DEPARTMENT OF MINES
SOUTH AUSTRALIA

DM 225/56.
HYD 181. 42/39.

Report on prospects of obtaining underground drainage of a swamp, Block 54 Hundred of Naracoorte.

G.H.Newland.

The property was inspected on 9. 2.56 in company with Mr. Newland.

REQUIREMENTS.

Mr. Newland requested advice on the possibility of draining a swamp of approximately 50 acres extent, at its peak level underground by means of a bore.

LOCATION AND TOPOGRAPHY.

Block 54 is located 2 miles north of Naracoorte. Approximately half the block is occupied by a clay floored flat known as Target Swamp dry at the time of inspection, but covered with water during the late winter, spring and early summer months. This flat lies between the low ridges forming undulations in the old Naracoorte Dune now fixed by vegetation. The flat is reported to be a cut off meander loop of Naracoorte Creek, occasional floods down this creek spreading out over the flat.

GEOLOGY AND HYDROLOGY.

The general geology in the vicinity of Naracoorte is illustrated by a section attached to an unpublished report by M. Solomon*. Naracoorte is underlain, by approximately 50 to 80 feet of consolidated Pleistocene aeolianite, 170 feet of Gambier limestone, and + 300 feet of Knight Formation.

It is unlikely that the geology beneath the swamp will be much different except that the aeolianite will be thinner and the swamp is underlain by several feet of stiff grey clay or marl.

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*SOLOMON, M, 1951, Proposed drainage bores at Naracoorte School Site.
Report 33/58 Geol. Surv. South Aust. unpublished.
File reference DM1181/51.

The Gambier limestone and the aeolionite are freely connected hydrologically and consequently constitute one aquifer.

The water level of two bores in close proximity to the swamp were measured. The water level in one 16 chains west was approximately 18 to 20 feet below swamp surface as measured by aneroid. The collar of this bore is 10 to 12 feet above swamp level. Water level in the Target Swamp bore, approximately 2 chains south of the southern limit of the swamps, was approximately 10 feet below swamp level.

A shallow unnamed bore a few feet deep has also been put down in the swamp itself. Water stood at about 12 inches from the surface at the time of inspection indicating a perched water table in the clay forming the swamp bed.

DRAINAGE PROSPECTS.

The first possibility to be considered is whether the seasonal advent of the swamp represents a rise in the groundwater table. Such an occurrence would make drainage is impossible. Water level in Target Swamp bore is only an estimated 10 feet below the swamp bed and fairly large seasonal fluctuations in the depth of the water table are known to occur in the area. However the presence of a perched water table in the swamp indicates an impervious layer beneath it and it is quite likely that the flooding of the swamp represents a rise in the perched water table. Mr. Newland has been advised to measure the depth to water in Target Swamp bore monthly to determine the highest level to which the gate table in the aeolianite rises in winter. The winter level is possibly at least 4 feet higher, giving a maximum head difference between the swamp water (which reaches a maximum depth of 1 foot 6 inches) and the water table of 7 feet 6 inches. This does not offer prospects of disposal of large volumes of water.

The swamp is reputed to be at least 50 acres extent at its maximum depth of 1 foot 6 inches. This means that 75 acre feet, or approximately 20½ million gallons, would have to be drained each year. This is a tremendous volume of water and

would necessitate more than one borehole at the head which would be available.

Another factor to be considered is that in other parts of the South-East drainage bores which have successfully drained large volumes of water for the first few weeks have then choked up and become useless.

It would appear therefore that prospects of successful drainage of Target Swamp through a bore or boreholes are not good.

CONCLUSION AND RECOMMENDATION.

Target Swamp on Block 54, is underlaid by Gambier limestone at shallow depth. Water could be successfully drained into these rocks if sufficient head exists between the swamp water and the water table at the end of winter. However even if such a head exists the volume of water to be drained from the swamp is so large as to make drainage by a borehole impossible and the project is accordingly not recommended.

W. Johnson.

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HYDROLOGY BRANCH.

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22.2.56.