

TR14-67-70

14. Preliminary report of the geology of the Meander River
No. 1 dam site

P. C. STEVENSON

The site is located in the Quamby Quadrangle on the Meander River just below its confluence with Warners Creek [565657].

The survey was undertaken at the request of the Rivers and Water Supply Commission.

ACCESS

A gravel road leads south from Meander, and from it farm and logging tracks give access to the reservoir area. These tracks become impassable to four-wheel drive cars after rain but would be passable with difficulty to tractors under all conditions except flood.

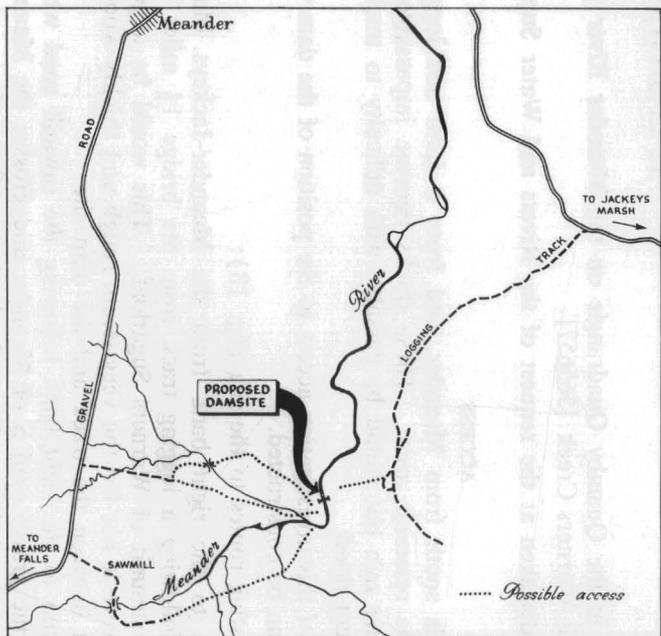
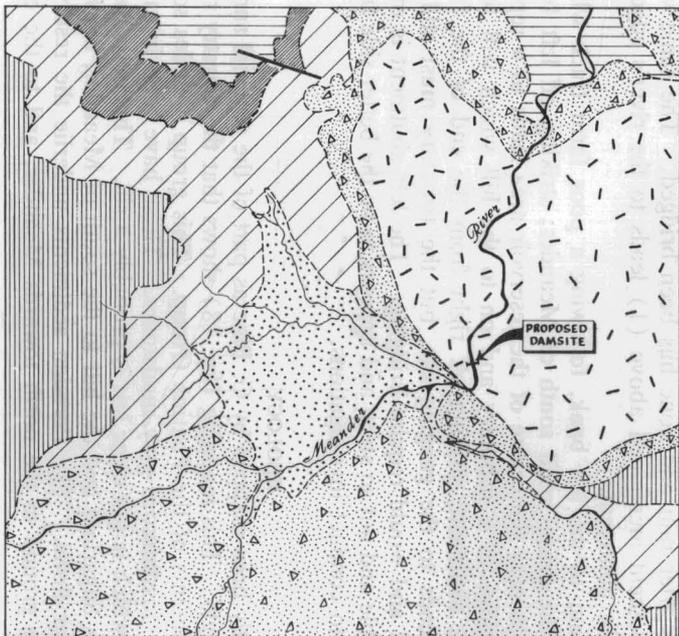
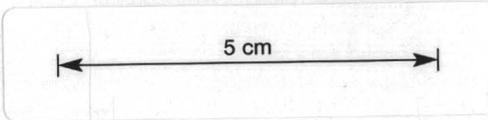
In the early stages of this investigation access to the position of the dam will be difficult until roads can be constructed.

There are three existing routes to the site (fig. 18):

- (1) Upstream to the right bank from the Meander-Jackeys Marsh road, following a logging track from the bridge $1\frac{1}{2}$ miles NE of the summit of Warners Sugarloaf. This would be a good route were it not for the very steep, rough and thickly wooded descent between the track and the dam site.
- (2) Downstream to the right bank following the sawmill road which leaves the gravel road S of Meander and crosses the Meander by a new log bridge. From the bridge it follows the southern margin of the reservoir area and must cross four tributaries, including Warners Creek. Land Rovers could not cross these streams after rain and none has been bridged. The same very steep descent mentioned above (1) leads to the river's edge at the right abutment.
- (3) Downstream to the left bank, following a poor farm track which leaves the gravel road south of Meander; striking off left from the track near the centre of the reservoir area leads to a repairable bridge of a tributary and on to the hill which will form the left abutment; striking off right from the end of the farm track leads to the gauging site, but the tributary must still be crossed and would require bridging. The left abutment is more accessible and not so steep and appears to be the better side from which to conduct investigations.

GEOLOGY

The area has recently been mapped by G. Pike as part of the regional survey of the Quamby Quadrangle. This mapping (fig. 18) shows that the country rock consists of Permian sediments of the Poatina Group. This group includes some sandstones but is mainly fossiliferous grey mudstones. These have been intruded by dolerite, the form of which is not clear but is probably a sill. This mass forms the twin hills of Warners Sugarloaf and the hill to the south of Meander, between which the Meander River flows. The Permian sediments underlie the reservoir area and form the rising ground to the north towards Meander, and to the east.



- | | |
|---|--|
| Alluvium | Liffey Group - sandstone. |
| Dolerite talus | Quamby Group - unfossiliferous pyritic mudstone. |
| Bogan Saddle Group - unfossiliferous mudstone. | Dolerite |
| Poatina Group - fossiliferous mudstone & sandstone. | |

Geology after G. Dike

| | |
|--|-------------------------------|
| DEPARTMENT OF MINES — TASMANIA | |
| GEOLOGICAL & ACCESS MAPS MEANDER RIVER NO 1 DAMSITE | |
| Date :- August 1969 | Scale in Chains 0 20 40 60 |
| Geologist :- P. Stevenson | Map sheet & No. :- Quamby 46 |
| Draftsman :- P. Rankivell | File No 3267 |
| Revisions :- | |

To the south lie the Tiers, of Permian and Triassic sediments and dolerite in ascending order. The dolerite has suffered vigorous erosion and has shed large spreads of talus, both angular and at distance more rounded boulders. Both from this source and locally from the Warners Sugarloaf dolerite mass, boulder-spreads fringe the reservoir area on the south and east. The boulders and to a lesser extent the Permian and Triassic material has been re-sorted and now forms a spread of alluvium which corresponds closely with the reservoir area. Within this, exposures of Permian mudstones are not seen and the alluvium only crops out in small sections in the river banks. At the abutments, however the dolerite forming the rising ground is well exposed and can be seen on the right bank to be massive, with joint planes defining slabs one to five feet thick and dipping steeply into the river. On the left abutment the slope is mantled with boulders but solid dolerite is probably present close to the surface and is seen in scattered outcrops.

GENERAL COMMENTS

As a dam site the location has much to recommend it. The dolerite abutments appear to be in sound material though the joint planes steeply dipping across the river may require minor local precautions.

The Permian-dolerite contact which runs N-S through the reservoir might in other circumstances be expected to cause leakage, but this cannot be regarded as likely here due to the high freeboard on all sides of the reservoir, and the very long leakage paths involved. The tight nature of the mudstones too, make leakage a minor hazard. The dolerite talus is often a leaky formation, but here the topography ensures that no leakage path exists.

The alluvium does not appear to extend between the abutments but if it does can only be thin.

Sources of materials are abundant. Dolerite for rock-fill could be obtained from the upper parts of the abutments. If a side spillway is planned the excavated material could be used. Quarry sites are abundant within a very short though steep haul of the dam site.

The alluvium consists of boulders, sand and clay and the swampy nature of much of the reservoir area shows that clays are common. The Permian mudstone north of the reservoir have weathered deeply to a brown plastic clay and deposits of this exist to some depth where the H.E.C. transmission line enters the reservoir area from the north.

RECOMMENDATIONS

The sound nature of the abutments should at this stage be assured by a seismic survey and this should be extended to cover possible quarry and spillway sites and should also ensure the presence of solid dolerite beneath the river bed (fig. 19).

Subject to modification, when the seismic results are known, diamond drilling of at least six holes to 100 ft each should then prove and augment the seismic findings and provide water pressure test results. If the quarry is to be distant from the dam site then additional diamond drill holes to block out reserves will be required (fig. 19).

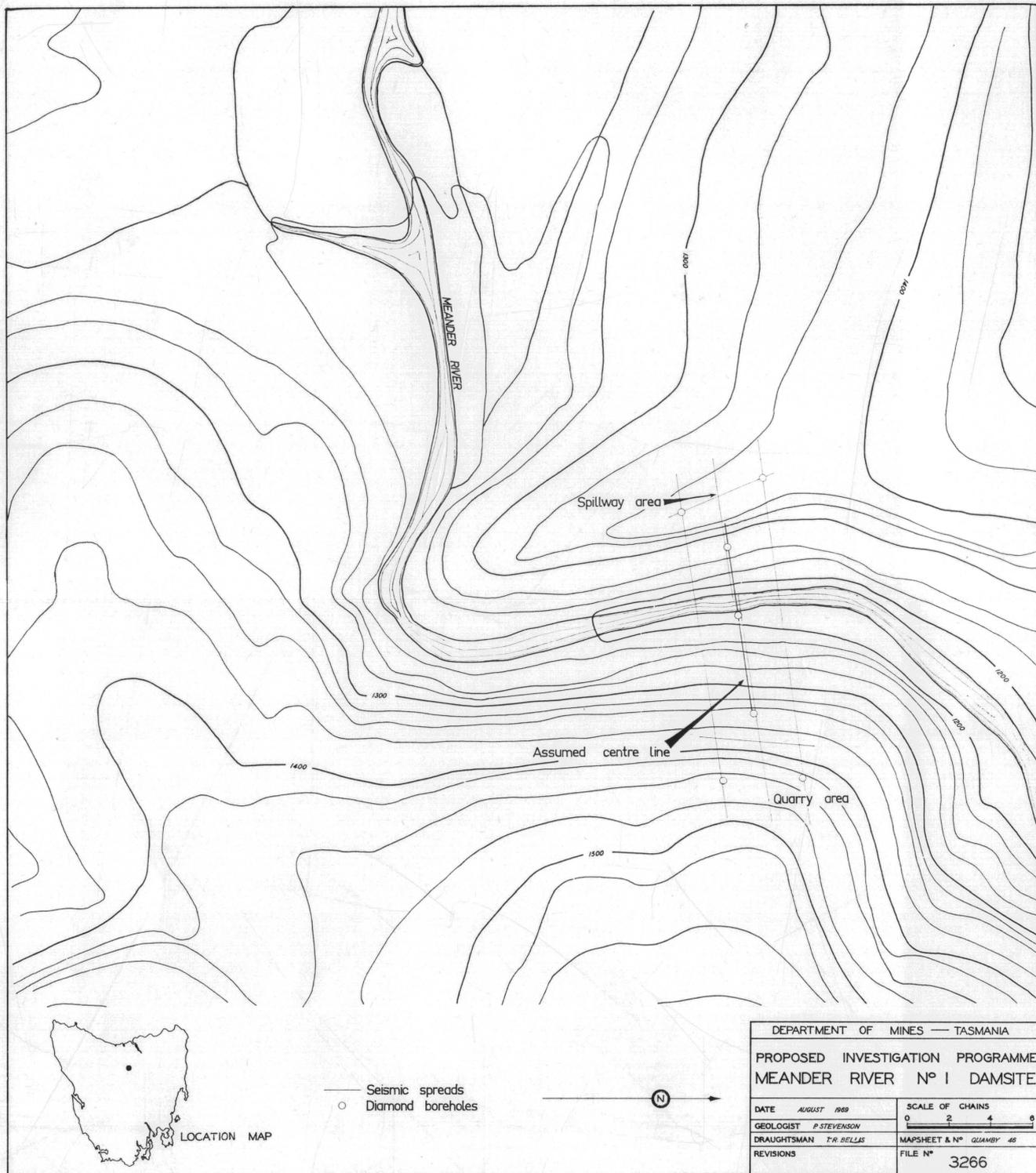


FIGURE 19

If a clay core is planned for the dam, the clay borrow areas may be more closely defined by a resistivity survey, after which a Proline auger or similar machine should be employed to block out clay reserves. It is recommended that clay samples be submitted to Soil Mechanics Division of the C.S.I.R.O. for testing for deflocculation, as some Permian clays are sensitive in this respect, e.g., Flagstaff Gully Dam (Inglis and Wood, 1965).

CONCLUSIONS

The preliminary work necessary to prove the fitness of this site is not extensive and the indications from surface examination are that only minor hazards exist. The joint dip directions in the dolerite abutments and the presence of dolerite in depth beneath them are of concern near the dam wall. The presence and quality of clay fill and the quality of dolerite fill, though hardly in doubt, must be checked.

Geophysical surveys followed by drilling are recommended to carry the study from the preliminary into the design stage.

REFERENCE

- INGLIS, O. G.; WOOD, C. C. 1965. *The passage of a wetting front through the earth retaining wall of the Flagstaff Gully Dam, Hobart.* Soil Mechanics Section, C.S.I.R.O: Syndal. (Paper presented at the 38th ANZAAS Congress, Hobart, 1965).