Assessment of the Proposed Water-Use Guidelines for Public Water Supplies

horizons regional council

November 2006

AQUAS Consultants Ltd

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Prepared for

Horizons Regional Council

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ASSESSMENT OF HORIZONS REGIONAL COUNCIL'S PROPOSED WATER-USE GUIDELINES FOR PUBLIC WATER SUPPLIES

EXECUTIVE SUMMARY

Horizons Regional Council (HRC) has identified 'increasing water demand' as one of four priority – or keystone – issues for the region. The total volume of permitted water takes has increased dramatically in recent years placing both surface water and groundwater resources under pressure.

The Council is taking a number of steps to address this, including development of water-use guidelines for public water systems – as a way to drive more efficient use. HRC asked AQUAS Consultants to assess the draft guidelines, taking into account:

- strategies and approaches in *other* regions in the country, and
- current water consumption levels and practices *within* the region.

A further purpose of the work was to identify opportunities for improved water-use efficiency in public water supply schemes in the region and promote best practices to District Councils.

Horizons Regional Council asked the consultant to examine the approach to water-use guidelines in several specific regions and others were considered as well. HRC also identified five public water supplies to serve as representative systems for the region – Bulls, Hunterville, Eketahuna, Levin and Feilding. These were used for information gathering and analysis.

Compared to other regions …

Compared to other regions, the guidelines proposed by HRC are in the middle of the range for domestic water use – more demanding than one guideline available for comparison, but less stringent than two others. They are also quite consistent with Ministry of Health guidelines for household requirements. The guidelines for non-domestic water use vary from region to region, but they all have similarities.

Overall, the HRC guidelines can be considered *suitable* or *fitting* for their intended use. A critique of the different components of the guidelines identified some possible refinements and these have been noted.

Considering water use in public systems in other regions, consumption in the systems examined for this report fall in the middle of the ranking – considerably higher than in rural systems in Rodney District, but generally lower than comparable systems in the Waikato. (By comparison, several of the systems in the region documented in an earlier report by Aqualinc demonstrated higher-end levels of water use.) Water use in the region could, thus, be considered in the middle to higher range overall, so efficiencies are certainly possible.

Relative to current use …

Current water use and practices in the representative systems was documented with support from four District Councils.

With the data available, certain assumptions and estimates were necessary in order to compare current use with the proposed water-use guidelines for public water supplies. For all four systems assessed, the average daily demand was below the reasonable use guideline – ranging from 72% to 94% of it. For 'high season' water consumption relative to the restricted use guideline, three of four systems assessed were above the desired level – ranging from 126% to 131% of the guideline. This suggests there are some fairly significant gaps to be closed under these conditions.

All things considered, the HRC water-use guidelines can be considered *realistic*. The reasonable use guideline (for normal river flow conditions) is generally achievable. The restricted use guideline (for low-flow conditions) is more difficult to achieve and will be a *real* stretch for some systems. Refinements of the guidelines and checking them against actual water use in a couple of systems may indicate a narrower gap between current use and guidelines making them easier to achieve yet still a good target.

Achieving desired results …

The guidelines have value as practical and real targets in water-use reduction efforts by District Councils for their public water supplies. To this end, they will contribute to sustainable management of water resources in the region.

Providing a definitive answer as to whether they will successfully protect the ecology/health of the river systems in the region is beyond the scope of this report. This requires compiling the guidelines/ allocations of all consent holders and assessing total takes against flow requirements as set out in the various One Plan policies relating to water allocation.

However, given a significant portion of the water consumption in public supplies is for essential use (i.e. domestic needs and commercial/industrial use integral to the economic health of the area), it can be argued that the guidelines set a framework for what's possible and appropriate for reductions in this component of water use. Any further reductions to ensure environmental protection will have to come from efficiencies achieved by other consent holders and in takes for non-essential use.

Promoting best practices …

This project has allowed an assessment of practical options and opportunities for improvement in the water systems studied. Participating District Councils will receive a short report summarising the information gathered and analysed along with specific suggestions for their own consideration.

An important intent of these reports is to show there are practical, cost-effective ways to reduce water use and that demand reduction efforts should be integral to water supply operations.

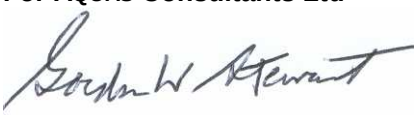
Recommendations …

To move forward with District Councils in this important effort, it is recommended that Horizons Regional Council:

- further refine the guidelines for simplicity, clarity and equity (based on the suggestions provided)
- develop best practice standards for industrial and agricultural water use covered in components (iii), (iv), (C) and (D) of the guidelines (to operationalise them and provide Councils with specific direction for their calculations)
- promote cooperative efforts amongst the Councils for such things as industrial water audits/advisory service and a region-wide summer water-use educational campaign
- consider giving financial support to the efforts mentioned in the previous point (if budgets permit) and taking an active role in the educational campaign.

These steps will help ease implementation of the water-use guidelines for public water supplies – by ensuring they are practical, easy-to-use and fair *and* by creating a positive and encouraging environment in which demand-reduction efforts can occur.

For AQUAS Consultants Ltd



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10 November 2006

Analysis & Report by AQUAS Consultants Ltd, Tauranga

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1 Background

Horizons Regional Council's One Plan is a statement of environmental policy for the entire Manawatu-Wanganui Region. It combines requirements under the RMA for a Regional Policy Statement *and* Regional Plan. It sets out a policy framework for managing resource use activities in an integrated manner across the region.

The One Plan identifies four priority – or 'keystone' – issues for the region:

- surface water quality degradation
- increasing water demand
- unsustainable hill country land use, and
- threatened native habitats.

This report addresses the issue of increasing water demand, with a particular focus on public water supplies.

1.1 Rationale for Efficient Water Use

Chapter 6 of the One Plan deals with water issues. It notes that the region contains three major river systems, five medium-sized systems, and a large number of small coastal systems (as well as a number of small lakes mainly along the west coast). The region also has an extensive groundwater resource, both shallow and deep systems. Some 12,000 bores now draw on the region's groundwater.

Surface water and groundwater are abstracted for a variety of uses, including community water supplies, irrigation, electricity generation, and for industry. While the amount of water used for power generation has not changed significantly in the last decade, other uses have steadily increased.

The total volume of permitted water takes has increased dramatically between1997 and 2004 – up 45% for groundwater and 108% for surface water. Increase in surface water takes by sector during the period are as follows:

- water supply – up 34%
- industry – up 44%
- agriculture – up 313%.

The increase in agricultural use is mainly irrigation for dairy farms. Agricultural use moved from 32% of the permitted water takes (by volume) in 1997 to 51% in 2004. In spite of this increase, surface water use for community supplies is still a significant factor – 39% of the total permitted takes in 2004.

As the One Plan notes, this increase in demand has placed both surface water and groundwater resources under pressure. This demand has potential impact on in-stream life, recreational activities (fishing and swimming), cultural/spiritual values, and the ability of waterways to assimilate waste.

While the overall increase in demand is a concern, timing of the abstraction is particularly important. Rivers experience natural low flows during summer, which coincides with greatest demand – for key local industries and for outdoor residential use in many urban areas.

There is a strong case for increasing water-use efficiency in public water supplies: It will contribute to environmental health of the water resource, protect it for other desirable uses, respect inherent cultural values, and possibly allow greater allocation for other activities that can contribute to the economy of the area.

1.2 Proposed Guidelines

Council provided the consultant with the current draft guidelines to use for calculations and comparisons. (See Appendix A.2 for the salient information drawn from Chapter 6 of the One Plan.)

The guidelines come in two parts for surface water allocation:

- reasonable and justifiable use under normal flow conditions
- restricted use when rivers are below their minimum flow.

For public water supplies, the following is proposed as reasonable/justifiable use under normal flow conditions:

(i) An allocation of 300 litres per person per day for domestic needs, plus
(ii) An allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
(iii) An allocation for industrial use calculated where possible in accordance with best management practices for water efficiency, plus
(iv) Any allocation necessary to cater for the reasonable needs of livestock or agricultural practices that are within the boundary of the public water supply system, plus
(v) An allocation necessary to cater for growth, where growth of the municipality is reasonably forecast, plus
(vi) An allocation for leakage equal to 15% of the total of subsections (i) to (v) above.

In applying the guidelines, the One Plan notes that where the existing allocation for a public water supply exceeds the allocation calculated in accordance with subsections (i) to (v) above, the Regional Council will establish, in consultation with the territorial authority, a timeframe by which the existing allocation shall be reduced to the calculated amount.

Where rivers used for public water supply are below their minimum flows (as listed in Policies 6-17 and 6-18), public water supply takes shall be restricted to a total public water consumption calculated as follows:

(A) An allocation of 250 litres per person per day for domestic needs, plus
(B) An allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
(C) An allocation which meets the reasonable needs of hospitals, other facilities providing medical treatment, schools, other educational facilities, and abattoirs, plus
(D) Any allocation necessary to cater for the reasonable needs of livestock that are within the boundary of the public water supply system, plus
(E) An allowance for leakage equal to that in (vi) for normal-flow conditions noted above.

The two guidelines differ in a number of ways. The allocation for domestic use is 50 l/p/d lower under restricted flow conditions than under normal flow. The reasonable use guidelines include a category (iii) for 'wet' industries generally; whereas, in the restricted use guidelines only abattoirs are mentioned in (C). Medical and educational facilities are noted specifically in (C) in the restricted use guidelines. Part (iv) in reasonable use guidelines allocates water for livestock or agricultural practices, while in the restricted use guidelines only livestock is mentioned in (D).

The allocation for commercial use is the same *percentage* in both guidelines, but the *actual* amount is less at low flow as it is calculated from a lower (domestic) base figure. However, this is less stringent than it appears as some of the customers in (ii) in the guideline for normal flow conditions shift from (B) to (C) in the restricted use guideline.

The Council is proposing that these guidelines be taken into account when considering consent applications.

Consumption levels proposed in the guidelines vis-à-vis actual use in the representative water supply systems is considered in Part 4 of the report.

1.3 Purpose of the Work

The major purpose of this work was to assess Horizons Regional Council's proposed water-use guidelines for public water supplies, informed by:

- strategies and approaches in *other* regions in the country, and
- current water consumption levels and practices *within* the region.

This information and data provides a basis to comment on whether the guidelines regime above and below minimum annual low flow will achieve the desired result (i.e. contribute to sustainable management of the resource). It will also allow the guidelines to be refined (if needed) prior to further discussion about them with District Councils.

Another important purpose of the work was to identify opportunities for improved water-use efficiency in public water supply schemes in the region and promote best practices to District Councils. Following collection of data on representative public water supply systems, the Councils involved were to be provided with short reports noting options and opportunities for improvement.

See Appendix A.1 for a detailed outline of the work.

1.4 Format of the Report

The report is organised to be as concise as possible – with summaries, discussion and recommendations in the body of the report, and full data and details in the appendices.

Part 2 following outlines the range of approaches taken in the other regions considered. Table 1 in Section 2.4 provides a summary of the findings for easy reference. Details on three regions that are quite active in addressing water efficiency in community supplies are included in Appendix B.

Part 3 provides a snapshot of current water use in community supplies around the region. The Regional Council identified five representative systems to examine – ranging from rural and small to urban systems of reasonable size – thus, providing a good overview of the situation in the region. Information and data summaries for the five systems appear in Sections 3.3, with details for each covered in their respective Water Supply Services Worksheet in Appendix C.

Part 4 comments on both the proposed water-use guidelines and current use in the representative public water supplies and compares the two. It then outlines some options and opportunities to close the gap between the two and concludes with some recommendations.

2 The Approach in Other Regions

Decisions by Regional Councils regarding water takes are increasingly focused on promoting efficient use. This means when water is allocated it is for a justifiable purpose *and* that the quantity taken is a reasonable allocation for the proposed use.

A good portion of water drawn for public water supplies is *essential* use – for household purposes and for commercial use integral to the economy of the community. It is important to develop guidelines that reflect this situation.

Regional Councils throughout the country are taking a variety of approaches to water-use efficiency for public supplies. This part of the report summarises these approaches – as a guide for Horizons Regional Council in refining its own water-use guidelines.

Information has been gathered on the following regions for the purposes of comparison:

- Greater Auckland
- Waikato
- Bay of Plenty
- Hawke's Bay
- Taranaki
- Greater Wellington
- Canterbury

Section 2.1 provides an overview of the different approaches and notes where the Regional Councils currently stand. Section 2.2 covers those that are addressing water use through plans and practices, while Section 2.3 looks at those with specific consumption guidelines or targets.

2.1 Overview by Region

The Greater Auckland region is committed to meeting the goals and objectives for sustainable water management as set out in the Auckland Water Management Plan. This Plan established a target of five percent reduction in per capita consumption across the region by 2024. All City and District Councils that are part of the Watercare Services network must prepare water demand management plans stating their target reductions and how they intend achieving them.

Environment Waikato is calling for District Councils to provide a water demand management plan as part of any resource consent application. (See 2.2 and Appendix B.1.)

Environment Bay of Plenty is developing a water sustainability strategy. The current focus is on water use in areas where it is fully allocated *and* looking at methods other than first-in first-served for allocating water. Council has indicated that water-use efficiency in community supplies is an important element which will be addressed when work on these broader policy issues is further along.

Hawke's Bay Regional Council is not examining water-use efficiencies at this time. Taranaki Regional Council is similarly not addressing the issue at a regional level, but there are some water conservation efforts underway at the local level. South Taranaki District Council, for example, is currently mounting a campaign to promote efficient water use.

In Greater Wellington, the Regional Freshwater Plan notes that demand management progammes and drought management plans will be considered as a part of the resource consent application process. A water management plan is currently being prepared for the four City Councils (using the Auckland Water Management Plan as a guide). Otherwise, approaches around the region vary and are covered in 2.2 and 2.3 below and Appendix B.2.

Canterbury is the one region that intends instituting per capita consumption guidelines. This is covered in Section 2.3 and Appendix B.3.

2.2 Plans & Practices

Environment Waikato is taking active steps to change processes for water allocation. Their *Working Discussion Document: Water Allocation Variations* notes that any resource consent application for the take and use of water for municipal supply shall provide:

- a water demand management plan
- a drought management plan
- a network efficiency and wastewater conservation plan, and
- an analysis of the wastewater disposal requirements associated with the water take.

Four District Councils in the region have recently prepared comprehensive water demand management plans and at least one has used it in the process of renewing their resource consent for water supply. Environment Waikato has indicated that over time they will be looking for implementation of these plans – i.e., there is an expectation not only of intent but action. See Appendix B.1 for details.

In the Greater Wellington region, several of the District Councils have water conservation measures referenced in their resource consents. Masterton, South Wairarapa and Carterton are all committed to action (see Appendix B.2 for details).

2.3 Guidelines & Targets

For the Kapiti Coast District Council, there are no specific conditions on the consent relating to water-use efficiency or conservation, but they do have to operate in accordance with a manual submitted to the Regional Council. The manual outlines water conservation measures and per capita consumption levels they are striving to reach.

Kapiti Coast aims to reduce *peak* residential water consumption to 400 l/p/d, consisting of 250 litres for essential use and 150 for non-essential uses. This applies to use by residential customers *only* (with commercial use tracked separately via metering and targets).

The Canterbury region has two sets of guidelines: one applying to the Waitaki catchment, the other proposed for the remainder of the region.

In the Waitaki catchment under normal flow conditions, the guideline is 300 l/p/d based on the population to be served for domestic use plus a reasonable quantity for other uses. When rivers or lakes are at or below minimum flows or levels the amount is not to exceed 250 l/p/d based on the population being supplied at the time, plus the minimum necessary for fire fighting and processing/storage of perishable produce. An allowance may also be made for reasonable leaks and losses from the system.

For the rest of the Canterbury region, efficiency of water use is covered in proposed variations to their Natural Resource Regional Plan. During times of low water availability, takes for community supplies shall be allowed up to 250 l/p/d based on current census population, plus an estimate of actual stock water drinking requirements, plus the minimum necessary to maintain fire-fighting capability. In addition, an allowance may be made for reasonable losses from reticulated supply systems, although this should decrease over time.

If the City or District Council has a water supply asset management strategy that restricts (in an alternative manner) the use of water supplied by the scheme during periods of low water availability, it can use this as the operative guide. This strategy must ensure that all practicable methods of water use conservation will be applied at the time of restrictions. Reporting on the implementation of this water supply asset management strategy during periods of low water availability will be required. This alternative may be secured as a condition of consent.

The per capita figures noted for Canterbury include water used for commercial purposes within the system, but not other uses as specifically stated (e.g., stock watering, fire fighting, protection of perishable produce).

Greater Auckland is the other region with targets as noted in Section 2.1. While there are no specific l/p/d goals – consumption varies widely amongst Councils – there is a five percent per capita target reduction (by 2024) across the region as a whole.

2.4 Summary of Regional Approaches

For easy reference, the approaches to water-use efficiency for public supplies in the regions examined are summarised in Table 1.

Table 1
Water-Use Efficiency in Public Supplies by Region

Status	Jurisdiction
Guidelines & Targets	Kapiti Coast DC – voluntary target peak consumption 400 l/p/d for *residential* use (250 essential + 150 in addition) Canterbury (Waitaki) – 300 l/p/d normal, 250 during low flow Canterbury (remainder) – 250 l/p/d (based on census population) during times of low water availability (includes commercial use but not other uses specifically stated in the policy) Greater Auckland – 5% per capita reduction region wide by 2024
Plans & Practices	Waikato – requires a water demand management plan *and* demonstration of implementation/action over time Masterton DC – proposed water-efficiency measures South Wairarapa – various conservation measures Carterton DC – various measures and regular reporting to Regional Council
Developing	Greater Wellington – water demand management plan being prepared for the four City Councils Bay of Plenty – intends addressing efficiency issues in water sustainability strategy currently under development
No Involvement	Taranaki – no action regionally, though some efforts at the local level (e.g. South Taranaki DC) Hawke's Bay – no attention to the issue to date

Discussion on these various approaches is included in Part 4 of the report.

3 Current Situation in the Region

The Regional Council identified five public water supply systems to be examined – Bulls, Hunterville, Eketahuna, Levin and Feilding. These range from small/rural systems to moderate size urban schemes and were deemed to provide a representative picture of water use in community schemes for the region. (Relevant information for Palmerston North is contained in a water demand management plan commissioned separately by the City Council and also prepared by AQUAS Consultants.)

3.1 Information/Data Gathering

The following steps were taken to gather and summarise information on the five water supply systems:

- Consultant provided with details for a contact individual at each Council.
- Phone call by the consultant to Council to: make contact, outline the purpose and nature of the work, and seek their support.
- Follow-up e-mail by consultant to confirm the work and ascertain the Council staff member to assist.
- Provide Councils with a Water Supply Services Worksheet as a first step in capturing and organising helpful information.
- Receive completed Worksheets from Councils, review them, and respond by e-mail for clarifications.
- Prepare a Data Summary sheet for each system based on the information in the Worksheet.
- Spend time in the region to visit the area served by each water system and meet with each Council staff contact to gather information more easily obtained via discussion.
- Revise and add to the Worksheet and Data Summary and prepare an Additional Information list for each system, then return this to Councils for their final review and approval.
- Make the necessary changes to the data and information based on each Councils review and feedback.

The Worksheets were provided to Councils on 12 July, with completed copies returned to the consultant between 2 August and 18 August. The consultant toured the areas covered by the water supply systems and met with Council staff during the week of 21 August. Revised data/information was sent to each Council for review by 30 August and all five were approved and finalised by 6 September.

The final Data Summary and Additional Information for the various systems appear in Sections 3.3.1 to 3.3.5. The final Worksheets appear in Appendix C.

3.2 Feedback on the Draft Guidelines from District Councils

The consultant had positive support from the District Council staff in providing data and meeting to discuss matters. They were helpful and efficient in reviewing information and offering feedback, especially given their many responsibilities and busy schedules.

The professionals representing the Councils in the work were as follows:

- Engineering Services Manager for Rangitikei DC (for Bulls and Hunterville)
- Utilities Manager and the Service Engineer for Tararua DC (Eketahuna)
- Utilities Manager for Horowhenua DC (Levin), and the
- Water Manager for Manawatu DC (Feilding).

In an informal lead-in to discussions with each Council, the representatives were asked their general impression of the draft water efficiency guidelines. Salient comments are as follows:

> *No problem with the need for guidelines at low flow, but concerns above that. There needs to be flexibility.*

It's important not to make it too complicated.

So far, we have been providing a water conservation plan for each system when applying for resource consents.

During low flow … it's difficult to minimise commercial use. Hosing bans aren't a problem, but it can be economically and politically difficult to be stringent with commercial demand.

Hard to pinpoint things when industries are so different from place to place.

It will be important to implement guidelines in a fair manner.

It is understood that, generally, the asset managers of the District Councils are in discussion with the Regional Council on the water-use guidelines for public water supplies. In the future, it would be helpful to include the Council representatives who have been involved in this project. Their interest – and detailed knowledge of their water supply systems – would be helpful in discussions.

3.3 Details of Representative Water Supply Systems

This section provides snapshot summaries of the five representative water supply systems examined during the study – Bulls, Hunterville, Eketahuna, Levin, and Feilding.

The following is provided for each system:

- a data summary in table format
- additional information gathered in discussion with Council staff
- a summary of current and planned demand management activities
- observations/comments on the data and information available.

All of this will be taken into account in Part 4 of the report when outlining options and opportunities for more efficient use of water in each of the systems.

3.3.1 Bulls

The table below summarises key data on Bulls public water supplies (drawn from the Worksheet in Appendix C.2). Additional information gained in discussions with the Council's Engineering Services Manager follows the table.

Table 2
Bulls Water Supply ~ Data Summary

Item	Data*	Calculations/Comments
Consent conditions	1700/day	Source: four bores adjacent to Rangitikei River. Consent expires 2022. Flow not to exceed 33 l/s Consent for water from new, deep bore in progress
Current use (system)	ADD 1200 PDD 1600	ADD = 71% of consent PDD = 94% of consent (PDD = 1.33 ADD)
Water storage capacity	767	= 64% of ADD and 51% of PDD
Customer connections and water costs	662 All metered	Air Force block is bulk metered Cost: $1.00 per cu m ($17.50 minimum 3x year)
Current population	1,812	2006 estimate
Current use (per capita)	ADD 662 l/p/d PDD 883 l/p/d	Includes NRW and Commercial (Riverlands meat processing consumes 500-800/day when operating). See recalculation below for more accurate picture.
Use by category (estimate)	Commercial ~50%	Riverlands meat processing currently takes 500 to 800/day = 42% of ADD and 50% of PDD
Leaks/losses details	Unsure at this time	2003 Detection Services work is most recent analysis. Helpful data for future analysis and comparisons: length of pipe network = 23 km and number of connections = 662; giving 29 connections/km.
Recalculated use per capita	ADD 386 l/p/d PDD 442 l/p/d	From 1200 – 500 = 700 / 1,812 From 1600 – 800 = 800 / 1,812 Revised figures shown if Riverlands excluded from 'Current Use' totals given its volume skews data . This is based on Riverlands ADD at 500 and PDD 800. These per capita figures still include *other* commercial and NRW.
Residential use estimate (net)	ADD 309 l/p/d PDD 331 l/p/d	Eliminate Riverlands and say 5% of remaining consumption is other commercial and 15% is NRW ADD = 1200 – 500 = 700 – 140 (20%) = 560, so per capita = 560 / 1,812 = 309 l/p/d. PDD = 1600 – 800 = 800 – 200 (20%) = 600 / 1,812 = 331 l/p/d
Possible future demand	ADD 2040 = 82% of *new* consent PDD = 2470 = 99% of *new* consent	Say by 2011, population increase of 7.5% (=1.5%/yr), ADD will be 1200 x 1.075 = 1290; PDD = 1600 x 1.075 = 1720 Add 600 for Riverlands + 150 for RNZAF and estimate new *total* consent (five bores) at 2500/day ADD = 1290 + 600 + 150 = 2040 PDD = 1720 + 600 = 150 = 2470

* All water volume figures are cubic metres unless noted otherwise

Additional Information

New Source of Supply – A new deep bore has been drilled and it appears it could produce about 1100 m^3/day. This will address periodic summer shortages when the current four shallow bores cannot deliver the consented amount and water restrictions need to be imposed. New (total) consent and supply should cater for possible future demand from increased production at Riverlands and higher occupancy rate at Ohakea (Air Force block).

Air Force Block – The housing block accounts for about 25% of residential accommodation in Bulls. Occupancy could increase significantly adding to future demand (as noted above). The block is bulk metered. The Air Force pays water costs and this is surcharged on rent for housing (but not on a volume basis).

Riverlands – Current use is some 42 to 50 percent of the water system daily total when the plant is operating. They have a bore for use when non potable water is acceptable and limited capacity for on-site supply. The 2003 Detection Services report indicated possible significant losses at the plant. Riverlands have not been proactive in managing water use (for efficiency).

Mains Water Pressure – Pressure is generally not high in the system and some areas do not have good pressure.

Garden Use – Outdoor use for watering gardens is not excessive (note modest difference between estimated residential ADD and PDD on Data Summary sheet). Thus, hosing bans have little impact on residential water use at this time of year.

Tanker Water – The 2003 Detection Services report noted that a significant amount of water was drawn from the system to fill tankers supplying rural customers when their water runs low. At the time there was no charge to tanker operators for this supply. This has since been rectified. Council now charges \$2.50/m^3 throughout the district and no takes are allowed from the Bulls system in the summer.

Demand Management Initiatives

***Current*:**
Metering and volume pricing
Telemetry data collection and analysis for leaks and losses.

Planned:
Council intends installing data loggers at Riverlands to track water use.
Provision of NZWWA booklet *Savings in your H_2OUSE*.
Could choose efficient fixtures, etc when Council facilities updated.
Next leak detection survey planned for 2010.

Comments

- Full metering is helpful as a motivator for efficient use (generally), but not in the Air Force block as individual properties are not charged on a volume basis.
- Good opportunities exist to examine water use at Riverlands and strive for greater efficiencies.
- Due to modest pressure throughout the system, there would be limited benefits in installing flow restrictors, pressure valves, etc on residential properties as a means of reducing water use.
- Given current patterns of summer water use, little benefits can be expected from a campaign focusing on this.
- Net residential use is relatively low compared to other systems studied.
- Future peak day demand (given possible use at Riverlands and the Air Force block) will push the new consent limit.
- Riverlands take nearly half of total daily supply when operating, so this must be considered when appraising use against water-use guidelines.

3.3.2 Hunterville

The table below summarises key data on Hunterville public water supplies (drawn from the Worksheet in Appendix C.3). Additional information gained in discussions with the Council's Engineering Services Manager follows the table.

Table 3
Hunterville Water Supply ~ Data Summary

Item	Data*	Calculations/Comments
Consent conditions	4968/day	Max abstraction rate 216 m^3/hr Consent to be renewed in 2007 likely seeking ~ 2200/day
Current use (system)	Urban 170 to 300/day, average 218 Rural – average 600/day (winter), 1200 (summer)	For the total system: Winter (low) = 170 + 600 = 770; Summer (high) 300 + 1200 = 1500 Urban: PDD = 1.38 ADD (i.e. 300 / 218) Rural: summer average use is 2x winter use
Water storage capacity	Urban – 300 Rural – 350	Urban storage = same as daily maximum Rural storage = 58% of winter average and 29% of summer average
Customer connections and water costs	Urban 243, all metered Rural 158, all on restricted supply (not able to meter)	Cost: $2.50 per cu m Cost: $150 per unit/year (unit = 1 cu m/day)
Current population (urban)	504	2006 estimate
Current use urban (per capita)	ADD 432 l/p/d PDD 595 l/p/d	From 218 / 504 From 300 / 504
Use by category (urban)	Difficult to determine at this time	
Current use rural (per connection)	3.78/day in winter 7.56/day in summer	= Use per connection (600 / 158 connections winter and 1200 / 158 summer)
Leaks/losses details	Unsure at this time	Most recent analysis done in 2003 Helpful data for future analysis and comparisons – *Rural system*: length of pipe network = 130 km and number of connections = 158; giving 1.22 connections/km. *Urban system*: length of pipe network = 10.3 km and number of connections = 243; giving 23.6 connections/km.
Future demand (rural and urban in total)	Winter average ~ 35% of new consent Summer average ~ 68% of new consent	No significant changes expected in population or commercial use/needs Demand relative to likely new consent Winter 770 / 2200 = 35% Summer 1500 / 2200 = 68%

* All water volume figures are cubic metres unless noted otherwise

Additional Information

Leaks & Losses Rural – Pipes are relatively new and it is a low-pressure system, so leaks and losses can be expected to be relatively low. There are bulk meters throughout the system, so areas can be isolated to assess for possible losses. Because it is a low pressure system, some customers might not get water if there is a leak in the pipes giving a further built-in 'alert' for leaks and losses.

Leaks & Losses Urban – In the 2003 leak detection work, night flow measurements on the Consolidated School showed a regular use of 0.4 m^3 of water used per half-hour period. This equates to 19.2 m^3/day and was approximately 8% of total demand for the day. This was attributed to water use in urinal(s), presumably due to a cyclical flushing system.

Mains Water Pressure – Pressure is generally good throughout the system.

Demand Management Initiatives

***Current*:**
Metering and significant volume price for urban customers
Urban system: telemetry data collection and analysis for leaks and losses.
Rural system: water meters on branch lines read monthly and closely monitored to detect leakage.

Planned:
Provision of NZWWA booklet *Savings in your H_2OUSE*.
Next leak detection survey planned for 2010.

Comments

- For urban customers, volumetric cost is significant which should be a strong financial incentive to reduce use.
- Given good pressure throughout the system, there are opportunities to reduce water use via flow restrictors, pressure valves, etc on residential properties.
- 2003 leak detection work showing water loss in the school overnight, demonstrates the potential value/water savings in conversion to on-demand or waterless urinal systems.
- 2007 consent application will be significantly lower than the current consent volume, freeing up allocation for others.

3.3.3 Eketahuna

The table below summarises key data on Eketahuna public water supplies (drawn from the Worksheet in Appendix C.4). Additional information gained in discussions with the Council's Service Engineer follows the table.

Table 4
Eketahuna Water Supply ~ Data Summary

Item	Data*	Calculations/Comments
Consent conditions	1600/day	Beginning 13 Dec 2006 – 1424/day; beginning 13 Dec 2014 – 1260/day; max flow rate – 75/hour (21 l/s) Low-flow conditions (until 2009): Up to 750/day at 15 l/s when river flow is between 412 and 325 l/s and 450/day when flow is < 325 l/s. Low-flow conditions (2009-2019): as above plus third condition – Up to 165/day at 5 l/s when flow < 240 l/s Take from Makakahi River, consent expires 2019
Current use (total system)	ADD 929 (Feb) 671 (June) PDD 1138 (Feb) 767 (June)	Feb ADD = 58% of consent, PDD = 71% of consent These totals include use by about 10 dairy farms on the intake line between the source and the water treatment plant for the town
Current use (town)	February ADD 757 February PDD 944	From tables provided. February ADD total system = 929 and for town = 757. So 172 for farms (=18.5% of total)
Water storage capacity	450	= 59% of town Feb ADD and 48% of PDD
Town customer connections and water costs	250 20 meters, 230 no meters	Unmetered: $192.40 (incl GST) annual charge Metered: $0.48/$m^3$ up to 100/quarterly and $0.66/$m^3$ for additional
Current population	440	2006 estimate
Current use (per capita) in town	Feb ADD 1,720 l/p/d Feb PDD 2,145 l/p/d	From 757 / 440 From 944 / 440 No significant industry in township, but use includes unmetered commercial properties and a number of farming operations in or on the edge of town
Use by category (town)	Difficult to determine at this point	Customer breakdown: residential 208; ICI 7; Council 5; agricultural 15; lifestyle blocks 12, other 5 (incl. golf club)
Leaks/losses details	Unsure at this point	See Additional Information for details Helpful data for future analysis and comparisons: length of pipe network = 21.4 and number of connections = 250, giving 11.7 connections/km
Future demand (total system)	ADD and PDD regularly above consent in times of (summer) low flow In 2014 Feb ADD is 74% of unrestricted consent, PDD is 90% of it	Steadily declining population and no increase in commercial use anticipated, so no significant changes expected in demand. If so, (current) Feb ADD as % of consent in 2014 (with no low-flow restrictions) is 929 / 1260 = 74%: of PDD = 1138 / 1260 = 90%

* All water volume figures are cubic metres unless noted otherwise

Additional Information

Type of System – The system serves about 10 dairy farms on the way into town – between the source and the town water treatment plant. Town customers (250 connections) include normal residential on small lots, commercial, and a range of agricultural users including grazing dairy and sheep. This is not a typical rural or urban system, but a bit of a hybrid (given the in-town use of water for agricultural purposes).

Dairy Farms on the Intake Line – Historically, these farms have not paid for water drawn from the system, are not subject to restricted flow delivery of water, and do not have on-site storage. Some are now metered for monitoring purposes, but there is still no water charge in place. Some farms are now providing for on-site storage. These farms take a considerable portion of the system total. In February 2006, for example, their daily average was 172 m^3 or 18.5% of the 929 m^3 for the system as a whole.

Town Water Use – As noted above, this is an unusual system. Inclusion of farming operations skews the per capita water use figures on the Data Summary sheet. One town customer, for example, runs a dairy operation on a 107 ha block. Another town (agricultural) customer has five connections, each one going to a separate trough for stock watering. Some troughs are old bath tubs; other troughs aren't level and are seen to be (regularly) overflowing.

Leaks & Losses – In the last financial year (prior to the consumption figures in the Data Summary), several significant leaks were found in the system. One was on a bridge abutment and draining into the river. Another had water discharging into a culvert, and a third was on private property and losing some 10 m^3 a day. Efforts are now ongoing to reduce losses (see details below).

Mains Water Pressure – Water pressure is generally high in order to ensure adequate pressure in some (distant and higher) areas.

Demand Management Initiatives

Efforts are now underway to assess opportunities and make changes in the interest of water-use efficiency. The approach is to "hit the easy stuff first".

Current efforts include:

- regular checks for leaks and losses in the system pipes
- rationalising extraordinary uses (e.g. reducing number of connections to one property, metering and volume charging, checking for obvious losses and inefficient application methods)
- metering commercial customers currently paying an annual flat rate.

Planned

It is intended that the bulk of the effort noted above would be completed by February 2007. Once this is completed, additional more specialised work such as monitoring night flows and acoustic testing for leaks will be considered. Installation of zone pressure valves is also planned.

Comments

- The current DM initiatives have significant potential in reducing water use in the system.
- Instituting a proper metering and pricing system for the (outer) dairy farms should reduce water use and it would make the provision of water more equitable amongst the various customers.
- Given good pressure throughout the system, there are potential benefits in reducing water on individual properties by installing flow restrictors on fixtures, pressure reducing valves at building intake, etc. (The benefit of this step is relatively small, though, compared to other current and planned activities as noted.)
- Other, more traditional, approaches to DM are best pursued once the overall changes/updating of the system noted above have been realised.

3.3.4 Levin

The table below summarises key data on Levin public water supplies (drawn from the Worksheet in Appendix C.5). Additional information gained in discussions with the Council's Utilities Manager follows the table.

Table 5
Levin Water Supply ~ Data Summary

Item	Data*	Calculations/Comments
Consent conditions	24000/day	10,000 average daily extraction allowed, drawn from Ohau River, consent expires 2011 Peak daily extraction = 24000 from Dec 1996, with five-yearly review of conditions
Current use (system)	ADD 8509 PDD 12656	ADD = 85% of 10000 PDD = 53% of 24000 (PDD = 1.49 ADD)
Water storage capacity	6750	= 79% of ADD and 53% of PDD
Customer connections and water costs	7,785 1,297 predominately ICI metered (17%) 6,488 residential unmetered (83%)	Cost: UAC $212 (incl. GST) Metered cost: UAC for 1 m^3/day + $0.65 per m^3 for consumption above that allowance Unmetered cost: UAC flat rate
Current population	19,706	2006
Current use (per capita)	ADD 432 l/p/d PDD 642 l/p/d	From 8509 / 19,706 From 12656 / 19,706
Approximate use by category	Residential ~ 62% Commercial ~ 15% NRW ~ 23%	This extracts NRW/UFW from estimates in 2.9 in the Worksheet Abattoir uses 10.2% of total; next four largest customers use 3.2% of total combined. Say commercial at 15% portion = 19% of revenue water (this could be a low estimate) NRW = Council use (5%) + UFW (18%)
Leaks/losses details	approx 18% of total	Based on total demand less metered amounts and an assessed average domestic flow taken from a sample of residential properties (50+) that have been metered for monitoring purposes Helpful data for future analysis and comparisons: length of pipe network = 200 and number of connections = 7,785, giving 38.9 connections/km
Residential use estimate (net)	ADD 267 l/p/d PDD 398 l/p/d	23% NRW and 15% ICI, means 62% residential, so ADD = 8509 x .62= 5276 / 19,706 = 267 l/p/d and PDD = 12656 x .65 = 7846 / 19,706 = 398 l/p/d
Possible future demand (2011 estimate)	ADD 9360 = 94% of 10000 consent equates to 469 l/p/d (gross) PDD 13922 equates to 698 l/p/d (gross)	10% increase in total demand anticipated in the next few years. Expected population increase ~50/year so increase of 250 by 2011. Population in 2011 = 19,956 Estimated ADD in 2011 = 8509 x 1.1 = 9360 Estimated PDD in 2011 = 12656 x 1.1 = 13922

* All water volume figures are cubic metres unless noted otherwise

Additional Information

Mains Water Pressure - Pressure is generally good throughout the system.

Summer Outdoor Use – Garden watering adds considerably to demand for water in the summer season.

Customer Education – Historically there has been a free tap-washer replacement programme for residential properties, but this has not been carried out during the past few years due to reduced interest.

Demand Management Initiatives

***Current*:**
Efforts are ongoing to meter commercial customers that are currently unmetered.
Monitoring rural connections (set for restricted flow provision of water) to detect any interference with these installations and rectifying problems.

Planned:
Concerted efforts around pressure management and leak detection.
Metering residential properties with swimming pools and charge the same volume rate as commercial.

Comments

- Metering effort with commercial customers (currently unmetered) could identify extraordinary use or otherwise undetected losses and lead to greater efficiencies.
- There have been no efforts yet to work with Levin Meats to assess water use so improvements could result here as well.
- Given good mains pressure, there are opportunities to reduce water use via flow restrictors, pressure valves, etc installed on customer's fixtures/reticulation. A controlled study to examine the benefits of this could be done using Council's pensioner flats and other congregate housing (such as Summerset-Levin Retirement Village and Rest Home, Madison Rest Home Hospital & Village, and PSSC housing).
- Given summer outdoor water use, there are opportunities to reduce use via a promotional campaign (while recognising that residential customers will not have *financial* motivations to change their habits given current pricing practices.)
- There may be value in a customer advisory service (as previously run) beyond replacing washers – for general water conservation information and advice. Reinstituting this service could be helpful, but it will require good promotional support and even a proactive approach targeting older homes with a higher likelihood of having inefficient fixtures.
- Looking ahead, anticipated increases in population will push ADD close to 10,000 daily consented volume.

3.3.5 Feilding

The table below summarises key data on Feilding public water supplies (drawn from the Worksheet in Appendix C.6). Additional information gained in discussions with the Council's Utilities Manager follows the table.

Table 6
Feilding Water Supply ~ Data Summary

Item	Data*	Calculations/Comments
Consent conditions	24600/day 22600/day during low-flow conditions	Surface take – 9000/day (and 140 l/s max) reducing to 7000/day (85 l/s max) during low-flow conditions Two bores total 15600 (max abstraction rates 280 and 400/hour)
Current use (system)	ADD 5735 PDD 9082	ADD = 23% of regular consent PDD = 37% of regular consent (= 1.58 ADD)
Water storage capacity	13980	6800 reservoir in reticulation system, plus two reservoirs at WTP with capacity of 7180 Storage = 244% of ADD and 154% of PDD
Customer connections and water costs	5,848 343 metered (6%) 5,505 unmetered (94%)	Metered: \$.50 per m^3 + rental charge (connection size) Unmetered: \$350/year
Current population	13,731	2006 estimate
Current use (per capita)	ADD 418 l/p/d PDD 661 l/p/d	From 5735 / 13,731 From 9082 / 13,731
Use by category	Residential – 80% Commercial – 20%	Based on estimate of metered customer use v unmetered. 10 largest water users consumed 9.7% of total in 05/06
Leaks/losses details	Unable to estimate accurately at this time	Overnight low-flow figures available to compare to peak and daily average flows, but uncertain of commercial night use + amount going to refill one reservoir then. Water-loss study a priority over the next two years. Helpful data for future analysis and comparisons: length of pipe network = 140 and number of connections = 5,848, giving 41.8 connections/km
Residential use estimate (net)	ADD 343 l/p/d PDD 543 l/p/d	Say residential is 80% of total as above (so still includes NRW/L&L in the figure) ADD = 5735 x .80 = 4588 / 13,371 = 343 l/p/d PDD = 9082 x .80 = 7266 / 13,371 = 543 l/p/d
Possible future demand (2011 estimate)	ADD 5993 = 24% of regular consent PDD 9490 = 39% of regular consent	No notable new industries expected in the near future. Future demand increases expected to be limited to urban growth. Estimated population in 2011 is 14,350 (4.5% increase from current). So ADD in 2011 = 5735 x 1.045 = 5993 and PDD = 9082 x 1.045 = 9490 ***Note***: Two things that could increase future demand beyond above general projection – (1) Transfer of estimated 1,000 Air Force families to Ohakea and (2) Commercial enterprises shifting to town supply from own bore in search of higher quality water due to more stringent export hygiene requirements.

* All water volume figures are cubic metres unless noted otherwise

Additional Information

Total System Supply – Commissioning of the bores has ensured robust, reliable water supply for the community and eliminates the need for water restrictions during summer months. Nevertheless, the bore water is viewed essentially as supplementary/back-up supply. The intent is to minimise its use, mixing it in when demand requires.

Leaks & Losses – The Water Manager has been in the position with Council for a year and is making a concerted effort to address unaccounted for water. Night flow figures are available but it is difficult to determine L&L from that because of commercial night use and one of the reservoirs is refilling at that time. Pressure management/leak detection are priorities over the next two years as identified in the Asset Management Plan. A water loss study of the reticulation system is planned.

Metered Customers – While only 343 *connections* are currently metered, it is estimated that about 75% of total commercial *water use* is covered by this metering. Efforts are underway to identify commercial customers (starting in the CBD) currently unmetered and converting them to metered accounts. Metering of extraordinary users is Council policy where there is a likelihood of high water use (including larger sections, those with swimming pools, etc.)

Mains Water Pressure – Pressure is generally good in the system, so there could be opportunities to reduce water use via flow restrictors, pressure valves, etc., installed on customer's fixtures/ reticulation.

Summer Outdoor Use – Garden watering adds considerably to demand for water in the summer season, so there are opportunities to improve efficiencies through an educational campaign (recognising that residential customers will not have financial motivations to reduce given pricing structures.)

Demand Management Initiatives

***Current*:**
Efforts are ongoing to meter commercial customers that are currently unmetered.
Water conservation pamphlets available at customer services desk and readily supplied to customers.
'Peter Pukeko' educational materials well received in schools.

Planned:
Increased effort to meter extraordinary users (e.g. larger sections, those with swimming pools)

Comments

- Metering effort with commercial customers (currently unmetered) could identify extraordinary use or other problems and unaccounted for water.
- Given good pressure throughout the system, there are opportunities to reduce water use via flow restrictors, pressure valves, etc on residential properties.
- There a number of industries using water in production/processing providing opportunities to explore water-use efficiencies.
- Given summer outdoor water use, there are opportunities to reduce use via a promotional campaign (while recognising that residential customers will not have *financial* motivations to change their habits given current pricing practices.)

4 Closing the Gap

This final part of the report synthesises the data and information set out in Parts 1 to 3.

Section 4.1 provides a critique of the current draft water-use guidelines along with a comparison to approaches taken in other regions. Section 4.2 reviews current water use in the representative systems, building on the details in Section 3.3 and Appendix C. It also compares water use with similar public systems in other regions.

Section 4.3 compares the draft guidelines to current use, while options and opportunities to close the gaps are noted in Section 4.4. The final section offers some recommendations for moving ahead.

4.1 Comments on the Proposed Guidelines

This section includes a comparative look at the guidelines followed by a critique and suggestions for fine-tuning.

4.1.1 Comparison to other guidelines

Part 2 of the report summarises the water-use efficiency approaches in seven other regions in New Zealand. Three areas have specific domestic per-person consumption targets or guidelines for comparison:

- Kapiti Coast District Council is aiming to reduce peak *residential* use to 400 l/p/d (made up of 250 litres for essential use and 150 non-essential).
- For the Waitaki catchment (Canterbury region), the guideline is 300 l/p/d above minimum flow and 250 l/p/d below minimum flow based on the population to be served.
- For the remainder of the Canterbury region, the guideline is 250 l/p/d during times of low water availability based on the current census population.

A further benchmark is provided by the Ministry of Health (2004) publication *Household Water Supplies: The selection, operation and maintenance of individual household water supplies*. While this resource focuses on on-site water systems, the household requirements noted are relevant for our purposes. The total is set at 300 l/p/d, consisting of:

- 5 litres for drinking, cooking, and food preparation
- 100 litres for bathing, showering and cleaning
- 145 litres for toilet flushing and clothes washing, and
- 50 litres for general use (presumed to cover some outdoor/garden use).

The Canterbury guidelines set out similar add-ons to domestic use to those proposed in the HRC guidelines. The Waitaki guidelines at normal flow simply say “a reasonable quantity for other water uses” above and beyond domestic use. Below minimum flow, these uses are stated specifically (e.g. for stock drinking-water requirements, for processing and storing of perishable produce, to maintain fire-fighting capabilities, and a reasonable allowance for losses). Interestingly, both the Canterbury guidelines for water use below minimum flow include water for commercial purposes *within* the per capita figures (not as an add-on as proposed by HRC).

Given the above, the HRC draft water-use guidelines do not appear unreasonable. They are more demanding than those set out by Kapiti Coast DC, but less stringent than those in Canterbury. The HRC guidelines of 300 l/p/d during normal times and 250 l/p/d restricted use during low flow are also consistent with the MoH household requirements (i.e. 250 l/p/d as essential use and 50 litres in addition for general use).

It should be noted that the Canterbury region (other than Waikaki) will allow a water supply asset management strategy – with suitable water conservation/restriction components – as an alternative condition of consent. Similarly, Environment Waikato does not have specific l/p/d guidelines, but will be asking that a water demand management plan be provided with any resource consent application. EW also notes that over time they will be looking for implementation of these plans. Hence, they have an expectation not only of intent but action.

HRC indicates a similar approach to EW in its proposed guidelines. That is, where current use exceeds guidelines for reasonable use (at normal flows), the intent to establish, in consultation with the relevant territorial authority, a timeframe by which the current use levels can be brought into line.

It will be important not only to *set* water-use guidelines as a general framework, but to ensure they are realistic *and* to create a positive and encouraging environment in which to close any gaps that exists.

4.1.2 Critique of the current draft guidelines

Following are some comments on the construction of the guidelines and review of the customer categories and their make-up.

(i) Domestic needs – This is straightforward with the 300 l/p/d allocation – and 250 for (A) – based on resident population. Councils can use census data for this over time, and they generally have planning growth projections for the intervening years as per (v) under reasonable use. Updated population figures could be used each year for calculations, with any new 'wet' industries getting their own specific allocation as in (iii) in the guidelines.

(ii) Commercial use – By definition, this would include all non-domestic use not deemed to be 'wet' industries covered in (iii). In ICI (industrial-commercial-institutional) terminology, this includes the commercial-institutional components. This is essentially customers using water for 'services' – cooking, washing, showers, toilets, etc. – covering restaurants, tourist/travel accommodations, educational and health facilities, retail and service businesses, plus others using *modest* amounts of water in operations. It would also include Council's own use (non-revenue water) for public facilities, mains flushing, wastewater treatment, etc. An allocation of 20% of domestic use is quite reasonable for this and probably on the high side, given that the major non-residential water users are not included here but in category (iii) instead.

(iii) Industrial use – This is 'wet' industries (i.e. customers using water in processing/operations). It is a good idea not to include them in category (ii), but allow a specific allocation given that water use and needs vary widely by industry. Including the "based on best management practices for water efficiency" clause implies that improvements on current use may be expected. For accurate figures, Councils would have to review their commercial customers list and 'flag' those that fit into this category and are, thus, not a part of (ii). If the best management practices clause is to be invoked, it will be necessary to establish the water use/quantity of product ratios deemed acceptable. (Data on this provided in the September 2004 Aqualinc report and an examination of some local industries can be used as a base in establishing standards.)

(iv) Livestock/agricultural – Determining an appropriate allocation for this will require some effort as well. Councils will have to identify customers with this use and – based on stock type and numbers on the property, water requirement for horticulture, etc – calculate a water-use allocation based on standards established by HRC. (The Aqualinc report and other information can be used to devise these.) There are animal health and crop protection issues to be considered in setting the standards so they cannot be *too* stringent. Some Councils use a restricted-flow system for these customers, so this could provide assistance in monitoring and managing this type of water use.

(v) Growth – See comments in (i) above.

(vi) Leakage – This is easily computed once water use in (i) to (iv) above are confirmed. The key will be to set a fair and reasonable leakage allowance. Exceptional efforts in New Zealand result in a leakage level slightly under 10%; whereas, many rural-based systems are known to have leakage (even well) in excess of 25%. These higher rates are driven in part by the low number of connections *per kilometre* of pipe. (This ratio varied widely in the systems studied – from a high of about 40 connections/km for Levin and Fielding to 29 for Bulls, 12 for Eketahuna and 1.2/km for Hunterville rural.) The 15% proposed (also suggested in the Aqualinc report) is not unreasonable as a target, but given the urban-rural differences it would be fair to include a different level of loss for each type of system. The 15% leakage allowance employs the 300 l/p/d domestic consumption (reasonable use) level as a base for calculations. This same calculated amount is used for the leakage level in the restricted use guideline.

Considering the differences in the reasonable use and restricted use guidelines (some of which were noted in Section 1.2), there are a few clarifications required as follows:

- Category (iii) includes all wet industries; whereas, (C) only allows for use by abattoirs. This implies other 'wet' industries would get no allocation under restricted-use conditions. (The Canterbury guideline, by comparison, includes industries involved in processing and storage of perishable produce.)
- Similarly, 'agricultural practices' included in (iv) are excluded from (D), implying they would get no water.
- Category (C) specifically notes allocation for hospitals, other facilities providing medical treatment, schools and other educational facilities. These are assumed to be part of (ii). If these facilities are shifted to category (C), the allocation for (B) may need to be altered accordingly.

In considering changes to the draft guidelines, comments of District Council staff (details in Section 3.2) should also be taken into account. There was a call for making sure it's not too complicated. The difficulty with stringent commercial demands was also noted. While water is essential in operations such as abattoirs and food processing, other industries using water are essential to the economic health of the towns in which they are located. Any undue restrictions on them should be avoided.

Based on all the information above, a number of possible changes to the current draft guidelines are apparent. The following should be considered in any further refinement of the guidelines:

- leaving in category (B) medical and educational facilities now implied in (ii)
- allowing the full range of industries in (iii) to be a part of (C) as well, perhaps with greater water-use efficiencies demanded via standards to be developed
- including all commercial agricultural/horticultural use in (D) as in (iv), driving efficiencies via specific standards
- considering two different levels of leakage allowance – say 15% for urban systems and 20% for rural – but with the leakage amount determined in (vi) used in (E) as in the current proposed guideline.

To operationalise the guidelines, it will be necessary to develop two sets of standards. This will turn the general statements in the guidelines ("An allocation …") into specific numbers that Councils can work with. Required are:

- industry best practice standards for determining allocations in (iii) and (C)
- specific standards for agricultural water use for determining allocations in (iv) and (D).

With respect to leakage covered in (vi) and (E) in the guidelines, Palmerston North City Council is now expressing leakage/loss *per property* rather than as a percentage of the total use for asset management planning. It would be worth discussing this approach with them and determine its merits for the guidelines. In any case, there should still be different *acceptable* levels of loss in urban and rural properties to reflect the difference in connections per kilometre. Rural guidelines could, perhaps, be based on length of pipe not number of connections if a fair and reasonable figure could be determined.

In the end, the purpose of the guidelines is to set maximum allowable consented volumes for regular- and low-flow conditions. Circumstances will dictate where the greatest water-saving gains are possible, and how targets are achieved can be determined by individual District Councils.

Providing specific industry and agricultural water-use standards and simplifying the guidelines (based on the suggestions above) would allow Councils to use them as practical targets in demand reduction efforts.

4.2 Comments on Current Water Use

The following table summarises current water use in the five representative systems (drawn from the detailed information in Section 3.3). The average day demand (ADD) and peak day demand (PDD) figures are based on gross water use – i.e. total consumption for the system including commercial, leakage, etc, expressed on a per capita basis (l/p/d).

Table 7
Representative Public Supplies ~ Water Use by System (l/p/d)

Water System	ADD	PDD	Residential Water Costs
Bulls	662	883	Metered - \$1.00 / m^3
Hunterville urban	432	595	Metered - \$2.50 / m^3
Eketahuna	1,720	2,145	Unmetered – \$192.40 / yr
Levin	432	642	Unmetered – \$212 / yr
Feilding	418	661	Unmetered - \$350 / yr

Total consumption in Bulls is driven by water use at the Riverlands meat processing plant. When operating, the plant takes 42%-50% of the system supply, with the higher end of the range in the peak season. If Riverlands' water use is eliminated so Bulls can more fairly be compared to the others, per capita use would be 386 (ADD) and 442 (PDD).

Eketahuna figures are skewed by a number of agricultural properties and lifestyle blocks drawing water from the town supply (including a dairy farm on a 107 ha block!). Thus, the figures shown are not an accurate representation of human per capita consumption. Hunterville is a small system with few commercial customers to push up water use.

Water-use figures for other systems in the region are noted in the 2004 Aqualinc report for Council – *Water Allocation Project - Stage 1*. These are also useful to note for comparison purposes and include: Dannevirke 983 l/p/d ADD and 1,300 l/p/d PDD; Foxton 556 ADD and 778 PDD; Marton 778 and 1,222; Palmerston North 440 and 570; Shannon 523 and 683; Taihape 682 and 955; and Wanganui 561 and 854.

Table 8 provides similar information to Table 7 for a number of public water supplies in other regions. These are provided for comparison.

In Hauraki District Council, all properties are metered. The Paeroa system provides water for a meat processing plant and a number of agricultural properties. Residential use in town is actually quite low, with an ADD of 210 l/p/d.

In Waipa District Council, residential properties are unmetered. Both Cambridge and Te Awamutu have Fonterra dairy plants which partially account for the high per capita figures in the table above. Both towns experience a significant increase in water use in the summer for garden watering. Residential customers pay a modest \$270 annual flat rate for water.

In Matamata Piako District Council, Morrinsville and Te Aroha have similar water-use profiles to Cambridge, Te Awamutu *and* Bulls – with one or two significant commercial customers inflating the per capita figures. Morrinsville has a dairy plant; in Te Aroha its two meat processing operations. Residential customers are unmetered, unless extraordinary use is expected. Te Aroha would be similar to Levin and Fielding – not all commercial customers are currently metered, but there is a programme in place to work toward 100% metering for this customer class.

Table 8
Other Public Water Supplies ~ Use by System (l/p/d)

Water System	ADD	PDD	Residential Water Costs
Paeroa	512	805	Metered - \$60 + \$0.80/m^3
Cambridge	883	1,572	Unmetered - \$270 / yr
Te Awamutu	998	1,405	Unmetered - \$270 / yr
Morrinsville	857	1,460	Unmetered – \$243, potential large users metered/charged \$0.65/m^3 above 82 m^3/quarter
Matamata	847	968	Same as Morrinsville
Te Aroha	1,560	1,938	Same as Morrinsville
Warkworth	205	n/a*	Metered – \$78 + \$2.06/m^3
Wellsford	279	n/a	Same as Warkworth
Hibiscus Coast	220	n/a	Metered – \$35 + \$1.50/m^3

*** n/a** = information not confirmed for this report

Rural settlements in Rodney District Council are fully metered. Wellsford and Warkworth, small settlements serving the surrounding agricultural areas, face an annual water charge of \$78 plus a volume charge of \$2.06 per cubic metre. Water use in both these areas (and the Hibiscus Coast) is at the very low end of the systems documented in Table 8.

Comparing Table 7 and data from the Aqualinc report with Table 8, the public water supplies in the Horizons region would generally fill out the middle to upper end of the ranking. Water use is considerably higher than in Rodney, but it is typically lower than in comparable settlements in the Waikato (excluding Paeroa with its low residential ADD of 210 l/p/d). Considering the data in the Aqualinc report, Dannevirke and Marton certainly tend to the top end of the range and others identified in that report exhibit higher water use than those in the current study.

While water use in Cambridge and Te Awamutu could be considered high to excessive (in the summer), use in the representative systems examined for this report is lower but there is still considerable room for improved efficiencies. The challenge will be to move from current levels to those proposed in the guidelines wherever there is a gap. (Closing the gap will obviously be more difficult in communities with higher water use as identified in the Aqualinc report.)

4.3 Comparing the Guidelines & Current Use

Charts are provided on the following pages for Bulls, Hunterville (urban), Levin and Feilding. These charts note current use and calculate guideline consumption levels for reasonable use at regular flow and restricted use at low flow.

It was not possible to construct a chart for Hunterville (rural) as no population figures were available (plus the system is primarily for stock-watering purposes). There is also no chart for Eketahuna. Given the complexities of that system and the lack of information currently held by the District Council, the calculation would require too many estimates for it to be meaningful.

However, the four systems documented provide helpful information to compare current use with the proposed guidelines – to see what sorts of gaps exist *and* explore how difficult it would be to close the gap via demand management efforts. The charts were devised as follows:

Current use – This information is taken directly from the corresponding tables in Section 3.

Reasonable use guideline – This was calculated using the formula provided by HRC (outlined in Section 1.2). Components (i) and (ii) were straightforward, using population figures provided by the Councils. Estimates were required for both (iii) and (iv). For (iii), information provided by the Councils allowed placement of some customers in this category. Where a peak daily figure was provided, this was used as a basis for the calculation. (This makes the guideline more liberal as in many cases peak use is significantly above typical daily use.) Slight reductions were applied to the base amount as a way of addressing the "best practices" clause in the guideline. For (iv), a simple estimate of the number of properties that might apply and apportioning each with a cubic metre per day of water was used for the calculation. Determining (vi) was a simple calculation as well – a percentage of the total of (i) to (iv). The overall total is the guideline for daily water use for the system as a whole.

Restricted use guideline – The same process was followed as in developing the reasonable use guideline, with estimates for (C) and (D) required. The resulting total is the guideline for daily water use at low flow. Some customers in (ii) shift into (C), making the required reductions less onerous in practice.

Comparisons – Based on the three components of the charts outlined above, a number of comparisons are noted including current use v the guidelines and v consent levels. The chart also notes the per capita targets (in l/p/d) "at reasonable use" and "at restricted use".

Given the assumptions necessary to do the calculations, the numbers provided should be used as a general guide. It would be helpful to obtain specific information for a couple of systems to plug in the actual numbers for (iii), (iv), (C) and (D). Levin and Feilding would be good ones to use for this exercise as would Palmerston North.

BULLS

All water use and guideline figures are in cubic metres per day.

Current Use

Item	Data	Calculations/Comments
Consent conditions	1,700	Flow not to exceed 33 l/s
Current use (system)	ADD 1,200 PDD 1,600	ADD = 71% of consent PDD = 94% of consent (PDD = 1.33 ADD)
Current population	1,812	Estimate at 2006

Guideline ~ Reasonable Use at Regular Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
1,636	(i) Domestic: 1,812 X .300 = 544 (ii) Commercial: 544 x .20 = 109 (iii) Industrial: Riverlands peak daily use 800, and 10% efficiency = 720 (iv) Stock/agriculture: to be determined, say estimate 50 @ 1 m^3 = 50 (v) Growth – guidelines recalculated (yearly) based on population/industry changes (vi) Leakage: 15% of 1,178 [i.e. total of (i) to (iv) above] = 213 Total all above = 1,636

Guideline ~ Restricted Use at Low Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
1,552	(A) Domestic: 1,812 X .250 = 453 (B) Commercial: 453 x .20 = 91 (C) Industrial: Riverlands use as in (iii) plus say another 25 estimate for other uses in this category = 745 (D) Stock/agriculture: general estimate as in (iv) = 50 (E) Leakage: same allowance as (vi) above = 213 Total all above = 1,552

Comparisons

Flow Level	Guideline-Use Comparisons
At Regular Flow	Guideline (1,636) is 136% of ADD and 96% of consent
At Low Flow	Guideline (1,552) is 97% of PDD and 91% of consent

System total	Current ADD	Current PDD	At reasonable use	At restricted use
l/p/d	662	883	902	856

HUNTERVILLE URBAN

All water use and guideline figures are in cubic metres per day.

Current Use

Item	Data	Calculations/Comments
Consent conditions	2,200	Approximate new consent in 2007 (urban and rural)
Current use (system)	ADD 218 PDD 300	Low 170 to high 300, average 218
Current population	504	Estimate at 2006

Guideline ~ Reasonable Use at Regular Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
231	(i) Domestic: 504 X .300 = 151 (ii) Commercial: 151 x .20 = 30 (iii) Industrial; Potato Packers = 6 (iv) Stock/agriculture: to be determined, say estimate 15 @ 1 m^3 = 15 (v) Growth – guidelines recalculated (yearly) based on population/industry changes (vi) Leakage: 15% of 196 [i.e. total of (i) to (iv) above] = 30 Total all above = 231

Guideline ~ Restricted Use at Low Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
202	(A) Domestic: 504 X .250 = 126 (B) Commercial: 126 x .20 = 25 (C) Industrial: Potato Packers as in (iii) = 6 (D) Stock/agriculture: general estimate as in (iv) = 15 (E) Leakage: same allowance as (vi) above = 30 Total all above = 202

Comparisons

Flow Level	Guideline-Use Comparisons
At Regular Flow	Guideline (231) is 106% of ADD and n/a w.r.t to consent (i.e. includes rural)
At Low Flow	Guideline (202) is 67% of PDD and n/a w.r.t. consent as above

System total	Current ADD	Current PDD	At reasonable use	At restricted use
l/p/d	432	595	458	399

LEVIN

All water use and guideline figures are in cubic metres per day.

Current Use

Item	Data	Calculations/Comments
Consent conditions	24,000	= Peak daily extraction allowed (10,000 average)
Current use (system)	ADD 8,509 PDD 12,656	ADD = 35% of 24,00 consent PDD = 53% of 24,000 (PDD = 1.49 ADD)
Current population	19,706	Estimate at 2006

Guideline ~ Reasonable Use at Regular Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
9,699	(i) Domestic: 19,706 X .300 = 5,912 (ii) Commercial: 5,912 x .20 = 1,182 (iii) Industrial: Levin Meats and others peak daily use 1200, 5% efficiency = 1140 (iv) Stock/agriculture: restricted flow 1 m^3/day x number of connections, estimate 200 connections like this = 200 (note: this includes human use on property as well) (v) Growth – guidelines recalculated (yearly) based on population/industry changes (vi) Leakage: 15% of 8,073 [i.e. total of (i) to (iv) above] = 1,265 Total all above = 9,699

Guideline ~ Restricted Use at Low Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
8,800	(A) Domestic: 19,706 X .250 = 4,927 (B) Commercial: 4,927 x .20 = 985 (C) Industrial: Levin Meats, etc. as in (iii) plus say another 400 estimate for other uses in this category = 1,540 (D) Stock/agriculture: restricted flow 1 m^3/day x 200 as in (iv) = 200 (E) Leakage: same allowance as (vi) above = 1237 Total all above = 8,800

Comparisons

Flow Level	Guideline-Use Comparisons
At Regular Flow	Guideline (9,699) is 114% of ADD and 40% of 24,000 consent
At Low Flow	Guideline (8,800) is 70% of PDD and 37% of 24,000 peak extraction allowed

System total	Current ADD	Current PDD	At reasonable use	At restricted use
l/p/d	432	642	492	446

FEILDING

All water use and guideline figures are in cubic metres per day.

Current Use

Item	Data	Calculations/Comments
Consent conditions	24,600	9,000 is surface water. Total 22,600 during low flow
Current use (system)	ADD 5,735 PDD 9,082	ADD = 23% of regular consent PDD = 37% of regular consent (PDD = 1.58 ADD)
Current population	13,731	Estimate at 2006

Guideline ~ Reasonable Use at Regular Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
6,394	(i) Domestic: 13,731 X .300 = 4119 (ii) Commercial: 4,119 x .20 = 824 (iii) Industrial: Lamb Packers, Feltex Carpets, McCain Foods, Lamb Packers, etc. say 10% of current total, so 574 and 5% efficiency = 517 (iv) Stock/agriculture: say estimate 100 at 1 m^3/day = 100 (v) Growth – guidelines recalculated (yearly) based on population/industry changes (vi) Leakage: 15% of 5,560 [i.e. total of (i) to (iv) above] = 834 Total all above = 6,394

Guideline ~ Reasonable Use at Low Flow

Guideline for Total System Use	Use by Category ~ Estimates ~ Calculations
5,921	(A) Domestic: 13,731 X .250 = 3,433 (B) Commercial: 3,433 x .20 = 687 (C) Industrial: same as (iii) above plus say 350 for all other uses in this category = 867 (D) Stock/agriculture: restricted flow 1 m^3/day x 100 as in (iv) = 100 (E) Leakage: same allowance as (vi) above = 834 Total all above = 5,921

Comparisons

Flow Level	Guideline-Use Comparisons
At Regular Flow	Guideline (6,394) is 111% of ADD and 26% of consent
At Low Flow	Guideline (5,921) is 60% of PDD and 26% of peak extraction allowed

System total	Current ADD	Current PDD	At reasonable use	At restricted use
l/p/d	418	661	466	431

Table 9 extracts key information from the charts on the previous four pages and provides some further calculations to compare actual use to the proposed guidelines.

PDD is the highest recorded water use on any *single day* throughout the year. The PDD/ADD ratio is shown for the four systems. Feilding is the highest, followed by Levin. Both of these Councils indicate summer garden watering as an issue driving this seasonal demand. Bulls, on the other hand, is affected by high production at Riverlands. Garden watering is not considered a significant part of it. Hunterville's high summer use can likely be attributed to stock watering and other agriculture more than domestic garden upkeep.

Table 9
Summary Comparison ~ Current Use & Proposed Guidelines (l/p/d)

Water Use Variable	Bulls	Hunterville*	Levin	Feilding
Current ADD	662	432	432	418
Current PDD	883	595	642	661
PDD/ADD ratio	1.33	1.38	1.49	1.58
High season use/ADD ratio	1.25	1.20	1.30	1.35
High season use (actual amount)	828	518	562	564
Reasonable use guideline	902	458	492	466
ADD as % of reasonable use guideline	72%	94%	88%	90%
Restricted use guideline	856	399	446	431
High season use as a % of restricted use guideline	97%	130%	126%	131%

***** urban system only

While there may be a few other days close to the PDD figure, it would be helpful to consider more typical or average higher use throughout the peak/summer season. This is termed 'high season use' in Table 9. For discussion purposes, an estimated 'high season use'/ADD ratio is provided for each system. These are somewhat arbitrary, but based on the circumstances in the system and the opportunities to reduce the higher summer use.

For Bulls the difference between the 'high season use'/ADD and PDD/ADD ratios is minor based on little variation due to garden watering and the range in Riverlands use by season is 42%-50% of the system total. A larger difference is given for Hunterville, but still recognising contribution of stock watering and agriculture to overall use. The biggest differences are given to Levin and Feilding, since a sizeable portion of their summer water use is non-essential (outdoor/garden).

The high season use (actual amount) is ADD (in l/p/d) x 'high season use'/ADD ratio. It is this figure that is compared to the restricted use guideline in the following discussion.

For comparisons, it makes sense to compare ADD with the reasonable use guideline as the average daily use will tend to occur under normal river flow conditions. Similarly, high season actual use is

compared to the restricted use guideline as this higher use will typically coincide with low-flow conditions.

ADD–reasonable use guideline comparison – As shown in Table 9, in all four cases the average daily use is below the reasonable use guideline. Average daily use is about 72% of the guideline for Bulls and ranges up to 94% for Hunterville.

High season use–restricted use guideline comparison – It's a different picture for this second, and more important, comparison. Three of four systems show actual use above the restricted use guideline, ranging from 126% of the guideline for Levin up to 131% for Feilding.

It should be remembered that these comparisons are also based on some assumptions as noted at the beginning of this section. However, the actual figures are not likely to vary too much from these estimates, so there appear to be some fairly significant gaps to close under restricted-use conditions if Councils are to comply with the guidelines.

The next section considers some demand management options available to narrow the gap between actual use and desired use as set by the guidelines.

4.4 Options & Opportunities to Close the Gap

All Councils involved in the project will receive a short report summarising the data and information on their system and outlining specific opportunities they could consider to reduce the demand for water. The report will also confirm the role demand reduction can and should play in a long-term water supply strategy.

This section highlights some of the opportunities covered in the Council reports. Not all options apply in all situations. Conversely, many of them would be applicable for public water supplies beyond the specific ones examined. Following are some of the key options.

Metering and volume pricing – The water use figures in Section 4.2 bear out the general experience that meters have a moderating effect on water use. This is especially true for non-essential/outdoor watering which drives high season use and occurs at the time of year when river low-flow levels are most likely. In spite of this, Councils that are not yet fully metered are not making any quick moves to do so. However, metering all commercial customers is a step in the right direction and this is happening in the three systems studied that are not now fully metered. This will help monitor and charge extraordinary users and motivate customers to use water more efficiently as it will be a direct cost of doing business.

Industrial/commercial water advisory – This builds nicely on the metering/pricing issue. Many public water systems have a few large customers that consume a significant portion of the daily supply. It makes sense to focus water-efficiency efforts on these customers first, then move on to medium-size and smaller businesses. Water audits and an advisory service for this customer class could play a significant role in helping Councils reduce total demand. Palmerston North City Council is keen to pursue this effort, so there may be opportunities for a cooperative effort to reduce costs and enhance results.

Summer water-use campaign – A campaign targeting residential customers and outdoor/ garden watering would address high season use which places extra stress on water resources in the region. This will be a challenge for areas where residential properties are not metered since there is no financial incentive to reduce water use. It will, thus, require a well-planned social marketing/ communication effort. Summer water use has been identified as an issue in Palmerston North, Levin and Feilding, and it is likely some other urban areas around the region face the same problem. A cooperative effort would again maximise benefits. Palmerston North City Council intends addressing this, so they might take a lead role in any activities that are planned.

Leak detection – Most Councils are addressing leaks and losses in one way or another. There appear to be real benefits to work that can identify leaks in mains and also on customer lines running off the mains. This is especially true where there is no residential metering that would help pick up losses via abnormally high readings. Such a programme by one District Council on the North Island

determined possible leaks on 80 properties. A letter sent to owners resulted in 75% of them doing the necessary repairs (confirmed by follow-up scanning). Subsequent correspondence and discussion with owners addressed the remaining problems. Cost to the Council is for the detection scan and administration for lettering writing, etc., as it is the responsibility of customers to fix leaks on their own property.

Pressure management – Attention to pressure management can have similar benefits. Many of the systems studied have very good pressure, which would allow install of pressure values to reduce mains pressure and lessen the likelihood of leaks. Pressure reduction valves on fixtures in properties (or where the water supply enters the facility) can be beneficial, too.

Residential water advisory – This can include simple checks for leak repairs and install flow-control devices (such as a cistern weight in old single-flush toilets). It also provides an opportunity to discuss customer water-use practices and promote conservation with customers. This is particularly helpful for older house (there are many throughout the region) that may not have been upgraded to include water-saving fixtures. This is another area where Councils might cooperate to share costs and time for an individual who could serve as a domestic water advisor (and even be coordinated with the industry/commercial water advisory service outlined above).

Public, community, and commercial toilets – There are significant benefits to be gained from retrofitting or upgrading urinals from cyclical flushing to on-demand or even waterless models. This reduces both water supply requirements and wastewater flows – a double benefit. Work carried out by Detection Services for Rangitikei District Council at the school in Hunterville, for example, attributed 0.8 m^3/hr or 19.2 m^3/day (8% of total use) to continuous flushing of urinals. This goes on all night, on weekends and during school holidays when these facilities are not even in use. Levin is upgrading public facilities (with manual flushing systems on urinals and dual-flush cisterns in some premises). This has reduced water use by up to 85% from previous levels. This sort of work can be done in Council-owned facilities, schools, community and sports clubs, and commercial establishments such as restaurants and pubs. Metered customers will be inclined to upgrade and further motivation could be provided through a variety of financial incentives (e.g. reduction in wastewater charges for those with more efficient systems).

The above points provide just a few examples of the opportunities available – and a sense of the water-reduction benefits that are possible when implemented over a period of time. The challenge will be to get Councils to integrate these sorts of 'soft' *demand management* options into their efforts that tend to have an *infrastructure planning* and *water supply* focus.

4.5 Summary & Recommendations

The overall purpose of this work was to assess Horizons Regional Council's proposed water-use guidelines for public water supplies. This was done by examining the guidelines from two angles, essentially asking the questions:

> *Are the guidelines* suitable *or* fitting *based on what is being done in other regions?*
>
> *Are the guidelines* realistic *given current water consumption levels and practices within the region?*

The information gathered to answer these two questions provides an opportunity to comment on whether the guidelines regime above and below minimum annual low flow will achieve the desired result (i.e. contribute to sustainable management of the resource). It also provides HRC with data to assist in any desired refinement to the guidelines.

A further purpose of the work was to identify opportunities for improved water-use efficiency in public water supply schemes in the region and promote best practices to District Councils.

The results of the work can be summarised as follows:

On the suitability of the guidelines …

Efforts in water-use efficiency in public water supplies were documented for seven other regions (six on the North Island). A range of approaches is apparent, but three areas have developed per person residential targets or guidelines (in l/p/d). Ministry of Health guidelines for household water requirement are also available for comparison. Information on non-domestic water use is available as a further guide.

HRC proposed guidelines are in the middle of the range for domestic needs – more demanding than one guideline available for comparison, but less stringent than the other two. They are also consistent with the MoH guidelines for household requirements. HRC guidelines for non-domestic use vary from the comparisons, but they all have similarities.

Overall, the HRC guidelines can be considered *suitable* or *fitting* for their intended use. A critique of the guidelines identified some possible refinements that could be made.

Background data and information used to consider the suitability of the guidelines appear in Part 2 and Section 4.1.

On how realistic the guidelines are …

Considerable work was done to document current water use and practices in the public water systems studied. This includes a water supply services data summary, additional notes and information on the system, and current and planned demand management initiatives. This data and information allows comparison of water consumption in similar public systems in other regions *and* relative to the proposed guidelines.

Compared to other regions, consumption in the systems examined for this report fall in the middle of the ranking – considerably higher than in rural systems in Rodney District, but generally lower than comparable systems in the Waikato. (By comparison, several of the systems in the region documented in an earlier report by Aqualinc demonstrated higher-end levels of water use.) Water use in the region could, thus, be considered in the middle to higher range overall, so efficiencies are certainly possible.

Certain assumptions and estimates were necessary to compare current use with the proposed guidelines (as noted in Section 4.3). For all four water systems assessed, the average daily demand was below the reasonable use guideline – ranging from 72% to 94% of it.

It was a different result for ‘high season’ water consumption relative to the restricted use guideline, with three of the four systems registered above the guideline. This results from the restricted use guideline normally being lower than the reasonable use guideline and the typically higher water use during this period with residential outdoor/garden watering and higher production levels in a number of processing industries. In three of the four systems where calculations where possible, high season use was above the restricted use guideline, exceeding it by 126 to 131%. This suggests there are some fairly significant gaps to be closed under these conditions.

Overall, the HRC water-use guidelines can be considered realistic. The reasonable use guideline (for normal river flow conditions) is generally achievable. The restricted use guideline (for low-flow conditions) is more difficult to achieve and will be a *real* stretch for some systems. Refining the guidelines and checking them against actual water use in a couple of systems (rather than the estimates used here for the calculations) may indicate a narrower gap between current use and guidelines, making them easier to achieve yet still a good target.

Background data and information used to consider how realistic the guidelines are appear in Part 3 and Sections 4.2 and 4.3.

On achieving the desired results. …

There is no question that the guidelines can serve as practical and real targets in water-use reduction efforts by District Councils for their public water supplies. To this end, they will contribute to sustainable management of water resources in the region.

Providing a definitive answer as to whether they will successfully protect the ecology/health of the river systems in the region is beyond the scope of this report. This requires compiling the guidelines/allocations of all consent holders and assessing total takes against flow requirements as set out in the various One Plan policies relating to water allocation.

However, given that a significant portion of the water consumption in public supplies is for essential use (i.e. domestic needs and commercial/industrial use integral to the economic health of the area), it can be argued that the guidelines set a framework for what's possible and appropriate for reductions in this component of water use. Any further reductions to ensure environmental protection will have to come from efficiencies achieved by other consent holders and in takes for non-essential use.

On promoting best practices …

This project documented current water use and practices in the systems studied, including active and planned demand management initiatives. This has allowed an assessment of practical options and opportunities for improvement. Councils will be provided these in a short report feeding back a summary of the information gathered and analysed and specific suggestions for their own consideration.

An important intent of the report is to show there are practical, cost-effective ways to reduce water use and that demand reduction efforts should be integral to water supply operations.

To move forward with District Councils in this important effort, it is recommended that Horizons Regional Council:

- further refine the guidelines for simplicity, clarity and equity (based on the suggestions provided in Section 4.1.2)
- develop best practice standards for industrial and agricultural water use covered in components (iii), (iv), C) and (D) of guidelines (to operationalise them and provide Councils with specific direction for their calculations)
- promote cooperative efforts amongst the Councils for such things as industrial water audits/advisory service and a region-wide summer water-use educational campaign
- consider giving financial support to the efforts mentioned in the previous point (if budgets permit) and taking an active role in the educational campaign.

These steps will help ease implementation of the water-use guidelines for public water supplies – by ensuring they are practical, easy-to-use and fair *and* by creating a positive and encouraging environment in which demand-reduction efforts can occur. Patience will be important, which means looking for change and improvement over a period of time.

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Appendix A
Background Information

A.1 Outline of the Work

A.2 HRC – Draft Water-Use Guidelines for Public Water Supplies

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A.1 Outline of the Work

<u>Purpose</u>: To help Horizons Regional Council refine the policy relating to efficient use of water in public water supplies and to promote best practices to District Councils

Overview

This work will build on the *Water Allocation Project – Stage 1* (2004) report prepared for Horizons Regional Council (HRC) by Aqualinc Research Limited and on the efficient use of water policy guidelines in the *One Plan: Working Document Version 4*. It will involve a review and assessment of water use in five representative systems (Bulls, Fielding, Eketahuna, Hunterville, and Levin) to compare consumption rates to those proposed in the efficiency guidelines.

The exercise will have three main outcomes:

- a refined draft of the efficient use of water guidelines for further discussion with District Councils
- a summary of sample steps that participating District Councils can take to improve water-use efficiency in the water systems studied
- an opinion on whether the water-use efficiency regimes contemplated in the One Plan above and below minimum annual low flow will achieve the desired result.

The overall goals of the project are to progress discussions toward sustainable water use in the region *and* to motivate District Councils to consider developing their own water management action plans.

Activities Involved

- Review all information provided by HRC; obtain clarifications and additional information as needed.
- Devise a data form to capture all relevant information on the five water systems under review (water use by customer type, water use by major industries, non-revenue and unaccounted-for water, metering and pricing policies, current educational efforts, etc.).
- Devise an interview form for use with water supply staff of participating Councils.
- Work with each Council to compile all necessary data and information, including initial provision of the data form, meeting with Council staff for clarifications/follow-up discussion, familiarisation 'tour' of the towns/water system, and possible site visits to sample industry customers.
- Contact other (representative) Regional Councils to ascertain their approaches to water allocation and water-use efficiency as a guide in any revisions to proposed HRC policies.
- Analyse all data/information gathered with a view to revisions to the proposed guidelines.
- Discussions with HRC on suggested changes to efficient use of water guidelines and prepare revised draft of same.
- Prepare a brief summary for each Council suggesting where to target water-use efficiency efforts in the water systems studied.
- Prepare a presentation on the data/information gathered *and* the refined guidelines; participate in discussion session.

Deliverables

- Report to Horizons Regional Council, including suggested revisions to the efficient use of water guidelines.
- Brief summaries for participating District Councils with suggested water-use efficiency activities for the water systems studied.
- PowerPoint presentation and participation in discussion/planning session with HRC and all District Councils in the region.

A.2 HRC – Draft Water-Use Guidelines for Public Water Supplies

Following are salient points from Version 5 of Horizons Regional Council's One Plan pertaining to the draft water-efficiency guidelines for public water supplies (as provided to AQUAS Consultants for review).

Policy 6-12: Reasonable and justifiable need for water

The amount of water taken by resource users shall be reasonable and justifiable for the intended use. The following measures for ensuring reasonable and justifiable use of water shall be taken into account when considering consent applications to take water for irrigation, public water supply or industrial use, and during reviews of consent conditions for these activities–

(c) For public water supplies, the following shall be considered to be reasonable–
(i) An allocation of 300 litres per person per day for domestic needs, plus
(ii) An allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
(iii) An allocation for industrial use calculated where possible in accordance with best management practices for water efficiency, plus
(iv) Any allocation necessary to cater for the reasonable needs of livestock or agricultural practices that are within the boundary of the public water supply system, plus
(v) Any allocation necessary to cater for growth, where growth of the municipality is reasonably forecast, plus
(vi) An allocation for leakage equal to 15% of the total of subsections (i) to (v) above.

Where the existing allocation for a public water supply exceeds the allocation calculated in accordance with subsections (i) to (v) above, the Regional Council will establish, in consultation with the relevant territorial authority, a timeframe by which the existing allocation shall be reduced to the calculated amount.

Policy 6-13: Efficient use of water

Water shall be used efficiently, including by the following measures–

(a) Requiring water audits and water budgets to check for leakages where appropriate,

(b) Requiring the use of, or progressive upgrade to, infrastructure for water distribution and/or irrigation that minimises wastage of water,

(c) Enabling the transfer of water permits in accordance with Policy 18-6,

(d) Requiring an investigation of seasonal storage options in areas where demand is likely to exceed availability during dry periods,

(e) Raising awareness amongst the Regional Community about water efficiency issues and techniques.

Policy 6-21: Apportioning, restricting and suspending takes in times of low flow

During times of low flow, takes from rivers shall be managed in the following manner–

(iii) Where rivers used for public water supply are below their minimum flows, as listed in Policies 6-17 and 6-18, public water supply takes shall be restricted to a total public water consumption calculated as follows–
(A) An allocation of 250 litres per person per day for domestic needs, plus
(B) An allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
(C) An allocation which meets the reasonable needs of hospitals, other facilities providing medical treatment, schools, other educational facilities, and abattoirs, plus
(D) Any allocation necessary to cater for the reasonable needs of livestock that are within the boundary of the public water supply system, plus
(E) An allocation for leakage equal to 15% of the total of subsections (A) to (D) above.

Appendix B
Approaches in Other Regions

B.1 Waikato

B.2 Greater Wellington

B.3 Canterbury

B.1 Waikato

In November 2004 Environment Waikato circulated a discussion document entitled *Issues and Options Paper for Water Allocation* asking recipients to reply to a predefined set of questions on the major water allocation issues facing the region.

Feedback on this paper informed the preparation of *Working Discussion Document: Water Allocation Variation*. The March 2006 version of this document notes that it is intended to provide a basis for consultation on the content of the draft policy which the Waikato Regional Council intends to propose in October 2006.

Relevant points from this document pertaining to efficient use of water are as follows (text quoted from the document):

Policy 5: Priority for Water Allocation
When the allocation level for any river exceeds either 70 percent of the allocable flow … or 70 percent of the sustainable yield for a ground water resource … water will be allocated in the following descending order of priority:
a. Essential domestic/municipal supply provided the need and efficient use is clearly established through a water management plan.

As a guideline this policy assumes that essential domestic use is 180 litres/person/day. This is noted as being based on an NZWWA guideline. There is no limit set in the policy, rather this number would be used as a guideline against which to measure efficiencies established in the water management plans. (Then questioned if lower guidelines should be included given current technologies – e.g. 130 possibly comfortably achievable.

Policy 7: Consent Application Requirements
When assessing resource consent applications for surface water takes or any subsequent water use, Council shall have particular regard to the following matters:
a. The applicant has a demonstrated need for the volume and rate of water sought and has identified and proposed appropriate water efficiency measures including an assessment of measures to be taken to reduce take and use during water shortages.
e. The applicant has demonstrated adequate consideration of alternative water sources including water harvesting and water reuse and that the current application is the best practicable option.

Policy 8: Applications for Municipal Supply
Any resource consent application for the take and subsequent use of water for municipal supply shall provide in addition to the provisions of other relevant policies in this document a plan that incorporates:
a. a water demand management plan
b. a drought management plan
c. a network efficiency and wastewater conservation plan, and
d. an analysis of the wastewater disposal requirements associated with the water take.

Policy 12: Levels of Priority to Apply During Water Shortages
The level of priority, in descending level of importance, for determining when water shortage restrictions shall apply is as follows:
a. Priority A consents: will generally include the essential domestic component of Municipal Supplies and stock water supplies …

3.3.4 Implementation Methods – Water Takes
3.3.4.2 Integration with Territorial Authorities
Environment Waikato will work with territorial authorities to:
b. encourage and assist territorial authorities to adopt water management tools to plan and manage future projected water use.

B.2 Greater Wellington

Greater Wellington (Water) collects and treats water supply for four city councils – Upper Hutt, Hutt, Porirua and Wellington. A water management plan is currently being developed, with intentions for it to go out for consultation in 2007. While no specific guidelines are currently in place, the ***Regional Freshwater Plan*** covers the issue generally (as follows):

Section 6.2.18 – To have regard to the following when considering an application for a resource consent to take water:

1. the amount of water required is reasonable, considering the intended use of the water
3. for any applicant taking water for public supply, the extent of any:
    - demand management programmes, or
    - drought management plans.

With the smaller TAs, approaches vary from one to the other, but generally rely on plans and measures not specific water-use targets (with Kapiti Coast being the exception – see below).

Masterton District Council proposed water-efficiency measures as part of their last consent application, and the consent states that they must implement the measures in accordance with that document.

For ***South Wairarapa*** District (Featherston and Greytown) the consent requires:

- Undertaking a programme of education to raise public awareness of water conservation issues and promote voluntary water conservation by the public;
- Investigating the efficiency of the distribution system and any leakage from the distribution system, pipe work and reservoirs;
- Planning for unusual events such as droughts;
- Investigating further water conservation measures and restrictions, including enforcing compliance with initiatives.

The consent for ***Carterton*** District water supply has the following condition:

The consent holder shall provide a report to the Wellington Regional Council every year prior to 31 May for the first five years of the consent, and thereafter at the request of the Regional Council, on progress with water-use reduction measures. These measures include:

- Active leak detection;
- Metering of extraordinary users and charging to discourage excessive use;
- Installation of bulk water meters;
- Providing advice through leaflets to community;
- Mains replacement;
- Staged water use restrictions;
- Toby valve replacement;
- Universal water metering for demand management and leak detection;
- Reservoir drawdown testing; and
- A revised strategy for minimisation via demand and supply management.

For the ***Kapiti Coast***, there are no specific conditions on the consent relating to water-use efficiency or conservation, but they do have to operate in accordance with a manual submitted to the Regional Council, which outlined water conservation measures. Council aims to reduce peak residential water consumption to *400 l/p/d*, consisting of 250 litres for essential use and 150 for non-essential uses. This applies to use by residential customers *only* (with commercial use tracked separately via metering and targets).

B.3 Canterbury

The ***Waitaki Catchment Water Allocation Regional Plan*** is an instrument of an independent Board established by Government to develop a plan for the catchment because Environment Canterbury (ECan) did not have an operative plan in that catchment at the time competition for the water resource was coming to a head.

Relevant points in the plan on ***efficient and effective use*** are as follows:

Policy 17 – By requiring resource consent applications for town and community water supplies or stock drinking-water supply systems to meet a reasonable use test in relation to the rate of abstraction and the volume of the proposal to take water, using as guidelines:
a. a volume of 300 litres per day per person based on the population to be supplied for domestic use
c. a reasonable quantity for other water uses supplied from the water supply system.

Policies on restrictions during times of low water availability

Policy 24 – By allowing consent holders to take water for domestic, stock drinking-water uses and for the processing and storage of perishable produce when rivers or lakes are at or below minimum flows or levels provided the amount taken does not exceed 250 litres per person per day based on the population being supplied at that time, plus actual stock drinking-water requirements, plus the minimum necessary to maintain fire-fighting capability and for the processing and storage of perishable produce. In addition, an allowance may be made for reasonable losses for reticulated supply schemes. The per-person provision for domestic uses includes residents and visitors being supplied at the time of the water shortage.

Policies that pertain to the broader region (separate from the Waitaki catchment) are covered in ***Variation 1 Proposed Natural Resource Regional Plan***. Chapter 5 deals with water quantity issues, with key points for community water supplies as follows:

Section 5.5.6 Reasonable and efficient use of water – Policy 17 notes that when processing applications for water permits, the efficiency of water use of the proposed activity, and of the measures intended for maintaining efficient use of water, will be considered.

Section 5.5.7, Policy 19 - Restriction of water use during times of low water availability.

19 (6) … takes shall be allowed up to 250 l/p/d based on current census population, plus an estimate of actual stock water drinking requirements, plus the minimum necessary to maintain fire-fighting capability. In addition, an allowance may be made for reasonable losses from reticulated supply systems, although this should decrease over time.

19 (7) … 19 (6) above shall not apply where the agency has a water supply asset management strategy that restricts (in an alternative manner) the use of water supplied by the supply scheme during periods of low water availability. This strategy must ensure that all practicable methods of water use conservation will be applied at the time of restrictions. Reporting on the implementation of this water supply asset management strategy during periods of low water availability shall be required. This alternative may be secured as a condition of consent.

The above per capita figures include water used for commercial purposes within the system, but not other uses as specifically stated (e.g., stock watering, fire fighting, protection of perishable produce) or a reasonable level of leaks and losses within the system.

Appendix C
Representative Water Systems
Completed Worksheets

C.1 Sample Worksheet

C.2 Bulls

C.3 Hunterville

C.4 Eketahuna

C.5 Levin

C.6 Feilding

C.1 Sample Worksheet

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Horizons Regional Council

Public Water Supplies – Water Efficiency Guidelines Project

WATER SUPPLY SERVICES WORKSHEET

for

[Name of District Council]

Provided to XXX xx July 2006

Public Water Supplies – Water Efficiency Guidelines Project

Review of Sample Water Supply Systems in the Region

Horizons Regional Council has asked AQUAS Consultants to examine the proposed efficiency guidelines for public water supplies. Part of this work involves looking at a few water supply systems in the region as examples to consider appropriateness of the guidelines and to explore opportunities for improved water-use efficiency.

This exercise will:

- help refine the guidelines to assist discussions amongst the Councils
- identify possible opportunities for improved efficiencies (particularly relating to customer water use) and provide this information to the District Councils for their own planning purposes.

This Worksheet provided to participating District Councils is the first step in the process. It is divided into three sections as follows:

- General Statistics & Trends
- Water Supply Services
- Demand Management Activities & Opportunities

The Worksheet is designed to capture and organise a range of helpful information on the water supply systems being examined. It isn't the intention to ask you to do any additional data gathering or tracking. Please just provide information that is readily available.

In completing the Worksheet:

- Data and responses can be inserted directly into this WORD document immediately following each item/question.
- If you are appending data or information to complete the Worksheet, please reference the item/question numbers here (1.1, 1.2, etc).
- If you organise your data in ways different to how it is described in the Worksheet, please enter it in whatever format is easiest for you.
- If data or information is currently unavailable for any items queried, please indicate.
- If any items do not apply to the water system, note 'n/a'.
- If you would prefer to relay any information on the telephone or in a meeting, please indicate and this will be arranged.

When we have reviewed the completed Worksheet, we will come back to you for any clarifications and additional information needed.

If you have any questions or concerns when completing the Worksheet, please call Gord Stewart on 07 577 1565 (or 027 416 5672) or by e-mail to gord@aquas.co.nz.

SECTION 1: General Statistics & Trends

Population

1.1 Population at 2001 Census

1.2 Estimate of current population (July 2006) *or* most recent estimate

1.3 Expected resident population in 2011 … in 2021 (*or* projected annual change in population)

Industry

1.4 Industry/commercial activities – what drives the economy of the area

1.5 Any anticipated change in industry/commercial activities in next few years (e.g. gain or loss of large businesses)

Other

1.6 Any data held by Council on typical/average age of the housing stock

1.7 Number of seniors/public housing units owned or managed by Council (if any)

1.8 Any other information that should be noted (i.e. things that might have an impact on demand for water)

SECTION 2: Water Supply Services

Source, system and supply info

2.1 Resource consent limits (per day, max flow rate, take during low flow, etc.)

2.2 Total storage/reservoir capacity for the system

2.3 Overall demand for water and seasonal variations
- Total annual production (note period)
- Average day demand
- Peak day demand
- Other (any other data/info tracked on water use)

2.4 Estimate of water loss/leaks
- As a percentage of total production
- Location/cause of losses

2.5 Any seasonal water shortages – time period (months of the year), frequency of occurrence (looking back 10 years say) and severity

2.6 Key concerns/issues looking ahead 1-2 years … 5 years … 10 years

Customer information

2.7 Number of customer connections
- Number with meters
- Number without meters

2.8 Number of *customers* served by water supply (different to population in 1.2?)

2.9 Customer breakdown (e.g. % of total connections *or* water use by customer class):
- Residential
- Commercial/industrial (including schools)
- Council use (community facilities, public toilets, etc)
- Agricultural
- Other

2.10 Any further breakdown of commercial/industrial customers (e.g. office/retail, manufacturing, hospitality)

2.11 Water rates (by customer type if it varies) – UAC, targeted rate, fixed annual charge, volume charge, etc.

Industry water use

2.12 List the 5 to10 largest water users and their annual use. Is the use seasonal?

2.13 Anticipated future increased needs from industry/agriculture - expansions, new arrivals, etc. (This may have been covered in 1.5.)

SECTION 3: Demand Management Activities & Opportunities

Revenue Water – Customer Level

3.1 List/describe any current demand management activities targeting customers
- Metering/volume pricing (could have covered this in 2.11)
- Information and education
- Promotion of water-saving technologies and practices
- Financial Incentives (e.g. rebates for low-flow showerheads)
- Regulatory (e.g. water restrictions)
- Recycling/reuse (stormwater, wastewater)

3.2 For any activities noted above, briefly describe the uptake, success, etc., to this point

3.3 Please list/describe any customer-level demand management activities you are *now* considering *or* planning

Non-revenue Water – Council use, leaks/losses, etc

3.4 Do you suspect there are any ways to improve water-use efficiency in Council facilities (offices, community halls, public toilets, etc)? If so, please list.

3.5 Please note (briefly) any *current* pressure management and/or leak detection/reduction efforts

3.6 Please list/describe any pressure management or leak detection efforts you are *now* considering *or* planning

3.7 Any other current activities *or* opportunities to reduce NRW in the system

In Addition

Any other information that might be helpful/should be considered and not covered in specific points in Sections 1, 2 and 3 above?

C.2 Bulls

Completed Worksheet received from RDC 9 August 2006, additions 28 August, reviewed by Council and finalised 4 September.

SECTION 1: General Statistics & Trends

Population

1.1 Population at 2001 Census - 1755

1.2 Estimate of current population (July 2006) *or* most recent estimate - 1812

1.4 Expected resident population in 2011 … in 2021 (*or* projected annual change in population)
2011 – 1900-2000
2021 – 2200

Industry

1.5 Industry/commercial activities – what drives the economy of the area
Services for the travelling public – cafes, public toilets, shops, etc.
Light commercial
Riverlands (beef) and Santa Rosa (chicken) processing.

1.6 Any anticipated change in industry/commercial activities in next few years (e.g. gain or loss of large businesses)
Air Force Block housing currently not fully occupied. With the expansion at Ohakea occupancy could increase significantly.
Riverlands has indicated they are likely to upgrade the plant to process more stock and would need more water (approx 600 cubic metres per day).

Other

1.6 Any data held by Council on typical/average age of the housing stock
Most appear to be 1960-1970's era.

1.7 Number of seniors/public housing units owned or managed by Council (if any) – 6 units

1.8 Any other information that should be noted (i.e. things that might have an impact on demand for water)

SECTION 2: Water Supply Services

Source, system and supply info

2.1 Resource consent limits (per day, max flow rate, take during low flow, etc.)
Water drawn from four shallow bores adjacent to Rangitikei River. Consent expires 16 January 2022. 1700 cubic metres/day, 33 l/s maximum flow

2.2 Total storage/reservoir capacity for the system - 767 cubic metres

2.2 Overall demand for water and seasonal variations
- Total annual production (note period)
- Average day demand 1200
- Peak day demand 1500
- Other (any other data/info tracked on water use)

Spreadsheet available.

2.4 Estimate of water loss/leaks
- As a percentage of total production
- Location/cause of losses

2003 Detection Services analysis reports a conservative loss of 6.2 m^3/hr and additional 'floating value' of 3.13/hr (total 9.33/hr). This gives conservative loss of 126 m^3/day and total possible 223/day (=11 to 18% of *current* total). The report also notes additional losses/excessive use possible at meat processing plant and some of NRW attributed to tanker fillings (which has since been addressed). Current NRW includes estimated 10 m^3/day water lost during treatment process.

2.5 Any seasonal water shortages – time period (months of the year), frequency of occurrence (looking back 10 years say) and severity
Every 2-3 years there tends to be times when the recharge rate in the well/bores reduces and 1700 cubic metres is not available. Hosing restrictions are put in place and industry is also restricted. Tends to be February to April period.

2.6 Key concerns/issues looking ahead 1-2 years … 5 years … 10 years
Drinking water standards. Storage.

Customer information

2.7 Number of customer connections 662
- Number with meters All properties except Air Force block which is bulk metered
- Number without meters

2.8 Number of *customers* served by water supply (different to population in 1.2?)

2.9 Customer breakdown (e.g. % of total connections *or* water use by customer class):
- Residential
- Commercial/industrial (including schools)
- Council use (community facilities, public toilets, etc)
- Agricultural
- Other

2.10 Any further breakdown of commercial/industrial customers (e.g. office/retail, manufacturing, hospitality)

2.11 Water rates (by customer type if it varies) – UAC, targeted rate, fixed annual charge, volume charge, etc.

$1.00 per cubic metre ($17.50 minimum charge every 4 months)

Industry water use

2.12 List the 5 to10 largest water users and their annual use. Is the use seasonal?

Riverlands	125,000 m^3
Santa Rosa	3,500
Café near bridge	3,000
Truck depot	2,500
McDonalds	1,800

Riverlands is seasonal with highest demand in February to April time when there is also slightly higher domestic use and when supply is more stressed.

Riverlands annual use gives an *average* of about 343 m^3/day, but this includes weekends and other times the plant is not operating. Demand *when operating* is about 500 ADD and 800 PDD as noted elsewhere.

2.13 Anticipated future increased needs from industry/agriculture - expansions, new arrivals, etc. (This may have been covered in 1.5.)

Riverlands extra 600 cubic metres per day

RNZAF extra 100-200 cubic metres per day

SECTION 3: Demand Management Activities & Opportunities

Revenue Water – Customer Level

3.2 List/describe any current demand management activities targeting customers
- Metering/volume pricing (could have covered this in 2.11)
- Information and education
- Promotion of water-saving technologies and practices
- Financial Incentives (e.g. rebates for low-flow showerheads)
- Regulatory (e.g. water restrictions)
- Recycling/reuse (stormwater, wastewater)

3.2 For any activities noted above, briefly describe the uptake, success, etc., to this point

3.3 Please list/describe any customer-level demand management activities you are *now* considering *or* planning

Council has ordered copies of the new NZWWA booklet *Savings in your HO_2USE*. Will be available for pick up at Council office, etc., and could do a distribution.

Non-revenue Water – Council use, leaks/losses, etc

3.4 Do you suspect there are any ways to improve water-use efficiency in Council facilities (offices, community halls, public toilets, etc)? If so, please list.

Considered when facilities are upgraded.

3.5 Please note (briefly) any *current* pressure management and/or leak detection/reduction efforts

Telemetry data collation and analysis

3.6 Please list/describe any pressure management or leak detection efforts you are *now* considering *or* planning

Next leak detection survey scheduled for 2010. Could possibly be done sooner if deemed to be a useful, cost-effective effort.

3.7 Any other current activities *or* opportunities to reduce NRW in the system

In Addition

Any other information that might be helpful/should be considered and not covered in specific points in Sections 1, 2 and 3 above?

Asset Age – Replacements of copper water mains and laterals have been carried out over the last few years.

The length of the pipe network for the rural scheme = 23 km
Number of connections = 662
Connections per km of pipe = 28.8

C.3 Hunterville

Completed Worksheet received from RDC 9 August 2006, additions 28 August, reviewed by Council and finalised 4 September.

SECTION 1: General Statistics & Trends

Population

1.1 Population at 2001 Census – 507 Hunterville township. Rural area no info available.

1.2 Estimate of current population (July 2006) *or* most recent estimate – 504

1.6 Expected resident population in 2011 … in 2021 (*or* projected annual change in population) – No change expected.

Industry

1.7 Industry/commercial activities – what drives the economy of the area
Rural area – sheep/beef farming, limited dairy farming.
Town – some services for travelling public including cafes and public toilets.

1.7 Any anticipated change in industry/commercial activities in next few years (e.g. gain or loss of large businesses)
No significant changes expected.

Other

1.6 Any data held by Council on typical/average age of the housing stock - properties date from 1900. Many houses 50 years plus old.

1.7 Number of seniors/public housing units owned or managed by Council (if any) - None

1.8 Any other information that should be noted (i.e. things that might have an impact on demand for water)

Rural scheme takes water from Rangitikei River via an infiltration gallery and apart from low dose chlorination there is no treatment. This scheme was established in the 1980s so most pipe materials are modern. It's a trickle-flow type system. The allocation of units is delivered over a 24-hour period and farmers must have at least 24 hours storage on-site.

The urban scheme was switched over to the Rangitikei River source when the rural scheme was installed. Further treatment and storage is provided for the urban area. Water meters were installed to all urban connections in February 2005. (See 2.3 regarding estimated reduction in water use as a result.) The pipe network is much older than for the rural system.

SECTION 2: Water Supply Services

Source, system and supply info

2.1 Resource consent limits (per day, max flow rate, take during low flow, etc.)
4968 cubic metres per day Consent renewal in 2007 and will be asking for around 2200 cu m/day

2.2 Total storage/reservoir capacity for the system
Rural 350 cubic metres
Urban 300 cubic metres

2.3 Overall demand for water and seasonal variations
- Total annual production (note period)
- Average day demand
- Peak day demand
- Other (any other data/info tracked on water use)

Urban – daily demand ranges from 170 to 300 cu m, with an average of 218. Demand was about 80 cu m/day higher before metering (= approx. 26% reduction)
Rural – summer daily demand about 1200 cu m; winter daily demand about 600 cu m

2.4 Estimate of water loss/leaks
- As a percentage of total production
- Location/cause of losses

Hunterville Urban – February 2003 report Jeff Booth Consulting Ltd report notes that minimum night flows for the entire reticulation was approx 8 cu m/hour and measured per hour per connection was deemed to be higher than acceptable. Detection Services work as a part of the analysis identified some 41 areas of water loss (including Council leaks, customer leaks and potential high users).
Current NRW includes estimated 5 cu m/day water lost during treatment process

2.5 Any seasonal water shortages – time period (months of the year), frequency of occurrence (looking back 10 years say) and severity. None

2.6 Key concerns/issues looking ahead 1-2 years … 5 years … 10 years
Meeting drinking water standards for urban supply. Identifying condition and performance of pipe network in urban area.

Customer information

2.7 Number of customer connections
- Number with meters
- Number without meters

Hunterville Rural – 158 all restricted supply (not possible to meter these type of connections)
Hunterville Urban – 243 all metered

2.8 Number of *customers* served by water supply (different to population in 1.2?)

2.9 Customer breakdown (e.g. % of total connections *or* water use by customer class):
- Residential
- Commercial/industrial (including schools)
- Council use (community facilities, public toilets, etc)
- Agricultural
- Other

Rural – mostly agricultural, a small number of domestic, school, commercial
Urban – mostly domestic, some light commercial and service (cafés, etc.)

2.10 Any further breakdown of commercial/industrial customers (e.g. office/retail, manufacturing, hospitality)

2.11 Water rates (by customer type if it varies) – UAC, targeted rate, fixed annual charge, volume charge, etc.

Hunterville Rural - $150 per unit per year (unit = one cu m/day)
Hunterville Urban $2.50 per cubic metre
Urban system water costs are capped and there is a degree of subsidy from general rates to keep the charge at $2.50/cu m

Industry water use

2.12 List the 5 to10 largest water users and their annual use. Is the use seasonal?

Major non-residential users
Potato Packers 2015 cu m/yr
Resthome 1400

2.13 Anticipated future increased needs from industry/agriculture - expansions, new arrivals, etc. (This may have been covered in 1.5.)

SECTION 3: Demand Management Activities & Opportunities

Revenue Water – Customer Level

3.3 List/describe any current demand management activities targeting customers
- Metering/volume pricing (could have covered this in 2.11)
- Information and education
- Promotion of water-saving technologies and practices
- Financial Incentives (e.g. rebates for low-flow showerheads)
- Regulatory (e.g. water restrictions)
- Recycling/reuse (stormwater, wastewater)

See 3.5

3.2 For any activities noted above, briefly describe the uptake, success, etc., to this point

3.3 Please list/describe any customer-level demand management activities you are *now* considering *or* planning

Council has ordered copies of the new NZWWA booklet *Savings in your HO_2USE*. Will be available for pick up at Council office, etc., and could do a distribution.

Non-revenue Water – Council use, leaks/losses, etc

3.4 Do you suspect there are any ways to improve water-use efficiency in Council facilities (offices, community halls, public toilets, etc)? If so, please list.

Very few Council facilities in Hunterville

3.5 Please note (briefly) any *current* pressure management and/or leak detection/reduction efforts

Hunterville Rural – water meters on branch lines read monthly and closely monitored to detect leakage.
Hunterville Urban – telemetry data collection and analysis

3.6 Please list/describe any pressure management or leak detection efforts you are *now* considering *or* planning

Next leak detection survey planned for 2010.

3.7 Any other current activities *or* opportunities to reduce NRW in the system

In Addition

Any other information that might be helpful/should be considered and not covered in specific points in Sections 1, 2 and 3 above?

Rural Scheme

Length of the pipe network for the rural scheme = 130 km
Number of connections = 158
Connections per km of pipe = 1.22

Urban Scheme

Length of the pipe network for the rural scheme = 10.3 km
Number of connections = 243
Connections per km of pipe = 23.6

C.4 Eketahuna

Completed Worksheet received from TDC 2 August 2006, additions 28 August, reviewed by Council and finalised 31 August.

SECTION 1: General Statistics & Trends

Population

1.1 Population at 2001 Census 558

1.2 Estimate of current population (July 2006) *or* most recent estimate 440

1.8 Expected resident population in 2011 … in 2021 (*or* projected annual change in population) Not known

Industry

1.9 Industry/commercial activities – what drives the economy of the area
Farming – mainly dairy and sheep

1.8 Any anticipated change in industry/commercial activities in next few years (e.g. gain or loss of large businesses)
No real large industry operating in Eketahuna and most likely to stay that way.

Other

1.6 Any data held by Council on typical/average age of the housing stock

1.7 Number of seniors/public housing units owned or managed by Council (if any)
Three one-bedroom units

1.8 Any other information that should be noted (i.e. things that might have an impact on demand for water)
Public swimming pool
Dairy farmers connected to intake line coming into town

SECTION 2: Water Supply Services

Source, system and supply info

2.1 Resource consent limits (per day, max flow rate, take during low flow, etc.)

Current consent is for 1600 m3/day. Beginning 13 Dec 2006 it reduces to 1424/day; beginning 13 Dec 2014 it goes to 1260/day. Maximum flow rate is 75/hour (21 l/s).

Low-flow conditions (until 2009): Up to 750/day at 15 l/s when river flow is between 412 and 325 l/s and 450/day when flow is below 325 l/s.

Low-flow conditions (2009-2019): as above plus third condition – Up to 165/day at 5 l/s when flow below 240 l/s.

2.2 Total storage/reservoir capacity for the system 450 m3 for town supply

2.3 Overall demand for water and seasonal variations – ADD and PDD figures in bullets below are for the total system including the approximately 10 dairy farms on the intake line coming into town as noted in 1.8.

- Total annual production (note period)
- Average day demand Feb 06 929 m3 April 06 842 m3 June 06 671 m3
- Peak day demand Feb 06 1138 m3 April 06 1004 m3 June 06 767 m3
- Other (any other data/info tracked on water use)

For town use (serving 440 population): February ADD 757 and PDD 944

2.4 Estimate of water loss/leaks

- As a percentage of total production
- Location/cause of losses

See Additional Information page for details

2.5 Any seasonal water shortages – time period (months of the year), frequency of occurrence (looking back 10 years say) and severity

Low river flows require water restrictions February/March at least every second year.

2.6 Key concerns/issues looking ahead 1-2 years … 5 years … 10 years

Customer information

2.7 Number of customer connections

- Number with meters 20
- Number without meters 230

Progressively working to meter all commercial customers and those with property > .9 ha

2.8 Number of *customers* served by water supply (different to population in 1.2?)

250 connections as in 2.7 serving a population of 440

(Some properties have more than 1 connection. There could be as many as 400 total connections.)

2.9 Customer breakdown (e.g. % of total connections *or* water use by customer class):

- Residential 208
- Commercial/industrial (including schools) 7
- Council use (community facilities, public toilets, etc) 5
- Agricultural 15
- Other 5 including the golf club
- Small Lifestyle blocks 12

			Cows	Heifers	Calves
T Burrell	9046	111.6945	290	63	50
A D Rasmussen	9050	88.012	229	50	50
L W Smith	9048	78.54	410	90	80
L W Smith	9070	81.93			
PJ & SM King Ltd	9047	126.312	328	70	62
G C Campbell	9038	255.17	473	100	94
Dewes Holdings	10284	164.798	428	94	85
R J Cresswell	9056	65.722	170	37	25
G B Hirst	9034	79.541	206	45	30
Paul Capes	Total	306.91	800	170	145
Paul Capes	8991				
Paul Capes	9043				
	Totals	***1358.63***	***3334***	***719***	***621***

Extra Land area within the town boundary 170 hec 420 acres at approx 4 sheep to acre equivalent of 1680 sheep in total

2.10 Any further breakdown of commercial/industrial customers (e.g. office/retail, manufacturing, hospitality) 2 Pubs and a Club

2.11 Water rates (by customer type if it varies) – UAC, targeted rate, fixed annual charge, volume charge, etc.

Non-metered pay $192.40 (incl GST) annually
Metered customers are billed quarterly, paying $0.48 per cu m for the first 100 cu m each period and $0.66 per cu m above that

Industry water use

2.12 List the 5 to10 largest water users and their annual use. Is the use seasonal?

Paul Capes 2480 m3
J Monaghan 2342 m3
C Anderson 1920 m3
Eketahuna Golf Club 1296 m3
H Moes 710 m3
Some of the above are farms in or on the edge of town ('inner farms).
This list does not include the farmers on intake line.

2.13 Anticipated future increased needs from industry/agriculture - expansions, new arrivals, etc. (This may have been covered in 1.5.)

SECTION 3: Demand Management Activities & Opportunities

Revenue Water – Customer Level

3.4 List/describe any current demand management activities targeting customers

- ❑ Metering/volume pricing (could have covered this in 2.11)
- ❑ Information and education
- ❑ Promotion of water-saving technologies and practices
- ❑ Financial Incentives (e.g. rebates for low-flow showerheads)
- ❑ Regulatory (e.g. water restrictions) Only when needed
- ❑ Recycling/reuse (stormwater, wastewater)

3.2 For any activities noted above, briefly describe the uptake, success, etc., to this point

When water restrictions are needed usually hand deliver letters to mail boxes around town to ensure receipt. Restrictions have little effect because of the range of extraordinary uses of water in the system. See Additional Information for details.

3.3 Please list/describe any customer-level demand management activities you are *now* considering *or* planning

Non-revenue Water – Council use, leaks/losses, etc

3.4 Do you suspect there are any ways to improve water-use efficiency in Council facilities (offices, community halls, public toilets, etc)? If so, please list.

3.5 Please note (briefly) any *current* pressure management and/or leak detection/reduction efforts

We are on the look out continuously for leaking troughs, pipes, illegal connections or unnecessary dual connections to the same property. See details in Additional Information.

3.6 Please list/describe any pressure management or leak detection efforts you are *now* considering *or* planning

3.7 Any other current activities *or* opportunities to reduce NRW in the system

In Addition

Any other information that might be helpful/should be considered and not covered in specific points in Sections 1, 2 and 3 above?

Length of the pipe in the network = 9.18 km into town + 12.2 km around town = 21.38 total
Number of connections = 250 - Could be as many as 400 – See 2.8
Connections per km of pipe (for 250) = 11.7

C.5 Levin

Completed Worksheet received from HDC 2 August 2006, additions 30 August, reviewed by Council and finalised 31 August.

SECTION 1: General Statistics & Trends

Population

1.1 Population at 2001 Census
19,527

1.2 Estimate of current population (July 2006) *or* most recent estimate
19,706

1.10 Expected resident population in 2011 … in 2021 (*or* projected annual change in population)
Anticipated growth of around +50 PA.

Industry

1.4 Industry/commercial activities – what drives the economy of the area
We have a primary rural servicing focus (with one large meatworks), although there are also a considerable amount in the fabric processing and dyeing area, as well as a large cardboard box factory.

1.9 Any anticipated change in industry/commercial activities in next few years (e.g. gain or loss of large businesses)
We have a number of new industry/commercial enterprises becoming established over a range of activities. A Loaded Hog brewery/bar/restaurant will be locating here and there is demand for industrial land.

Other

1.6 Any data held by Council on typical/average age of the housing stock
Levin has a considerable number of older houses with a significant number built in the 60's during a building boom in that era.

1.7 Number of seniors/public housing units owned or managed by Council (if any)
Total of 100, in groupings, maximum 30-40 in one location.

1.8 Any other information that should be noted (i.e. things that might have an impact on demand for water)
Levin is recognised as an area where a lot of people retire to. The population demographics have a much higher percentage from average number of retired residents. These people tend to have activities with higher water use than normal (such as enthusiastic gardeners).

SECTION 2: Water Supply Services

Source, system and supply info

2.1 Resource consent limits (per day, max flow rate, take during low flow, etc.)

"3. The average daily abstraction of water from the Ohau River under this permit shall initially be 10,000 cub mtrs with the objective of reducing this to a target average daily extraction of 8,000 cub mtrs by 31 December 1996.

4. The peak daily abstraction of water from the Ohau River under this permit shall be 18,500 cub mtrs until 31 December 1996.

5. The average daily abstraction of water from the Ohau River under this permit for the period 31 December 1996 until 31 December 2011 shall be determined from the Review of Conditions at 31 December 1996, and thereafter at 5 yearly review of periods.

6. The peak daily abstraction of water from the Ohau River under this permit during the period 31 December 1996 to 31 December 2011 shall initially be 24,000 cub mtrs and thereafter shall be determined from the 5 yearly review of conditions."

2.2 Total storage/reservoir capacity for the system
Currently a nominal 6,750m3 of treated water storage capacity.

2.3 Overall demand for water and seasonal variations
- Total annual production (note period)
  Total during 2005 - 3,105,679m^3
- Average day demand
  During 2005 - 8,509 m^3
- Peak day demand
  During 2005 - 12,656 m^3
- Other (any other data/info tracked on water use)

2.4 Estimate of water loss/leaks
- As a percentage of total production
- Location/cause of losses

It is suspected that a lot of these leaks would be present within the property boundaries, as evidence from new metering installations has found that to be the case at a very high proportion of installations.

Leakage rate in the system estimated at 18% based on total demand less metered amounts and an assessed average domestic flow taken from a sample of residential properties (50+) that have been metered for monitoring purposes.

2.5 Any seasonal water shortages – time period (months of the year), frequency of occurrence (looking back 10 years say) and severity.
There has been the need to impose Irrigation restrictions most summers for the purposes of (1) minimising excess water demand in an effort to match availability within the river source and (2) to ensure the water use does not exceed Consent limits.

2.6 Key concerns/issues looking ahead 1-2 years … 5 years … 10 years

Maintaining an adequate availability to meet residential demand particularly as the number of properties and residents increase, as well as retaining adequate capacity to meet industrial and commercial demands as the water use in these areas continues to increase.

Customer information

2.7 Number of customer connections 7,785

- Number with meters 1,297
- Number without meters 6,488

Metered customers are predominantly industrial and commercial properties. Council has considered implementing Universal metering, but deferred this following the LTCCP submission process.

2.8 Number of *customers* served by water supply (different to population in 1.2?)

7,785 connections serving population of 19,706

2.9 Customer breakdown (e.g. % of total connections *or* water use by customer class):

- Residential Approx. 80%
- Commercial/industrial (including schools) Approx 10%
- Council use (community facilities, public toilets, etc) Approx 5%
- Agricultural Approx 5%
- Other

Agricultural use is largely for horticulture and stock (beef, sheep) watering.

2.10 Any further breakdown of commercial/industrial customers (e.g. office/retail, manufacturing, hospitality)

2.11 Water rates (by customer type if it varies) – UAC, targeted rate, fixed annual charge, volume charge, etc.

UAC $212 (incl. GST) for 2006/07

Volume charge for metered customers is $0.65/m3 beyond 1m^3/day allowance covered by UAC.

Metered customers are billed quarterly – only sent an invoice if consumption is over the allowance for the period (i.e. 91 m3 for 91 days)

Industry water use

2.12 List the 5 to10 largest water users and their annual use. Is the use seasonal?

Levin Meats (abattoir)	318,000 some seasonal variations (see below)
Levin Eel	27,500 seasonal
Levin WWTP	21,200 regular
Rhodia chemicals	19,300 regular
Masonic Village	14,500 regular
Carter Holt	14,300 regular

Total for 6 above = 414,800 = 13.4% of total annual use in system

Levin Meats takes about 10% of total supply averaged over the year. Use varies from a low of around 700 m3/day in the winter to a high of around 1000 m3/day during summer.

2.13 Anticipated future increased needs from industry/agriculture - expansions, new arrivals, etc. (This may have been covered in 1.5.)

It is anticipated that a further 10% increase in demand will occur through both residential and commercial development during the next few years.

SECTION 3: Demand Management Activities & Opportunities

Revenue Water – Customer Level

3.5 List/describe any current demand management activities targeting customers

- ❑ Metering/volume pricing (could have covered this in 2.11) YES
- ❑ Information and education YES
- ❑ Promotion of water-saving technologies and practices YES
- ❑ Financial Incentives (e.g. rebates for low-flow showerheads)
- ❑ Regulatory (e.g. water restrictions) YES
- ❑ Recycling/reuse (stormwater, wastewater)

3.2 For any activities noted above, briefly describe the uptake, success, etc., to this point;

There is a noticeable difference in water use between residents on an on-demand (metered) charging regime compared with those on UAC rates. We have a number of residential properties throughout Levin that are monitored for water use which we can compare with metered residential properties in Ohau and in the rural areas.

There appears to be a reasonable level of compliance with respect to irrigation restrictions when imposed. Council has also employed inspectors to check on water use and report instances of abuse. A follow up note from Council usually has the desired effect.

3.3 Please list/describe any customer-level demand management activities you are *now* considering *or* planning

Council has also been undertaking inspections of some rural connections in order to detect any cases of interference with these installations. It is surprising to find a high level of tampering of some restricted flow connections to enable a higher flow rate to be obtained.

Non-revenue Water – Council use, leaks/losses, etc

3.4 Do you suspect there are any ways to improve water-use efficiency in Council facilities (offices, community halls, public toilets, etc)? If so, please list.

Council has metered most of the public facilities and is internally invoicing for this water use. The Managers responsible for those assets now have a financial incentive to minimise water wastage at these premises.

Assistance has also been provided to reduce water use, i.e. manual flushing systems on urinals and fitting dual-flush cisterns in some premises has reduced water use to some 15% of previous levels.

3.5 Please note (briefly) any *current* pressure management and/or leak detection/reduction efforts

Council has set up zones within Levin to enable District metering to be undertaken. The purpose of this has been to identify areas with elevated UFW factors that should be prioritised when undertaking an acoustic survey. Funding has been provided for these activities within the LTCCP. Metering of these areas with greater accuracy meters are planned to be fitted soon. Rural areas are metered separately but, with the equipment used, there could be leaks and losses that remain undetected.

3.6 Please list/describe any pressure management or leak detection efforts you are *now* considering *or* planning

There are a number of options that are being considered for further evaluation including pressure management.

3.7 Any other current activities *or* opportunities to reduce NRW in the system

In Addition

Any other information that might be helpful/should be considered and not covered in specific points in Sections 1, 2 and 3 above?

Length of the pipe in the network = 200 km
Number of connections = 7,785
Connections per km of pipe = 38.9

C.6 Feilding

Completed Worksheet received from MDC 2 August 2006, additions 30 August, reviewed by Council and finalised 25 September.

SECTION 1: General Statistics & Trends

Population

1.1 Population at 2001 Census
2001 13,641

1.2 Estimate of current population (July 2006) *or* most recent estimate
2006 estimate 13,731

1.11 Expected resident population in 2011 … in 2021 (*or* projected annual change in population)
2011 14,350 = estimated 4.5% increase in 11 years
2021 15,000 = estimated 9.2% increase in 15 years

Industry

1.4 Industry/commercial activities – what drives the economy of the area
Industry in Feilding is primarily one of supporting the farming community. There are a number of food processing industries that are high users of water. At present these industries largely source their water from private bores. However with more stringent export hygiene requirements there is a trend for these industries to rely more on the public supply.

1.10 Any anticipated change in industry/commercial activities in next few years (e.g. gain or
loss of large businesses)
There are no notable new industries expected to be developed in the near future. McCains Foods is closing down this year with the loss of about 150 jobs. There is high expectation that this site will be re-established with a replacement similar industry.

Other

1.6 Any data held by Council on typical/average age of the housing stock
Average age within the district, not specifically Feilding is 40 years

1.7 Number of seniors/public housing units owned or managed by Council (if any)
Council owns and manages 198 residential retirement units – mainly one-bedroom units and older complexes. Could be up to 20 in one location.

1.8 Any other information that should be noted (i.e. things that might have an impact on demand for water)

Feilding's proximity to Palmerston North means that it acts as a satellite town providing labour to the larger city. Feilding's growth can closely be attributed to the growth in Palmerston North and in the district as a whole, not solely on its own industrial expansion.

As in section 1.4 above: With the town now providing a higher quality of water there is an increasing requirement from industry to use the public supply as opposed to their traditional bore supplies.

The transfer of an estimated 1,000 Air Force families to Ohakea is expected to increase the population of Feilding to above the predicted figures.

SECTION 2: Water Supply Services

Source, system and supply info

2.1 Resource consent limits (per day, max flow rate, take during low flow, etc.)

Surface take – Barrows Rd: 9,000 m3 per day reducing to 7,000 m3 per day during low river flow conditions. Max rate of abstraction 140 l/s or 85l/s depending on river conditions.

Bore take – Newbury Line: 6,000 m3 per day at a maximum rate of abstraction of 280m3/hour

Bore take – Campbell Rd: 9,600 m3 per day at a maximum rate of abstraction of 400m3/hour

Total take (three above) = 24,600 m3 (22,600 during low-flow) Deep bores commissioned in 2001

2.2 Total storage/reservoir capacity for the system

1 reservoir in the reticulation system with a holding capacity of 6,800 m3

2 reservoirs at the Almadale WTP with holding capacities of 1,135 m3 and 6,045 m3

Total storage (three reservoirs) = 13,980 m3

2.3 Overall demand for water and seasonal variations

- Total annual production — 2,091,866 m3 annual production in 05/06 year
- Average day demand — 5,735 m3/day average demand in 05/06 year
- Peak day demand — 9,082 m3/day peak demand in 05/06 year
- Other (any other data/info tracked on water use) The telemetry system is being upgraded and this will enable real time collection and monitoring of water take and water use information.

2.4 Estimate of water loss/leaks

An in depth water loss survey has not been undertaken. Some assumptions using the night time low flow only are available. These are inherently inaccurate as the Fraser Drive reservoir fills during the night and the overnight commercial use is not known.

Using the overnight low flow on an average day the following figures are identified

Overnight low flow	=	100 m3/hour
Peak daily flow	=	375 m3/hour
Average daily flow	=	200 m3/hour

- As a percentage of total production
- Location/cause of losses Commercial use and reservoir recharge are both assumed to contribute to the overnight low flow volume in addition to system losses.

2.5 Any seasonal water shortages – time period (months of the year), frequency of occurrence (looking back 10 years say) and severity

Prior to the installation of the groundwater bores in 2000 water restrictions were and annual event.

However no water shortages are now occurring since the commissioning of the Newbury Line and Campbell Rd bores.

2.6 Key concerns/issues looking ahead 1-2 years … 5 years … 10 years

Replacement of old cast iron pipe is a priority over the next 3 years

Commencement of a study to assess the water loss within the reticulation system is planned to commence in the short term.

Better management of pressure differentials within the town to provide a more consistent level of service.

Attend to backflow protection issues within the reticulation system.

Customer information

2.7 Number of customer connections

There are 5,848 connections to the water supply system

- Number with meters — 343 connections are metered (6%)
- Number without meters — 5,505 connections are not metered (94%)

2.8 Number of *customers* served by water supply (different to population in 1.2?)

Same as population

2.9 Customer breakdown (e.g. % of total connections *or* water use by customer class):

It is not possible to determine this ratio accurately as all commercial users are not metered.

The total metered usage for 05/06 financial year was 369,852 m3. This represents 18% of the water consumed.

The best guess estimate is

- Residential — 80%
- Commercial/industrial (including schools) — 20%
- Council use (community facilities, public toilets, etc) — Insignificant
- Agricultural — Insignificant
- Other — Insignificant

2.10 Any further breakdown of commercial/industrial customers (e.g. office/retail, manufacturing, hospitality)

Not assessed

2.11 Water rates (by customer type if it varies) – UAC, targeted rate, fixed annual charge, volume charge, etc.

Water rates for Feilding $350 per year for non metered connections. Metered charges currently $0.50 per m3 plus a meter rental charge determined by the size of the connection.

Industry water use

2.12 List the 5 to10 largest water users and their annual use. Is the use seasonal?

1. Lamb Packers — 63,221
2. Feltex Carpets — 44,534
3. McCain Foods — 28,917
4. Manawatu Transport — 18,142
5. Feilding Intermediate — 11,178
6. Farmers Transport — 9,756
7. Feilding High School — 8,327
8. Empire Tavern — 7,172

9. North St School 6,883
10. Venison Packers 5,683

2.13 Anticipated future increased needs from industry/agriculture - expansions, new arrivals, etc. (This may have been covered in 1.5.)

Future demand increases are expected to be limited to urban growth.

SECTION 3: Demand Management Activities & Opportunities

Revenue Water – Customer Level

3.6 List/describe any current demand management activities targeting customers

- Metering/volume pricing (could have covered this in 2.11) Universal metering of all consumers is an ongoing debate in council. No intention to universally meter at this time.
- Information and education Water saving pamphlets available at customer services desk and readily supplied to consumers.
- Promotion of water-saving technologies and practices As above. 'Peter Pukeko' educational information available
- Financial Incentives (e.g. rebates for low-flow showerheads) None
- Regulatory (e.g. water restrictions) Water restrictions are now not required following recent augmentation of the water supply sources
- Recycling/reuse (stormwater, wastewater) None

3.2 For any activities noted above, briefly describe the uptake, success, etc., to this point

The 'Peter Pukeko' educational material has been very well received by schools

3.3 Please list/describe any customer-level demand management activities you are *now* considering *or* planning

Metering of extraordinary users is council policy where there is a likelihood of high water use.

Non-revenue Water – Council use, leaks/losses, etc

3.4 Do you suspect there are any ways to improve water-use efficiency in Council facilities (offices, community halls, public toilets, etc)? If so, please list.

Water use in Council facilities is minor. Normal maintenance requirements are implemented to minimise loss through leaking plumbing fittings.

3.5 Please note (briefly) any *current* pressure management and/or leak detection/reduction efforts

At this time no. See 3.6

3.6 Please list/describe any pressure management or leak detection efforts you are *now* considering *or* planning

Work in this area is considered a priority over the next 2 years and is identified in the Asset Management plan Development Plan.

3.7 Any other current activities *or* opportunities to reduce NRW in the system

As in 3.6 above. Plan is commence a Water Loss Study of the reticulation system.

In Addition

Any other information that might be helpful/should be considered and not covered in specific points in Sections 1, 2 and 3 above?

The recent commissioning of the water supply bores at Newbury Line and Campbell Rd coupled with the current upgrades to the Almadale WTP has advanced Feilding from a community that suffered from variable water quality and that faced severe water restrictions during summer months to a community that now has a robust, reliable water supply of good quality that is able to provide well-being to the community.
The next progression in the improvement of the water supply system is the evaluation of water losses within the system and the better management of pressure differentials experienced by consumers. There is a strong relationship between these two issues that will be addressed in the proposed Water Loss Study. (See 2.6 and 3.5 – 3.7.)

Length of the pipe in the network = 140 km
Number of connections = 5,848
Connections per km of pipe = 41.8