Section

/77

GROUNDWATER SURVEY

Hundred Barossa, Section 205

- D.W. TWIGGER -

D.R. COLEY

Department of Mines
South Australia —

DEPARTMENT OF MINES
SOUTH AUSTRALIA

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by

D.R. COLEY
GEOLOGICAL ASSISTANT
HYDROGEOLOGY SECTION

Rept.Bk.No. 74/77
G.S. No. 5396
Hyd. No. 2638
D.M. No. 254/74

14th March, 1974.

DEPARTMENT OF MINES
SOUTH AUSTRALIA

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GROUNDWATER SURVEY

Location

General: 2.5 km south of Cockatoo Valley

Region: 4

County: Adelaide

Hundred: Barossa

Section: 205

Owner: D.W. Twigger

Postal Address: 15 Ranger Road,
ELIZABETH PARK. 5113.

Telephone: 62-5313 Ext. 2218
Monday to Friday 10 a.m. to 4 p.m.

Requirements

Water required for: Domestic Use and Horses

Quantity: 1 litre/sec. (approx.)

Quality: For Domestic use less than 1,500 mg/litre
For Horses less than 7,000 mg/litre

HYDROGEOLOGICAL REPORT

Physiography and Land Use

The property inspected lies in moderate relief country in the central Mt. Lofty Ranges adjacent the Barossa Reservoir. The block slopes from 255 m above sea level at the southern end down to 230 m above sea level at its lowest point at the head of a gully to the north. Much of the surrounding land is still under native vegetation and although the block inspected has been cleared the new owner intends to allow the already returning native vegetation to grow.

The owner intends building a house at the southern end of the block, high on the slope.

Climate

Nearest rainfall station: Williamstown.

Mean annual rainfall: 675 mm (27 inches), 1880-1964.

Remarks on rainfall pattern: Most rain falls in the winter months and greater than 50 mm per month can be expected from April through to October.

Surface Hydrology

Creek Characteristics: No creeks traverse the property. A drainage gully has its origin at the northern end of the block. Drainage is towards the west into the South Para River system.

Springs: No springs were observed on the property.

Surface storage: There is a small dam at the northern end of the block.

Geology

Soil Cover: Soil over most parts of the block is a reworked Tertiary sand. In the region of the dam the soil is much more clayey and lies above phyllitic shale.

Rock Units: Tertiary - Ferruginous and lateritic quartz gravel.
Torrensian- "Aldgate Sandstone".
Archean - Phyllitic Shale.

Lithology: The Tertiary laterite covers most of the block and is a poorly sorted very coarse ferruginous cemented quartz gravel. Aldgate sandstone does not occur on the property but outcrops to the east.
Archean rocks outcrop along the western boundary where they emerge from beneath the laterite. They are very fine grained metamorphic rocks and weathered at the surface.

Direction and Amount of dip: Rocks on the block are probably dipping at a shallow angle only, towards the southeast, due to their proximity to an anticlinal axis.

Structural Features: The block is high up on the eastern limb of an anticline whose axial plane slopes towards the east and southeast. This means that Aldgate Sandstone may possibly occur beneath Tertiary rocks on the block. If it does it is most likely to occur towards the eastern boundary and drilling should be carried out here in an attempt to intersect this favourable rock type.

Aquifer Assessment

Type: This is of the free water table type, the water being held in the cracks and fissures of the hard rock below the water table.
The Tertiary rocks do not constitute an aquifer since they are only a thin capping and do not extend to the water table. There are two mine shafts in the Tertiary laterite and these contain water soon after rain. This seepage can be seen to flow out from the gravel of the

sides of the shaft.

Aldgate Sandstone is generally regarded as a good aquifer due to its porous nature and lack of contaminants likely to increase salinity. However, this unit does not outcrop on the block and probably does not occur at depth. Drilling close to the eastern boundary will enhance chances of intersecting this unit. The Archean rocks in the area are dominantly mica schists and meta-greywackes. The phyllitic shale outcropping on the block is very fine grained and probably tightly jointed. Weathering products associated with this type of rock often fill up valuable voids which may normally contain water. Although this is a poor aquifer it probably underlies the whole of the property and could be expected along practically the complete depth of any bore drilled.

Potential Recharge: Rainfall is quite high and soil conditions will enhance recharge. Due to the height of the area, runoff will be high thus decreasing recharge somewhat. Overall, potential recharge is quite good.

Borehole Site Location

General: The bore should be drilled at the head of the gully at the northeastern end of the property.

Reason for location: This is the position of maximum recharge and drilling here gives most chance of intersecting Aldgate Sandstone.

Proposed Depth: 75-90 m

Expected Yield: 1 litre/sec

Expected Quality: 2,000 mg/litre

Probable Log: Soil

Archean - undifferentiated

Drilling and Testing Recommendations

Drilling Hazards: Drilling should be carried out using a rotary rig. The hole should be cased through the weathered zone to hard rock and the casing should project approx. 0.5 m above ground surface to prevent soil falling down the bore.

Sampling: All waters cut should be sampled. 1 litre or 26 fl. oz. samples will be tested free of charge by this Department. A record of rock type intersected during drilling should be kept. This log would be appreciated by the Department.

Pump Test: On completion of bore development, a pump test should be carried out to determine the maximum safe pumping rate. This service can be provided by the driller or by the pump supplier.

Summary

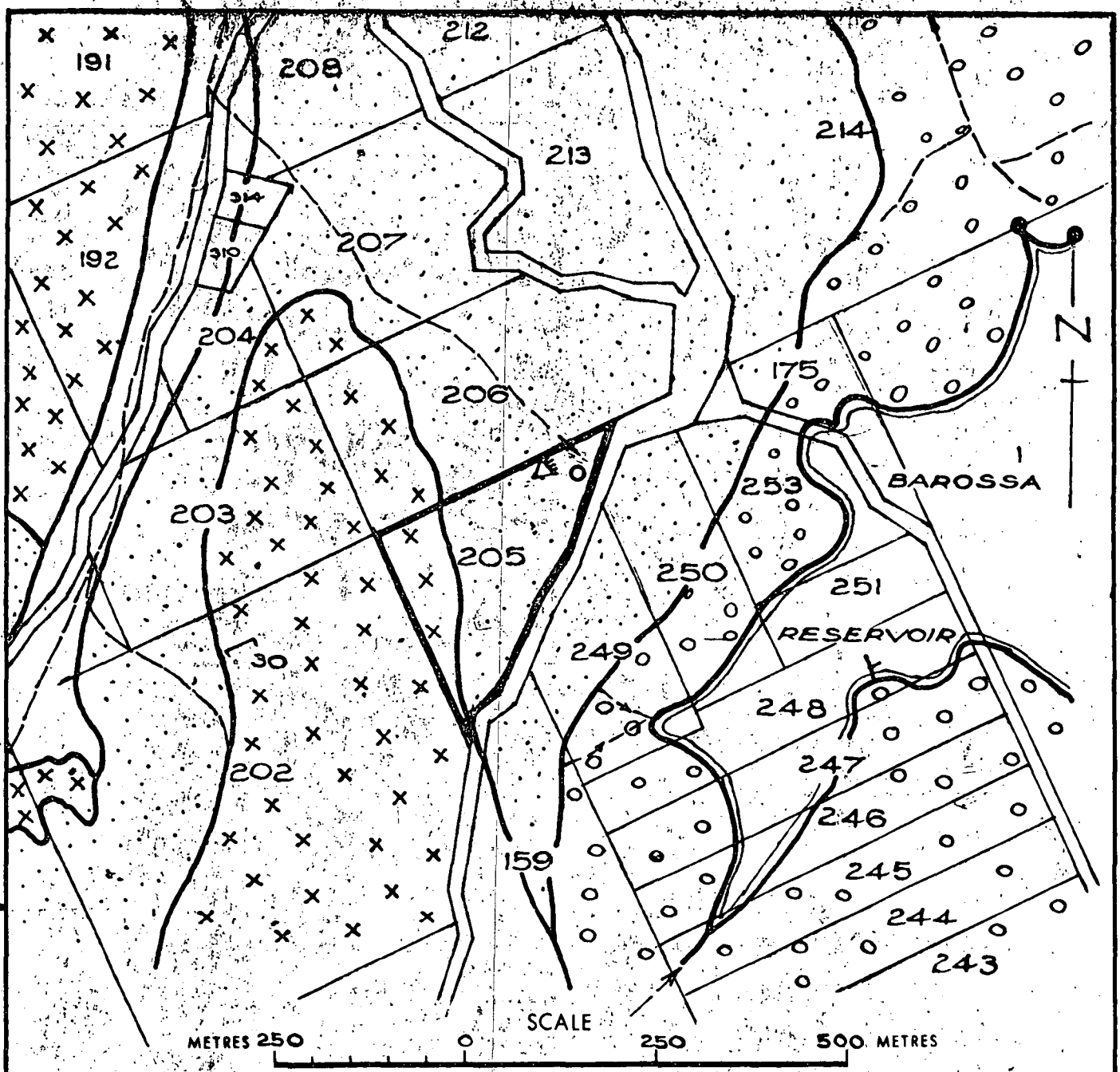
The property inspected lies in moderate relief country in the central Mt. Lofty Ranges. Rainfall is moderately high but the aquifer is an Archean phyllitic shale, such rocks generally being regarded as poor in their aquifer properties. A bore drilled as suggested should produce approx. 1 litre/sec. of water having 2,000 mg/litre of total dissolved salts.

D. R. Coley

DRC:JS
14th March, 1974.

D.R. COLEY
GEOLOGICAL ASSISTANT
HYDROGEOLOGY SECTION

Survey Date : 27.2.74.



LEGEND

- Quaternary – Shallow alluvial deposits of Creek channels
- Tertiary – Lateritic gravels
- Torrensian – Sandstone
- Archean – Undifferentiated

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 ○

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**	Date: MAR 1974
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