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Preliminary reconnaissance investigation of a proposed dam site for the Bridport town supply.

W.R. Moore

A preliminary reconnaissance geological and geophysical investigation was undertaken on the proposed dam site, about one kilometre south of Bridport, at the request of the consulting engineers of the Scottsdale Municipality.

PHYSIOGRAPHY

The proposed dam site is situated where the Brid river cuts through a NNW-SSE ridge in a narrow gully (fig. 1). The ridge is a conspicuous landmark and is formed by hardened sandstone and siltstone. These sediments form the metamorphosed contact zone in the Mathinna Beds between the Mathinna sediments inland and the granite exposed on the coast.

The northern abutment of the dam site is a steep spur which runs from the river to the top of the NNW-SSE ridge. This abutment spur is separated by a narrow deep NNW-SSE valley from the remainder of the reservoir area. In contrast, the southern abutment is a low wide spur which slopes gently up from the stream to the south.

Much of the reservoir area along the northern bank of the Brid river is formed by high ground from a series of narrow NNE-SSW ridges and valleys. The southern bank of the reservoir upstream from the abutment ridge lies on alluvial flats. These flats are the only cleared pastoral land. The remainder of the area is covered by high bracken fern and other secondary growth. With this type of vegetation cover no detailed geological or geophysical investigation was possible at the site.

GEOLOGY

Traverses were undertaken on both banks of the Brid river from the old pump station to the George Town-Bridport highway. Exposures on the abutments and in the reservoir area are very few and poor as much of the area is covered by a layer of superficial windblown sand. The only outcrops found near the dam site were in old exploration pits on the northern bank. These pits showed weathered sandstone or sandstone boulders.

Steeply dipping beds of fine-grained sandstone with minor siltstone beds are seen in the face of the quarry near the existing weir. These sediments were baked and well jointed.

SEISMIC SURVEY

Two seismic spreads were fired in the approximate vicinity of the dam site along two old vehicle tracks using 12 geophones with the Geospace GT.2A seismograph. Geophone spacings were 7.6 m on the northern abutment and 15.2 m on the southern. On each abutment a weathering spread with a total length of 15.2 m was fired.

On the northern abutment spread a surface layer (V_0 = 600-1200 m/s) overlay an intermediate layer (V_1 = 2100-2750 m/s) which was underlain by a third layer (V_2 = >4500 m/s). The calculated interface depths from these three layers using averaged velocities were 8-11 m (V_0/V_1) and 30-40 m (V_1/V_2).

The surface layer was thickest at the northern end of the spread and

the intermediate layer lensed out towards the south. The travel time curves for this spread are asymmetrical but this is thought to be the result of the steep ground surface slope rather than a slope on the velocity layers.

On the southern abutment spread the seismic velocity for the surface layer (V_0) was 600-1500 m/s, the intermediate layer (V_1) 2100-2400 m/s and the third layer (V_2) 4000-4500 m/s. Averaged velocities gave calculated depths to the two interfaces as 10-12 m (V_0/V_1). The travel time curves showed on this spread as one of a series of small, stepped increasing velocities found to be characteristic of the spreads fired elsewhere above Mathinna sediments.

The two weathering spreads gave a surface velocity layer (V_0) of 300 m/s overlying a second layer (V_1) of 1200 m/s. The thickness of the surface layer in the weathering spreads was calculated to be 1 and 2.3 m.

GEOLOGICAL INTERPRETATION

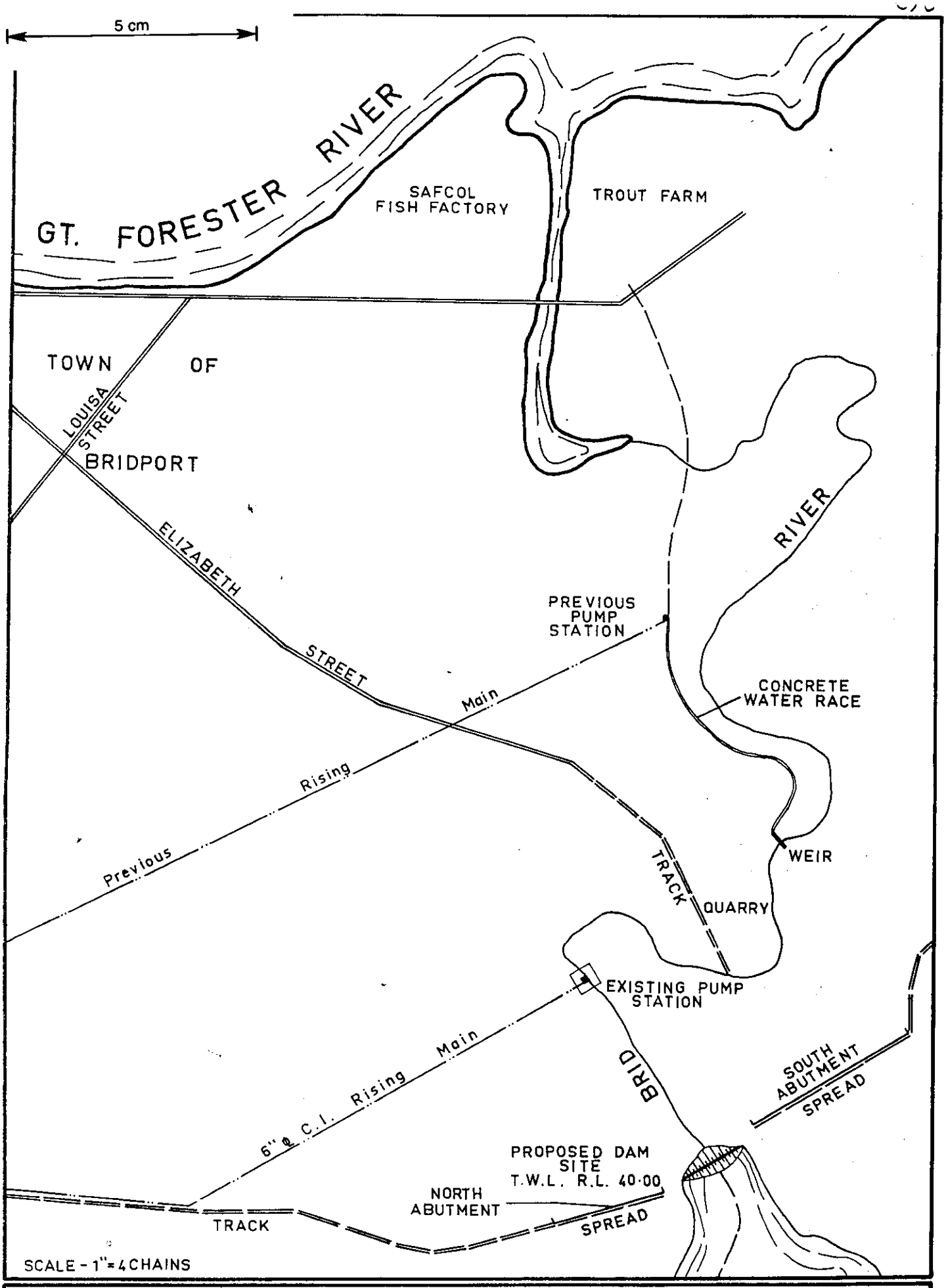
In the weathering spreads V_0 (300 m/s) is considered to be the surface layer of grey, windblown sand and soil overlying deeply weathered Mathinna sediments with open jointing. In the other two longer spreads the surface layer is interpreted as deeply weathered open-jointed Mathinna sediments. The intermediate layer is jointed Mathinna sediments with the joints probably containing groundwater. This intermediate layer overlies a third layer of unweathered Mathinna sediments with tight joints.

RECOMMENDATIONS

In the Bridport-Waterhouse area, Mathinna sediments lithologically similar to those exposed in the quarry have yielded 75-225 *l*/min of groundwater from bores drilled to 45-60 m. The Mathinna sediments appear to be one of the most reliable groundwater source beds in the Scottsdale area. With such a potential aquifer forming the dam site an exploratory groundwater bore hole should be drilled on this ridge near the dam site before any further investigation is undertaken on the site.

If this bore hole produced little or no groundwater then a detailed investigation of the site could be considered. This would necessitate clearing the abutment areas and bulldozing the centre line of the proposed dam site to rock surface. In addition the reservoir area should be burnt off. This burning and clearing would permit a detailed geological and geophysical investigation to be undertaken of the abutments and the reservoir area.

[5 February 1973]



DEPARTMENT OF MINES - TASMANIA

LOCATION PLAN - PROPOSED DAM SITE TOWN SUPPLY - BRIDPORT

GEOLOGIST	Draftswoman	Date	Scale	
W.R. MOORE	B.E. Cook	January/February 1973	1": 4 Ch.	3712

FIG 1