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## Section 4 — Engineering Geology

THE FORTH PIPELINE  
SUPPLEMENTARY REPORT

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## INTRODUCTION

The route finally adopted for the new pipeline to supply Devonport and environs is the "Northern Route". Since this route crosses two landslide areas, consideration has been given to the possibility of movements on the pipeline route during the life of the scheme.

## LANDSLIDE AREAS

The two major areas are the Forth Hill, on the east bank of the river just south of the township, and the Don Hill, overlooking the Don River at Tugrah. These are the zones A and B of the earlier report. (Burns, K. L.—*Tas. Dept. Mines Tech. Reports No. 3, 1959.*)

The geological information obtained is compiled in a plan for each area. (*Tas. Dept Mines Tech. Reports No. 3, 1959, fig. 26.*)

## Don Hill

The bedrock here is Permian fossiliferous conglomerate siltstone, overlain by sandstones of the Mersey Coal Measures and pebbly siltstones corresponding to the Woodbridge Group. These rocks dip steeply east due largely to drag-dip on a major Tertiary fault a short distance west, so that they outcrop as narrow belts with a N.N.W. strike. The belt of Mersey Coal Measures passes through the western side of the slide zone, and it is probable that the slides moved on a bedding surface, possibly a coal measures clay or shale, which dips east into the Don River.

The landslide toes appear truncated by the river terrace, which means the movement predates the present meander pattern of the Don River, i.e., it occurred some thousands of years ago. The landslide morphology has been somewhat modified by subsequent erosion.

The direct cause of slippage is undercutting by the Don River and since this process has now largely ceased, the slides are considered stable. The only activity noted consists of small slides where undercutting is still effective, but this is away from the pipeline route, and will not affect it.

## Forth Hill

This landslide zone is entirely in basalt. The morphology is fresh only in the southern part, but even here it has been modified by ordinary processes of erosion, so that the movements must have occurred a long time ago.

The defined slides appear to be moving on a surface about 100 feet above the river, and there are many springs issuing at this

height. In the northern part, a small area of white clay occurs on a bench at this level, so it is likely that the slides are moving on this clay bed.

Present movements are confined to a small slide on the river bank where a small creek supplies excessive amounts of water into the slide area. There is no indication of recent movement anywhere else.

### CONCLUSIONS

The major slides zones are ancient, and are probably related, though perhaps indirectly, to a period of higher sea level about 6000 years ago. Observations throughout the district show many slides formed in this period, most of them due directly to undercutting by wave action. Nowhere is there evidence of large-scale modern movement—the modern landslides are confined to small slides on the steep slopes remaining after the earlier movement.

Renewed large-scale movements of the slide zones are therefore ruled out; the remaining possibility is that there may be small slides where the pipeline crosses the old landslide heels. The areas concerned are from 3000 to 3800, 18200 to 18400 (and possibly in the deep creek from 5700 to 6200 (pipeline footages). Although there has been movement in the past, in these areas, this has now ceased. There are no abnormal drainage conditions and the existing slide surfaces are lubricated mainly by rain water passing through to join the water table which is probably usually below the slides. The pipeline crosses these places in short steep rises so that it will have strength to resist small movements. It is therefore considered that these areas, although they are formed slides, are not dangerous slopes to cross.

Careful consideration was given to the possibility of precautionary measures concurrent with pipeline construction. As pointed out by the Senior Geologist, Mr. T. D. Hughes, the only effective drainage would be by adits, and as there is not excessive water present to require drainage this procedure would be pointless. The existing landslide heels, although closed depressions, are free draining, and do not store water even after heavy rain, so the formed slip surfaces are acting as drainage channels.

### RECOMMENDATIONS

The route adopted, although crossing formed slips, is reasonably safe for pipeline construction. A check should be made during construction to ensure no new slips are caused by the excavation. Care should be taken to prevent leakages in the portions 3000-3800, 5700-6200, 18200-18400 (pipeline footages). Permeable backfilling in these areas is unnecessary and even harmful as it will increase the amount of rain water delivered into the formed slides.