

1980/51. Radiometric survey, Fingal Tier

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Abstract

A spectrometer survey undertaken concomitantly with a magnetometer survey of the Fingal Tier region, a dolerite capped plateau in eastern Tasmania, has not revealed any geologically interpretable features. Analysis has been restricted to total intensity and it is possible that spectral analysis may prove more useful.

INTRODUCTION

A magnetometer survey of Fingal Tier (Leaman and Richardson, 1980b) was proposed in order to reduce potential ambiguities in gravity interpretation. As discussed (op.cit), the gravity results proved more reliable and comprehensive than anticipated (Leaman and Richardson, 1980a) and the magnetic surveys undertaken added some additional detail only. In order to acquire the necessary range of spectral detail, reduce the impact of drape errors in rough country, evaluate continuations and develop an appreciation of adequate processing techniques in this environment, the survey was flown at 900 m (50 m clear of highest point) and 1050 m. A gamma ray spectrometer survey was undertaken concomitantly, since the possibility of acquiring additional useful data at low cost existed. The spectrometer was used at both altitudes.

Apart from a small region in the north of the area, on the slopes of the Fingal Tier escarpment, and in the central south where Triassic coal measures are exposed, the bulk of the area is surfaced by dolerite. The dolerite is present as thick but variable sheets and pipes. Dolerite products, especially talus, repose on most slopes and conceal much of the coal-bearing sequence.

EQUIPMENT AND SPECIFICATIONS

The complete specifications for the survey have been given by Leaman and Richardson (1980b, Appendix 3) but a summary is given below.

Nominal flight line spacing:	250 m
Tie line bearing:	0 degrees
Nominal aircraft speed:	100 knots
Reading interval:	0.8 seconds
Sample interval:	approximately 35 m
Sensor height:	900, 1050 m
Magnetometer accuracy:	1 nT
resolution:	0.1 nT
Aircraft:	Cessna Al85E with Bonzer Mk10 radar altimeter and 16 mm ground tracking frame camera
Detector:	241 NaI (Tl) Gamma Ray Detector, 256 channel spectrometer/analyser

RESULTS

Results of total radiometric intensity are provided in Figures 1 and 2 for surveys at low and high (900, 1050 m) level respectively. Contour interval in each case is 10 counts per second. Figure 3 presents the topography.

Comparison of Figures 1 (especially) and 3 reveals the expected sub-

stantial correlation between intensity and terrain clearance. Indeed the 200 cps contour line is approximately equivalent to the 700 m terrain contour. Thus the observations reflect the elevated terrain along the northern escarpment and across the heart of the area. All anomalies correlate with topographic features and no known major structures or geological boundaries may be identified. This observation remains true for those areas where the structure transects a region where elevation differences are small or absent (e.g. the feeder extension and dyke edges near EP900810 or EP915810 or around the Duncan mine - compare Leaman and Richardson, 1980a, b).

Data from the higher survey (fig. 2) are less informative and possibly of doubtful reliability. This is suggested by the relationship between traverse lines and contour character. However, for those areas with acceptable character and intensity differences a simple terrain clearance correlation is apparent. The only deviations from this correlation occur at EP795845, EP810857, and EP995840. Since these features were not recorded at low altitude they are probably spurious.

INTERPRETATION

No interpretation, other than that given above, is possible. All features may be accounted for simply and are related to terrain-sensor clearance. No features of structural significance may be recognised.

CONCLUSION

The results of this survey suggest that total radiometric intensity surveys in eastern Tasmania, over post-Devonian rocks, are not prospective exploration tools. However, it remains possible that spectral analysis of the data, not undertaken here, may have yielded more useful results.

REFERENCES

LEAMAN, D.E.; RICHARDSON, R.G. 1980a. Gravity survey of the East Coast Coalfields. *Department of Mines, Tasmania.*
LEAMAN, D.E.; RICHARDSON, R.G. 1980b. Magnetic surveys, Fingal Tier region. *Unpubl.Rep.Dep.Mines Tasm.* 1980/46.

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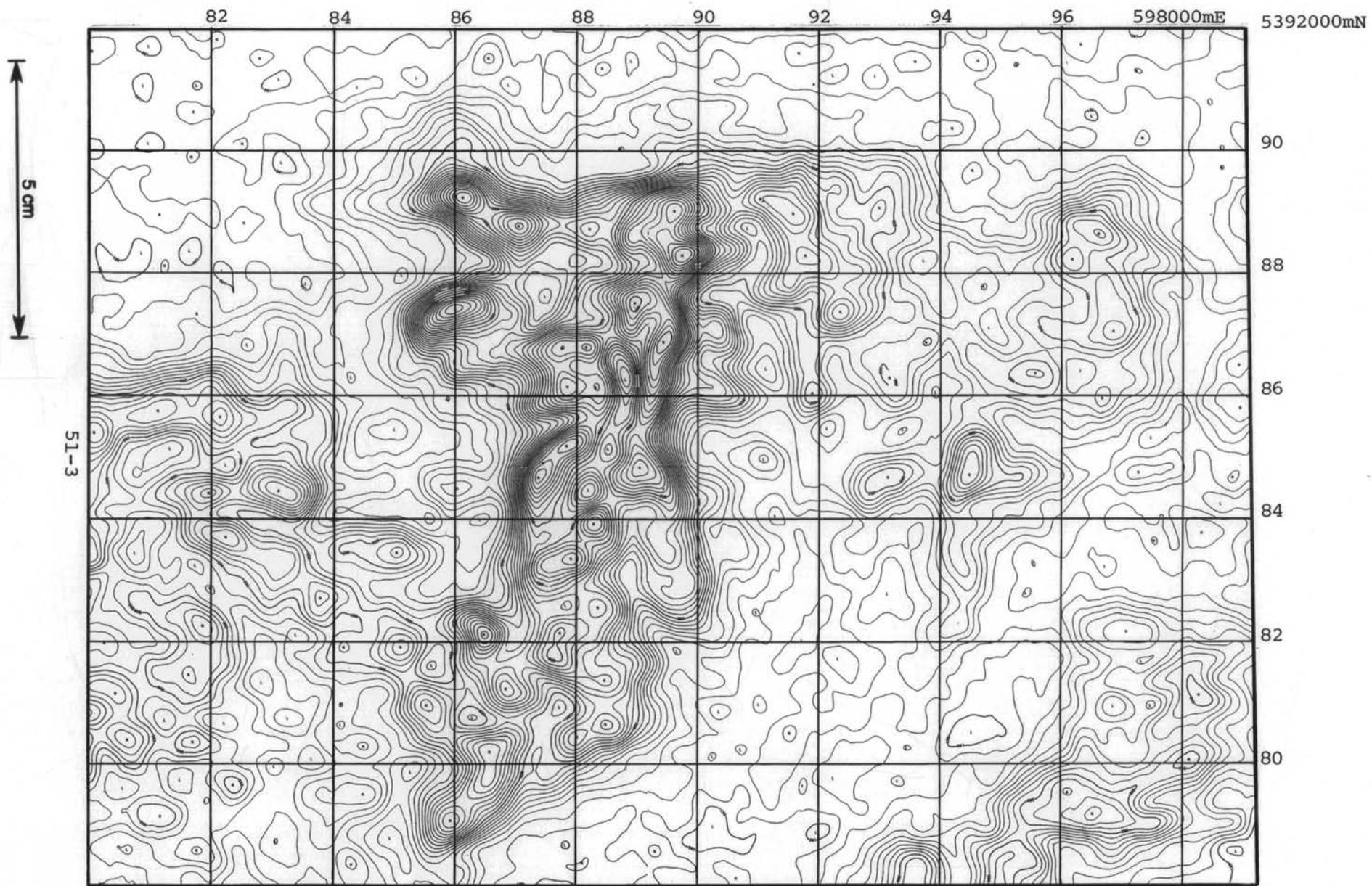


Figure 1. Contours of total radiometric intensity, $h = 900$ m

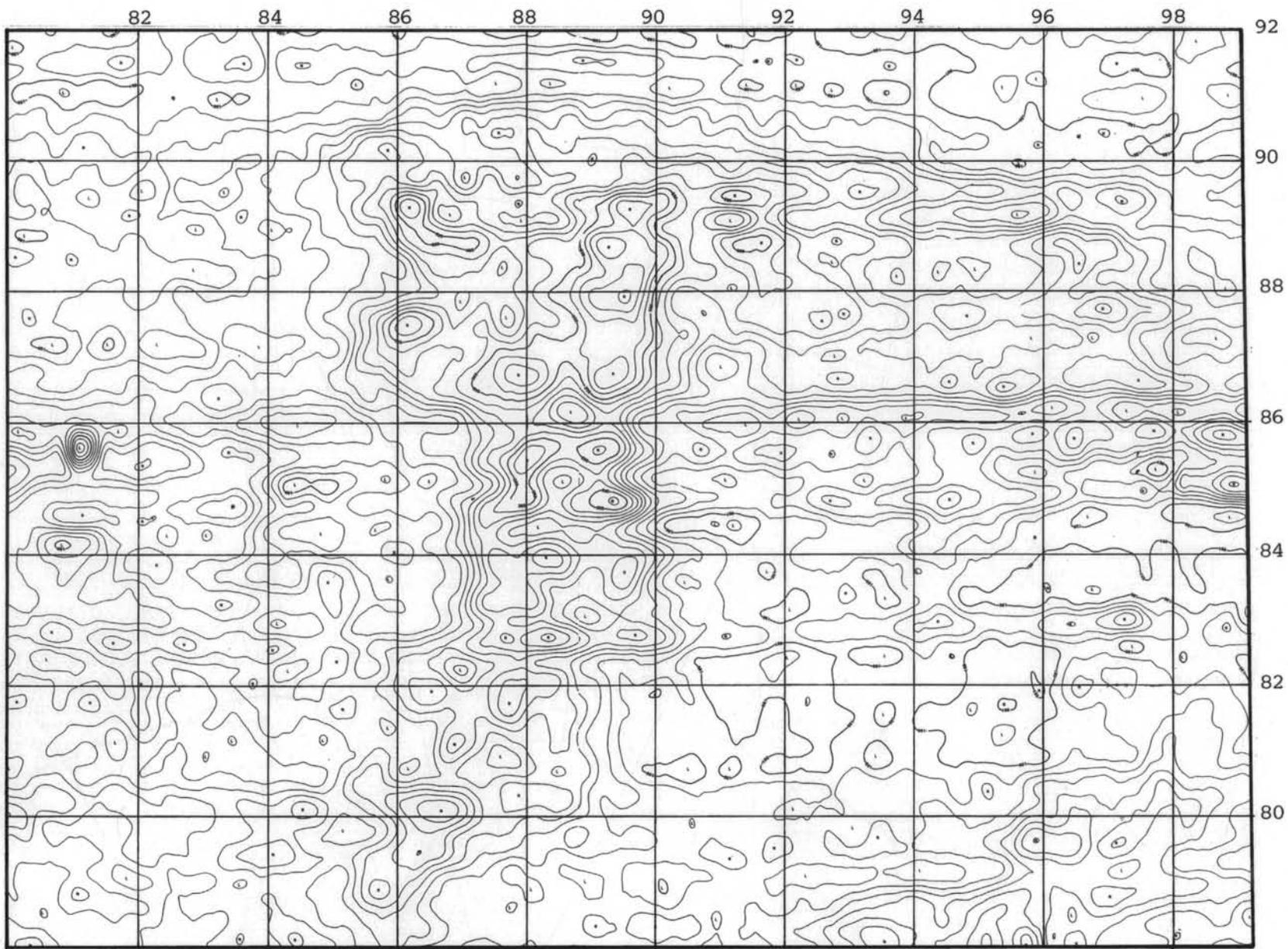


Figure 2. Contours of total radiometric intensity, $h = 1050 \text{ m}$

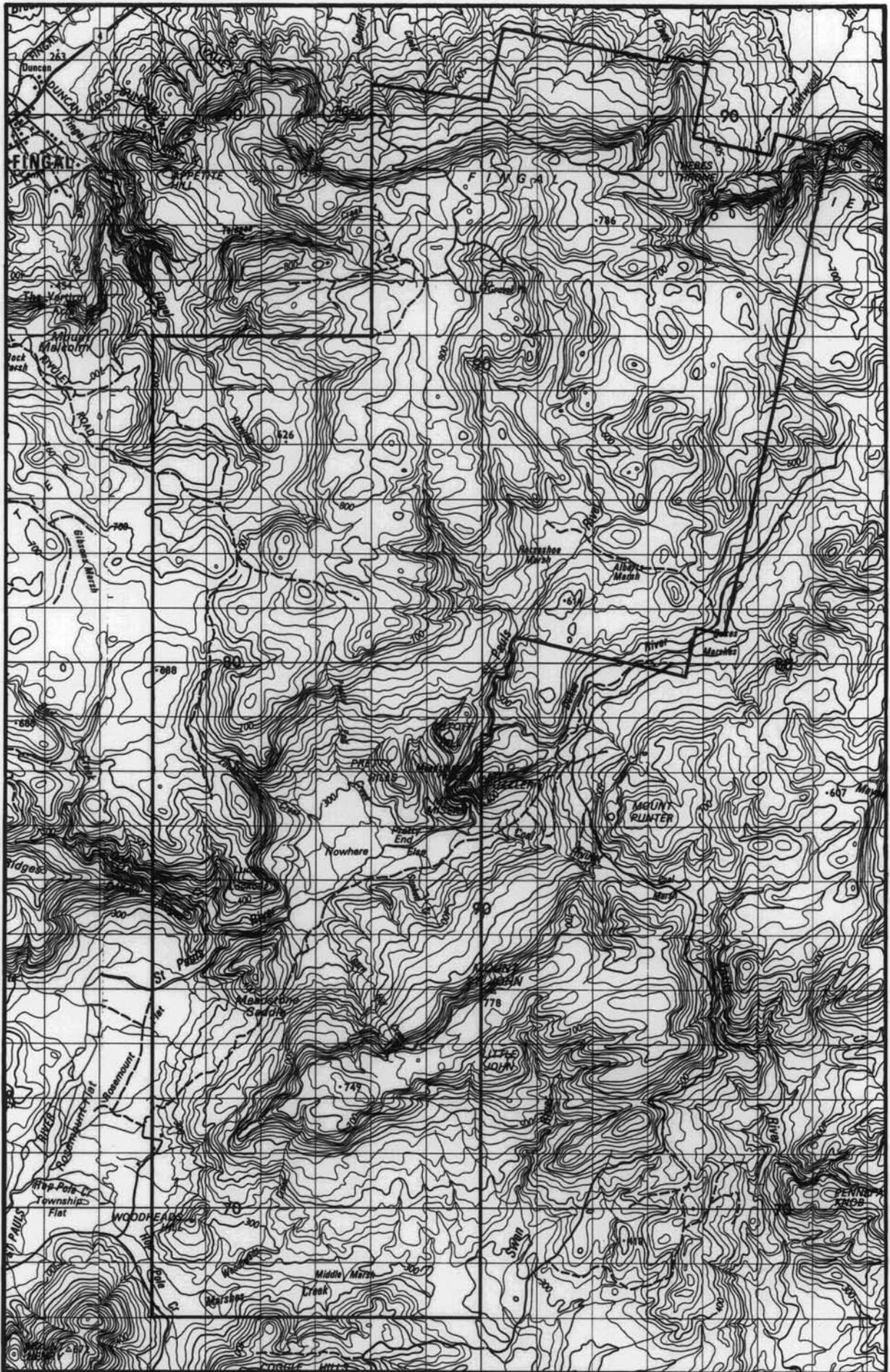


Figure 3. Topography of survey area. State Reserve outlined

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