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5. FURTHER EXAMINATION OF PROPOSED DAM SITE, COLES BAY

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INTRODUCTION

As one means of providing water for a town supply at Coles Bay a dam has been proposed in a small creek N of the town. Preliminary geological work was undertaken by Matthews (1966) and this revealed two possible gouge zones, one on either side of the proposed dam site. Electrical geophysical methods have been used to determine the depth of these zones.

The resistivity probe method, using the Schlumberger electrode configuration, was employed with the electrode line along the strike of the suggested gouge zones. Fig. 23 shows the observations plotted as a function of apparent resistivity and half current electrode separation. The latter factor approximates the effective depth of current penetration. Quantitative interpretation was facilitated by using the standard three layer Schlumberger curves (Compagnie Generale de Geophysique, 1955).

SUMMARY OF CONDITIONS AT DAM SITE

The dam is to be built on unweathered granite. However, in the low saddles adjacent to the site, granite does not outcrop. In these zones the section is thought to be soil, weathered granitic material and granite. The resistivity curves verify this. The dry sandy soil has a resistivity of some 1200-1500 ohm-metres and is the upper layer. Below the soil the resistivity decreases to approximately 80-100 ohm-metres. This fall reflects the increased clay content of the zone of weathered granite. The lowermost layer, of unweathered granite, is of very high resistivity and this is indicated by the (sometimes sharp) increase in resistivity with increased depth.

Curves 1 and 2, of probes on the western gouge zone, show 1-2 feet of soil, about 20 feet of weathered rock, and granite at 20-23 feet.

Curves 3, 4 and 5 show the form of probes on the eastern gouge zone. In this zone the soil ranges in thickness between 3 and 7 feet. The gouge is deepest near the western outcrop and shallows eastward. The maximum observed depth to granite is 45 feet.

Thus the western gouge zone has a base at about creek level, while that of the eastern side extends up to 20 feet below creek level.

5 cm

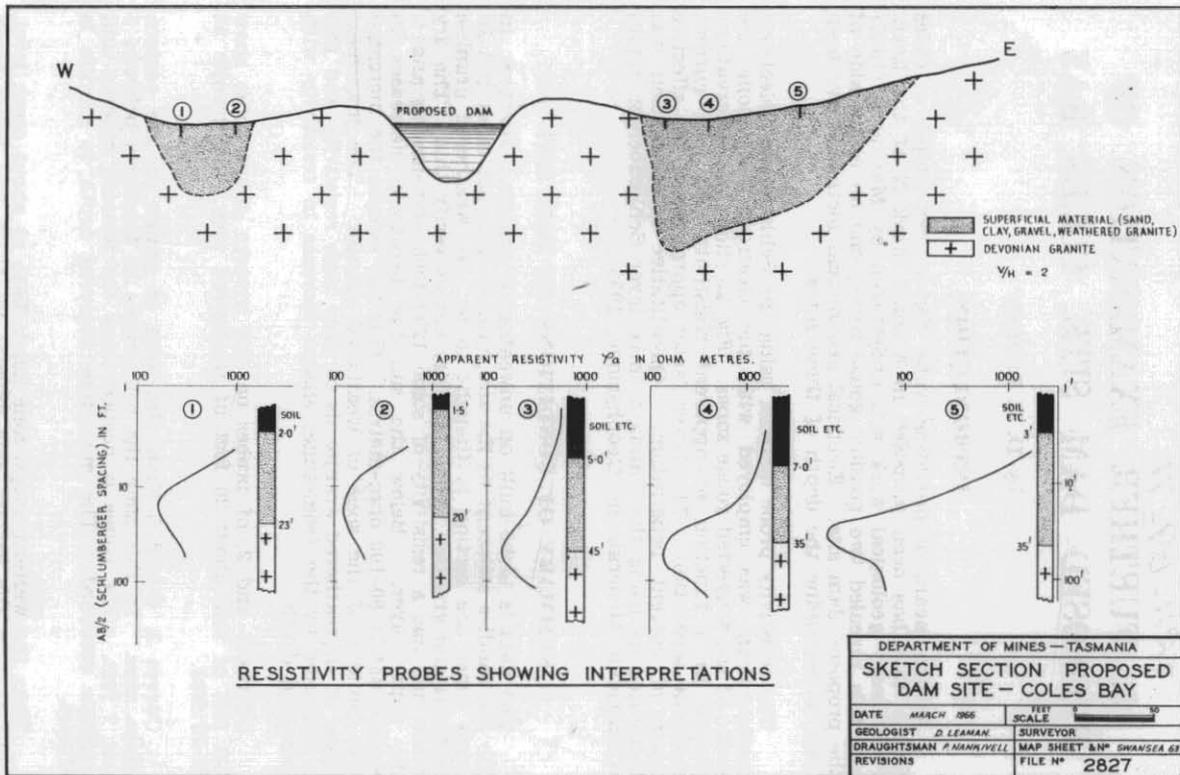


Figure 23

CONCLUSION

The results of the resistivity survey suggest that water is currently being diverted from the stream course, which is to be dammed, through a deep gouge zone a little E of the dam site. Further, the construction of a 15-20 feet dam in the creek will increase the leakage by increasing the head of water; in view of the limited storage and recharge capabilities of the area, this is a luxury which cannot be afforded.

RECOMMENDATIONS

If it is proposed to continue with this site, which is poor from the geological and hydrological viewpoints, drilling will be necessary along the length of the gouge zones in order to check the geophysical interpretation and to determine whether the depth of the zones is in fact maintained along their length.

REFERENCES

- COMPAGNIE GENERALE DE GEOPHYSIQUE, 1955—Abaques de Sondage Electrique. *Geophys. Prosp.*, 3, Suppl. 3
- MATTHEWS, W. L., 1966—Examination of Proposed Dam Site, Coles Bay. *Tech. Rep. Dep. Min. Tas.*, 10, 72-74