

# **Kāpiti Coast Water Conservation Report 2022/23**

**[FINAL]**



## Revision History

Revision N°	Prepared By	Description	Date
0	T Drewitt / B Thompson	Draft for review	10/08/2023
1	T Drewitt	Final following AMG review	30/08/2023

## Document Acceptance

Action	Name	Signed	Date
Prepared by	T Drewitt / B Thompson, Compliance		30/08/2023
Reviewed by	N Ulrich, Senior Asset Planning Engineer		26/09/2023
Endorsed by	R Pillai, Acting Manager, Water & Wastewater Services		26/09/2023
Approved by	S Mallon, Group Manager, Infrastructure Services		02/10/2023
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 2022/23.
- 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 2023/24.

This report covers the four water supplies managed by the Council: Ōtaki Supply, Hautere Water Supply, Waikanae Water Supply (servicing, Waikanae, Paraparaumu and Raumati (WPR)) and Paekākāriki Water Supply.

## Key water conservation activities in 2022/23

In 2022/23, 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 2022/23

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. Despite sweeping the entire network, leakage continues to be a challenge in Ōtaki. The district wide peak target does not specifically apply to Hautere as this is a rural water supply scheme. Table 1 shows the 2022/23 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)
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 2022/23	554	964	378	409	393
Reach 490 l/p/d target?		N/A			

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

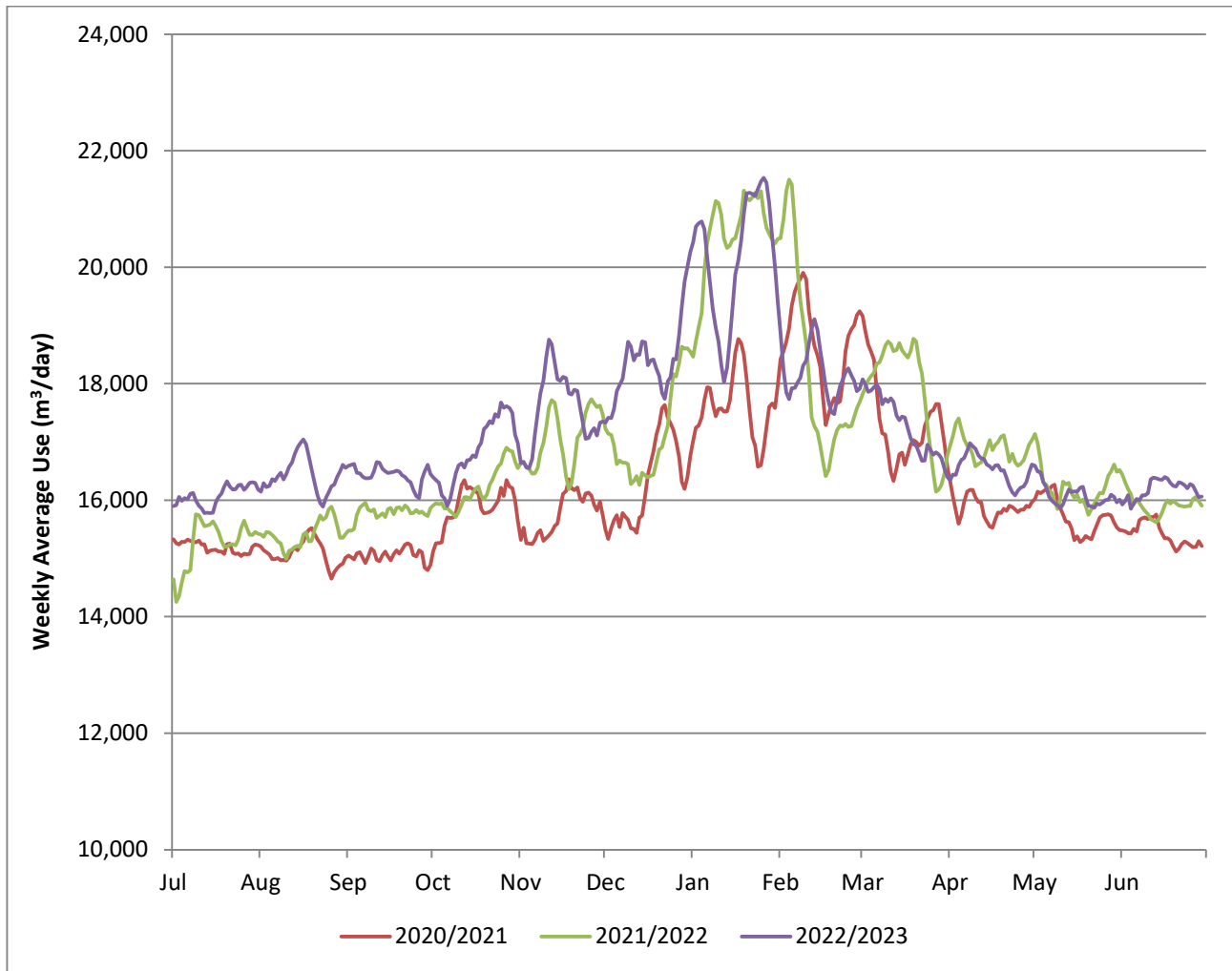


Figure 1: Comparing the District water demand for the last three years.

## Investigating and repairing public and private leaks

The Council prioritised four zones for leak detection and repair, with one zone in Waikanae and three zones in Ōtaki. The investigations covered 18% of water networks.

The key highlights included:

- Paekākāriki network stabilised.
- Major leak in Hautere found and repaired.
- Large leak in Ōtaki found and repaired.
- Water meter-based charging continued to encourage people to repair their leaks. Over 2022/23, the Council gave 380 property owners a credit for repairing their leaks (up 16% from 2021/22).

## Estimated water loss higher in 2022/23 than 2021/22

The Council will continue to engage specialist leak detection contractor to carry out acoustic leak surveys for 2023/24. The scope of works includes an acoustic ground survey by water zone to test all fittings (meters, valves, hydrants, etc., where practical) using acoustic leak detection instruments.

The Council uses the Water loss 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. The results for each scheme are set out in Section 3 of this report.

District Wide	2020/21	2021/22	2022/23
<b>Peak day</b>	(24,100 m <sup>3</sup> /day) or 435 L/p/d	(23,157 m <sup>3</sup> /day) or 406 L/p/d	(22,755 m <sup>3</sup> /day) or 393 L/p/d
<b>Average day</b>	(15,979 m <sup>3</sup> /day) or 283 L/p/d	(16,501 m <sup>3</sup> /day) or 287 L/p/d	(16,588 m <sup>3</sup> /day) or 284L/p/d
<b>Current Annual Water Loss</b>	879,700 m <sup>3</sup> annually or 132 L/conn/day	928,100 m <sup>3</sup> annually or 138 L/conn/day	1,281,300 m <sup>3</sup> annually or 186 L/conn/day
<b>International Leakage Index (ILI)</b>	1.85 (A Band)	1.93 (A Band)	2.62 (B Band)

Table 2: Comparing the performance of The Council water supplies<sup>1</sup>

## Work programme for 2023/24

The Council's focus for 2023/2024 will be to:

- Locate and repair leaks in the Ōtaki and Waikanae.
- Investigate installing leak detection equipment into the Hautere Network.
- Continue water mains and laterals renewal programme based on risk conditions and performance information.
- Continue to support the community to use water, wisely.
- Implement LoRa remote metering network and trial installation on high usage properties and multi-primary/check meters to identify leakage.

A total of \$2,080,000 funding is available in 2023/24 for water conservation and demand management activities.

<sup>1</sup> Council now includes Hautere Water Supply in reported figures.

# Contents

<b>Executive Summary</b>	<b>i</b>
Overview	i
Key water conservation activities in 2022/23	i
District peak water met 490 L/p/d again in 2022/23	i
Investigating and repairing public and private leaks	ii
Estimated water loss higher in 2022/23 than 2021/22	iii
Work programme for 2023/24	iii
<b>1 Introduction</b>	<b>1</b>
1.1 Introduction	1
1.2 Background	1
<b>2 Consent requirements</b>	<b>2</b>
<b>3 Peak day and water loss performance for 2022/23</b>	<b>4</b>
3.1 District peak water use target met for 2022/23	4
3.2 Reporting on the performance of each Water Supply over 2022/23	4
3.3 Long term demand forecasting	14
<b>4 Water conservation and demand management 2022/23</b>	<b>17</b>
4.1 Ongoing demand management activities	17
4.2 Finding and repairing public and private leaks	17
4.3 Regulation	18
4.4 Financial Incentives	18
<b>5 Water Conservation and Demand Management Activities 2023/24</b>	<b>19</b>
5.1 Council leadership	19
5.2 Better data, Better results	19
5.3 Reducing leakage in water supplies	19
5.4 Regulation	20
5.5 Financial Incentives	20
5.6 Education	20
5.7 Fostering innovation	20
5.8 Investing in water demand management and leak reduction for 2023/24	20
<b>6 Population changes</b>	<b>22</b>
6.1 Population figures	22
6.2 Calculating per capita water consumption	22
<b>7 Bibliography</b>	<b>23</b>
<b>Appendix A: Assessment of Environmental Effects</b>	<b>24</b>
<b>Appendix B: Ongoing Water Conservation Measures</b>	<b>25</b>
a) Council Leadership	25
b) Better data, better results	26

c) Education	28
d) Fostering innovation	28

<b>Appendix C: Infrastructure Leakage Index Water Losses</b>	<b>29</b>
--	-----------



# 1 Introduction

---

## 1.1 Introduction

This report provides a summary of the Council's progress towards achieving the Kapiti Coast District's water conservation target of 490 litres per person per day (L/p/d) and provides details of water conservation and demand management activities undertaken in 2022/23 and proposed for 2023/24. This report covers the four water supplies managed by the Council, being Ōtaki Supply, Hautere Water Supply, Waikanae Supply (servicing Waikanae, Paraparaumu and Raumati (WPR)) and Paekākāriki Water Supply.

## 1.2 Background

The 2002 Sustainable Water Management Strategy (the "Strategy") sets out the Council's vision for water management in the district over the next fifty years. The Strategy recognises that sustainable water management is a district-wide issue and needs to account for residential growth and economic development. 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.

In 2010, the Council developed the Water Conservation Plan to ensure the community reached the 490 l/p/d per peak day target by 2016. The Water Conservation Plan contains a series of water demand management measures to achieve the target. There are seven action areas in the plan:

- Council leadership – The Council needs to demonstrate throughout its activities that 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 l/p/d 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.

In addition to the peak water target, the Council's water take resource consents for the district water supply requires the Council to prepare a Water Conservation Report that tracks compliance with the peak target and provides details of water demand management measures in the district.

## 2 Consent requirements

Several Greater Wellington Regional Council (GWRC) consents held by 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 Hautere, Ōtaki and Waikanae 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;	4.2
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 2022/23

### 3.1 District peak water use target met for 2022/23

The Kapiti Coast community met the district level peak water target in 2022/23 without the Council introducing water restrictions. The recent growth and higher network losses meant average daily demand increased from 16,501 m<sup>3</sup>/day to 16,588 m<sup>3</sup>/day, while peak use decreased from 23,157 m<sup>3</sup>/day to 22,755 m<sup>3</sup>/day.

Table 4 shows the gross daily peak water use for 2022/23 and the preceding five years for the four 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. The target does not apply to the Hautere Scheme as this is a community water supply and includes irrigation supply. 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
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
2022/23	554	964	378	409	393
<b>Reach 490 l/p/d target?</b>		N/A			

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

### 3.2 Reporting on the performance of each Water Supply over 2022/23

#### 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 (m<sup>3</sup>/day) and L/p/d.
- Annual consumption summary of each supply (residential, commercial and leakage).
- Number of days the supply was over the 490 L/p/d target.
- The Current Annual Water Loss (CARL), being 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.
- The World Bank Institute performance band and their recommended actions for that band.

Please note that the Council has updated the method in how water consumption and water loss is reported. The Council shifted from using the reservoirs flows for Paraparaumu and Waikanae to the flows leaving the Waikanae Water Treatment Plant (WTP). The plant meters are more accurate, and the reporting now includes any potential losses in the mains supplying water to the reservoirs. The Council is now also sanity checking very high and very low demand days to ensure the recorded flows are accurate. Using the new method, the Council updated historic data for consistency.

### 3.2.2 District-wide results for last three years

The district-wide peak target of 490 L/p/d was met on in 2022/23. Public side leaks increased by 350 m<sup>3</sup>/day compared to the previous year. Figure 2 and Table 6 show the water use trends over the past three years.

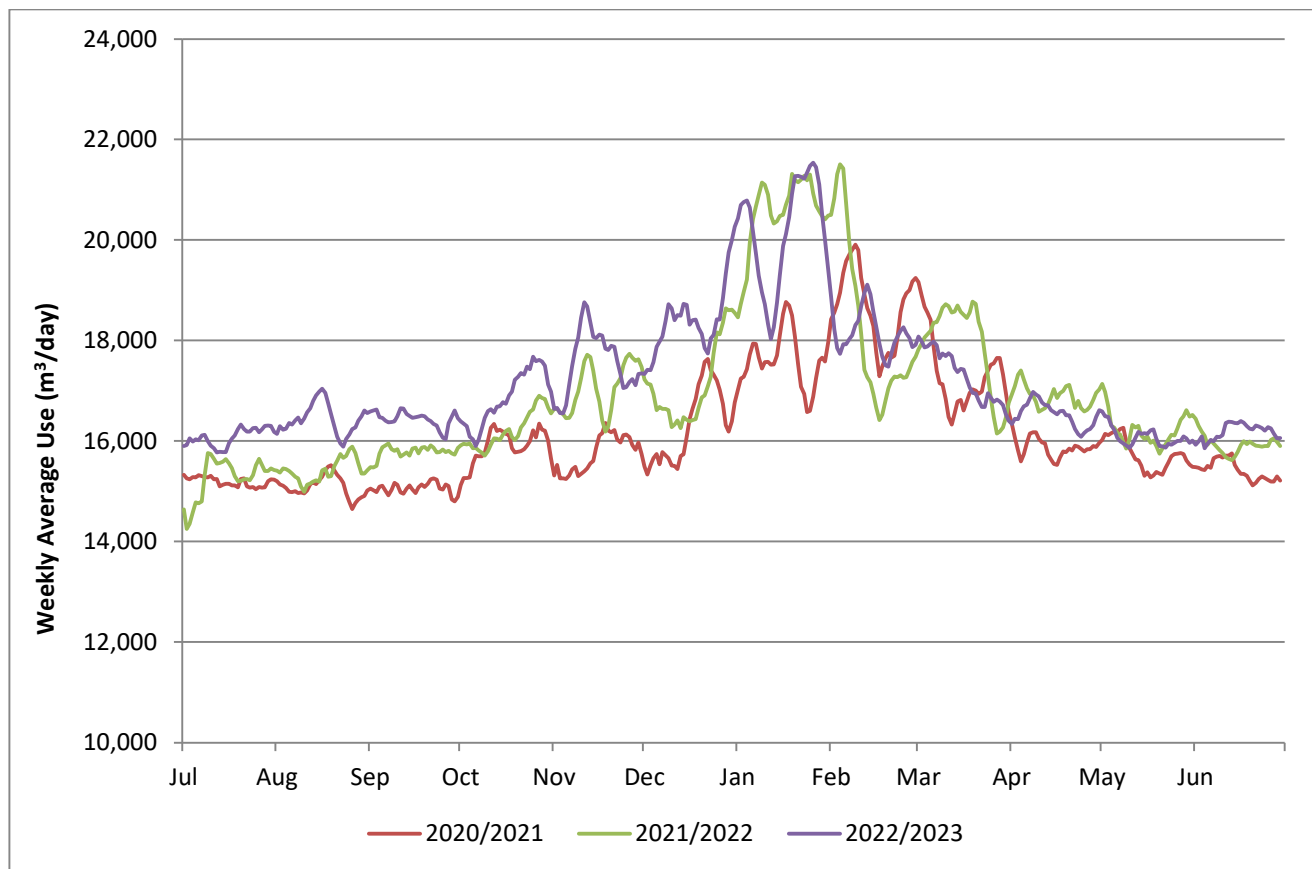


Figure 2: Changes in District-wide water demand for the last three years

District Wide	2020/21	2021/22	2022/23
<b>Peak day</b>	(24,100 m <sup>3</sup> /day) or 435 L/p/d	(23,157 m <sup>3</sup> /day) or 406 L/p/d	(22,755 m <sup>3</sup> /day) or 393 L/p/d
<b>Average day</b>	(15,979 m <sup>3</sup> /day) or 283 L/p/d	(16,501 m <sup>3</sup> /day) or 287 L/p/d	(16,588 m <sup>3</sup> /day) or 284 L/p/d
<b>Current Annual Water Loss</b>	879,700 m <sup>3</sup> annually	928,100 m <sup>3</sup> annually	1,281,300 m <sup>3</sup> annually
<b>International Leakage Index (ILI)</b>	1.85 (A Band)	1.93 (A Band)	2.62 (B Band)

Table 5: Performance of the Council water supplies for last three years (2021/22 and 2022/23 include Hautere)

Figure 3 shows the peak and average daily use in Kapiti per year since 2014/15. Figure 3 shows that the average daily water use is remaining constant, and the peak daily water use is fluctuating but has decreased since 2020/21. Figure 4 shows the CARL for Kapiti Coast. Figure 4 shows that losses have increased by around 6% over the past year, and this is largely due to an increase in losses within the WPR network, to be discussed further in this report.

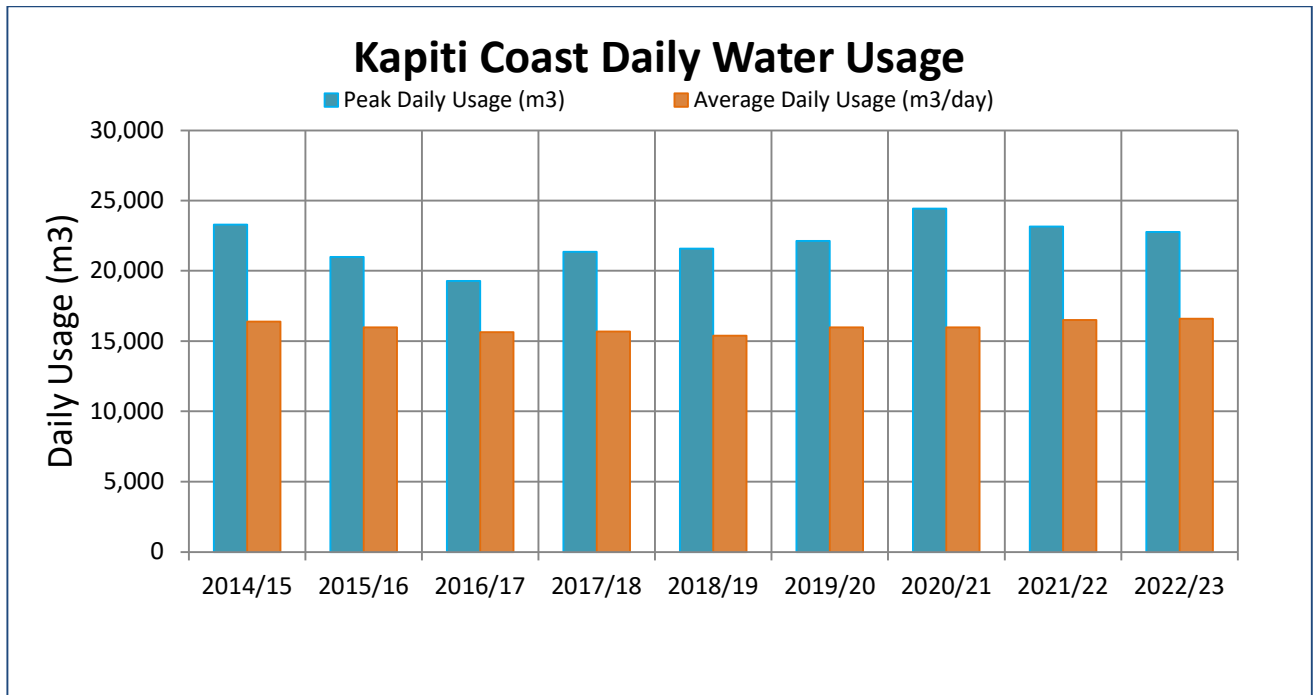


Figure 3: Peak and average daily water usage in Kapiti (2014/15-2022/23)

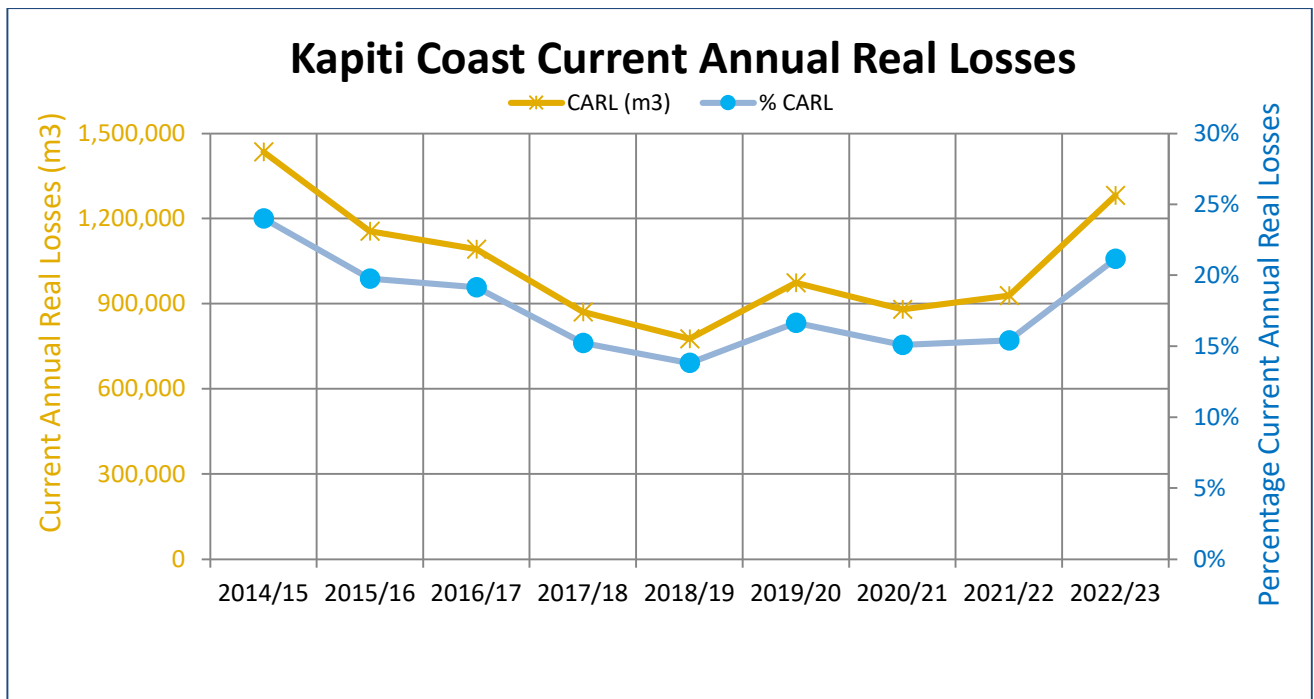


Figure 4: Current Annual Real Losses in Kapiti (2014/15-2022/23)

### 3.2.3 Ōtaki Water Supply

Figure 5 and Table 7 show the changes in the Otaki Water Supply over the last three years. The peak target was not met in Otaki in 2022/23, however the number of days over 490 L/p/d dropped from 54 to 14 days compared to 2021/22. Figure 6 shows leaks in Otaki continue to be an issue. Council contractors swept the entire network over the 2022/23 summer, but no major leaks were found. The leakage in 2022/23 is still about double the leakage in 2014/15. The Council will be undertaking further leak investigations in early 2023/24.

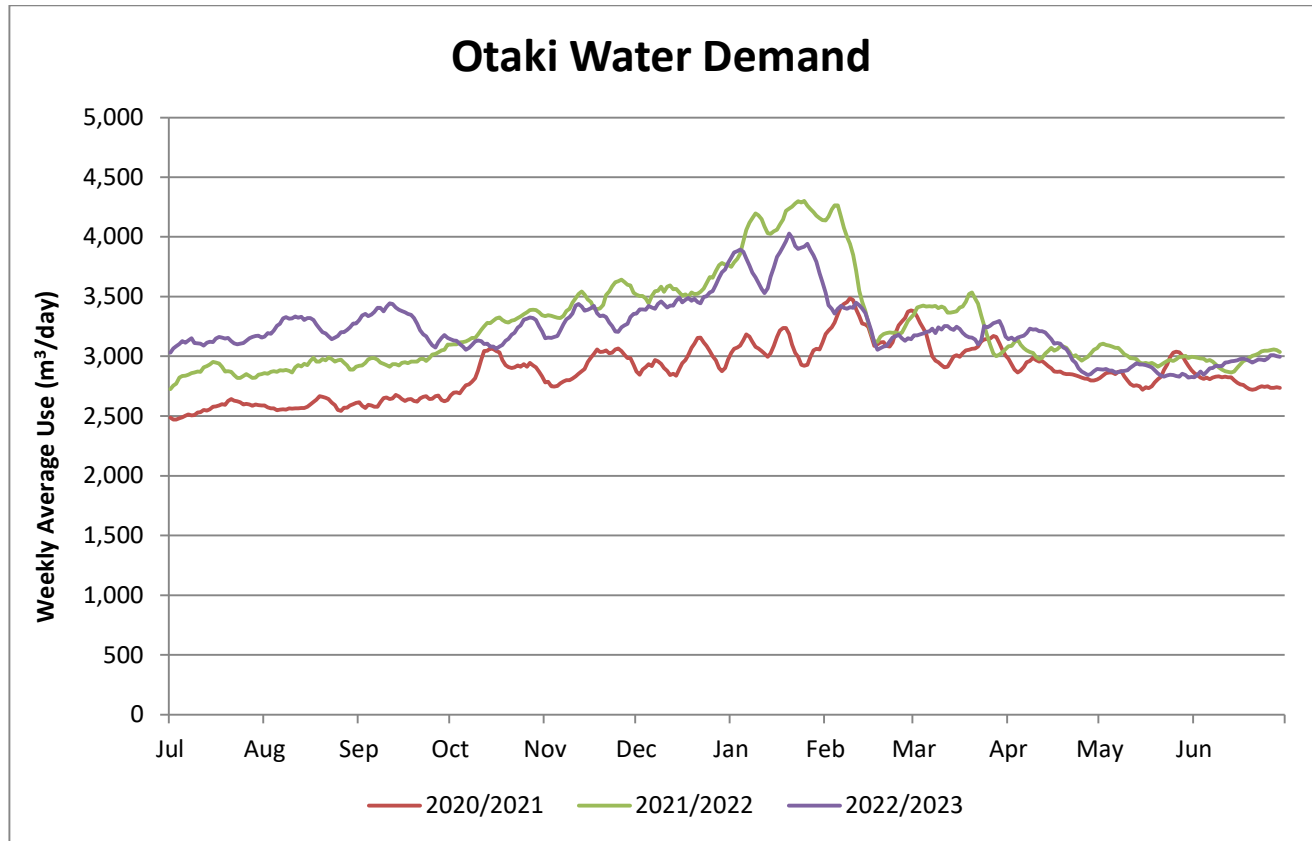


Figure 5: Changes in the Ōtaki Water Supply over the last three years

Ōtaki Supply	2020/21	2021/22	2022/23
<b>Peak day</b>	4,580 m³/day 625 L/p/d	4,425 m³/day 593 L/p/d	4,209 m³/day 554 L/p/d
<b>Days over 490 L/p/d target</b>	2	54	14
<b>Average day</b>	2,879 m³/day 390 L/p/d	3,259 m³/day 433 L/p/d	3,214 m³/day 419 L/p/d
<b>Current Annual Water Loss</b>	316,930m³ annually	379,033 m³ annually	396,050 m³ annually
<b>International Leakage Index (ILI)</b>	4.5 (C band)	5.2 (C Band)	5.3 (C Band)

Table 6. Performance of Ōtaki Water Supply for last three years

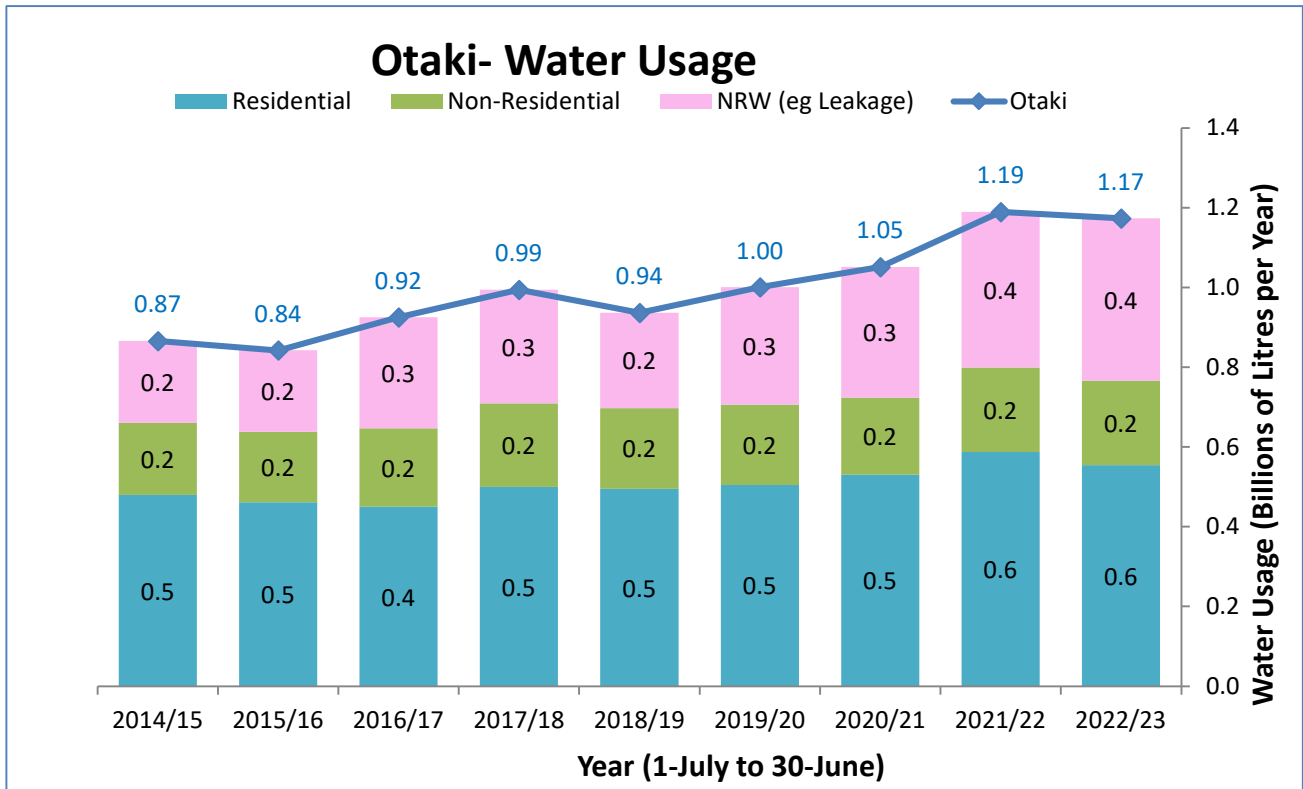


Figure 6: Water use in Otaki by demand (2014/15 – 2022/23)

### 3.2.4 Hautere Water Supply

The Hautere Water Supply is a restricted supply, where the Council restricts water to each property (in multiple of 1000 L/day, depending on allocation). Each customer must provide a tank to contain the water and a pump to provide an on-demand supply to the household for 5 days of supply. Figure 7 tracks water use in Hautere over the past three years, and Table 8 shows key water use indicators for 2022/23. This information has not been provided in previous reports.

The district wide peak daily demand target of 490 L/p/d does not apply to the Hautere Water Scheme. Instead WGN16002 requires the Council to undertake water conservation measures and active leak detection when the Otaki River flow falls below 4,120 L/s. The Council set up a Water Conservation trigger using data from GWRC's "Compliance Flow at the Pukehinau Site."

Table 7 and Figure 8 show that, over 2022/23, the Otaki River fell below the trigger level over 10-11/10/2022. The Council did not act as rain was forecast on the 12/10/2022. The Council will undertake water conservation measures with the community when the river levels are dropping and there is no rain forecast for the foreseeable future.

Figure 7 shows higher than typical winter usage over 2022 and Council staff concluded that this was likely due to a leakage. Finding leaks in the Hautere Supply can be difficult, due to the low density of connections and pipe material installed. After months of periodic investigations, field staff identified and repaired the leak in early March 2023. Figure 7 shows usage returning to historical levels after the leak repair work.

The Council is looking to trial pressure and flow sensors within the network to monitor and respond to leakage in the Hautere network.



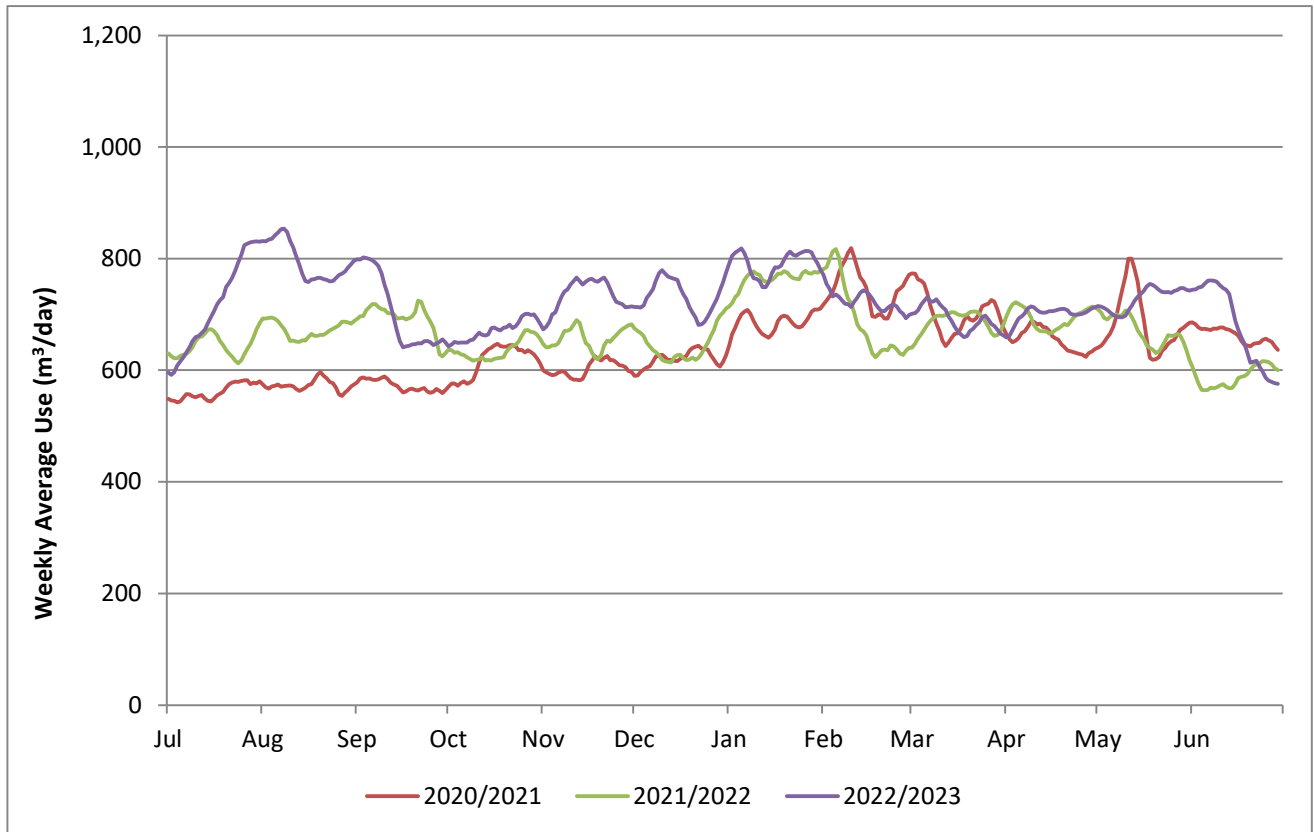


Figure 7: Changes in the Hautere Water Supply over the past three years

Hautere	2022/23
<b>Peak day</b>	878 m <sup>3</sup> /day 964 l/p/d
<b>Dates Otaki Fell Below 4,120 l/s</b>	10/10/2022 (4,000 L/s) 11/10/2022 (4,000 L/s)
<b>Average day</b>	722m <sup>3</sup> /day 793 l/p/d
<b>Current Annual Water Loss</b>	97,500m <sup>3</sup> /year 267 m <sup>3</sup> /day 837 l/conn/day
<b>International Leakage Index (ILI)</b>	4.35 (C band)

Table 7: Summary of Hautere Water Supply performance for 2022/23

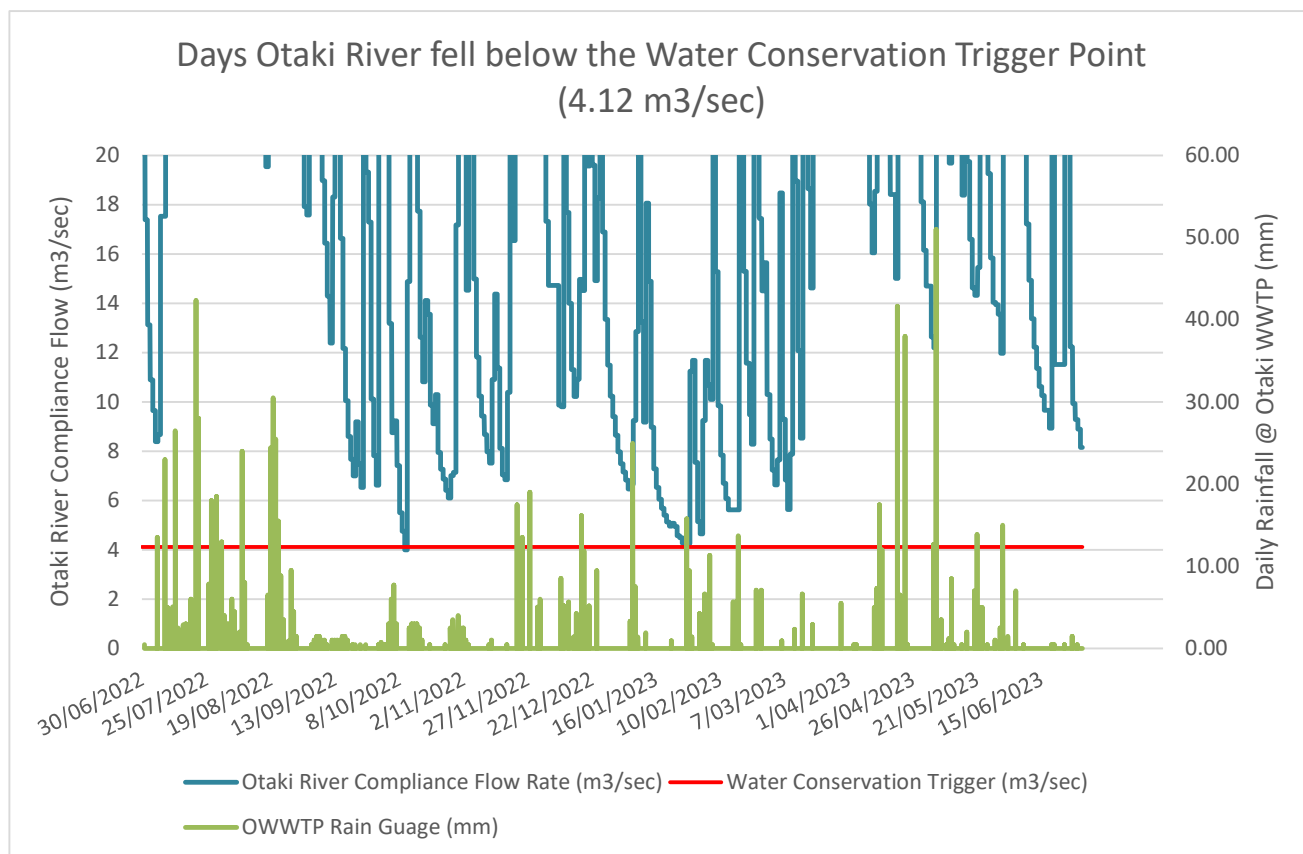


Figure 8: Otaki River flow compared to rainfall data – 2022/23

### 3.2.5 Waikanae/Paraparaumu/Raumati Water Supply

Figure 9 and Table 8 track water use in WPR over the past three years. The Council met the peak target of 490 L/p/d for 2022/23. However, annual losses have increased from 77 L/conn/day to 126 L/conn/day. Figure 9 shows the influence of rainfall on demand indicates a close correlation. Figure 10 shows that, while commercial and residential water use decreased from previous years, the water loss in the reticulation has increased. This suggests that water loss in the Waikanae networks is increasing, as shown in Figure 11. The Council will be undertaking further leak investigations and repairs over 2023/24 to ensure leakage stabilises.

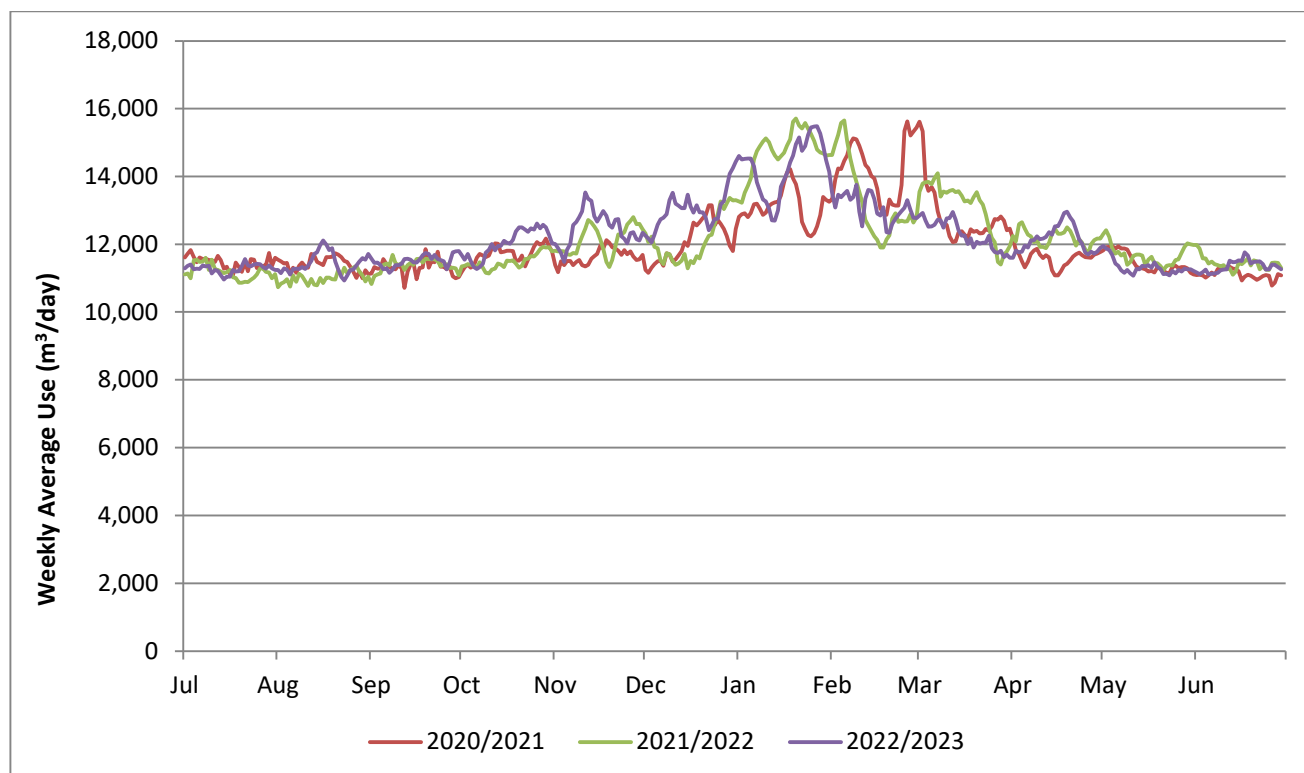


Figure 9: Changes in the WPR Water Supply for the last three years

WPR Supply	2020/21	2021/22	2022/23
<b>Peak day</b>	18,472 m <sup>3</sup> /day 401 L/p/d	17,987 m <sup>3</sup> /day 383 L/p/d	18,019 m <sup>3</sup> /day 378 L/p/d
<b>Days over 490 L/p/d target</b>	0	0	0
<b>Average day</b>	11,960 m <sup>3</sup> /day 258 L/p/d	12,133 m <sup>3</sup> /day 257 L/p/d	12,189 m <sup>3</sup> /day 254 L/p/d
<b>Current Annual Water Loss</b>	495,900 m <sup>3</sup> annually or 82 L/conn/day	473,000 m <sup>3</sup> annually or 77 L/conn/day	783,700 m <sup>3</sup> annually or 126 L/conn/day
<b>International Leakage Index (ILI)</b>	1.4 (A band)	1.3 (A band)	2.1 (B band)

Table 8: Performance of WPR water supply for last three years

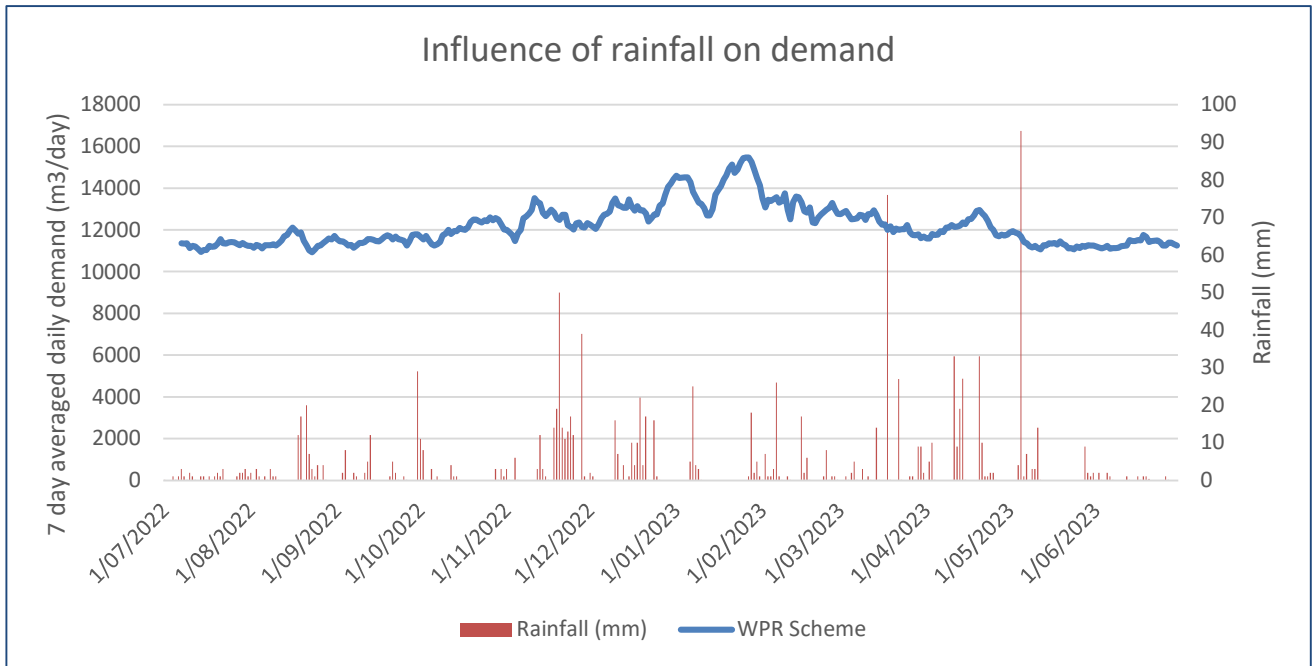


Figure 10. Rainfall impacts on WPR water demand

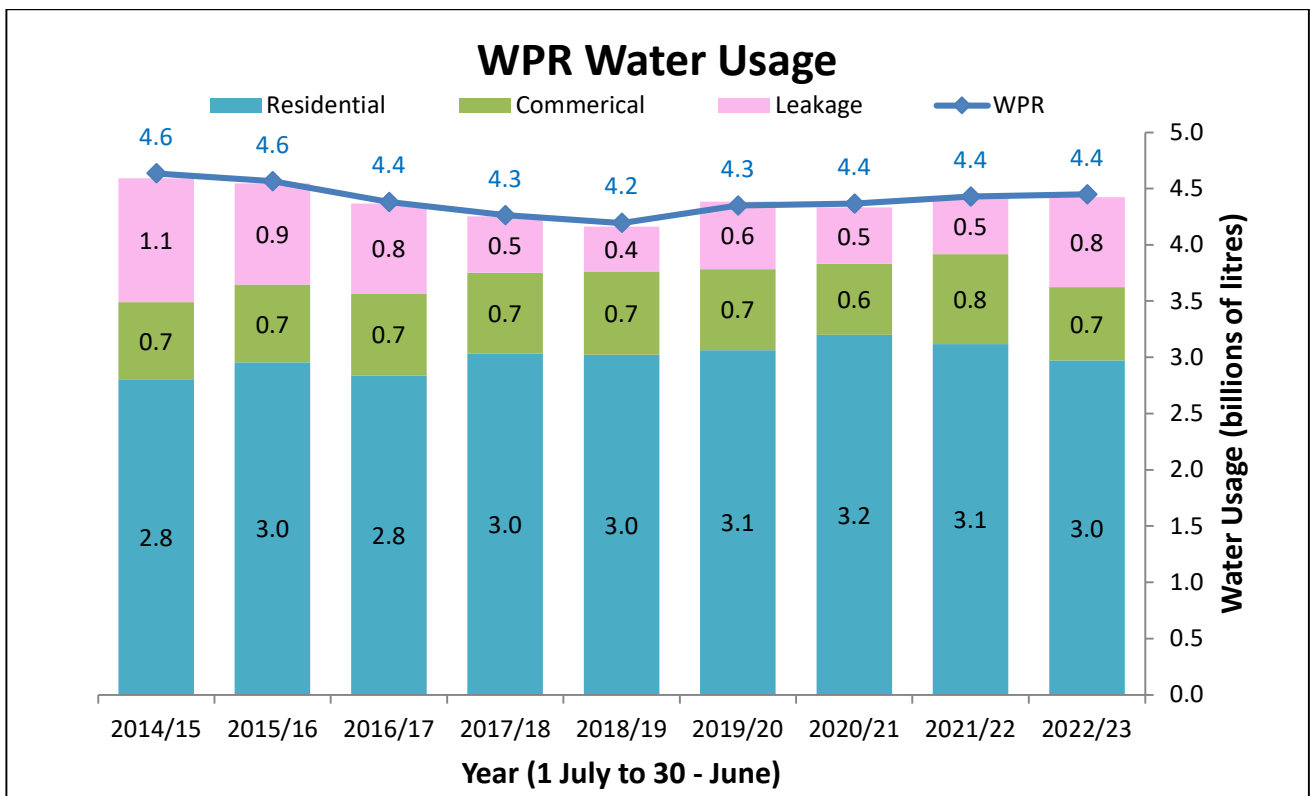


Figure 11. Water use in WPR by demand (2014/15 – 2022/23)

### 3.2.6 Paekākāriki Water Supply

Figure 12 and Table 9 track water use in Paekākāriki over the past three years. The peak target of 490 L/p/d was met in Paekākāriki for 2022/23. Figure 13 shows water use by demand. Leakage and residential water use remained steady with only slight increases from previous years.

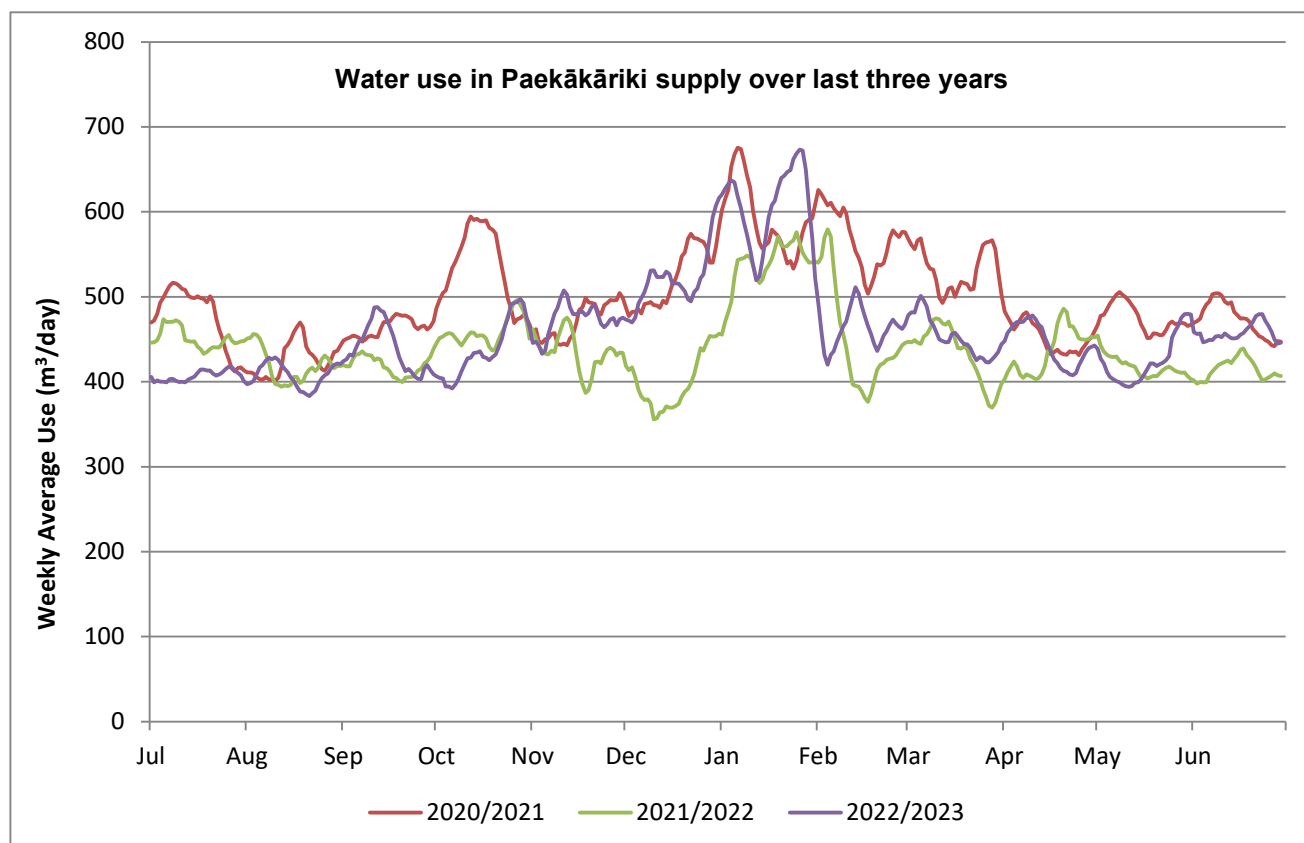


Figure 12. Changes in the Paekākāriki Supply water demand for the last three years

Paekākāriki	2020/21	2021/22	2022/23
<b>Peak day</b>	731 m <sup>3</sup> /day 408 L/p/d	641 m <sup>3</sup> /day 357 L/p/d	743 m <sup>3</sup> /day 409 L/p/d
<b>Days over 490 L/p/d target</b>	0	0	0
<b>Average day</b>	499m <sup>3</sup> /day 279 L/p/d	439m <sup>3</sup> /day 245 L/p/d	462m <sup>3</sup> /day 257 L/p/d
<b>Current Annual Water Loss</b>	38,961 m <sup>3</sup> annually	37,358 m <sup>3</sup> annually	43,838 m <sup>3</sup> annually
<b>International Leakage Index (ILI)</b>	2.3 (B band)	2.5 (B band)	2.6 (B band)

Table 9. Performance of Paekākāriki water supplies for last three years

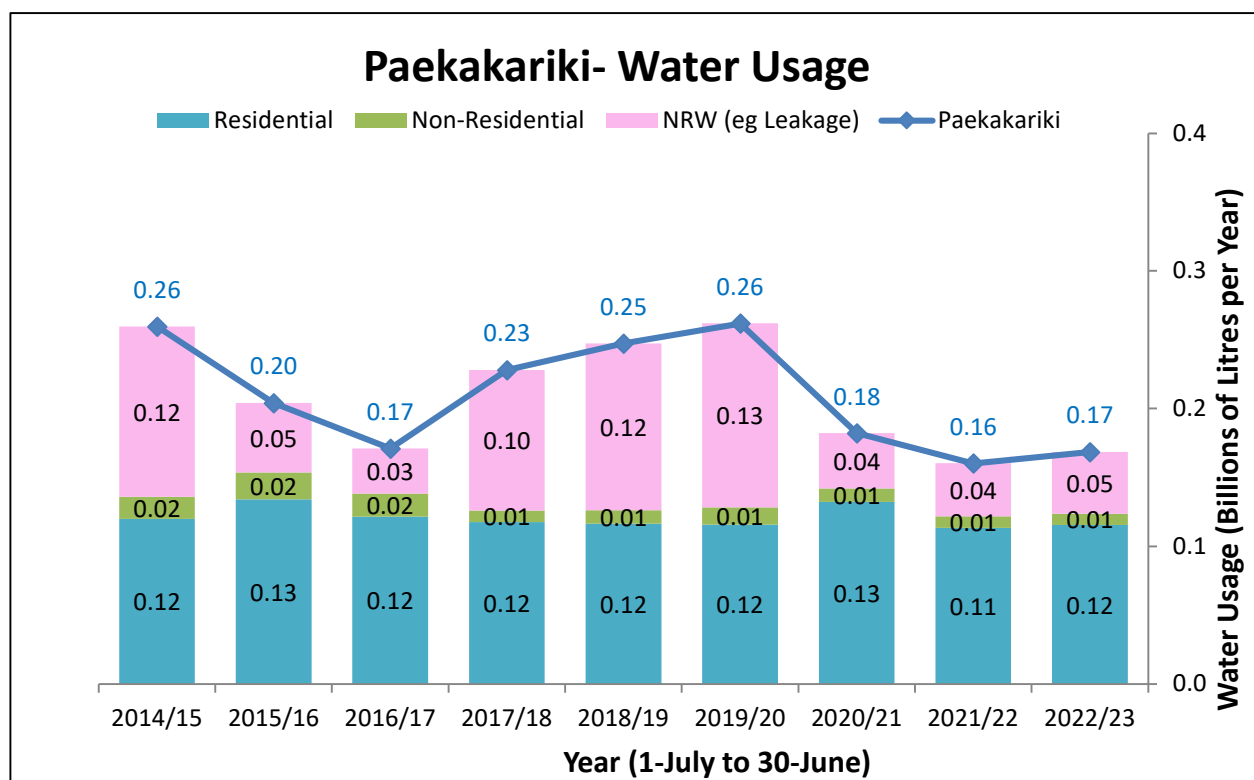


Figure 13. Changes in the Paekākāriki Supply water demand for 2014 - 2023

### 3.3 Long term demand forecasting

The Council regularly reviews long-term demand and supply forecasts for the WPR, Paekākāriki and Otaki water supplies. The purpose of the reviews is to confirm that water supply will be available consistent with the various consents to meet projected demand over the long-term. Forecasting also helps the Council establish the water demand management measures required going forward to meet the projected demand for each supply.

#### 3.3.1 Otaki water supply

Figure 14 shows the Otaki daily water usage and predicted population growth to 2054. Figure 14 shows that the Council will be on track to meet maximum demand forecasts to 2050/51 under the proposed consent renewal for the Otaki water supply. The Council is investigating options for a new water supply source beyond the term of the new consent, which is anticipated to be 2047.

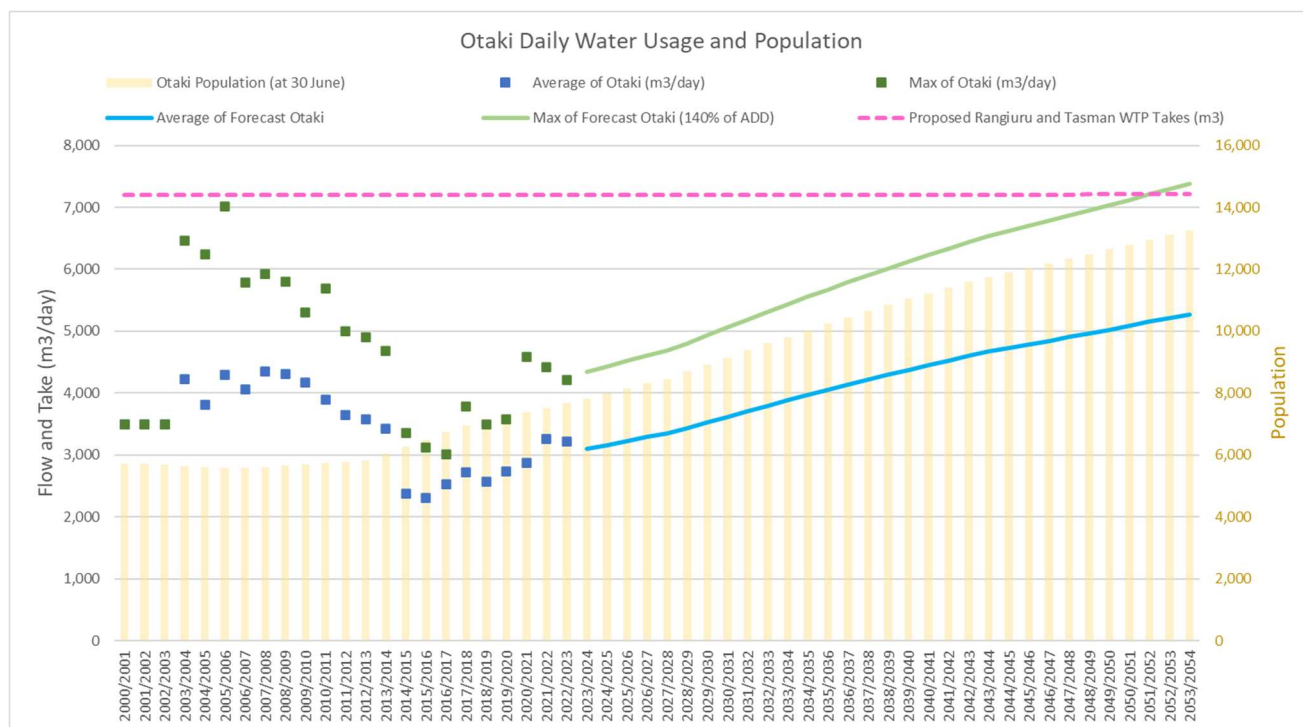


Figure 14: Otaki daily water usage and population

### 3.3.2 WPR water supply

Figure 15 shows the WPR daily water usage and predicted population growth to 2053. Figure 15 shows that the Council is on track to progress to Stage 2 of the Waikanae River Recharge Scheme in 2036/37. The resource consent and original forecasting anticipated progressing to Stage 2 in 2033, so this is 3-4 year later than originally forecasted. The population has increased as predicted, but demand management measures have been more effective than originally anticipated.

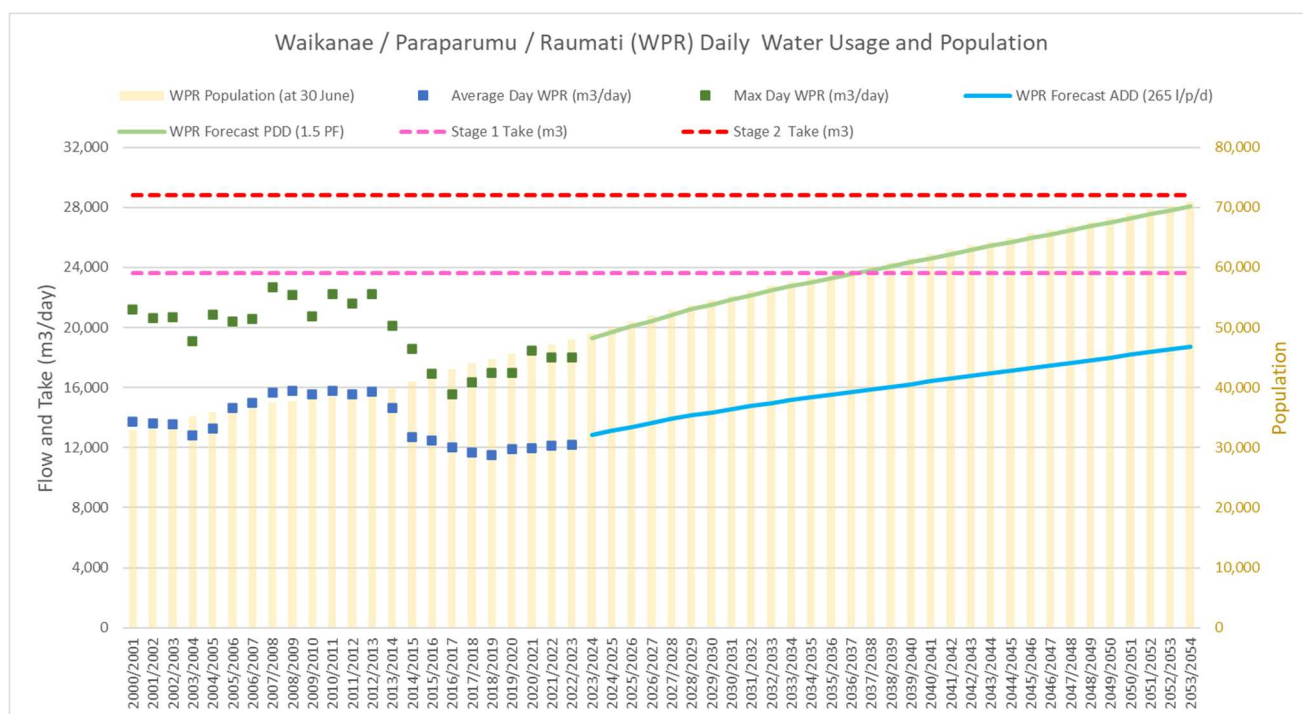


Figure 15: WPR daily water usage and population

### 3.3.3 Paekākāriki water supply

Figure 16 shows the Paekākāriki daily water usage and predicted population growth to 2053. Figure 16 shows that the Council will be well within the consent limits to 2053. The current consent for Paekākāriki expires in October 2038 and the Council re assess water use requirements beyond this term as part of the application process to renew the consent.

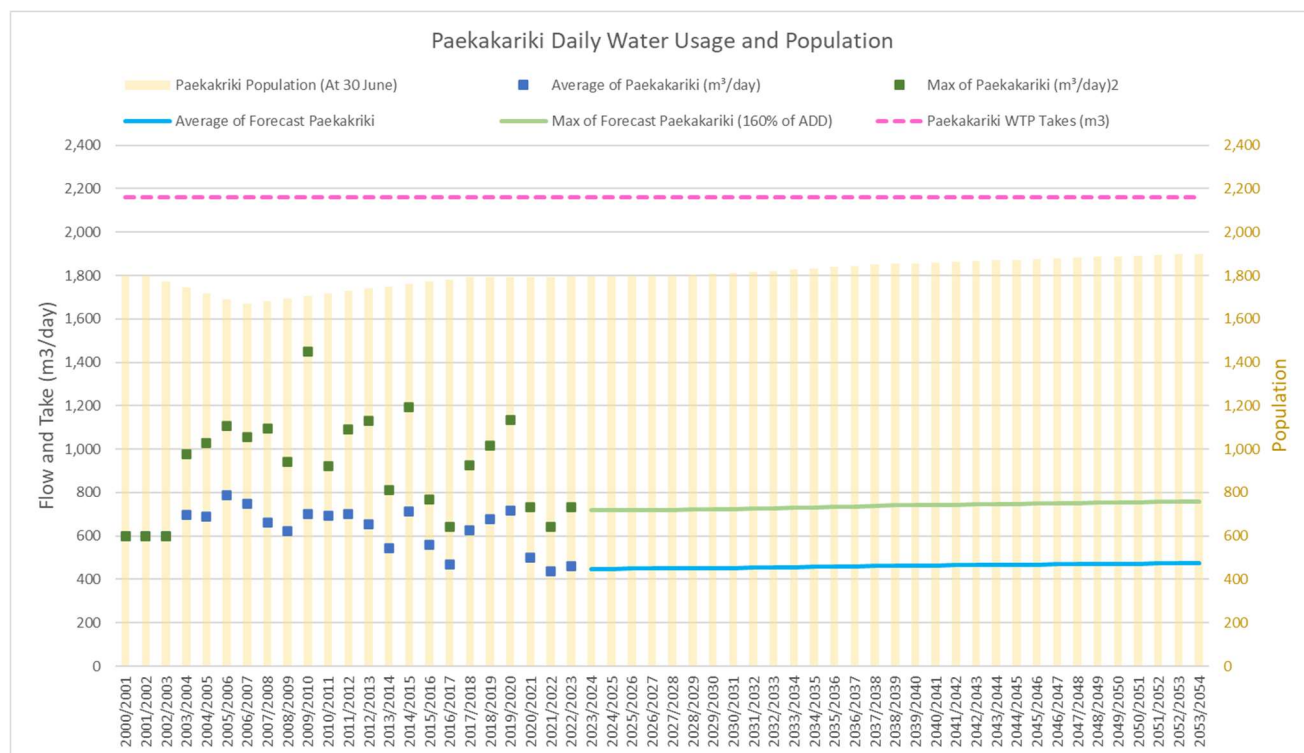


Figure 16: Paekākāriki daily water usage and population



## 4 Water conservation and demand management 2022/23

### 4.1 Ongoing demand management activities

The Council implements several ongoing water conservation activities, including keeping the community informed, managing the Council's own water use, understand water use trends and leakages, education and fostering awareness. These measures are described in Appendix B and are typically the same year-to-year.

### 4.2 Finding and repairing public and private leaks

Over 2022/23, the Council informed properties with suspected leaks and investigated approximately 18% of the district's supplies for leaks. Key outcomes include:

- The Council investigated four of the 23 zones – this resulted in 18% of the network length being surveyed for leakage.
- The Council reviewed how planning around replacing assets causing leak issues.

#### 4.2.1 Results from planned 2022/23 leak detection

The Council prioritised four zones for leak detection and repair, with three zones in Waikanae and the Paekākāriki network. The investigations covered 85.9km, 18% of the 471.3km of water networks. The leak investigation in Otaki had limited impact on demand despite 76 leaks identified at approximately 400 m<sup>3</sup>/day.

#### 4.2.2 Reactive renewal work undertaken by the Council

Table 10 shows the reactive work undertaken by the Council in 2022/23 on the public networks to resolve leaks as they arose.

Reason for service request	Year		
	2020-21	2021-22	2022-23
Burst Water Pipe	51	69	38
Leaking Fire Hydrant	23	15	14
Leaking Water Toby	85	57	39
Leaking Water Valve	2	1	2
Water Leak - Cause Unknown	400	424	513
Water Toby Fault	82	85	86
No Water Supply	54	50	51
<b>Total Interventions</b>	<b>675</b>	<b>701</b>	<b>743</b>

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

## 4.3 Regulation

### 4.3.1 New homes

The Council **approved 218 District Plan compliant homes** across the District water zones over the 2022/23 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 L of rainwater storage to supply the toilets and outside taps. When the rainwater level falls below 1,000 L, mains water will top up the tank at a rate of 600 litres/day.
- A greywater diversion device and a 4,000 L of rainwater storage to supply the toilets and outside taps. When the rainwater level falls below 1,000 L, mains water will top up the tank at a rate of 600 L/day.
- An alternative solution that demonstrates it can achieve the reduced peak water use targets.

## 4.4 Financial Incentives

### 4.4.1 Encouraging people to fix leaks on their property

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

The council waived a total of \$290,810 (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.

### 4.4.2 Providing financial support to those in need

Over 2022/23, the Council offered three schemes to support residents on a limited income to assist residents in financial hardship:

- Rates Assistance – 1,268 successful applications (including GST).
- Temporary Rates Assistance related to water repairs (up to \$300 towards hardship) – 32 successful applications.
- Water Rates Remission for vulnerable households relating to high water use – 4 successful applications.
- Two properties took up the Interest-free rates payback scheme to install rainwater tanks.

## 5 Water Conservation and Demand Management Activities 2023/24

---

### 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 on water supply

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 and Waikanae will be an important focus for 2023/24.

#### 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 on the following page 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.

## **5.4 Regulation**

### **5.4.1 The Council's District Plan water demand management requirements**

There will be no change over 2023/24.

## **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 2023/24.

### **5.5.2 Rates relief**

Over 2023/24, the Council will continue to provide financial assistance to those in need. The following remissions will be available, being \$323,55 (including GST):

- Rates Temporary Financial Assistance Remission provides up to \$300 towards significant one-off costs causing financial hardship. This includes repairing leaks.
- The Rates Assistance Rates Remission provides up to \$300 of rates remission.
- Water Rate Remission for Vulnerable Households provides rate remission up to \$120 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 2023/24**

Table 11 outlines the key funding allocations for water conservation and leak management work for 2023/24.

Activity	District-wide budget for 2023/24
Keeping community informed (18856)	\$125,000
The targeted rate for rainwater or greywater systems (60123)	\$100,000 to fund targeted rates
Financial assistance (rates team)	\$320,000
Water Meter Management (18857)	\$255,000
Leak detection (18846)	\$55,000
Reticulation maintenance and repair (18831)	\$510,000
Planned and unplanned renewals (18811&18812)	\$715,000
<b>Total</b>	<b>\$2,080,000</b>

Table 11: Planned expenditure for 2023/24 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 12 shows the population figures for each supply and the District (rounded to nearest 10 persons).

Year	Ōtaki	WPR	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
2022/23	7,520	47,200	1,790	57,420	900

Table 12: 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. NZ Water, 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 A: 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 B: Ongoing Water Conservation Measures

---

### a) Council Leadership

#### i) Keeping the community informed

##### (1) 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

##### (2) Up to date information for frontline staff

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.

##### (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.

#### ii) Council managing its own use of water efficiently

##### (1) Monitoring water use at the Council's 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.

##### (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.

##### (3) Minimising 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.

## b) Better data, better results

### i) Understanding trends in water use and leakage

The Council monitors trends in water use and leakage.

#### (1) Weekly leak monitoring

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 13. 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 <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 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 13: World Bank Institute Bands for Leak Management in Developed Countries

Figure 17 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 17: Examples of how the Council grades a zone's water performance week-to-week

## (2) Undertake water balance reports for all water supplies

The Council uses the annual WaterNZ Bench loss tool for each water supply to show:

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

## (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.); and
- feed annual water uses into the water balance model to determine annual water lost through leaks.

**ii) Finding and repairing private leaks**

After each billing cycle, the Council investigate properties with high reads. 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 day 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).

**c) 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.

**d) 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.

## Appendix C: 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 (m<sup>3</sup>/year) and unavoidable annual real losses (m<sup>3</sup>/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