

UR197A-01

Seismic survey, Birralee Creek catchment area.

W.L. Matthews

Three seismic spreads were fired at positions where boreholes were recommended for observation of water table fluctuations (Matthews, 1973). Their positions are shown on Figure 1. The widespread distribution of dolerite suggests that it could underlie the Triassic sediments.

Spreads 1 and 2 have coincident shot points at their western ends; Spread 1 having a 3 m, and Spread 2 a 7.6 m, geophone spacing. An extension shot 91 m west of Spread 2 was fired to probe to a greater depth. Interpreted sections are shown on Figure 2 and a summary of the results is given below.

Spread 1

Velocity (m/s)	Thickness (m)	Depth to Basement (m)	Interpretation
275	1.2-1.5		Soil, loose sand.
610	1.5-3		Compacted or clayey sand.
1920	-	3.7-4.3	Triassic sediments.

Spread 2

460	3		Soil and sand.
1220	4.6-6.1		Wet sand, clayey sand or very weathered rock.
2290	-	7.6-9.1	Triassic sediments.

The extension shot indicated a seismic velocity for the basement of 2835 m/s which also suggests Triassic sediments to the depth probed. Unweathered dolerite, if it occurs, is unlikely to be encountered at depths of less than 45-50 m.

There are some differences in the interpretation of the seismic velocities and layer thicknesses between Spreads 1 and 2. The top layer in Spread 2 (fig. 2) may be the equivalent of the top two layers of Spread 1. The interpretation of the middle layer in Spread 2 is based on data from only two geophones at the west end of the spread. The variation in the velocity for the basement may be due to less weathered rock with less open joints being encountered with deeper probing.

Spread 3 had a geophone spacing of 7.6 m and was fired on both ends with an extension shot 96 m west of the spread. The interpretation is summarized below.

Velocity (m/s)	Thickness (m)	Depth to Dolerite (m)	Interpretation
790	1.8-3.7		Damp sand or clayey sand.
2040	15.9-20.7		Triassic sandstone and, or mudstone.
5490	-	19.5-22.6	Dolerite.

CONCLUSIONS

A bore in the vicinity of Spreads 1 and 2 would probably penetrate Triassic sediments for most of its depth i.e. at least to 45-50 m and the

water table would probably be encountered before these depths were reached.

Dolerite almost certainly underlies the Triassic sediments under Spread 3. The intrusion will have baked and perhaps reduced the porosity of the sediments. The extent of this alteration will depend on the size of the dolerite body. There is a reasonable chance that water would be obtained in the overlying sediments because the nature of the relief suggests that if a water table exists, it would probably be at shallow depth.

REFERENCE

MATTHEWS, W.L. 1973. Representative basin study: Birralee Creek, eastern Tasmania. *Unpubl.Rep.Dep.Mines Tasm.* 1973/74.

[11 January 1974]

GEOLOGICAL MAP OF BIRRALEE CREEK CATCHMENT AREA.

GEOLOGIST W.L.MATTHEWS. 1973

Scale 1 : 50 000

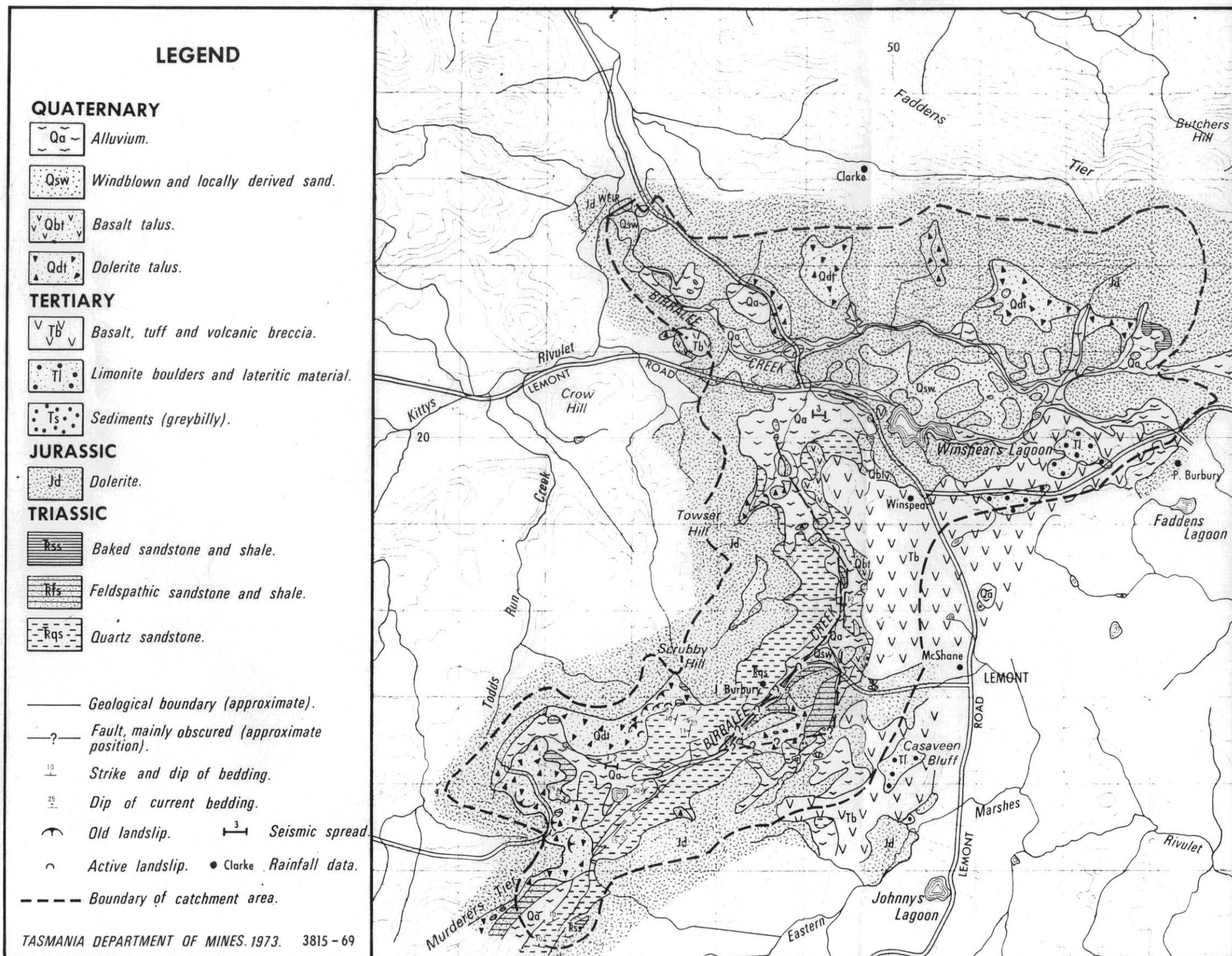
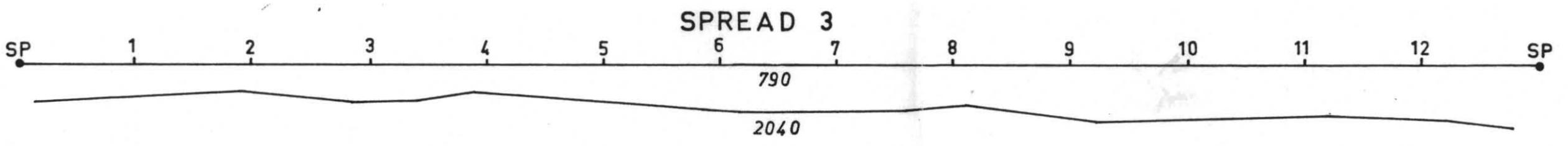
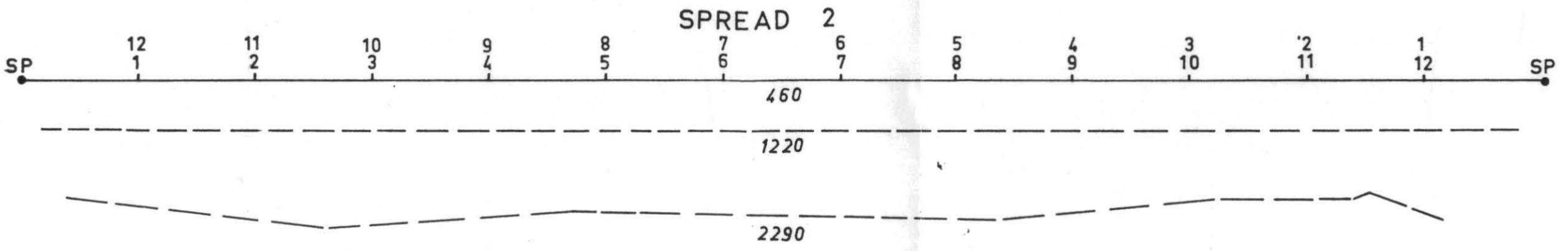
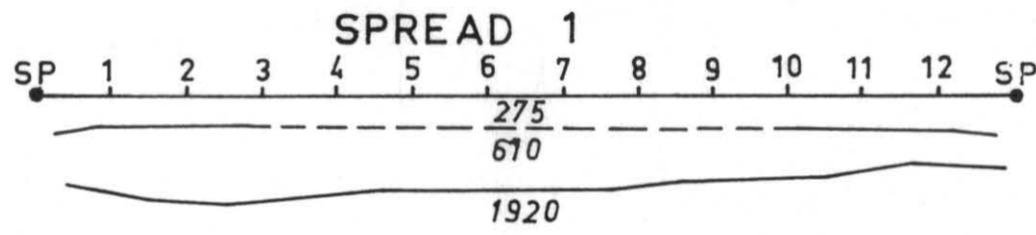


FIG-1.

5 cm

SEISMIC SPREADS - KITTY'S RIVULET



5 cm

0 10 20 30 METRES

SEISMIC VELOCITIES IN METRES/SECOND

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FIG. 2