

# Winner's Bore—hard-won outback water

## *An important legacy of the Palaeovalley Groundwater Project*

*John Wischusen and Steven Lewis*



Nyirripi and Kintore are remote Aboriginal communities in the south-west of the Northern Territory, separated by a vast expanse of inhospitable desert. When Kintore community was established in 1981 the poor condition of the regional road network meant that a vehicle journey between the two communities involved considerable back-tracking and in excess of 450 kilometres of driving. In the late 1980s community members graded a more direct track to form the Kintore to Nyirripi back-road which is about 200 kilometres long (figure 1). However, the relatively small population of both communities and the remote arid location of this road meant vehicle breakdowns *en route* could be hazardous. This applied particularly during the summer months when temperatures commonly exceed

40°C and there were no permanent watering points readily accessible to travellers anywhere along the road.

The dangers posed by vehicle breakdowns on this remote road are widely recognised by the people of Kintore, Nyirripi and surrounding areas. In the summer of 1991 a famous Walpiri tracker and community police officer, Gavin Spencer, and three young children under 10 years of age (including two of his daughters) perished on this road after the vehicle in which they were travelling broke down. Mr Spencer attempted to save the lives of the children by burying their bodies under sand to conserve moisture. However by the time help finally arrived, Mr Spencer and three girls had perished. This tragedy took place very close to the present location of Winner's Bore.

In January 2008 a local couple from Kintore also broke down along the Kintore–Nyirripi back-road, near the then-dry Kalipima natural soak. They were carrying more than 30 litres of water in the vehicle and apparently tried to seal their leaking radiator with spinifex resin. The patch failed



**Figure 1.** Location of Winner's Bore, and the route of the Kintore to Nyirripi back-road. The areas marked in green define national parks.

and most of their available water was used up in the overheating radiator. When searchers arrived on the scene they found the man's body, and the woman died shortly after rescue. They had been broken down for only two days in the 40°C plus heat.

**“The Project team agreed that an accessible watering point would be installed somewhere along the Kintore to Nyirripi back-road, should they succeed in finding fresh groundwater.”**

These tragic events were paramount in the minds of senior staff from the Central Land Council (CLC) when negotiating with Geoscience Australia and the Northern Territory government, through the Department of Natural Resources, Environment, The Arts and Sport, about the commencement of the Palaeovalley Groundwater Project drilling program. The Project team agreed that an accessible watering point would be installed somewhere along the Kintore to Nyirripi back-road, should they succeed in finding fresh groundwater. They would also endeavour to equip the bore with a mechanical hand-pump for use in future emergencies. This bore would also serve the dual purpose of providing a groundwater monitoring point in this otherwise remote region.

### **The Palaeovalley Groundwater Project**

The Palaeovalley Groundwater Project (Water for Australia's Arid Zone) aims to better understand the characteristics and behaviour of groundwater resources in Australia's arid areas. It is being led by Geoscience Australia in collaboration with geological and water resource agencies from South Australia, Western Australia and the Northern Territory. The consortium also includes several mining and exploration industry partners. The four-year project commenced in April 2008 with funding of \$4.935 million provided through the Raising National Water Standards program which is administered by the National Water Commission. The program supports the Australian Government's National Water Initiative through funding projects which improve Australia's national capacity to measure, monitor and manage our water resources.

Two of the Nyirripi investigation bores encountered fresh groundwater during drilling operations along the Kintore–Nyirripi

back-road. In particular, bore RN 18362 (the location of which was selected by Maria Woodgate from the Northern Territory government) was drilled to 79 metres and encountered low salinity groundwater containing total dissolved solid composition of 760 milligrams per litre which is potable quality water. Following completion of drilling, this bore was specially constructed and equipped with a flush cap windmill-like pump column. This would allow for later installation of a hand-pump mechanism so that groundwater could be readily extracted by a simple operation. An equipped bore would potentially save lives and hopefully prevent future tragedies.

The Project Team approached the Central Land Council about the possibility of using abandoned hand-pump mechanisms from nearby local communities to install and commission the watering point. During these discussions, Council anthropologist Hugh Bland suggested 'Winner's Bore' as the name for the Nyirripi to Kintore road bore. 'Winner' is the nickname of a local member of the community who is something of a celebrity around the Nyirripi region. He has walked back into town from several broken-down vehicles along this track, with the longest walk being some 70 kilometres.



**Figure 2.** CAT hand-pump of the type installed at Winner's Bore. The durability of these hand-pumps stems from their occasional use compared to the near continuous operation cycles of similar flush cap pumps used for windmill-operated systems (photo courtesy of Dr Bruce Walker).

## The CAT hand-pump

In the early 1980s, when many Aboriginal outstations were being established in central Australia, money and resources were scarce. Consequently, expensive bore infrastructure such as windmills or submersible bore pumps were beyond the budget of many early settlements. To overcome this problem, Dr Bruce Walker turned his mind to designing a hand-pump mechanism whilst camping at an outstation near Mt Liebig. At the time Dr Walker was the head of the Centre for Appropriate Technology (CAT), a national indigenous science and technology organisation funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs. His design involved fitting a hand-operated mechanism to a windmill pump column so that a single operator could obtain groundwater by hand-pumping. This original bush design was subsequently fine-tuned and modified to become the well known CAT hand-pump range which was widely manufactured in the Alice Springs CAT workshop during the 1980s. Though once a common sight across many central Australian communities, the CAT hand-pumps are rarely seen on bores nowadays as most have been replaced by solar submersible bore pump systems.

The residents of Kintore have a particular affinity for mechanical bore hand-pumps, as the first reliable water supply scheme established at the community used CAT hand-pumps. Following the drilling of two successful bores in the fractured rock aquifers of the Kintore Ranges over 300 Pintubi Aboriginal people turned up to camp on these bores in 1981 and promptly announced that they were going to stay there permanently. However, to sustain their

'return to country' the Pintubi needed reliable bore pumps and these came in the form of the then new CAT hand-pumps (figure 2).

The CAT hand-pumps proved to be durable and easy to operate. Similarly the steel CAT hand-pump frames are very hardy and commonly remain intact even after years of service, although many outstations in this region now use solar submersible pumps. Ironically, the actual pumping mechanism used for Winner's Bore was sourced from an abandoned CAT hand-pump left outside the Nyirripi community workshop for some considerable time.

## Installation at Winner's Bore

The drill crew from the Northern Territory Government's Water Resources Branch completed the bore at RN 18362 so that it was ready and pre-equipped for installation of the CAT pump frame following drilling operations in September 2009. It was fortunate that Dr Bruce Walker, the original designer of the CAT hand-pump, was keen and available to assist the Project team with the installation of the pump mechanism. His timely and invaluable assistance ensured that the set-up of the hand-pump was completed without any problems in December 2009. This allowed Winner's Bore to become operational

at the start of the extreme summer period, when it would potentially be most needed.

After installation and testing of the pump frame all that remained was to inform the local communities. Dr Bruce Walker, accompanied by Dr John Wischusen of Geoscience Australia, met with elders from the Kintore community to inform them that Winner's Bore on the Nyirripi to Kintore back-road was now operational. The shallow water table means that only one or two pumps are needed before water is delivered from the standpipe.

The only additional capital outlay for this hand-pump was the purchase of the pump column and associated fixtures for around \$3000. However the installation of a hand-pump at Winner's Bore is a lasting and durable legacy of the Palaeovalley Groundwater Project in this remote part of central Australia. While the discovery of fresh groundwater in this area is of potential long-term economic and social benefit to the local people (such as a water resource to support future horticulture projects) the tangible outcome of an operating hand-pump on the Kintore to Nyirripi back-road also provides an immediate community benefit. An additional benefit is that Winner's Bore can also be used to monitor any variation to the chemical composition of the groundwater that may occur over time.

#### **For more information**

**phone** Steven Lewis on +61 2 6249 9390  
**email** [steven.lewis@ga.gov.au](mailto:steven.lewis@ga.gov.au)

#### **Related websites/articles**

*AusGeo News* 93: Understanding Australia's arid zone palaeovalley systems  
[www.ga.gov.au/ausgeonews/ausgeonews200903/inbrief.jsp#inbrief3](http://www.ga.gov.au/ausgeonews/ausgeonews200903/inbrief.jsp#inbrief3)

### **Palaeovalleys**

Palaeovalleys are geologically ancient river valleys which no longer function as active surface water systems. Palaeovalleys in outback Australia were originally formed when climatic conditions were different than they are today. An example is the Eocene epoch (about 56 to 34 million years ago) when rainfall levels were significantly higher and much of the present-day outback was covered by rainforests. Although surface water no longer flows in most of the palaeovalleys, the sediment which has filled the river channels commonly forms good quality aquifers which are capable of storing significant quantities of groundwater. In many desert areas of Australia, the groundwater resources contained in palaeovalley aquifers may be the only reliable supply of potable water available to remote water users such as aboriginal communities and pastoral stations.



**Australian Geothermal Energy Conference**  
www.ausgeothermal.com  
16-19 November Adelaide Convention Centre

*Tomorrow's energy, today*

AGEA AGEG

Contact Sapro Conference Management  
Fax: +61 8 8274 6000  
Email: [agec2010@samea.asn.au](mailto:agec2010@samea.asn.au)

For more information see the conference website  
[www.ausgeothermal.com](http://www.ausgeothermal.com)