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THE STONY RISE RESERVOIR SITE

Introduction:

The search for a suitable reservoir site near Devonport has led to acceptance of a site near the Stony Rise. This is the site No. 3 of the report of 10/9/56 ("Reservoir Sites on Kelcies Tier").

Although solid dolerite outcrops each side of the site, a fault passing through the site was predicted, and the possibility of Permian siltstones underlying the reservoir site was indicated.

Nature of the Bedrock:

Excavations in trenches show the dolerite is overlain by clays which preserve the dolerite structure, with white spots due to felspars in a red matrix derived from pyroxenes. Platy jointing is also retained.

Overlying the weathered dolerite is structureless clay, blue, white and brown, with incipient parting and containing rounded quartz pebbles. This is probably weathered Permian, possibly transported in Tertiary time.

The surface is a bed up to 4' thick of nodular rock, consisting of pebbles of basalt and haematite (?) in a cement of white clay. The clay was instantly recognised by J. Evans (H.E.C. Soil Division) as derived from basalt.

Structure:

The rock distribution indicates a basin plunging east. The circumference is solid dolerite, the next circumferential ring is weathered dolerite, and the centre is occupied by pebbly clay. The basin possibly deepens on the southern side. A bore showed the weathered dolerite becomes a typical yellow dolerite clay in depth.

The nodular rock is a blanket in the centre of the basin.

Dam Construction:

Doubts about the permeability of the weathered dolerite have been removed by the discovery that it becomes the typical yellow clay in depth.

The pebbly clays appear impermeable, as trenches hold water. However, field tests are advised to make certain. The borehole encountered no sand-lenses, and none were found in trenches, so that even if this rock is Tertiary, it does not seem to contain permeable sands that occur elsewhere, as on the Tugrah Road.

The nodular rock is also impermeable, but appears unsuitable for dam construction, as basalt clays can be very unstable. Tests in the Public Works Department laboratory would resolve this point.

Conclusion:

Provided the possibility of leakage beneath the dam is properly evaluated, there is nothing to prevent

usual construction methods. If the permeability of the pebbly clays is too high, a cut off trench to the dolerite clay, which would need to be somewhere about 30 feet deep, would be sufficient to prevent leakage.

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