

# REPORT

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Greater Wellington Regional Council

Wairarapa Water Use Project  
Water Races - Information Review

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## Executive Summary

Work on the Wairarapa Water Use Project (WWUP) is in progress towards identifying suitable storage sites for water to be used for a range of purposes, including irrigation. The question has been raised as to whether parts of the existing water race systems in the Wairarapa valley could be used as a means of water conveyance from rivers to potential storage sites, or from storage sites to areas of demand for the irrigation water.

This report has been prepared to address the first phase of assessing the viability of incorporating all or parts of the existing race network into the WWUP as a water conveyance/distribution mechanism. It presents the results of a scan and collation of existing information on aspects of the water races and identifies information gaps and likely or potential issues, risks and benefits that may be involved with integration of part or parts of the water race network in the WWUP.

Six water race systems currently operate in the Wairarapa, namely:

- Opaki and Te Ore Ore in Masterton District,
- Taratahi and Carrington in Carterton District,
- Moroa and Longwood in South Wairarapa District.

Previously an "Upper Plains" race system operated in the Masterton area, but this was decommissioned in the early 1990's and replaced by a piped water system.

The water races were established primarily to supply water for stock, and are still used mostly for this purpose although other uses that are currently permitted include a few specified takes for irrigation of dairy farms and a vineyard, frost protection, domestic uses, wetlands, fire-fighting and other minor industrial purposes, including supply to a piggery. It is thought that only a small percentage of the total volume of water within the races is actually used for these other purposes, although actual use may exceed that which is currently consented. In any case, far more significant amounts are either "lost" through evaporation and/or seepage or returned to natural surface water downstream. During wet conditions and at certain locations, significant quantities of water from surface runoff also enter the water races.

The races take water from the Ruamahanga, Waingawa, Waiohine and Tauherenikau Rivers, and Mangatarere Stream. Each race system varies in length, capacity and in the areas of land serviced. Together they cover a significant part of the Wairarapa Valley from north of Masterton to the head of Lake Wairarapa, and are a long established and integral part of the environment.

Much of the available information on the water races has been generated by, or on behalf of, the regional and district councils in relation to consents associated with the RMA (or its predecessors). Because of this, the primary focus of the information is on the effects of the races on the flows and associated values of their source rivers and downstream receiving waters, rather than on the races in their own right.

The key determinant of whether parts or all of the water race systems should be considered for inclusion in the WWUP is their location relative to potential water storage sites and potential water demand or service areas. (At the time of undertaking this review a short-list of potential storage sites had not been confirmed.) If this test were passed, the main issues to be considered in relation to the WWUP include:

- Race condition. Little specific information exists on the overall condition of the races. Local knowledge and anecdotal evidence suggests that the width, depth and general condition of the races are variable, both along individual races and across the many race branches. Most, if not all, races leak water to groundwater (one source estimates this loss for Taratahi and Carrington as up to 50%), but this has not been quantified. These losses

indicate that to be included in the WWUP, the races may need upgrading to be suitable for use.

- Capacity. Although the spatial distribution of the races is well defined and mapped, there is very little information on the capacity of the races. Information is restricted to the consented volumes, which may or may not bear accurate relationship to capacity. The consented maximum intake volumes are:
  - i. Opaki 230 l/s
  - ii. Te Ore Ore 300 l/s
  - iii. Taratahi 481 l/s (but new consent application seeks a maximum “flushing” flow of up to 800 l/s)
  - iv. Carrington 113 l/s (but new consent application seeks a maximum “flushing” flow of up to 250 l/s)
  - v. Moroa 500 l/s
  - vi. Longwood 250 l/s

These rates apply to the intake channels; there is no evidence that sufficient capacity exists for these flows to be carried throughout the entire race network. No specific information on channel size and capacity throughout the water race systems was discovered during this review.

- Ownership & Control. The six race systems are managed by the Masterton, Carterton and South Wairarapa District Councils. These territorial local authorities are empowered to operate the races and have access to them through the provisions of the Local Government Act 2002, and local water race bylaws. However, they do not generally own the land or hold easements across the land through which the races pass (although there is at least one known exception to this, at the head of the Opaki race). There is uncertainty as to how control may be retained over any races incorporated into a WWUP scheme, and how management of them might be effected, taking into account current legislation and local bylaws (both existing and proposed). Based on comments received to date, there would appear to be a general willingness or desire by at least some (if not all) of the territorial authorities to divest management responsibilities for the races to the regional council (or possibly another party). These issues are all of relevance to any possible ownership structure of any parts of the race that might be used as part of a WWUP scheme.
- Landowner views. The races all pass through privately owned land. While it is expected that some landowners will wish to retain the water races and may oppose their modification or change in use, others who may currently regard the races as of no value or even as a nuisance might view modifications or more particularly closures, more favourably. Landowners who anticipate benefits from incorporation of the races in a WWUP scheme are more likely to be supportive of modification and use of the races for additional purposes. The actual effects on landowners will depend on the number and types of properties affected by any race of interest to the WWUP, whether the landowners use water from the races or have an interest in using the race water for irrigation, or whether the races contribute to their value and/or enjoyment of the land. These issues would need to be properly scoped once specific races or sections of races have been identified as being of potential interest.
- Race Age. It appears that some races were constructed pre-1900, and are therefore subject to the Historic Places Act 1993. Requirements generated by this legislation will create an added consideration to the use of any water races that were in existence prior

to 1900. This situation may apply to the Carterton District races and the Moroa race in South Wairarapa District, but more investigation of these races is required to confirm which part or parts of them might be subject to this legislation.

- Cultural considerations. Tangata whenua's views on the water races and their value have not been determined during this review, and need to be explored. For example, it is unclear whether the transfer of water between different catchments may be of concern. Specific concerns would need to be properly scoped if specific races or sections of races were identified as being of potential interest.
- Consent considerations. The operation and management of the races is effected through the use of local bylaws (by the district councils) and resource consents (granted by the regional council). Use of the races for additional purposes may require either amendment of the current provisions, and/or possibly new bylaws and resource consents. Detailed investigation of these requirements would be required.

Further issues of relevance to consider include:

- Effects generated by any changes to the race network on the existing in-stream ecology of the natural stream impacted by the water races, and the existing hydrological system. These effects would need to be investigated and evaluated as part of ongoing pre-feasibility investigations.

At face value, available information suggests that some consideration should be given to utilising specific sections of the Wairarapa water race systems where they may be useful as components of a potential distribution system to transport water from potential water storage sites to irrigation demand areas. However, the lack of information on the capacity of the races and their apparent tendency to lose and gain water down their lengths are major constraints, which would require detailed analysis.

There may be some potential benefits in integration of the water race network within a distribution network associated with the WWUP if parts of the race network were to align with parts of any proposed WWUP distribution system. The relative costs and time efficiencies of upgrading an existing race in comparison with construction of a new canal or piped system would need to be investigated.

There are possibly wider environmental benefits associated with use of the existing water races that are aligned with both the objectives of the Resource Management Act and the WWUP vision of achieving more sustainable and more efficient use of the Wairarapa water resources. However, the key issues noted above may ultimately carry more weight in determining whether integration of parts of the water races in a WWUP scheme can be achieved.

# 1 Introduction

Work on the Wairarapa Water Use Project (WWUP) is in progress towards identifying suitable storage sites for water to be used for a range of purposes, including irrigation. The question has been raised as to whether parts of the existing water race systems in the Wairarapa Valley could be used as a means of water conveyance from rivers to potential storage sites, or from storage sites to areas of demand for the irrigation water.

This report has been prepared to address the first phase of assessing the viability of incorporating all or parts of the existing race network into the WWUP as a water conveyance/distribution mechanism. It presents the results of a scan and collation of existing information on aspects of the water races, and identifies information gaps and likely or potential issues, risks and benefits that may be involved. The information scan has included a review of the written material listed in Section 7.1. Preliminary discussions were also held with representatives from the territorial local authorities and a landowner through whose property one of the race passes, the results of which were taken into account in this report.

Six water race systems operate in the Wairarapa, namely:

- Opaki and Te Ore Ore in Masterton District
- Taratahi and Carrington in Carterton District
- Moroa and Longwood in South Wairarapa District

Previously there was also an “Upper Plains” race system on the plains area to the north-west of Masterton. This race system was decommissioned by the Masterton District Council in the early 1990s and replaced by a reticulated water supply.

All the race systems were established primarily to supply water for stock, and are still used mostly for this purpose although other uses that are currently permitted also include: a few specified takes for irrigation of dairy farms and a vineyard, frost protection, domestic uses, wetlands, fire-fighting and other minor industrial purposes, including supply to a piggery.

The systems vary in length, capacity and areas of land covered: Taratahi and Moroa are the largest, with many branches covering a total of approximately 240 km each, while the Te Ore system is a relatively simple 1-2 channel scheme totalling only a few kilometres in length. Together the race systems cover a significant part of the Wairarapa Plains from north of Masterton to the head of Lake Wairarapa, and are a long established and integral part of the environment.

The races are managed by the three Wairarapa district councils (Masterton, Carterton & South Wairarapa District Councils) under powers derived from both national legislation and local government bylaws. Generally the councils levy a water race rate on landowners serviced by the races (the exact administration details vary slightly between the three districts). Water for the races is drawn from five rivers (Ruamahanga, Waingawa, Waiohine, Tauherenikau Rivers and Mangatarere Stream). These takes are authorised by resource consents granted to the respective district councils by the Greater Wellington Regional Council (GWRC). The consents for the Masterton District races are current until December 2018, while those for the Moroa and Longwood (South Wairarapa District) races are current until April 2025 and April 2020 respectively. Applications for resource consents for the Taratahi and Carrington races in Carterton District are currently under consideration by GWRC.

Any use of the race water for a purpose other than stock water and other minor uses requires the specific agreement of the relevant council, and a variation of resource consents held by that council.

## 2 Overview

Information on the Wairarapa water races is summarised in Table 1 contained in Appendix A, and described in more detail in the following subsections.

### 2.1 Location

Six operational water race systems in the Wairarapa valley extend over discrete areas from the Te Ore Ore plains (just east of the Ruamahanga River) in the north, to near the head of Lake Wairarapa in the south.

The race systems in Masterton District are:

- Opaki
- Te Ore Ore

The race systems in the Carterton District are:

- Taratahi
- Carrington

The race systems in the Carterton District are:

- Moroa
- Longwood.

The first figure in Appendix B shows the general location of these water race systems.

All the water races have been mapped and included on GWRC's GIS system since 2009. The six plans in Appendix B are taken from this source, and show the location of each of the races in more detail (note: the plans are at different scales).

### 2.2 Water Sources & Sinks

#### 2.2.1 Opaki

The Opaki race draws water from the Ruamahanga River, where the Mokonui Fault crosses; about 3.5 km upstream of the confluence with the Kopuaranga River (see Table 1 for grid reference). It also receives spring discharges in low lying areas, and "probably" contributes to some groundwater recharge in more permeable areas<sup>1</sup>. Flow gauging by GWRC on Opaki water race<sup>2</sup> showed that up to 30% of the water taken from the Ruamahanga River is effectively lost from the race system due to a combination of evaporation and overland flow in addition to seepage to groundwater.

The race system has six main branches. Residual water from the races discharges to the Waipoua River at four points and to Henley Lake via Hiona Stream.

#### 2.2.2 Te Ore Ore

Water in the Te Ore Ore race is taken from the Ruamahanga River at Black Rock Road, immediately east of Landsdowne Hill. Like the Opaki race system, it also receives spring

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<sup>1</sup> Gyopari, M.C. & McAlister, D. (2010): Wairarapa Valley Groundwater resource Investigation – Upper Valley Catchment hydrogeology and modelling.

<sup>2</sup> Noted in Thawley, S. (2003)

discharges in low lying areas, and “probably” contributes to some groundwater recharge in more permeable areas.<sup>1</sup>

The race commences as a single channel, before breaking into 2 channels in its central part, and then re-combining into a single channel again. Residual flows in the race discharge into a modified ephemeral watercourse that eventually flows to the Whangaehu River.

### 2.2.3 Taratahi

The Taratahi water races form an extensive network totalling around 240 km in length in numerous branches, over the Taratahi Plains both east and west of SH2. The main source of water for the races is the Waingawa River, the intake being located downstream of the confluence with the Atiwhakatu River.

The race system is also boosted by inflows from spring flows that are associated with the Masterton & Carterton Faults and the Parkvale Spring system. Parkvale Stream and Booths Creek are also secondary water sources, and are, in turn, fed by the races.

Residual flows from the Taratahi water races discharge to the Ruamahanga and Waiohine Rivers, the Waingawa Wetland and a number of un-named streams and storage ponds.

An analysis undertaken in 2000<sup>3</sup> indicated that as much as 50% of the water in the Taratahi races might be lost as seepage to groundwater.

### 2.2.4 Carrington

The upper Mangatarere Stream is the source for the Carrington water race system. This system has a number of branches, totalling approximately 36 km. Residual flows discharge back to the Mangatarere Stream at a number of locations between Andersons Line and Brooklyn Rd, and to Enaki Stream.

### 2.2.5 Moroa

The Moroa water races are similar to Taratahi, in that they form an extensive network of races approximately 240 km in total length.

The intake for the Moroa races is in the Waiohine River, upstream of the rail bridge. The race system comprises a single channel for the first 1 km, before dividing into a network consisting of 13 main branches and numerous minor branches. Residual water in the system flows mostly into the Tauherenikau catchment, terminating at fourteen locations<sup>4</sup> - although the existing resource consent only approves discharge to five locations (Waiohine River, Dock Creek, Otakura Stream, & Papawai Stream).

Thawley (2005) mentions that the Moroa races are separate from natural water courses, and do not interact with permanent streams. The initial part of the race feeds the intake for the Greytown-Featherston public water supply and the races are linked to the Battersea Drainage system and also the Greytown Stormwater system. Thawley (2005) also notes that some maps (e.g. in the Moroa Race AEE report of 2001 and GIS coverage held on GW Arcview) incorrectly depict some of the “artificially modified watercourses” of the Battersea Drain as part of the Moroa water race system.

<sup>3</sup> Stronge, J. M. (2000): An investigation into the Taratahi and Carrington Water races, Carterton, Wairarapa. (Research project for Bachelor Applied Science, Massey University, Palmerston North.)

<sup>4</sup> Thawley, S. (2005): Assessment of resource consent applications for the continued operation of the Moroa and Longwood water races. Greater Wellington Regional Council, Attachment to Report 05.93.

### 2.2.6 Longwood

The Longwood races are fed from an intake on the Tauherenikau River. The races consist of 4 main branches, and they discharge at seven downstream locations including the Tauherenikau River and Otairira Stream. Again, Thawley (2005) notes that this scheme is separate from natural watercourses.

## 2.3 Physical Attributes

There is very little available information on the specific characteristics of the water races. In particular, no information was located that specifies channel widths, depths or capacities.

However, in general:

- The races are all open, unlined channels. They are generally culverted where they are crossed by roads and gateways, and flumes exist to cross some natural (typically ephemeral) watercourses.
- Some interact with perennial and ephemeral natural streams (and the distinction can become a bit blurred).
- They vary in width from narrow channels less than 1 metre wide, to channels that can be several metres wide. Channel widths and depths (and therefore capacities) vary along races (tending to decrease downstream) and also between different branches of the race systems. Enquiries were made with each district council but no cross sections or race survey data have been located to date.
- In some places the water levels in the channels are almost at the same level as the surrounding land, while in other places the channels are more incised and well defined.
- They are all gravity operated and so require a minimum amount of water at the intake to “drive” each system. Intakes to the races are manually controlled.
- Bed strata is variable throughout the races, and reflects the underlying geology, the flow conditions in the races and the sediments that have been washed into them over time; hence bed strata can vary from a stony matrix to predominantly mud and silt.

## 2.4 Flows

Some flow gauging has been undertaken in all races, mostly at intakes, and some intermittent flow gauging has also been undertaken at several intermediate sites in the Taratahi network. However, none of the races has had a study of flows through them that would fully characterise their flow regimes.

The consented takes for each of the races (and those sought for Taratahi & Carrington) are based (in part) on the amount of water considered necessary to drive and maintain flows through the races (see Table 1 for details). In summer months and in times of low flow the supply of water is sometimes insufficient to maintain flow in some branches of the races.

It should be noted that the consented intake flows for the races relate to the flows in the single intake channels, rather than in the race branches downstream.

One report estimated that up to 100 l/s is discharged from the end of the Moroa race system, and 50 l/s is discharged from the Longwood races back to receiving waters (during low flows)<sup>4</sup> but this has not been verified by gauging. Corresponding figures for the other race systems were not available.

Quantification of flows in the larger race systems are complicated by the interaction of the races with natural streams and/or springs (particularly Taratahi), the losses to groundwater, and the

interaction with stormwater inflows. With regard to the latter, it is noted that the Greytown stormwater system discharges to 8 races within the Moroa water race system<sup>5</sup>.

## 2.5 Areas Serviced & Water Use

Table 1 identifies the size of the areas served by each of the race networks. The largest system is the Taratahi network, extending over 10,000 ha and passing through approximately 330 properties. Te Ore Ore is the smallest network, servicing only a few properties.

The reports and studies reviewed all concur that actual usage of the water in the race networks is low – estimates vary from as low as 1%, up to about 5%. For the Moroa system, this equates to somewhere between 11.5 l/s to 25 l/s<sup>6</sup> (comparative figures are not available for the other races). From this, it can be concluded that much of the available water resource in the races is under-utilised, although the races contribute in other ways to the groundwater hydrology, natural ecology and aesthetics of the areas through which they flow.

The resource consents for each of the races specify the particular uses to which water in the races may be applied, as follows:

- Opaki – domestic & stock water and irrigation for one vineyard.
- Te Ore Ore – domestic & stock water and irrigation for a dairy farm.
- Moroa – domestic & stock water and two irrigation takes.
- Longwood – domestic & stock water only.

It is anticipated that use of the water in the Taratahi and Carrington races will be similarly controlled by new resource consents currently under consideration (see Section 2.9). Their AEE's note current water uses being irrigation stock water, garden watering, potable water, dairy shed wash down and cooling water.

Any further uses outside of these specifically identified purposes must be authorised by a variation in the relevant resource consent. There is anecdotal evidence that unauthorised use of the water race water occurs in at least some of the race systems. This includes such activity as the use of weirs in summer months to increase race levels in order to passively irrigate surrounding land, and takes for irrigation outside those specifically authorised in the current resource consents. The current resource consents for the MDC and SWDC races have conditions requiring the relevant councils to undertake water use reviews, in order to establish better understanding of the actual use and efficiency of use of the water resources. They have also introduced the use of management plans/codes of practice to encourage landowners to take more responsibility for minimising wastage or inappropriate use of water in the races (although it is noted that adherence to these is voluntary, and the extent to which active promotion of the plans/codes is undertaken is unclear).

It should also be noted that the water races also function as stormwater drainage systems, receiving overland flows from surrounding land (and in the case of Moroa, discharges from the Greytown stormwater system).

## 2.6 History & Heritage Status

The Moroa Water race system, constructed in the 1890's, is the oldest scheme. There is some uncertainty as to the exact age of the Carterton District races, but it is likely that at least parts of

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<sup>5</sup> Greytown Stormwater Management Plan (1997)

<sup>6</sup> Thawley,S.(2003)

Taratahi were hand-dug prior to 1900. Construction of the Carrington system was undertaken sometime after 1900 - possibly in the 1930's as Depression work.

The Longwood system was constructed in the 1920's, and the Te Ore Ore and Opaki schemes were constructed "in the first half of the 20<sup>th</sup> century". A Deed of Easement<sup>7</sup> establishing the right of the Masterton County Council to create the uppermost part of the Opaki water race is dated 1909.

## 2.7 Ownership

All of the races pass through privately owned land. The races do not have their own titles and some reports state that there are no easements over the titles of the land through which they pass. It was beyond the scope of this report to check the land titles pertaining to land crossed by the water races. However an easement is known to exist over at least two properties at the head of the Opaki water race. Hence, caution should be employed before making any assumptions relating to ownership and easements over particular sections of the race network.

The territorial local authorities are empowered to operate the races and have access to them through the provisions of the Local Government Act 2002, and local water race bylaws. This is discussed further in Section 2.8.

## 2.8 Operation & Management

The district councils are responsible for the operation, administration and management of the water races in their respective areas. They achieve this via a number of instruments, including:

- resource consents under the Resource Management Act 1991 for take, use and discharge of water in the races,
- local bylaws that establish the rights and responsibilities of the councils and race users,
- the Local Government Act 2002 and the Local Government (Rating) Act 2002, that give local authorities the right to establish and operate water races, establish bylaws, and set water race rates; and
- co-ordination of user groups or management committees that have varying degrees of input into the functioning of the race schemes.

These are discussed in more detail in the following sub-sections.

### 2.8.1 RMA Resource Consents

The three district councils control the operation of the races via resource consents granted to them by GWRC for the supply of water to, and discharge of water from, the races. The consents also permit the councils to undertake works in the beds of the source rivers at the race intakes. The consents impose limits on the amount of water that may be taken into the races, via a core and supplementary allocation that is dependent on flows in the source rivers. These are as follows:

Opaki:	Up to 170 l/s (core), 230 l/s (supplementary).
Te Ore Ore:	Up to 250 l/s (core), 300 l/s (supplementary).
Taratahi:	Up to 481 l/s currently, but under review. New consent applications seek a "flushing flow" up to 800 l/s.

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<sup>7</sup> Instrument No 102080 (184/157)

- Carrington: Up to 113 l/s currently, but under review. New consent applications seek a “flushing flow” up to 250 l/s.
- Moroa: Up to 450 l/s (core), 500 l/s (supplementary). (There is also a limit of 500 l/s on the combined take for the Moroa water race and the Greytown/Featherston public water supply when the Waiohine flow is below 3,040 l/s.)
- Longwood: Up to 180 l/s (Core), 250 l/s (supplementary).

Table 1 in Appendix A gives further details, and copies of the consents are included in Appendix C.

The consents held by MDC for the Opaki & Te Ore Ore races expire in December 2018. The use (take) of water within the race systems by third parties is included as a condition on the consents, as follows:

- Opaki – the consent notes specifically that water from the race may only be used for “domestic and stock water purposes” and for one specific irrigation activity for a 70 ha vineyard located on Loop Line (this take is for up to 13 l/s or a maximum amount of 91 m<sup>3</sup>/ha/week). Any other use of the water requires MDC to seek a change of consent conditions.
- Te Ore Ore – the consent does not specifically note the purposes for which the race water is able to be used, other than specifying two takes of up to 132.6 l/s for irrigation of 310 ha of dairy pasture (equating to 259 m<sup>3</sup>/ha/week). This is noted as the primary use of the race in summer. Any other use of the water requires MDC to seek a change of consent conditions.

Resource consents for the SWDC races expire in 2025 (Moroa) and 2020 (Longwood). The use (take) of water within the race systems by third parties is included as a condition on these consents as follows:

- Moroa – the consent notes that the water may only be used for “domestic and stock water purposes” and two specific takes for irrigation:
  - i. Up to 17.5 l/s, 22 hrs/day, 7 days/week, Oct to April from a tail race that discharges to Dock Creek;
  - ii. Up to 4 l/s, 12 hrs/day, Nov to April from a tail race that discharges to Otakura Stream.
- Longwood – the consent authorises use of the water only for domestic and stock water purposes.

Any other use of the water requires SWDC to seek a change of consent conditions by GWRC.

CDC has lodged applications for new resource consents to operate both the Taratahi and Carrington water races. Summary information for these applications is included in Appendix D. These applications are currently under consideration by GWRC. Submissions have been received from a number of parties (including both landowners and environmental groups and agencies). Consent processing has been subject to delays caused by requests for further information under the RMA by GWRC, and CDC’s response to those requests. The AEE report accompanying the consent applications notes the following existing uses of the water from the CDC races:

- Taratahi – stock water, irrigation of domestic gardens and other “limited domestic non-potable purposes”. The AEE report also notes that there are 15 current “industrial” users of the water resource in the Taratahi races; these include truck wash, fire-fighting, yard washing, plant watering, stock water, non-potable domestic uses, and 6 takes for frost protection. It is estimated that these uses only amount to 1-2 l/s each.
- Carrington – stock water, and other domestic non-potable purposes. There is currently one “industrial” user – Reids Piggery (Haringa Rd), which takes an estimated 1-2 l/s for

stock watering and wash down water. The AEE report also notes that most industrial users have other water supply sources (e.g. bores).

## 2.8.2 Water Race Bylaws

The district councils also control the management of the races through existing bylaws, copies of which are included in Appendix D.

The Masterton District Council Consolidated Bylaw 2008 Part Ten – Water Races applies to the Opaki and Te Ore Ore races.

The Wairarapa South County Water Race Bylaw 1987 was adopted by the Carterton District Council's predecessor, the Wairarapa South County Council in 1987, and still currently applies to the Taratahi and Carrington races.

The Moroa Water Race Bylaw 2007 applies to the Moroa Water Races, and the Featherston-Longwood Water Race Bylaw 1936 applies to the Longwood Water Races.

In general, these bylaws are intended to assist efforts to maintain flows and enhance the water quality in the relevant water races. With the exception of the Longwood Water Race Bylaw, they specifically establish the primary purpose of the races as being the supply of water for stock watering purposes. (The Longwood Bylaw is silent on this point.)

They all also list, among other things:

- A range of prohibited activities, including such things as bathing or washing, contamination of the water in the races, obstructing the flow in the races, animals or vehicles in the races (except at authorised crossings), and waste of water taken from a race (the detail varies slightly between the different bylaws).
- Restrictions on activities such as diversion of water from the races, widening, deepening or altering the course of any race, making of any structure over a race, pipe a race, plant any tree, hedge, shrub or other plant of any kind within 5 metres of a race, and erection of any buildings or structures within 5 metres of a race (again, the specific detail varies among the different bylaws).
- The Masterton Bylaw specifically makes the take of water from the relevant races subject to payment of a water race rate, and the Moroa Bylaw authorises SWDC to charge rates for the provision of the water race system.

All the Bylaws require landowners/occupiers to assume responsibility for cleaning and maintenance at their own cost. The councils maintain the intakes and deal with any emergency situations that may arise with the water supply. However, CDC also cleans and maintains its water races, and charges landowners for this service.

Owners are also obliged by the bylaws to allow the relevant council access for maintenance and/or information gathering/audit.

It should be noted that SWDC is in the process of redrafting a new consolidated bylaw to cover operation of the Moroa and Longwood systems. The intention is to have a proposal out for public consultation during 2012. The processes for the making, amending or revoking of bylaws by a local authority (including requirements for a consultation) are specified in the Local Government Act 2002.

## 2.8.3 Other legislation

The Local Government Act (2002) allows a local authority to:

- Construct works on private land that it considers necessary for the supply of water through water races (s181 (1) (b)) although the prior consent of the owner of the land is required (s181 (3)).
- Enter land to inspect, alter, renew, repair or clean any work that has been constructed (s181 (4)) although reasonable notice must first be given to the owner and occupier (s181 (5)).
- Restrict the supply of water in a water race in certain circumstances (s193).

Section 228 of the Act also specifies all the activities that constitute an offence in relation to water races.

The Local Government (Rating) Act gives local authorities the power to fix and charge rates for water race operation, and apply them to “every owner or occupier of land within the water race district”.

#### 2.8.4 Management Groups

##### Masterton District

MDC authorises use of water from the races via agreement with individual landowners and subject to the payment of a water race rate. The council also co-ordinates the Opaki Water Race Users Forum and the Te Ore Ore Water Race Users Forum, which are convened annually as a condition of the current resource consent. The purpose of these meetings is to discuss implementation of the respective water race Management Plans (see Appendix E) that were prepared as part of the current resource consents.

The MDC Utilities Manager (James Li) is responsible for operational oversight and management of the two races within Masterton District.

##### Carterton District

The Carterton District races are classified according to a three-level system (A, B, C) which determines the level of annual maintenance undertaken by the Council. Water race rates are levied on all landowners according to the classification, and this funds both the maintenance works and also any capital expenditure.

CDC employs a race overseer to attend to operational aspects of the water races.

CDC co-ordinates the Carterton Water Race Management Committee, consisting of four representatives elected by the water race users, the CEO (Colin Wright), three CDC Councillors (one of whom Chairs the meeting – currently Grant Smith), CDC’s Asset Manager (Gary Baker) and the Race Overseer (Melvin Pike). The Committee determines policy governing the races and sets targets for maintenance. Meetings are called as required.

Any code of practice requirements for the CDC water races have yet to be determined as part of the consideration of the current resource consent applications.

##### South Wairarapa District

SWDC charges a water race rate to landowners serviced by the races; this is calculated according to the capital value of the properties serviced, whether or not they use the water.

SWDC is required to implement a Code of Practice for both its races (see Appendix E). This is aimed at encouraging better practice among race users in order to improve water quality. Adoption of the code by landowners is voluntary; the Council has no power to enforce it. The consent for the Longwood race also requires SWDC to convene an annual Water Race Users Forum to discuss the Code of Practice.

The Council used to co-ordinate the Moroa Water Race Committee, but this appears to have been defunct for some time. It is SWDC's intention to establish a new Water Race Management Committee as part of its new consolidated bylaw for the two water races which is currently in preparation.

SWDC currently contracts out maintenance of their race network (where it is undertaken).

## 2.9 Water Quality

Some water quality data is available for parts of all of the race systems, but it is limited in its extent.

The quality of water in the races reflects the land use practices in the surrounding land. The GWRC assessment report for the consent applications for Moroa & Longwood water races (Thawley 2005), data presented in the AEE for the Taratahi & Carrington water race consents, and statements in the Moroa & Longwood Water Races Code of Practice all suggest issues with elevated nutrients and faecal coliforms within these races. Contamination can arise from a number of sources. Where stock has access to races there is opportunity for direct input of faecal matter, and the potential for increase in suspended solids. Stormwater runoff can carry nutrients, sediment and other chemical contaminants into the races, and maintenance and cleaning of the races can also contribute to elevated levels of suspended sediment. No specific information relating to these matters was located during this review.

In relation to specific races, the following information is available:

- Opaki: Sampling for water quality was undertaken at six sites on five occasions between March and May 2002<sup>8</sup>. This showed that Dissolved Reactive Phosphorus (DRP), total Phosphorus, ammonia nitrogen, total nitrogen, turbidity & suspended solids increased over the length of the race, as did bacterial pollution. The levels of these pollutants tended to be higher in the water race than in the Waipoua River. The current resource consent requires further water quality monitoring of the race discharge on a fortnightly basis between November and April, and the water discharged from the Opaki race to the Waipoua River must meet the requirement that *"for any 12 consecutive samples no more than two samples shall have an E Coli count greater than 550 cfu/100ml (unless monitoring shows that this standard was also exceeded at the inlet to the water race)"*. (Monitoring data was not accessed during this review.)
- Te Ore Ore: Water quality monitoring undertaken between March and May 2002 (see Thawley 2003) was limited; the results showed that although there was some degradation in total Nitrogen and Phosphorus concentrations over the length of the race, it did not appear to contribute to increases in these parameters in the receiving waters. Monitoring did show that the race was creating additional bacterial pollution in the Whangaehu River.
- Taratahi: The Parkvale Stream (which interacts with the Taratahi races) was sampled at several locations in 2007, as part of a thesis investigation<sup>9</sup>. The results showed the stream to be much degraded, both in terms of chemical parameters, clarity and suspended solids (and dairying was implicated as a cause). There is no comparable data for Booths Creek or Waikoukou Stream, which also interact with the races, or for other parts of the race system, but the AEE report assumes the water quality in these watercourses would be similar, given the similar surrounding land use practices.

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<sup>8</sup> Thawley, S (2003)

<sup>9</sup> Noted in Taratahi Water Race Scheme AEE (2011)

- Carrington: The race system discharges to the Waiohine River via the Mangatarere Stream. The AEE report for the current resource consent application notes recent monitoring of the Mangatarere Stream discharge is high in contaminants, and above GWRC guidelines in regard to nitrogen, ammonia, total Nitrogen, total Phosphorus, Dissolved Inorganic Nitrogen (DIN) and Dissolved Reactive Phosphorus (DRP). The report notes there is no information on the water quality within the races themselves, although it assumed to be similar to that in the Mangatarere main stem and tributaries.
- Moroa: Limited water quality monitoring undertaken 2000-2001<sup>10</sup> indicated deterioration in quality (including bacterial levels) between the race intake and discharge points. This indicated that the races were contributing to deterioration in the Waiohine and Tauherenikau Rivers. The current resource consent requires water quality monitoring of the race intake and at four discharge points on a fortnightly basis between November and April. (This data was not accessed during this review.)
- Longwood: Limited water quality monitoring undertaken 2000-2001 indicated that the condition of water entering Donalds Creek (downstream of the race) was very poor, and bacterial levels increased significantly between the intake and discharge points. The current resource consent requires water quality monitoring of the race intake and at three discharge points on a fortnightly basis between November and April. (This data was not accessed during this review.)

Since water in the races is currently used for stock watering and other purposes including some irrigation, it is not likely that the current water quality (although degraded) would present a significant constraint for further irrigation use in general terms, although this would need further assessment. In particular, the contribution of stormwater discharges such as in the Greytown area and overland flows into water races during wet periods might present specific water quality issues in some races. If the races were to carry higher flows associated with conveyance of irrigation water to or from storage reservoirs this might improve the quality of the water in the races (assuming appropriate control of water quality in those reservoirs prior to release).

## 2.10 Ecological Values

Although the race systems are artificially created waterways, they have been part of the natural landscape for a long time (over 100 years in some instances). In that time they have developed their own natural habitat and they now contribute to the Wairarapa's ecosystems and natural biodiversity (for example, they support some of the district's only remaining natural wetland and bush areas, such as the stand of kahikatea on the corner of East Taratahi and Perry's Rd)<sup>11</sup>. This view was supported by responses from stakeholder groups interviewed as part of a research project on the race systems undertaken by a Massey University student in 2000 (and reported in Good Earth Matters (2000)).

Some ecological assessment within the water races has been undertaken, but most of it is in relation to the Taratahi races.

Available data tend to suggest that races support relatively degraded aquatic communities that contain pollution-tolerant taxa. However, paradoxically there is also evidence that the more sheltered races, particularly those that may experience stagnation during times of low flow, may be providing refugia for nationally or regionally threatened species, such as the brown mudfish

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<sup>10</sup> Thawley (2005).

<sup>11</sup> Noted in Good Earth Matters (2000).

(*Neochanna apoda*) and this is similar to the situation that has been found to occur in the Distribution Races in Canterbury<sup>12</sup>.

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<sup>12</sup> Noted in section 3.3.2 of the Taratahi Water Race Scheme AEE (2011), and in an internal GWRC email (A Perrie to B Geden 30 July 2009).

## 3 Issues for Consideration

This section identifies issues relevant to consideration of the water races as part of the WWUP.

### 3.1 Location

The key determinant of whether parts or all of the water races should be considered further as a potential means of water conveyance for the WWUP is their location relative to potential water storage sites and water demand (service) areas. At the time of undertaking this review the short-list of potential storage sites had not been determined. Once this has been completed, the location of the water races can be taken into account in the assessment of distribution options and cost implications.

### 3.2 Race Upgrade – Implications

Most of the existing water races are relatively narrow and shallow, and some culverts and crossings are quite restricted (Colin Wright, *pers comm.*). It is assumed that any flows as part of the WWUP would be much higher than current flows in the race systems. Therefore it is likely that any races included in a distribution system would need to be enlarged and upgraded (including lining or realignment) or rationalised, with accompanying upgrades of any supporting infrastructure, such as culverts and control gates.

Information sources make specific reference to there being interaction with the groundwater system to varying degrees, particularly in the Taratahi, Te Ore Ore and Opaki races. It is probably reasonable to assume it also happens in the other race systems, especially where the races cross areas of higher permeability. This indicates that any specific races that might be considered for inclusion in the WWUP distribution system would need to be assessed for water-tightness, and depending on the outcome of such investigations, the race may require lining. This may have effects on the current groundwater regime in some locations.

The cost implications of upgrading the races for the WWUP would need to be assessed. Upgrading also introduces consent considerations under local bylaws, the RMA and the Historic Places Act.

Inclusion and development of parts of a race system as an irrigation distribution system may also necessitate closing off of some existing channels to minimise water loss. This has potential to affect some existing users of the races, and also may affect the ecology in both the enhanced races and the abandoned ones.

Increasing the flow in some channels may be welcomed by some users (particularly those farmers who benefit from the scheme) but may be viewed less favourably by landowners who benefit from and enjoy the current races from a more aesthetic aspect. It is assumed that supply to existing users would have to be maintained in order to gain community acceptance of any scheme to utilise water races for irrigation.

There is also potential for inclusion of parts of the race system in an irrigation distribution system to impact on the existing secondary purpose of many of the races as a stormwater overflow system.

These impacts and effects are discussed in more detail below.

### 3.3 Legal Restrictions on Use

The purposes for which the water races have been established and for which they are operated are defined by the relevant bylaws applying to each scheme, and the Local Government Act 2002. The Masterton and Moroa Bylaws specifically define a “water race” in terms of the meaning

prescribed in the Local Government Act 2002, which confines the use of the race “solely or principally for farming purposes”, or for any other purpose that may have been specifically prescribed for the race when the bylaw came into operation. This definition almost certainly also applies to the Taratahi, Carrington and Longwood schemes (but would need to be confirmed).

It should be noted that the legislation only authorises operation of the races by a local authority (i.e. a district or regional council), not by any other party. There is provision in the Local Government Amendment Act (No 5) 1999 however, for ratepayers to take over ownership and administration of water race schemes.

The secondary use of a water race as a distribution system for either transport to or from water storage areas, or for enhanced irrigation supply, may fall within the ambit of the “farming purposes” requirement. If so, then the use of the races for water distribution purposes would not be contrary to the existing bylaws or the requirements of the Local Government Act 2002. However, if it were to be considered to lie outside the scope of the prescribed primary purposes, then an alteration to the relevant bylaws or even repeal and replacement of these bylaws might be required.

The exact mechanism by which authority to control and operate the races, or parts of the races, might be transferred to a party other than a local authority has not been investigated during this review and would therefore need further consideration and clarification if it were contemplated.

In addition, any widening or alterations to the races would require specific approval of the relevant councils under the relevant bylaw (in addition to any consents under the RMA that might also be required). This approval would be considered by the relevant council and/or Water Race Management Committee (where there is one); however we are not aware of any defined processes for how this might proceed.

A detailed consideration of the relevant provisions of the Local Government Act and the bylaws that pre-date it was not within the scope of this review. Consideration of this, and the other issues noted, would need to be addressed further with the district councils, either separately or jointly. Indications from discussions held with a range of people as part of information-gathering for this report are that the district councils consider the management of the water races costly in terms of time and resources.

### 3.4 Resource Consent Requirements

The currently consented flows in the water races would only provide sufficient water to irrigate a few hundred hectares. If it is assumed that the races were included in the WWUP and were upgraded to carry additional flow, this might necessitate:

- Variation to existing resource consents, or new resource consents to abstract water from the existing source (if an increase were to be sought).
- New resource consent(s) to abstract from new source(s).

In addition, use (upgrading) of the existing races or construction of new ones for water distribution might involve some or all of the following activities:

- Injection (discharge) of a new water supply into the races at one or more points;
- Extraction of water (take or diversion) from the races at one or more points;
- Discharge of enhanced flows to the receiving waters;
- Works in, on or over the bed of the water race.
- Works on land.

The consent requirements for these activities are discussed below.

The only exclusion for “water” in the RMA is any water in a “pipe, tank or cistern”. This means that any take, use, damming or diversion of water within a water race is subject to Section 14 of the RMA, thus requiring specific authorisation, either by a national environmental standard, a rule in the relevant regional plan and proposed regional plan (if there is one), or a resource consent.

There is no relevant national environmental standard, nor does the current Regional Freshwater Plan for the Wellington Region specifically authorise take and diversion of water from water races (and the recently released National Policy Statement for Freshwater Management does not direct councils to make any changes in relation to such matters). The current resource consents held by the local authorities for operation of the races authorise certain identified uses of the water as a condition of the consents (refer Sections 2.5 and 2.8.1); any additional uses require authorisation via a variation of these consents. It is likely that use of the races for distribution of water from the WWUP would be considered outside the scope of the existing consents held by the local authorities, which would mean that a new resource consent for these activities would need to be sought from the regional council.

Section 15 of the Resource Management Act 1991 restricts the discharge of water into water unless it is expressly allowed by a national environmental standard or other regulations, a rule in the relevant regional plan and proposed regional plan (if there is one), or a resource consent. Again, since the only exclusion for “water” in the RMA is any water in a “pipe, tank or cistern”, this means that any discharge of water into a water race, and any discharge of water from a water race into natural water, is subject to Section 15 of the RMA.

Again, there is no relevant national environmental standard, nor does the current Regional Freshwater Plan specifically authorise discharges of water from water races (and the recently released National Policy Statement for Freshwater Management does not direct councils to make any changes in relation to such matters). Hence, resource consent for any new discharges from the races (whether at intermediate and/or end points) would also need to be sought from the regional council.

Any applications for resource consent required by sections 14 and 15 of the RMA would be assessed in terms of the requirements of:

- The current National Policy Statement for Freshwater Management
- The operative Wellington Regional Policy Statement
- The proposed Wellington Regional Policy Statement
- The Wellington Regional Freshwater Plan
- The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.
- Any specific management plans for the relevant catchments or rivers.

Although not required at this stage, assessment of any proposal against the proposed National Environmental Standard for Ecological Flows and Water Levels might also need to be taken into account, depending on the status of that piece of legislation at the time. GWRC is currently working towards a new Regional Plan, the provisions of which may differ from the current operative plan. Once this becomes a formally proposed Plan, its provisions will also need to be considered.

Section 13 of the RMA prohibits specified uses of river beds unless expressly allowed by a national environmental standard, a rule in the relevant regional plan and proposed regional plan, or a resource consent. According to definition in the RMA, “rivers” do not include water supply races, and so any requirement for resource consent under section 13 RMA for works in the bed of races should apply only to those parts of the water races that are considered to be natural water courses. This generally only applies to parts of the Taratahi Water Races (Thawley, *pers comm*).

Any applications for resource consent required by section 13 of the RMA would be assessed in terms of the requirements of:

- The current National Policy Statement for Freshwater Management
- The operative Wellington Regional Policy Statement
- The proposed Wellington Regional Policy Statement
- The Wellington Regional Freshwater Plan
- Any specific management plans for the relevant catchments or rivers.

The provisions and requirements of the current Wairarapa Combined District Plan and the Regional Soil Plan for the Wellington Region in relation to s9 RMA land use requirements would also need to be taken into account in respect of any works proposed on the races themselves or the land adjacent to them. It is noted that the Combined District Plan does not specifically recognise or address the Wairarapa water races.

### 3.5 Heritage Issues

Any site associated with human activity prior to 1900 is an archaeological site in terms of the Historic Places Act 1993; this is relevant to those parts of the Moroa and Carrington/Taratahi races that were constructed prior to 1900.

It is an offence under s 99 of the Act to destroy, damage or modify an archaeological site without authorisation from the NZ Historic Places Trust. This means that any works (such as lining or widening) that were to destroy, damage or modify the pre-1900 parts of the Moroa/Carrington/Taratahi races would need prior approval from the Trust.

At this stage, there is some confusion in the literature as to whether the Taratahi or Carrington races are the older. More investigation of records that may be held by CDC would be required to clarify this matter, and also to define the exact parts of the Taratahi/Carrington races that pre-date 1900.

Similarly, it is not clear if all or only part of the Moroa Race system was constructed prior to 1900. Further investigation of this also would be needed to confirm which parts, if any, would be subject to the Historic Places Act requirements.

### 3.6 Effects on Water Race Ecology

It is noted that even though the races are man-made, they have been part of the existing environment for more than a century in some cases, and have been colonised to varying extents by the biota (aquatic plants and animals, including birds) of the area. In this sense they have the potential to contribute to the natural values and biodiversity of the existing environment.

Modification or closure of some parts of the race network, coupled with increased flows in channels selected as part of an irrigation water transfer or distribution network is likely to have some flow-on effects, both positive and negative, on the existing race ecology. The extent to which any ecological values existing in the races might be affected by modification of the race system and the importance of this would need to be assessed as part of future feasibility investigations (relating in particular to s 13, 14 & 15 RMA consent requirements).

### 3.7 Effects on Existing Users

Incorporation of parts of a water race system in the WWUP has potential to generate both positive and negative effects on existing water race users.

If some parts of the races were to be modified or closed, the effects on those landowners who legitimately use the races for stock water or other purposes would need to be assessed and

remedied. In respect of direct access by stock to the races, it is noted that the SWDC Code of Practice actively discourages stock wading in the races, and suggests various methods for preventing this, including fencing of the races and pumping of stockwater to troughs. In addition, the Dairying and Clean Streams Accord (between Fonterra, local government and national government agencies) also supports the exclusion of dairy cattle from "streams"<sup>13</sup>. Hence, for landowners who rely on water races for their only stock water the impact of modification of the existing races would be determined largely by the availability of alternative water supplies. This issue would need to be managed to gain acceptance by farming landowners to alteration of the race network. This acceptance may be more likely if they were able to benefit in other ways from water supply from the WWUP.

From the information provided to us during this review, it appears that some landowners who currently pay water race rates (in CDC or SWDC) but do not use the races might also be comfortable with closure of race branches affecting their properties, as they regard the current rates charges as an unnecessary expense. Some dairy farmers who have no need for the races may see their removal as a benefit, as it would enable them to increase the area of land in production and improve accessibility across the land, allowing more flexibility in their land management. For some landowners the water races form an important and integral part of the environment from an aesthetic view. These values also have an economic dimension to them, as the presence of water races adjacent to lifestyle blocks tends to be reflected in the relative capital values of such properties. Hence modification and/or closure of races adjoining such properties may have the potential to generate opposition.

The reactions of local landowners to changes in the water race systems will depend on:

- the continued availability of water if they require it
- the exact nature of the changes
- the types of properties that are affected
- the actual dependency on the race system
- environmental effects (both perceived and real)
- any personal costs associated with the changes.

As mentioned in Section 1, MDC closed the Upper Plains water race system in the early 1990's; the process that was followed and how it was managed provides a precedent that might be of interest to the WWUP.

### 3.8 Effects on Hydrological System

The existing race systems are known to act in some places as receiving areas for stormwater runoff, and as drainage channels. Any modification of parts of the race network would need to take this into account, to ensure the potential for flooding of surrounding land was not increased.

Special consideration would have to be given to the races in the Greytown area if they were involved, as eight of these races (in the Moroa network) receive stormwater flows from the Greytown stormwater system.

Several reports note that at least some of the race systems, or parts of them, are considered to contribute to groundwater recharge. However, some authors indicated that the significance of this might be overstated. However, there are no comprehensive data available to quantify the amount of water that is lost to groundwater throughout each of the race systems. If parts of the races were to be lined to prevent losses to groundwater (as part of inclusion in the WWUP) then

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<sup>13</sup> The definition of "streams" in the Accord, viz. "deeper than ankle depth, wider than a stride & permanently flowing", may encompass many of the water races also.

there is potential for effects on the groundwater hydrology of the areas surrounding these races. This could have flow-on effects for any downstream users of the groundwater resource.

These issues might need to be considered further as part of the feasibility investigations.

### 3.9 Cultural Considerations

Maori regard water as a taonga or treasure left by ancestors for the life-sustaining use of their descendants. They also consider water to possess a life force, or mauri, and to have a spirit, or wairua, in relation to the quality and use of that water<sup>14</sup>. Use of the water races for water transfer or distribution would need to be considered from the perspective of tangata whenua in relation to these values; for example, the extent to which artificial mixing of waters may be an issue would need to be explored especially if water from different catchments was involved.

This would need to be taken into account if existing race networks were to be used for the transfer or distribution of water as part of the WWUP. It should be noted that some of the existing races already shift water between different sub-catchments, and any changes associated with the WWUP would need to be considered within this context.

Such matters would need to be considered in the design of any conveyance systems, and explored through consultation with tangata whenua.

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<sup>14</sup> Bevin, G. (1998): Wairarapa Water Races: Issues and Consent Requirements.

## 4 Potential Benefits

An advantage of the existing water race systems is that they provide a ready-made system that is already in place within a considerable part of the Wairarapa Valley and across private land. They form an integral and accepted part of the existing landscape. In these respects, adaptation of their use for water transfer or distribution as part of the WWUP might offer some benefits to the WWUP, depending on the relative location of potential storage sites and WWUP service areas to the races.

Use of the race network for WWUP water supply purposes could improve the efficiency of use of the water races, which is considered by GWRC to be relatively low. In this respect, inclusion of part or parts of the race network in the WWUP would be in accordance with the requirements of Section 7 of the RMA, to ... "have particular regard to ... the efficient use and development of natural and physical resources".

There are possibly also wider environmental benefits which are aligned with the objectives of the WWUP vision of achieving more sustainable and more efficient use of the Wairarapa water resources.

## 5 Conclusions

The six Wairarapa water race schemes cover approximately 23,500 hectares (using approximately 600km of water races) of the Wairarapa Valley and are a long established and integral part of the environment. They offer a potential benefit to the WWUP by providing an existing water distribution network with a wide spatial extent. However, their potential use in the WWUP is dependent, among other things, on their location relative to potential WWUP water storage sites and service areas.

The water races provide essential water for stock and other domestic uses in some areas, particularly those that would otherwise be affected by summer drought, and they add value to many lifestyle properties as both a practical and aesthetic water resource. Some races also function at times as a stormwater drainage system, helping to drain overland stormwater flows, and at other times they act as a source of water to boost the flows in natural streams.

For some properties, particularly farms with access to alternative water supplies and also lifestyle properties that are required to pay water race rates but do not have access to them, the races are regarded as a nuisance serving no useful purpose.

Much of the available information on the water races has been generated by, or on behalf of, the regional and district councils in relation to consents associated with the RMA (or its predecessors). Because of this, the primary focus of much of the information derived during this review is on the effects of the races on the flows and associated values of their source rivers and downstream receiving waters, rather than on the races in their own right.

As noted in Section 3.1, the key determinant of whether the existing water races could be considered as a potential means of water conveyance from rivers to potential storage sites, or from storage sites to areas of demand for the water for the WWUP, is the location of the races relative to water storage sites and areas of demand. If this first test were passed, then there are a number of other important issues to consider.

- In the first instance, there is little specific information on the overall condition and capacity of the races to carry the flows that might be required by the WWUP. Local knowledge and anecdotal evidence suggests that the width, depth and general condition of the races vary widely, both along individual races and across the many race branches. There is also an indication that many races leak water to groundwater (one source estimates this loss for Taratahi and Carrington as up to 50%). These issues indicate that any races considered for inclusion in the WWUP may need upgrading in order to be suitable for use.
- There are also issues around ownership and control of the races that need further exploration. Local authorities are empowered to operate the races and have access to them through the provisions of the Local Government Act 2002, and local water race bylaws. However indications at this stage are that they do not own the land or (generally) hold easements across the land through which the races pass (although at least one exception to this is known). Thought would need to be given to the possible ownership structure of any parts of the race that might be used as part of a WWUP scheme, and how this might be authorised, taking into account current legislation and local bylaws (both existing and proposed).

Other matters that would need to be considered (once storage areas are confirmed) include:

- Effects on landowners. These will depend on the number and types of properties affected by any race of interest to the WWUP, whether the landowners use water from the races

or have an interest in using the race water for irrigation, or whether the races contribute to their enjoyment of the land. These issues can only be properly scoped once specific races or sections of races have been identified as being of potential interest.

- The requirements of the Historic Places Act in relation to disturbance of historic structures and archaeological sites would need to be addressed in relation to the use of any water races that were in existence prior to 1900. This applies to the Carterton District races and the Moroa race in South Wairarapa District, but more investigation of these races is required to confirm which part or parts of them might be affected.
- Consent considerations. The operation and management of the races is effected through the use of local bylaws and the powers of local government legislation (by the district councils), and by resource consents granted to the district councils by GWRC. These provisions are granted for specific uses of the races and the water resource within the race. Use of the races for other purposes may require amendment to these provisions and possibly new bylaws and resource consents.
- Cultural issues. These have not been specifically assessed during the current review. Consultation with tangata whenua would be needed to identify any cultural issues, including, for example, matters relating to any transfers of water between different catchments.
- Effects generated by any proposed changes to the race network on the existing aquatic ecology of the races, and the existing surface and groundwater hydrological system. These would need to be investigated and evaluated as part of ongoing feasibility investigations.

Finally, if modification or closure of any parts of the existing races were to be required in conjunction with the WWUP, then consultation with affected landowners would form a critical part of the success or otherwise in achieving this. Maintenance or replacement of their existing water supply would likely be necessary to achieve community acceptance of any upgrade proposal (unless suitable alternative water supplies were already available). The experience of the Masterton District Council in effecting the closure of the Upper Plains race north of Masterton in the 1990's provides some precedent in this regard.

## 6 Further Work

At this stage, the available information suggests that the consideration of utilising the Wairarapa water race systems as a potential distribution system to or from potential water storage sites should continue, particularly given the spatial extent of the race network. This view is supported by the feedback received to date from the personnel spoken to as part of this review. However, the first step is to determine potential linkages to the potential water storage sites.

Even if the geographic linkages are sufficient to engender further consideration, a major constraint exists due to the lack of information on the capacity of the races in relation to the assumed water releases from storage sites. This matter is of critical importance to the study and would need to be addressed early to determine whether investigation of other aspects is warranted.

It has already been noted that other areas of future work could address:

- The extent to which current legislation and local bylaws would permit the use of the water races as an irrigation transfer or distribution network, and whether mechanisms exist to enable transfer of control of the races, or parts of the races to a third, private, party;
- The ages of the water races in relation to Historic Places Act requirements;
- The views of tangata whenua.

Finally, it may also be of future benefit to the project to seek some additions to the proposed Regional Plan that might clarify where and how the plan applies to the Wairarapa water race systems. For example, inclusion of a map or maps defining where the races are “artificial channels” and where they are “natural watercourses” would be useful. Further work could address the potential for this and possibly other improvements and clarifications in the proposed Regional Plan.

## 7 Information Sources

### 7.1 Reports and Documents

Beca Carter Hollings & Ferner Ltd (Beca) (2008): Wairarapa Regional Irrigation Scheme – Prefeasibility Report. Prepared for Meridian Energy Ltd (Client) and the Wairarapa Regional Irrigation Trust.

Carterton District Council:

- Long Term Council Community Plan, Finance & Strategy Volume; 2005 -2006.
- Annual Reports - extracts relating to Rural Water Services – 2006, 2007, 2008, 2009, 2010.
- Taratahi Water Race Scheme. Resource Consent Application and Assessment of Environmental Effects, November 2011 (Version 2). Prepared on behalf of CDC by Boffa Miskell Ltd, with hydrological input & assistance from Eastern Consulting Ltd.
- Resource Consent Application for the Taratahi Water Race Scheme (information summary sheet).
- Carrington Water Race Scheme. Resource Consent Application and assessment of Environmental Effects, November 2011 (version 2). Prepared on behalf of CDC by Boffa Miskell Ltd, with hydrological input & assistance from Eastern Consulting Ltd.
- Resource Consent Application for the Carrington Water Race Scheme (information summary sheet).
- Wairarapa South County Water Race Bylaw 1987.
- Good Earth Matters Consulting Ltd (2000): Carterton District Water races – Uses, Efficiency and Value within the Community (A summary paper prepared for Carterton District Council).

Department of Internal Affairs (1999): Taking Over Land Drainage and Water Race Schemes – A Guide for Ratepayers. October 1999.

Greater Wellington Regional Council:

Internal Correspondence

- Email from Geoff Ewington to Bruce Geden, 28/7/09, re GIS mapping of water races.
- Email from Bruce Geden to Geoff Ewington et al, 14/7/09, re Irrigation & stock water races discussion.
- Email from Alton Perrie to Bruce Geden, 30/7/09, re stock water races ecology.
- Stock Water Races Discussion Record – GWRC/Grow Wellington/WRIT/CDC 23 July 2007.

Resource Consent records

- Carrington Water Race
- Longwood Water Race
- Moroa Water Race
- Opaki Water Race
- Taratahi Water Race

Reports

- Bevin, G. 1998: Wairarapa Water Races – Issues and Consent Requirements. Wellington Regional Council.

- Ewington, G & Thawley, S. (2009): Taratahi Plains – Water Races and Natural Watercourses: Classification of the Taratahi Water Race and Natural Water Courses. GWRC internal report WAR/01/0227/1.
- Gyopari, M.C. & McAlister, D (2010): Wairarapa Valley groundwater resource investigation –Upper Valley catchment hydrogeology and modelling.
- Gyopari, M.C. & McAlister, D (2010): Wairarapa Valley groundwater resource investigation – Middle Valley catchment hydrogeology and modelling.
- Gyopari, M.C. & McAlister, D (2010): Wairarapa Valley groundwater resource investigation – Lower Valley catchment hydrogeology and modelling.
- Ohau Plants Ltd (2011): Cultural Values for Wairarapa Waterways Report (draft). (Produced for GWRC).
- Stansfield, B. (1996): An Ecological Assessment of the Taratahi Water Race (to determine if any ecological impacts were caused by a truck wash discharge to the race at Ravensdowne Fertilizer Works, Masterton).
- Thawley, Stephen (2000): Report to Rural Services & Wairarapa Committee. GWRC internal report 00.513, 4 July 2000.
- Thawley, S. (2003) Assessment of resource consent applications for the continued operation of the Te Ore Ore and Opaki Water Races. Attachment 3 to GWRC internal report 03.670.
- Thawley, S. (2005): Assessment of resource consent applications for the continued operation of the Moroa and Longwood water races. Attachment to GWRC Report 05.93.

Local Government Act 2002.

Local Government (Rating) Act 2002.

Masterton District Council:

- Extracts from Annual Reports (Cost of Services Summary) 2006/07 to 2010/11.
- Consolidated Bylaw 2008 Part Ten – Water Races.

South Wairarapa District Council:

- Annual Report 2010/2011 – Water Supply & Water Supply Operating Statement.
- Code of Practice – Moroa and Longwood Water Races.
- Consent No. WAR 010200 (Operation of the Moroa Water Race) – granted 13/4/2005.
- Consent No. WAR 010201 (Operation of the [Longwood] Water Race).
- Featherston-Longwood Water Race Bylaw (1936) Featherston County Council.
- Greytown Stormwater Management Plan (1997). Produced by Evans Consulting Engineers in conjunction with Montgomery Watson, for SWDC, June 1997.
- Moroa Water Race Annual Report. July 2009 –June 2010.
- Moroa Water Race Bylaw 2007.

Tonkin & Taylor Ltd:

- Email from Sally Marx to Bruce Geden, 23/3/12, re Stock water races (*regarding water race management*)

### Newspaper Articles

- Wairarapa Times-Age: article dated 26/8/05, "Water, water everywhere and Carterton knows where it is".
- Ashburton Guardian: article dated 7/10/11, "Stock water plan to save our river".

### WWUP:

- Copps, G (Grow Wellington): Assessment of potential demand by off-farm users. WWUP report dated 31 Jan 2012.

## 7.2 Personal Communications

The following people have been consulted in the course of this review:

- Colin Wright (CEO, Carterton District Council)
- Kereana Sims (Carterton District Council)
- James Li (Utilities Manager, Masterton District Council)
- Bill Sloan (Utilities Manager, South Wairarapa District Council)
- Simon Leary (Utilities Engineer, South Wairarapa District Council)
- Bob Tosswill (landowner at head of Moroa water race)
- Colin Munn (GWRC)

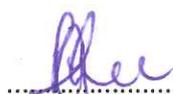
## 8 Applicability

This report has been prepared for the benefit of Greater Wellington Regional Council with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:

  
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Authorised for Tonkin & Taylor Ltd by:

  
.....

David Bouma

Project Director

Reviewed by Sally Marx (Project Manager)

PL

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Appendix A: Table **1** – Water Races Summary Information



Appendix B: Plans



## Appendix C: Existing Resource Consents

- WAR 010204 – Opaki Water Race
- WAR 010203 – Te Ore Ore Water Race
- WAR 010200 – Moroa Water Race
- WAR 010201 – Longwood Water Race



Appendix D: Resource Consent Application Summary  
Sheets

- Taratahi Water Race Scheme
- Carrington Water Race Scheme



## Appendix E: Existing Bylaws

- Masterton District Council – Consolidated Bylaw 2008: Part Ten Water Races
- Wairarapa South County Water Race Bylaw 1987
- Moroa Water Race Bylaw 2007
- Featherston –Longwood Water Race Bylaw 1936



## Appendix F: Water Race Management Tools

- Masterton District Council – Water Race Management Plan – Te Ore Ore Water Race
- South Wairarapa District Council – Code of Practice – Moroa & Longwood Water Races

