BORE COMPLETION REPORT
RN 15148
PIRRUPAKARALINTJA
OUTSTATION
PETERMANN LAND TRUST

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Hydrogeology Section
Water Resources Group
ALICE SPRINGS
1987

(Report edited and distributed 1992)
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PRINCIPAL ENGINEER GROUNDWATER 1
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# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L/s</td>
<td>Litres per second</td>
</tr>
<tr>
<td>L/c/d</td>
<td>Litres per capita per day</td>
</tr>
<tr>
<td>mm</td>
<td>Millimetre</td>
</tr>
<tr>
<td>m</td>
<td>Metre</td>
</tr>
<tr>
<td>m³/d</td>
<td>Cubic metres/day</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

A groundwater search was carried out at Pirrupakaralintja, a locality situated 65 km southwest of Mt Olga (Fig 1). The purpose of the search was to provide a potable groundwater supply for an outstation of the Mutijulu community at Uluru (Ayers Rock).

Office assessments, field work and grading and drilling operations were financed by the office of Local Government and carried out in accordance with the Water Resources Production Bore Drilling Programme. Drilling sites were selected in the presence of representatives of the Mutijulu community and co-ordinated by the community advisor Ms Kim Anson. Road grading work was organised by the Mutijulu community. Drilling operations were carried out by Power and Water Authority contractors Gorey & Cole Drillers, and the bore tested by Water Resources' bore testing crew.

2. WATER DEMAND

It is expected that the outstation will be occupied, on a semi-permanent basis, by approximately 20 people (Kim Anson, personal communication). According to information collected by the Water Resources Group's office in Alice Springs, the peak summer water demand at Uluru is less than 400 L/c/d. Consequently, the peak water demand of 20 people at Pirrupakaralintja should be less than 8000 L/d. A bore yielding 0.1 L/s, continuous pumping rate, could satisfy this demand.
Outcrops at Pirrupakalintja consist mostly of schist (Pinyinna Beds), quartzite (Dean Quartzite) and gneiss (Olia Gneiss) forming a relatively high inselberg, covered at its foot by a cover of thin Tertiary conglomerate, (Fig 1). On the basis of experience with similar landforms in the region, it was considered that areas away from the outcrops of crystalline crocks, where the Cainozoic cover could be thicker, had potential for providing groundwater too saline for human use. Therefore, drilling targets were selected as close as possible to the mountain, in an attempt at intercepting aquifers that could be recharged by runoff collected by its slopes.

No faults crossing the crystalline rocks were noticed during the field inspection. The only targets found were outcrops of well parted Dean Quartzite. These targets provided drilling sites for bores RN 15147 and RN 15148.

Bore RN 15149 was drilled where the community preferred to establish their outstation, next to a major creek, in an area where it was thought that thick alluvial materials and scree could provide aquifers.
Only bore RN 15148 (Fig 1) was successful. The groundwater was found between 76 and 79 m in layers of quartzite interbedded with quartz mica schist. The airlifted yield of the bore was 2 L/s and groundwater conductivity 900 $\mu$S/cm. The bore was constructed using slotted casing.

Preliminary and Step Testing of the bore showed significant drawdown at low pumping rates and slow recovery at water levels. The bore subsequently forked during a constant-rate test at 0.4 L/s.

Bore RN 15147 (Fig 1) was also drilled in quartzite. It struck small amounts of seepage at 53 m. As the rock was hard and penetration rates were very low, the bore had to be abandoned at 54 m. Groundwater conductivity was 200 $\mu$S/cm.

Bore RN 15149 (Fig 1) struck small amounts of seepage in weathered schist. It was backfilled after reaching a total depth of 121 m.
The groundwater airlifted by bore RN 15148 was analysed by the PAWA laboratories in Darwin. TDS content (570 mg/L) was within limits acceptable for human consumption. With the exception of Iron and Fluoride, no chemical component exceeded such limits. A sample taken during testing of the bore however (Table 1), revealed a marked increase in most dissolved solids, affecting the taste and hardness of the water. Health-related limits however were not exceeded, and the supply as tested is technically potable.
6. CONCLUSIONS/RECOMMENDATIONS

1. Of three bores drilled for outstation water supply purposes at Pirrupakaralintja, only one bore, RN 15148, was successful in obtaining supply. The other bores were backfilled.

2. Testing shows that the supply available from RN 15148, being derived from a fractured rock source, is limited in yield. It is recommended that this bore be equipped with a hand pump only, with pump intake set at 73 m below ground level. When measured in March 1988 standing water level in the bore 28.5 m below ground level.

3. Water quality from RN 15148 is not good, as TDS, hardness and other characteristics are high for drinking water. A sample taken during bore testing however shows that health-related chemical limits are not exceeded.

4. Should the bore be used for production, a minimum distance of 200 m should be maintained between the bore and pit latrine or septic disposal system. Such installations should not be constructed in a higher topographic position nor up hydraulic gradient from the bore to avoid its contamination by pollutants transported by surface or ground water.
ATTACHMENTS
DEPTH (m) | BORE GRAPHIC CONSTRUCTION LOG | STRATA DESCRIPTION (WATER STRUCK) | AQUIFERS
---|---|---|---
0 | 0 | SANDY CLAY | 0
5 | 4.5 | WEATHERED SANDSTONE | -5
10 | 6 | SANDSTONE | -10
15 | 12 | | -15
20 | 30 | QUARTZITE | -20
25 | 54 | SEEPAGE | -25
30 | 38.4 R SWL | 30/7/87 | -30
35 | 53 | | -35
40 | | | -40
45 | | | -45
50 | | | -50
55 | | | -55
60 | | | -60
65 | | | -65
70 | | | -70
75 | | | -75
80 | | | -80
85 | | | -85
90 | | | -90
95 | | | -95

COMPOSITE LOG OF BORE RN 15147

ATTACHMENT 2a
POWER AND WATER AUTHORITY
WATER RESOURCES GROUP

DEPTH (m) | BORE CONSTRUCTION LOG | GRAPHIC STRATA DESCRIPTION | AQUIFERS (WATER STRUCK)

0 | 168mm Ø STEEL CASING | SANDY CLAY | 0
3 | 219mm Ø STEEL CASING | QUARTZ MICA SCHIST | 57.8 SWL
60 | INTERBEDDED QUARTZITE AND SCHIST | 31/7/87
76 | OXY SLOTTED | 75
80 | 80.7 | 70
85 | 73.5 | 65
90 | 60 | 60
95 | 55 | 55

COMPOSITE LOG OF BORE RN 15148

ATTACHMENT 2b
<table>
<thead>
<tr>
<th>BORE REGISTERED NUMBER</th>
<th>DATE OF SAMPLING</th>
<th>SPECIFIC CONDUCTANCE (µs/cm at 25°C)</th>
<th>TOTAL DISSOLVED SOLIDS (mg/L)</th>
<th>pH</th>
<th>SODIUM, Na</th>
<th>POTASSIUM, K</th>
<th>CALCIUM, Ca</th>
<th>MAGNESIUM, Mg</th>
<th>TOTAL HARDNESS (AS CaCO₃)</th>
<th>FERROUS (TOTAL), Fe</th>
<th>SILICA, SiO₂</th>
<th>CHLORIDE, Cl⁻</th>
<th>SULPHATE, SO₄⁻</th>
<th>NITRATE, NO₃</th>
<th>BICARBONATE, HCO₃⁻</th>
<th>FLUORIDE, F</th>
<th>NACL (CALC FROM CHLORIDE)</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>15147</td>
<td>29.07.87</td>
<td>315</td>
<td>225</td>
<td>6.6</td>
<td>29</td>
<td>14</td>
<td>14</td>
<td>6</td>
<td>60</td>
<td>45</td>
<td>44</td>
<td>47</td>
<td>27</td>
<td>9</td>
<td>54</td>
<td>07</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>15148</td>
<td>22.03.88</td>
<td>2700</td>
<td>1710</td>
<td>7.5</td>
<td>304</td>
<td>32</td>
<td>128</td>
<td>75</td>
<td>628</td>
<td>180</td>
<td>3.3</td>
<td>50</td>
<td>588</td>
<td>340</td>
<td>2</td>
<td>219</td>
<td>1.7</td>
<td>969</td>
</tr>
<tr>
<td>15149</td>
<td>NIL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</table>

Analysis in milligrams per litre - mg/L (unless otherwise stated)

WATER QUALITY DATA
Bore location: Pirrupakaralintja via Ayers Rock

Map: SG 52.7 Grid reference: 3113 - 8296

Client/owner: DCD
Client's reference:
Purpose of supply: Aboriginal Outstation

RECOMMENDATIONS
Pumping rate: Hand pump L/s. Pump setting: 73.00 m below ground level
General recommendations are given on the reverse side.

The aquifer and bore can/cannot sustain higher pumping rates with deeper pump settings or for short periods in favourable seasons. Further advice can be obtained from: Water Resources (In all correspondence refer to the bore's RN number). Alice Springs

BORE DATA
Finished depth: 80 m Completion date: 31/7/87 Test date: 22/3/88
Standing water level 57.84 m on 3
Construction details:

<table>
<thead>
<tr>
<th>Interval (m)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>0 - 4.5</td>
<td>219mm OD Steel Surface Casing</td>
</tr>
<tr>
<td>0 - 73.5</td>
<td>152mm ID Blank Steel Casing</td>
</tr>
<tr>
<td>73.5 - 80.00</td>
<td>152mm ID Steel Casing with 9mm Perforations</td>
</tr>
</tbody>
</table>

Notes: 1. Top of casing as constructed was 0.60 m above ground
2. All depths are measured from natural ground level
3. Test rates are not indicative of safe long term pumping rates.

WARNING: MINIMUM INTERNAL BORE DIAMETER IS 152 mm

COMMENTS
This bore forked at 0.4L/s in 10 hours.
The SWL altered day to day I suspect that we are mining this aquifer.

I recommend that this bore only be equipped with a hand pump because of the low yield, and will not sustain long term pumping even at rates below 0.4L/s water tastes salty.

Bob Jones T01

WATER QUALITY

ATTACHMENT 4

See water laboratory report (Analysis No.)
RECOMMENDATIONS FOR FINISHING, OPERATING AND PROTECTING GROUNDWATERBORES

Attention to the following points will ensure a long and safe life for the bore supply and help prevent pollution of the groundwater resource.

1. Construct a concrete apron around the bore head to prevent surface flow, seepage and waste from entering the bore.

2. Seal the space between the casing and pump equipment to prevent entry of vermin, dirt and pollutants.

3. Maintain pumping equipment in good order to prevent pollution. Prevent spillage of fuel and oil on the ground around the bore. Store fertilizer and other chemicals at least 50 m away.

4. Keep stock away from the bore head. Discourage domestic activity at the bore. The first tap on the pipeline should not be less than 5 m from the bore head.

5. Pumping the bore at higher than recommended rates may fork the bore leading to instability or pump maintenance problems. Seek the professional advice of an hydrogeologist or groundwater engineer.

6. If the bore is no longer required, the casing is to be removed or securely capped and the bore backfilled with clayey material. A cement plug may be required in some instances.

In addition, please ensure that the BORE IDENTIFICATION TAG is retained securely at all times. The registered bore number is Water Resources Division's only reference to the scientific and engineering data on this bore, and hence important to WRD's further advice to bore owners.
# FINAL STATEMENT OF BORE

**Name of Bore:** R.N. 15147  
**Date of Commencement:** 29-7-87  
**Date of Completion:** 30-7-87  
**Total Depth:** 54.05m

## Description of Strata (including colour and hardness)
- 0-6 Sandy Clay
- 6-12 Schistey Sand
- 12-30 Sandstone
- 30-54 Quartzite

## Additional information of interest about bore
- **Reference:** 3122-8281  
- **Map Number:** SG 52-7

## Samples of Strata and Water Supplies

<table>
<thead>
<tr>
<th>Strata</th>
<th>1st Supply</th>
<th>2nd Supply</th>
<th>3rd Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## For Office use only

- **Standing Water Level:** 58.39m
- **Pumping Supply Litres/sec:** SEEPAPE
- **Duration of Pump Test:**
- **Water Level During Test:**
- **Quality:** Good, Fair or Bad

**Name of Property:** PIRRUPAKARALINTJA  
**Description of Property:** Aboriginal Lease  
**Name of Owner:** D.C.D.  
**Name of Contractor:** Gorey & Cole Drillers  
**Name of Driller:** N. Murphy

---

C. L. Duffy, Government Printer of the Northern Territory
### FINAL STATEMENT OF BORE

**Name of Bore:** LORRAINER BORE  
R.N. 15148

**Name of Property:** PIRRUPAKARALINTJA

**Description of Property:** Aboriginal lease.

**Name of Owner:** D.C.W.

**Name of Contractor:** Gorey & Cole Drillers

**Name of Driller:** N. Murphy

**Date of Commencement:** 80 - 7 - 87

**Date of Completion:** 31 - 7 - 87

**Total Depth:** 80 meters

### Particulars of Casing

- A 5 meter of 219mm Steel
- 80.68 m of 16.8mm Steel

### Particulars of Perforations or Screens

- 73.5 - 80 m

### Water

<table>
<thead>
<tr>
<th>Supply</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Struck at</td>
<td>76 - 79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td></td>
<td>28.5</td>
<td></td>
</tr>
<tr>
<td>Water Level</td>
<td>57</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Pumping</td>
<td>2.0</td>
<td></td>
<td>0.44</td>
</tr>
<tr>
<td>Duration</td>
<td>1 1/2 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality:</td>
<td>Good, Fair or Bad</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cond.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sampled and Water Supplies**

- Sandy Clay
- Schist
- Quartzite
- Quartzite + Schist

**Location of Bore or supply sketch on the site hereon:**

- SE of (by)  
- NW of SW

**Circle appropriate direction.**

**Use known point such as existing bore, homestead, outstation, etc.**

**Notice non applicable**

**Office use only:**

- G.L. DUFFIELD, Government Printer of the Northern Territory
<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Description of Strata (including colour and firmness)</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>Sandy Clay.</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>Laterite</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>Siltstone</td>
</tr>
<tr>
<td>30</td>
<td>42</td>
<td>Sandstone</td>
</tr>
<tr>
<td>42</td>
<td>78</td>
<td>Schist + Quartz.</td>
</tr>
<tr>
<td>78</td>
<td>108</td>
<td>Schist.</td>
</tr>
</tbody>
</table>

**Name of Bore:** R.N. 151 49.  
**Name of Property:** PIRRUPAKARALINTSA.  
**Description of Property:** Aboriginal Lease.  
**Name of Owner:** D.C.D.  
**Name of Contractor:** Gorey & Cole Drillers.  
**Name of Driller:** N. Murphy.  
**Date of Commencement:** 1-8-87  
**Date of Completion:** 2-8-87  
**Total Depth:** 121.15 m.  

**Particulars of Casing:**  
**Particulars of Perforations or Screens:**  
**Water:**  
<table>
<thead>
<tr>
<th>1st Supply</th>
<th>2nd Supply</th>
<th>3rd Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Struck at</td>
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</tr>
<tr>
<td>Standing Water Level</td>
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</tr>
<tr>
<td>Pumping Supply</td>
<td>Litres/sec</td>
<td>SEEAGE.</td>
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<tr>
<td>Duration of Pump Test</td>
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</tr>
<tr>
<td>Water Level During Test</td>
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<td></td>
</tr>
</tbody>
</table>

**Quality:** Good, Fair or Bad  

**Signatures:**  
- N.T.W.A.  
- A.L. DUFFIELD, Government Printer of the Northern Territory