

1982/24. Slope stability investigation of land near Second River,  
North Lilydale.

W.R. Moore

#### Abstract

The stability of a large block of land on the north bank of the Second River was investigated. Three stable areas are present on which building could be recommended; two areas are on ground with low slopes of 5°-7° on the top of two spurs, while the third is on a narrow strip at the break of slope at the front of the block. A suitable house site was selected on the larger northern spur. If further subdivision with building is contemplated outside the area recommended, subsurface investigation will be required.

#### INTRODUCTION

At the request of his building consultant G.E. Austin, Mr P.C. Hinds requested that the slope stability of his block at North Lilydale be investigated. Some of the area had been classified as Zone B on the preliminary landslip zone map of the Lilydale area. Zone B is defined as an area of potential landslide, which should be investigated before any building is undertaken. Mr Hinds indicated that he was only interested in the one house site, but with such a large block further subdivision was likely in the future.

#### LOCATION

Hinds' block is located approximately 4 km north-east of Lilydale on the North Lilydale Road [EQ200363], and is situated on the north bank of the Second River, the river forming the southern boundary of the block. The northern boundary is adjacent to a four-wheel-drive vehicle track known as Snake Track. The western boundary is formed by North Lilydale Road, while the block's eastern boundary coincides approximately with the bush line (fig. 1).

#### MORPHOLOGY

The block is situated on the lower western slopes of a north-south trending ridge and comprises two low spurs separated by a shallow gully. This gully subdivides the block into two sections.

The northern section is a broad and flat-topped east-west trending spur with a slope of 5° to the west. The spur ends with a break in slope to form a long uniform slope of 8°. This slope flattens to form a concave slope of 5° near the North Lilydale Road.

The section south of the gully comprises a narrow spur with a slope of 7° to the south-west. The area of low sloping ground on the top of this spur is limited. The spur ends with a sharp break in slope to form uniform slopes of 11°-12° towards the high river bank. The river bank has very steep slopes and in places is near vertical where the bank has been undercut by the Second River.

#### GEOLOGY

The block is covered by a grey clay loam soil. The underlying rock is exposed along the northern bank of the Second River and comprises steeply dipping beds of slate, baked mudstone, and silty sandstone of the Mathinna Beds.

5 cm

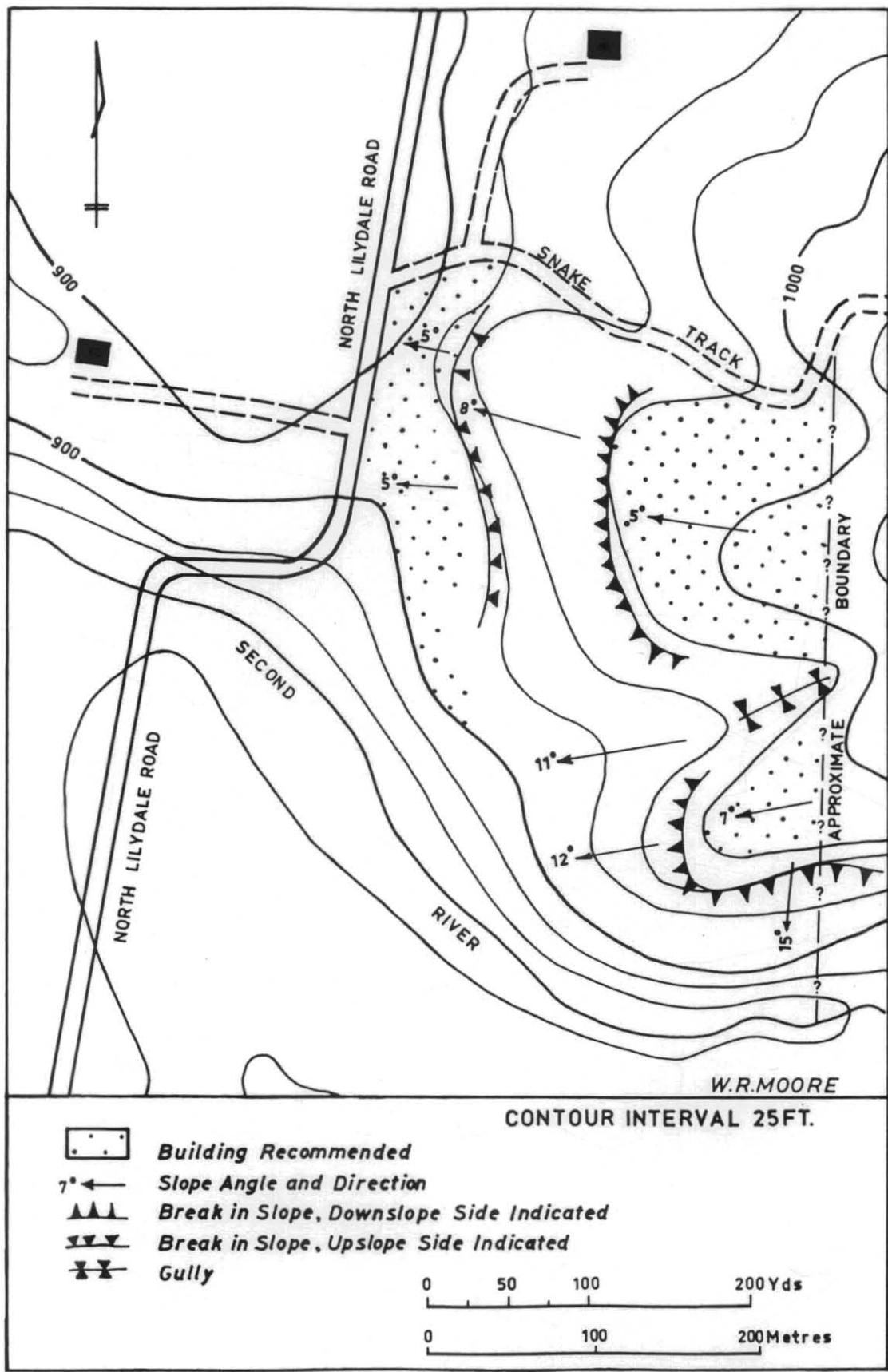


Figure 1. Slope stability investigation, North Lilydale.

Overlying these rocks is a transitional weathering zone of yellow and brown soft mudstone and clay. This zone is not well exposed along the Second River because of the thick secondary growth. It was not possible to estimate the thickness of this critical horizon of mudstone and clay at this locality.

SLOPE STABILITY

It is in the transitional horizon of weathered mudstone and clay between the surface soil and solid rock that slope failure appears to occur in deeply weathered Mathinna Beds sediments. The landslides are usually a shallow translational type, with the failure occurring at the interface between the rock and the overlying clay.

Landslides are not as numerous in the Lilydale district in areas underlain by Mathinna Beds sediments compared with areas of Permian mudstone, but nevertheless they do occur and sometimes on very low angle slopes (Moore, 1976).

The most stable areas on the block are the low sloping ground on the top of the two spurs and the narrow strip fronting onto North Lilydale Road; this is the upper section of a wide flat that extends west of the road. There appears to be little to no risk of slope failure in these three areas and building could be recommended.

There are some very steep slopes on the south-west corner of the block, with the southern slope of the spur in this area steepening rapidly to 15°. Even though this slope is short, it is too steep for building to be contemplated. The long 11°-12° WSW-trending slope on the same spur is considered to be marginally stable, and before any building could be recommended on this slope, the thickness of the clay above the rock and its properties would have to be investigated. If the clay horizon was found to be thin, a building could have its foundations bed to the rock and the additional risk of slope failure by building would be minimal. Before recommending building on this slope, a thorough subsurface investigation would be required.

The risk of slope failure on the long uniform 8° western slope from the northern spur does not appear great. Preferably before recommending building on this long slope, some subsurface information would be required.

CONCLUSIONS

Three areas of this large block are considered to be stable and suitable for building on the limited surface examination undertaken. These three areas are shown as areas on which building is recommended on Figure 1.

For the remaining area of the block no building is, at this stage, recommended. Some of the block is too steep for building to be contemplated without specialised structures; these are the 15° and steeper areas bordering the Second River. The west and WSW-trending slopes of 8° and 12° from the two spurs would require subsurface investigation before building could be recommended. On the steeper slopes of 12° this would require trenching, geological logging, and laboratory testing of the clay.

Of the three areas recommended for building, the area on the northern spur is the most stable, as the area of low slope is wider. This area has other obvious advantages for a house site such as an access track already present along the Snake Track and a more extensive view.

There is ample room for a house and septic tank on this northern spur. The overflow from the tank should be piped to the floor of the gully to the south, from where it can drain down the gully. If this overflow was piped only to the break in slope between the 5° and 8° slopes, small parasitic slumping could be induced in this area.

RECOMMENDATIONS

- (1) The house be sited on the low sloping area of the northern spur, near the middle of the area recommended.
- (2) The septic tank be placed on this spur and the overflow piped to the gully floor to the south.
- (3) If any future subdivision requires further building outside the areas recommended, a subsurface investigation would be required.

REFERENCE

MOORE, W.R. 1976. Investigation of a proposed building site at Lebrina. *Unpubl.Rep.Dep.Mines Tasm.* 1976/23.

[29 June 1982]