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GROUNDWATER SURVEY
HUNDRED BARUNGA, SECTIONS 49, 51

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Department of Mines
South Australia —

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DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
ENGINEERING DIVISION

GROUNDWATER SURVEY

HUNDRED BARUNGA, SECTIONS 49, 51

by

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Geologist

and

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Student Geologist

2nd January, 1973

Rept.Bk.No. 73/1

DEPARTMENT OF MINES
SOUTH AUSTRALIA

Rept.Bk.No. 73/1
G.S. No. 5007
Hyd. No. 2470
D.M. No. 1203/72

GROUNDWATER SURVEY

Location

General: 3 km west of Lake View

Region: 4

County: Daly

Hundred: Barunga

Sections: 49, 51

Name of Property: MANRESA

Owner: Mr. B.J.F. Burns

Postal Address: Manresa
Lake View

Telephone: Lake View 5

Requirements

Water required for: Irrigation of 12-16 hectares (30-40 acres) of lucerne

Quantity: Probably at least 9-13 500 l/h (2-3 000 g/h).

Quality: Less than 2 000 milligrams per litre (1 milligram per litre is equivalent to one part per million).

HYDROGEOLOGICAL REPORT

Physiography and Land Use:

The property lies at the north eastern end of the Barunga Range, a small range of northerly trending hills west of the main Mount Lofty Ranges. The owner's land embraces both the hilly rises and the lower angle slopes of the main range. Surface elevation varies from 340 m (1100 ft) on the hill tops to 120 m (400 ft) on the lower slopes east of the house. East of the property is an internally draining depression with numerous dry salt lakes.

Most of the land is cleared and used for crops and sheep grazing. A few acres on the steeper hilly slopes are covered with a sparse native vegetation.

Climate:

Nearest rainfall station: Snowtown.

Mean annual rainfall: 400 mm (15.77 in).

Remarks on rainfall pattern: The rainfall on the property is larger than that received at Snowtown as reported by the owner during the inspection. An average of 430 mm (17 in) is recorded at the house and is reported to be fairly reliable. Little rain falls in summer and thus an alternate supply is required to supplement this source.

Surface Hydrology:

Creek names: Unnamed.

Characteristics: Ephemeral, running only during times of heavy rainfall.

Springs: Springs are reported by the owner in the creek which runs past the house. These were dry at the time of the inspection and according to the owner, they flow only during winter. Water from the springs was originally pumped into a large concrete tank and used as a domestic supply in the early days when the district was first settled. Over the years however, the springs appear to be gradually drying up. The occurrence of springs in this vicinity may be a result of faulting in the sandstone aquifer.

Surface Storage: A few small dams have been constructed on the property. The owner intends excavating a large dam for storage if sufficient supplies from a bore are obtained.

Geology:

Soil Cover: Top soil is a brown silty clay, fairly sandy with decomposed bedrock fragments and some calcrete.

Rock Units: (1) Pleistocene slope deposits
(2) Barunga Sandstone

Lithology: (1) This is slope debris derived from the breakdown of bedrock. It consists of red brown clays, in part mottled and containing bedrock pebbles. It is very plastic when moist and has good retention properties. Its thickness may reach up to 20 m (65 ft).

(2) Bedrock is composed of crossbedded, fine to medium grained partly arkosic sandstones and quartzites. Colour is generally pinkish to white.

Direction and Amount of dip: Bedrock dips about 10-15° to the east and north east.

Structural Features: Strong joint sets are present - one set is parallel to the bedding and another almost vertical.

Aquifer Assessment:

Type: Free water table. Water should be present in the pore spaces and fractures in the sandstone and quartzite beds of the Barunga Sandstone.

Extent: The aquifer should underlie all of the property but at different depths. The further east from the Barunga Range, the deeper would a bore have to be drilled to intersect the aquifer (covered by an increasing thickness of slope debris away from the ranges).

Potential Recharge: Recharge is expected from lateral and vertical seepage of rainwater down to the water table. Run-off from the surrounding hills should provide reasonable amounts of recharge to the aquifer along the larger creek which flows down past the house.

Borehole Site Location:

General: A site was chosen on the creek which runs past the house in the position where the owner has reported spring activity in wetter periods of the year.

Reason for Location: This site was chosen because it appears to have the best potential recharge for any portion of the property. Spring activity in this vicinity may indicate a fault zone, in which case a borehole penetrating this zone should produce better supplies than one drilled further downstream past the house.

Proposed Depth: 60-75 m (200-250 ft).

Expected Yield: 9000-13500 l/h (2-3000 g/h).

Expected Quality: 1000-2000 mg/l.

Probable Log: 0-10 or 15 m - Brown to red brown clays with sandstone and quartzite pebbles.

10 or 15-70 m - Sandstone, quartzite beds of the Barunga Sandstone.

Drilling and Testing Recommendations:

Drilling Hazards: The only hazards expected would be caving of the hole where it penetrates the slope deposits. This can be prevented by casing.

Sampling: Any water samples should be brought in to the Department of Mines for testing (free of charge). A geological log of the strata intersected while drilling would be appreciated.

Pump Test: A pump test (say 24 hours' duration) should be carried out on the bore to determine supply especially since little is known about hydrological conditions in this area. The department could perhaps be advised when the bore is completed and arrange for such a test.

Summary:

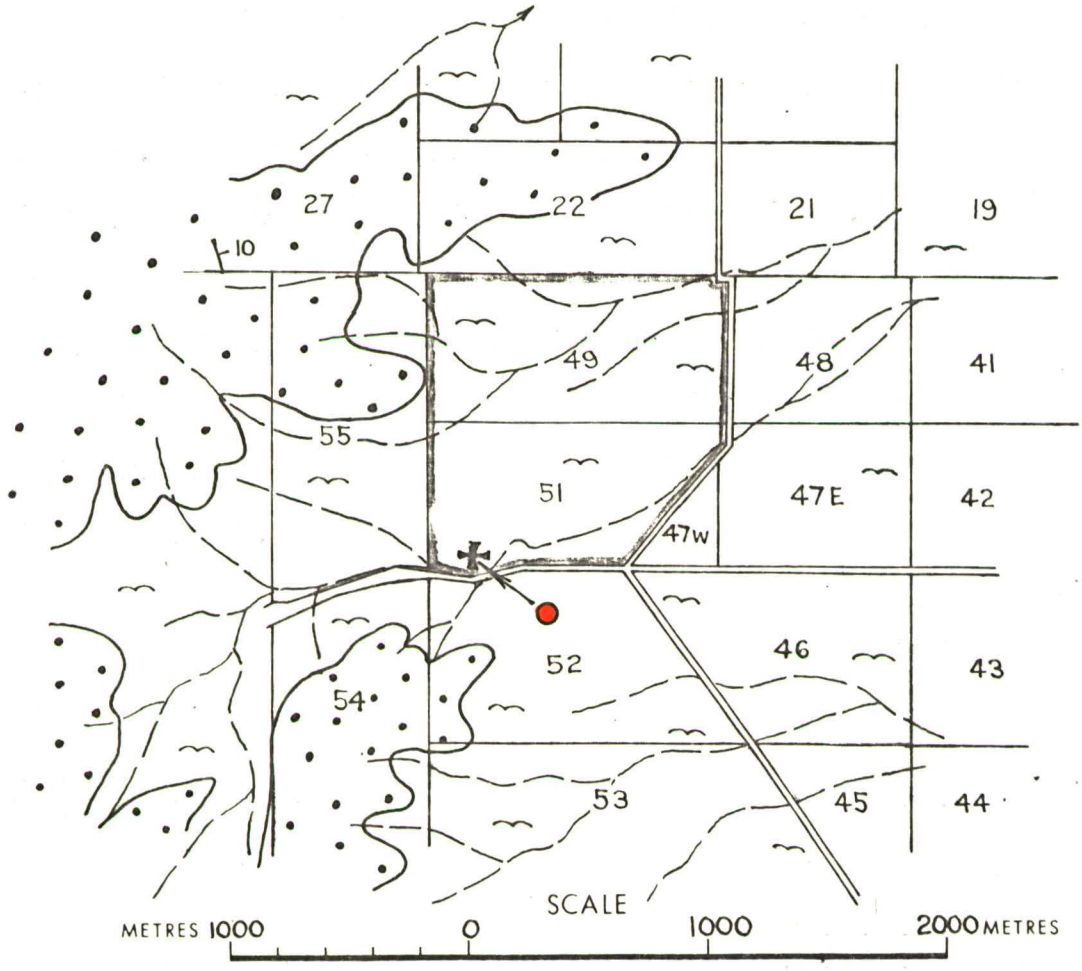
A site was chosen on the largest creek on the property where springs are reported by the owner during wetter periods of the year. A bore at this location should penetrate clean, jointed and porous sandstones and quartzites. Although no other bores have been drilled in the area (due to a reliance on mains supply) it is felt that drilling at this site could be successful - the good aquifer and recharge conditions and presence of springs point favourably to reasonable supplies of good quality water being obtained.

2nd January, 1973

A.F. WILLIAMS
Geologist

Survey Date: 19/12/72

A. BELPERIO
Student Geologist



LEGEND

Brown to red-brown clays with bed rock pebbles and cobbles. Recent to Pleistocene alluvium.

Proterozoic, cross-bedded, fine to medium grained, arkosic sandstone and quartzite. — Barunga Sandstone

Existing borehole
160 — Depth in metres
2015 — Salinity in milligrams per litre
5000 — Supply in litres per hour
2-72 — Month, year

Well

Spring

Abandoned borehole

Proposed boresite

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

HYDROGEOLOGY SECTION	GROUNDWATER SURVEY SEC 49 & 51 HD. BARUNGA B.J.F. BURNS	Date. 11 Jan 1973
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Drn. A.F. Ckd.		Gc4

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