

06_5285

Report on West Sedgwick Area, Report on Geology,
Geophysical Surveys, Geochemical Surveys
Rio Tinto Australian Exploration Proprietary Limited*
Boniwell, J.B.; Fraser, R.; Muc

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED
MELBOURNE, AUSTRALIA

PROJECT:— PRP 7/100

REPORT No. :— 1958/5

REPORT ON WEST SEDGWICK AREA

Report on Geology

by R.B. Fraser

Report on Geophysical Surveys

by J. Boniwell

Report on Geochemical Surveys

by E. Muceniekas

06_5285

Report on West Sedgwick Area, Report on Geology,
Geophysical Surveys, Geochemical Surveys
Rio Tinto Australian Exploration Proprietary Limited*
Boniwell, J.B.; Fraser, R.; Muc

FILE REFERENCE :— 8D/20

MAP REFERENCE :—

DATE :— April, 1958.

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

NORTH-WEST TASMANIAN REGIONAL INVESTIGATIONS - PRP 7/100

REPORT ON WEST SEDGWICK AREA

C O N T E N T S

- | | | |
|----|---|----------------|
| 1. | <u>NOTES ON THE GEOLOGY OF THE WEST
SEDGWICK AREA</u> | R.B. Fraser |
| | Map T.398 - Preliminary Geological Map-
West Sedgwick Area. | 400' to 1" |
| 2. | <u>GEOPHYSICAL SURVEYS - WEST SEDGWICK</u> | J. Boniwell |
| | Map T.392 - Equi-Ratio Contours,
West Sedgwick Anomaly. | 400' to 1" |
| | Map T.393 - Lines of Equal Phase
Difference, West
Sedgwick Anomaly. | 400' to 1" |
| | Map T.400 - Residual Gravity Contours
West Sedgwick Anomaly | 400' to 1" |
| | Map T.401 - Bouguer Gravity Profiles
West Sedgwick Anomaly | 400' to 1" |
| 3. | <u>GEOCHEMICAL INVESTIGATIONS</u> | E. Muceniekas |
| | Map T.354 - Geochemical Testing
Comstock Area. | 20 chns. to 1" |
| | Map T.390 - Geochemical Map
West Sedgwick Area. | 400' to 1" |

NOTES ON GEOLOGY OF THE WEST SEDGWICK AREA

by

R. B. FRASER

Preliminary detailed mapping at a scale of 1 inch to 400 feet was done by the writer on the actual location and environs of the West Sedgwick ground E/M anomaly.

The rocks of the area correspond to the 'Marginal Schists' zone of the Mt. Lyell area. Hydrothermal alteration, feldspathisation and silicification are marked but not of the same intensity as in the immediate vicinity of the Mt. Lyell ore-bodies.

Rocks are mainly altered flow porphyries, agglomerates, conglomerates, sedimentary and tectonic breccias, slates and siltstones. Hornblende prophyry appears to mark the western boundary of the more altered zone.

Beds alternate rapidly, and due to brecciation and faulting, dips have local significance only. A thorough search of the area was made but outcrops are few and small and the size of most has been exaggerated for mapping purposes. The area is almost wholly covered by heavy scree and debris.

Stratigraphically the zone is favourable in the regional sense and for the proximity of the postulated cross feature of the Sedgwick Fault. However in detail there is nothing positive to suggest the presence of an ore-body.

The anomaly occurs about 400 feet west of the Owen Conglomerate, which forms the Sedgwick Massif, in an area of heavy Owen scree. At the southern end of the anomaly, scree cover decreases and cover is mostly clay, much of which has been formed in situ. Along the trend of the anomaly to the north west scree depth deepens rapidly. The Jukes Conglomerate does not outcrop between the anomaly and the Owen Conglomerate. East of the anomaly two faults have been recognised in the Owen, but these may extend to the anomalous zone. One strikes roughly north and faults middle against lower Owen. Relative movement appears to be west block moved roughly north north east and upwards. Across the south end of the Owen outcrop a zone of fracturing and silicification trends towards the southern end of the anomalous area. A number of small folds occur at the base of the middle Owen and suggest faulting between it and the lower Owen. The east limbs have shallow dips, but the west limbs are steeper up to as much as 75°. The dips in the lower Owen east of the anomaly are steep west and pebble imbrication suggests overturning at one point.

It is emphasised that there is insufficient outcrop for anything but the most speculative extrapolations through the anomaly zone and certainly insufficient for drill siting. Pyritisation is very sparse and more evidence of it would be expected to be found in the rocks near the anomaly, if there was a disseminated type of orebody. The rocks near the anomaly show little of the typical alteration seen in the vicinity of ore-bodies in the region. What geological evidence there is, suggests that economic mineralisation is unlikely. Any further exploration, particularly siting of drills must be based on geophysical evidence.

R. B. Fraser,
Geologist.

NORTH-WEST TASMANIAN INVESTIGATIONS - PRP/7/100

GEOPHYSICAL INVESTIGATION - WEST SEDGWICK AREA

by

J. Boniwell

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 electromagnetically.

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 Lyell ground, the other in the south-west corner of the surveyed area and held by R.T.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 Lyell shear?). However, the inferred geophysical strike (WNW) 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 RL (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.B. 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.

ADDENDUM

Gravity Surveys, West Sedgwick Anomaly

The electromagnetic anomaly of the West Sedgwick grid was covered gravimetrically on April 16th and 17th.

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 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 (Map 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 mineralisation can be present, and as this could not possibly be of economic dimensions, no further work, particularly drilling is warranted.

J.B. Boniwell.

by

E. Mucenickas

GENERAL.

This report describes the coverage and results of geochemical investigations for copper-lead-zinc in the area underlain by Cambrian rocks on the western and southern fringes of Mt. Sedgwick, selected on geological grounds as potential northerly extensions of the Mt. Iyell copper belt.

The field work was undertaken in two stages. Initially (13th-31st January), a regional reconnaissance was carried out over an area of some three square miles; subsequently, after completion of a ground geophysical survey in the western portion of the area, detailed spot testing was conducted at short and regular intervals along the geophysical grid lines (26th February to 9th March).

APPLICATION OF THE METHOD

Dithizone was used as indicator, thus no distinctions made for lead or copper. However, anomalies due to copper were identified in some creek waters.

The bedrock of these areas is usually covered by a veneer of residual clay up to 4 - 5 feet thick, and adjacent to the conglomerate escarpment the soil is buried beneath coarse scree material. A peat blanket is also present in places so that testing requires a careful selection of traverses and soil types.

The area is part of the zone in which the vegetation has largely been killed by fumes from the Iyell Smelters. There was, however, no noteworthy interference by contamination from this source.

In view of the abnormally high rainfall (approx. 130 inches annually) and pronounced ground relief, peak anomalies can be expected to occur only in close proximity to significant mineralisation.

ACCOMPANYING PLANS

Fig. 1: Regional Reconnaissance of Mt. Sedgwick area. (Photo Scale 1 inch equals 20 chains). Plan No. T.354.

Fig. 2: Detailed geochemical Map of the West Sedgwick area. (Scale 1 inch equals 400 feet). Plan No. T.390.

RESULT OF REGIONAL RECONNAISSANCE

The location of spot anomalies found during the regional reconnaissance is shown on Fig. 1.

High anomalies were found in soil covered areas at points Nos. 22, 24 and 25, later identified to lie within the West Sedgwick Anomaly, and described in detail in the following section.

Margaret Anomaly

The reconnaissance work also revealed the presence of mineralised soils half a mile northerly of the Sedgwick Anomaly, where a ground E.M. high, open to the eastward, was subsequently recorded in the same area. It is therefore considered that further detailed geochemical work is warranted here.

A generally widespread but weak reaction was observed to coincide with the distribution of porphyry type outcrops; the same has since been found in the similar rocks occurring near Mt. Tyndall to the north.

DETAILED SURVEY

An area measuring 8,000 feet by 2,000 feet was covered by systematic testing along geophysical grid lines and led to the following principal results:-

1. West Sedgwick Anomaly

A well defined anomalous zone measuring approximately 3,500 feet long by 600 feet wide (T.390), which trends north-westerly near the foot of the Owen Conglomerate escarpment at West Sedgwick. The eastern portion of this zone is covered by scree, while the western side is featured by clay soil with a few exposures of deeply weathered bedrock.

The order of the anomalies recorded in this zone is higher than found elsewhere in the locality, especially in the central sections of the anomaly which are hachured on Map T.390.

It should be stressed that this geochemical anomaly coincides closely in position with the West Sedgwick ground E.M. anomaly.

2. Iyell Sedgwick Anomaly

Another anomalous zone was found within the Mt. Iyell M. & R. Co. property, also in an area where marked ground E.M. anomalies are shown on the geophysical plans. (Nos. T.392 & T.393). In this case the positive geochemical reactions were chiefly found in the sandy silts of the creek beds. (See T.354.)

Another small area of anomalous readings occurs near the geophysical baseline adjacent line 5,200.

E. Muceniekas,
Geochemist.

April 21st, 1958.

ADDENDUM TO - GEOCHEMICAL INVESTIGATIONS - WEST SEDGWICK AREA

by

E. Mucznickas

A. West Sedgwick Area. (See Map T.390)

Three samples have been analysed spectrographically by the South Australian Mines Department with the following results:-

	No. 1	No. 2	No. 3	No. G3
Location	Base line W. 6650' & N. approx. Peg No. 11 on line 6800 W.	Base line W. 6500' & N. approx. Peg No. 11 on line 6800 W. Exact location marked by white rag.	Base line W. 5400' & N. approx. Peg No. 9 on line 5400 W.	Base line 5200' W. 9 N. ex Creek
Soil	Brown peaty sand	Sandy peat	This is not a soil sample but black manganese dioxide coating on rocks ex creek	This is not soil sample but manganese dioxide coating on rocks, similar to sample No. 3
Cu	25 ppm	70 ppm	5 ppm	2 ppm
Pb	25 "	100 "	15 "	10,000
Zn	50 "	60 "	300 "	1 -
Co	1 "	1 "	500 "	10
Cr	600 "	1000 "	10 "	60
Mn	-	-	Very high	Very high.

Conclusion:

As the sample No. 3 and No. G3 were taken from the same creek but not at the same time, and as the spectrographic results vary so considerably (No. 3 Zn 300 p.p.m. and No. G3 10,000 p.p.m. = 1% Zn) it is necessary that a further check be taken as sample G3 is of great interest.

B. N.E. Comstock Area (See Map T.357)

Samples have been analysed by spectrograph, from the above area.

Samples 1E, 2E and 3E are of some interest, as their Pb content is higher than background (500 - 800 p.p.m.)

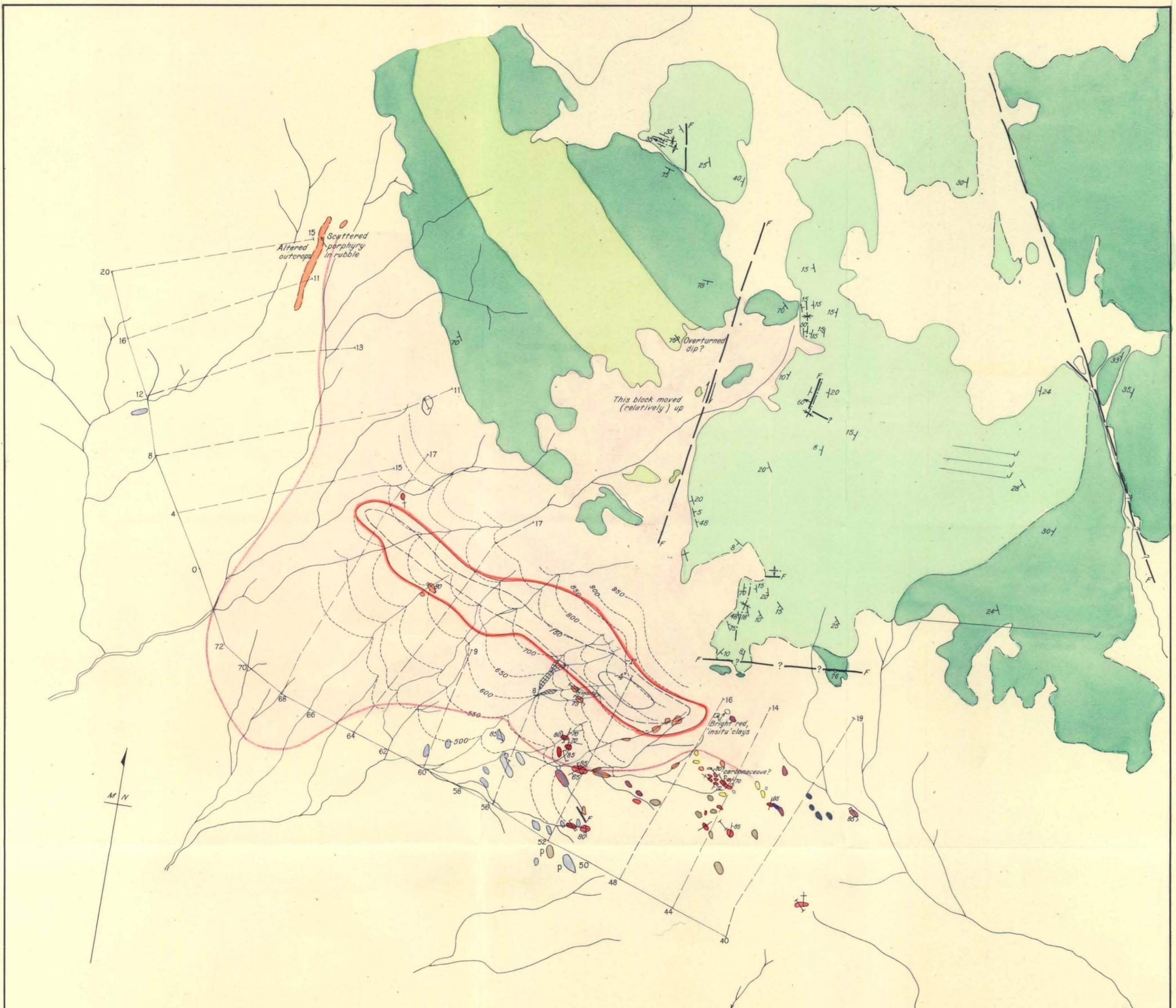
Sample 5E, no interest (a real E.M. anomaly.)

Sample 6E, interesting only for increased Zn content to 400 p.p.m.

Samples 7E, 8E, 9E, 10E, 13, no interest.

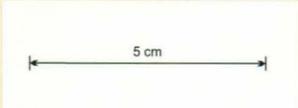
Sample 27 has high Cu content. (250 p.p.m.) for that area.

Sample 26, no interest.



Legend

- Alteration of scree in creek bed due to stream action, possibly some Mn. and other mineralisation
- Outcrop boundary
- 45° Strike and dip of beds
- Joint
- Fault
- Fault - position inferred
- Fault - possible extension under cover
- Pyrite
- Outline of phase difference anomaly
- Area covered by heavy scree
- 80° inclined Vert. Strike and dip of cleavage
- 35° Fold axis with plunge
- Geophysical grid
- 58 Topographic contour. 563 N taken arbitrarily as 500'
- Middle Owen Conglomerate and Sandstone. Undifferentiated.
- Lower Owen Conglomerate. White conglomerate and sandstone.
- Lower Owen Conglomerate. Undifferentiated.
- Grey to black slates, some sparsely pyritised and tectonically brecciated. Locally slightly carbonaceous and feldspathised
- Quartz chlorite schist some feldspar metasomatism, probably derived from acid porphyry
- Siltstones undifferentiated - some argillaceous members
- Pink, green and blue mottled rocks. Much altered. Some quartz veins possibly originally igneous correspond to the 'Marginal Schists' of the Mt Lyell area
- Siltstone, probably volcanic ash
- Altered porphyry undifferentiated
- Felspathic breccia or agglomerate. Much altered. Contains slate and detrital quartz fragments, some quartz veining. Minor pyrite
- Quartz-feldspar-hornblende porphyry. Hornblende subhedral, minor augite. Apparently extrusive
- White, hydrothermally(?) bleached material. Original nature indeterminate. Some quartz veins & pyrite

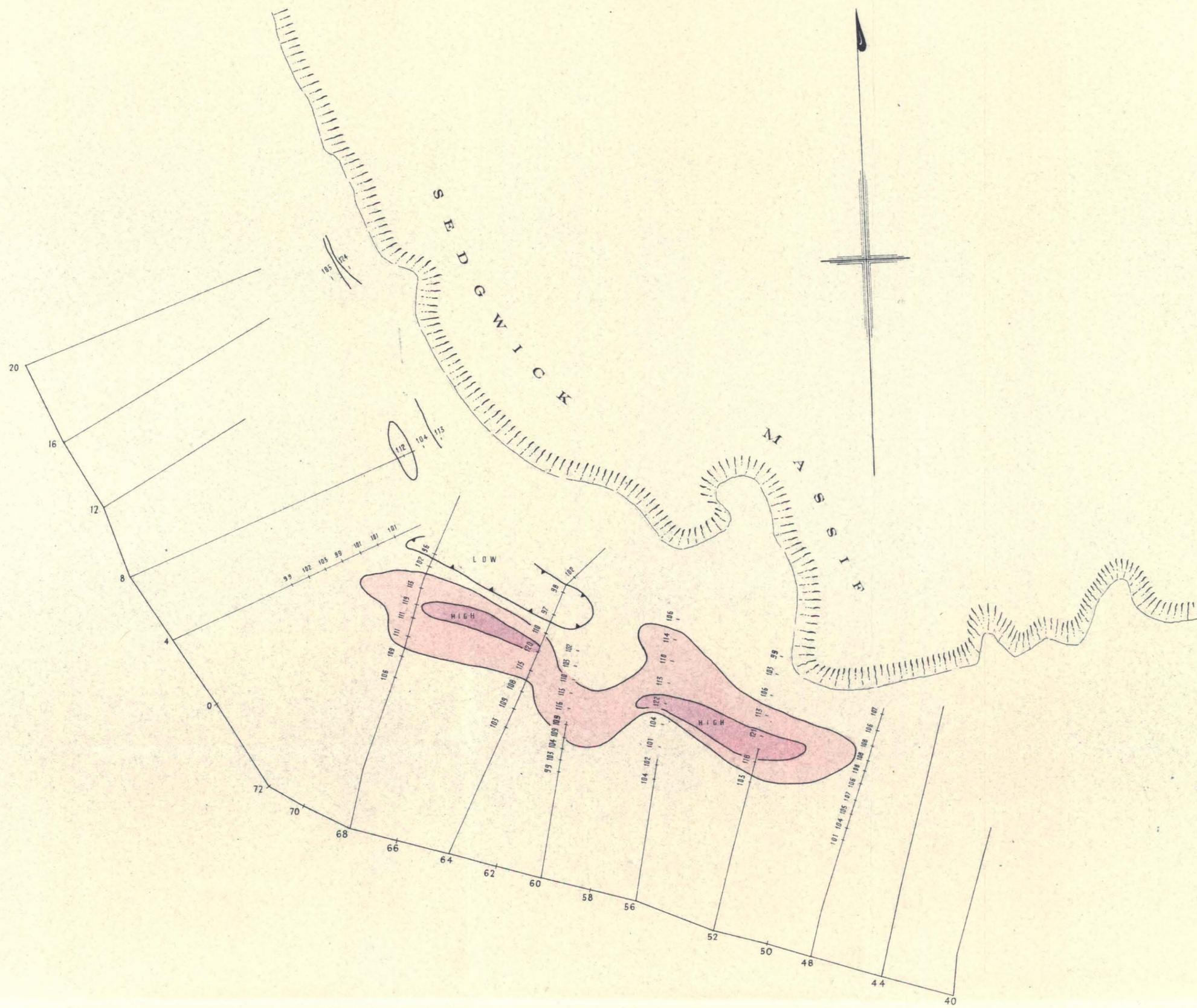


RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

PRELIMINARY GEOLOGICAL MAP

WEST SEDGWICK AREA 06-5285

Date: April, 1958	Geologist: R.B. Fraser	Authority: P.R.P/7/100
Scale: 400 feet to 1 inch (approximately)		Plan No T 398

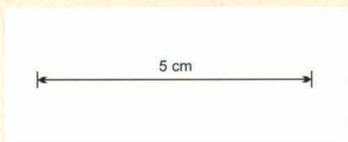


Legend

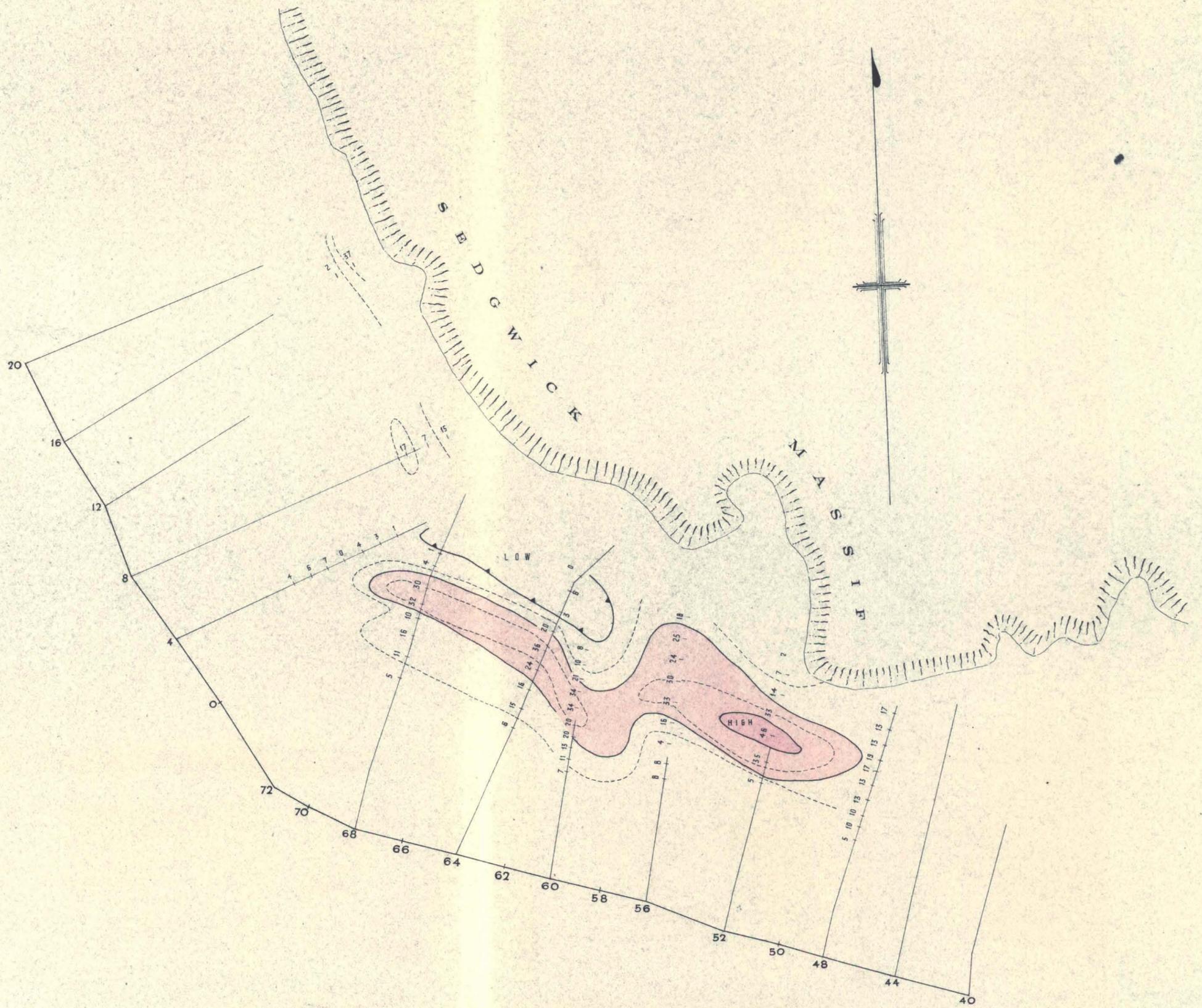
Equi-ratio contours (interval 0-10)

Values express ratio ($\times 100$) of signal amplitudes obtained from two reference points 100 apart in the sense \rightarrow the nearer \rightarrow 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.

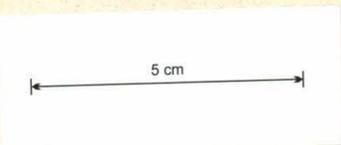


RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED		
N. W. TASMANIA		
WEST SEDGWICK ANOMALY		
EQUI-RATIO CONTOURS		
06-5285		
DATE : APRIL 1958	SCALE : 1 INCH = 400 FEET	
Geologist : R. B. Fraser	Geophysicist : J. Boniwell	
Draftsman : D. J. Lawford	Authority : PRP /7/100	PLAN Nº T 392



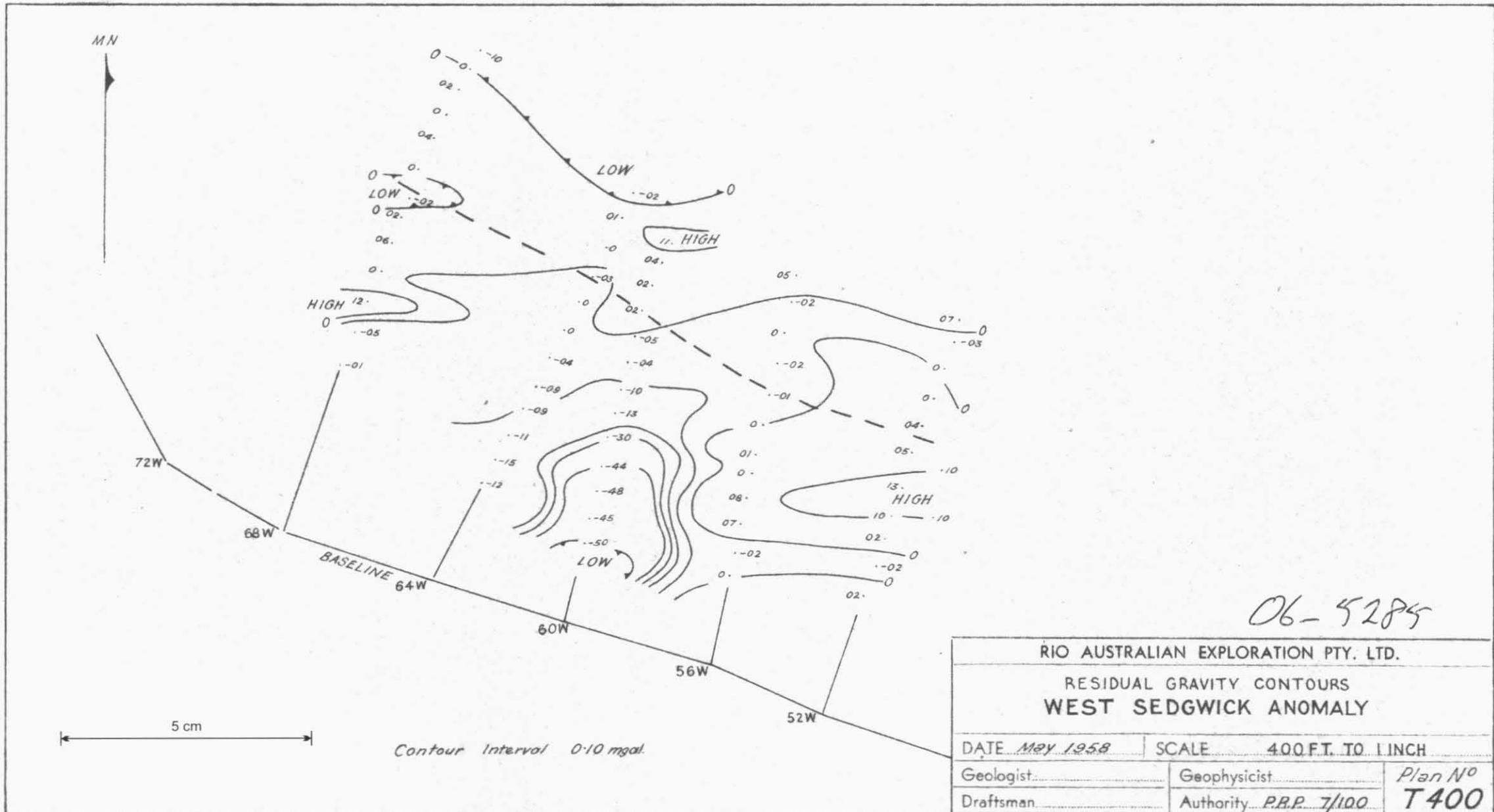
Legend

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



06-5285

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED			
TASMANIA			
WEST SEDGWICK ANOMALY			
LINES OF EQUAL PHASE DIFFERENCE			
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
Geologist.....	Geophysicist.....	Plan No
Draftsman.....	Authority <i>P.R.P. 7/100</i>	T400

BASELINE

Vertical Scale 1" = 1.0mgal.

Horizontal Scale 1" = 400'

CONDUCTOR AXIS



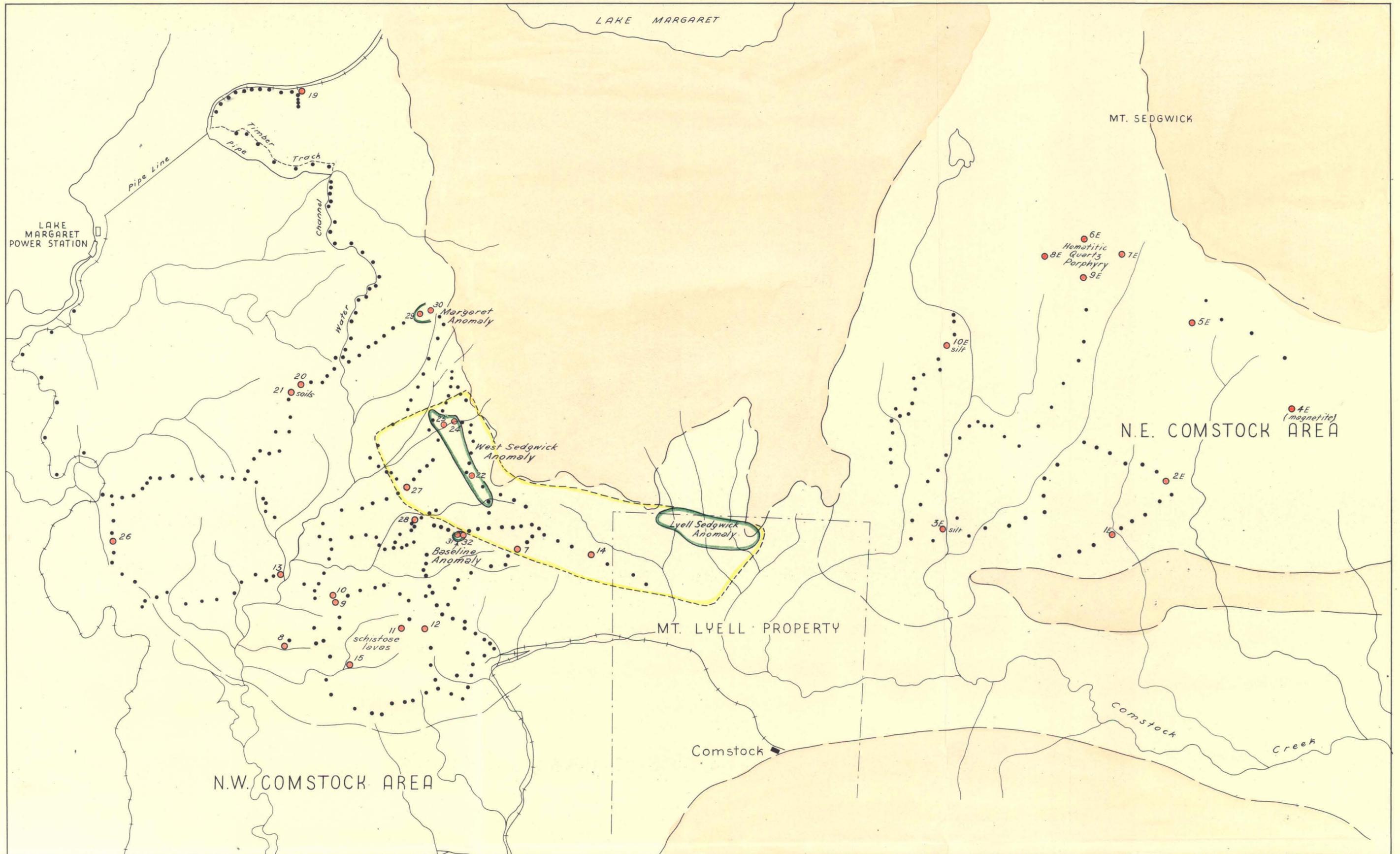
5 cm

06-5285

NOTE:-
Profiles are not shown related in space in the baseline direction.

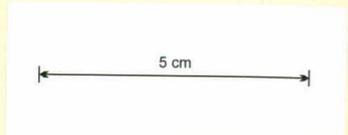
COMMON DATUM ALL LINES

RIO AUSTRALIAN EXPLORATION PTY. LTD.		
BOUGUER GRAVITY PROFILES		
WEST SEDGWICK ANOMALY		
DATE <i>May 1958</i>	SCALE 400 FT. TO 1 INCH	
Geologist.....	Geophysicist.....	Plan No
Draftsman.....	Authority <i>PRP/7/100</i>	T401



- Owen Conglomerate
- Volcanics of the Dundas Group: chlorite-quartz schists; sheared porphyries, etc.
- Groups of tests along traverses.
- Medium Cu, Pb-Zn anomaly in soil, silt or water.

- Principal anomalous areas
- Areas covered by subsequent detailed geochemical survey



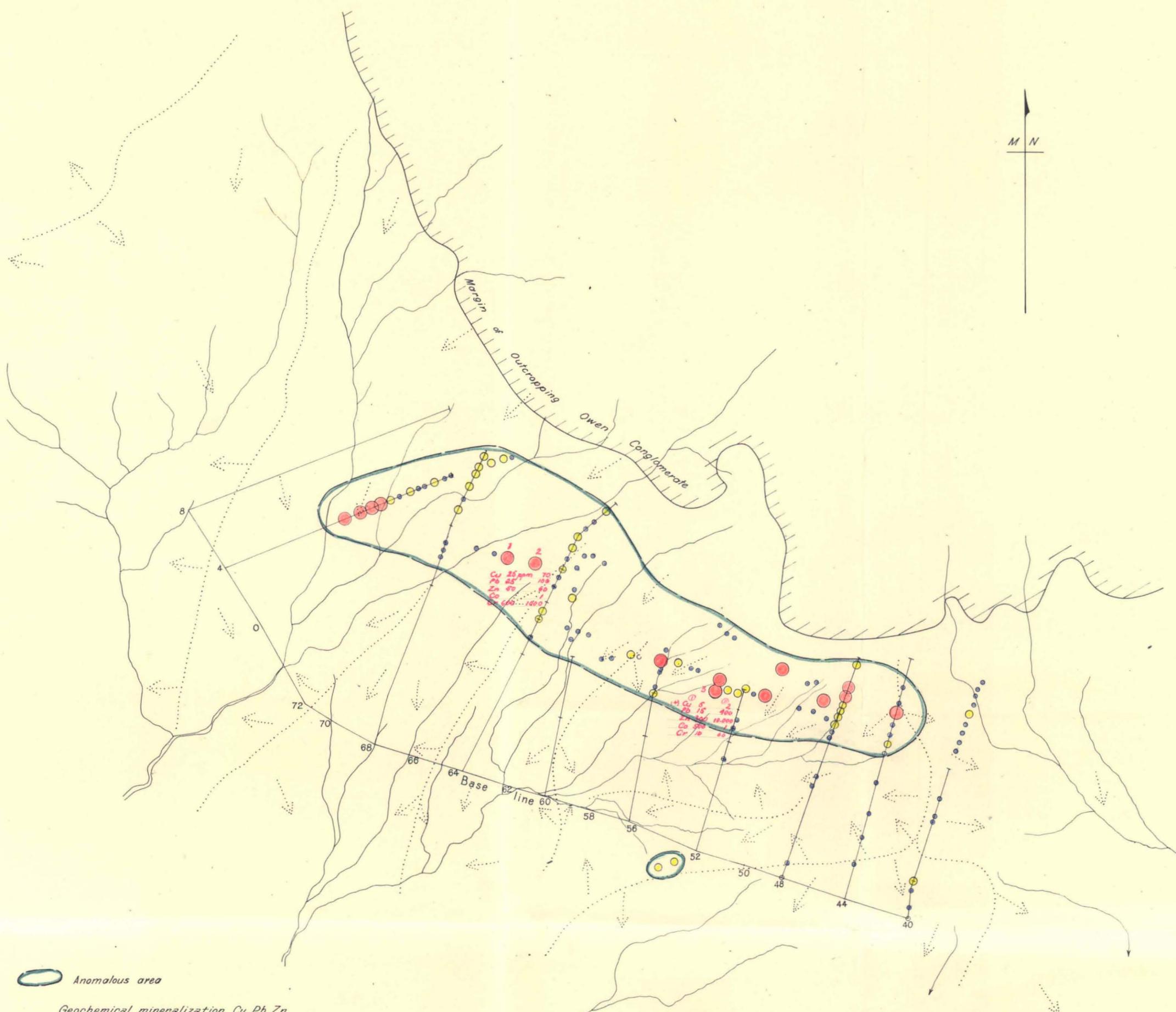
RIO TINTO AUSTRALIAN EXPLORATION PTY. LTD.

**GEOCHEMICAL TESTING
COMSTOCK AREA
TASMANIA**

06-5285

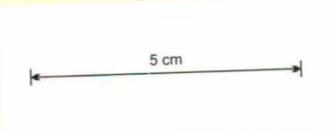
Feb. 1958	Geochem.: E. Mucenickas	PRP/7/100	1 inch - 20 chns	PLAN N° T354
-----------	-------------------------	-----------	------------------	--------------

Amended April 58



- Anomalous area
- Geochemical mineralization Cu, Pb, Zn
- Low anomaly
- Medium anomaly
- High anomaly
- Watershed (for geochemical requirements)
- Approximate direction of run-off
- Creeks
- E.M. Base line and grid lines

N.B. No pegs could be found north of the following:-
52 North 8, 56 North 8, 60 North 11



06-5285

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED		
GEOCHEMICAL MAP		
WEST SEDGWICK AREA		
Date: - April, 1958	Geochemist: E. Mucenikas	Plan No T 390
Scale: 400 feet to 1 inch approximately	Authority: PRP/7/100	