

TR11-106-108

18. RESISTIVITY INVESTIGATION OF THE PROPOSED NUNAMARA WATER TUNNEL

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INTRODUCTION

The Launceston City Corporation plans to build a tunnel to carry water through a spur at Nunamara. The only rock type to be encountered along the tunnel line is dolerite. The outcrop is marked only along the N side of the spur (50-200 feet), where the dolerite is very massive and coarsely jointed.

GEOPHYSICAL METHOD

A resistivity traverse, using the Schlumberger configuration, was made along the line of the proposed tunnel. The effective depth of current penetrations was 100 feet, and thus all the material to a depth of 100 feet was electrically sampled. This is sufficient to show clearly deeply weathered zones.

Fresh unjointed dolerite has a resistivity in excess of 10,000 ohm-feet, whereas completely decomposed dolerite has a resistivity of 20-50 ohm-feet. Intermediate values may indicate extent of jointing and/or weathering.

RESULTS

The values of resistivity show a general increase from the 50 to the 100 feet marks and a decrease from the 100 to the 450 feet marks. The high values in the region of 100 feet reflect the massive outcrops on this part of the spur.

The readings between 150-190 feet are suspect due to the rocky nature of the surface, which has probably prevented good ground connections being made. The readings may however be reliable, in which case a deep zone of weathering is indicated.

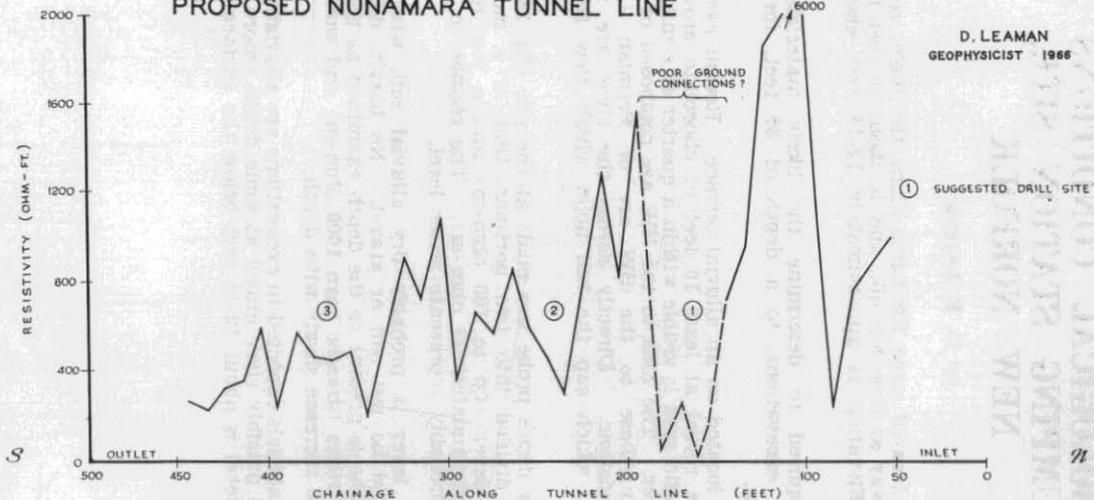
The suggested interpretation of the profile is shown on fig. 37 but generally a low value has been taken to indicate a shear zone and a high value fairly solid rock. Intermediate values probably reflect the joint density which appears to decrease northward.

RECOMMENDATIONS

Before an attempt is made to construct the tunnel some test drilling is recommended. It is suggested that drilling continue 5 feet below the level of the proposed tunnel, no hole being deeper than 45 feet. Three sites are suggested which should permit fuller use of the resistivity profile (see fig. 37).

5 cm

RESISTIVITY TRAVERSE PROPOSED NUNAMARA TUNNEL LINE



WEATHERED ROCK AND/OR HIGH JOINT DENSITY	MOD. SOLID ROCK	MOD. SOLID ROCK	MASSIVE ROCK	?	MASSIVE ROCK	MASSIVE ROCK
POSSIBLE SHEAR ZONE (CLAY)	POSSIBLE SHEAR ZONE	POSSIBLE SHEAR ZONE			POSSIBLE SHEAR ZONE	

SUGGESTED ROCK CHARACTER

DEPT. OF MINES
2945

FIGURE 37

Site No. 1 will indicate whether a deep zone of weathering is present or whether poor ground connections were made over fairly massive rock.

Site No. 2 should check the theory that values of 250 ohm-feet reflect shear zones, and the exact nature of such zones. Such values occur at 85, 235, 345 and 395 feet.

Site No. 3 should reveal extensively jointed dolerite and the character of the rock at this point will give a good indication as to the constructional difficulties to be expected since the rock at Site No. 3 should be of much poorer quality than that at 50-80 feet, 90-140 feet, 190-225 feet, 250-290 feet and 310-330 feet.