DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
ENGINEERING DIVISION

GROUNDWATER SURVEY
Section 448, Hundred of Dalkey

- C.G. LeCornu -

by

D.R. COLEY
GEOLOGICAL ASSISTANT
HYDROGEOLOGY SECTION

Rept.Bk.No. 73/289
G.S. No. 5293
Hyd. No. 2606
DM. No. 1079/73

30th November, 1973

DEPARTMENT OF MINES
SOUTH AUSTRALIA

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GROUNDWATER SURVEY

Location

General: 5.5 km northeast of Longplains

Region: 4

County: Gawler

Hundred: Dalkey

Section: 448

Owner: Mr. C. G. LeCornu

Postal Address: C/- Hindmarsh Hotel,
Pirie Street,
ADELAIDE.

Telephone: 223 5941

Requirements

Water required for: Irrigation and stock (sheep and beef cattle).

Quantity: For irrigation, 4 litre/sec. (3,000 galls/hr.).
For stock, 0.1 litres/sec. say (150 galls/hr.).

Quality: For irrigation less than 2,000 mg/litre.
For stock less than 10,000 mg/litre.

HYDROGEOLOGICAL REPORT

Physiography and Land Use

The property lies in a dune field topography typical of

the area between the northern Mt. Lofty Ranges and Gulf St. Vincent. The topography is very flat exdept for northwesterly trending sand dunes, one of which cuts across the applicants property. The owner uses the land for cereal growing and for the raising of sheep and beef cattle.

Climate:

Nearest rainfall station: Balaklava

Mean Annual rainfall: 389 mm (1,532 pts)

Remarks on rainfall pattern: The rainfall in the area is relatively low and is only capable of supporting cereal crops and sheep and beef cattle. Intensive cropping is impossible without irrigation. Most of the rain falls in the winter months and animal fodder is most abundant at this time of the year, drying off and decreasing in quantity through the summer.

Surface Hydrology

Creek name: There are no creeks on the property.

Springs: No springs were visible on the property.

Surface storage: There is no surface storage on the property.

Geology

Soil Cover: The soil is essentially a light buff to red sandy loam to sand. The soil is actually part of the Quaternary loess deposits and belongs to the Fulham and Molineaux sands of the dunefields.

Rock Units: Fulham and Molineaux Sands
Woorinen Formation
Pooraka Formation
Basement

Lithology: The red brown Fulham sand and pale yellow Molineaux Sand together make up the dunefields. The sand dune on the property is 5-6 m high and composed of red Fulham sand.

The Woorinen is not present everywhere but lenses out in places and hence it is not known as to whether it appears beneath the dune sands in this area. It is essentially an aeolian calcareous sand.

The Pooraka formation is a pale red-brown sandy clay containing carbonate of the Loveday soil. It contains gravel lenses near the ranges.

The basement in the area is at a depth of approximately 120 m and is of unknown rock type.

Direction and Amount of dip: Not known.

Structural Features: Not known.

Aquifer Assessment

Type: Any aquifers above basement are of the confined type, water being held in the pores between sand and gravel particles in clastic layers. Clay also holds water but yields poor supplies due to the low permeability of clay.

Very few bores have been drilled in the immediate vicinity of the property but trends in similar areas suggest water quantity, and quality to be low. Better quality water in small amounts is often found by drilling on the flanks of sand dunes with the hope of striking a layer of fresh water in the sands, perched above more saline water. However, in this case, the depth of the dune on the property would not warrant such a bore being drilled.

Quantity of water is governed mainly by the type of clastic layer which is intersected by the bore and also by the rainfall which controls recharge to the aquifer in this area. The clastic layers change in their facies (grain size, type of sediment etc.) in a lateral direction and so it is impossible to determine where is the best position to drill. However,

drilling in the lowest topographic position on the property will decrease the distance to the water table and so reduce cost to the owner.

At best, a small supply of stock quality water is expected from any bore drilled on the property.

Potential Recharge: Recharge is fairly consistent in any one area. Rainfall is low and much evaporates before soaking into the ground although the sandy topsoil should decrease this latter effect.

Borehole Site Location

General: In the depression on the western boundary of the property.

Reason for location: This position will decrease slightly the distance from the surface to the water table and is the area of maximum recharge on the property.

Proposed Depth: 45-60 m

Expected Yield: 0.3 litres/sec say (250 galls/hr.)

Expected Quality: 3,000 mg/litre but may be as high as 10,000 mg/litre.

Probable Log: Dune sand

Clay and sand with possible gravel lenses.

Drilling and Testing Recommendation

Drilling Hazards: The bore should be drilled with a cable tool rig and cased during drilling, the casing being not more than 2 m above the bottom of the hole at any one time.

Sampling: Water samples should be collected and tested immediately water is cut. It is best to stop further drilling until the water is tested for total salt content to prevent unnecessary deepening of the bore and possible contamination by deeper, more saline water when water of suitable quality has already been reached. Water will be tested free of charge by the

Department of Mines if so desired. A written log of rock type intersected during drilling would be appreciated by the Department.

Pump Test: This may be carried out by the driller or by the pump supplier.

Summary

The property lies in the flat dunefields area south of Balaklava in a low rainfall cereal growing district. A bore drilled on the property is expected to yield a small quantity of marginal quality stock water.

D. R. Coley

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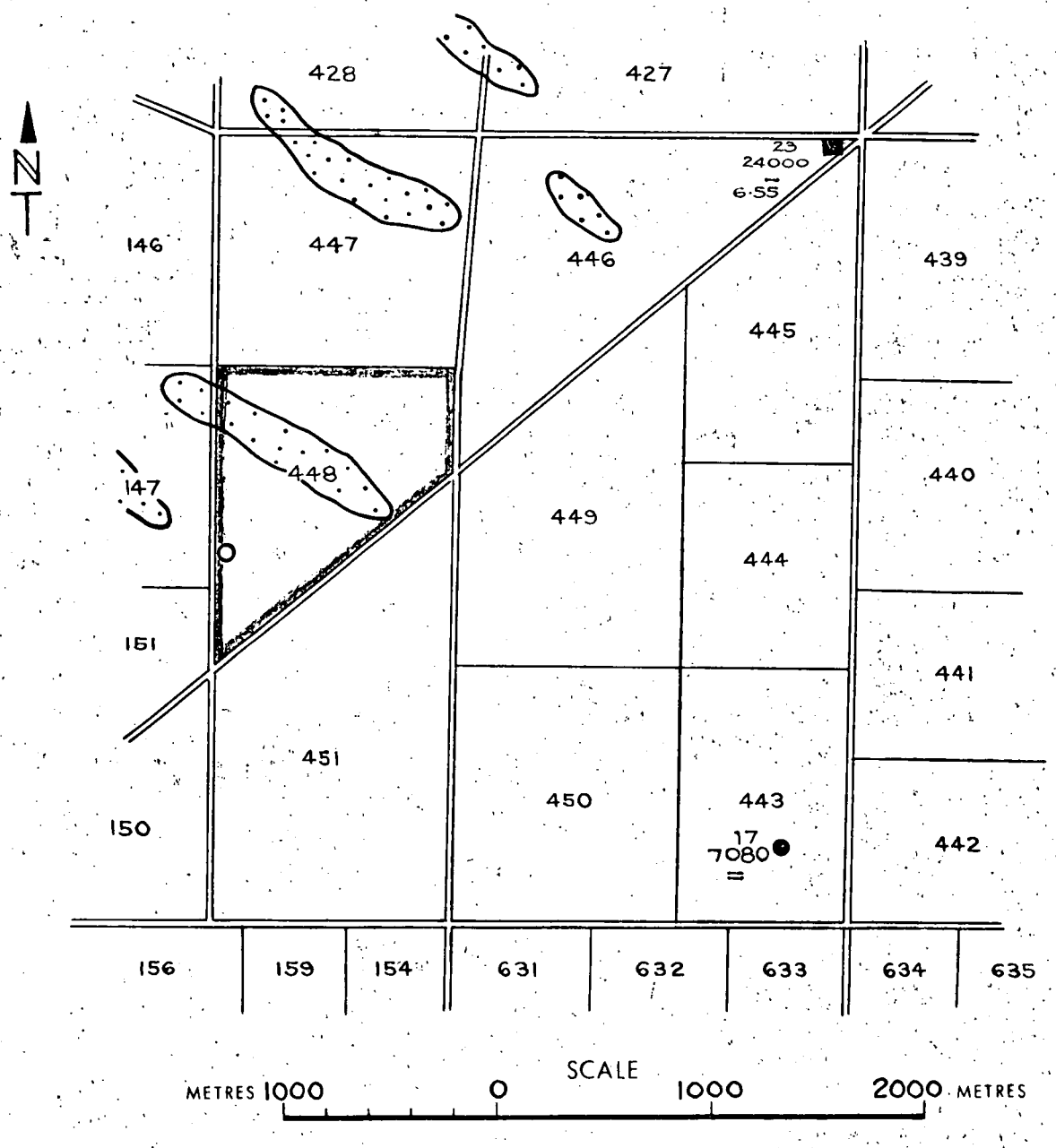
GEOLOGICAL ASSISTANT

DRC:TG
30.11.73



LEGEND

Recent - Red brown aeolian Fulham Sand and pale yellow Molineaux Sand

Pleistocene - Pooraka Formation, pale red-brown clay

Existing borehole ● 160 —Depth in metres
2015 —Salinity in milligrams per litre
5·0 —Supply in litres per sec.
2-72 —Month, year

Well ■
Spring ✛
Abandoned borehole ✱
Proposed boresite O

Strike and dip of bedding 60
Strike and dip of jointing 50
Strike and dip of foliation 35
Strike and dip of cleavage 45

Geological boundary
Fault line
Drainage lines
Surface storage

DEPARTMENT OF MINES - SOUTH AUSTRALIA

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