





Kāpiti Coast Water Conservation Report 2021/22

[FINAL]

Revision History

Revision N°	Prepared By	Description	Date
1	Ben Thompson & Tess Drewitt	Draft for issue to AMG	19/12/2022
2	Tess Drewitt	Final	07/03/2023

Document Acceptance

Action	Name	Signed	Date
Prepared by	Ben Thompson, Water Conservation Officer Tess Drewitt, Compliance Officer		19/12/2022
Reviewed by	Nick Ulrich, Senior Asset Planning Engineer		25/01/2023
Reviewed by	Ramesh Sharma, Water and Wastewater Services Manager		
Approved by	S Mallon, GM Infrastructure		
on behalf of	Kāpiti Coast District Council		

Executive Summary

Overview

Kāpiti Coast District Council (the 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 490 litres/person/day (l/p/d) peak water target and water conservation management activities in 2021/22
- Meet the reporting requirements of the consents governing the operation of River Recharge with Groundwater (RRwGW) scheme
- Set out the proposed water conservation work programme for 2022/23.

This report covers the three water supplies managed by the Council; Ōtaki Supply (including Hautere Water Supply), Waikanae Supply (servicing, Waikanae, Paraparaumu and Raumati (WPR)) and, Paekākāriki Water Supply. This is the first Water Conservation Report where the Council is reporting on the Hautere Water Supply due to water conservation reporting requirements (Section 6 - WGN160082 [38112] s127 variation).

Key water conservation activities in 2021/22

In 2021/22, the Council focused on:

- Continued use of water meter-based charging to encourage efficient water use
- Continued assistance to the District's residents to reduce water use and repair leaks
- Monitoring network performance and targeted leak location and repair activities.

District peak water met 490 l/p/d again in 2021/22

At a District level, peak demand stayed below the 490 l/p/d target. The WPR and Paekākāriki supply met the 490 l/p/d target while Ōtaki did not. The Ōtaki exceedance was due to an undetected leakage. The district wide peak target does not specifically apply to Hautere as this is a rural water supply scheme. Table 1 shows the 2021/22 peak demand (l/d/p) for each water supply and District-wide.

Year	Ōtaki (l/p/d)	Hautere (l/p/d)	WPR (l/p/d)	Paekākāriki (l/p/d)	District-wide (l/p/d)
2013/14	791	1,042	508	465	539
2014/15	543	1,009	456	679	471
2015/16	486	1,050	408	436	414
2016/17	453	1,160	362	362	371
2017/18	554	1,144	376	518	403
2018/19	496	1,024	382	566	398
2019/20	498	1,029	376	632	402
2020/21	495	968	401	408	413
2021/22	593	955	383	357	406
Result 2021/22	Exceeded target	N/A	Target met	Target met	Target met

Table 1. Comparing peak daily demand for each water supply and the Kāpiti Coast District

Figure 1 highlights the increasing demand during the warmer months, and the sustained higher use during and after Covid 19 lockdowns.

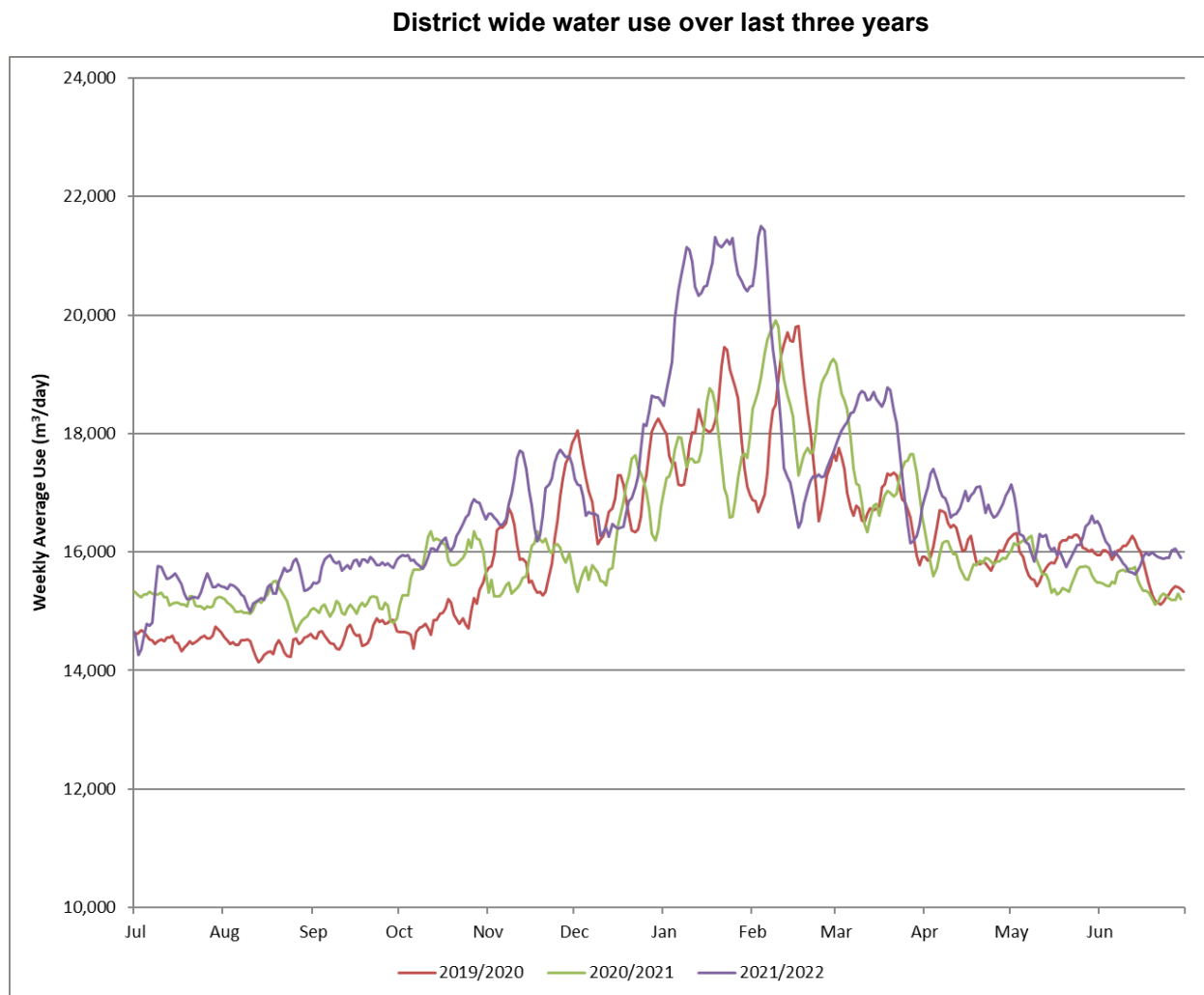


Figure 1. Comparing the District water demand for the last three years

Investigating and repairing public and private leaks

The Council prioritised four zones for leak detection and repair, with two zones in Waikanae and three zones in Ōtaki. The investigations covered 84.9km, 20.1% of the 422.3km of water networks, excluding the Hautere Scheme.

The key highlights included:

- Paekākāriki network stabilised.
- No major leaks in zones found. Repairs made no noticeable change in night flows.
- Water meter-based charging continued to encourage people to repair their leaks. Over 2021/22, the Council gave 326 property owners a credit for repairing their leaks (up 9% from 2020/21).

Estimated water loss lower in 2021/22 than 2020/21

The drone investigations of Ōtaki had little success finding leaks in Waikanae and Ōtaki. The Council will be returning to conventional acoustic leak methods for 2022/23.

The Council uses the Waterloss Benchmark approach to estimate water loss for our water supply schemes. Table 2 summarises the estimated daily water loss for the District over the last three years. Results for each scheme are set out in Section 4 of this report.

District Wide	2019/20	2020/21	2021/22
Peak day	(22,119 m ³ /day) or 402 l/p/d	(23,185 m ³ /day) or 413 l/p/d	(23,157 m ³ /day) or (406 l/p/d)
Average day	(15,965 m ³ /day) or 290 l/p/d	(15,920 m ³ /day) or 284 l/p/d	(16,501 m ³ /day) or 290 l/p/d
Current Annual Water Loss	1,391,400 m ³ annually or 184 l/conn/day	1,278,400 m ³ annually or 167 l/conn/day	1,267,300 m ³ annually or 164 l/conn/day
International Leakage Index (ILI)	3.0 (B Band)	2.7 (B Band)	2.6 (B Band)

Table 2: Comparing the performance of The Council water supplies (* please note Council now includes Hautere Water Supply in reported figures).

Work programme for 2022/23

The Council's focus for 2022/2023 will be to:

- Locate and repair leaks in the Ōtaki and Waikanae.
- Continue water mains and laterals renewal programme based on risk conditions and performance information.
- Continue to support the community to use water, wisely
- Continue to analyse consumer water use to identify future reduction and education opportunities.
- Trial Ultrasonic meters on restricted supply properties
- Implement LoRa remote metering network and trial installation on high usage properties and multi-primary/check meters to identify leakage.

A total of \$2,735,000 funding is available in 2022/23 for water conservation and demand management activities.

Contents

Executive Summary	iii
Overview	iii
Key water conservation activities in 2021/22	iii
District peak water met 490 l/p/d again in 2021/22	iii
Investigating and repairing public and private leaks	iv
Estimated water loss lower in 2021/22 than 2020/21	v
Work programme for 2022/23	v
1 Introduction and overview	1
1.1 Sustainable Water Management Strategy 2003 set the direction	1
1.2 Kāpiti Coast Water Conservation Plan 2010 mapped how to get there	1
2 Consent requirements	2
3 Peak day and water loss performance for 2021/22	4
3.1 District peak water use target met for 2021/22	4
3.2 How will the Council report water supply performance over 2021/22?	4
4 Water conservation and demand management activities 2021/22	10
4.1 Council leadership	10
4.2 Better data, better results	11
4.3 Finding and repairing public and private leaks	13
4.4 Regulation	14
4.5 Financial Incentives	14
4.6 Education	15
4.7 Fostering innovation	15
5 Water Conservation and Demand Management Activities 2022/23	15
5.1 Council leadership	15
5.2 Better data, Better results	16
5.3 Reducing leakage in water supplies	16
5.4 Regulation	17
5.5 Financial Incentives	17
5.6 Education	18
5.7 Fostering innovation	18
5.8 Investing in water demand management and leak reduction for 2022/23	18
6 Population changes	18
6.1 Population figures	18
6.2 Calculating per capita water consumption	19
7 Bibliography	20
Appendix 1 Assessment of Environmental Effects	21
Appendix 2 Infrastructure Leakage Index Water Losses:	22

1 Introduction and overview

This Kāpiti Coast Water Conservation Report documents whether the Council met the peak water use 490 l/p/d target and discusses efforts to reduce private and public leakage over the 2021/22 financial year. Section 4 outlines how effective the Council was in reaching the peak demand and leak targets at a District level and for each water supply. Section 5 provides more detail on what the Council did over 2021/22, and Section 6 discusses the work planned for 2022/23.

This report covers the three water supplies managed by the Council; Ōtaki Supply (including Hautere Water Supply), Waikanae Supply (servicing, Waikanae, Paraparaumu and Raumati (WPR)) and Paekākāriki Water Supply. This is the first Water Conservation Report where the Council is reporting on the Hautere Water Supply due to new water conservation reporting requirements.

1.1 Sustainable Water Management Strategy 2003 set the direction

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

The Strategy set a peak water target of 400 l/p/d by 2013/14, with an additional 90 litres for leakage. To reach the target, the Council recognised households, schools and businesses, and the Council itself each play its part. This was subsequently revised by the water conservation plan and consent requirements.

1.2 Kāpiti Coast Water Conservation Plan 2010 mapped how to get there

The Council developed the Water Conservation Plan to ensure it and the community reached the 490 l/p/d per peak day target by 2016. The Water Conservation Plan 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.

There are seven action areas in the plan:

- Council leadership – The Council needs to demonstrate throughout its activities that it is walking the talk. The 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 the water is being used and lost, the Council can better target resources for better outcomes.
- Managing leaks in public networks and private property – fixing leaks provides more capacity for future generations.
- Regulation – The Council uses the District Plan to ensure new homes should meet the 490 lpd target. The Water Supply bylaw to manage summer demand, water pricing and minimising wastage.
- Financial Assistance – The Council offers an “interest-free” targeted rate for households to install rainwater or greywater systems to offset public water use. It also offers rates subsidy for hardship.
- Education – The 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 – The Council recognised the importance of new ideas and technology in assisting local businesses, and residents save water.

2 Consent requirements

Several Greater Wellington Regional Council (GWRC) consents held by the the Council for the Paekākāriki, Waikanae and Ōtaki supplies have water conservation consent conditions. The relevant consent conditions that this report addresses are listed below.

Water Permit WGN130331 [32355] Paekākāriki Water Supply groundwater and surface take

The Water Permit WGN130331 [3255] does not explicitly require an Annual Water Conservation Report for the Paekākāriki Supply, but the Council will provide the information to be consistent with the Waikanae and Ōtaki supply reporting.

Water Permit WGN160082 [38812] Hautere Rural Water Supply groundwater take

Condition 7 requires the Council to produce an Annual Water Conservation Report that details water conservation initiatives and leak detection work for the year and planned works for the coming year.

Water Permit WGN130103 [35973] Waikanae Water Supply groundwater take

Condition 4 requires the Council to implement water conservation and water demand management measures as necessary to achieve the reductions in water demand necessary to reduce maximum peak daily water demand to 490 l/p/d for the Waikanae, Paraparaumu and Raumati supply area.

Water Permit WGN130103 [35974] Waikanae Water Supply surface water take

Condition 4 requires the Council to implement of water conservation and water demand management measures as necessary to achieve the reductions in water demand necessary to reduce maximum peak daily water demand to 490 l/p/d for the Waikanae, Paraparaumu and Raumati supply area.

Condition 25 requires the Council to submit an Annual Water Conservation Report to GWRC by 30 September each year. The Annual Water Conservation Report shall be made available to the public on the Council's website by 30 September each year. Table 3 lists the matters that the Annual Water Conservation Report is required to address and the relevant sections of this report.

Conditions	Section in this annual report
a) Summary of the consent holder's progress towards achieving its water conservation target of 490 l/p/d;	Executive Summary
b) Details of peak summer daily use expressed as l/p/d;	3.1
c) Outcomes of any water conservation measures to reduce peak demand, including but not limited to water meters;	4.1 – 4.7
d) A discussion of any reduction in peak daily demand;	3.2
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.	5.3

Table 3:. Condition 25 of consent WGN130103 [35974]

Water Permit WGN050025 [33147] Waikanae back-up water supply groundwater take

Condition 15b requires the Council's Annual Report submitted by 31 July to include 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 increase in population, any reduction in peak daily water demand and the achieved results of these measures.

Water Permit WGN080379 [32187] Otaki Water Supply Tasman Road groundwater take

Condition 11 requires the Council to prepare an Annual Report on the water conservation measures carried out over the previous summer. The report shall assess the effectiveness of the conservation measures and describe the proposed measures to be implemented over the coming summer period. The Annual Water Conservation Report shall be submitted to GWRC by 31 November each year.

Water Permit WGN080379 [32188] Otaki Water Supply Rangiuru Road groundwater take

Condition 11 requires the Council to prepare an Annual Report on the water conservation measures carried out over the previous summer. The report shall assess the effectiveness of the conservation measures and describe the proposed measures to be implemented over the coming summer period. The Annual Water Conservation Report shall be submitted to GWRC by 31 November each year.

3 Peak day and water loss performance for 2021/22

3.1 District peak water use target met for 2021/22

The Kapiti Coast community met the District level peak water target without the Council introducing water restrictions. The recent growth and higher network losses meant average daily demand increased from 15,397m³/day to 15,512m³/day, while peak use decreased from 20,367m³/day to 19,849m³/day.

Table 4 shows the gross daily peak water use for 2021/22 and the preceding five years for the three water supplies. While the Council reached the 490 l/p/d target for the District, WPR and Paekākāriki supply, unresolved water loss in Ōtaki caused the peak demand to exceed the target. Section 4.2 provides more detail on the performance of each water supply.

Year	Ōtaki l/p/d	Hautere l/p/d	WPR l/p/d	Paekākāriki l/p/d	District-wide l/p/d
2013/14	791	1,042	508	465	539
2014/15	543	1,009	456	679	471
2015/16	486	1,050	408	436	414
2016/17	453	1,160	362	362	371
2017/18	554	1,144	376	518	403
2018/19	496	1,024	382	566	398
2019/20	498	1,029	376	632	402
2020/21	495	968	401	408	413
2021/22	593	955	383	357	406
Result 2021/22	Exceeded target	N/A	Target met	Target met	Target met

Table 4: Peak consumption for each water supply for the last three years

3.2 How will the Council report water supply performance over 2021/22?

3.2.1 Overview

This section sets out more detail for each supply, including:

- A graph comparing daily demand for last three years
- Average and peak daily demand in cubic meters per day (m³/day) and litres/person/day (l/p/d)
- Number of days the supply was over the 490 l/p/d target
- The Current Annual Water Loss (CARL) is the amount of water lost through leakage for the year as a daily amount (results by supply available for the first time this year)
- The International Leakage Index (ILI) grading of the supply. ILI is the ratio between the amount of water lost for the year and the annual amount of unavoidable water loss. The lower the ratio, the better performing the network is for water loss. Appendix 2 provides more detail on ILI.
- The World Bank Institute performance band and their recommended actions for that band.

3.2.2 District-wide results for last three years

- 490 l/p/d peak target met
- Public side leaks increased

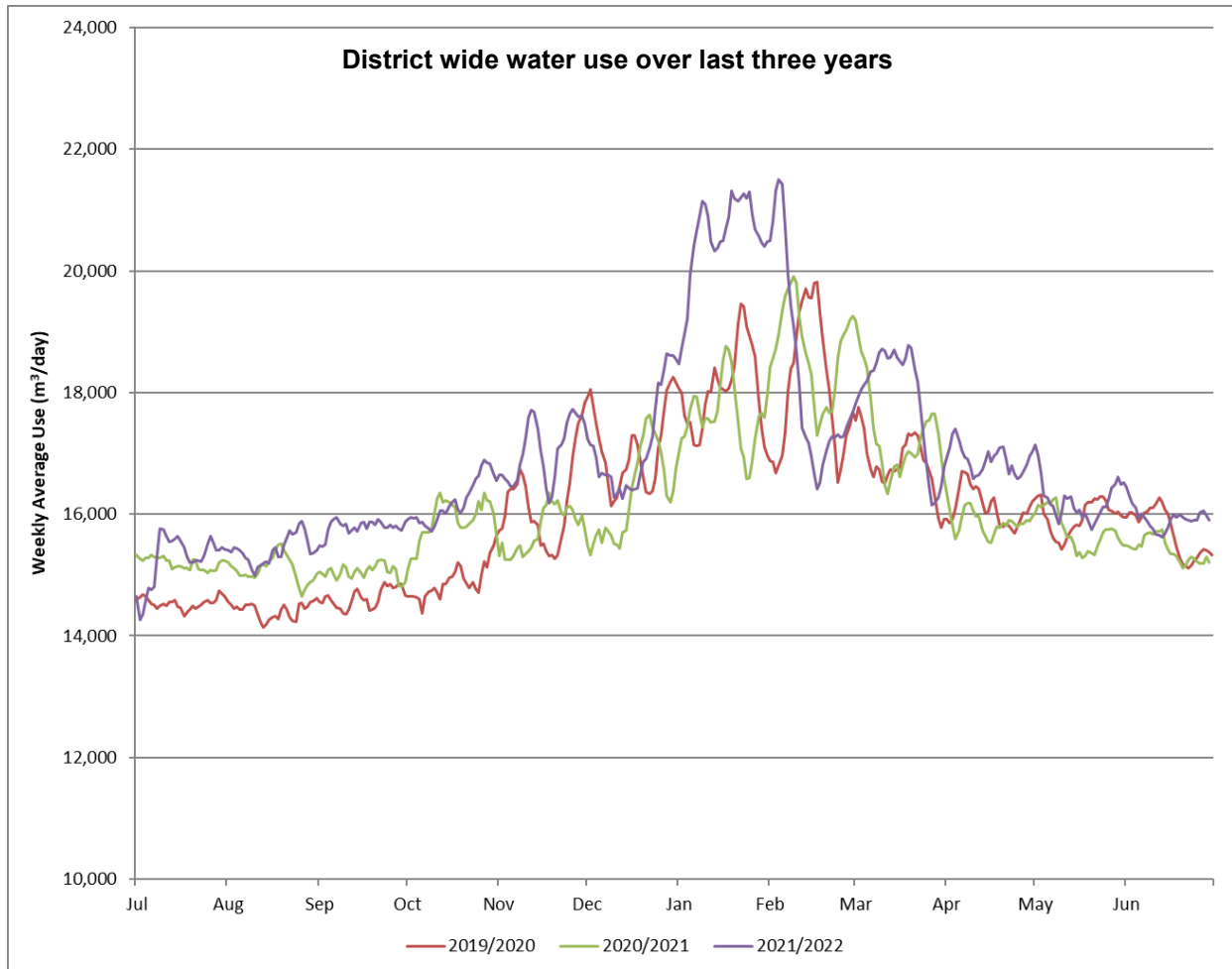


Figure 2. Changes in District-wide water demand for the last three years

District Wide	2019/20	2020/21	2021/22
Peak day	(22,119 m ³ /day) or 402 l/p/d	(23,185 m ³ /day) or 413 l/p/d	(23,157 m ³ /day) or (406 l/p/d)
Average day	(15,965 m ³ /day) or 290 l/p/d	(15,920 m ³ /day) or 284 l/p/d	(16,501 m ³ /day) or 290 l/p/d
Current Annual Water Loss	1,391,400 m ³ annually or 184 l/conn/day	1,278,400 m ³ annually or 167 l/conn/day	1,267,300 m ³ annually or 164 l/conn/day
International Leakage Index (ILI)	3.0 (B Band)	2.7 (B Band)	2.6 (B Band)

Table 5. Compares performance of the Council water supplies for last three years (please note that 2021/22 includes Hautere for the first time)

3.2.3 Ōtaki Water Supply

- 490 l/p/d peak target not met
- Public side leaks increased.

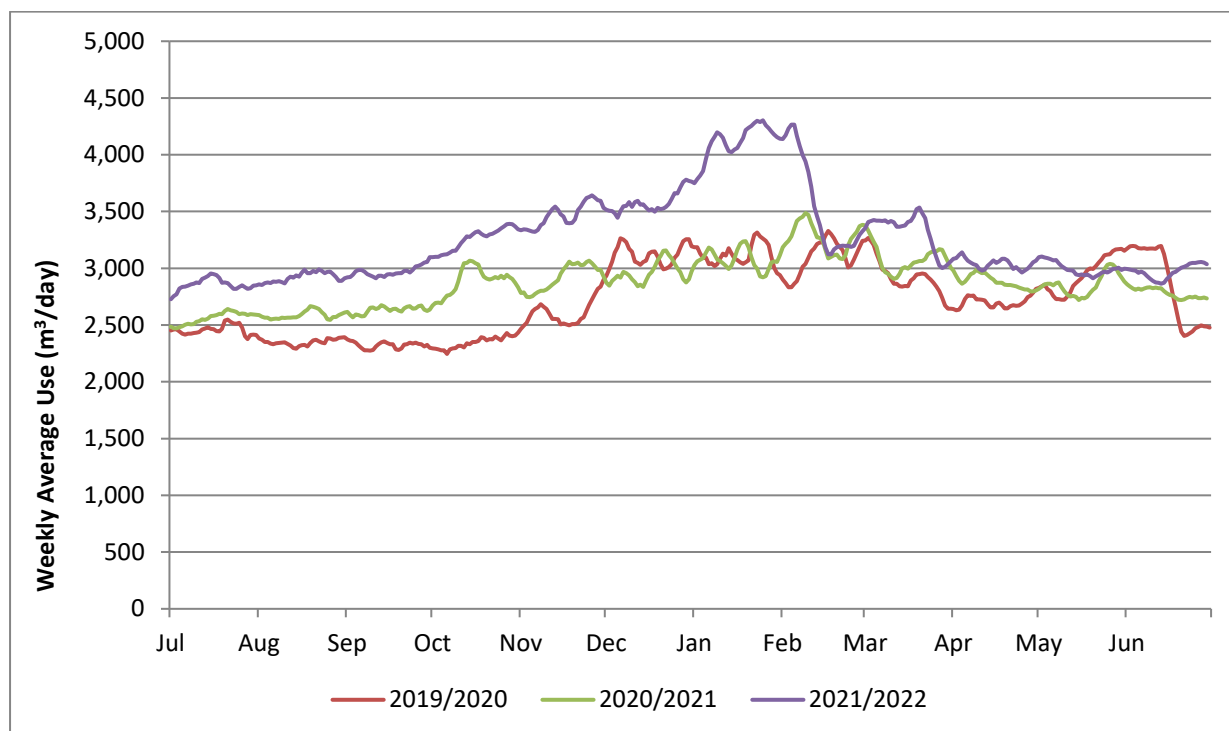


Figure 3. Changes in the Ōtaki Scheme over the last three years. Note the impact of the increased water loss

Ōtaki Supply	2019/20	2020/21	2021/22
Peak day	3,570 m ³ /day 498 l/p/d	3,626 m ³ /day 495 l/p/d	4,425 m ³ /day 593 l/p/d
Days over 490lpd target	2	1	54
Average day	2,720 m ³ /day 376 l/p/d	2,821 m ³ /day 383 l/p/d	3,259 m ³ /day 433 l/p/d
Current Annual Water Loss (2017/18 is base year)	307,293 m ³ annually or 280 l/conn/day	328,650 m ³ annually or 297 l/conn/day	415,367 m ³ annually or 369 l/conn/day
International Leakage Index (ILI) (2017/18 is base year)	4.4 (C band) Poor leakage, intensify reduction efforts	4.6 (C band) Poor leakage, intensify reduction efforts	5.8 (C Band) Poor leakage, intensify reduction efforts

Table 6. Comparing performance of Ōtaki water supply for last three years

3.2.4 Waikanae/Paraparaumu/Raumati Water Supply

- 490 l/p/d peak target met
- No requirement for water restrictions

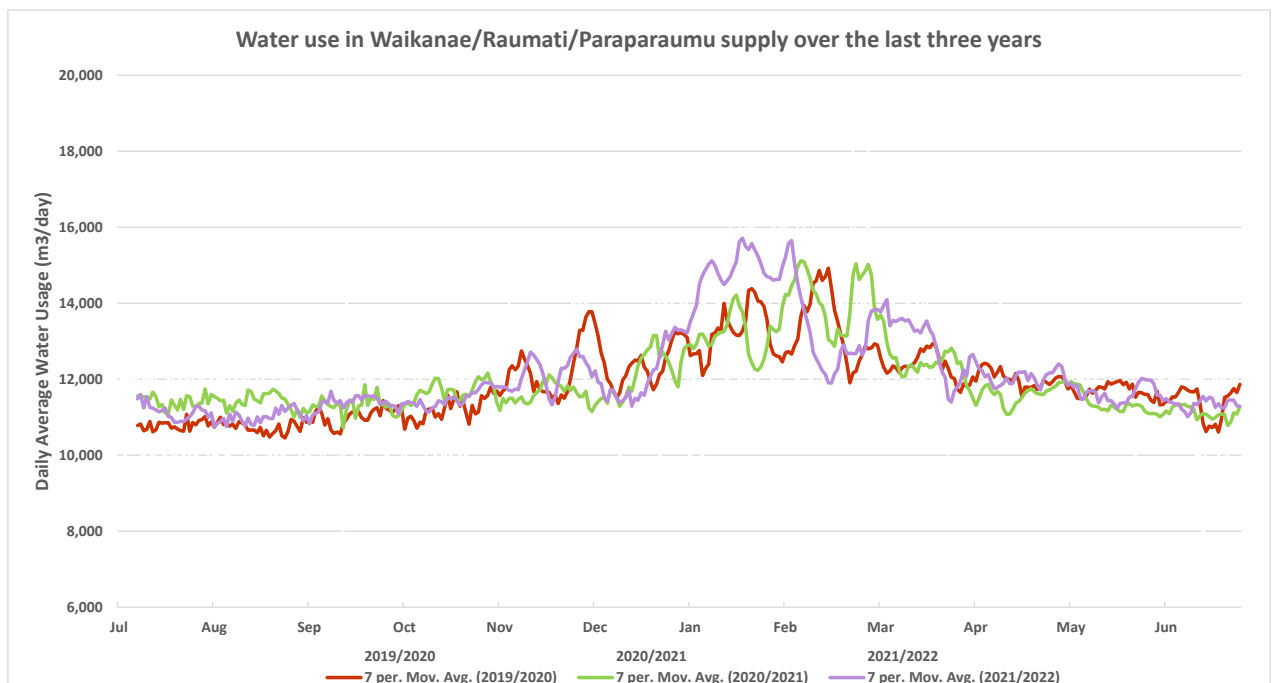


Figure 4: Changes in the WPR water demand for the last three years

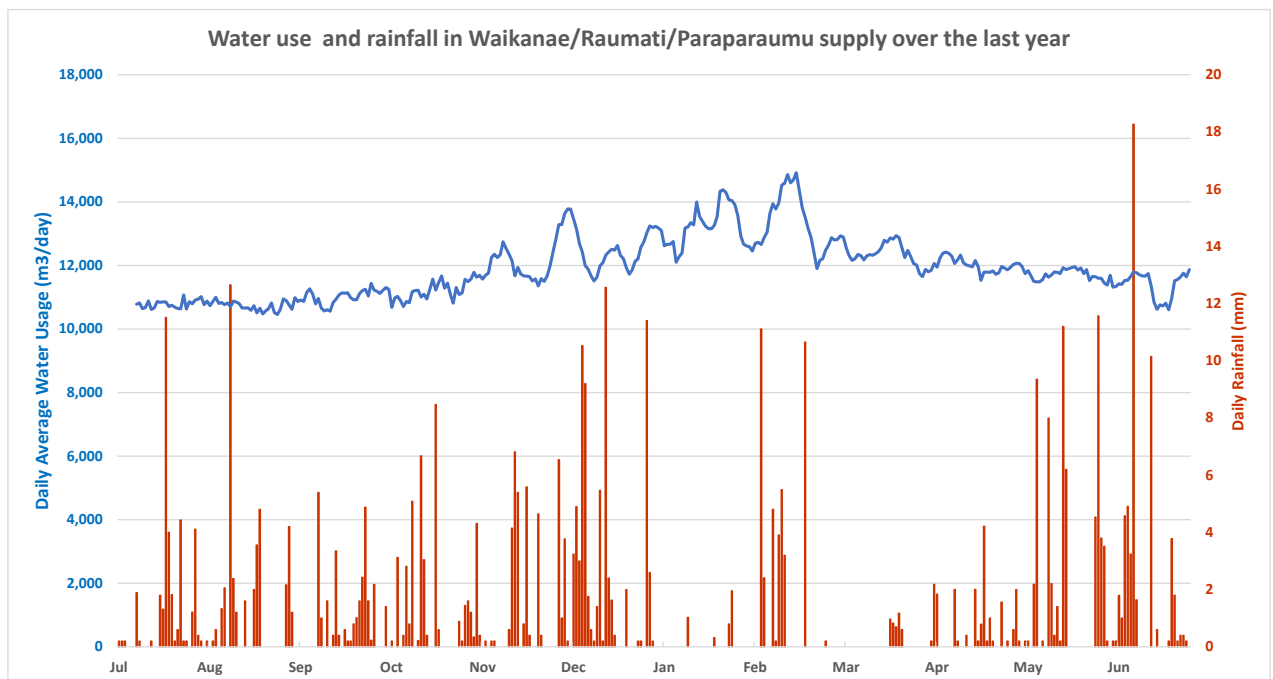


Figure 5: Rainfall impacts on WPR water demand

The current annual water loss increased by 546m³/day. The Council will sweep the entire Waikanae network to isolate and reduce the increasing leakage.

WPR Supply	2019/20	2020/21	2021/22
Peak day	16,989 m ³ /day 376 l/p/d	18,472 m ³ /day 401 l/p/d	17,987 m ³ /day 383 l/p/d
Days over 490lpd target	0	0	0
Average day	11, 883 m ³ /day 261 l/p/d	11,960 m ³ /day 258 l/p/d	12,133 m ³ /day 257 l/p/d
Current Annual Water Loss (2017/18 is base year)	855,200 m ³ annually or 156 l/conn/day	811,100 m ³ annually or 136 l/conn/day	713,500 m ³ annually or 135 l/conn/day
International Leakage Index (ILI) (2017/18 is base year)	3.0 (B band) Opportunity for improvements	2.7 (B band) Opportunity for improvements	2.6 (B band) Opportunity for improvements

Table 7: Compares performance of WPR water supply for last three years

3.2.5 Paekākāriki Water Supply

- 490 l/p/d peak target met
- No requirement for water restrictions
- Water supply stable over 2021/22.

This year peak demand stayed under the 490 l/p/d peak target. Also, the base water loss remained steady, with water demand in July 2020 being similar to June 2021. The leakage remained lower over 2021/22.

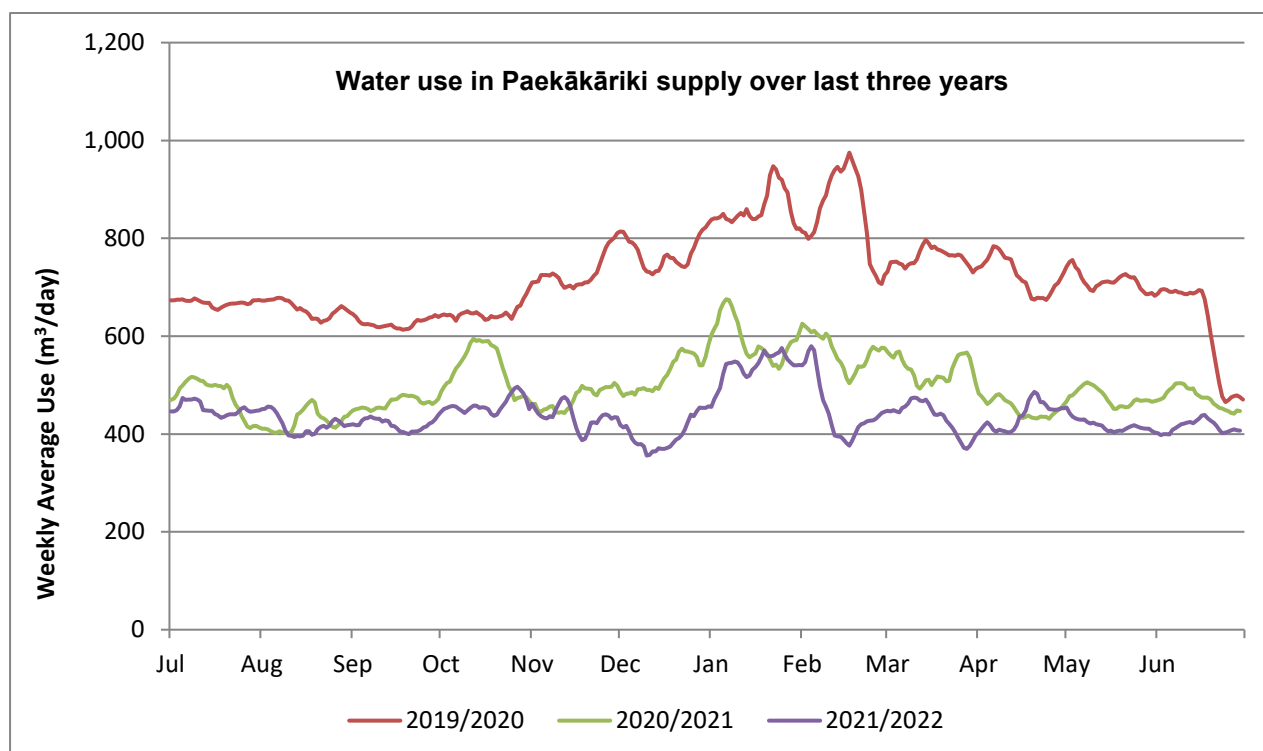


Figure 6: Changes in the Paekākāriki Supply water demand for the last three years

Paekākāriki	2019/20	2020/21	2021/22
Peak day	1134 m ³ /day 632 l/p/d	731 m ³ /day 408 l/p/d	641 m ³ /day 357 l/p/d
Days over 490lpd target	21	0	0
Average day	717m ³ /day 448 l/p/d	499m ³ /day 316 l/p/d	499m ³ /day 316 l/p/d
Current Annual Water Loss (2017/18 is base year)	135,707 m ³ annually or 543 l/conn/day	46,567 m ³ annually or 187 l/conn/day	42,101 m ³ annually or 167 l/conn/day
International Leakage Index (ILI) (2017/18 is the base year)	8.1 (D band) Very inefficient use of water and leak detection critical	2.8 (B band) Potential for improvement	2.5 (B band) Potential for improvement

Table 8:. Compares performance of Paekākāriki water supplies for last three years

3.2.6 Hautere Water Supply

The district wide peak daily demand target of 490 l/p/d does not apply to the Hautere Water Scheme.

The Hautere supply was set-up as a cooperative venture between the farmers of the area and the Horowhenua District Council as a rural stock supply. The water mains were generally laid in private property and no easement were registered over them. The scheme took over from a water race and was intended originally for dairy farming with opportunity for farmers to supply their houses with disinfected water. The water was allocated on a basis of 1 unit (1,000 litres) for each 2.236 hectares of land within the scheme.

Since the dairy industry diminished, the area has seen a rise in life style blocks. When land is subdivided the units remain within the land and are divided according to the owners wishes.

Council resolved to close the scheme in 1999 and not permit any further connection, except where it was a reallocation of existing units. The Hautere Scheme is capped as the cost of upgrading the supply was considered unaffordable to the community. This supply was restricted to keep the size and therefore the cost of the pipes, reservoirs, and treatment plant to a minimum.

The Hautere scheme is self-funded, not subsidised by other properties within the Kapiti Coast District. The units that are allocated have been paid in full, even if the water is not used. There are no unallocated units in the Hautere Water Scheme.

The supply is restricted. This means that water is fed to each connection through a very small orifice 24 hours a day at a constant rate, that is, it takes 24 hours to deliver the number of units allocated. Each customer is required to provide a tank to contain the water and a pump to provide an on-demand supply to the household and the consumers tank should hold at least 2 days' supply and preferably 5 days' supply.

Water restrictors are considered more effective than water meters at limiting demand and water meters may not be viable on each property as the trickle feed flow is too low for turbine meters to accurately record the water consumption. Council is looking to trial ultrasonic meters on some of these supplies in 2022/23 to determine if flows can be accurately recorded.

4 Water conservation and demand management activities 2021/22

4.1 Council leadership

4.1.1 Keeping the community informed

Over 2021/22, the Council continued keeping the community informed through its usual channels.

Informed community outcomes

- Wide range of channels used to communicate with the public
- The community had clear information to make decisions on improving their water use
- The Council contacted residents with suspected leaks promptly

4.1.1.1 Keeping the community informed via online resources

The Council uses its website and Facebook page to inform the community and answer any question raised by the community. The website contains a range of resources, including:

- How to locate a leak
- How to read the water meter and monitor water use
- Good garden practice to create a water efficient garden

4.1.1.2 Ensure frontline staff had up to date information

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

4.1.1.3 Water Conservation Advisor (WCA)

After each water meter reading cycle, the WCA investigated any property using more than 2,000 litres/day for possible leaks, misreads or high use. The Council sends a leak notice to any property with 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 publicly available and included with all leak notifications.

The Council is also investigating any properties with reads that do not change. The Council replaced any faulty meters.

4.1.2 The Council is managing water use efficiently in its assets

Reduce the Council water use outcomes

- Report tool in place to identify opportunities to fix leaks or replace inefficient fixtures.
- The Council uses shallow groundwater for irrigating most of the parks across the District
- Future proof new buildings to be water efficient

4.1.2.1 Council monitors water use at its properties

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

The Council uses a water use database to monitor consumption on its properties. The Property Group and Community Service Group receive updates after each reading cycle on water use from each property. The data helps prioritise any maintenance needed, such as repairing leaks or replacing inefficient toilets or taps.

4.1.2.2 Making new buildings and renovations more water-efficient

When the Council builds new or renovates, it makes every effort to install water-efficient appliances where possible and to use rainwater for toilet flushing and outdoor use.

4.1.2.3 Minimise public water use on sports fields and amenity areas

All the major Council sports fields use onsite bores as a preferred source of water for irrigation.

The 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 in areas with high pedestrian activity.

4.2 Better data, better results

4.2.1 Understanding trends in water use and leakage

Better data, better results outcomes

- Monitored and prioritised zones for leak detection and repair
- Targeted zones based on ILI leakage performance
- Monitored water consumption at the property level.
- Notified owners if they had a suspected leak.

4.2.1.1 Undertake weekly monitoring of leaks across District networks and supplies

The Council uses a weekly minimum night flow “traffic light report” to assess the performance of each network at a District Metered Area (zone) level.

Each week, the automated report provides feedback on the ILI performance in each zone, where:

- Anything lower than an ILI score of 3 is green
- Anything between 3 and 4 is yellow
- Anything higher than 4 is red.

The Council bases the grading on the World Bank’s leak management bands shown in Table 9. In October, the Council reviewed the performance of each zone and selected those with consistently high ILI for leak detection. Any network with a grade higher than 2 has opportunities for future improvements.

Band	ILI Range	Guideline description of Real Loss Management Performance Categories
A	<2.0	Further loss reduction may be uneconomic unless there are shortages; careful analysis is needed to identify cost-effective leak management
B	2.0 to <40	Possibilities for further improvement consider pressure management, better active leakage control, better maintenance
C	4.0 to <8.0	Poor Leakage management, tolerable only of plentiful cheap resources; even then, analyse level and nature of leakage, intensify efforts
D	8.0 or more	Very inefficient use of resources, indicative of poor maintenance and system condition in general, leakage reduction programs imperative and high priority

Table 9:. World Bank Institute Bands for Leak Management in Developed Countries

Figure 7 shows three examples from the Waikanae network. In this example, if the results remained unchanged, then Kakariki would be selected for leak investigation, Hemi may if budget permitted, and Te Moana would be left alone.



Figure 7. Examples of how the Council grades a zone's performance week to week

4.2.1.2 Undertake water balance reports for all water supplies

The Council uses the annual WaterNZ Benchloss tool to each water supply to show:

- Daily water loss
- ILI grade and World Bank Band for leak management
- World Bank's recommendations for further improvement

4.2.1.3 Monitoring water use at the property level

The Council uses a reporting tool to analyse water use by the customer, zone, network and District. The Council uses the tool to:

- identify properties with potential leaks or faulty meters
- understand consumption by user type (such as households, schools, motels etc.)
- feed annual water use into the water balance model to determine annual water lost through leaks.

4.3 Finding and repairing public and private leaks

Over 2021/22, the Council informed properties with suspected leaks and investigated approximately 37% of the District's supplies for leaks.

Finding and repairing leak outcomes:

- Nine of the 21 zones investigated, 20% of the network length surveyed for leakage
- It was too cold for the drone surveying
- The Council reviewed how planning around replacing assets causing leak issues

4.3.1 Results from planned 2021/22 leak detection

The Council prioritised four zones for leak detection and repair, with three zones in Waikanae and the Paekākāriki network. The investigations covered 84.9km, 20.1% of the 422.3km of water networks, excluding the Hautere Scheme.

4.3.2 Reactive renewal work undertaken by the Council

Table 10 shows the reactive work undertaken by the Council in 2021/22 on the public networks to resolve leaks as they arose.

4.3.3 Finding and repairing private leaks

After each billing cycle, the 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 legitimate high 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).

Table 10. Reactive leak maintenance on each network over the 1 July – 30 June period for the past three years

Reason for service request	Year		
	2019-2020	2020-2021	2021-2022
Burst Water Pipe	31	29	69
Leaking Fire Hydrant	15	23	15
Leaking Water Toby	53	85	57
Leaking Water Valve	1	2	1
Water Leak - Cause Unknown	377	400	424
Water Toby Fault	100	82	85
No Water Supply	84	54	50
Total Interventions	661	675	701

4.3.4 The Council reviewed current public-side leak management programme

The Council efforts over 2021/2022 were to ensure the 2022 Water Supply AMP includes budgets for a lateral replacement programme, and pressure management upgrades.

Section 5.3.3 provides more detail on the Council's aims from 2022/23 and the following ten years.

4.4 Regulation

4.4.1 How many new homes were built this year?

The Council **approved 274 District Plan compliant homes** across the District water zones over the 2021/22 period.

Since 2008, the Council has required all new homes with an on-demand connection to the 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.

4.5 Financial Incentives

4.5.1 Encouraging people to fix their leaks

Three hundred and thirteen (313) property owners received a remission of excess volumetric water rates charges resulting from private water leaks, once the leak was repaired.

The council provided a total of \$203,720.73 (including GST) in private water leak remissions.

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.

4.5.2 Providing financial support to those in need

Over 2021/22, the Council offered three schemes to support residents on a limited income to assist residents in financial hardship:

- **Rates Assistance** – 1.275 successful applications (total remissions \$280,490.00 (including GST)
- **Temporary Rates Assistance related to water repairs** – 12 successful applications (\$3300 including GST)
- **Water Rates Remission for vulnerable households relating to high water use** – 5 successful applications (\$354.22 including GST) Interest-free rates payback scheme to install rainwater tanks

4.6 Education

The Council has education resources on the website and water testing kits available for schools to use. Staff are available to talk with the school when requested.

4.7 Fostering innovation

The 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 Conservation and Demand Management Activities 2022/23

5.1 Council leadership

5.1.1 Keeping the community informed

5.1.1.1 Continue using website and Facebook page to keep people informed

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

5.1.1.2 Elected members and the Council staff will be kept up to date

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

5.1.2 Providing advice to the community on saving water

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

5.1.3 Reduce the Council water use

The Council will monitor and continue to seek ways to reduce water use at properties under its control using the information provided by water metering.

5.2 Better data, Better results

5.2.1 Zone metering

The Council will continue monitoring minimum night flows and prioritise leak detection by a zone's snapshot ILI grade.

5.2.2 Reporting water use and water leaks

The Council will provide a water balance on water used and lost over the year at the District and Supply level.

5.3 Reducing leakage in water supplies

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

Using information from the water-use monitoring and reporting tool, the Council will monitor zones weekly to prioritise zones for leak investigation and repairs. Otaki will be an important focus for 2021/22, as well as monitoring Paekākāriki night flows for any return of the high leakage rates.

5.3.2 Finding and repairing private leaks

The Council will continue to proactively review the latest billing data for signs of leakage and approach property owners early if an issue is identified.

The 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 pursued.

5.3.3 Embedding a Lateral leakage reduction programme

Table 11 outlines the activities for reducing lateral leakage the Council will undertake over the next three years, over ten years and over a thirty-year time period.

Target date	Activity undertaken
Years one to three	Set a baseline for service requests and minimum night flows to monitor the benefits of pressure management
	Implement improved data collection and analysis of service requests and renewals
	Implement a new approach to reactive repairs and develop a rider mains policy
	Replace Galvanised Iron pipe in the District Metered Areas (DMAs) subject to pressure management
	Investigate pressure Management for the three DMAs with the highest Benefit-Cost Ratios (BCR) - Kāpiti Road, Rauparaha Road, Te Moana Road
	Commence proactive renewals of galvanised iron, polybutylene (Dux) and PVC in the highest priority DMAs (Otaki Beach, Paekakariki, Hemi Street, Kakariki Reserve)
Years four to ten	Assess the cost and benefit of widening the pressure management network to other DMAs, and implement if practicable
	Broaden the proactive renewals programme to replace a wider range of pipe materials, locations and age
	Install Smart meters (using remote recording) on large use customers, 'Multi-Primary' and difficult to read 'Check' meters.
Years 11 to 30	Staged renewal programme based on lateral age and condition
	Tying into mains renewal programmes and other works
	Laterals to be replaced as necessary as part of wider mains replacement programme

Table 11. Lateral Leakage Reduction Programme

5.4 Regulation

5.4.1 The Council's District Plan water demand management requirements

There will be no change over 2022/23.

5.5 Financial Incentives

5.5.1 Interest-free rates payback scheme

There are no changes expected with this activity, and \$165,000 of funding has been allocated for 2022/23.

5.5.2 Rates relief

Over 2022/23, the Council will continue to provide financial assistance to those in need. The following remissions will be available:

- Rates Temporary Financial Assistance Remission provides up to \$300 towards significant one-off costs causing financial hardship. This includes repairing leaks. There is a total of \$25,000 available for 2022/23.
- The Rates Assistance Rates Remission provides up to \$300 of rates remission. Combined with the Water Rates Remission, there is a total of \$ 240,467 available for 2022/23.
- Water Rate Remission for Vulnerable Households provides rate remissions towards the cost of water for households with two or more dependents who receive the Working for Families Tax credit and meet other criteria.

5.6 Education

The Council will continue providing water education resources for local schools.

5.7 Fostering innovation

The 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.

5.8 Investing in water demand management and leak reduction for 2022/23

Table 12 outlines the key funding allocations for water conservation and leak management work for 2022/23.

Activity	District-wide budget for 2022/23
Keeping community informed (18856)	\$120,000
The targeted rate for rainwater or greywater systems (60123)	\$100,000
Financial assistance (rates team)	\$284,000
Water Meter Management (18857)	\$245,000
Leak detection (18846)	\$56,000
Reticulation maintenance and repair (18831)	\$485,000
Planned and unplanned renewals (18811&18812)	\$1,445,000
Total	\$ 2, 735, 000

Table 12. Planned expenditure for 2022/23 for water demand management and leak reduction

6 Population changes

6.1 Population figures

The Council now enlists SensePartners to provide population projections. It uses a similar process to estimate population by overlaying their forecasts over the water supply boundaries.

Table 13 shows the population figures for each supply and the District. (rounded to nearest 10 persons)

Year	Ōtaki	WPR combined	Paekākāriki	District Total	Hautere
2012/13	5,820	39,110	1,740	47,520	850
2013/14	6,050	40,080	1,750	48,730	860
2014/15	6,270	41,050	1,760	49,940	860
2015/16	6,500	42,020	1,770	51,150	860
2016/17	6,730	42,990	1,780	52,370	860
2017/18	6,950	43,960	1,790	53,570	870
2018/19	7,100	44,770	1,790	54,540	880
2019/20	7,240	45,580	1,790	55,500	880
2020/21	7,380	46,390	1,790	56,460	890
2021/22	7,520	47,200	1,790	57,420	900

Table 13. Population numbers connected to each water supply

6.2 Calculating per capita water consumption

The flow meters for reservoirs and zones report to the Council's SCADA system, where flows are recorded and daily totals calculated. The 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, Hautere, Waikanae, Paraparaumu and Raumati networks, for WPR as a whole and Paekākāriki.

7 Bibliography

- Sustainable Water Use Strategy, Kāpiti Coast District Council, September 2003
- 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
- Lateral Leakage Reduction Programme, CH@M, November 2019
- Who uses less water? Dual supplied vs standard supplied homes, M & P Consulting, May 2020
- Lateral Repair and Replacement Analysis, M & P Consulting, May 2020

Appendix 1 Assessment of Environmental Effects

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.

Appendix 2 Infrastructure Leakage Index Water Losses:

There has been considerable thought given to water network performance measures, which is captured in Water New Zealand's Water Loss Guidelines 2010.

Extract from Water New Zealand's Water Loss Guidelines 2010 –Page 17

Since the early 1980s, it has been recognised that percentages are unsuitable for assessing the operational efficiency of management of real losses (leakage and overflows) in distribution systems. This is because the calculated percentages are strongly influenced by the consumption of water in each system and variations in that consumption. Non-Revenue Water expressed as a per cent by volume of Water Supplied, although traditionally widely used, also suffers from similar significant problems to % Real Losses when used as a PI. Appendix C provides more information on this topic in the context of the range of consumption data in New Zealand.

Extract from Water New Zealand's Water Loss Guidelines 2010 –Page 18

Around 2005, the IWA Performance Indicators Task Force began to consider the need to select the most appropriate PIs not only on the basis of Function (Financial, Operational, etc), but also to distinguish (Ref. 8) between:

- **Metric benchmarking** – for more demanding comparisons between Water Suppliers
- **Process benchmarking** –for setting targets and ongoing monitoring of progress towards those targets.

The 2008 Benchloss NZ manual recommends that:

- **Infrastructure Leakage Index (Op 29)** is preferable for **Metric** benchmarking, as it takes account of differences in system specific key parameters (mains length, number of service connections, customer meter location, average pressure)
- **Litres/service connection/day (Op 27) or kl/km of mains/day (Op 28) (depending upon service connection density)** is preferable for **Process** benchmarking of progress towards reaching target for reductions in Real Losses of a specific Water Supplier

The Infrastructure Leakage Index calculates the ratio between current annual real losses (m³/year) and unavoidable annual real losses (m³/year) as defined in the Water New Zealand's Water Loss Guidelines 2010. While it can be a bit tricky to explain the concept of ILI calculation, the World Bank Institute leakage management bands give a clear measure of loss management performance for water networks.

Extract of band descriptions from Water New Zealand's Water Loss Guidelines 2010 –Page 18

Table 2.3 World Bank Institute Bands for Leakage Management in Developed Countries

Band	ILI Range	Guideline Description of Real Loss Management Performance Categories for Developed Countries
A	< 2.0	Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost-effective leakage management
B	2.0 to < 4.0	Possibilities for further improvement; consider pressure management, better active leakage control, better maintenance
C	4.0 to < 8.0	Poor leakage management, tolerable only if plentiful cheap resources; even then, analyse level and nature of leakage, intensify reduction efforts
D	8.0 or more	Very inefficient use of resources, indicative of poor maintenance and system condition in general, leakage reduction programs imperative and high priority