

Q51/62  
(K)

Q-51

623001

**RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED**  
**MELBOURNE, AUSTRALIA**

**PROJECT:—**

**REPORT No.:—**

GEOPHYSICAL SURVEYS  
GOOSENECK AREA, TASMANIA

by

J.B. Boniwell

**GEOPHYSICS**

58-249

Geophysical Surveys, Gooseneck Area  
J.B. Boniwell 17/10/58

**FILE REFERENCE:—**

**MAP REFERENCE:—** T468 - T471

**DATE:—** 17/10/58

623

(10)

000

## Geophysical Surveys

GOOSENECK AREA, Tas.

MICROFILMED

A large North-South embayment in the upthrown residues of the Owen Rift Valley whose in-filling conglomerates are represented locally by the Gooseneck to the West, and the southern part of the Marchison to the East, was covered electromagnetically. The Cambrian rocks so exposed must express some structural by-product of the main rift movement, and as such, are a favoured setting for mineralisation.

WORK

An orthogonal grid of lines controlled by a Base-line bearing 342 degrees azimuth and spaced at 400' intervals, was cut and picketed at approximately 100' stations. A dual frequency, horizontal loop method (Turam) provided the primary coverage. The results from the lower frequency only, viz. 440 cps. have been compiled into two conjunctive plans, on which, for convenience, the grid has been idealised.

Audliary gravimetric and magnetic coverage succeeded the primary phase, and was confined to the electrically anomalous zones only. Three various overlays depict their results.

The reduction of the gravity data to Bouguer values was based on a surface density of 2.65 gms./cc., and the further reduction to residual values was achieved by the empirical removal of regional effects. As might be expected over so extensive a strip of rugged country, the latter were not consistently uniform, but care was taken, where possible, not to err on the side of exaggeration.

DISCUSSION OF RESULTS

The results of the primary coverage was marked by the discovery, in the eastern half of the area, of a large order zone of conduction varying in quality from medium to good. It was traced for a total distance of 5000', and can be presumed to continue even further, especially to the North. This zone, for the most part, displays a consistent dip to the West of about 55-60 degrees, although to the South (line 70S) where a thickening and varying overburden has possibly distorted the definition, dips East can be inferred.

A feature of this horizon is the change in strike circa line 48S. The electrical pattern in this vicinity widens, and in such a way to suggest that the southern area persists, perhaps as a distinct entity, as far North as line 36S. The apparent importance of this possible "break" is revealed in the auxiliary evidence.

Both gravimetric and magnetic correlations exist, the latter, albeit, of sporadic incidence and variable characteristics. However, much significance can be attached to the consistent positive gravimetric expression over the zone, particularly as the magnetic activity, where it exists, is of an order and character to presume the presence of magnetic mineralisation. Even so, only the further presence of non-magnetic sulphides can account in full the order of the gravity anomalies, and this conclusion has been heightened by the discovery at surface of pyritised slates coincident with the electrical axis.

This band of black compact slates, approximately 100' wide, could be carbonaceous enough to explain the electrical disturbance, but it is clear that the gravity correlation demands a greater density than the slates would appear to have, later shown to be 2.44 gms./cc. versus 2.72 gms./cc. for the country rock, a quartz felspar porphyry. Thus, it is fairly certain that sulphides exist, and that, in consequence, the conduction is due, in part at least, to the mineralisation.

In many places, the anomalous gravity is too wide to be explained solely by the pyritised slates if they behave in depth as consistently as their surface expression. It appears, therefore, much of the mineralisation is actually contained in the porphyry on either or both walls, and at depths too great for the Vanan method. If such is the case, then the sizable incidence of ore-minerals is a distinct possibility.

However, assuming the mineralisation to be essentially pyritic, and it to be disseminated to the extent of an average 10%-15% total sulphides, then for a strike length of 5000', a tonnage of 20 million tons could be expected, or for 20% total sulphides, a tonnage of 13 million tons. Such bodies, on the gravimetric evidence, would hardly exceed 500' from surface. Although nothing is known of grade, it must be considered unlikely that ore-mineralisation would pervade the whole zone, so that, to be conservative, tonnages considerably less than those given must be allowed. Nonetheless, for a sulphide body of dimensions of 5000' by 200', a figure of 40-45 thousand tons / vertical foot can be deduced, but it is at once clear that this determination is largely dependent on the width given to the body, and, as indicated above, this may vary considerably.

In the vicinity of line 52S, some marked changes occur in the gravimetric and magnetic correlation. These are undoubtedly related to the discontinuity both correlations display at this point, and very probably to the change in strike of the electrical zone. In the South, the correlations are noticeably different: the gravimetric has broadened and is less definitive, whilst the magnetic has reverted polarity. It suggests, as did the electromagnetic earlier, that a differing geophysical entity exists, that, perhaps, the mineralisation and its mode of occurrence has changed.

Much of this sector is covered by a thin veneer of Owen conglomerates. Thus, it is difficult to ascribe causes to the observed effects, but it would seem fairly apparent that a cross-structure, or structures, has produced the geophysical "breaks".

## Summary and Recommendations

A mineralised body of substantial tonnage has been indicated. It appears essentially pyrite, but hanging and foot-wall mineralisation may be significantly different, and, in places, quite extensively disseminated into the porphyrys. Average percentage of total sulphides would appear to lie between 10% - 20%.

It is recommended at the outset, that the mineralised zone be tested by at least three diamond drill holes, sited as follows:

Line 40s, 40 chained feet East along the traverse from station 8E, depression -45 degree, bearing East along the line of sight of traverse.

Line 52S, 50 chained feet West along the traverse from station 4E, depression -50 degrees, bearing East along the line of sight of traverse.

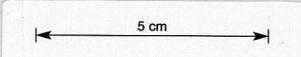
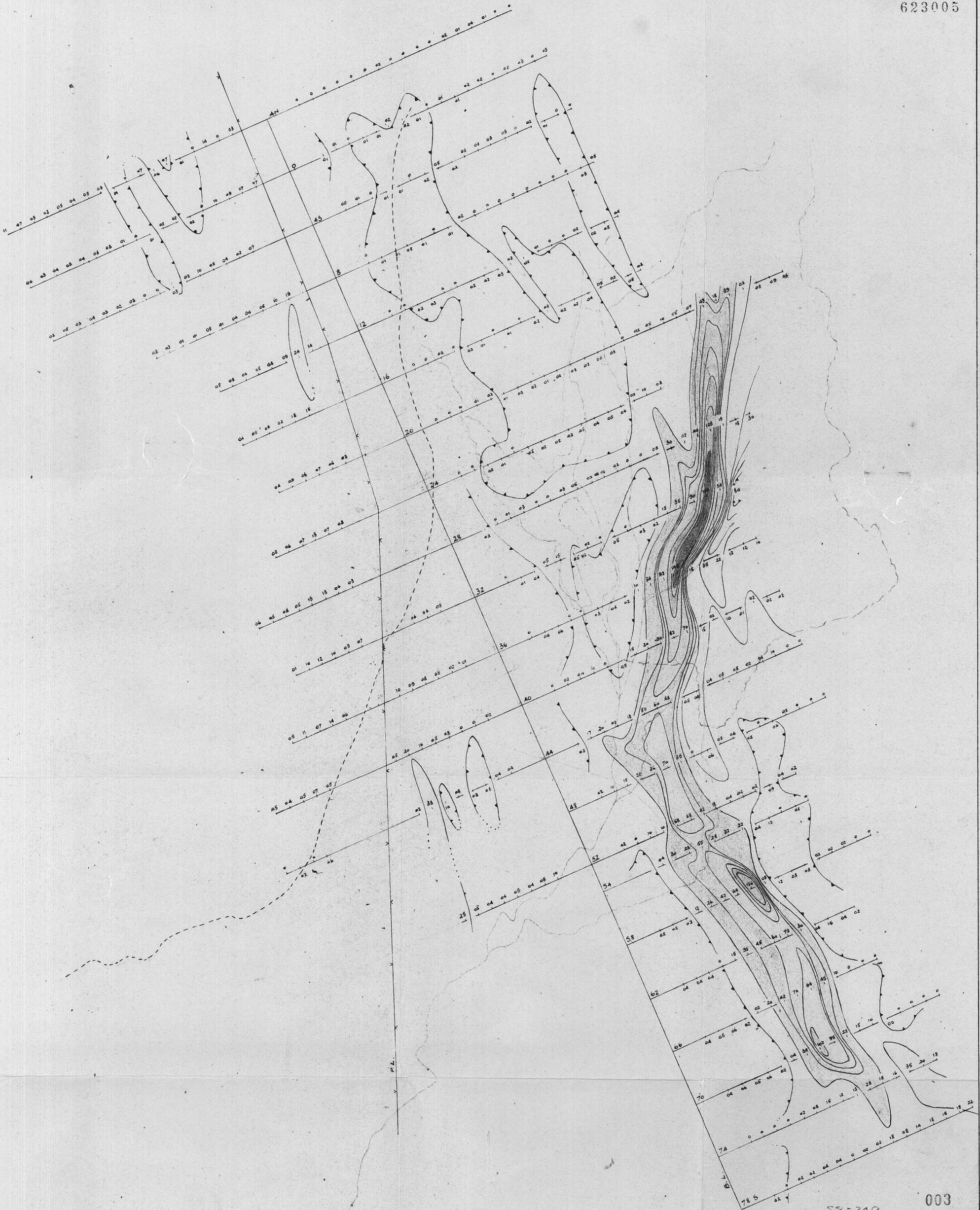
Line 70S, at station 8E, depression -45 degrees, bearing East along the line of sight of traverse.

The estimated lengths would bear 350', 500', 700' respectively.

The three holes are designed to test, on judicious sections, the mineralisation in the North, in the possibly faulted region of the centre, and in the different geophysical setting of the South. The site of the last hole is conditional on dip, since, as indicated, steep East dips may exist here.

17<sup>th</sup> Oct 1958.

J.B.Boniwell



70  
04  
NEGATIVE VALUES (X10)  
POSITIVE VALUES (X10)

Contour Interval  $-2^{\circ}$  (440 c.p.s)

Values ascribed to the point midway between two pegged reference points 100' apart.

003

59-249

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

N. W. TASMANIA

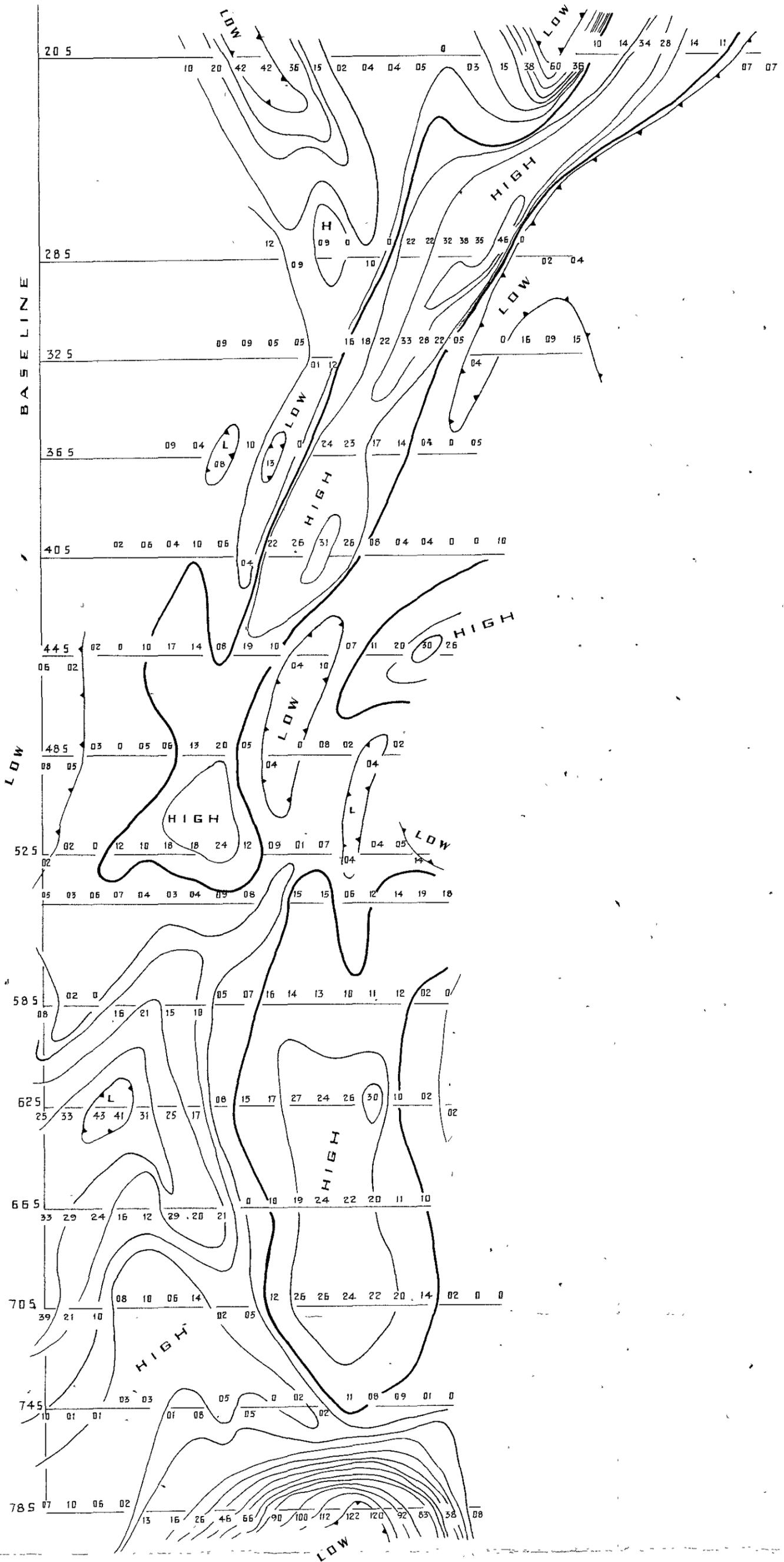
**LINES OF EQUAL PHASE DIFFERENCE**  
**GOOSENECK AREA**

SCALE 400 FT. TO 1 INCH

Geophysicist J. Boniwell

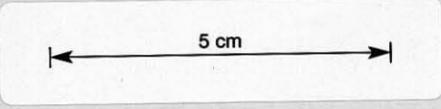
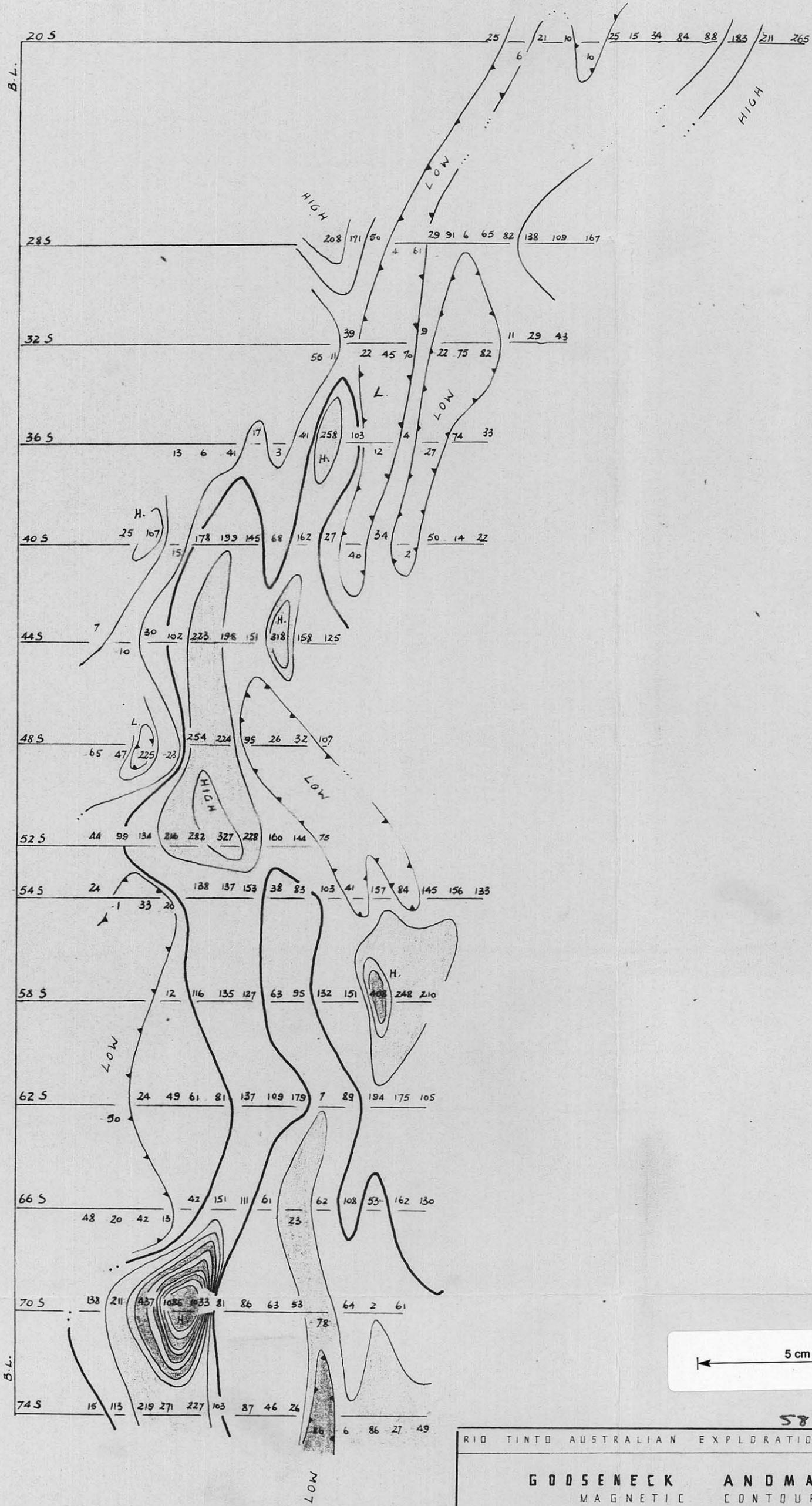
P.R.P. 7/100

**T468**



58-249

RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED	
<b>GOOSENECK ANOMALY RESIDUAL GRAVITY CONTOURS</b>	
CONTOUR INTERVAL 0.10 mgal	
DATE OCTOBER 1958	SCALE: 1 INCH = 400 FEET
GEOPHYSICIST J. BONIWELL	AUTHORITY PRP/7/100 PLAN # T 469

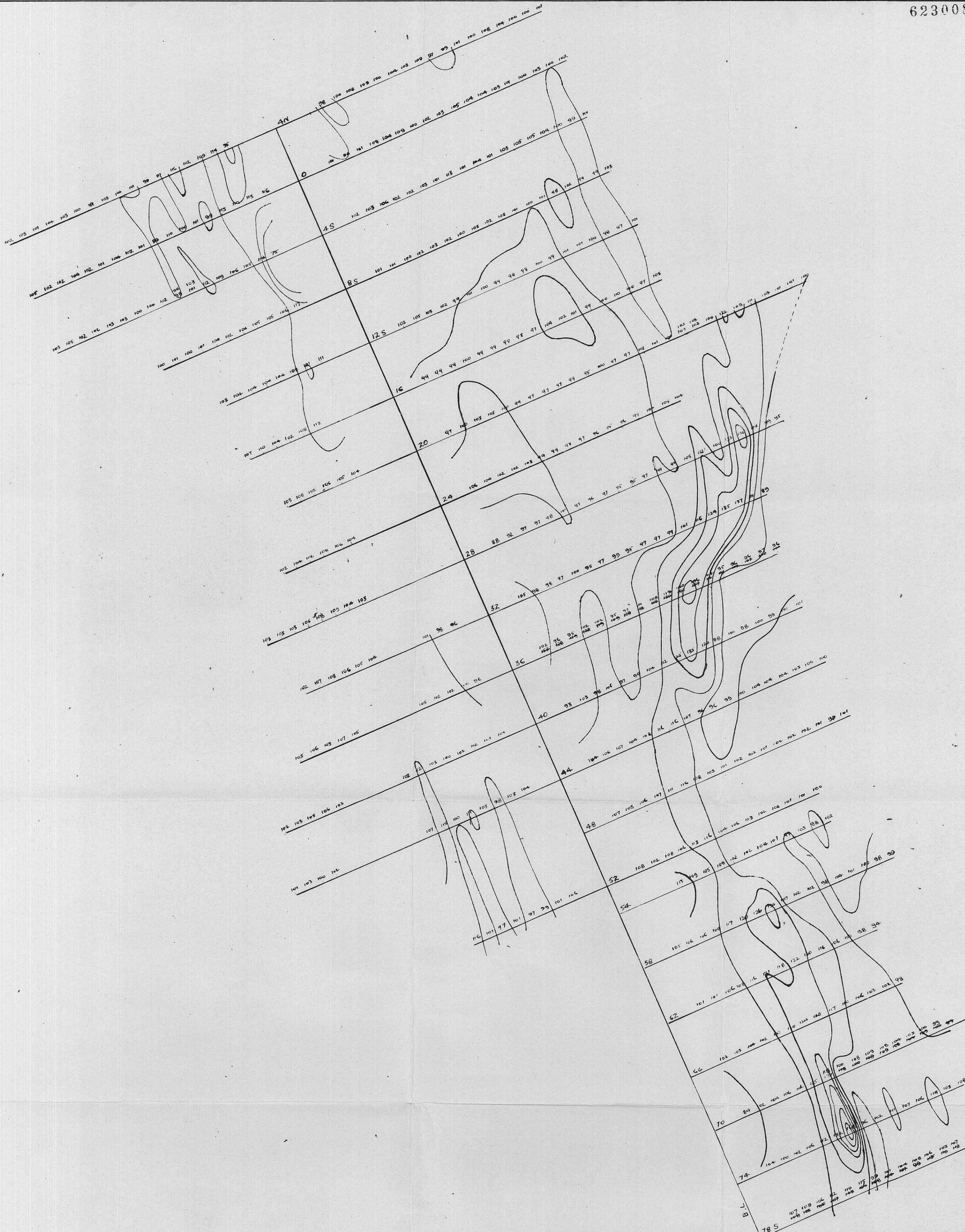


58-249

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED.		
<b>GOOSENECK ANOMALY</b>		
MAGNETIC CONTOURS		
CONTOUR INTERVAL: 100 gamma.		
DATE: OCTOBER 1958	SCALE: 1 INCH = 400 FEET	
GEOPHYSICIST: J. BONIWELL	AUTHORITY: PRP 7100	PLAN N° T 470

52      64  
78

Positive values  
Negative values



58-249

004

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

N.W. TASMANIA

**EQUI-RATIO CONTOURS  
GOOSENECK AREA**

SCALE : 400 FT TO 1 INCH

Geophysicist J. Bonriwell

P.R.P. T/100

**T471**

5 cm

Contour Interval : 1