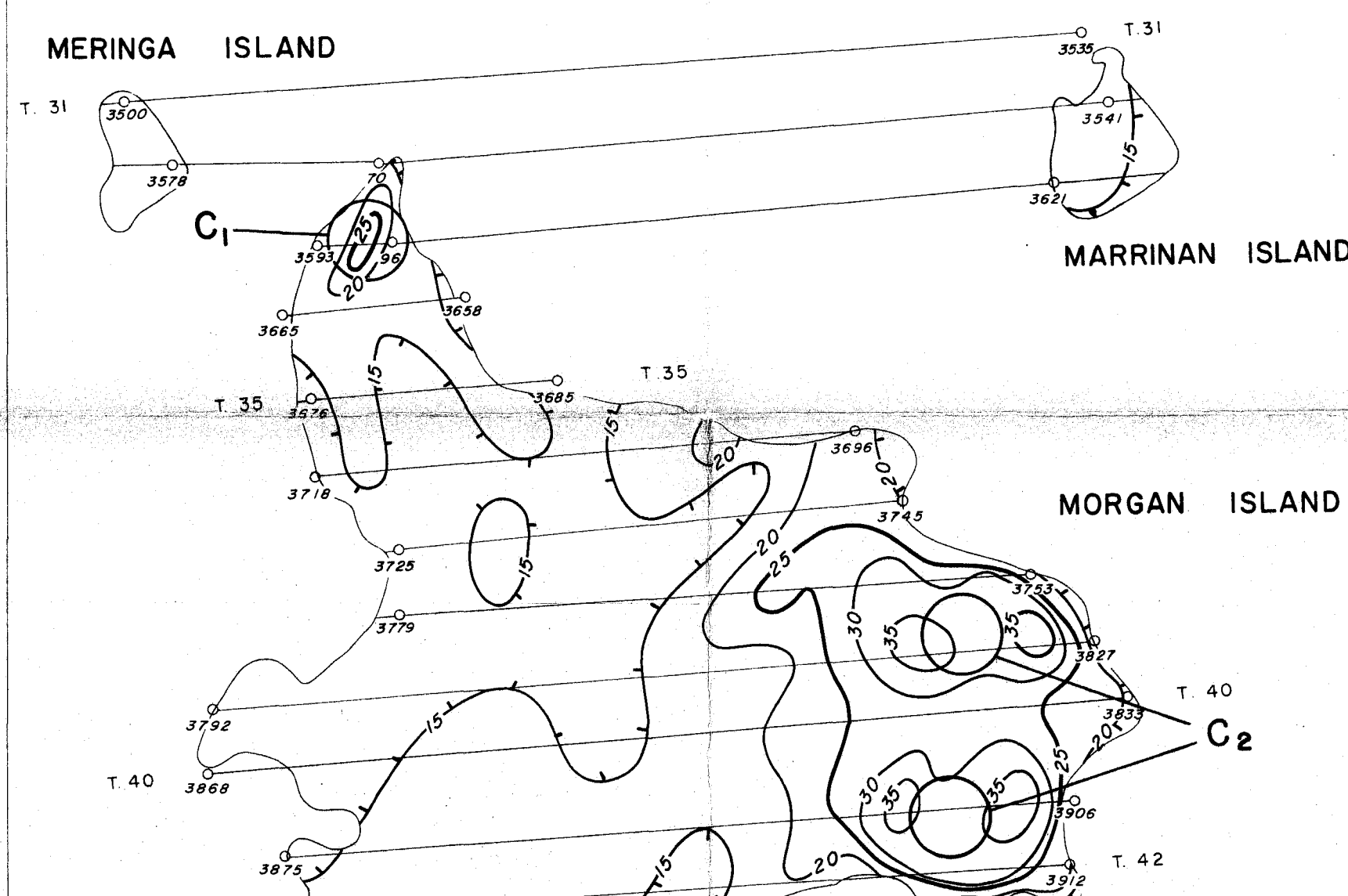
CHANNEL 3 (1.6 TO 2.0 MeV) CONTOURS  
 AIRBORNE RADIOMETRIC SURVEY  
 BLUE MUD BAY AREA - N.T.  
 NORANDA AUSTRALIA LIMITED  
 SCALE 1" = 2000'(APPROX.)

FLIGHT LINE INTERVAL - 1000 FEET  
 FLIGHT ALTITUDE - 300 FEET M.T.C.  
 CONTOUR INTERVAL - 5 COUNTS

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

BB ANOMALIES OF INTEREST  
 DETAILS IN REPORT

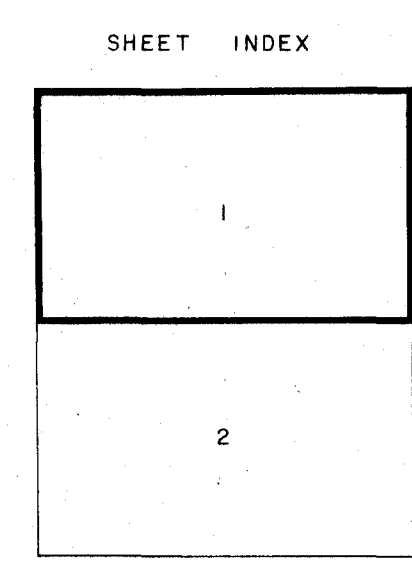
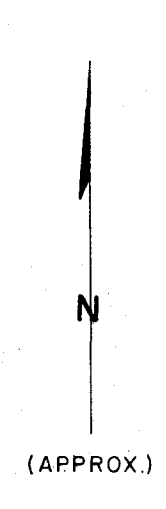




○ C ANOMALIES OF INTEREST  
DETAILS IN REPORT

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.

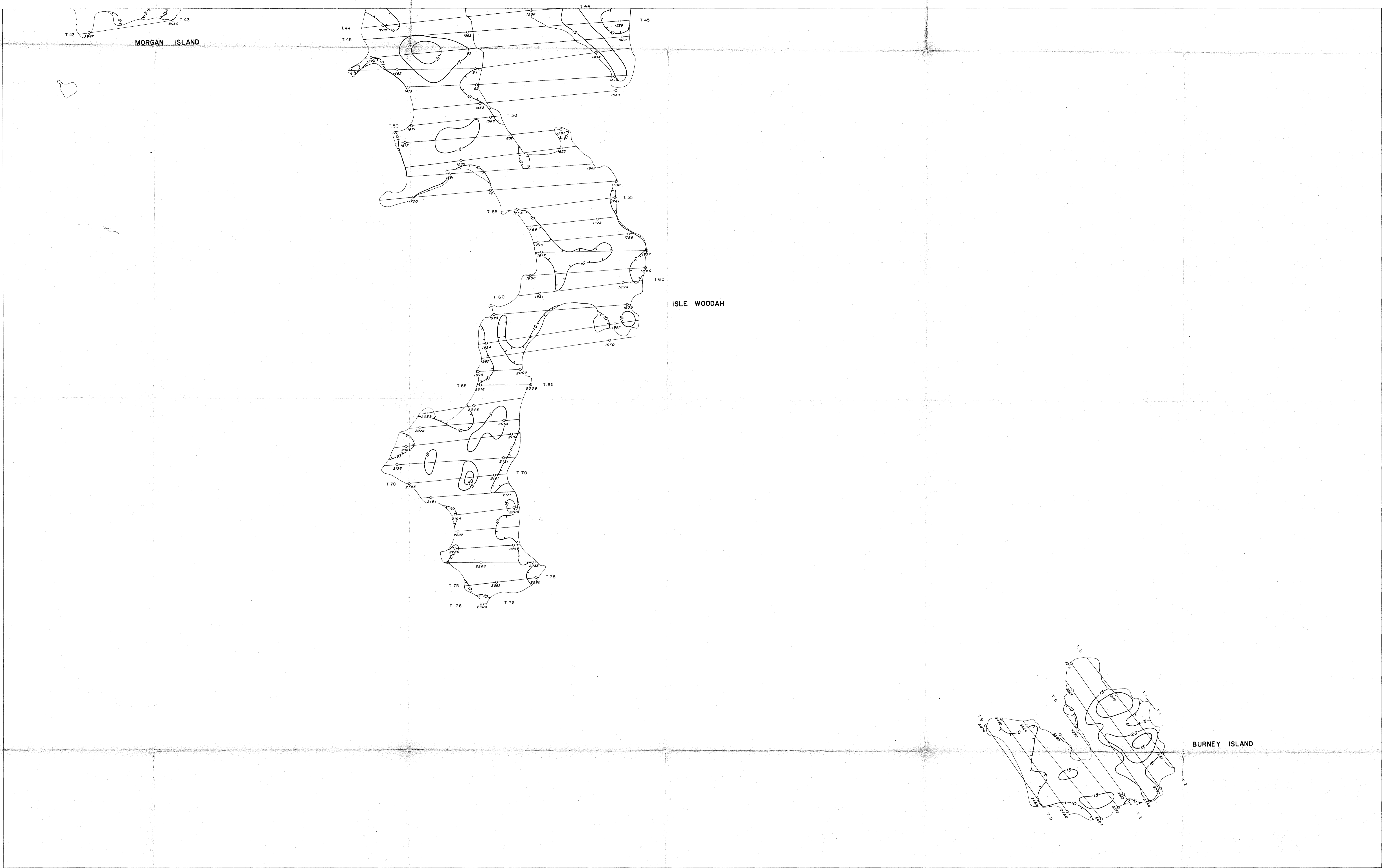


CHANNEL 3 (1.6 TO 2.0 MeV) CONTOURS  
AIRBORNE RADIOMETRIC SURVEY  
ISLE WOODAH AREA - N.T.

NORANDA AUSTRALIA LIMITED

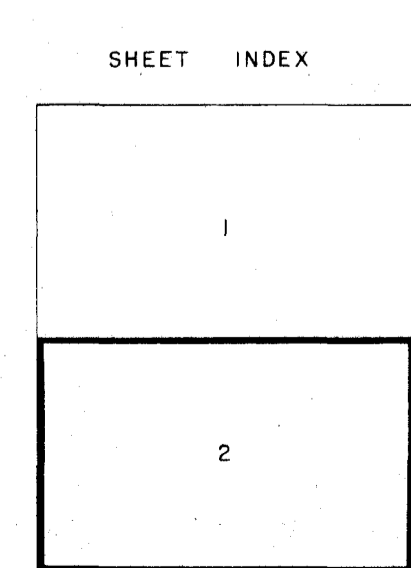
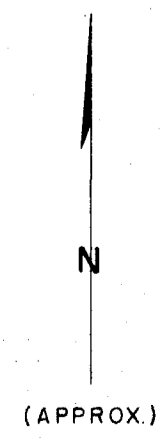
SCALE 1" = 2000'(APPROX.)





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.

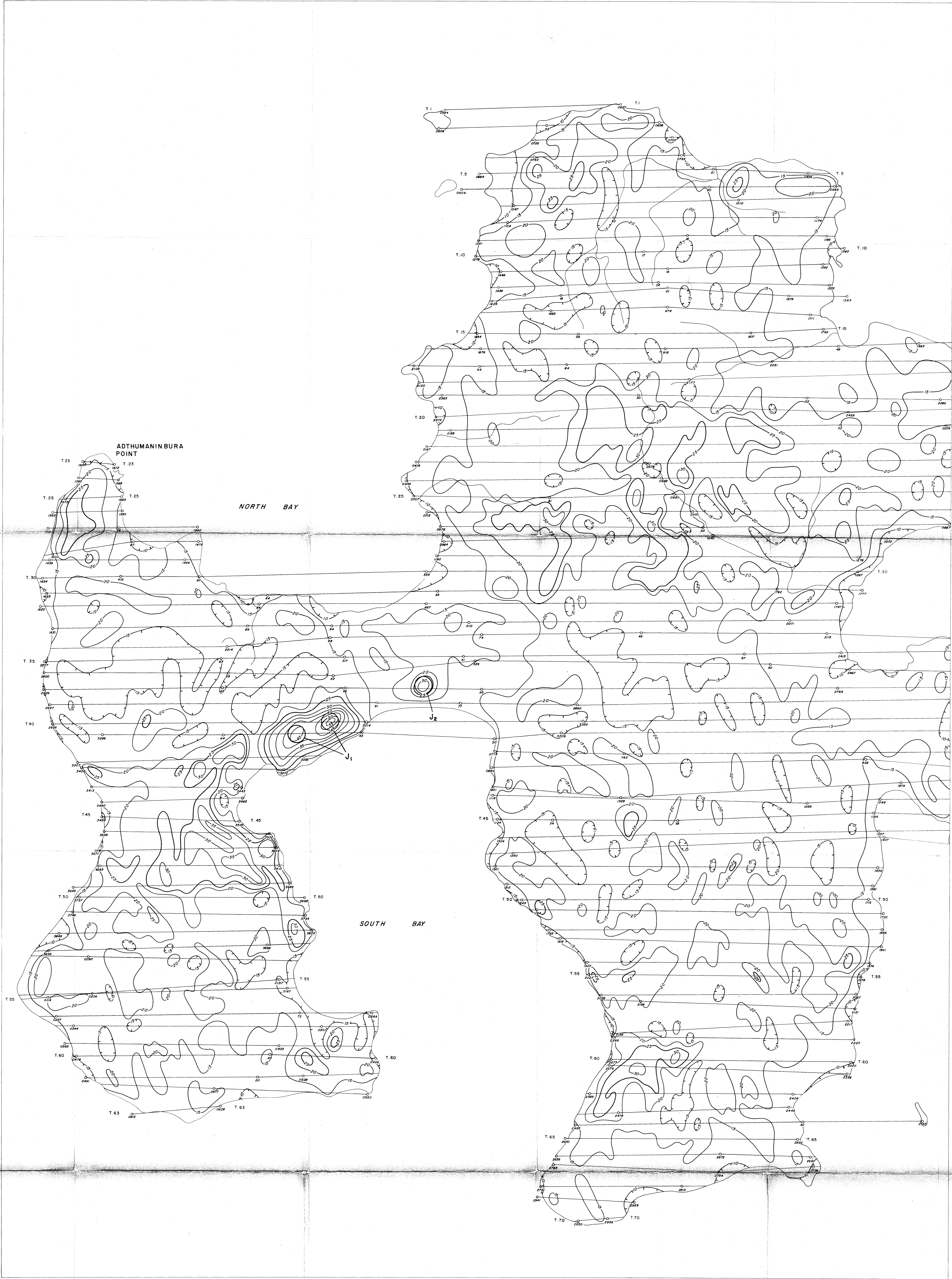


CHANNEL 3 (1.6 TO 2.0 MeV) CONTOURS  
 AIRBORNE RADIOMETRIC SURVEY  
 ISLE WOODAH AREA - N.T.

NORANDA AUSTRALIA LIMITED

SCALE 1" = 2000'(APPROX.)





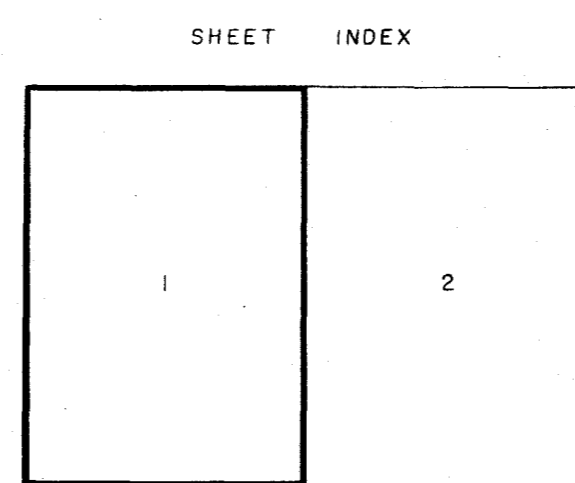
ADTHUMANINBURA  
POINT

NORTH BAY

SOUTH BAY

FLIGHT LINE INTERVAL — 1000 FEET  
 FLIGHT ALTITUDE — 300 FEET WIC.  
 CONTOUR INTERVAL — 5 COUNTS

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



CHANNEL 3 (1.6 TO 2.0 MeV) CONTOURS  
 AIRBORNE RADIOMETRIC SURVEY  
 BICKERTON ISLAND AREA - N.T.

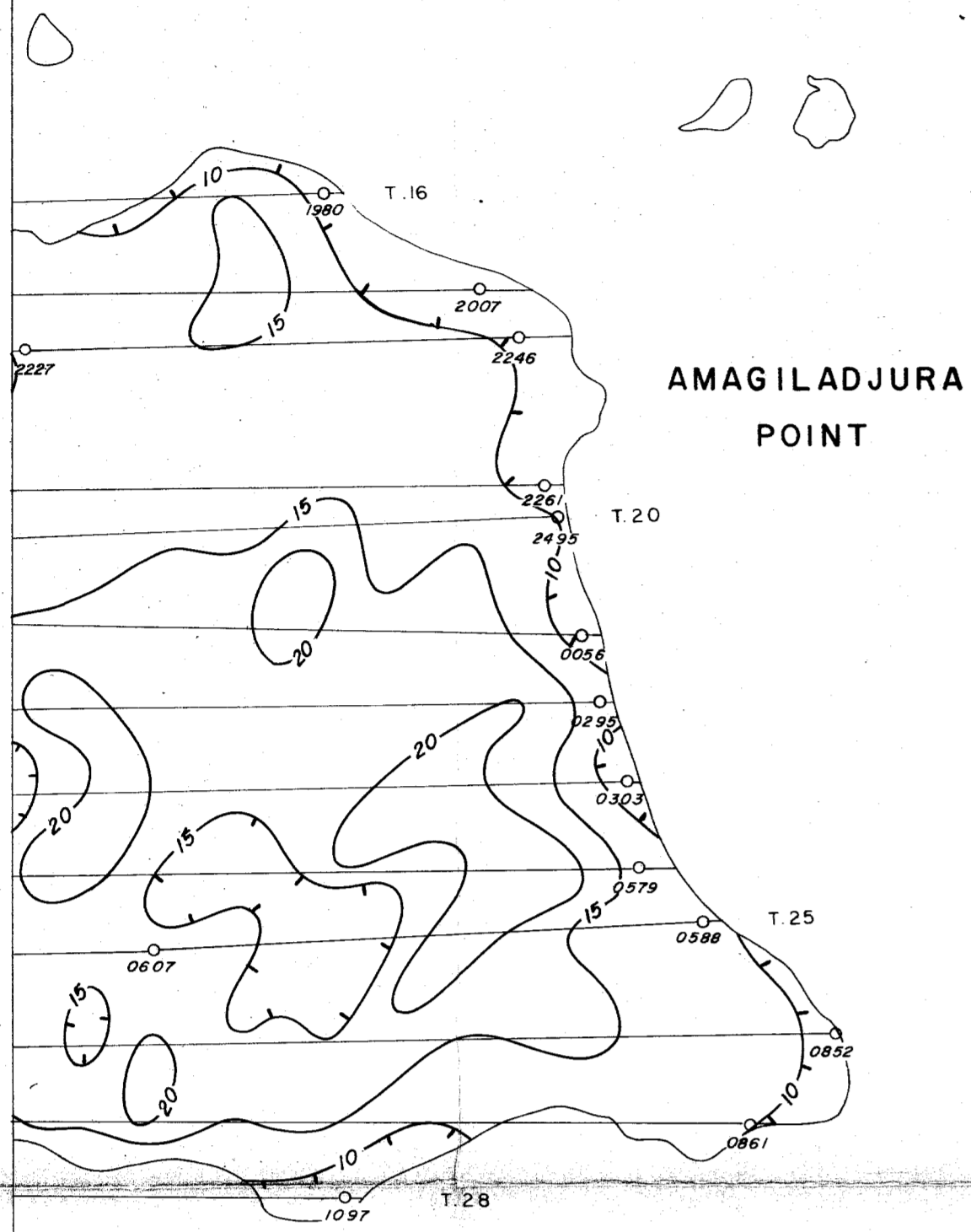
NORANDA AUSTRALIA LIMITED

SCALE 1" = 2000' (APPROX.)

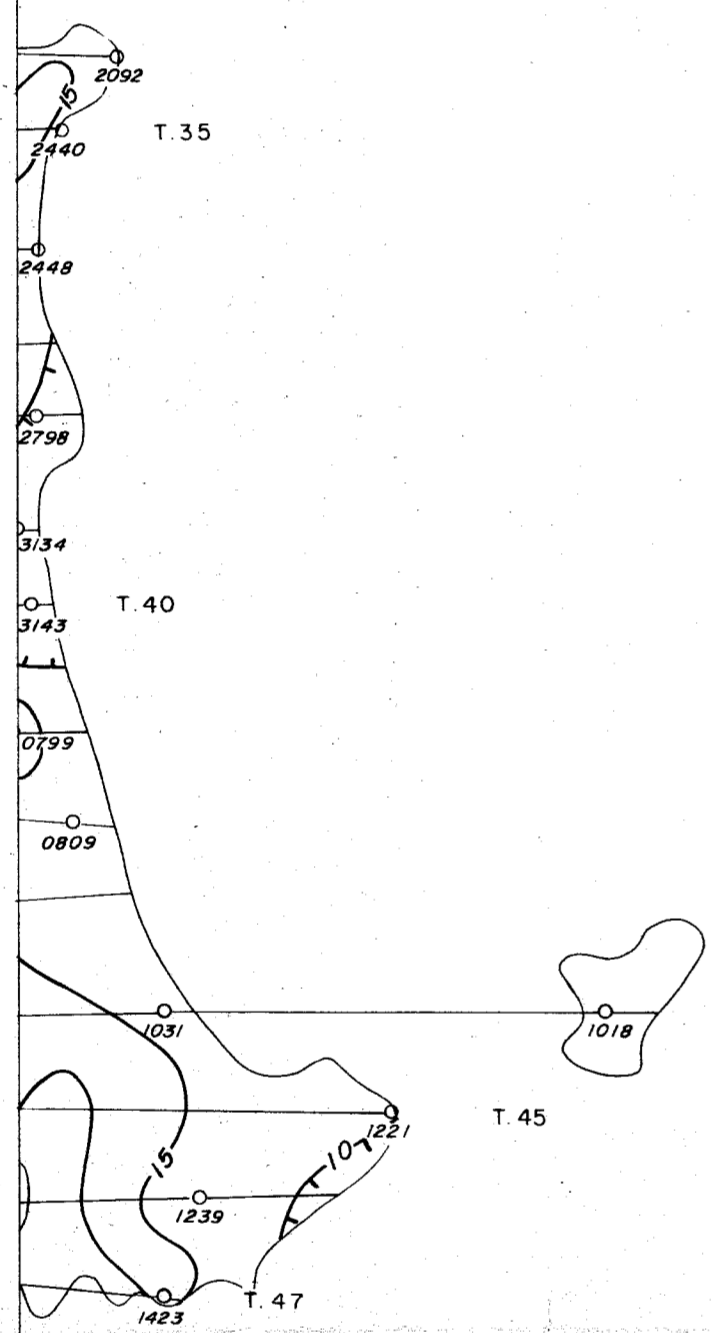
SURVEYED AND COMPILED 1968 BY  
 GEOPHYSICAL RESOURCES DEVELOPMENT CO.,  
 RANGSATE, N.S.W.  
 CR 63/29  
 SHEET 1

PLATE 4

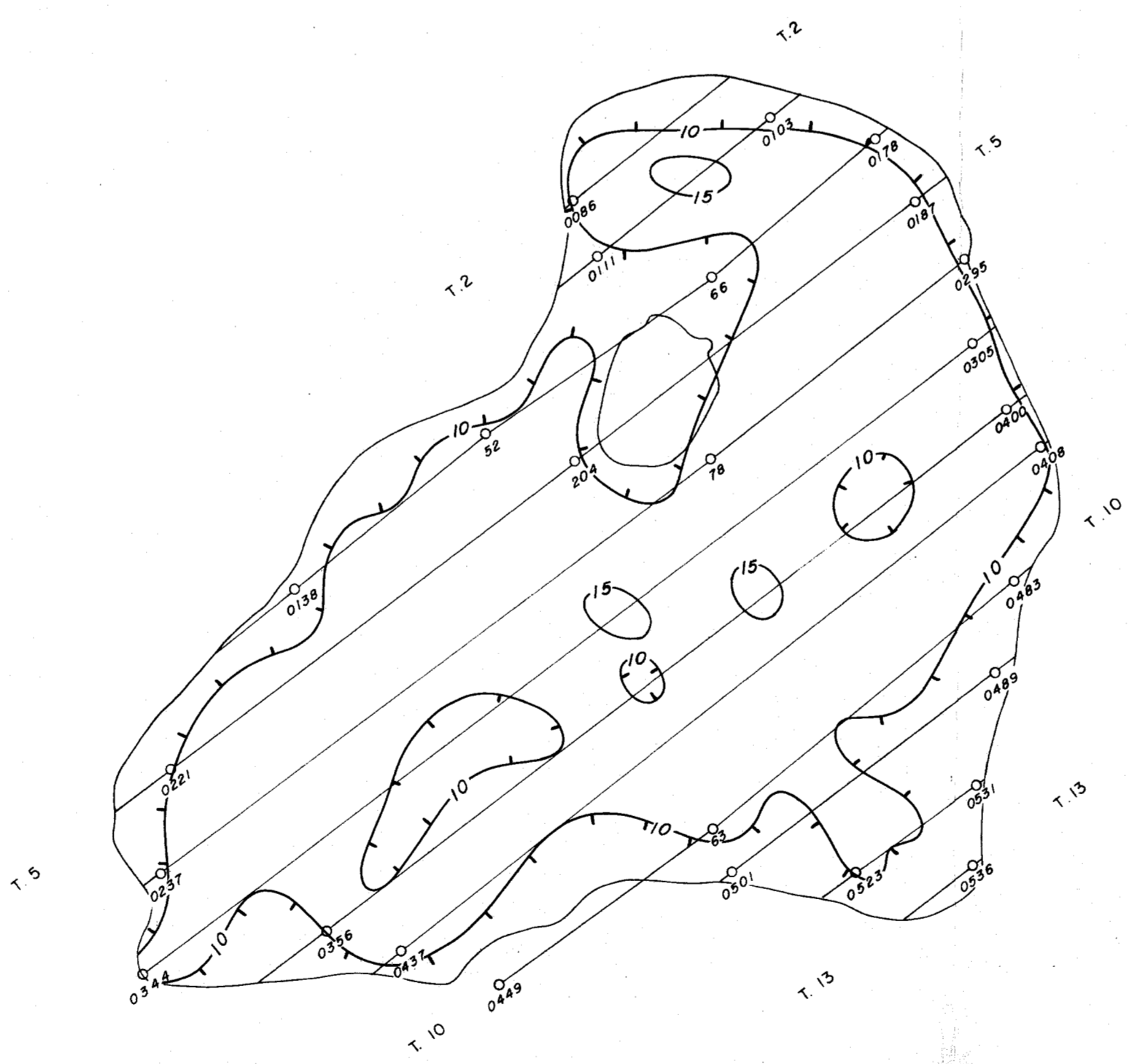




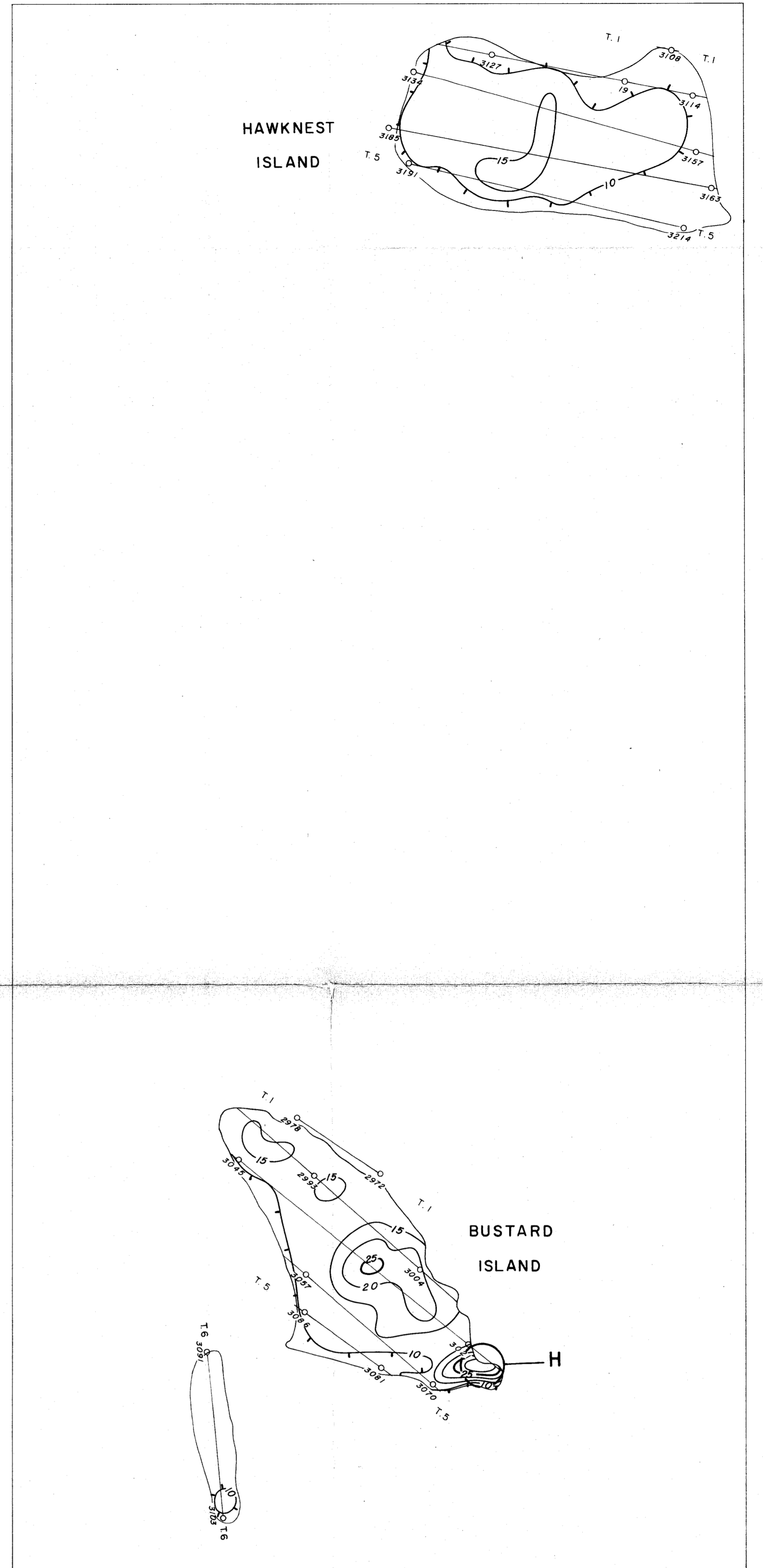
AMAGILADJURA  
POINT



WARWICK  
CHANNEL



CONNEXION ISLAND



HAWKNEST  
ISLAND

BUSTARD  
ISLAND

○ H 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

N  
(APPROX.)

SHEET INDEX	
1	2

CHANNEL 3 (1.6 TO 2.0 MeV) CONTOURS  
AIRBORNE RADIOMETRIC SURVEY  
BICKERTON ISLAND AREA - N.T.

NORANDA AUSTRALIA LIMITED

SCALE 1" = 2000' (APPROX.)

SURVEYED AND COMPILED 1968 BY  
GEOPHYSICAL RESOURCES DEVELOPMENT CO.  
RAMSGATE, N.S.W. CR 69/29

PLATE 5 SHEET 2