Section 2—Engineering Geology

TR7-81-82

DAM SITE, FLAGSTAFF GULLY

by R. Jack.

The Clarence Commission intends to augment the Eastern Shore water supply by constructing a water storage dam across the upper part of Flagstaff Gully. The consulting engineers are Gutteridge, Hawkins and Davey.

SITUATION

The dam is situated on Flagstaff Gully between Flagstaff Hill and a small unnamed hill to the west. It is approximately 2½ miles NNE of Bellerive. The damsite has been excavated to provide a more suitable storage area and also to find a suitable support on which to build the dam wall.

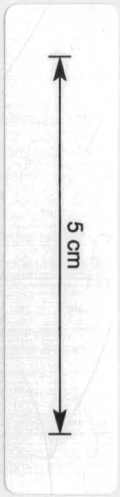
GEOLOGY

The rocks where it is proposed to build the dam wall are fossiliferous mudstone and shale belonging to the Ferntree Formation of Permian Age. Beyond the eastern limit of the dam wall dolerite occurs intruding the Permian rocks and this material appears suitable for filling in the dam wall.

The middle section of the dam foundations was mapped in detail. The mudstone and shale strike NW and dip at a shallow angle to the SW. The angle of dip varies slightly but is about 6° on the eastern side of the area mapped to 8°-10° on the western side. Jointing is well developed and occurs throughout the area. The main joint directions are at 300° with near vertical dip and at 260° with a dip from vertical to 75° to the SE. Some fracturing and minor faulting is apparent on the western part of the mapped area, and although the movement due to faulting is small—a displacement of two feet was noted in one place—it has been sufficient to brecciate the rock locally and allow the surface weathering to penetrate deeper into the rock in the brecciated areas. These brecciated areas are now mainly clay filled near the surface but the weathering effects are not expected to penetrate deeply. There is also some weathering of the more susceptible shaly beds in the mudstone; this is a near surface effect only and should not occur in depth.

HOLDING QUALITIES

Below the zone of surface weathering the mudstone and shale are fairly competent and the rock relatively impervious. It is to be expected that some water will percolate down through them as boring elsewhere in similar rocks has yielded appreciable quantities of water. The joint planes provide the channels down which most of the water will percolate, but this loss should not be too large and grouting is not considered necessary or practicable.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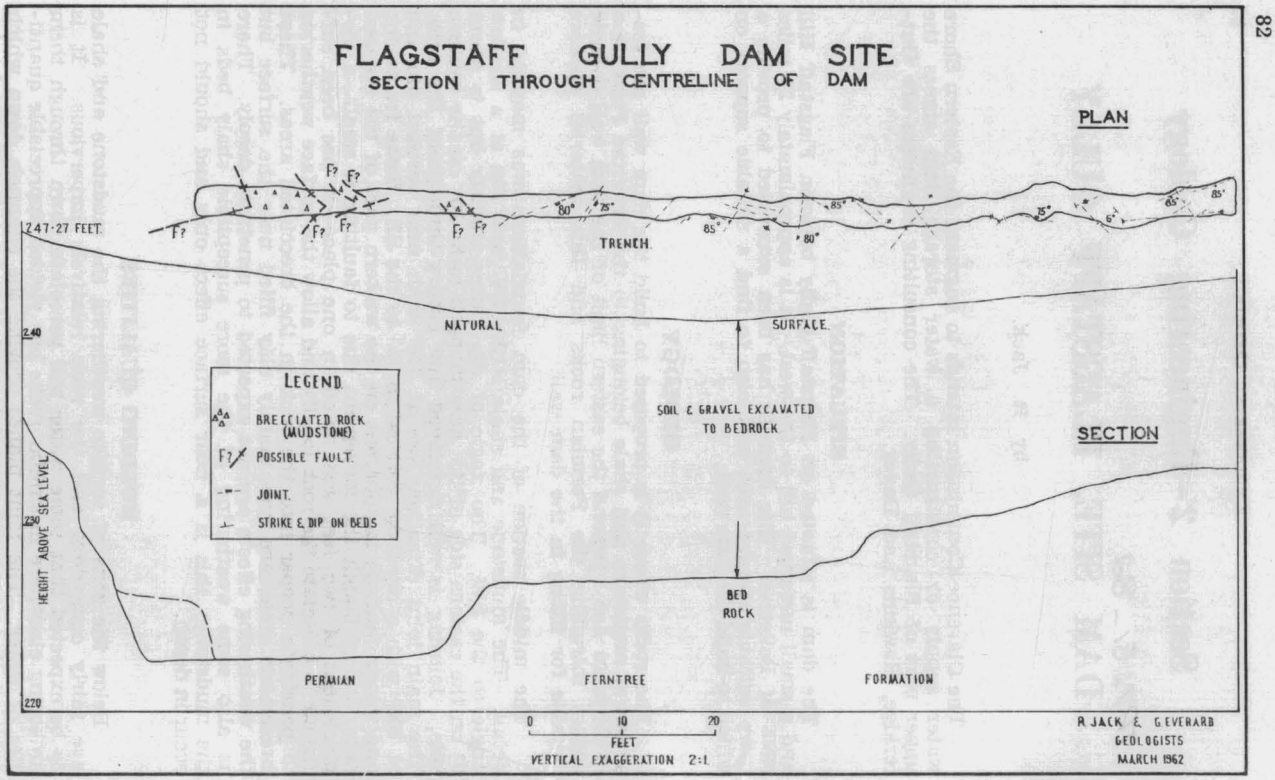
FLAGSTAFF GULLY DAM SITE
SECTION THROUGH CENTRELINE OF DAM
PLAN
247·27 FEET.
TRENCH.
NATURAL SURFACE.
SOIL & GRAVEL EXCAVATED TO BEDROCK
SECTION
BED ROCK
HEIGHT ABOVE SEA LEVEL
240
230
220
LEGEND
BRECCIATED ROCK (MUDSTONE)
POSSIBLE FAULT.
JOINT.
STRIKE & DIP ON BEDS
PERMIAN
FERNTREE
FORMATION
0 10 20
FEET
VERTICAL EXAGGERATION 2:1
R. JACK & G. EVERARD
GEOLOGISTS
MARCH 1962

FIGURE 25.