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15. GEOLOGY OF THE PROPOSED DAMSITE, BLYTHE RIVER ESTUARY

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This report concerns the geology of the Blythe River estuary between the Bass Highway bridge and the sea, in connection with a proposal to dam the Blythe River at high water level, in the vicinity of the railway bridge.

At the estuary of the Blythe River there is a fairly flat plain consisting of unconsolidated sandy sediments. This material has been deposited by marine and river agencies upon an embayed platform cut into hard bedrock at a time when the sea was at a higher level. The Blythe River has cut its present course through these recent sediments, and bedrock is exposed in several places along the banks of the river. In addition, patches of bedrock with a thin covering of sandy soil (about 2 feet thick) are found protruding through the sediments. These patches represent positive irregularities on the undulating surface of the embayed platform.

The bedrock distribution is shown on the accompanying geological map (Figure 32).

The rock types present in the area, passing from oldest to youngest are described briefly below.

Precambrian rocks

These are dominantly very hard well bedded quartzite often with a well developed cleavage parallel to the bedding. Interbedded with the quartzite are thin bands of phyllite (or slate) which weathers easily into a soft clayey rock. Three bands of phyllite are found on the wave cut platform at East Blythe Head, and are expected to be in the bed of the Blythe River on the downstream side of the railway bridge.

Dolerite dykes intrude the Precambrian rocks in the Burnie area. These rocks are extremely hard when fresh, but are very susceptible to weathering and in a perpetually wet environment they decay in a manner similar to basalt. One of these dykes, concordant to the bedding, is exposed on the wave cut platform $\frac{1}{4}$ of a mile west of Blythe Heads. No dolerite outcrops occur in the immediate vicinity of Blythe Heads, and as the river bed cuts obliquely across the strike of the quartzite, there can be no concordant dolerite body in the bed of the river. The chance of a discordant dolerite body within the river bed is very remote.

Semi-consolidated sand and gravel

Overlying the quartzite in the embayment is a sheet of fairly well bedded sand and gravel 20 feet thick. This rock is semi-consolidated and can be crumbled between the fingers with difficulty. It consists of sand bands containing irregular gritty lenses, and roundstone gravel with a sand matrix. There is no size fraction smaller than fine sand, and the grains are partially cemented by red ferruginous and black carbonaceous material. The rock has a high void space component and is very porous and permeable.

Unconsolidated sand

Overlying the previous band is 6 to 10 feet of clean white sand which blankets most of the area. This is thought to be old (Pleistocene?) beach sand.

Currently depositing sediments

These include the beach sands to the west of Blythe Heads, the sand bar across the mouth of the river, the sand in the river bed in the vicinity of the railway bridge, and the sand, gravel and mud lying between high-water and low-water marks in the estuary.

There are no bedrock exposures in the bed of the river in the vicinity of the railway bridge, and at low tide only sand is exposed. The thickness of this sand is not known but in my opinion it is about 10 or even 20 feet thick. The Railway Department is at present drilling the river bed beneath the railway bridge, and should be able to furnish data relevant to this question.

CONCLUSIONS

From the view point of bedrock distribution, the most suitable dam site would be 400 feet on the upstream side of the railway bridge, where the dam would join solid rock on both sides of the river.

The only problem is the unknown thickness of unconsolidated river sand in the bed of the Blythe River in this vicinity.