



Report **04.417**
Date 31 May 2004
File WO/03/06/09

Committee **Rural Services and Wairarapa**
Author **Steve Blakemore, Manager, Planning & Resources**

Status of Wairarapa Groundwater Takes

1. Purpose

To inform the Committee of the current status of groundwater takes within the Wairarapa and related issues.

2. Background

2.1 Statutory Position

The management of water resources and the issue of water permits are functions of Regional Councils under the Resource Management Act 1991.

The Regional Policy Statement sets out the objectives, policies and methods for managing the freshwater resource and the associated Regional Freshwater Plan establishes the specific policies and rules for the taking of groundwater.

Takes of groundwater are permitted, provided they are less than 20,000 litres per day and:

- Water is taken a rate of no more than 2.5 litres per second
- There is no more than one extraction point for each certificate of title
- There are no adverse effects on adjacent bores.

All other takes of groundwater require resource consent and are discretionary activities - applications may be granted or declined. Applications for consent are processed in the order in which they are received.

Consent applications are considered as to whether they are sustainable and their effects on the environment are acceptable. Policy 6.2.3 of the Regional Freshwater Plan assists in making decisions on consent applications as it specifies safe yields for all identified groundwater zones/aquifers in the Wairarapa. No

groundwater takes are to exceed the safe yield for each groundwater zone/aquifer unless it can be shown that the proposed take is sustainable in the long term.

2.2 The Resource

The main groundwater zones/aquifers in the Wairarapa are confined to the Wairarapa valley with very limited groundwater resources available in the eastern hill country.

Yields of groundwater within the valley are quite variable due to the complex hydrogeology, reflecting the effects of strata and faults. Compared with surface water the resource and its management can be complicated. Aquifers may be shallow or deep – over 100 metres. They may also be confined by impervious strata, and there may be several sub aquifers within a groundwater zone.

2.3 Previous Review

This paper follows on from a review of Wairarapa groundwater resources undertaken in 2001. This previous review identified the problems that were merging in some aquifers, which eventually led to moratoriums, and metering requirements.

3. Current Position

3.1 Overview

Groundwater resources are coming under increasing pressure. There are now three shallow aquifers that are fully allocated where the amount of groundwater allocated is equivalent to the annual safe yield. The Martinborough Eastern Terraces is the only deep aquifer that is fully allocated, however there are a number of other deep aquifer systems where there is concern about declining groundwater levels and/or the level of allocation from sub aquifers within a wider groundwater zone. A summary of the current position of all groundwater zones/aquifers is presented in Appendix 1.

Since 2001, there have been moratoriums in place on three deep aquifer systems where declining groundwater levels were observed in Greater Wellington's monitoring bores. These deep aquifer systems are Parkvale, Kahutara, and Martinborough Eastern Terraces. Discussion on how these aquifer systems have responded since 2001 is provided later in the report.

3.2 Overall Use

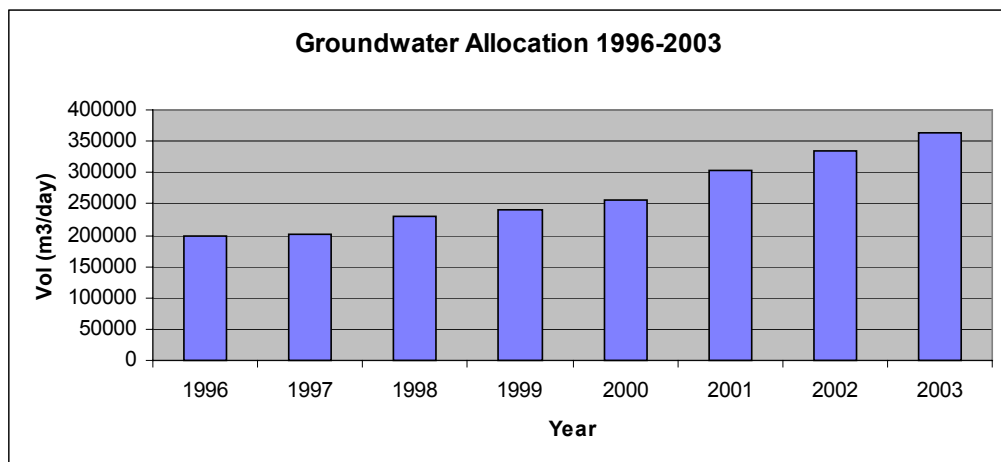
Policy 6.2.7 of the Regional Freshwater Plan encourages the use of groundwater as opposed to surface water. This policy is reflected in the table below which shows there are twice the number of groundwater takes compared with surface water takes.

Wairarapa Consented Water Takes			
Take	No.	Volume per day Cubic metres	Average daily take Cubic metres
Surface Water	169	469,636	2,779
Underground Water	317	319,171	1,007
Total	486	788,807	1,623

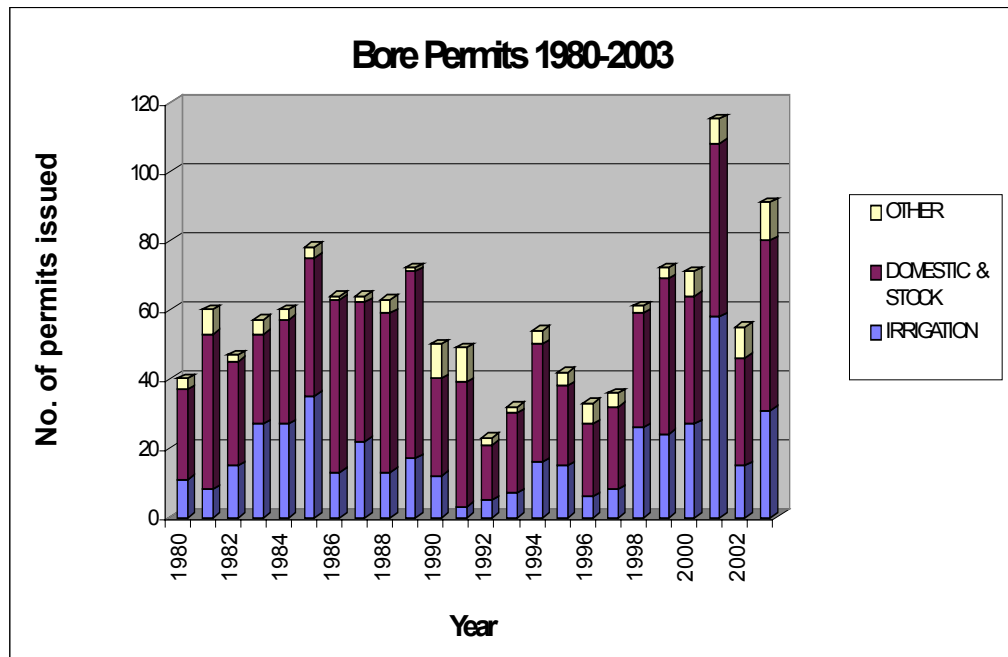
Nevertheless there is far more water allocated from surface water resources because the yields of groundwater bores are generally less than the demand for some activities. Overall, municipal water supplies and water races would not be able to obtain sufficient volumes of water from groundwater. Recently, underground water takes have been established to supplement municipal water supplies at Carterton and Greytown.

3.3 Trends

Since 1996, there has been an 84% increase in the allocation of groundwater as shown in the following graph.



Bore permits are also a good indicator of the level of groundwater development. In the early 1990's there was little development of the groundwater resource, however development has increased markedly since 1998 as shown in the following graph.



There was a big increase in consented groundwater takes in 2001, coinciding with high dairy farm incomes following a dry summer.

Since 1996, large increases in groundwater allocation have occurred in a number of groundwater zones/aquifers as shown in the following table:

Groundwater zone	Proportion of annual safe yield allocated	
	1996	2004
Ahikouka (shallow aquifer)	25%	65%
Battersea (all aquifers)	50%	94%
Lower Valley (aquifer 2)	40%	94%
Middle Ruamahanga (shallow aquifer)	41%	100%
Parkvale (aquifer 2 & 3)	47%	78%
Riverside (shallow aquifer)	12%	100%
Tawaha (shallow aquifer)	53%	100%
Te Ore Ore (deep aquifer)	49%	87%

More than 95% of groundwater allocated has been for irrigation purposes. Of this only 10% is for horticulture.

3.4 Register of Interest

Since December 2003, a formal register has operated, recording clients interest in taking surface water in localities where the resource is fully allocated, or a moratorium is in place. Whilst it is not possible to issue consent under these

circumstances, allocation may become available in the future under the following scenarios:

- A review of the resource results in additional allocation being available
- An existing consent lapses, is surrendered, cancelled, or varied to take less water.

Clients are being asked to formally register their interest in the resource, with their letter being “queued” on file. In the event of resource becoming available, the client with the longest standing interest will be given a set time to lodge a full consent application and AEE to use the resource. If this is not received, the next person will be given the opportunity.

3.5 Conceptual Model

Sufficient data is now available for a conceptual hydrogeological model to be made of the underground water resources of the Wairarapa Valley. This model will allow safe yields to be refined for individual aquifers and give an increased understanding of the dynamics of these systems.

Funding provision is available in the Departments budget and this project will commence shortly.

4. Issues

4.1 Allocated versus Actual Use

Under the RMA, consent holders can choose to use only part of their consented take, or none at all. In doing so, the resource becomes effectively “tied up” and not available for other users. The recent RMA amendments extended the period in which a consent can be “unused” from two to five years. Hence it is now more difficult to lapse or cancel consents that are not used.

For groundwater resources, such partial or non takes, mean that although aquifers may be fully allocated on paper, there is potentially still room to allocate water based on actual use. Also at present, groundwater consent applications are based on estimating a peak daily demand for a set period of time, generally 30 weeks per year. Actual use is likely to be well less than this amount as there will be a number of those weeks where irrigation demand is significantly less than the peak daily demand.

To assess the difference between allocated and actual use, Greater Wellington has implemented a programme requiring water meters to be installed on groundwater takes in aquifers that are either fully allocated or stressed. Phase I of this programme involved the installation of approximately 40 water meters in the Martinborough Eastern Terraces, Kahutara, Parkvale, and Huangarua groundwater zones/aquifers in 2002.

Last year, a number of other groundwater zones/aquifers were identified where water metering was considered essential. In Phase 2, approximately 100 bore

owners have been requested to install water meters by August 2004 in six more groundwater zones/aquifers. Once these water meters are installed, all groundwater zones/aquifers (except the Ahikouka aquifer) where groundwater allocation exceeds 50% of the annual safe yield will be metered.

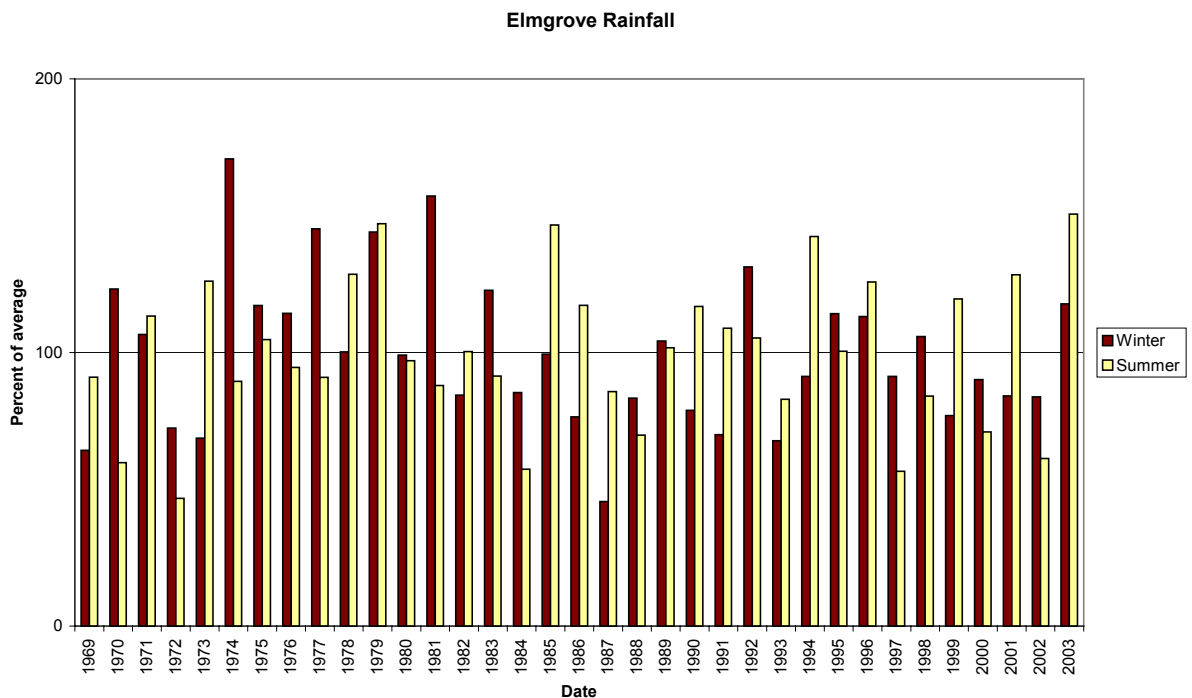
At present water meters are read at the start of each irrigation season, so after two irrigation seasons it will be possible to accurately determine the difference between allocated and actual use. Council may then consider reviewing the individual groundwater consents, thereby freeing up water for other users.

4.2 What is happening in moratorium areas?

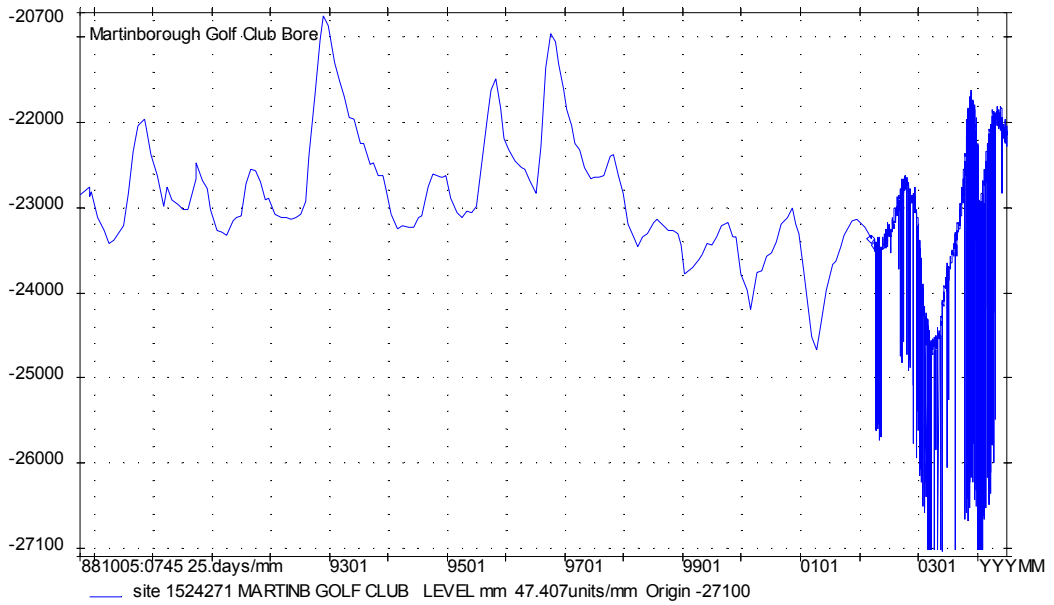
Since moratoriums were put in place on the Martinborough Eastern Terraces, Parkvale, and Kahutara aquifers, monitoring of groundwater levels has continued along with additional investigations to determine recharge sources for these aquifer systems.

In all three aquifer systems, groundwater sampling has confirmed that these aquifer systems are recharged solely from rainfall and in the case of the Parkvale and Kahutara aquifers, the waters are old - greater than 50 years.

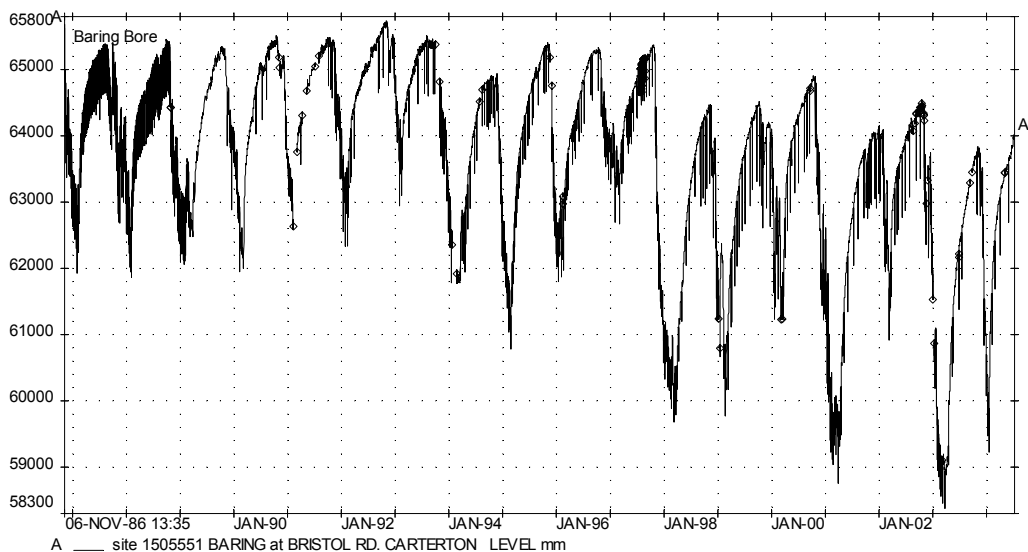
Over the past year the Wairarapa has experienced two consecutive six month periods of above average rainfall as shown on graph for Elmgrove near Greytown. This is the first time that this has occurred since 1996. Between May 1996 and May 2003, there were only two summer periods where rainfall was above average and one winter period where rainfall was above average, out of a total of 12 periods.



In response to the most recent period of above average rainfall, groundwater levels in the Martinborough Eastern Terraces have recovered significantly as shown on the following graph. Although this recovery is encouraging, careful management is still required, as the depth of available groundwater is still limited to no more than 10 metres.



In the case of the Parkvale and Kahutara aquifers, the response has been less evident as shown by the record from the Baring monitoring bore in the Parkvale aquifer at Bristol Road. This record shows that continued careful management of these aquifer systems is required and the current moratoriums should remain. Fortunately, the depth of available groundwater for these confined artesian aquifer systems is significantly greater than the Martinborough Eastern Terraces aquifer at 30 metres or more.



4.3 20,000 litre rule

The present permitted rule is detailed in 2.1. By implication it conveys a message that takes of this size are *de minimis* - too small to be of concern, with insignificant effects on the environment. It also infers that resources are infinite.

Whilst this may have been an appropriate approach at the time the Regional Freshwater Plan was developed, it is an area of increasing concern. Whilst it may be appropriate on a case by case basis, more recent experience has shown that the issue needs to be considered cumulatively

This has arisen for the following reasons:

- Intensified lifestyle subdivision may cumulatively increase the number of 20,000 litre takes from ground water.
- This may reduce the water available for consented takes.
- It may also affect the availability of water for existing 20,000 litre users

With underground water, these concerns have only become apparent at Martinborough where the underground resource is small and subdivision is intense.

Currently a staff task group is examining this issue and will be reporting to Committees by the end of this year. An approach being considered is to limit permitted takes in some areas to the reasonable needs of stock drinking water and domestic use.

4.4 Efficiency of Use

Objective 6.1.3 of the Regional Freshwater Plan aims to ensure that water taken from aquifers is used efficiently and water conservation is practised. However under Policy 6.2.6, a “broad brush” approach is taken requiring irrigation rates to be no more than 350 cubic meters per ha per week (equivalent to 35 mm of rainfall). All consent applications achieve this requirement.

Efficiency questions are illustrated in the following alternative scenarios.

Consider two applications to irrigate from the same resource:

1. An application made to irrigate pasture at the maximum application rate of 350 cubic meters per ha per week on the most porous unsheltered soils, using an inefficient border dyke system.
2. An application made to irrigate from the same aquifer applying only 100 cubic meters per ha per week on well sheltered, moisture retentive soils growing a high gross margin crop, with water applied using an efficient dripper system.

Under the present approaches:

- If application one was made first and the volume was available, consent would be granted.
- If application 2 was received only a few minutes later than application 1, and the aquifers safe yield had been fully used, it would be declined.
- Efficiency could only be considered if both applications were received simultaneously.

These scenarios highlight the problems and controversy that our Region will increasingly face as individual water resources progressively become fully allocated. It is the basis of a growing national debate that initially surfaced in the Project Aqua applications.

Environment Canterbury is reportedly seeking amendment of the RMA to enable competing resource consent applications to be judged on their merits. They maintain that the community expects consents to be dealt with in their merit and are developing their own framework to hopefully implement this.

Central Government has established a working group that is looking at water allocation issues facing the country as part of their National programme for Water. A public discussion document on future approaches is intended to be released in the next few months.

As the Regions individual water resources approach, or become allocated, there is likely to be an increasing call for consent applications and renewals to take account of the efficiency of water use and water conservation.

4.5 Needs Based Consents

There will be considerable advantages in taking a “needs” based approach to irrigation consents. That is, considering and granting applications on the basis of actual soil and crop needs. In this way the size and frequency of takes would be determined by:

- The soil types to be irrigated and their ability to retain water.
- The crops to be grown and their water needs.
- The frequency with which the soil water will need to be replenished.

Such an approach is quite achievable and has the potential to “free up” water for other users without reducing current production. To implement this approach, some further research and modelling will be required, followed by changes to the water efficiency policy in the Regional Freshwater Plan.

5. Conclusions

- The present underground water resources of the Wairarapa are becoming increasingly fully allocated.

- Water metering will eventually enable a review to be made of underground water allocated to consents, based on annual usage.
- Aquifer Safe Yields provide the basis for sustainably managing aquifers.
- Development of the conceptual model will improve overall management and refine the safe yields for different aquifers
- Needs based consents provide the means to improve water use efficiency and assist allocation and should be further developed.
- The “first come, first served” basis for allocating water needs review. Council should approach this as part of the current national programme.

6. **Communication**

This report has been made available to news media. Publicity and consultation will be essential once any draft proposed changes to the Freshwater Plan are approved in principle by Committees.

7. **Recommendation**

That the Committee receive the report and note its contents.

Report prepared by:

Stephen Thawley
Resource Advisor

Report approved by:

Steve Blakemore
Manager, Planning &
Resources

Report approved by:

Colin Wright
Divisional Manager, Wairarapa