Kāpiti Coast
DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Kāpiti Coast Water Conservation Report 2015/16

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Revision History

Revision N°	Prepared By	Description	Date
1	Ben Thompson	Initial draft for review	27/7/16
2	Ben Thompson	Final draft for issue to AMG	1/8/16

Document Acceptance

Action	Name	Signed	Date
Prepared by	Ben Thompson		22/09/2016
Reviewed by	Martyn Cole		20 Sept 16
Approved by	Sean Mallon		20/9/16
on behalf of	Kāpiti Coast District Council		

1 Executive Summary

Kāpiti Coast District Council (Council) is committed to delivering a sustainable water management strategy and achieving the adopted water conservation target. This Water Conservation Report has been prepared to document:

- performance against the target in 2015/16
- the 2016/17 water conservation work programme.

This report covers the three water supplies managed by Council; Ōtaki Supply, Waikanae Supply (servicing, Waikanae, Paraparaumu and Raumati (WPR) and Paekākāriki Water Supply. The '2010 Water Conservation Plan identifies seven action areas. These are being actively delivered and include:

- Council leadership
- Better data, better results
- Reducing leakage in water supplies
- Regulation
- Financial Incentives
- Education
- Technical innovation

1.1 Key water conservation activates in 2015/16

In 2015/16 Kāpiti Coast District Council focused on:

- Continued water use management system improvements
- Supporting the first Charging Regime Advisory Group (CRAG) review on water pricing
- Continued assistance to the District's residents to reduce water use and repair leaks
- Monitoring network performance and targeted leak location and repair activities

1.2 Water use 2015/16

Despite the 2015/16 summer being drier than the 2014/15, there was a slight reduction in peak demand against last year. On average District peak daily use reduced to 420 lpd. While Ōtaki hasn't yet reached the target, there has been continued progress towards it. The WPR and Paekākāriki supplies met the 490 lpd target. Table 1 shows the peak day demand as litres per person per day (lpd) for each water supply and District-wide.

Year	Ōtaki	WPR	Paekākāriki	District-wide
2012/13	819	553	514	590
2013/14	777	532	486	557
2014/15	554	406	726	437
2015/16	511	404	475	420
	Progressing towards target	Target met	Target met	Target met

Table 1 Downward trends in peak water demand as litres per person per day for each Kāpiti supply

Figure 1 highlights the continued reduction in demand experienced in 2015/16.

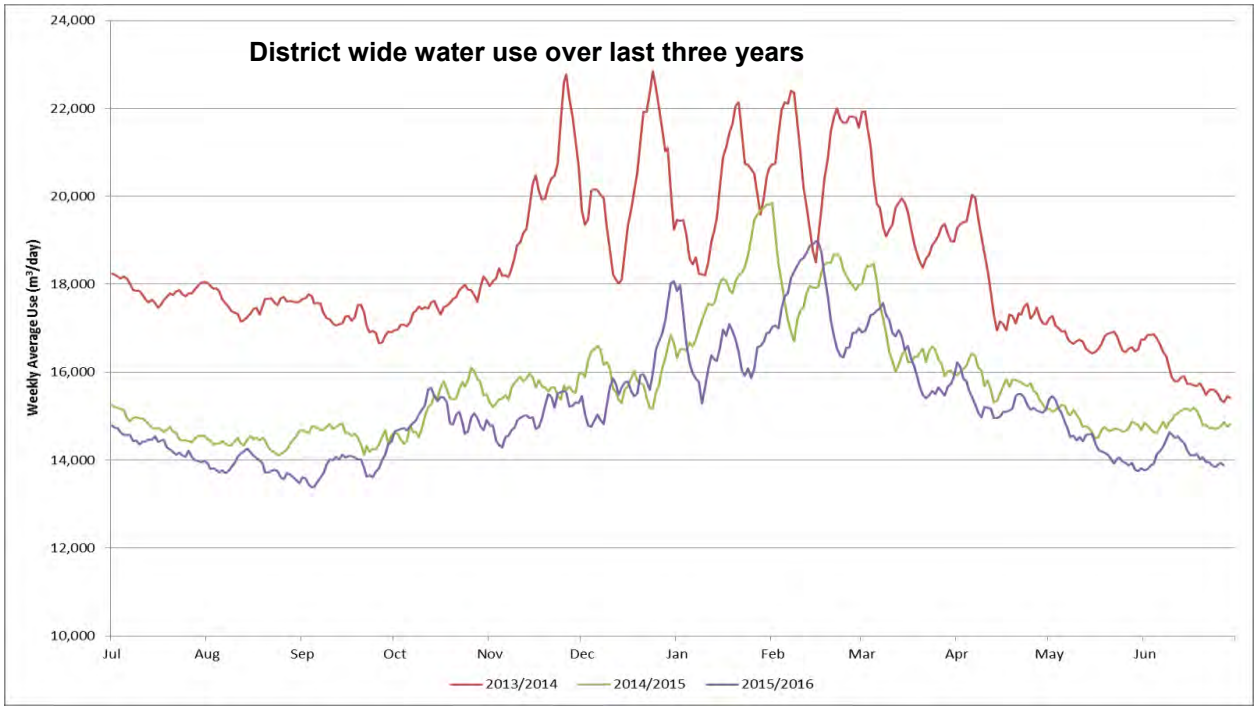

Figure 1 Changes in District water demand for the last three years since the installation of water meters and new metered charging in place

1.3 Maintaining the networks, investigating and repairing leaks

Using the improvements in the water use reporting Council undertook weekly reviews of trends in minimum night flows at District Meter Area (zones), network and at supply level. Council prioritised three zones for leak detection and repair (one in Ōtaki and two zones in Waikanae). The investigations covered 53.5km, 13% of the 420.9km of water networks (excluding Hautere Scheme). Table two shows the results of the surveys.

Leak type	Ōtaki Supply Estimated Water-loss(m^3/day)	WPR Supply Estimated Water-loss (m^3/day)	District Overall Total (m^3/day)
Public leaks	1	171	172
Private leak	76	68	144
Total	77	239	**316**

Table 4 Summary of estimated savings from leak investigations and repair for 2015/16

1.4 Water loss estimate 2015/16

This year Council has again improved the accuracy of the water loss calculation by using consumer water meter data, the Waterloss Benchmark approach and applying water use management improvements. Using this approach Council can also now calculate the 95% confidence levels for the results being +/-10.3%.

Current Annual Real Losses for 2015/16 are estimated as 3, 353 m^3/day (+/- 10.3%) against an average daily use of 15,169 m^3/day.

1.5 Work programme for 2016/2017

Council's focus for 2016/2017 will be on:

- Continued support of the community to use water wisely
- Analyse consumer water use to identify future reduction and education opportunities
- Complete the Water Communication and Engagement Plan to guide future communications
- Revisit 2014 Water Management Review to identify new priorities for improved management
- Continued monitoring of network performance and prioritise of leak location, repairs and renewals.

A total of $1.46 million of funding is available in 2016/17 for activities associated with the water conservation and demand management.

Contents

2 Introduction and overview

Kāpiti Coast District Council (Council) is committed to delivering a sustainable water management strategy and achieving the adopted water conservation targets. This Water Conservation Report has been prepared to document the progress towards those targets in the 2015/16 and set out works planned in the future to achieve and maintain water use targets.

This report covers the three water supplies managed by Council; Ōtaki Supply, Waikanae Supply (servicing, Waikanae, Paraparaumu and Raumati) and Paekākāriki Water Supply.

Kāpiti Coast District Council's key water use management documents are the 2003 Sustainable Water Management Strategy and 2010 Water Conservation Plan as described below.

2.1 Water Matters - Sustainable Water Management Strategy 2003

The 2002 Sustainable Water Management Strategy sets out Kāpiti Coast District Council's vision for water management in the district over the next fifty years. Central to this Strategy is there is considerable room within each catchment within the next fifty years for further development. That potential is only there if demand for water is reduced and there is careful management of water storage.

None of the communities are likely to reach the final capacity of their catchment within the fifty years of this Strategy – if they make a conscious effort to reduce demand. However, by the end of the fifty year period, at current population growth levels and with a stringent demand management regime in place, Waikanae will have come close to the capacity of natural systems to deliver water. If the community fails to adapt its levels of water use then the limits will be reached much earlier. If that happens, the desired balance between residential growth and supporting local economy may not be as achievable.

The Strategy set a peak water target of 400 Litre/person/day by 2013/14, with an additional 75 litres for leakage. To reach the target, Council recognized households, schools and businesses and Council itself each play their part. This was subsequently revised by the water conservation plan and consent requirements.

2.2 Kāpiti Coast Water Conservation Plan 2010

The Water Conservation Plan was designed to ensure Council and the community reached the 490 litres per person (lpd) per peak day target by 2016. It contains a series of measures and tactics. No one initiative alone will help reach the target but by combining them, it is hoped the peak water target can be reached and sustained.

The decision to implement water meter pricing in 2012 proceeded Council adopting the Water Conservation Plan in 2010. Water meters complement the activities outlined in the plan and provide more certainty that the 490lpd peak water target will be reached.

To reach the target, the Conservation Plan states it will be critical for Council, residents and business to each play a part.

Council has multiple roles in this, as a water supplier, reticulation network owner, a consumer of water as well as providing leadership and support to the community around finding ways to use water efficiently.

There are seven action areas in the plan:

- Council leadership – Council needs to demonstrate throughout its own activities that is walking the talk. Council also recognised its role in supporting local residents and businesses with good information on saving water.
- Better data, better results – with better information on where water being used and lost, Council can better target resources for better outcomes.
- Regulation – Council uses the District Plan to require new homes meet the 490 lpd target. The Water Supply bylaw to manage summer demand, water pricing and minimising wastage.
- Financial Assistance – Council offers an interest free targeted rate for households to install rainwater or greywater systems to offset public water use. Also offers rates support for hardship
- Education – Council recognised the importance of students of all ages understanding the importance of their water supply and the role water has in local life.
- Technical innovation – Council recognised the importance of new ideas and technology in assisting local businesses and residents save water.

Figure 2 The Kāpiti Coast Water Conservation Plan includes the seven action areas

This report uses the action areas to describe and detail the work undertaken by Council over the 2015/16 year and planned work for the 2016/17 year.

3 Consent requirements

A number of consents held by Council, including those for the development and operation of the River Recharge with Ground Water scheme, have water conservation consent conditions. The relevant consent conditions that this report addresses are listed below.

Water Permit WGN130103 [337590] Groundwater take

Condition 4 requires the implementation of water conservation and water demand management measures referred to in section 1.3 of the *Assessment of Environmental Effects* (Appendix 1) that accompanied the application as necessary to achieve the reductions in water demand necessary to reduce maximum peak daily water demand to 490 litres per person per day for the Waikanae, Paraparaumu and Raumati supply area by 31 July 2016.

Water Permit WGN130103 [33760] Surface water take

Condition 4 requires the implementation of water conservation and water demand management measures referred to in section 1.3 of the *Assessment of Environmental Effects* (Appendix 1) that accompanied the application as necessary to achieve the reductions in water demand necessary to reduce maximum peak daily water demand to 490 litres per person per day for the Waikanae, Paraparaumu and Raumati supply area by 31 July 2016.

Condition 25 requires the submission of an annual Water Conservation Report to the Manager by 30th August each year. The annual Water Conservation Report shall be made available to the public on the Kāpiti Coast District Council website by 30th August each year. The annual Water Conservation Report shall report on the year 1st July to 30th June inclusive, and includes Table 3 to assist in assessing report for compliance.

Water Permit WGN050025 [33147]

Condition 15b requires reporting on measures undertaken to investigate, implement and manage water conservation methods to reduce water demand on the Kāpiti Coast, including the introduction of water meters, any increases in population, any reduction in peak daily water demand and the achieved results of these measures.

Table 3 Condition 25 of consent WGN130103 [33760]

Conditions	Section in this annual report
a) Summary of the consent holder's progress towards achieving its water conservation target of 490 Litres/person/day;	Executive Summary
b) Details of peak summer daily use, expressed as L/person/day;	5.2
c) Outcomes of any water conservation measures to reduce peak demand, including but not limited to water meters;	4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7
d) A discussion of any reduction in peak daily demand;	5.2
e) Details of any increases in population	6.1
f) Investigations and work completed to identify and fix leaking water pipes;	4.3
g) Details of any planned work to identify and fix leaking water pipes in the coming year.	7.3

4 Water conservation and demand management activities 2015/16

4.1 Council leadership

4.1.1 Informed community

Over 2015/16 Council enacted a review of the water meter charging regime, which included how well the Council communicated the charging with the community and how well it promoted services that could assist local businesses or residents affected by water meter charging.

Council maintained the approach and mix of communication used over previous years. In 2015/16 Council began preparing a working draft of the Water Communication and Engagement Plan to inform future communication on water.

4.1.1.1 CRAG review on water meter charging regime

On 10 December 2015, Council resolved to reconvene the Charging Regime Advisory Group (CRAG) to review the metering regime. CRAG consisted of key stakeholders of the community who were tasked with assessing if the current metering regime was efficient and equitable.

The following sectors were represented in the CRAG process:

- Chair: Mr Don Hunn
- Grey Power: 1 member
- Council of Older Persons: 1 member
- background in financial skills: 1 member
- community interests and low income households: 2 members
- Chamber of Commerce: 1 member
- Landlord interest – 1 member
- Council: 2 Councillors
- Iwi: up to 3 representatives

All members were ratepayers or residents of the Kāpiti Coast District.

CRAG felt the charging regime has been widely accepted by the community with no evidence of widespread hardship or desire for change. While the CRAG group were satisfied with current charging structure they had two recommendations pertinent to keeping the community better informed.

- *Further steps should be taken to ensure the community is aware of the assistance available, both with leak detection as well as with high water invoices. It should also undertake a review of the criteria for high water invoices to ensure such assistance is more widely available to those in genuine need;*
- *Council continues to publicize the importance of water conservation as the best way to manage future costs as well as protect a finite resource, by limiting per capita consumption and postponing the need for further infrastructure development*.

4.1.1.2 Reviewing the Water Engagement and Communication Plan

During 2015/16 Council prepared a working draft of the Communication and Engagement Plan (the Plan) to guide ongoing communication with the community.

The Plan:

- outlined the work programme for water for the next ten years
- identified the key themes of managing the activity
- incorporated relevant recommendations provided through the CRAG review
- is cognisant of the Council Communication Strategy.

The final document will be completed in 2016/17.

4.1.1.3 Communicate with the public

Council ensured its website remained current. Council used its **Facebook page** and posts updates to inform the community and answer any question raised by the community.

Council contacted property owners if their high water use was suspected to be caused by a leak. In addition to the advice offered through the water conservation advisor service, a directory of local plumbers (including advice from consumer affairs on engaging a tradesman) was publically available and included with all leak notifications.

For the property owner, they found out they had a leak early and saved high costs in charges through fixing the leak. For the community, leaks fixed quickly, reduces water lost to unrepaired leaks.

4.1.1.4 Elected members and Council staff

Elected members were briefed on the CRAG report and their review of water pricing regime and the development of water rates for 2015/16.

Customer services staff remain critical to answering residents queries. As the front face of Council its important customer services is able to field people's queries efficiency as they are received.

Informed community outcomes

- CRAG review recommended improvements
- Working draft of Water Communication and Engagement Plan prepared
- Wide range of channels used to communicate with public
- Community had clear information to make decisions on improving their water use

4.1.2 Quality advice and information

4.1.2.1 Water Conservation Advisor (WCA)

Water Conservation Advisor offered free water conservation home visit service to offer advice (leaks and water use). Investigating high water use on private property and offering advice on repairing leaks was a large part of this service in 2015/16.

There were 664 visits over 2015/16.

4.1.2.2 Green Gardener

The Green Gardener offered free garden advice to residents to create water efficient gardens via articles, workshops and demonstrations. Throughout the year the Green Gardener:

- Provided weekly advice on Beach Fm
- Wrote monthly articles on gardening in Council publication Ontoit
- Ran fifteen workshops on water efficient gardening

The Green Gardener also worked with schools to encourage waterwise gardening practice. This included:

- Advising five schools, two colleges and two early childhood centres on their school gardens
- Creating a portal on Coucil website to link to water efficient garden resources
- Running four cluster meetings for teachers to upskill on waterwise gardening

The Green Gardener also kept in frequent contact with local gardening industry and provided workshops, dropped off brochures and feedback any concerns to Council.

4.1.2.3 Ecodesign Advisor (EDA)

Offered free independent advice on new, proposed and existing homes and this year undertook:

- **187 home visits:** As part of the resident's whole home consultation, awareness was raised on water conservation. Typically, water conservation makes up 20% of the two hour consultation and covers:
  - Water use in kitchens, bathrooms, WC, laundries and gardens;
  - Water meters; and
  - Explain what grey water and rain water collection is and how the water can be used,
  - Promote the Targeted Rate Funding for grey water and rain water collection and use.
  - Also provided free shower water flow rate bags, shower timers and WC water saving Gizmo where appropriate.
- **252 short contacts:** Residents asked specific questions about their homes. These included questions on residential water use. (See above)
- **12 presentations:** Delivered to community groups, professional groups and Government Departments: The whole home review presentation includes residential water conservation, rain and grey water systems and reading of water meters.

4.1.2.4 Rental market advice

Landlords and tenants each had a representative in CRAG. This ensured their views were incorporated in the review and final recommendations.

4.1.2.5 Community and business groups

Te Ati Awa, the Kāpiti Chamber of Commerce, Greypower, Council of Elders and Budgeting Services each had a representative in CRAG. This ensured their views were incorporated in the review and final recommendations.

The Water Conservation Advice service offered free advice to business around:

- Understanding their water consumption and potential causes of any unexpected high costs
- Addressing any private leaks

- Ways of reducing costs through saving water

Quality advice and information outcomes

- Targeted residents and businesses with high water use to support them to fix leaks or reduce their use
- Community water use awareness raised and residents informed of water use reductions actions and support available to them.

4.1.3 Reduce Council water use

Council provides a number of services for the local community requiring water. Council has made efforts to ensure it uses water efficiently.

4.1.3.1 New buildings and renovations

When Council builds new or renovates, it makes every effort to ensure water efficient appliances are installed and where possible the use of rainwater for toilet flushing and outdoor use. The Mazengarb soccer changing rooms for example utilising rainwater for all toilet flushing.

4.1.3.2 Irrigating sportsfields and amenity areas

All major Council sportsfields are now irrigated with onsite bores not from treated water supplies.

Council selects summer hardy plants for much of its amenity planted areas and concentrates annuals around town centre areas. This reduces the amount of water needed to areas with high pedestrian activity.

4.1.3.3 Coastlands Aquatic Centre has upgraded how it captures water use

Over 2015/16, Council trialled software to capture and monitor daily operational data from the Coastland Aquatic Centre. Readings of the pool water meter were taken two times a day. This allowed Council to identify trends in water use and address potential issues as they arose.

4.1.3.4 Water Use Reduction Plan

Council has a number of properties it owns, manages on behalf of other government agencies or leases to businesses or community groups.

Further work has been undertaken to inform on Council water use and identify water use reduction opportunities. The findings will be incorporated into the 2016/17 Water Reduction Plan.

Reduce Council water use outcomes

- Future proof new buildings to be water efficient
- Appropriate use on non-potable water sources
- Trialling software to track daily water use in a facility
- Identified water reduction opportunities.

4.2 Better data, better results

4.2.1 Understanding water use

4.2.1.1 Monitoring leakage and use across District networks and supplies

Over 2015/16, Council implemented the remaining stages in its Water Use Management project plan. The following work is now complete:

- All minimum night flow (MNF) reports for the water zones (distinct metered areas) in each network have been completed and uploaded into Wateroutlook live site. Each zone now has alert levels for prioritising leak detection. These are monitored weekly.
- Completed a pilot water balance report for the Paekākāriki Supply. This uses annual metered consumption and network data captured from SCADA to calculate water loss. The water balance process will be rolled out for other schemes over 2016/17.
- Council prepared a Water Use Management – Procedures Manual documenting the sources of water use data, Council's systems for data management, the transfer of data between systems, data validation and reporting processes.

4.2.2 Network performance, renewals planning and leakage reduction analysis

There are 19,693 service pipes (laterals) across the four main water supply schemes/networks of Ōtaki, Waikanae, Paraparaumu-Raumati and Paekākāriki. These have a total length of 102 km, which represents 20% of the total length of public water reticulation pipework.

The Council undertook an investigation into the condition of laterals in the network. The study assessed if there were any water loss issues and if further measures were needed to minimise losses.

The study identified a frequency of repairs and replacements for water laterals that was up to seven times the NZ Water Loss Guidelines' reference frequency. This indicates that there may be an issue with the performance of water laterals in the District (particularly in terms of material choice and length of the laterals). This was supported by the Council's Operations team who noted that laterals often contribute up to 80% of their workload for the water reticulation networks/schemes in the District.

While any lateral leak or burst will result in some water loss, currently it is not clear whether there are significant impacts from the performance of the District's laterals on water losses across the four schemes/networks. One of the challenges is accessing data from each intervention to build up a more detailed picture of the issue.

Figure 3 on page 9 outlines the studies recommendations. In line with the recommendations Council has:

- Continued reactive repairs and replacements for laterals that have more than three repairs
- Improved the data collected and monitoring of each lateral intervention
- Continued active leak detection efforts in zones that have the highest estimated levels of water loss
- Prepared cost estimates for lateral renewal options to be considered in conjunction with the 2016/17 mains renewals programme.

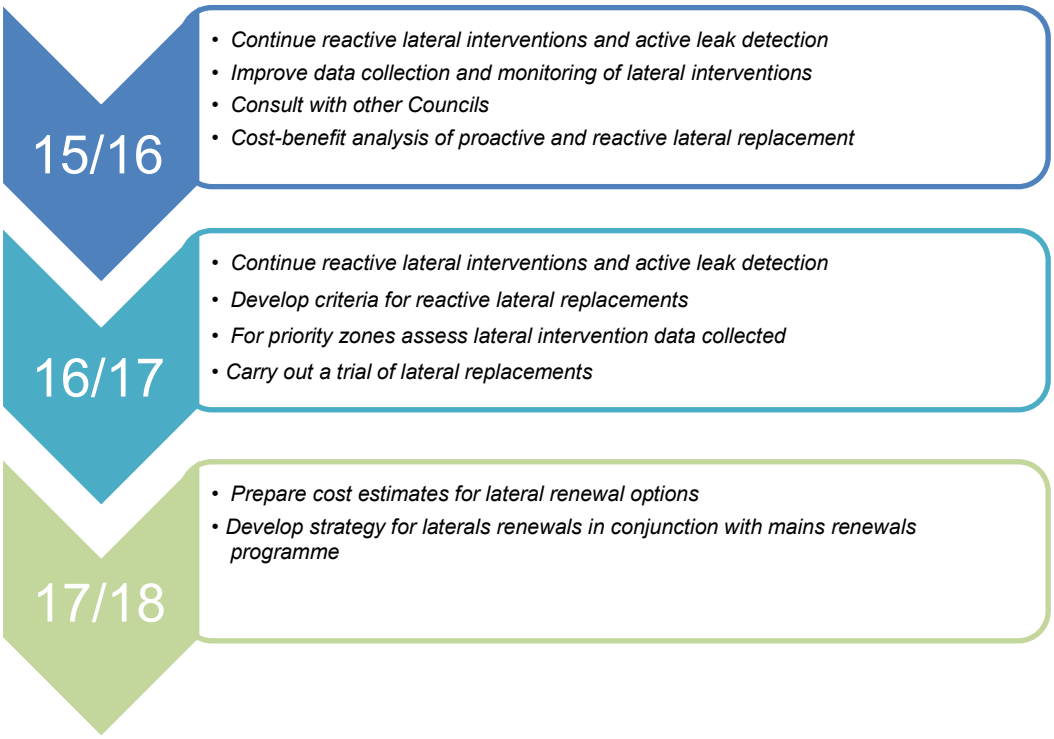

Figure 3 Recommended activities to carry out in relation to laterals over the next three years in the lead up to Council's next Long Term Plan 2018-2038

Better data, better results outcomes

- Completed the Water Use Management project, where each zone, network and supplies water use and loss being proactively monitored
- Council completed a pilot of the water balancing tool using the Paekākāriki supply
- Procedure manual completed on Council water management to ensure proper process followed
- Lateral study identified improvements in data collection, as well identifying areas to trial a lateral replacement programme in 2016/17.

4.3 Reducing leakage in water supplies

4.3.1 Finding and repairing leaks on the public side of reticulation network

4.3.1.1 Leak investigations

Council undertook weekly reviews of minimum night flows in each of the zones to identify zones for targeted leak detection and repair. Council developed alert levels based on historical performance of each zone to gauge priorities for leak detection.

After six months of weekly monitoring, one zone in Ōtaki and two in Waikanae were prioritised for leak detection and repair for 2015/16. The investigations covered 53.5km, 13% of the 420.9km of water networks (excluding the Hautere Scheme).

Ōtaki results

In Ōtaki, the Waitohu Zone showed signs of increasing minimum night flows. The leak sweep covered 15.3km (27%) of the Ōtaki Supply and 547 private connections (a mixture of rural and residential properties). The majority of leaks identified were private leaks. Figure 6 shows the results of how the minimum night flow changed after repairs undertaken from March 2016.

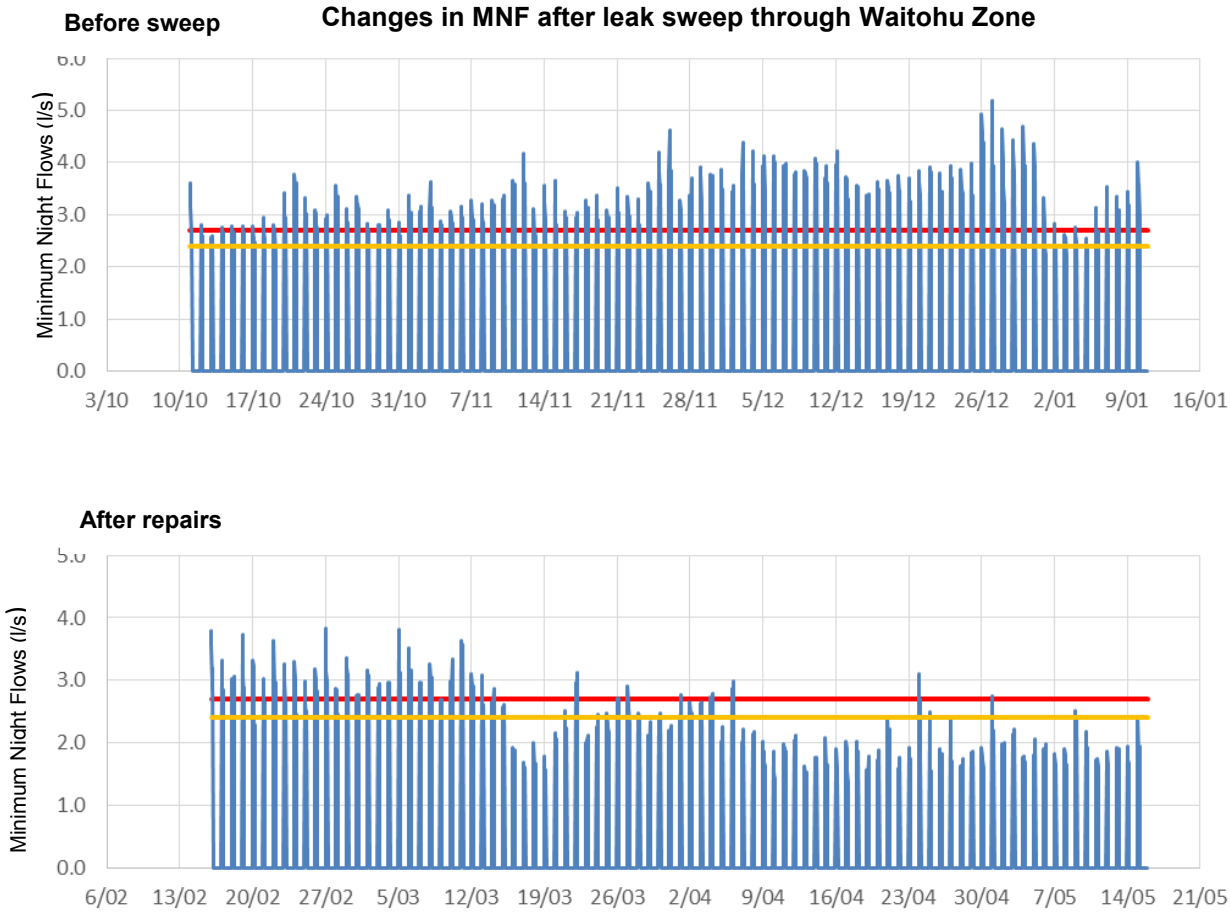

Figure 4 Impact on Waitohu MNF from leak detection and repairs.

Waikanae results

Council noticed the minimum night flows (MNF) steadily increasing in Te Moana and Hemi zones and being over the (orange) and (red) alert levels (shown in figures 5 &6).

In February, Council commissioned an acoustic leak sweep of each zone and covered 38.2km (42%) of the Waikanae Network and 2,805 properties.

Figure 5 and 6 show the public side leaks being repaired in the two zones over March and April, as well as private leaks being repaired after notification. The minimum night flows for both zones fell below the orange alert level.

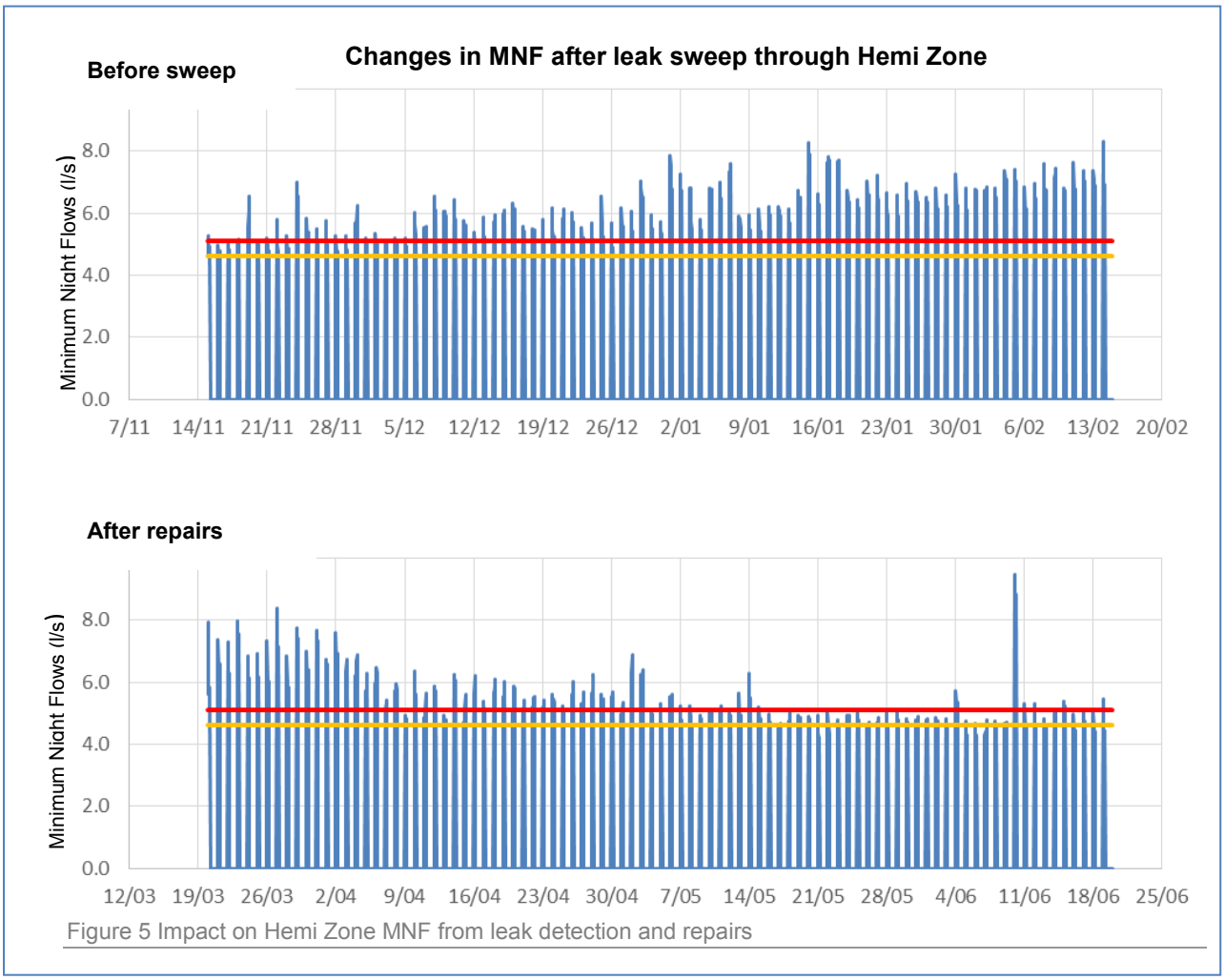

Figure 5 Impact on Hemi Zone MNF from leak detection and repairs

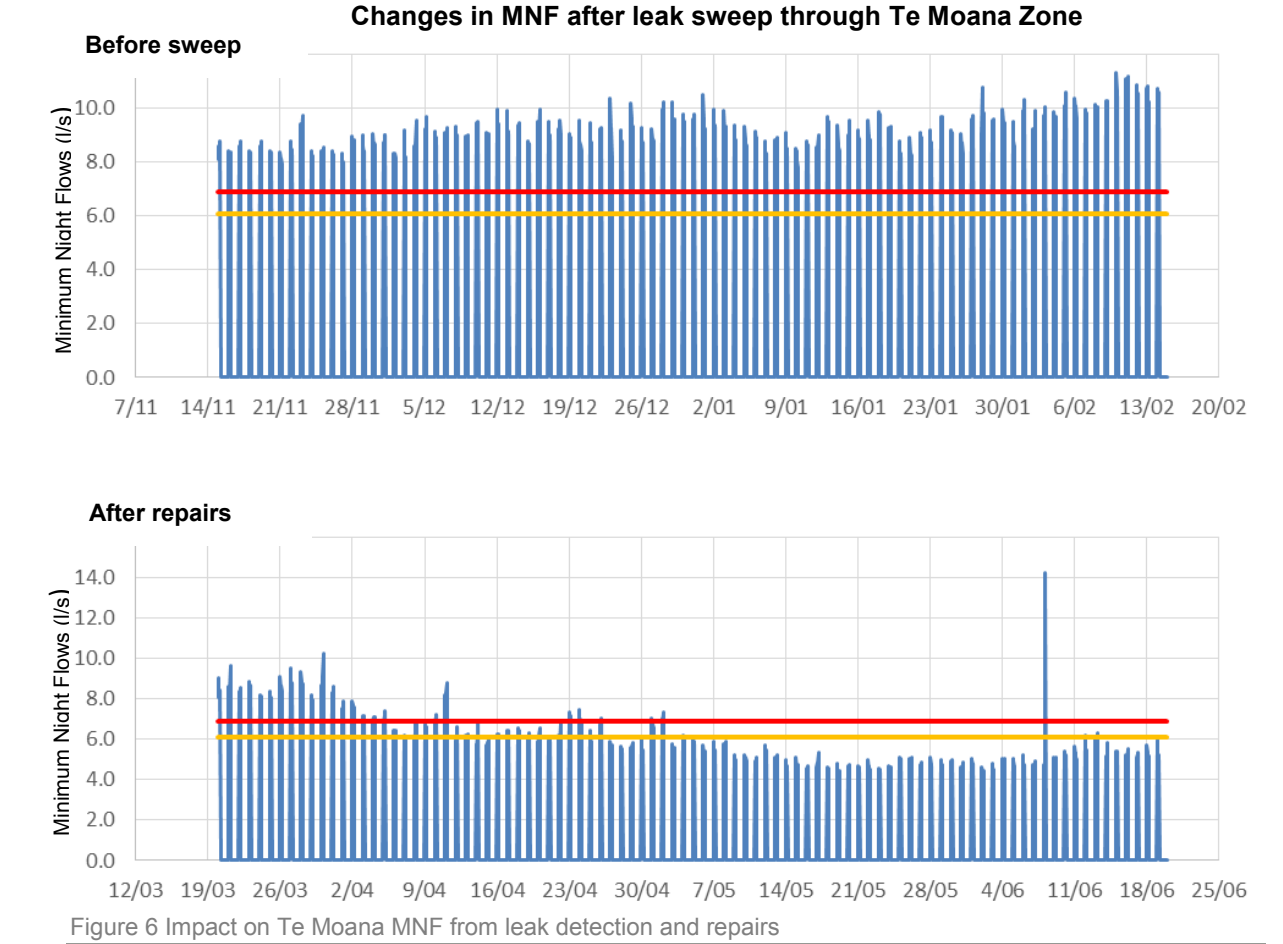

Figure 6 Impact on Te Moana MNF from leak detection and repairs

Summary of results

The surveys identified 31 suspected leaks totalling an estimated 316m^3/day water loss over the three zones. These have all now been repaired. Table 4 summarises the issues identified by the leak investigations.

	Ōtaki Supply		WPR Supply		
Leak Type	Amount of Issues Identified	Estimated Water-loss (m^3/day)	Amount of Issues Identified	Estimated Water-loss (m^3/day)	Estimated Water-loss Total (m^3/day)
Lateral	0	0	16	140	140
Valves or Tobies	1	1	4	31	32
Private leak	6	76	11	68	144
Estimated total water lost		**77**		**239**	**316**

Table 4 Summary of leak investigations and repair for 2015/16

4.3.1.2 Reactive and planned renewal work undertaken by Council

Table 5 shows the reactive and planned renewal work undertaken by Council in 2015/16 on the public networks to resolve leaks as they arose, as well as planned renewals.

Activity undertaken	Reactive or planned	Ōtaki Network	WPR Network	Paekākāriki Network	District Total*
Repair hydrants	Reactive	3	6		9
Replace hydrants	Reactive	5	10		15
Adjust hydrants	Reactive	1	7		8
Repair Main	Reactive	3	4		7
Repair Main - Asset Failure	Reactive	6	9	1	16
Repair Main (+/=100mm) - Asset Failure	Reactive	2	9		11
Install Main	Planned		2		2
Replace main	Reactive		1		1
Repair Valve	Reactive	1	16		17
Adjust Valve	Reactive		6		6
Replace Valve	Reactive	1	5		6
Repair Toby	Reactive	9	41	3	53
Replace Toby	Reactive	32	104	7	143
Adjust Toby	Reactive	5	11		16
Repair Lateral	Reactive	21	51	6	78
Repair Lateral - Third Party	Reactive		1		1
Repair Lateral - Asset Failure	Reactive	42	142	11	195
Replace Lateral	Reactive	12	53	2	67
Total		**143**	**479**	**30**	**651**
* Doesn't include Hautere Water Supply					

Table 5 Reactive leak maintenance on the each network over the 1 July 2015 – 30 June 2016 period.

4.3.2 Finding and repairing private leaks

After each billing cycle, Council assesses the water accounts for any properties using more than 2000 litres/day, or have experienced a 40% increase in water consumption for the quarter. The Water Conservation Advisor visits the properties to assess if there is a leak, a misread or high legitimate use.

If there is a leak, the Council sends the property owner a leak notification letter to fix the issue within 21 days, a directory of local plumbers who can help and a credit due to water loss application form (invites the property owner to apply for a credit on their water account if they fix the leak in a timely manner).

Finding and repairing leak outcomes:

- Continued systematic approach to the prioritisation of DMA leakage control activities
- 3 of the 19 zones, 9% of the network length surveyed for leakage.
- 316 m3/day of estimated leakage identified and repaired through leak surveys.
- Proactive investigations on private leakage after each billing cycle

4.4 Regulation

4.4.1 Council's District Plan water demand management requirements

Since 2008, Council has required all new homes with an on demand connection to Council water supply to include one of:

- 10,000 litre of rainwater storage to supply the toilets and outside taps. When the rainwater level falls below 1,000 litres, mains water will top up the tank at a rate of 600 litres/day.
- A greywater diversion device and a 4,000 litre of rainwater storage to supply the toilets and outside taps. When the rainwater level falls below 1,000 litres, mains water will top up the tank at a rate of 600 litres/day.
- An alternative solution that demonstrates it can achieve the reduced peak water use targets.

These requirements flatten any peak demands arising from outdoor use from new homes being built.

Council also developed communication material around complying with the District Plan requirements for home owners, builders, plumbers and real estate agents.

District Plan water demand management outcomes:

- Council approved about 172 District Plan compliant homes across the District over the 2015/16 period
- Council updated its guidance document around the District Plan water demand management requirements.

4.5 Financial Incentives

4.5.1 Credit due to fixing private leaks

Property owners can apply for a credit on their water account if they can provide evidence of fixing their private leak. Successful applicants were not charged for the water lost to leaks. The aim was to encourage property owners to fix their leaks.

333 property owners received credits on their water account for fixing leaks. In total 140,715m^3 of water was estimated to be lost by leakage and $139,308 of credits was applied.

Leak credit outcomes:

- Over 333 properties fixed leaks and sought a credit for water lost due to the leak.

4.5.2 Hardship grants

Council offered three schemes to support residents on limited income to assist residents in financial hardship.

- The General Hardship Rate Remission provides up to $300 towards rates. In 2015/16, 672 households obtained the General Hardship Rates Remission
- The Rate Remission for Significant Costs causing financial hardship provides up to $300 towards significant costs causing financial hardship. This includes repairing leaks. In 2015/16, 19 households obtained a Rate Remission for Significant Costs.
- The Water Rate Remission for Vulnerable Households relating to high water use provides a rates remission towards the cost of water for households with four or more dependents who receive the Working for Families Tax credit and meet other criteria. In 2015/16, 6 households obtained a water rates remission on their water account.

4.5.3 Interest free rates payback scheme

Council offers a $5,000 targeted rate for residents to install a rainwater tank or greywater system for outdoor irrigation. 20 properties have taken up the offer in 2015/16. A total of $90,091 of the $217,350 funding available has now been committed.

Interest free rates payback outcome:

- 20 properties took up the offer over the 2015/16 period.

4.6 Education

Water Education Service provided curriculum units and facilitator support for Early Childhood Education, Primary Schools and Colleges wanting to explore water supply and conservation as a topic.

Education outcome:

- Local students and their families had the opportunity to learn about water conservation and water metering.
- Two schools visited the Waikanae water treatment plant
- Three schools undertook field trips to Whareroa farm for water studies.

4.7 Fostering innovation

Council continued its “open for business” approach to companies developing new technology by providing feedback on any designs shown or legislation that may apply.

5 Water use results 2015/16

5.1 Changes in water use

The water demand over 2015/16 was similar to 2014/15. Figure 6 shows the continued reduction in water use that occurred over 2015/16. While 2015/16 was drier than 2014/15 average daily demand dropped slightly from 15,726 to 15,169 and peak daily demand from 20,019 to 19,617 cubic metres per day.

District wide water use over last three years

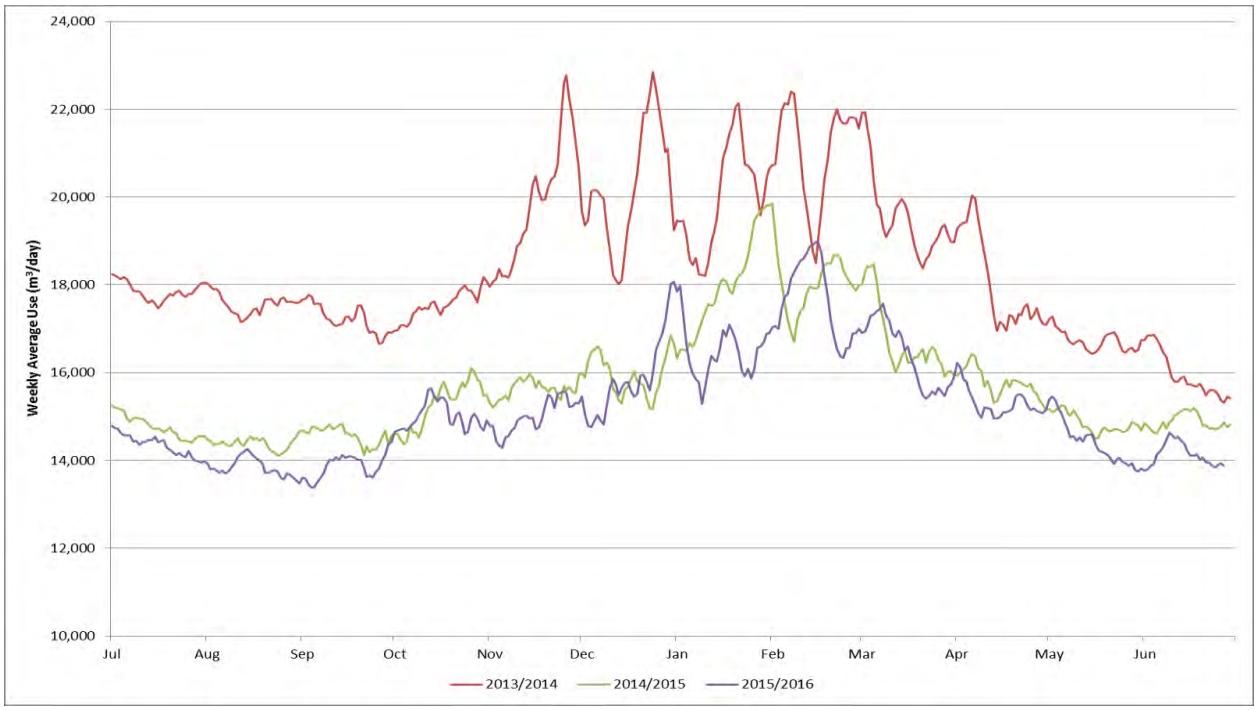

Figure 6 District wide water demand for the last three years has changed with the installation of meters and new metered charging in place

In the Ōtaki Scheme, there was a continued reduction in peak demand, with a reduction of 241m^3/day between 2014/15 and 2015/16. Average demand also decreased, with a change of 259m^3 between 2014/15 and 2015/16. Figure 7 shows the changes in water use between 2014/15.

In the WPR Scheme, there was a slight reduction in daily average demand from 12,442 m^3/day to 12,305 m^3/day and a slight increase in peak daily demand from 15,865 m^3/day to 15,901 m^3/day. Figure 8 shows how demand changed for WPR.

In the Paekākāriki Scheme, there was a dramatic reduction in peak demand from 2014/15, due to a number of leaks being repaired. Peak demand dropped from 1,193 m^3/day to 769 m^3/day and average demand fell from 711 m^3/day to 558 m^3/day. Figure 9 shows how the demand changed for Paekākāriki.

Water use in Ōtaki supply over last three years

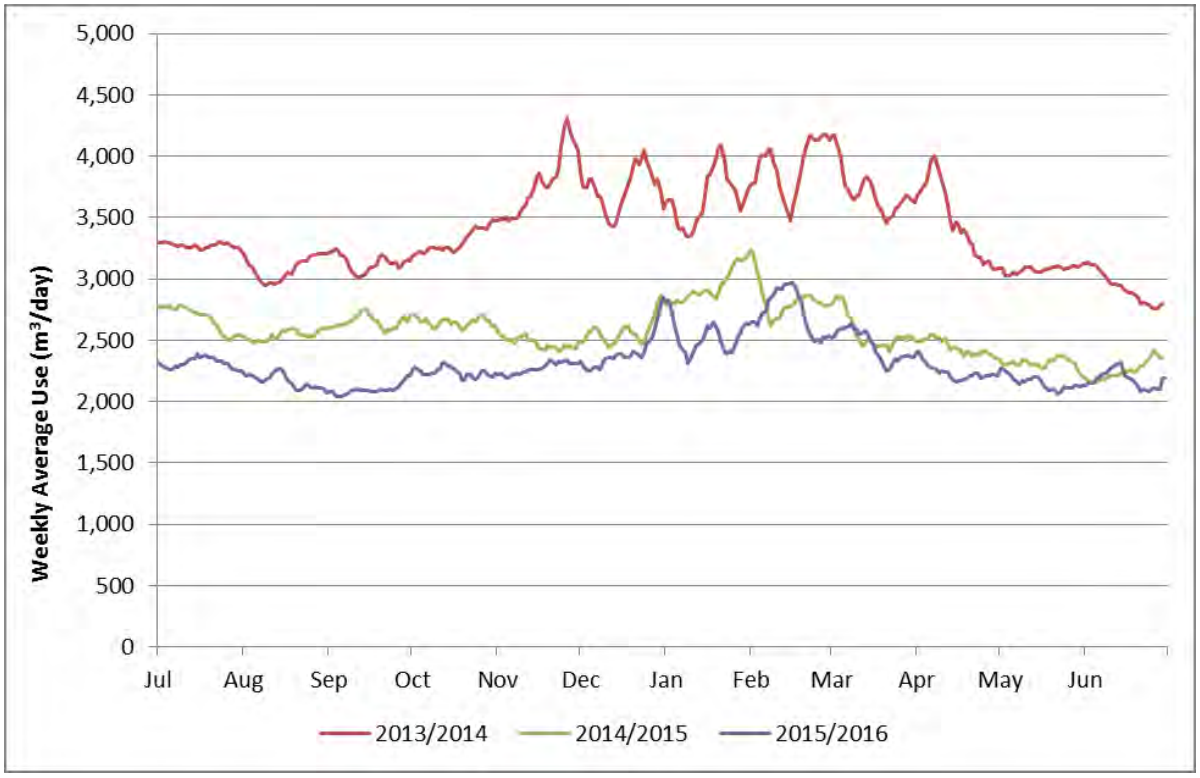

Figure 7 The Ōtaki water demand for the last three years has changed with the installation of meters and new metered charging in place

Water use in WPR supply over last three years

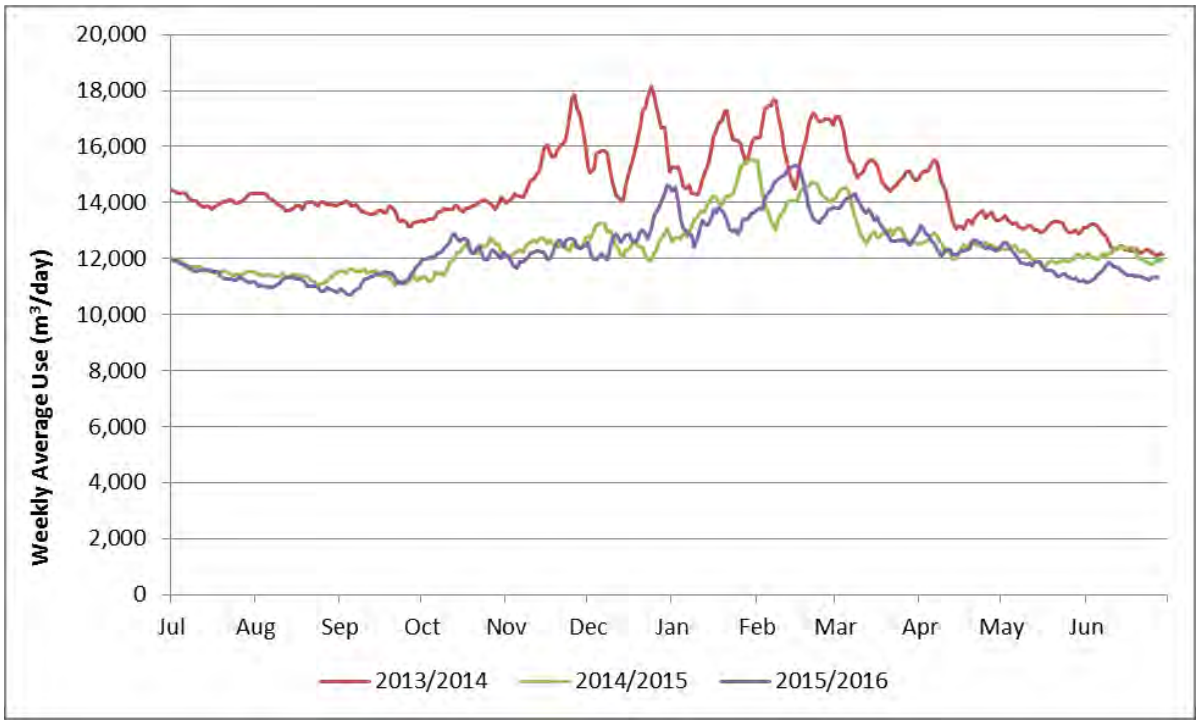

Figure 8 The WPR water demand for the last three years has changed with the installation of meters and new metered charging in place

Water use in Paekākāriki supply over last three years

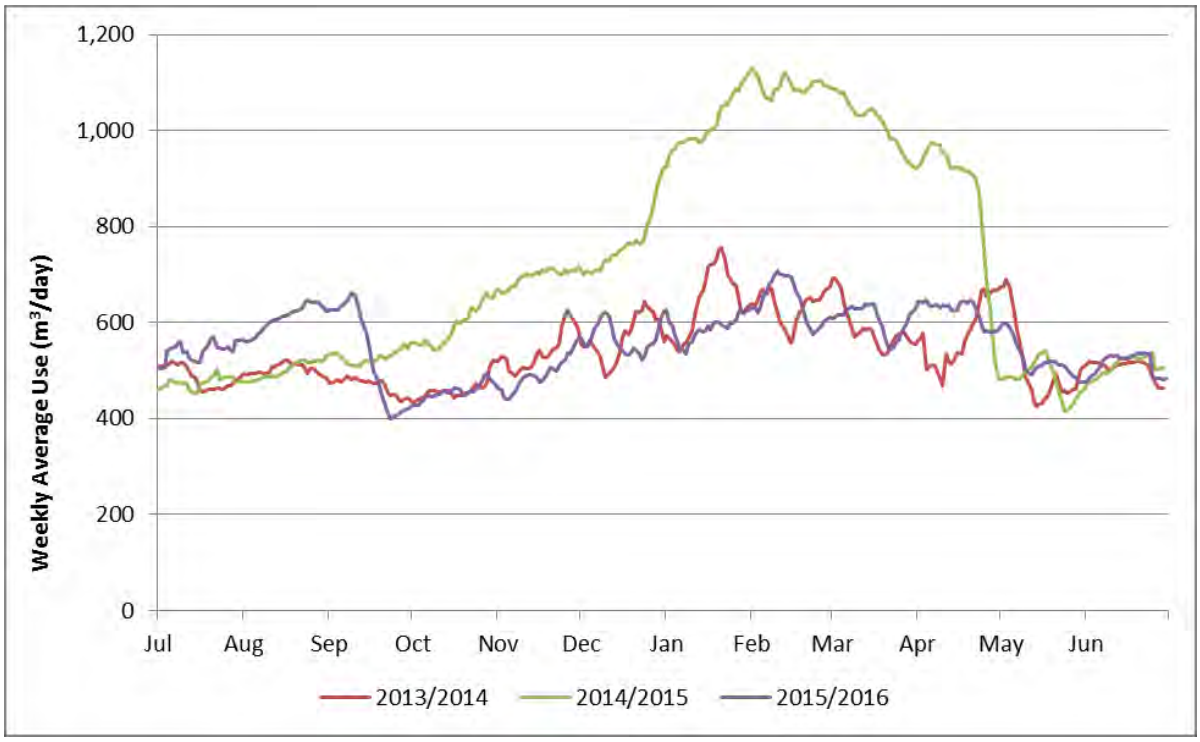

Figure 9 The Paekākāriki water demand for the last three years has changed with the installation of meters and new metered charging in place

5.1.1 Estimated water loss for 2015/16

Water loss is the difference between water input into supply (whether supplied or exported) and the authorised water consumption. After accounting for unauthorised use and under reading by meters (apparent losses) , the amount left is water lost to leaks, overflows or bursts. Figure 10 shows the standard components of water balance for New Zealand water supply distribution systems.

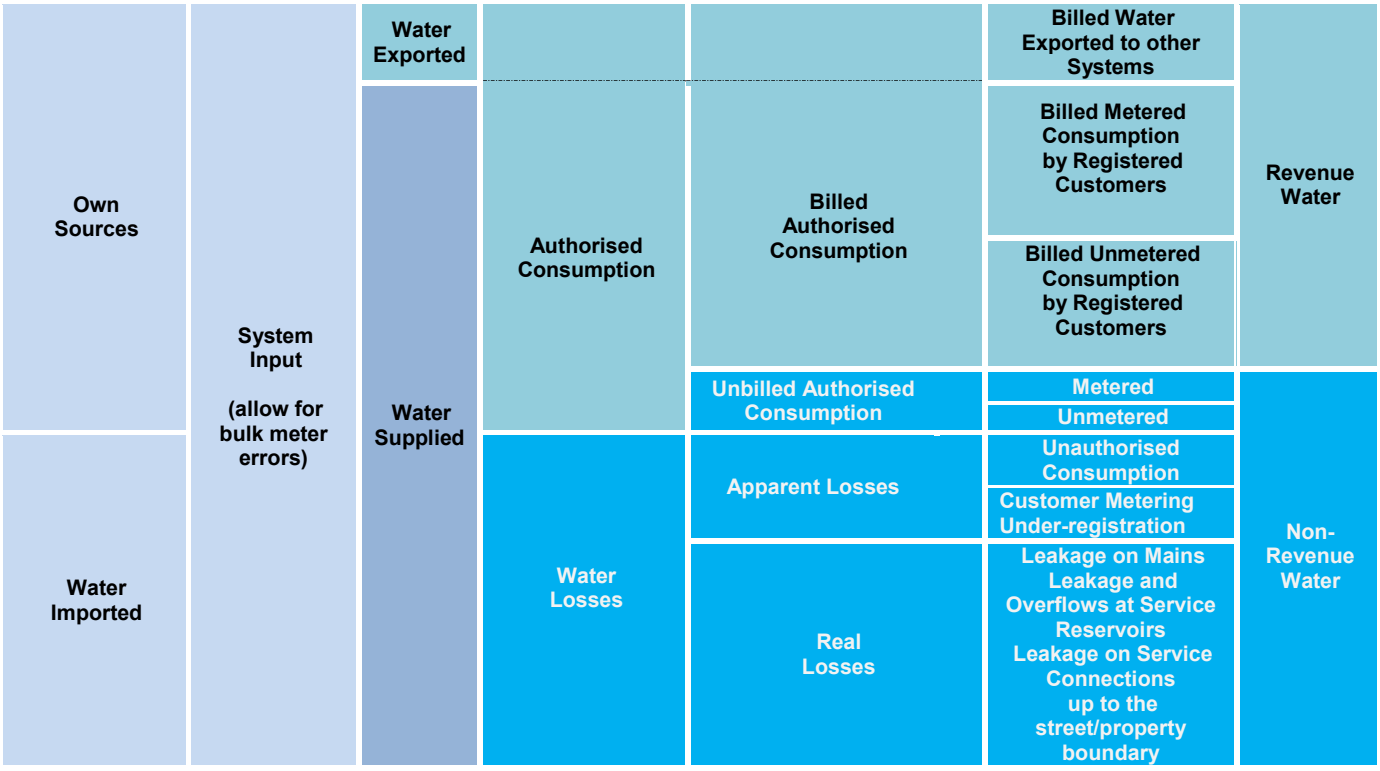

Figure 10 Standard Components of Water Balance for New Zealand Water Supply Distribution Systems

In 2014/15, Council used water meter records to revise the allocation of estimated water loss in 2012/13 improving the understanding of private verses public water losses. This year Council has improved the accuracy of the water loss calculation with water meter records and by using the Waterloss Benchmark (shown figure 10) and water use management improvements. Using this approach Council can also now calculate the 95% confidence levels for the results being +/-10.3%.

Table 6 shows the 2014/15 and 2015/16 averaged daily water loss estimates across the District. Table 6 also includes the daily water loss estimate, as defined by Department of Internal Affairs of real water loss, meter under-registration and theft.

Water losses	2014/15 (m^3/day[1])	2015/16 (m^3/day[1])
Current Annual Real Losses (CARL)	3,680	3,350 (+/- 10.3%)
CARL, meter under-registration and theft	-	3,580 (+/- 10.3%)

Table 6 Estimated water loss results for 2014/15 and 2015/16.

5.2 Peak water use

All water supplies, apart from Ōtaki reached the 490 lpd target. Figure11 shows peak water use has declined in all water supplies across the District. The District peak day demand of 420 lpd was a 3% reduction from peak demand in 2014/15.

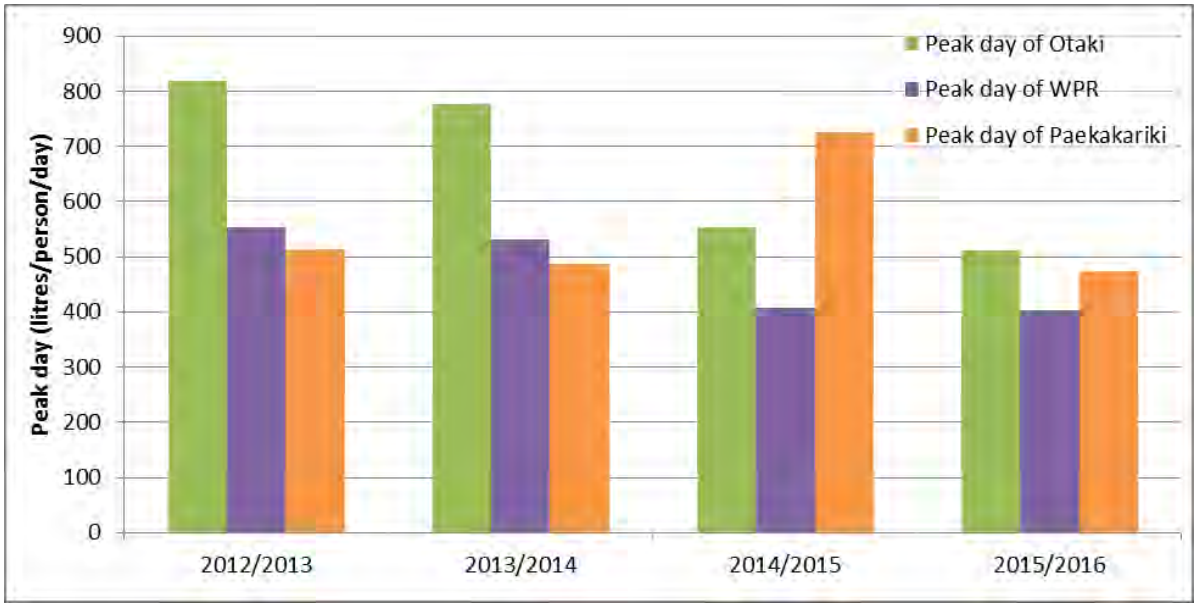

Figure 11 Changes in peak water use since water meters introduced

The peak water use for the three water supplies for 2015/16 and the preceding years is shown in and Table 7.The district's peak water use dropped slightly since last year, despite 2015/16 summer being one of the driest on record. While the Ōtaki supply fell slightly, the peak demand still sits above the 490lpd target. The peak water use across the WPR saw only a slight reduction and Paekākāriki has now met the 490 lpd target.

Year	Ōtaki	WPR	Paekākāriki	District-wide
2014/2015	554	406	726	437
2015/2016	511	404	475	420
Result 2015/16	On target	Target met	Target met	Target met

Table 7 Peak consumption for each network and high water use days

[1] Rounded to nearest 10 m^3/day

6 Population changes

6.1 Population figures

Council uses the New Zealand Census "Usual resident population" data for population calculations. In the inter-Census years, Council uses population estimates developed for Council's 2015 Long Term Plan. To calculate the per capita consumption the census area units are overlaid with the water supply area boundaries and populations allocated to DMAs and Water supply schemes.

Population source	Year	Ōtaki	WPR combined	Paekākāriki	District Total
Census 2006 Usually Resident Population	2005/06	5,466	35,748	1,590	42,804
Census 2006-2013 linear interpolation	2006/07	5,540	36,055	1,604	43,200
Census 2006-2013 linear interpolation	2007/08	5,615	36,363	1,619	43,596
Census 2006-2013 linear interpolation	2008/09	5,689	36,670	1,633	43,992
Census 2006-2013 linear interpolation	2009/10	5,763	36,977	1,648	44,388
Census 2006-2013 linear interpolation	2010/11	5,837	37,284	1,662	44,784
Census 2006-2013 linear interpolation	2011/12	5,912	37,592	1,677	45,180
Sum of 2013 zone population estimates from Census 2013 Usually Resident Population aligned to zone boundaries	2012/13	5,986	37,899	1,691	45,576
2013 to 2018 linear interpolation	2013/14	6,022	38,281	1,668	45,971
2013 to 2018 linear interpolation	2014/15	6,059	38,663	1,645	46,366
2013 to 2018 linear interpolation	2015/16	6,095	39,045	1,622	46,761
2013 to 2018 linear interpolation	2016/17	6,131	39,427	1,598	47,156

Table 8 Population numbers connected to each water supply

6.2 Calculating per capita water consumption

The flow meters for reservoirs and zones report to Councils SCADA system were flows are recorded and daily totals calculated. Council calculates the daily per capita water consumption by dividing the daily reading by population to give an average water litres/person/day. This is recorded for the Ōtaki, Waikanae, Paraparaumu and Raumati networks, for WPR as a whole and Paekākāriki.

7 Water Conservation and Demand Management Activities 2016/17

7.1 Council leadership

7.1.1 Informed community

7.1.1.1 Investigate recommendations made by CRAG

In their final report, CRAG recommended Council:

- *Further steps should be taken to ensure the community is aware of the assistance available, both with leak detection as well as with high water invoices.*
- *It should also undertake a review of the criteria for high water invoices to ensure such assistance is more widely available to those in genuine need;*
- *Council continues to publicize the importance of water conservation as the best way to manage future costs as well as protect a finite resource, by limiting per capita consumption and postponing the need for further infrastructure development*.

These recommendations will be incorporated into the Water Communication and Engagement Plan.

7.1.1.2 Communications and engagement planning

Council will complete the Water Communication and Engagement Plan to guide future communications. Work in 2016/17 will cover:

- Refine the working draft of the Plan
- Finalise the Plan for keeping the community informed on issues relating to water.

7.1.1.3 Digital support

Council will ensure it keeps the information current and up to date on water. Council's Facebook page and other channels will be used to inform the community and identify and answer any questions from the public.

7.1.1.4 Elected members and Council staff

Elected members and Council staff will continue to be kept up to date with developments in water.

7.1.2 Quality Advice and information

7.1.2.1 Water Conservation Advisor

Water Conservation Advisor will continue providing the free water conservation home visit service to offer advice (leaks and water use).

7.1.2.2 Green Gardener

Green Gardener will continue offering free garden advice to residents, community groups and schools to create water efficient gardens via articles, workshops and demonstrations.

Over 2016/17 Green Gardener will be working alongside local community gardens to set up low cost demonstration gardens.

7.1.2.3 Ecodesign Advisor

Ecodesign Advisor will continue including water conservation in the two hour assessment of resident home's.

7.1.2.4 Community groups and business

While water meters have been implemented, experiences in other areas show it takes time for community to adjust. Council will continue to be available to assist community groups adjust to the new charging scheme. A focus on providing a tool for water wise businesses to undertake a water audit will be progressed from the work undertaken with schools to date.

7.1.3 Reduce Council water use

All Council properties pay applicable rates in accordance with the ratings Act (2002) including water rates. Council will monitor and continue to seek ways to reduce water use at properties under its control using the information provided by water metering.

Over 2016/17, Council aims to:

- Identify and analyse water use in areas managed by Council
- Prioritise areas for further investigation
- Pilot a water audit on a key Council asset

7.2 Better data, Better results

7.2.1 Zone metering

7.2.1.1 Monitoring leakage across District networks and supplies

The Council has completed the Water Use Management project plan. Systems are in place with alerts for each zone and weekly review of night flows is now standard practice. The Council will use these reports to prioritise zones for targeted leak detection programme.

7.2.2 Understanding water use

Using the consumer meter readings, the accuracy of system and zone water balance calculations will be significantly improved allowing increased confidence in water use figures to target active leakage control, repairs and future renewals.

With the completion of the work programme arising from the 2015 Water Management Project, Council will revisit the 2014 Water Management Review report and identify priority areas for improved management.

Over 2016/17 Council aims to:

- Roll out water balance process for all water supplies
- Incorporate pressure levels from Ōtaki and WPR water models (due to be completed in March 2016) into water balance calculations. This will further improve the accuracy of water loss levels.
- Investigate water use by sector to identify trends in use to identify future engagement initiatives

- Revisit the 2014 Water Management Report to identify priority areas for improved water management

7.2.3 Network performance, renewals planning and leakage reduction analysis

Council will progress the recommendations in the 2016 lateral investigation report. Over 2016/17 Council will:

- Improve how it captures asset information on each lateral repair or replacement. This will help identify priority areas for lateral replacements. Developing a mobile field solution for capturing asset data will be a priority for 2016/17
- Develop criteria for reactive lateral replacements, so in future laterals will be replaced rather than repaired if criteria met.
- Trial a lateral replacement programme based on criteria developed.

7.2.4 Investigate the high minimum night flow anomaly in Kakariki Zone

The Kakariki zone has high night flows compared to the other zones in the Waikanae network. Active leak detection surveys have been completed in the zone, but the night flows have not reduced substantially. This anomaly will be investigated by Council over 2016/17.

Council propose to review the data integrity of the system monitoring water flowing into and out of the zone, as well as the integrity of the zone boundaries to confirm the accuracy of the night flows. Once complete further work to identify and resolve the causes of these high night flows will be undertaken.

The anomaly in the Kakariki zone highlights the need to revisit the 2014 Water Management Report now the first stage of water use management improvements are complete. In particular reviewing data custody processes to identify any improvements in capturing and transferring of data for water reporting purposes.

7.3 Reducing leakage in water supplies

7.3.1 Finding and repairing private leaks

Council will continue proactively reviewing the latest billing data for signs of leakage and approaching property owners early if an issue is identified.

Council will use its Water Supply Bylaw to request property owners to fix their private leaks within 21 days of notification. Property owners will still be able to apply for a credit on their water account due to fixing the leak. All identified leaks will be actively monitored and outstanding leakage pursed.

7.3.2 Finding and repairing leaks on the public side of reticulation network

Using information from the Wateroutlook monitoring and reporting tool, Council will monitor zones weekly to prioritise zones for leak investigation and repairs.

$66,745 in total will be available for leak detection and repair across the District in the 2016/17 Annual Plan.

$449,929 of funding is available in total for network maintenance across the District in the 2016/17 Annual Plan.

As mentioned in Section 7.2.3, Council will be developing criteria for replacing laterals and trialling a lateral replacement programme in a priority area.

$571,200 of funding is available for mains renewals across the District in the 2016/17 Annual Plan.

7.4 Regulation

7.4.1 Council's District Plan water demand management requirements

Council completed the guidance material for rainwater and greywater requirements in 2015/16. Over 2016/17, Council will introduce this material for customers.

7.5 Financial Incentives

7.5.1 Interest free rates payback scheme

No changes expected with this activity and $210,000 of funding has been allocated of 2016/17.

7.5.2 Rates relief

Over 2016/17, Council will continue providing financial assistance to those in need. The following remissions will be available in 2016/17:

- The General Hardship Rate Remission provides up to $300 of rates remission. There is a total of $ 125,000 available for 2016/17.
- Rate Remission for Significant Cost provides up to $300 to towards significant costs causing financial hardship. This includes repairing leaks. There is a total of $ 25,000 available for 2016/17.
- Water Rate Remission for Vulnerable Households provides rate remissions towards the cost of water for households with four or more dependents who receive the Working for Families Tax credit and meet other criteria. There is a total of $ 50,000 available for 2016/17.

7.6 Education

Council will continue providing facilitated education service for local schools.

Council will fund this activity through the Water Education budget ($41,820).

7.7 Fostering innovation

Council will continue its "open for business" approach to companies developing new technology by providing feedback on any designs shown or legislation that may apply.

7.8 Investing in water demand management and leak reduction for 2016/2017

Table 11 outlines the key funding allocations for water conservation and demand management work for 2016/17.

Activity	District-wide budget for 2016/17
Keeping community informed	$ 66,300
Water Education	$ 41,820
Targeted rate for rainwater or greywater systems	$ 210,000
Water network condition rating and investigation	$ 51,000
Leak detection and repair	$ 66,745
Reticulation maintenance	$ 449,929
Mains renewal and repair	$ 571,200
Total	**$1,456,994**

Table 9 Planned expenditure for 2016/17 for water demand management and leak reduction

8 Bibliography

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Kāpiti Coast Water Conservation Plan, Kāpiti Coast District Council, October 2010

Kāpiti Coast Long Term Plan 2015, Kāpiti Coast District Council, 2015

Water Loss Guidelines. NZWater, 2010.

Kāpiti Coast District Council Water Management Review, GHD, May 2014

Water Use Management – Project Scoping Report, CH2M Beca, February 2015

Water Laterals Assessment, CH2M Beca, December 2015

Charging Regime Advisory Group Tariff Review, CRAG, March 2016

Water Use Management Procedures Manual, CH2M Beca and M & P Consulting , May 2016

Appendix 1 Assessment of Environmental Effects section 1.3

1.3 Meeting Water Conservation Targets

Council is implementing the Water Matters Strategy and working towards improving water conservation across the district. The district has historically been a high water consumer in comparison with other districts. The intention is to stabilise daily WPR consumption at 490 litres per person per day (L/person/day), which includes an allowance for water losses. This allowance is for unaccounted water lost from the reticulation, including unauthorised connections and loss through leaks from reservoirs, supply pipes, and connections.

RRwGW has been designed to deliver a peak of 490 L/person/day to an estimated population of between 53,120 and 65,940 by 2060.

"Litres per person per day" is a common measure but does not mean that all of this water is used by individuals at home. The measure is an average figure for all users, including homes, businesses, industry, schools, hospitals, Council facilities, fire fighting, etc.

Peak daily use across the WPR area currently stands at around 590 L/person/day. Within the WPR area, the peak use averages around 550 L/person/day (Paraparaumu/Raumati) and around 720 L/person/day (Waikanae). These usage figures include water losses.

The importance of water conservation has been an ongoing theme during the community consultation for this project, with both Council and the community raising a range of methods to achieve lower consumption rates of drinking water. Council's water conservation initiatives go hand-in-hand with the water supply project. Council has a wide range of conservation initiatives for reducing demand, from the Green Plumber and the Green Gardener services; the Eco Design Advisor; the Kāpiti Coast Sustainable Home and Garden Show, the Summer On The Coast programme, Plan Change 75 (requiring a water tank/ grey water system for any new or relocated dwelling), education in local schools, water metering and financial incentives that provide loans for installation of non-potable water systems. Water metering is a critical element of Council's conservation strategy.

The conservation target of 490 L/person/day forms a fundamental design assumption for the Kāpiti Water Supply Project. Council believes it is an important and realistic target and has implemented a range of measures to help ensure 'water wasters' and inefficient users of drinking water are mindful of the need to reduce consumption and use water wisely. However, should the target not be achieved by 2016, the benefit of the RRwGW scheme is that its staged delivery can be brought forward if required. Council is committed to seeing its water supply infrastructure and associated consents as part of a long-term framework for water abstraction, environmental monitoring and responsible management of the district's water resource.