

RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED
MELBOURNE AUSTRALIA

GEOPHYSICAL SURVEYS
WEST SEDGWICK AREA - TASMANIA

ADDENDUM
GRAVITY SURVEY – LYELL SEDGWICK

ADDENDUM II
GRAVITY SURVEYS – WEST SEDGWICK
ANOMALY

by

J B Boniwell

7th March 1958

58_205

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GEOPHYSICAL SURVEYS, WEST SEDGWICK AREA, TASMANIA

by

J.B. Boniwell

(7.3.58)

P L A N S

		<u>Scale</u>
Plan No. T.381	E.M. Survey. Lines of equal phase difference	400' to 1"
T. 380	E.M. Survey. Equi-ratio contours.	" "

A D D E N D U M

Gravity Survey, Lyell Sedgwick, by J.B. Boniwell] End of report
(21.1.59)

T.504 Gravimetric Survey.

A D D E N D U M II

Gravity Surveys, West Sedgwick Anomaly, by
J.B. Boniwell (19.4.58)

T. 392	Equi-ratio contours	400' to 1"
T. 373	Lines of Equal Phase difference	" "
T. 400	Residual gravity contours	" "
T. 401	Bouguer gravity profiles.	

MICROFILMED

A zone, approximately 2,000 feet wide, skirting the present edge of the Owen conglomerates of the Mt. Sedgwick massif, and extending from the Comstock valley to the Lake Margaret moraine, was covered electro-magnetically.

WORK

An orthogonal grid of lines at 400 feet intervals, stations at 100 feet intervals, was designed, by virtue of two Base-lines bearing 290 and 342 degrees, to remain normal to the western escarpment of Mt. Sedgwick. A dual frequency horizontal loop electromagnetic method (Turam) provided the primary coverage. Magnetic traversing in selected areas provided auxiliary data.

Results have been compiled into two conjunctive plans and pertain to the lower applied frequency only, viz. 440 cps. Apart from certain disparities in vital areas, the grid has been idealised for the purposes of this presentation.

The plan depicting lines of equal ratio readings contains several superficial effects inherent to the electromagnetic work in this survey. The most apparent is the incidence of abnormal ratios up to 1,200 feet away from the primary cable between lines 00-32W inclusive. Due to the twin circumstances of a large distance between electrodes (8,000 feet) and a bad electrical ground in the West, the primary cable has behaved essentially as an aerial giving rise to a longitudinal attenuation of its signal. This departure from a homogeneous field may be corrected for on theoretical considerations, but for the lines concerned is hardly necessary.

Anomalous ratio readings occur on line 36N and on the first station on line 48N. The first are due to the close proximity of a pertinent electrode, the second to faulty chainage. The affected readings, therefore, have been deliberately excluded from consideration.

DISCUSSION OF RESULTS

Two separate areas of electrical disturbance have been indicated, one at the head of the Comstock Valley and in Igell ground, the other in the south-west corner of the surveyed area and held by R.F.A.E.

The first, whilst extensive and open to the east, is ill-defined and often exhibits patchy correlation between peak phase and ratio anomalies. Nonetheless, this disturbance assumes significance in the light of a theory that relates the adjacent glacial embayment in the otherwise unbroken facade of the West Sedgwick wall to a line of bedrock weakness possibly extending north from the Comstock mine (the Igell shear?). However, the inferred geophysical strike (NW) is inconsistent with a uniformly north-bearing shear zone to a degree where it may be concluded that either structural controls have violently distorted the electrical horizons or the theory is not valid. As no dips can be recognised from the geophysical evidence, the distribution and quality of the electrical anomalies suggest widespread haphazard dissemination of pyritic mineralisation, in parts possibly as stringers, particularly to the north, but generally as vaguely shaped masses.

The second and more definitive area of disturbance is a well-delineated system of two segments, the more easterly dipping north, the westerly south. This system is on strike with a zone of sheared Cambrian sediments (Dundas Group), dipping steeply north and containing in the areas of outcrop, non-conducting slates. This circumstance, coupled to the fair order and quite good quality of the peak electrical anomalies, favours a mineralised zone as a causative source for the disturbance, and the high location of the system on the scree slopes in relation to the conglomerate contact heightens this interpretation. If correct, the mineralisation is clearly non-magnetic, although magnetic activity near the BL (also detected in the air-borne survey) indicates the incidence of magnetite-rich rocks there.

The cause of the apparent electrical discontinuity in this second area is problematic, but is suggestive of either a transverse rock movement coupled to distortions of dip and strike in the west segment, or a fractured fold. The abruptness with which the anomaly ceases to the west is suggestive, again, of a fault boundary whose relation to any mineralisation would become important to a future search.

RECOMMENDATIONS

Assessment of the mineral potential of the R.T.A.E. anomaly should be furthered by geophysical (gravimetric), geochemical and geological means with an emphasis on local structure.

J.B. Boniwell
Geophysicist.

Zeehan, Tas.
7th March, 1958.

ADDENDUMGRAVITY SURVEY, LYELL SEDGWICK

Gravimetric coverage of the complex electrical disturbance at the SE end of the West Sedgwick geophysical grid - work outstanding from the previous season - was completed on the 20th December, 1958.

The field observations were reduced by the same correction factor as that applied to observations recorded over the West Sedgwick anomaly. The Bouguer profiles, it is seen again, contain similar expressions of the mass effects of the Owen conglomerates, and of their relief in the Sedgwick massif. Regional gradients, therefore, have been determined on the same criterion of distance from the conglomerate mass-centre as before, thus allowing for the substantial embayment in the outcrop wall opposite the northern ends of lines 4W and 8W. These gradients are shown in profile.

It is at once clear that no local residual anomalies consistent with increased densities correlate with the electro-magnetic indications. Indeed, a zone of gravity low so corresponds with the broad phase anomaly to actually imply a decrease in density; this is perhaps due to an imperfectly conducting rock-type, e.g. sheared slates, or to an overburden condition. Nonetheless, it would appear that geologic strikes conform to a BL direction more probably than to a N-S direction implicit to a regional structure striking North into the embayment, as previously mentioned.

In view of the latter and the lack of gravimetric evidence of mineralisation, little significance can be given to this immediate locale. No further work is recommended.

Zeehan, Tas.,
21st January, 1959.

J.B. Boniwell,
Geophysicist.

Gravity Surveys, West Sedgwick Anomaly.

The electromagnetic anomaly of the West Sedgwick grid on lines 52-68W was covered gravimetrically on April 16th and 17th. Plans T.392 and 393 show the amended plots of the E.M. anomaly.

Observed values were reduced by a factor of 0.06 mgal/vert. foot to allow for free air and Bouguer effects. The resulting profiles of Bouguer gravity (Plan T.401) contain inherent expressions of the near-proximity of the Sedgwick massif, and to a lesser extent, of the effect of its relief. As their magnitude is patently a direct function of distance from the mass centre of the Owen Conglomerates, the removal of these expressions from the gravity data needs be controlled on this basis. The plan of residual gravity (Plan No. T.400) has been so derived.

It is at once clear that no significant mass concentration is associated with the electrical axis. It is true that the latter lies within a broad ill-defined zone of positive gravity, but much of this zone has been simulated by a flanking area of large negative gravity, and is considered, therefore, to be no more than an expression of near-surface rock. The cause of conduction now appears most likely due to a carbonaceous facies in a band of slates striking through the anomaly.

On the electrical and gravimetric evidence, only minor mineralization can be present, and as this could not possibly be of economic dimensions, no further work, particularly drilling is warranted.

Zeehan, Tas.
19th April, 1958.

J.B. Boniwell,
Geophysicist.

LAKE MARGARET



LEGEND

Lines of Equal Phase Difference (interval -2)

Negative values (x10) in degrees
Positive values

Electrode positions on Baselines

Note: Values ascribed to the point midway
between two reference points 150' apart.

58-205 003

RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED

ELECTROMAGNETIC SURVEY

WEST SEDGWICK AREA

LINE OF EQUAL PHASE DIFFERENCE

SCALE 400 FT TO 1 INCH

Draftsman J.L.Peter P.R.P. 7/100 PLAN NO T381

LAKE MARGARET



REFERENCE

-  Equi-ratio contours (Interval 0-10)
-  Electrode positions on Base Lines
-  Magnetic profiles on scale 1 inch to 500 gammas showing positive sense

NOTE: Values express ratio (X100) of signal amplitudes obtained from two reference points 100 feet apart in the sense: the nearer; the further from the primary cable; and are corrected for normal attenuation of the primary signal with distance. Values are ascribed to the point midway between the reference points.

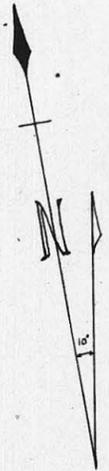
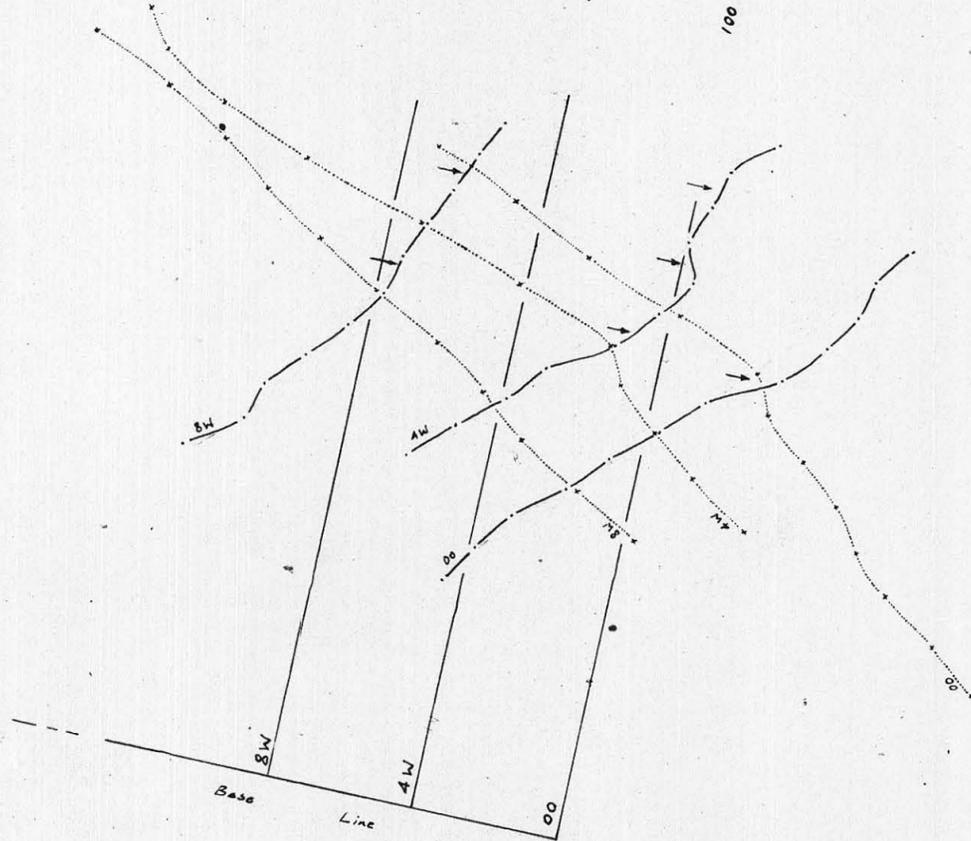
5 cm

58-205 004

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED		
ELECTROMAGNETIC SURVEY		
WEST SEDGWICK AREA (TAS.)		
EQUI-RATIO CONTOURS		
SCALE 400 FEET TO 1 INCH		
Date MARCH 1958	PRP17/100	Plan No T380

006

Topographic Plotting Data



WEST SEDGWICK GRID

COMSTOCK GRID

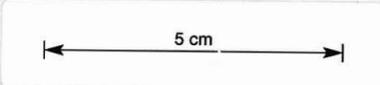
LEGEND

- BOUGUER GRAVITY SHOWING REGIONAL GRADIENT
- TOPOGRAPHY
- ELECTROMAGNETIC AXES

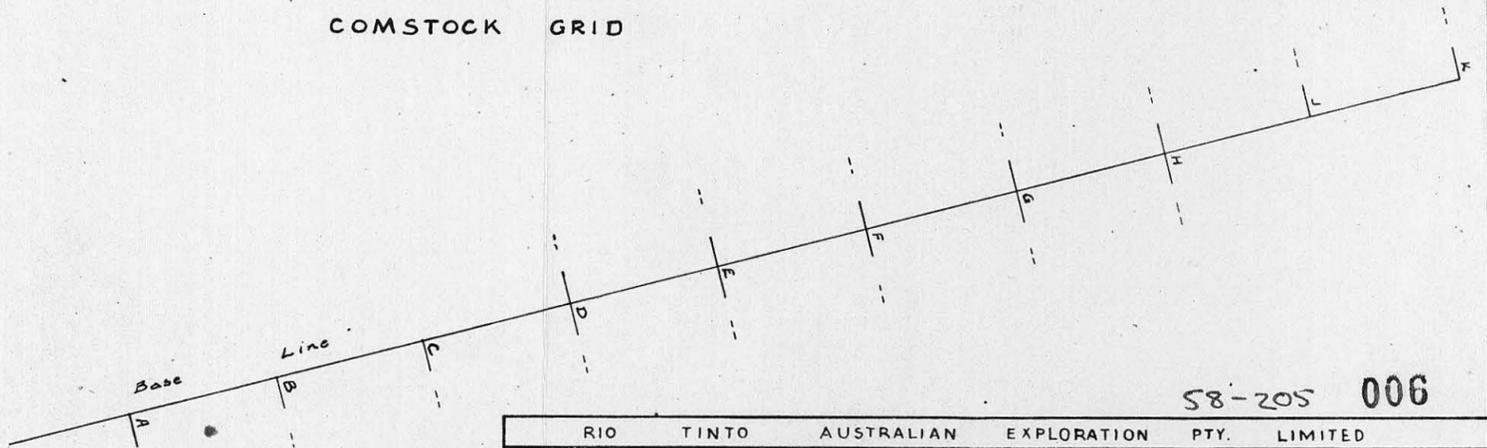
SCALES

- GRAV. : 1 inch = 10 mgal.
- TOPOGR. : 1 inch = 50 feet
- IN PLAN : 1 inch = 400 feet

N.B. Positive sense for profiles is to West in plan.



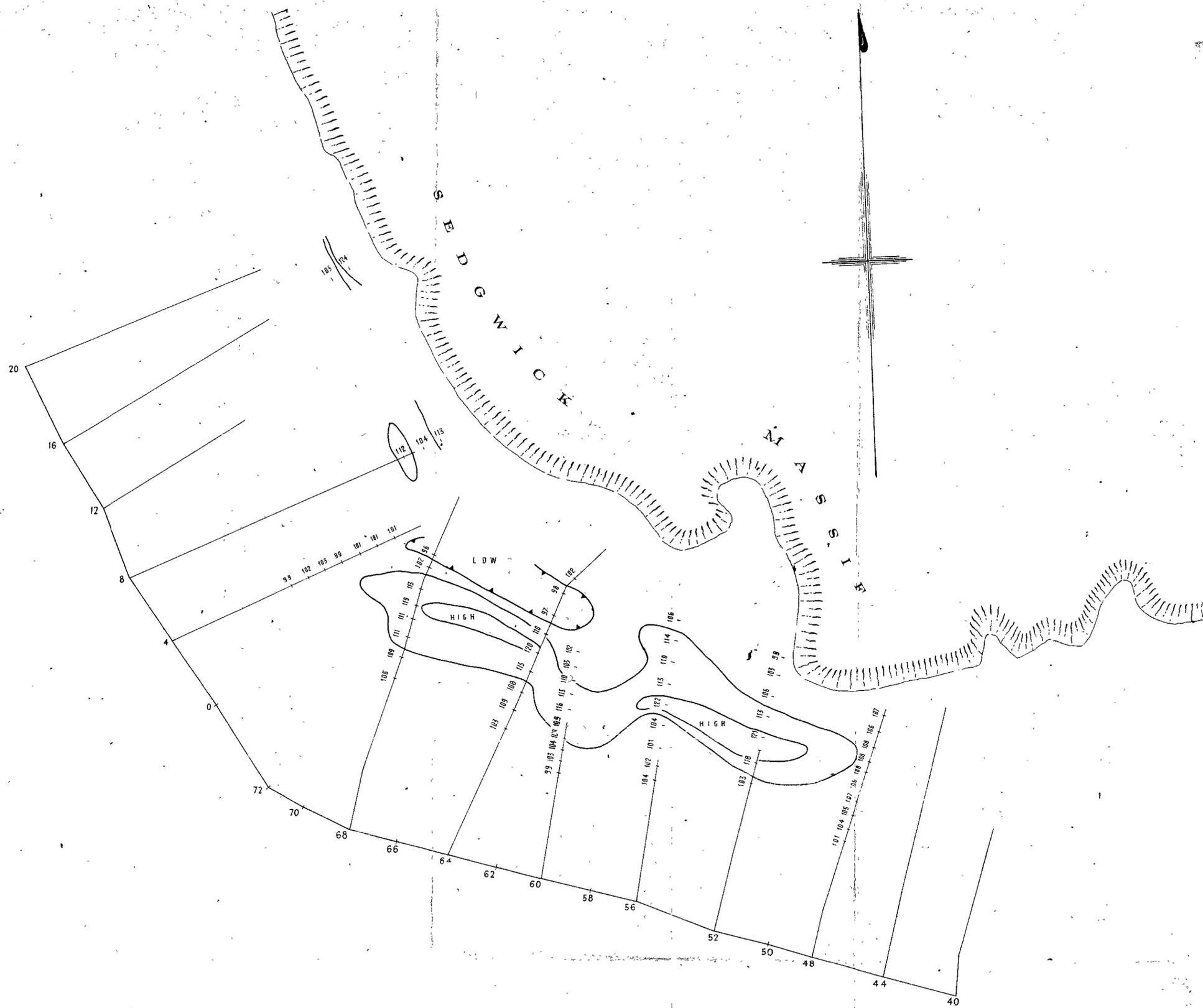
Based on plan T386



58-205 006

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED			
GRAVIMETRIC SURVEY			
WEST SEDGWICK - COMSTOCK AREA			
February 1959		PRP/7/100	Plan No T504

433008



Legend

Equi-ratio contours (interval 0 10)

Values express ratio ($\times 100$) of signal amplitudes obtained from two reference points 100 apart in the sense - the nearer the further from the primary cable and are corrected for normal attenuation of the primary signal with distance

Values are ascribed to the point midway between the reference points.



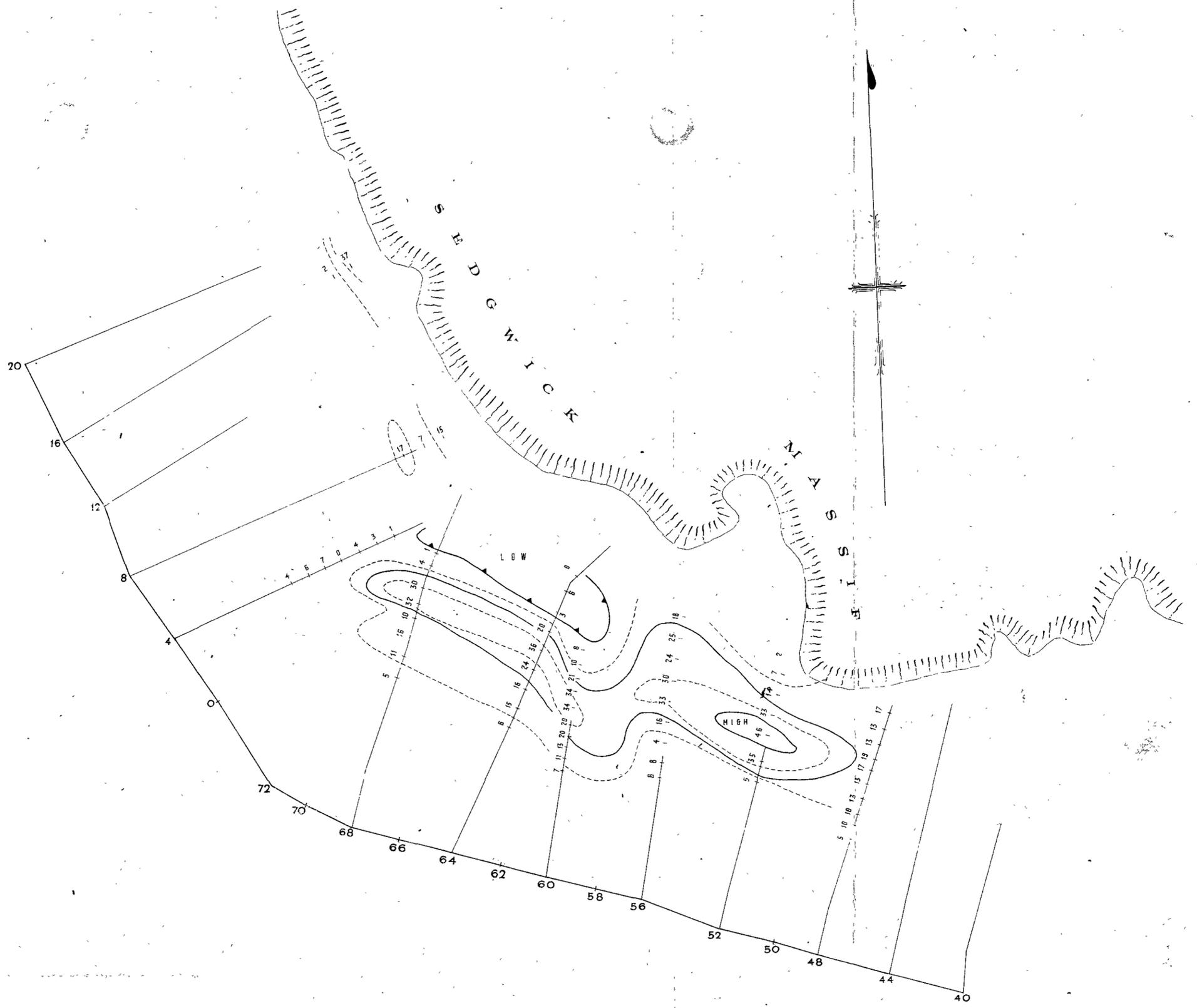
58-205

RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED

N. W. TASMANIA

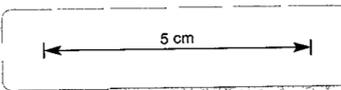
WEST SEDGWICK ANOMALY 008
EQUI-RATIO CONTOURS 433009

DATE	APRIL 1958	SCALE	1 INCH = 400 FEET	
Geologist	R B Fraser	Geophysicist	J Boniwell	
Draftsman	D J Lawford	Authority	PRP /7/100	PLAN Nº T 392



Legend

-  Lines of equal phase difference (interval -2°)
 -  Negative values ($\times 10$) in degrees.
 -  Positive values
- Values ascribed to the points midway between two reference points 100' apart

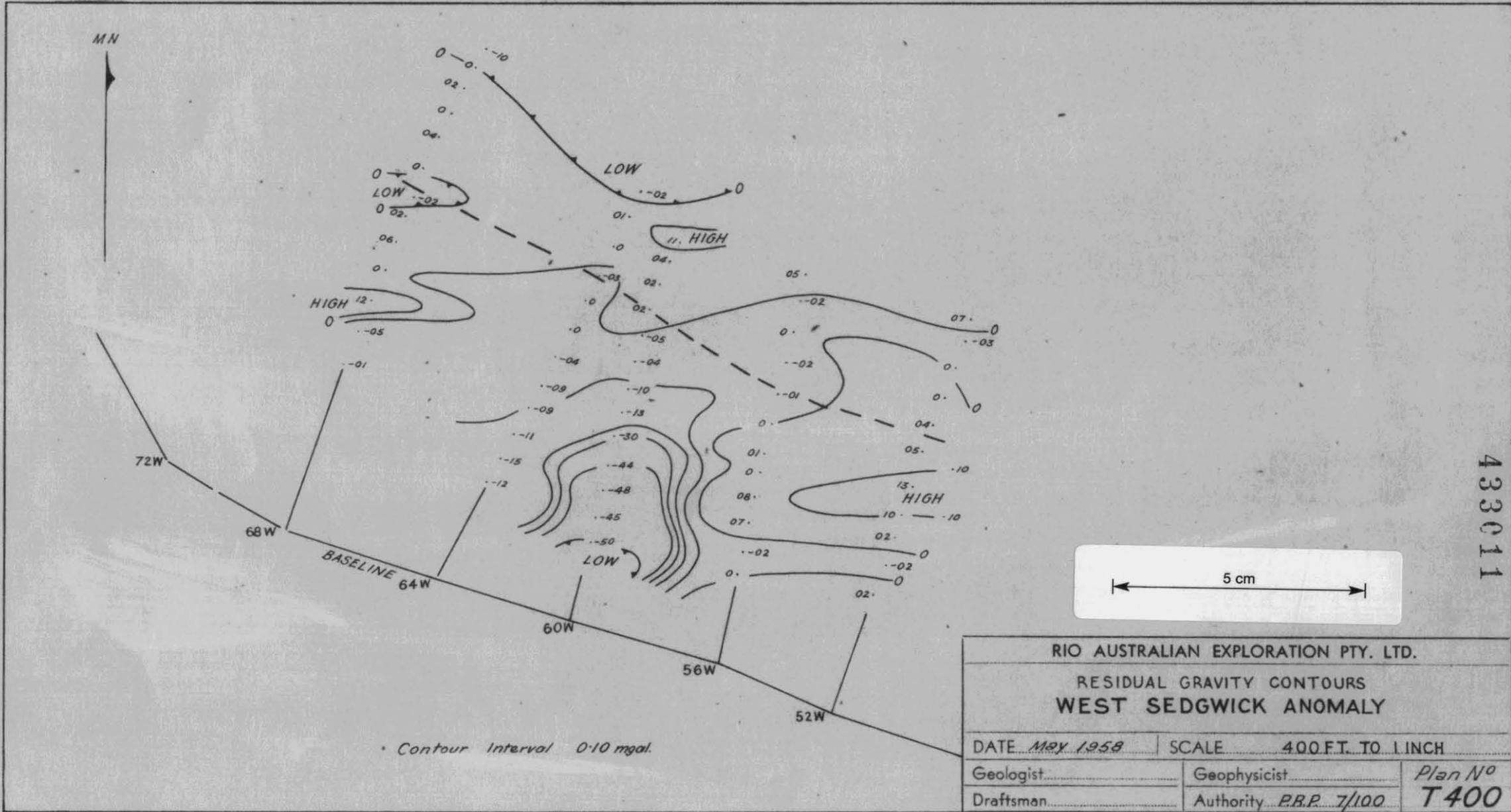


433010 58-205

RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED

N.W. TASMANIA
WEST SEDGWICK ANOMALY
 LINES OF EQUAL PHASE DIFFERENCE 009

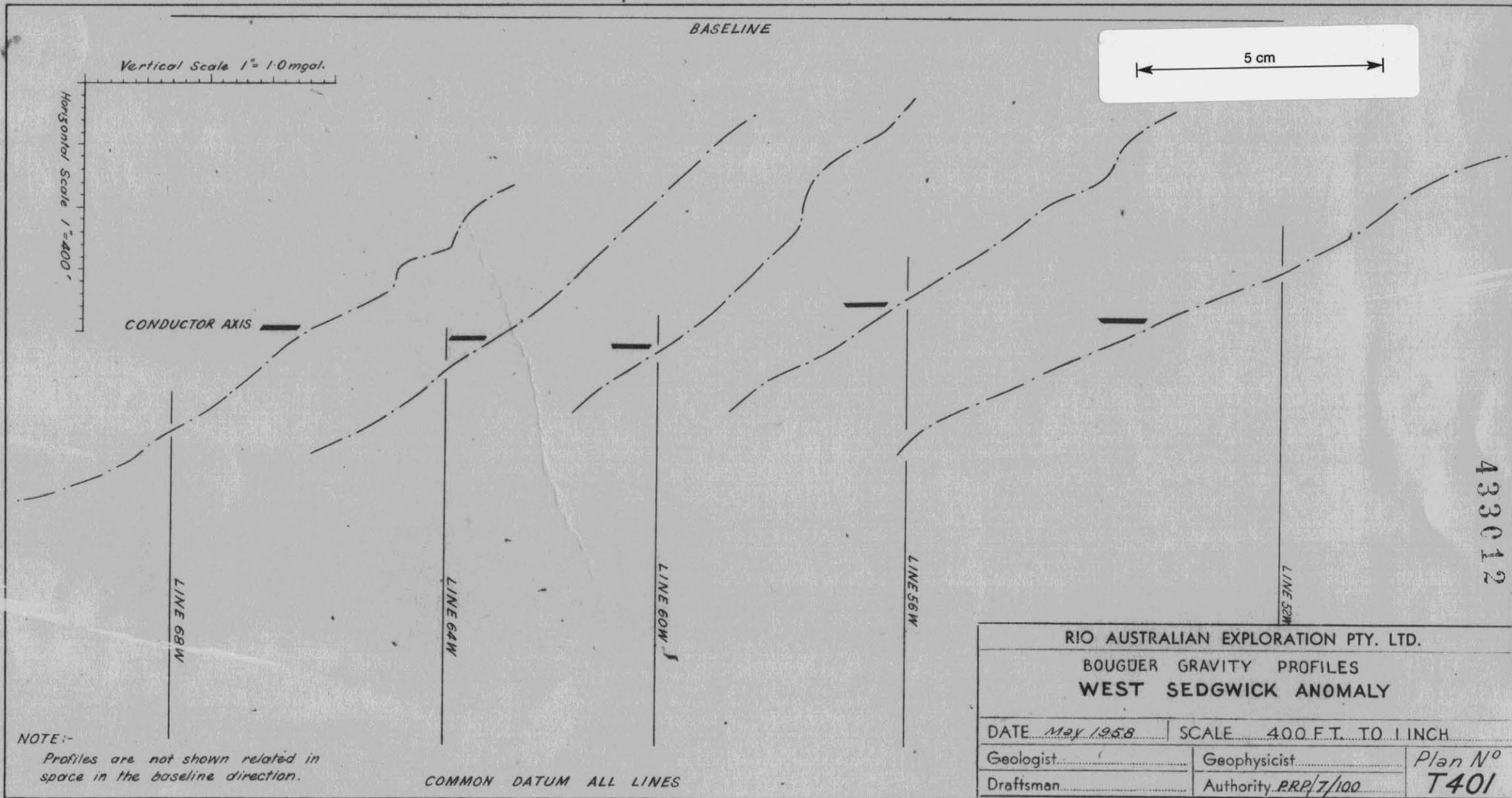
DATE	APRIL 1958	SCALE	1 INCH = 400 FEET
Geologist	R B Fraser	Geophysicist	J Boniwell
Draftsman	D J Lawford	Authority	PRP/7/100
			PLAN NO T 393



RIO AUSTRALIAN EXPLORATION PTY. LTD.

RESIDUAL GRAVITY CONTOURS
WEST SEDGWICK ANOMALY

DATE <i>May 1958</i>	SCALE 400 FT. TO 1 INCH	Plan No T400
Geologist.....	Geophysicist.....	
Draftsman.....	Authority <i>P.B.P. 7/100</i>	



433012