

# Chapter 35: Awatere And Blind River Catchments

## Introduction

There are limited groundwater resources in the Awatere River catchment which reflects the lack of suitable large, permeable, sedimentary geological formations to form aquifers.

Most water in the Awatere catchment is sourced from infiltration galleries that are constructed in the bed of the Awatere River. Even though the infiltration galleries are below ground the water that they are accessing is essentially Awatere River water (Fig. 35.1).



Figure 35.1: Outcropping papa mudstone with thin veneer of aquifer forming gravels

The low permeability of the geological formations in the Awatere River Valley means there is limited potential for high yielding aquifers to exist. The predominant papa mudstone and greywacke/argillite sandstone do not store or transmit water well. The geology is also more diverse mineralogically than the rock types which form the Wairau River Catchment, and more structurally complex due to folding and faulting.

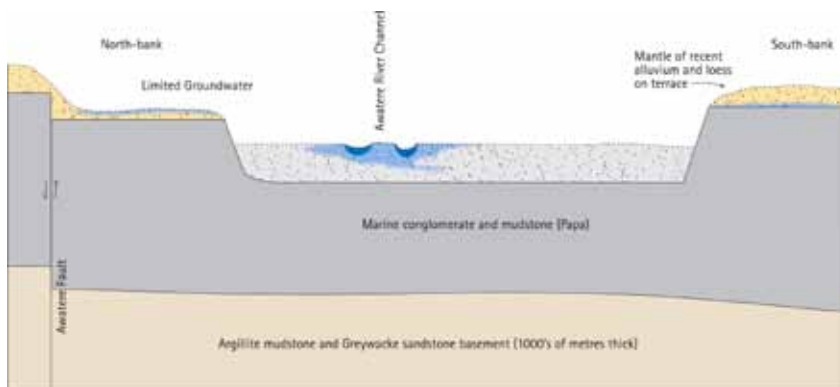


Figure 35.2: Awatere River terrace aquifers and geology

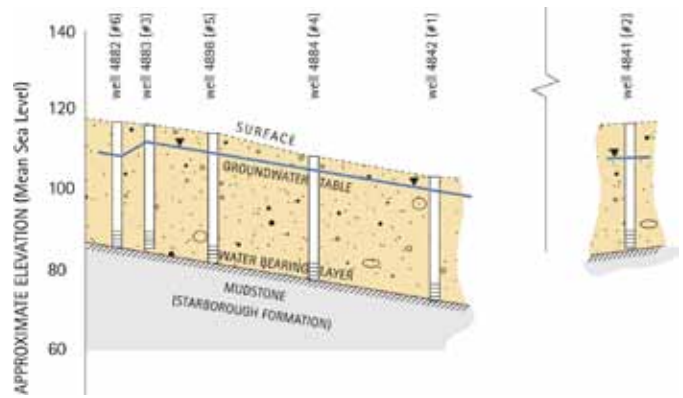


Figure 35.3: Dumgree Road geological section

Small volumes of groundwater have been tapped by shallow wells on the upper terraces of the Awatere River Valley, which are elevated above the present day channel. These thin aquifers are hosted by gravels forming a veneer overlying the Papa mudstone of the Starborough Formation (Fig. 35.2).

Based on well drilling logs these thin surface aquifers are limited to supplying small volumes of water for stock, domestic use, or for small scale irrigation. Well yields are typically low and correspond to an estimated transmissivity range of between 2 and 200 m<sup>2</sup>/day.

A series of deeper wells were drilled at Dumgree Road in 2008 and showed that the alluvium can be over 30 metres thick (Fig. 35.3). A water bearing layer consistently occurs at the base of each of these wells, where drainage from the overlying gravels accumulates at the interface with the Papa mudstone. The static water level in each well is similar, supporting the concept of a continuous sequence of alluvium.

The underlying Papa mudstone material is porous and contains water. It is however essentially impermeable and does not allow sufficient movement of water to represent an economic aquifer. In other words groundwater moves so slowly through it that it can't be pumped out at a sufficiently high rate, and conversely it does not recharge at a sufficiently fast rate. It is also likely to contain elevated levels of sodium or chloride, reflecting its marine origin and lack of throughflow.

In 2000 test well P29w/0094 was drilled into Papa mudstone near the intersection of Seaview and Reserve Roads, on the upland area seaward of Seddon. It was drilled to a depth of 73 metres and encountered a low yielding, salty water bearing layer at the base of the well. Shell material was noted by the driller, confirming the marine origin of the sediments. The poor yield of this well and its salty water are likely to be typical of the Papa mudstone material in this area generally.

As a result of the low yielding aquifers in the Awatere Catchment Area, most water for crop irrigation, domestic, stock and the Seddon municipal supply originates from the Awatere River, or its tributaries such as Black Birch Stream.

## Blind River area

### Introduction

Local groundwater resources are limited in the Blind River Catchment and most crop irrigation water either is imported from the neighbouring Awatere River Catchment, or represents spring runoff that has been intercepted by earth dams.

### Groundwater systems

A surface aquifer exists in the Blind River Catchment and is associated with the thin mantle of alluvium overlying the Papa mudstone basement. This relatively small natural reservoir provides baseflow for wetlands, the Blind River and to maintain freshwater flow to the coastal estuary. Under typical summer conditions all water used for drinking, stock supply or irrigation will indirectly come from groundwater storage.

The existence of Blind River channel flow depends on the thickness of the alluvium overlying the impermeable papa basement. If the alluvium is thin, water is forced to the surface and appears as river flow. Where there is a thicker sequence of alluvium, Blind River flow is lost to groundwater and the river dries up in that reach. This explains why Blind River channel flow is intermittent along its length (Fig. 35.4).

In some places the alluvium may not exist, or it may be so thin that it doesn't store appreciable volumes of groundwater. Outcropping mudstone is a clear sign that the alluvium, and groundwater, does not exist in a particular area.

### Recharge and flow patterns

Because the Blind River Aquifer is relatively thin, it is likely to be discontinuous and have limited

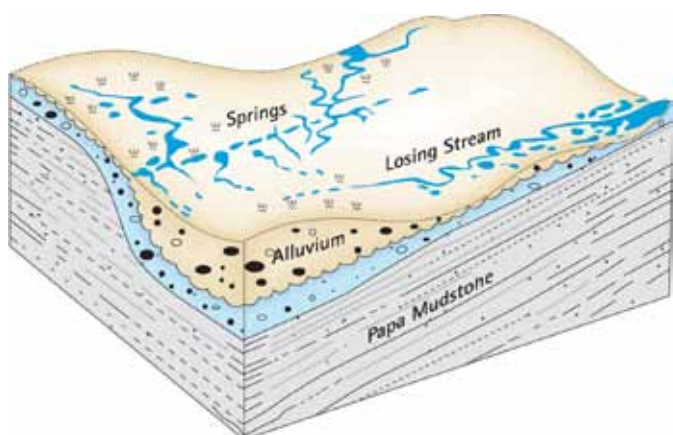


Figure 35.4: Blind River Catchment Aquifer



Figure 35.5: Shallow groundwater at Blind River (PDP - 2001)

storage and will drain quickly. The limited available drawdown explains the use of infiltration galleries or a series of shallow wells connected together to access groundwater.

Excavations in 2001 discovered the existence of the Blind River Aquifer beneath the flats at Cable Station Road near the mouth of Blind River (Fig. 35.5) (PDP - 2001). While water permits exist to take irrigation volumes of water, it is uncertain how much water is actually available or pumped, especially in drier seasons.

In 1983 the MCRWB commissioned an assessment of the groundwater resources available for the irrigation of crop and pasture in the Blind River area. The report concluded that the geology precluded the possibility of high yielding aquifers. The best option for sourcing irrigation quantities of water was to harvest and store Blind River winter flow in dams.

The report stated: "...the prospect of locating a groundwater reservoir with sufficient supply and reliability for an irrigation scheme is very poor, primarily because of the thin nature of younger gravels along the river and of the great thickness of mudstones underlying all of the property" (GCNZ - 1983).

In 2002 test well P29w/0122 was drilled near SH1 at Taimate. The well was drilled to a depth of 112 metres. Drilling encountered a combination of clay and mudstone, with no apparent alluvium. No significant water bearing layers were found.

## References

- GROUNDWATER CONSULTANTS N.Z. LTD. 1983. MARLBOROUGH REGIONAL WATER BOARD ASSESSMENT OF GROUNDWATER RESOURCES FOR IRRIGATION AT GLENBEIGH STATION, BLIND RIVER
- PATTLE DELAMORE PARTNERS LTD. 2001. BLIND RIVER ABSTRACTION, PREPARED FOR MR MICHAEL DAVISON