GROUND MAGNETIC SURVEY

BALFOUR, TASMANIA.

C.P. Taylor

MELBOURNE JANUARY, 1965.

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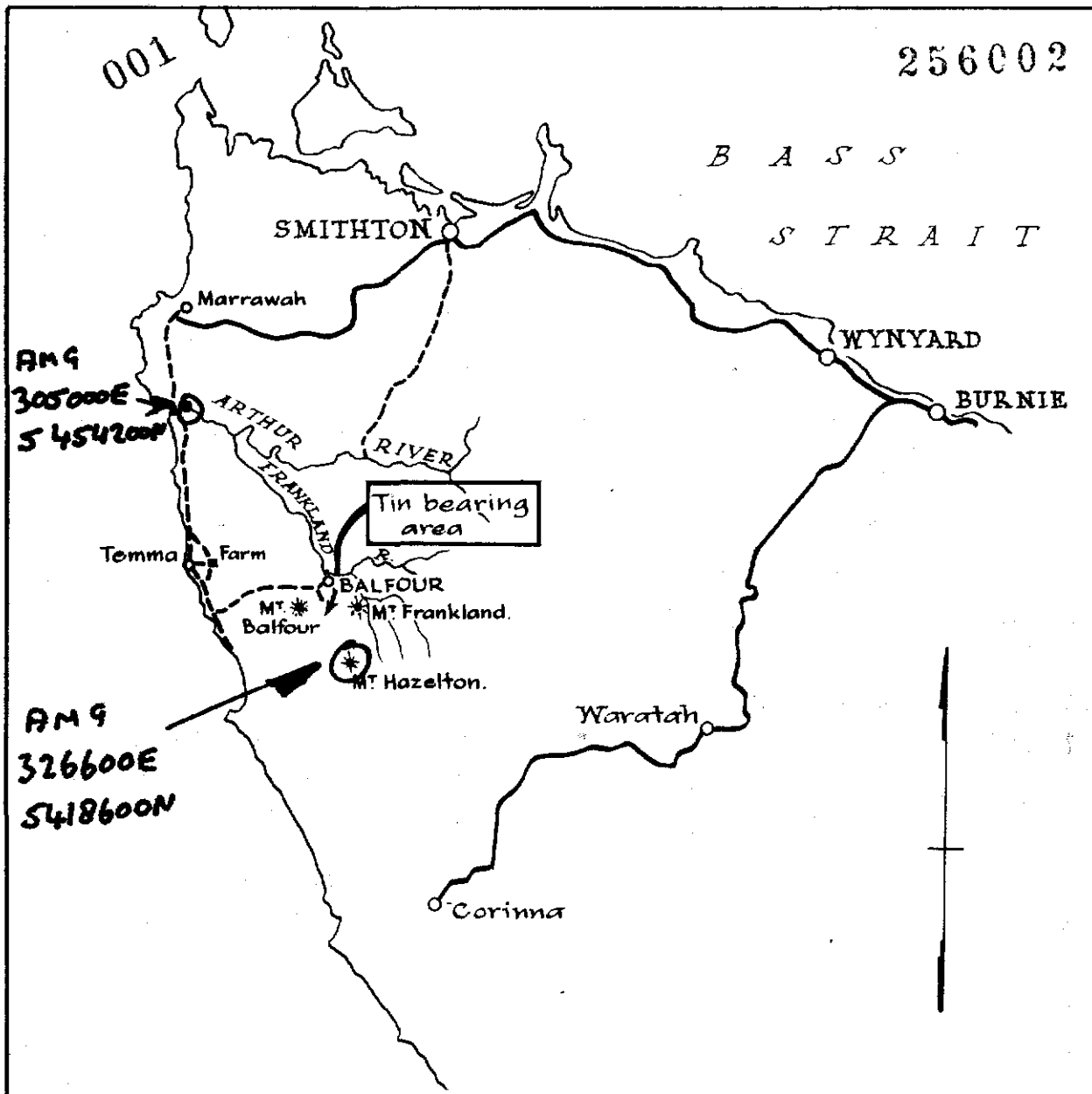

AMG REFERENCE POINTS ADDED

PLAN SHOWING LOCATION
BALFOUR TIN AREA
TASMANIA

Scale : 1inch = 15miles

Gss 818

INTRODUCTION.

Gravity and ground magnetic surveys made at Balfour in February and March 1964 have been described by Taylor (1964). A magnetic anomaly detected over Specimen Hill extends north and south of the option area held at that time.

While based at Zeehan the Bureau of Mineral Resources made at our request a small aeromagnetic survey over Specimen Hill and flew traverses to the coast west and south of Balfour. Their results, uncorrected for regional variation, are shown on Fig.1. An elongated anomaly, which was large compared with the magnetic variations in the Temma-Balfour area, was detected over Specimen Hill and extends for at least two miles along strike.

A quantitative interpretation of the aeromagnetic anomaly indicated a magnetic source 700 feet wide, 350 feet below the surface, dipping east at 70° and having a susceptibility of 2.5×10^{3} cgs units. The nature of this magnetic zone is unknown. The near surface tin mineralization at Specimen Hill, which is fine quartz-cassiterite veins in quartzites, is non-magnetic and could not cause the anomaly. Below the oxidised zone, however, these veins may be replaced by massive sulphides which are magnetic. The calculated susceptibility supports this as it is of the same order as that of the pyrrhotite bearing lodes at Renison Bell, Cleveland and Mt. Bischoff.

Of the four bores drilled on Specimen Hill only DDB.4, which was 550 feet deep, was sufficiently deep to have had a chance of intersecting the magnetic body. From 350 ft. to 550 ft. it intersected siltstones with sulphide grains and some quartz

cassiterite veins. The only core below 350 ft. examined in thin section, which came from a depth of 525 ft., was described by Whitehead and Apthorpe (1964) as "sericite quartzite with secondary carbonate and sulphides mainly pyrrhotite but with traces of sphalerite and chalcopyrite". This 2" section was estimated to contain 8% by volume of pyrrhotite which would make it slightly magnetic. This bore is located where the anomaly is not strongly developed and is on the western edge of the magnetic zone.

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SURVEY DATA.

The survey was made from 7th to 16th December 1964 by C.P. Taylor, assisted by R. Williams, R. Hagger and L. Hollingsworth, using Askania Werke torsion magnetometer No. Gfz. 582374.

The aim of the survey was to extend the previous ground survey southward to define the position and extent of the magnetic anomaly detected at Specimen Hill.

Traverses, shown on Fig. 2, were 500 ft. apart and stations were every 100 feet. Surveying was by the compass and tape method. Spot readings were also taken along unsurveyed tracks north of Specimen Hill to outline the northern limits of the anomaly.

The assumed zero value for the survey corresponded to an instrument reading of 122.00. Drift and diurnal corrections were made to the readings.

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RESULTS.

Fig. 2 is a magnetic contour map of the area.

The survey resolved the anomaly detected by the aeromagnetic traverses and partially defined by the previous survey. It is at least two miles long along strike and extends further south than shown on Figure 1.

The survey results supported the quantitative interpretation given for the aeromagnetic results.

Plane table survey using the established grid showed that south of Specimen Hill there is surface and near surface mineralization which when projected downdip at 70° corresponds to the position of the magnetic zone postulated to explain the observed anomaly. This association between anomaly and mineralization occurs over the full length of the anomaly and is most pronounced when geological and magnetic results are considered on a regional scale. It supports the possibility that the quartz cassiterite veins on the surface are replaced by massive sulphides at depth.

The magnetic anomaly is generally consistent with regional structure. Its axis is about 350°, which is the direction of the average strike of the Balfour sequence and of the quartz veins, and it corresponds to an east dip of 70° which agrees with some field observations. Many structural features shown on the geological maps of Specimen Hill and the Balfour District do not correspond to the anomaly, possibly because they refer to small scale features.

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CONCLUSIONS & RECOMMENDATIONS.

The magnetic surveys at Balfour have defined a distinctive anomaly which extends at least two miles parallel to the strike of the rocks. Clear indications of mineralization are visible in the surface and near surface rocks along the full length of the anomaly.

None of the rocks recorded so far from near the surface at Specimen Hill are even weakly magnetic and they could not produce the observed anomaly. Analysis of the anomaly, and comparison of its features with similar anomalies in comparable geological environments, indicate that the quartz-cassiterite veins near the surface may pass into massive sulphides at depth. Support for this possibility is given by bore DDB.4.

A vertical bore 800 feet deep is recommended at 3250'S/200'W E? to test the rocks causing the anomaly. Only minor road construction would be needed to gain access to this drill site. If the mineralization intersected by this bore warrants further investigation a deep angle hole would be required to intersect the full width of the mineralized zone.

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REFERENCES.

TAYLOR, C.P. - 1960 — Geophysical Exploration, Balfour, Tasmania. Company report.

WHITEHEAD, S and APTHORPE, M 1964. — Specimens from Balfour, Tasmania. Company report.

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MELBOURNE
CPT/HH
11th January, 1965.

C. P. Taylor.

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TEMMA FARM

TEMMA HARBOUR

NELSON R.

FRANKLAND R.

NORTON R.

TRAMWAY

BALFOUR

Interbedded quartzites, mudstones and siltstones of Balfour type.

Bog iron ore.

MT BALFOUR

MT FRANKLAND

Interbedded quartzite, mudstones and siltstones of Balfour ? type

Greens Ck

Daisy Ck

THORNTON R.

LINDSAY R.

LEIGH R.

MT HAZELTON

PEDDER R.

Approx. North

5 cm

TOTAL MAGNETIC FIELD RANGES

	< 800
	800 – 900
	900 – 1000
	1000 – 1100
	1100 – 1200
	> 1200

LEGEND

- Basaltic soils.
- Sand dunes.
- Granite.
- 900 — Contours of
- 850 — Total Magnetic Intensity.
- Airborne Proton Magnetometer Traverses flown by B.M.R.

MAGNETIC CONTOURS

TEMMA - BALFOUR AREA

WEST COAST OF TASMANIA

GEOLOGY AND BASE
COMPILED FROM UNCONTROLLED AERIAL PHOTOGRAPHS

APPROX. SCALE : 1 INCH = 65 CHAINS

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3.6.64.

MAGNETIC CONTOUR MAP
BALFOUR, TASMANIA.

SCALE OF FEET
0 400 800 1200

5 cm

LEGEND

- Road.
- Costean
- Shaft
- Tramway
- Traverse cutting contours.
- 500 / 550 — Magnetic intensity contour in gammas.
- ●DDB2 Diamond drill hole.
- ● Proposed
- Creek

5000'W 2500'W 00 2500'E

3500'N 2500'N 2500'S 5000'S 7500'S

9M 63 / 8M 63 — 10M 63 / 11M 63

Tin Creek

Balfour township

DDB1 DDB2 DDB3 DDB4

No.1 Costean · No.2 Costean · No.3 Costean · No.4 Costean · No.5 Costean · No.6 Costean · No.7 Costean

Dam · Adit · Soil outcrop · Quartz and pit · OC black shale · Quartzite · Conglomerate

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MAGNETIC CONTOUR MAP
BALFOUR, TASMANIA.

5000'W 2500'W 00 2500'E

3500'N 2500'N 2500'S 5000'S 7500'S

SCALE OF FEET
0 400 800 1200

5 cm

LEGEND

- Road
- Costean
- Shaft
- Tramway
- Traverse cutting contours.
- 500 / 550 — Magnetic intensity contour in gammas.
- ⊙DDB2 Diamond drill hole.
- Creek

LOCALITY MAP
SMITHTON
Marrawah
BALFOUR
Mt. Hazleton
Waratah

Tin Creek
Balfour townsite
DDB.6
DDB2
DDB1
DDB3
DDB4
DDB5
No.6 Costean
No.5 Costean
No.4 Costean
No.1 Costean
No.2 Costean
No.3 Costean
No.7 Costean
10M 63
11M 63
9M 63
8M 63
Dam
Adit
Gossan outcrop
Quartz and gossan
O.C. black shale.
Quartzite
Conglomerate

N.B. to accompany log of D.D.H.5 on file No. 58/124

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BALFOUR TIN

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FIG 3