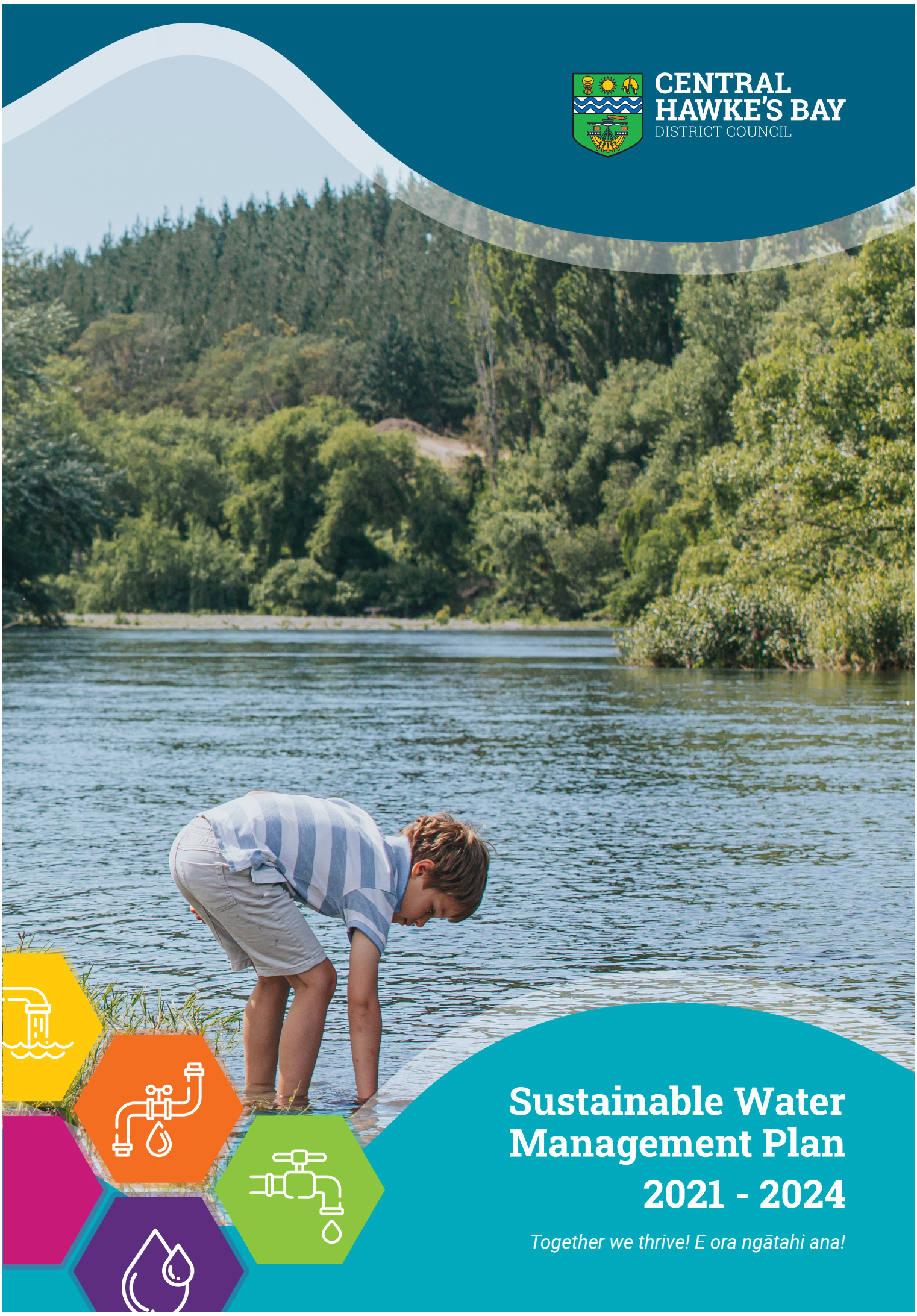
CENTRAL HAWKE'S BAY
DISTRICT COUNCIL



Sustainable Water Management Plan 2021 - 2024

Together we thrive! E ora ngātahi ana!

Document Overview

Document Status

Version	Comments	Status	Date
001	First Version	Draft – Awaiting Approval	13-02-2021
002	First workshop with Council	Working Draft	Sept 2020
003		Working Draft	21-09-2020
004	Updated with consents	Working Draft	29-09-2020
005		Working Draft	18-11-2020
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007		Final Draft – Awaiting Approval	24-02-2021
008	Minor tweaks		16-03-2021
1.0	Adopted by Council	Approved - Operational	25-02-2021
2.0	Designed version	Approved - Operational	08-04-2021

Document Purpose

The Sustainable Water Management (SWM) Plan (2021) has been developed to demonstrate Council's programme for managing water demand such that the potential effects on the water takes are minimised. The SWM Plan identifies how the Council and the Community will improve water-use efficiency and reduce water loss in operations using a range of techniques that are consistent with industry practice and supports Council's desire to become an efficient user of this valuable resource.

Document Audience

This Policy applies to all Council staff and contractors.

Document Contributors

Contributor	Name and Title	Approval Date
Creator	Daniel Johnson, Water Group Manager - WSP	08-02-2021
Reviewer	Ian Cover, 3 Waters Operations Manager, CHBDC Wayne Termaat, Outcomes Manager, Veolia	15-02-2021
Authoriser	Darren de Klerk, Director Projects and Programmes - CHBDC	16-02-2021
Approver	CHBDC Finance and Infrastructure Committee	25-02-2021

Related References

Documents Informing Asset Management Strategy and Direction

- Water Safety Plans
- Water Supply Bylaws 2018
- DRAFT Water Supply Bylaw 2021
- Organisational Values
- Project THRIVE Documentation
- Infrastructure Strategy 2021
- Long Term Plan 2018-21
- DRAFT Long Term Plan 2021-2031
- Draft District Plan
- Spatial Plan
- Environmental and Sustainability Strategy
- Water Asset Management Plan
- DRAFT 3 Waters Asset Management Plan 2021

Contents

Action Plan

Purpose of this Plan

Hawke's Bay Regional Council (HBRC) require a Water Management Strategy as part of the resource consent which demonstrates how demand for water from the water supply bore will be minimised at times of low flows in the Rivers.

As a requirement of the consents for Johnson Street, Waipawa (WP030817T), Tikokino Road, Waipawa (WP030818T), Meta Street, Takapau (WP140534T) and State Highway 2, Waipukurau (AUTH-113708-03) the Central Hawke's Bay District Council is required to submit a water management strategy to the HBRC.

In response to these requirements, the following Sustainable Water Management (SWM) Plan (2020-2023) has been developed to demonstrate Council's programme for managing water demand such that the potential effects on the water takes are minimised. The SWM Plan identifies how the Council and the Community will improve water-use efficiency and reduce water loss in operations using a range of techniques that are consistent with industry practice and supports Council's desire to become an efficient user of this valuable resource.

Purpose of this Plan

The purpose of our SWM plan is to highlight our activities and those areas where we are promoting water sustainability.

Our approach to water sustainability can be grouped into four key areas/ themes:

- Engaging with our customers
- Ensuring environmental vitality and sustainability through our way of working
- Improving our assets
- Working with our stakeholders.

To ensure we value our most natural resource, water, our focus is on reducing leakage, working with our customers to use water wisely and in a sustainable manner and using the most appropriate ways to store and distribute water to ensure a reliable and consistent supply of water.

We are aware that the effects of water efficiency activities are difficult to measure (even where good demand component measurement is in place); however, we are committed to exploring water efficiency opportunities.

While the SWM Plan has been developed to meet consent conditions, it also serves as a base document for the implementation of Council's long-term strategic direction and District Plan which identifies the sustainable management of natural and physical resources and the social, economic, environmental and cultural well-being of the community

Alignment with Council's strategic framework:

- ***Social and Cultural – A health, safe place to live:*** Risks to public health are identified and appropriately managed
- ***Economic – A place with a thriving economy:*** Central Hawke's Bay District has an efficient and affordable water infrastructure
- ***Environmental – A place that is environmentally responsible:*** Central Hawke's Bay plans and manages water use to minimise the effect on the environment.

Relationship with Other Plans

Introduction

To achieve a holistic and integrated approach to three waters management in the District that is consistent with Council's District Plan, other Policies, Plans, Strategies and Objectives and also reflect the principles of the Te Mana o Te Wai. The following overarching purposes has recently been set for all four water services bylaws (Water Supply, Stormwater, Wastewater and Trade Waste).

The Sustainable Water Demand Management Plan is an enabling tool to support the management of water demand in the district and complements the water supply bylaw whilst link to the plans and purposes below.

1. Integrated Approach

Adopt an integrated and holistic approach to the Three Waters (water supply, wastewater including trade waste and stormwater) that recognises the interconnections between each of the waters and promotes their sustainable use and management.

2. Environmental Responsibilities

Facilitate environmentally responsible practices by raising awareness of how the Three Waters interact and effect the District's natural environment. Additionally, ensure that Council meet its own responsibilities in terms of resource consent requirements set by the Hawke's Bay Regional Council.

3. Sustainable Practices

Encourage and incentivise the community and businesses to adopt practices that lead to the enhancement of the environment and the sustainable management of water resources including water and product stewardship, rainwater harvesting, waste minimisation and cleaner production.

4. Support Sustainable Growth

Support the sustainable provision of three waters infrastructure to enable future growth while minimising impacts on the environment.

5. Achieve Project Thrive Values

Develop and implement Three Water Bylaws to give effect to 'Project Thrive' values in particular trust, honesty, respect, innovation, and valuing people.

6. Te Mana o Te Wai

Recognise the fundamental concept of Te Mana o Te Wai as prescribed under the National Policy Statement for Freshwater Management 2020 and in particular the need to restore and preserve the balance between the water, the wider environment, and the community.

7. Tangata Whenua Status

Recognise the status of tangata whenua as Kaitiaki.

8. Durable Infrastructure

Develops and maintain durable and resilient infrastructure that achieves Council's levels of service in an efficient and cost-effective manner.

Water Supply Schemes

The provision of systems for the extraction, treatment and distribution of water is a function of Council's permitted activities and governed by the Local Government Act 2002 and the Health Act 1956.

There are five potable water supply schemes that are operated and maintained by Council:

- **Waipukurau** – an on-demand scheme servicing the Waipukurau township. Water is sourced from four bores located at the foot of Pukeora Hill (approximately 4 km west of Waipukurau). The bores are hydraulically connected to the Tukituki River. Water is pumped to a reservoir on Pukeora Hill and treated with UV and chlorination. The supply to the reticulation comprises two 'zones. Most connections are supplied in the high-pressure zone, which is serviced by the Pukeora reservoir, with the smaller Mangatara Road tank at the east end of the scheme supplying a small number of houses during high demand (back-feed). Hunter Park reservoir, which is located on top of Hunter Memorial Park, is fed from the Pukeroa reservoir and supplies the low-pressure zone area (central north area of township). There is also a small offtake (Shand booster pump) after the Pukeora reservoir. This supplies some high elevation connections via a gravity supply from the Shand reservoir.
- **Waipawa- Otāne*** – an on-demand scheme servicing the two townships of Waipawa and Otāne. Water is sourced from a bore on Tikokino Road which is pumped to two reservoirs approximately 4.5 km on Abbotsford Road. A second bore located in Johnson Street supplements the supply and pumps into a low-pressure zone of the network. The bores are hydraulically connected to the Waipawa River. Water from the Abbotsford Road reservoir gravitates into the Waipawa township reticulation. A dedicated main from the Abbotsford reservoir also fills the Otāne reservoir which gravity supplies the Otāne township. The Otāne township is also supplied from a second connection to the Waipawa reticulation via a pressure reducing valve. *Supplied from two different bores and treatment plants.
- **Takapau** – an on-demand scheme servicing the Takapau township, with some farm connections being metered. Water is sourced from a deep bore located in Meta Street, treated for manganese and iron removal (ultrafiltration) and chlorinated before being stored in seven tanks. Water is pumped from the tanks to the reticulation, also filling the SH2 (Sydney Street) reservoir on the west side of the network.
- **Pōrangahau-Te Paerahi** – an on-demand scheme servicing the Te Paerahi Beach and Pōrangahau settlements. Water is sourced from a bore located off Beach Road and treated for manganese and iron removal (green sand filtration) and chlorinated (UV and chlorine). Ion exchange has recently been installed to soften the water. Booster pump stations supply the stored treated water to the township and Te Paerahi Beach networks. There is further storage in the Pōrangahau township network in the form of three treated water reservoirs on the hill next to the township.
- **Kairakau** – a scheme servicing the Kairakau domestic properties, public toilets and camping ground. Water is sourced from a spring and a bore. Raw water is chlorinated and then pumped to the network via a series of treated water reservoirs. The campground has its own dedicated reservoir, with a further three supplying the community. Each property has an onsite rainwater collection tank (minimum volume 1,800 L) which is also supplemented by the Council supply.

In addition to the above, there are further water supply activities within the District that Council considers as part of the over-arching approach to sustainable water management:

- **Pourerere Campground** – a Council water supply servicing the Pourerere camping ground, public toilet block and two houses. Water is taken from a spring in Gibraltar Road and supplied via a 20mm diameter pipe.
- **Russell Park / Waipukurau Sports Fields** – Council has a consent to take as use water from the Tukituki River for the purpose of irrigating 17.5ha of sports field at Russell Park in Waipukurau.

Table 1 and Figure 1 provides an overview of the potable water supply schemes serviced by the Council.

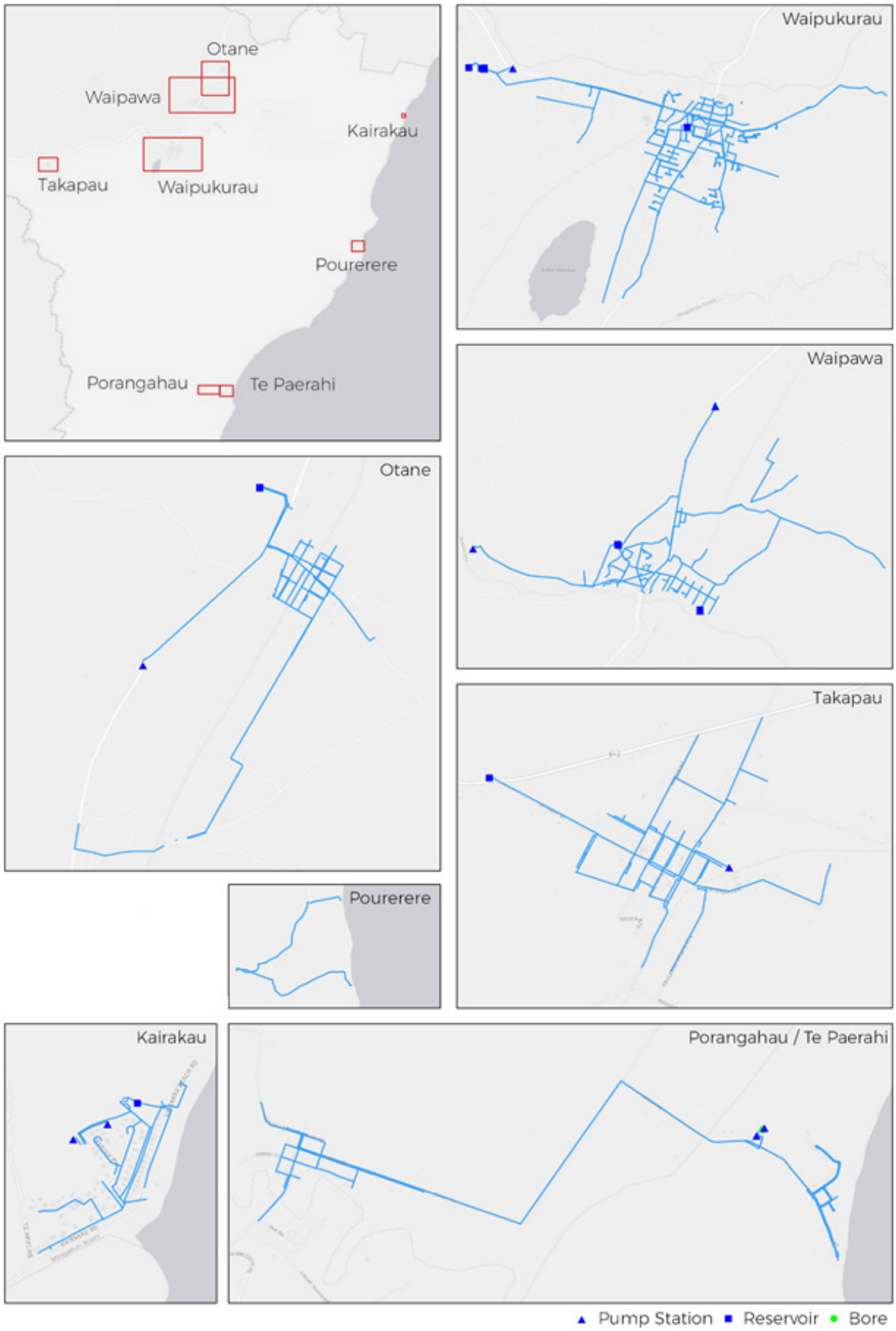


Figure 1: Central Hawkes Bay District Council Water Supply Schemes Overview

Table 1: Potable Water Supply Scheme Overview

Water Supply	Supply Type	Population	No. Connections	Length of Mains (km)	Source	Treatment	Storage	Pump Station
Waipukurau	On-demand	3,666	2,249	79.1	5 bores	UV, Chlorination	Pukeroa Hill - 2,700 m³ Hunter Park - 900 m3 Mangatarata Rd tank 20 m³ Shand Rd - m³	1 no.
Waipawa - Otāne	On-demand	2,355	966 + 326	77	3 bores	UV, Chlorination	Abbotsford Rd - 400 m³ + 700 m³ (treated) Johnson Street – 210cm³ Otāne – 2 x 150 m³ (treated)	
Takapau	On-demand	570	278	16.4	1 bore	UV, Greensand, Ozone	Meta St – 240 m³ SH2 – 230 m³	
Pōrangahau -Te Paerahi	On-demand	160	133 + 110	16.2	1 bore	UV, Greensand, Ion Exchange	Beach Rd - 96 m³ (raw) + 264 m³ (treated) New treated storage – 180 m³	1 no.
Kairakau	On-demand to rainwater tanks	83	84	3.3	1 spring, 1 bore	Chlorination	4 x 25 m³ (raw) 3 x 25m³ + 20m³ (treated)	1 no.

Reticulation

In terms of the reticulation network the water supply schemes have a range of pipe materials and age (0 – 113 years). A high-level assessment of 'age based' condition was undertaken for each water supply as shown in Figure 2.

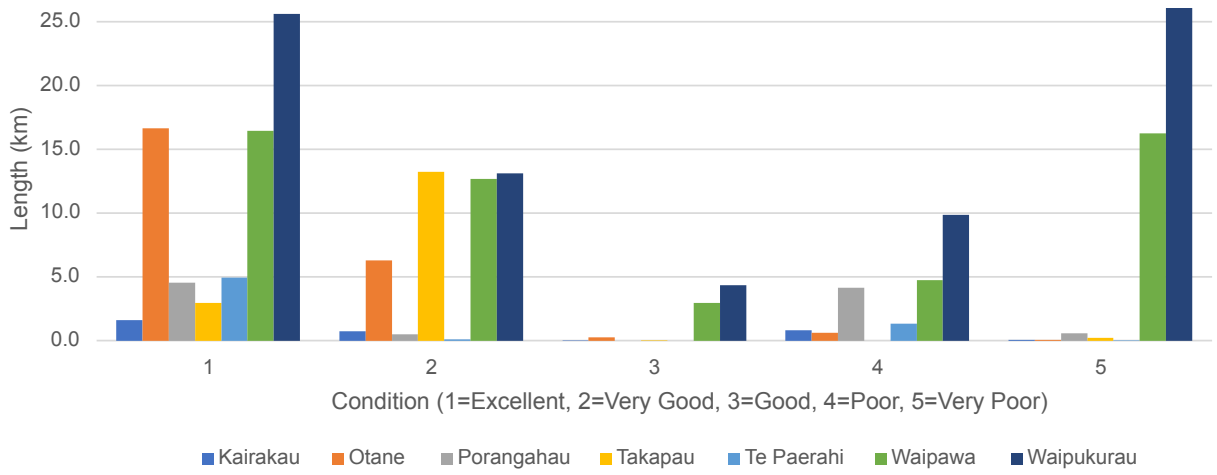


Figure 2: Water Supplies Pipe Age Based Condition

Observations – Pipe Age Based Condition

- Waipukurau (36km, 46%), Waipawa (21 km, 40%) and Pōrangahau (4.7 km, 48%) are estimated to have > 40% of pipes that are assessed as being in poor to very poor condition.
- Pipe condition assessment and development of a strategic renewals programme will enable the Council to prioritise and target pipe renewals as part of an over-arching water loss management strategy (refer 'Leakage' section).

Storage – Resilience

The optimal volume of treated water storage for a water supply usually comprises a balance between considering resilience (climate change, planned and unplanned interruptions), water quality and demand. Generally, more than one day of storage at peak day demand could be considered the minimum required to help mitigate the effect of any supply interruption and allow Council time to initiate a response (e.g. repairs, conserve water communication). A general assessment of the CHBDC water supplies against current peak day and average day demand is shown in Table 2 .

Table 2: Water Supply Treated Water Storage No. Days for Peak Day and Average Day Demand

Water Supply	Treated Water (m3)	Peak day demand (m3/day)	No. hours storage	Average day demand (m3/day)	No. hours storage
Waipukurau	3,600	6,480	13 hours	4,277	20 hours
Waipawa- Otāne	1,600	3,513	10 hours	1,872	9 hours
Takapau	470	686	14 hours	378	13 hours
Pōrangahau-Te Paerahi	464	399	16 hours	151	42 hours
Kairakau	95	42	54 hours	24	95 hours

Observations – Treated Water Storage

- All the water supplies, except for Kairakau, have less than one day of storage a current peak day demand.
- Further assessment of storage is required that considers resilience scenarios and considers the impact of future demand.

Pressure

Council has a legal requirement to ensure that an adequate and continuous supply of water is provided at a pressure that enough for user activities and firefighting purposes. Figure 4 show the maximum pressure contours predicted by the current hydraulic models for Waipukurau and Waipawa- Otāne. Generally, pressures vary from 75m down to 20m in Waipukurau, with the lower pressures evident in the low-level area supplied by the Hunter Park Reservoir. There are higher pressures in excess of 90m evidenced in the Waipawa- Otāne water supply with pressures in the Waipawa network being dictated by the pumping required to supply the Abbotsford Reservoir. The Otāne network is already fed through a PRV on the incoming main from Waipawa.

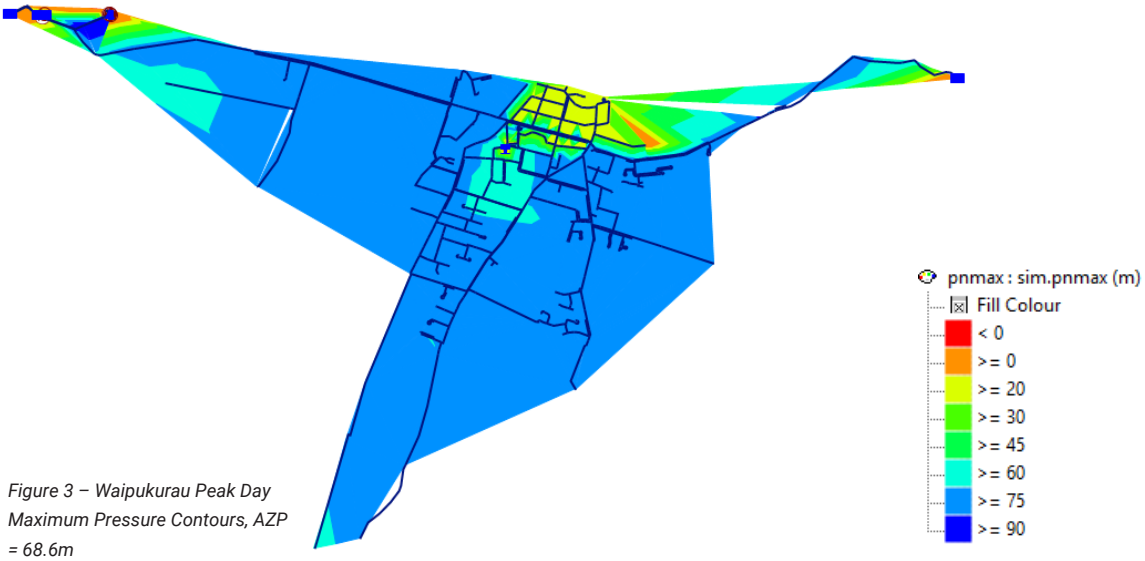


Figure 3 – Waipukurau Peak Day Maximum Pressure Contours, AZP = 68.6m

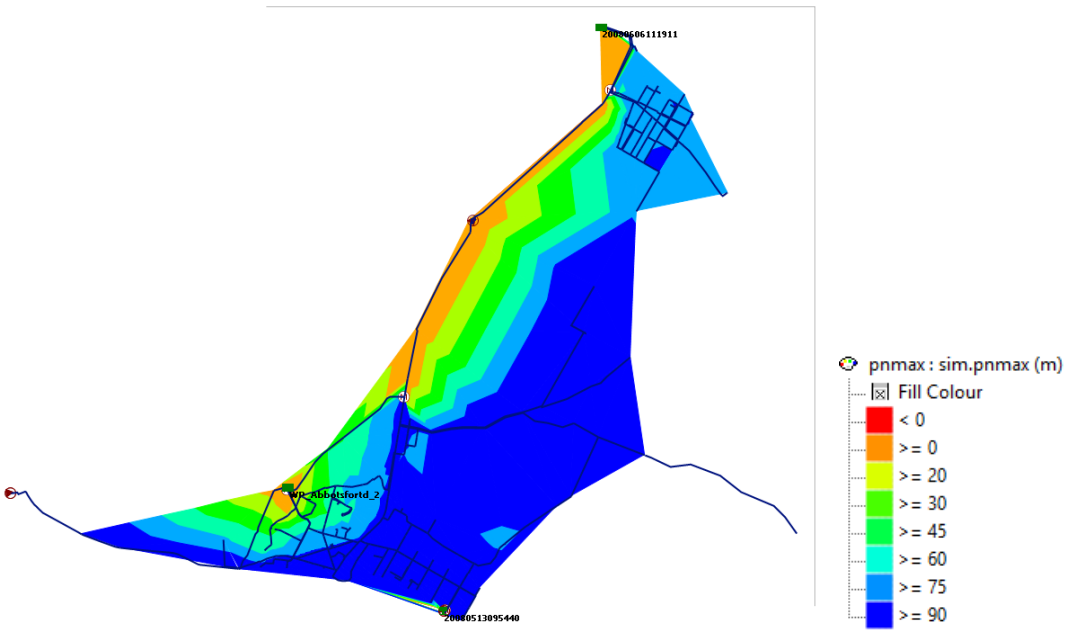


Figure 4: Waipawa- Otāne Peak Day Maximum Pressure Contours, AZP = 62.5 m

In terms of the Takapau water supply pressures are dictated by the WTP pump station operating to the Sydney Street reservoir on the west side of the network. The pressures in the network vary depending on whether the WTP pump station is operating. The head difference between the pump station and reservoir is approximately 18m, which suggests network pressures are already low.

Pressure reduction (management) is a key component of an over-arching water loss management strategy in terms of 'squeezing the box' (refer 'Leakage' section). Council investigated the opportunity to implement a form of pressure reduction for the low-level zone in the Waipukurau water supply as part of an overall firefighting capacity assessment (Waipukurau Detailed Modelling Outpus, WSP, July 2016). The assessment with the hydraulic model determined that using a Pressure Reducing Valve (PRV) was feasible but could potentially add a risk in terms of achieving fire flow during the event of a fire if the valve was not set up operate correctly.

Observations – Pressure

- There may be further opportunity for pressure reduction as part of an over-arching leakage reduction strategy in the Waipukurau and Waipawa- Otāne water supplies. However, this may be limited by the need to maintain fire fighting capacity.
- Pressure reduction in the other water supplies is unlikely to be feasible.

Consents and Regulative Requirements

Consents

This section is to confirm the requirements which the Council water supplies must be operated under, particularly during river low flows and peak water use. The consents set out the water take and restriction limits on when this can be taken.

Water Supply System	Source Number	Consent Number (Hyperlink)	Max. Consented Take	Restriction Limits	Expiry Date
Waipukurau	Well No.s 15107 5617, 5676, 16892, 16893 (SH2)	AUTH-113708-03	All Wells and / or a Cumulative rate of 100 litres per second. 60,480m³ 7-day period 3,144,960 m3 in 12-month period	Tukituki River Level 1: 3,000 L/s @ Taipairu Rd Level 2: 2,300 L/s @ Tapairu Rd	31-May-2028
Waipawa- Otāne	Well No. 2402 (Johnson St)	WP030817T	35 litres per second 21,168m³ 7-day period	Waipawa River Level 1: 3,700 L/s @ SH2 Level 2: 2,300 L/s @ SH2	31-May-2028
	Well No.s 5618 , 5619, (Tikokino Rd)	WP030818T	55 litres per second 33,264m³ 7-day period	Waipawa River Level 1: 3,700 L/s @ SH2 Level 2: 2,300 L/s @ SH2	31-May-2028
Takapau	Well No. 1762 (Meta St)	WP140534T	19.0 litres per second 31,600 m³ per 28-day period 410,800 m3 in 12-month period	N/A	31-May-2035
Pōrangahau -Te Paerahi	Well No. 4993 (Beach Rd)	WP090150T	10.2 litres per second 6,169m³ per 7-day period	N/A	31-May-2034
Kairakau	Well No. 3130 (Brodie Pl)	WP090153T (Bore)	1 Litre per second 605m³ per 7-day period	N/A	31-May-2029
	Spring (Brodie Pl)	WP090166T (Spring)	0.7 Litres per second 420m³ per 7-day period	N/A	31-May-2029
Pourerere Campground	Spring	WP010510T	0.25 Litres per second	N/A	31-May-2022
Waipukurau Sports Fields	Well No. 1461 (Russell Park)	AUTH-125279-01	6 Litres per second 7,120 m3 per 28-day period Not exceeding 173 m3/day if flow at Tapairu Rd and Red Bridge measuring sites are below low flow triggers levels	Tukituki River 2,300 L/s @ Tapairu Rd 4,300 L/s @ Red Bridge	31-May-2039*

Table 3: Water Supply Permits – Current

Water Supply, Consent & River	Monitoring Site	Flow Triggers	Required
Waipukurau WP030775T Tukituki River	Taipairu Rd #23207	1) at or < 3,000 L/s implement public education as per WMS 2) at or < 2,300 L/s = implement demand mang & water conservation as per WMS	Purpose of Water Management Strategy (WMS): a) statement of purpose b) commitment to demand management and water conservation measures during low flows in Tuktuki River. c) confirm bylaws for non-compliance of water use restrictions or water use directions. d) when HBRC advise flow is at or below 2,300 L/s – implement demand management and water conservation measures as set out in the WMS e) when HBRC advise flow is at or below 3,000 L/s – implement public education as set out in the WMS f) document water conservation measures as part of annual monitoring report g) within 5yrs. of consent issue a report including up to date population projections
Waipawa – Otāne WP0308 Waipawa River	SH2 #23211	1) at or < 3,700 L/s implement public education as per WMS 2) at or < 2,300 L/s = implement demand mang & water conservation as per WMS	Purpose of Water Management Strategy (WMS): a) statement of purpose b) commitment to demand management and water conservation measures during low flows in Waipawa River. c) confirm bylaws for non-compliance of water use restrictions or water use directions. d) confirm public education programme to communicate the need for efficient water use at times of low flow during the Waipawa River. d) when HBRC advise flow is at or below 2,300 L/s – implement demand management and water conservation measures as set out in the WMS e) when HBRC advise flow is at or below 3,700 L/s – implement public education as set out in the WMS e) document water conservation measures as part of annual monitoring report f) within 5yrs. of consent issue a report including up to date population projections
Takapau WP140534T Tukipo River	1 - Red Bridge #23201 2 - Tapairu Rd #23207 3 - Ashcott Rd #23213 up to 30 June 1 - Red Bridge #23201 2 - Tapairu Rd #23207 3 - Ashcott Rd #23213 from 1 July 2023	1) at or < 4,300 L/s 2) at or < 2,300 L/s 3) at or < 1,043 L/s 1) at or < 5,200 L/s 2) at or < 2,500 L/s 3) at or < 1,043 L/s	Develop and implement a Water Conservation and Demand Management Strategy (WDCMS) to include, but not limited to the following: Purpose of strategy - Commitment to the implementation of a range of demand management and water conservation measures to minimise consumption at times of low flows and which may include water use restrictions, water use direction, pressure management and reduction, leak detection, metering and education A detailed explanation of how the WDCMS will be implemented. Ensure that the WCDMS is implemented when the low flow triggers are reached and continue to be implemented until flow return to be in excess of the trigger limits.

Climate Change

WSP have undertaken a review of how climate change may affect demand, or impact and limit supply for the Waipukurau Second Water Supply Project (Demand Analysis and Future Supply Security, WSP, February 2020). In terms of climate changes, the following observations and comments were made:

- In the Hawke's Bay Region, it is projected that, compared to 1995 data, temperatures are likely to be between 0.7˚C to 1.1˚C warmer by 2040 and 0.7˚C to 3.1˚C warmer by 2090 (MfE 2018).
- Changes in rainfall will vary across the district, however at present downscaled models are not refined enough to directly attribute projected changes to specific catchments. The seasonal distribution of rainfall is projected to change the most; with winter rainfall projected to decrease by up to 13% in Napier by 2090. Summer and autumn rainfall, however, are expected to increase (MfE 2018).
- According to the most recent projections (MfE 2018), the frequency of extreme rainfall days is not expected to increase in the Hawke's Bay District as a result of climate change.

The main impacts of climate change on the water supplies will be:

- Demand for residential irrigation during periods of drought is likely to increase due to increasing soil moisture deficits. A theoretical assessment (WSP, 2020) indicates the increase in demand associated with climate change could be about 460m³/day. The degree to which this additional demand occurs will depend on the effectiveness of our water management strategies and the community's future attitude to water use.
- Changes in river flows and hydrology - while increases in rainfall volume are projected over summer periods, some models suggest that this increase will come from more extreme, less frequent events. This will lead to flashier rivers flows, with higher suspended sediment loads, interspersed by longer periods of drought and lower river levels. For example analysis estimates that the Tukituki River (refer Figure 5) mean flow may decrease by up to 2% by 2090 with median flows decreasing by 8% by 2040 and 13% by 2090 (WSP,2020). This will likely increase the average number of days where flows fall below the current consented limit of 2,300 L/s, which will increase the duration of time CHBDC must implement after conservation and demand management measures. Subsequently community supplies reliant on water from primary sources (i.e. rivers and streams) will be affected.

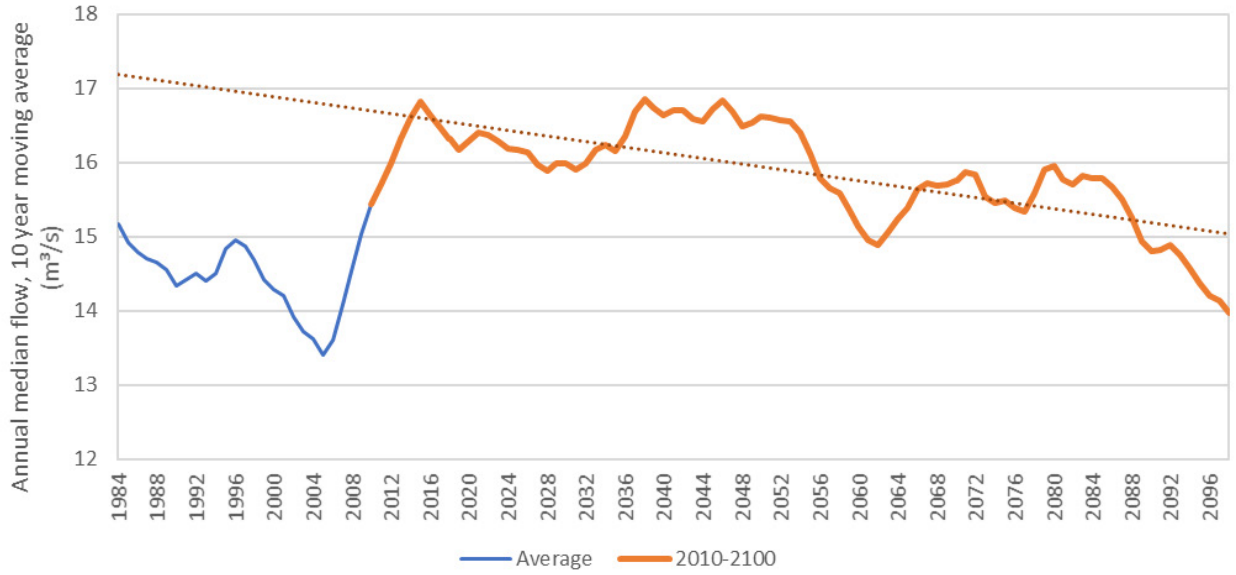


Figure 5: Trend in Tukituki River at Tapairu flow record (10 year moving average of annual median

Observations – Consents and Impact of Climate Change

- Drier and longer summers means there is likely to be longer periods of restrictions required across the district as demand increases and river flows decrease
- Restrictions may need to be put in place if more extreme storm events result in increased degradation of raw water quality over time which cannot be treated by the current water treatment plants.
- Effective communication (and escalation) of conservation of water and increasing user awareness will play an important role in managing demand.
- The focus on water consumption and management may increase with enforcement of greater restrictions on takes and river flows.

Demand: Current and Future

Water Demand & Availability

Historic Water Demand

Table 5 presents the historical peak day and average day source demand recorded for the water supplies based on daily volume totals. Kairakau demand has been assessed using monthly volume totals. Peak day demands have been identified in **red**.

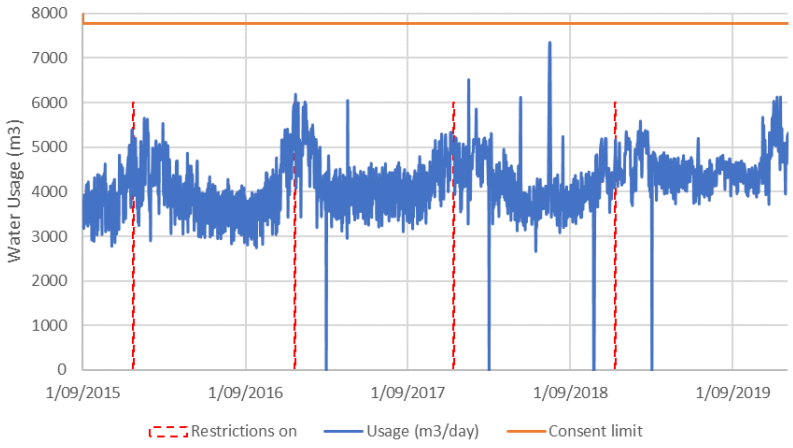
7 Year	Waipukurau		Waipawa - Otāne		Takapau		Pōrangahau – Te Paerahi		Kairakau
	Peak Day	Average Day	Peak Day	Average Day	Peak Day	Average Day	Peak Day	Average Day	Monthly Average
2015-16	5,647	3,944	3,268	1,967	**686**	417	283	131	-
2016-17	6,172	4,151	2,972	1,728	586	369	323	145	-
2017-18	**6,480**	4,224	3,214	1,808	640	364	252	146	**42**
2018-19	5,588	4,397	2,693	1,888	678	356	**399**	172	35
2019-20*	6,130	4,671	**3,513**	1,968	613	381	271	159	32+

*2019-20 is for period 1 September to 31 December 2019, +2019-20 is for period September to December 2019.

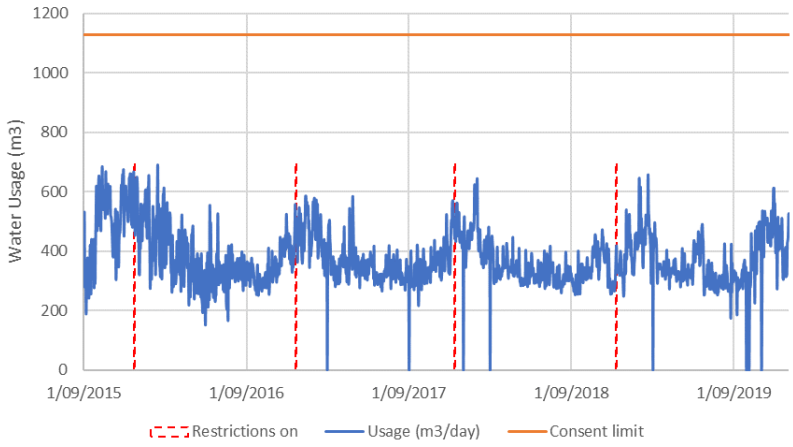
Table 5: Historical Peak Day and Average Day Demand (m3/day)

The following graphs show the historical trend for the five water supplies. These are based on daily totals recorded at the source, except for Kairakau which is based on monthly totals.

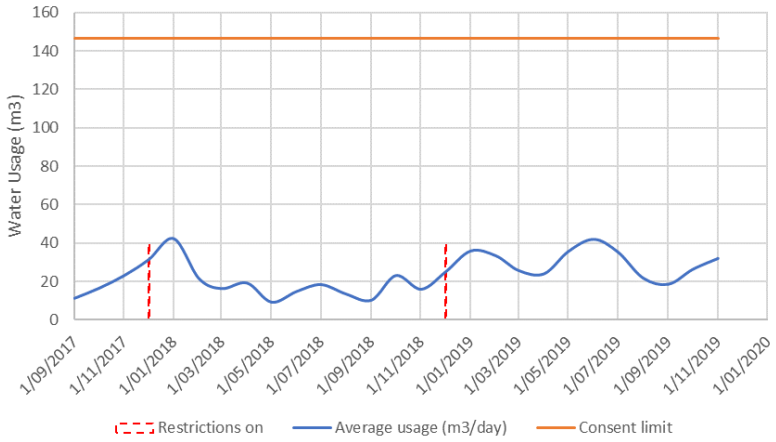
Waipukurau Daily Water Usage, September 2015 - January 2020



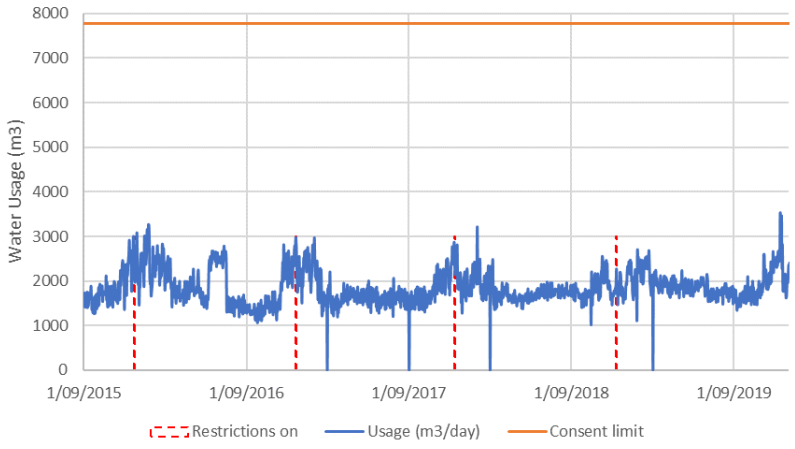
Takapau Source Daily Water Usage, September 2015 - January 2020



Kairakau Source Average Daily Water Usage, September 2017 -November 2019



Waipawa/ Otāne Daily Water Usage, September 2015 - January 2020



Pōrangahau Source Daily Water Usage, September 2015 - January 2020

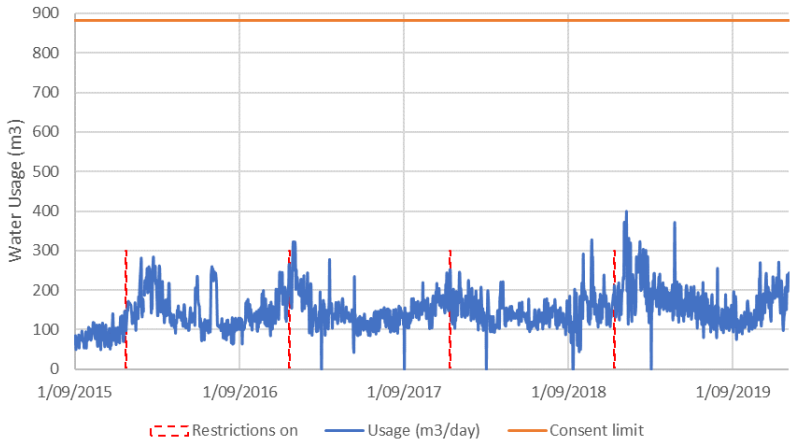


Figure 6: Historical Demand Profiles, Restriction on and Consented Volumes

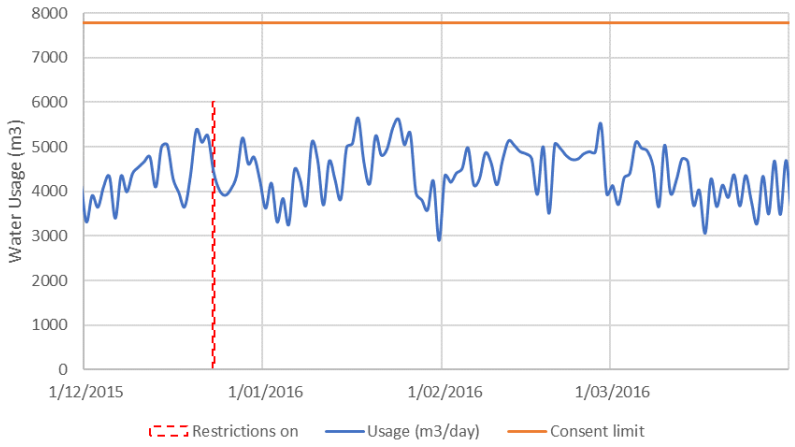
Observations – Demand and Availability

- Peak day usage occurs around the December – January period, coinciding with the Christmas and school holiday periods.
- The estimated peak day demands for the water supplies have not accounted for reservoir turnover.

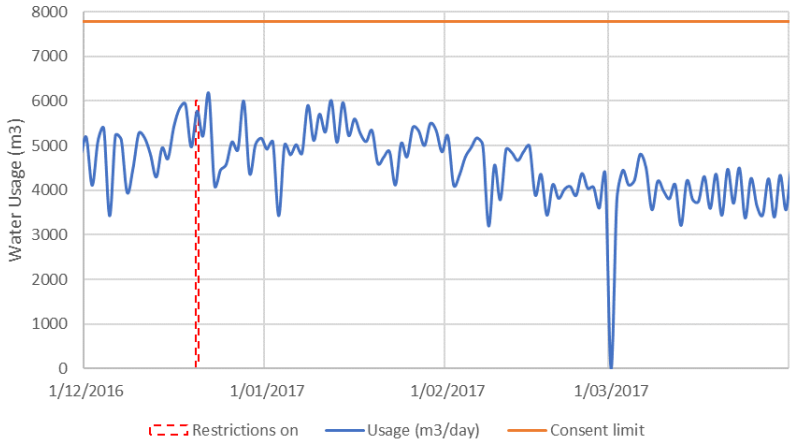
In terms of the impact of restrictions on demand a comparison of Waipukurau water supply over the December to March period for years 2015-2018 shows. Restrictions were put in place on the following dates:

- 23 December 2015
- 20 December 2016
- 11 December 2017
- 10 December 2018

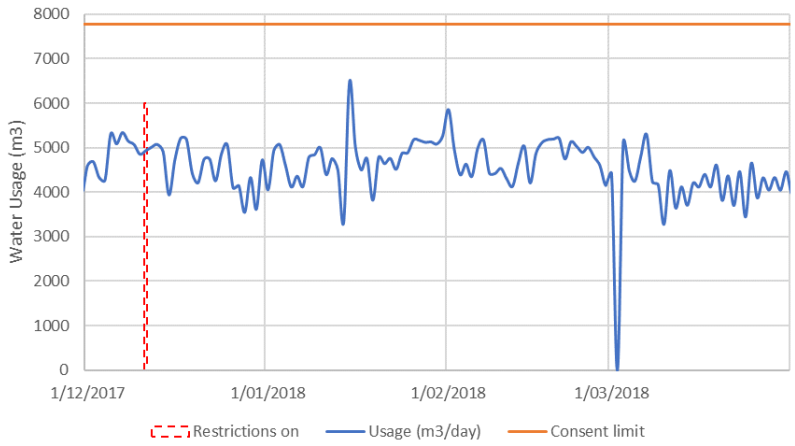
Waipukurau December 2015 Demand - Restrictions On



Waipukurau December 2016 Demand - Restrictions On



Waipukurau December 2017 Demand - Restrictions On



Waipukurau December 2018 Demand - Restrictions On

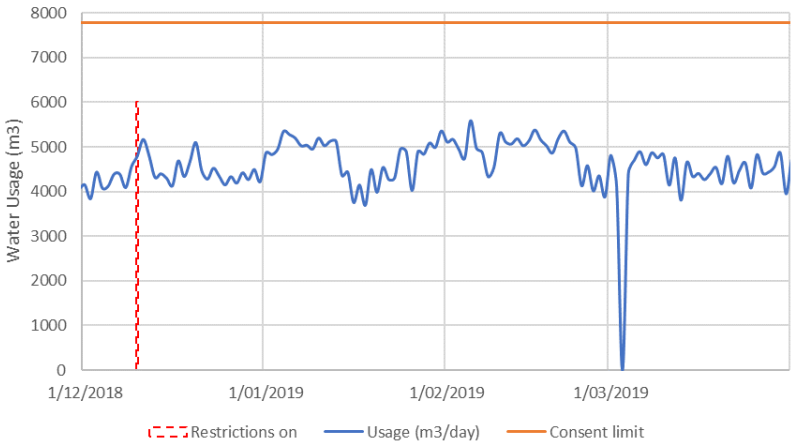


Figure 7: Comparison of Waipukurau Demand and Impact of Restrictions

Observations – Restrictions

- Generally, there is a lag in demand decreasing. This could be attributed to the time for the conserve water messaging to be received and implemented by customers.
- Demand does appear to decrease for a period before flattening out / increasing.
- Overall it is difficult to determine how effective water restriction measures are currently.

Water Availability (Consents) vs Demand (Current & Future)

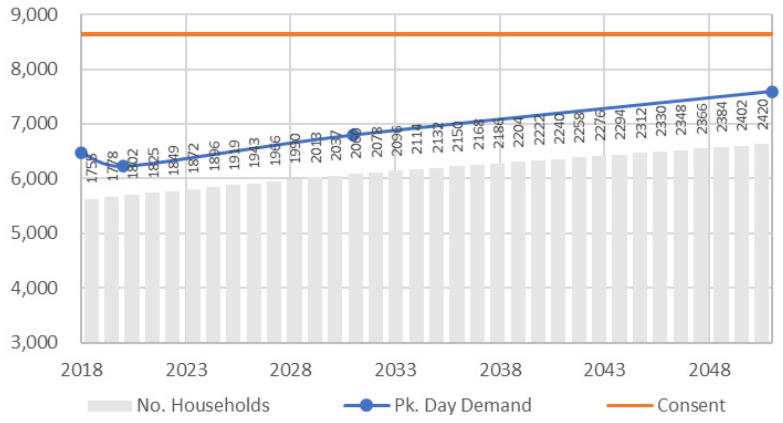
A review of future peak day demand has been undertaken using the 2020/21 'medium' growth projections for number of households for townships and the district proposed for the 2021 Long Term Plan.

Year	Waipukurau	Waipawa - Otāne	Takapau	Pōrangahau – Te Paerahi	Kairakau
2015-16	5,647	3,268	686	283	-
2016-17	6,172	2,972	586	323	-
2017-18	6,480	3,214	640	252	42
2018-19	5,588	2,693	658	399	36
2019-20*	6,480	3,513	613	271	32
Current consented maximum take (m³/day)	8,640	7,776	1,128	881	146
Current peak day (m³/day)	6,480	3,513	686	399	42
*2019-20 is for period 1 September to 31 December 2019, +2019-20 is for period September to December 2019					

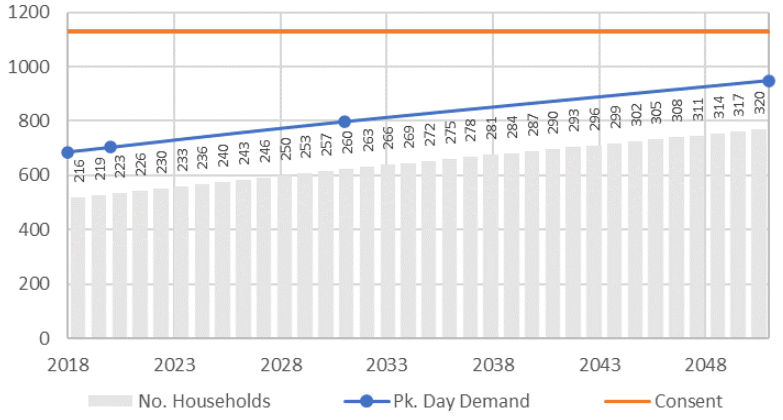
Table 6: Historical Peak Day and Average Day Demand (m³/day)

A review of future peak day demand has been undertaken using the 2020/21 'medium' growth projections for number of households for townships and the district proposed for the 2021 Long Term Plan (refer Figure 8).

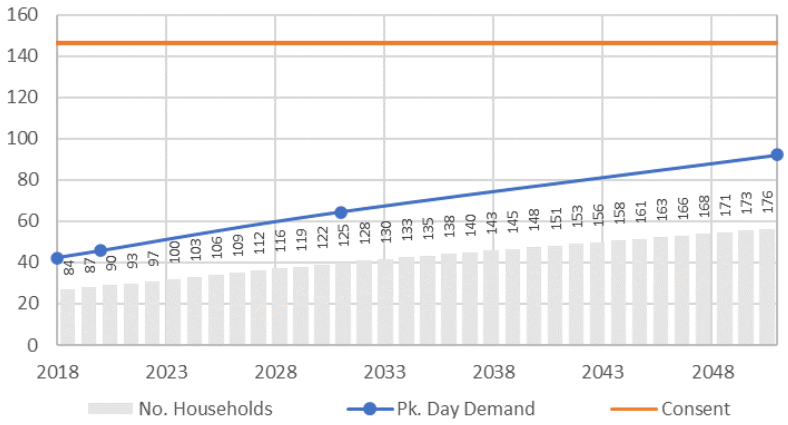
Waipukurau - Projected Peak Day vs Consented Volume (m³/day)



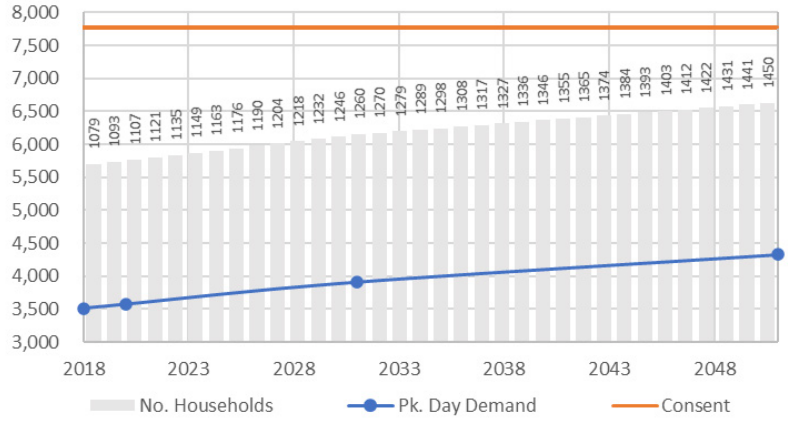
Takapau - Projected Peak Day vs Consented Volume (m³/day)



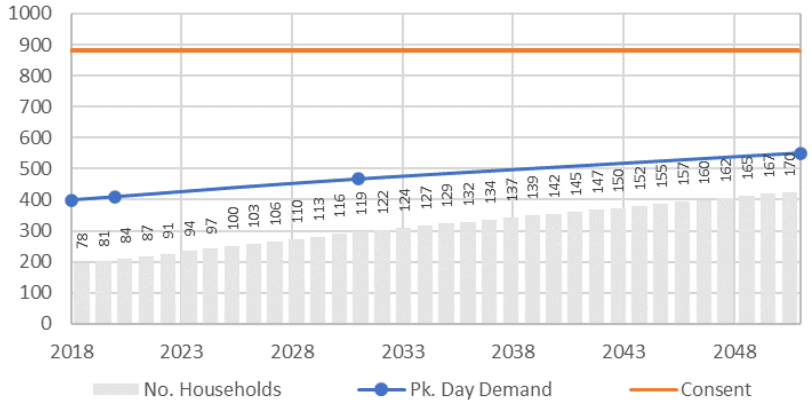
Kaiakau - Projected Peak Day vs Consented Volume (m³/day)



Waipawa/ Otāne - Projected Peak Day vs Consented Volume (m³/day)



Pōrangahau/Te Paeahi - Projected Peak Day vs Consented Volume (m³/day)



Projected Household Growth 2020-2055

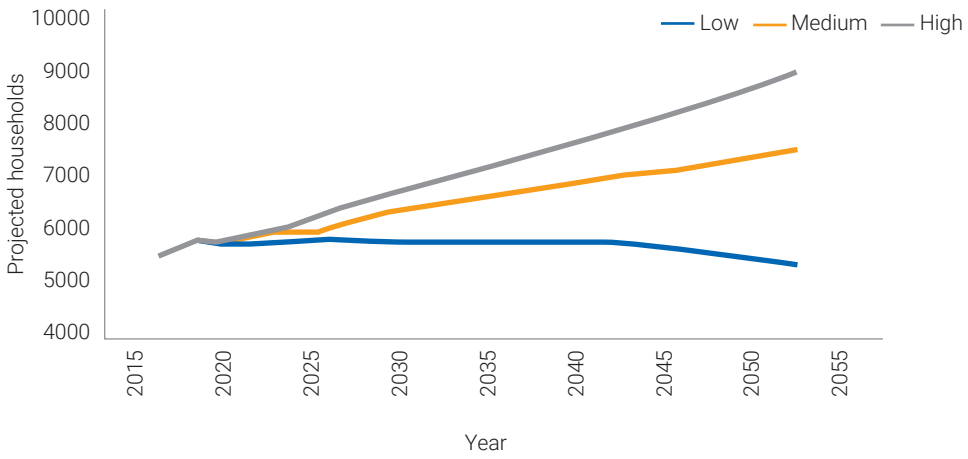


Figure 8: Projected Future Demand & No. Households vs Consented Volume

Observations – Water Availability

- The projected growth forecasts and equivalent increase in the water demand for the water supplies indicates that there is still enough headroom in terms of consented volumes for the existing sources and estimated future peak day demand in 2051.
- This assessment has not considered additional commercial / industrial growth or tourism. Future projections and demand forecasting should be aimed at understanding what the likely trends will be in relation to these growth areas.

Leakage

As the water supply system ages, there is a tendency for a natural rate of rise of Real Losses (leakage) through new leaks and bursts, some of which will not be reported to the Council. This tendency is controlled and managed by some combination of the four primary components of Real Losses Management shown by the arrows in Figure 9.

- Pressure management
- Speed and quality of repairs
- Active leakage control
- Pipeline asset management

The International Water Association (IWA) Water Loss Task Force (WLTF) have examined the relationships between pressure, burst frequency and background losses and developed a theory regarding water loss management which they describe as 'squeezing the box'. This theory is demonstrated by Figure 9 The 'Squeezing the box' approach is now widely used internationally to demonstrate the essential principles for effective management of Real Losses. The volume of Current Annual Real Losses (CARL) from a distribution system is represented by the large box. The CARL volume exhibits a continual trend to increase as new leaks and bursts occur, and the distribution system deteriorates with age, but it can be constrained and reduced by an appropriate combination of pressure management, speed and quality of repairs, active leakage control (to locate unreported leaks and bursts), and pipeline and assets management.

Real losses cannot be eliminated totally. The lowest technically achievable annual volume of real losses for well-maintained and well-managed systems is known as unavoidable annual real losses (UARL).

Using the four methods of leakage management real losses can be controlled, but (at the current operating pressure) cannot be reduced any further than the UARL. However, although the UARL represents the minimum level of real losses that could technically be reached, for most utilities it will not be economic to reduce real losses to this level. There will be some intermediate economic level of real losses which it is appropriate for a utility to achieve.

The best practice performance indicator for the technical efficiency of Real Losses is the Infrastructure Leakage Index (ILI). This is the non-dimensional ratio of CARL divided by UARL. In order to calculate the ILI a water supplier needs to know and have confidence in significant range of data and parameters:

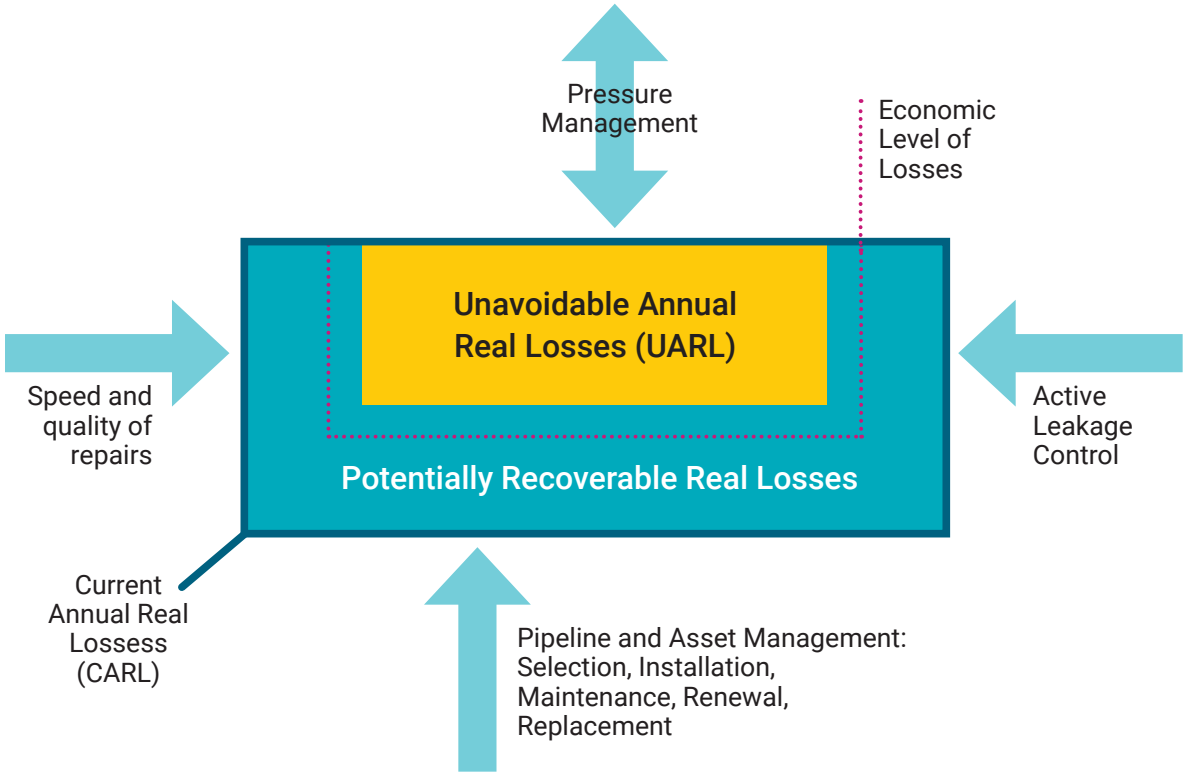


Figure 9: The 4 Components Approach to Management of Real Losses

- Water balance – standard components of demand for a top down water balance that requires leakage, minimum night flow estimates, demand types and equivalent volumes for metered / non-metered and residential / non-residential customers
- Network data – pipe length (by type and material), number of billed properties, number of service connections, service connections by material type, average zonal pressure (AZP), average zonal night pressure (AZNP)
- Burst data – reported bursts and unreported bursts (number and type of reported bursts, typical run times categorised by type), including cost and frequency of ALC for unreported bursts, burst flow rates, natural rate of rise of bursts

As an alternative the Snapshot ILI was developed by the IWA Water Loss Group to assist water authorities to target zones for Active Leakage Control (ALC) interventions. The snapshot ILI is a function of the night leakage rate (MNF – legitimate use) divided by the UARL, it provides a simpler approach for targeting ALC across water supplies. Figure 10 shows the components required to calculate the snapshot ILI.

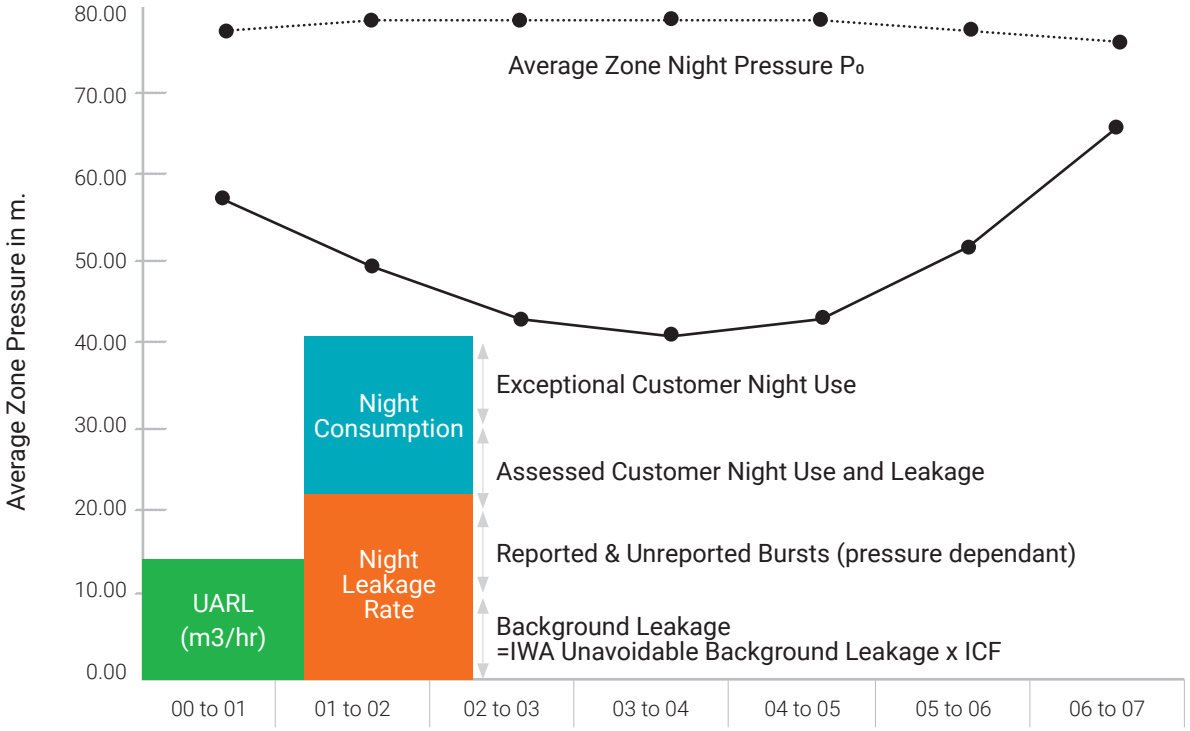


Figure 10: Snapshot ILI

The ILI can be used to categorise performance in real losses into one of four bands, as shown in Table 7. MNF calculations are reliant on estimating the legitimate night usage in order to define the level of leakage.

Band	ILI Range	Guideline Description
A	<2	Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost-effective improvement
B	2 to < 4	Potential for further improvements; consider pressure management, better active leakage control practices, and better network maintenance
C	4 to < 8	Poor leakage record; tolerable only if water is plentiful and cheap; even then, analyse level and nature of leakage and intensify leakage reduction efforts
D	8 or more	Very inefficient use of resources; leakage reduction programs imperative and high priority

Table 7: World Bank Institute Bands for Leakage Management in Developed Countries

The snapshot ILI is particularly useful where it is not easy to calculate the CARL and annual ILI such as:

- Where residential properties and some non-residential properties are unmetered, resulting in significant uncertainties with the assessment of CARL; and
- Where continuous MNF data is unavailable.

A review of the availability and quality of data for the CHBDC water supplies has identified that the snapshot ILI approach is the current best approach for leakage benchmarking purposes. Table 8: Snapshot ILI Parameters presents the input parameters required to deliver the ILI and estimated / assumed values.

Water Supply	Waipukurau	Waipawa - Otāne	Takapau	Pōrangahau - Te Paerahi	Kairakau
System Input - AD	4,277	1,872	378	151	24
System Input - PD	6,130	3,770	686	399	42
Total Length of mains (km)	79.1	77.0	16.4	16.2	3.3
Total number of connections	2,173	1,254	272	243	84
AZP (m)	64	65	18	40	17
AZNP (m)	65.7	66.0	18.4	40.8	17.3
Min Night Flow (m³/hr)	72.0	41.8	5.4	4.9	1.7
Including Unavoidable Annual Real Losses (UARL) (m³/hr)	10.8	7.8	0.5	1.0	0.2
Legitimate Usage - 4L/conn/hr (m³/hr)	8.7	10.0	2.2	1.9	0.7
Total Leakage Rate (m³/hr)	63.3	31.7	3.3	2.9	1.0
Average Day Use (L/conn/day)	1,269	886	1,102	333	**-2**
Average Day Use (L/person/day) *assume occupancy rate of 2.8	453	316	394	119	-
Peak Day Use (L/conn/day)	2,122	2,399	2,234	1,354	212
Total Leakage (L/prop/day)	699.2	607.2	288.0	288.0	288.0

Table 8: Snapshot ILI Parameters

It should be noted that the negative average day use for the Kairakau water supply is due to all customers having rainwater tanks which are supplemented by the Council's water supply. The estimated ILI and predicted band for the CHBDC water supplies is presented in Table 9.

Water Supply	Snapshot ILI	Band	Confidence	Key Assumptions and Data Limitations
Waipukurau	6.7	C	Average	System input based on average day demand from 5 years of historical daily totals. No. of connections obtained from 2018 AMP figures. Length of mains based on GIS. MNF obtained from hydraulic model.
Waipawa- Otāne	5.3	C	Average	System input based on average day demand from 5 years of historical daily totals. No. of connections obtained from 2018 AMP figures. Length of mains based on GIS. MNF obtained from hydraulic model.
Takapau	11.6	D	Low	System input based on average day demand from 5 years of historical daily totals, of which for 1-year restrictions were in place. No. of connections obtained from 2018 AMP figures. Length of mains based on GIS. MNF estimated based on similar NZ water supplies using a 'per connection' approach. AZP derived from average static head estimate using approximate elevations at pump station / reservoir and across water supply.
Pōrangahau -Te Paerahi	5.0	C	Low	System input based on average day demand from 5 years of historical daily totals, of which 1-year restrictions were in place. No. of connections obtained from 2018 AMP figures. Length of mains based on GIS. MNF estimated based on similar NZ water supplies using a 'per connection' approach. AZP derived from average static head estimate using approximate elevations at pump station / reservoir and across water supply.
Kairakau	10.2	D	Low	System input based on monthly totals from 2 years of historical data, both of which restrictions were in place. System input based on average day demand from 3 years of historical daily totals. No. of connections obtained from 2018 AMP figures. Length of mains based on GIS. MNF estimated based on similar NZ water supplies using a 'per connection' approach. AZP derived from average static head estimate using approximate elevations at pump station / reservoir and across water supply.

Table 9: Estimated ILI for CHBDC Water Supplies

Observations - Leakage

- The snapshot ILI estimates indicate that there is opportunity for Council to implement strategic leakage management and active leakage control across all the water supplies.
- At the same time Council should focus on improving the overall understanding and confidence in the key parameters that underpin successful leakage management – data improvement areas include billing information, number and type of customers, metered and non-metered customers.

New Zealand Benchmarking

The Infrastructure leakage index is a non-dimensional performance indicator used for comparing the operational management of real water losses. It is the ratio of Current Annual Real Losses to Unavailable Annual Real Losses.

Figure 11 shows the Average daily residential water use (Litres/person/day). Bars are colour coded according to the proportion of the network that has residential water metering.

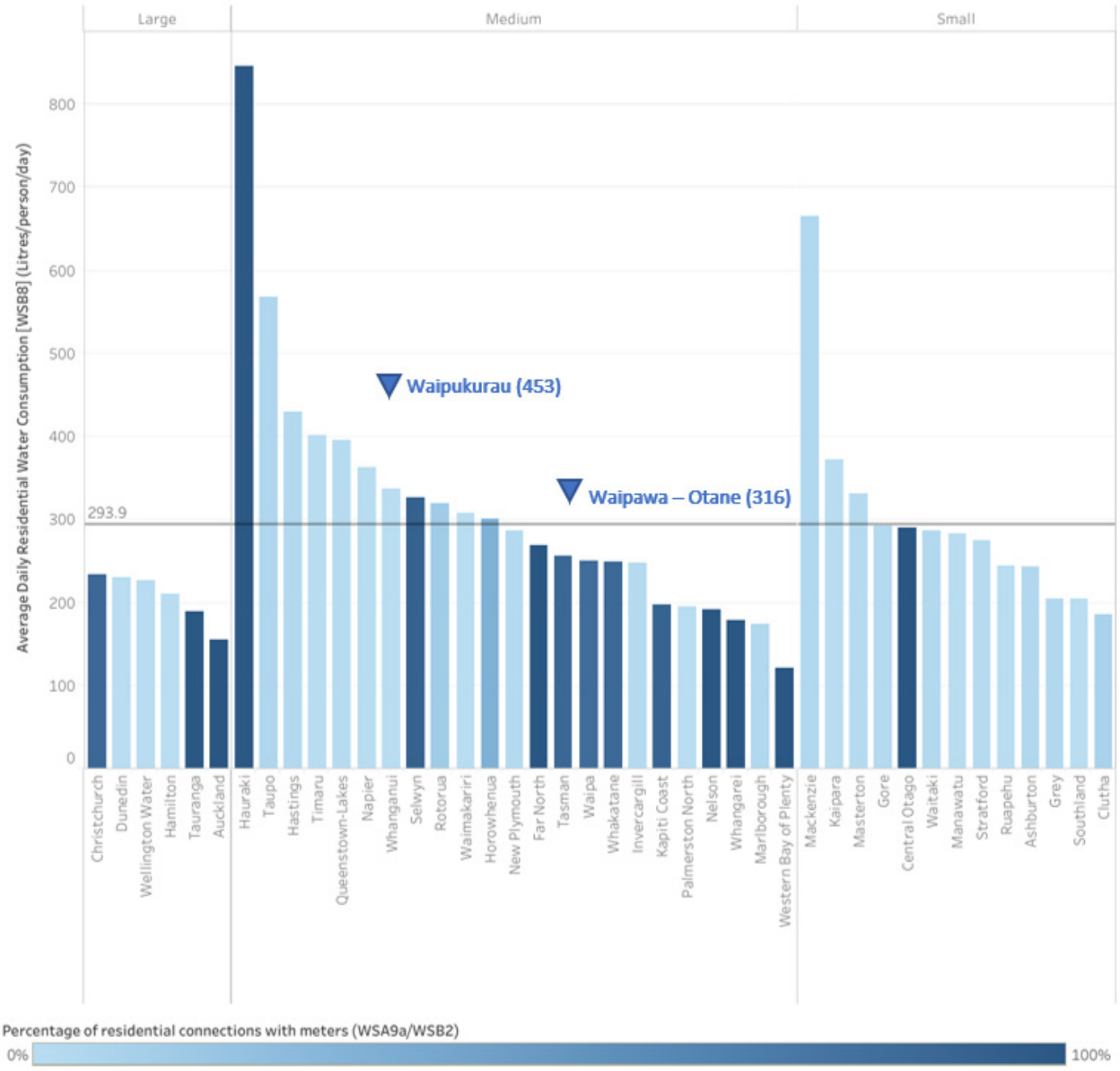


Figure 11: Average Daily Residential Demand (Litres/person/day)

Figure 12 shows the Infrastructure Leakage Index (sourced Water New Zealand – Residential Water Efficiency) Figures shown on bars, have been colour scaled based on levels of residential metering, as this affects the accuracy of water loss calculations.

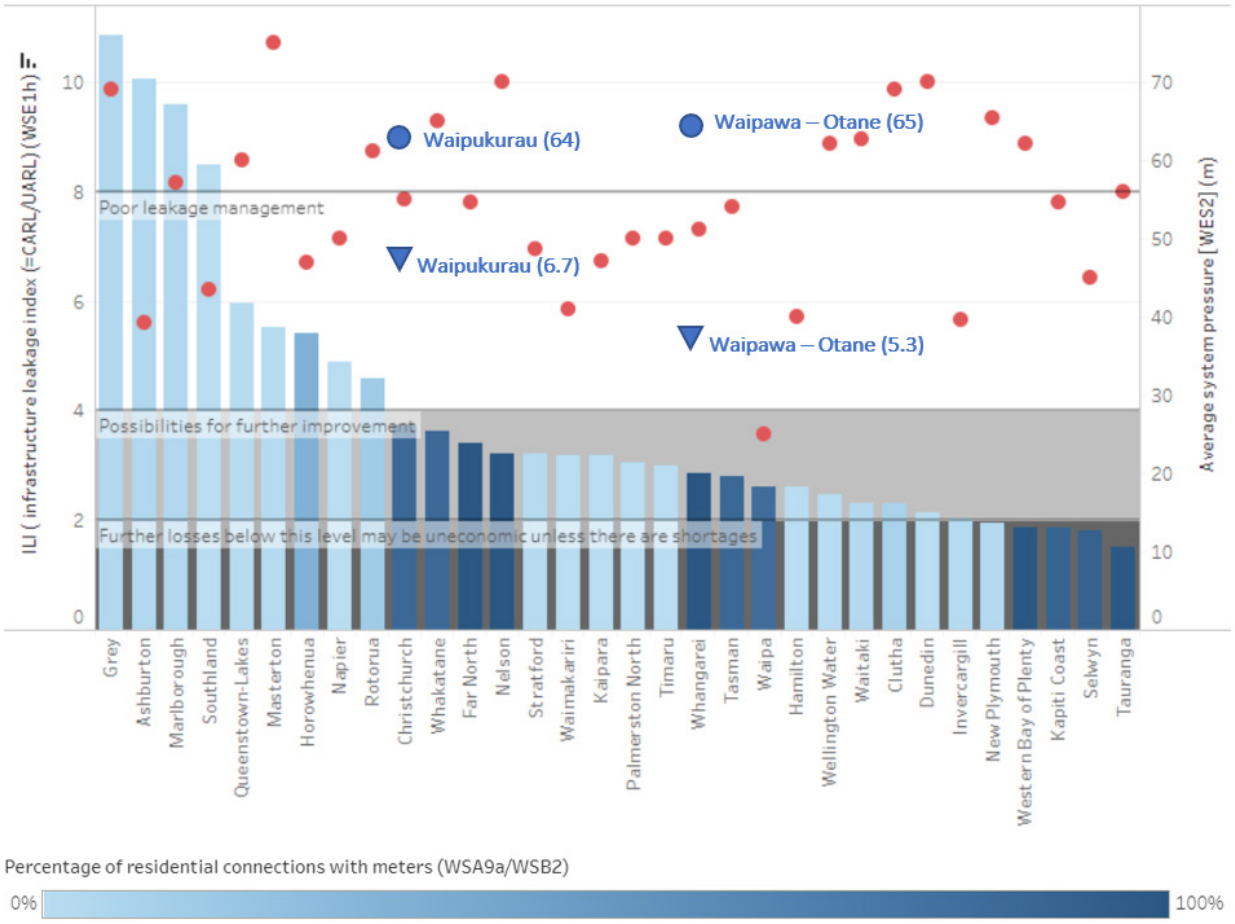


Figure 12: ILI FY2019 (Average system pressure, in m head, represented by red dots)

Average daily residential water use (Litres/person/day). Bars are colour coded according to the proportion of the network that has residential water metering.

Observations – Benchmarking

- Water consumption and leakage rates vary considerably throughout New Zealand. Those supplies with residential metering typically have the lowest average daily residential usage and ILI, which clearly highlights the benefits of residential customer metering.
- The benefits from pressure management are unclear from the data provided, however the use of other metrics such as burst frequency (number of mains breaks) will likely provide a more informative measure with benefits such as a reduction in breaks, and a reduction in demand and water loss.
- Tauranga and Nelson City Councils have seen a reduction in residential consumption to <200 L/per/d with the rollout of universal metering city wide, compared to Waipukurau (453 L/per/d) and Waipawa – Otāne (316 L/per/d) which demonstrates the potential for significant reduction in demand.
- Target measures for residential consumption and water loss should be set based on achievable targets that can be reduced through the implementation of the plan. At this time, it is recommended that New Zealand TLAs are continued to be benchmarked against.

Current Approach

Current Sustainable Management Practices

Engagement and Public Education

In 2016 Council implemented a new consultation and engagement activity called Project Thrive. The aim of Project Thrive was to increase visibility of Council's strategic direction and aspirations for the District to the community, and thereby support decisions on investment into infrastructure.

One of the key focus areas in this engagement for Council was elevating the importance of water for the future of the District. Council has continued to invest in raising the profile of investment decisions in three waters infrastructure through their #bigwaterstory, which included seeking feedback from the community on support for the capital works delivery programme.

#the BIG Water Story

#bigwaterstory will continue to be an important tool for Council as part of establishing further improvement measures, undertaking investigations and implementing demand management strategies to underpin the future approach to sustainable water management in the District:

- Incorporating 'smart growth' into the objectives for the management of the water supplies.
- Developing clear 'road maps' for water activities so that both communities and Council are clear on the priorities and directions.
- Ensuring 'planning for tomorrow' is considered as part of 'future-proofing' and undertaking 'environmentally responsible' decision making.

Council also undertakes a public education programme focused at a school level throughout the District. Year 3 through to Year 8 children participate in a water awareness programme in the classroom and are provided with water education and water conservation information brochures.

Observations – Engagement

Council have set up a responsive and collaborative engagement tool through Thrive and the #Big Water Story. These activities are already seeing the benefits of an elevated and transparent messaging to the community on why certain decisions are being made for the water supplies. It is recommended that the improvements and action plan identified in this Plan are presented to the community using the Thrive and #bigwaterstory engagement platforms so that the community can understand why it is important for Council to continue to invest in infrastructure and sustainable management activities for the water supplies.

Plans and Policies

Council has several plans and policies that include provisions for the promotion of sustainable water management practices. These include the District Plan, Water Services Bylaw, Long Term Plan, Environmental and Sustainability Strategy and the Engineering Code of Practice.

As well as seeking to ensure that future development is appropriately accommodated for, the District Plan's intention is to underpin the Resource Management Act requirements by encouraging sustainable water management of the district's sources. For example:

- The resource consents relating to Council's taking of water are considered as part of district wide matters and activities.
- Part C Section 6 of the draft 2019 District Plan sets out the use of water efficient landscaping / planting and water saving devices for developments.
- Part D Section 15 of the draft 2019 District Plan outlines that Council is required to manage the effect of the operation, maintenance and upgrading / development of the water supplies on the environment, whilst balancing the social, cultural and economic wellbeing of the communities.

Council's Water Bylaw 2018 is made under the authority of the Local Government Act 2002, and Council can:

- Erect, construct, and maintain any public work, which in the opinion of the Council may be necessary or beneficial to the District
- Consult with communities
- Complete assessments of water services within the District
- May make bylaws with regards to water services within the District.

In terms of demand management 708.7.3 of the Water Bylaw currently states that "The customer shall comply with any restrictions which may be required by Council to manage high seasonal or other demands. Such restrictions shall be advised by public notice. Even when such restrictions apply Council shall take all practicable steps to ensure that an adequate supply for domestic purposes is provided to each point of supply".

In terms of emergency restrictions 708.7.4 of the Water Bylaw currently states that "During an emergency Council may restrict or prohibit the use of water for any specified purpose, for any specified period, and for any or all of its customers. Such restrictions shall be advised by public notice. Council may enact penalties over and above those contained in these conditions to enforce these restrictions. The decision to make and lift restrictions, and to enact additional penalties, shall be made by Council or any officer authorised to exercise the authority of Council".

In terms of flow meter installation 708.12 .1 of the Water Bylaw currently states that "Meters for on demand supplies, and restrictors for restricted flow supplies, shall be supplied, installed and maintained by Council, and shall remain the property of Council. Where on demand supplies are not universally metered, Council where it considers water use is unusually high, reserves the right to fit a meter at the customer's cost, and charge accordingly".

Observations – Policies and Plans

The current source capacity versus demand assessments in this Plan indicate that there is capacity between consented water volumes and forecasted growth projections for the water supplies. However, it is likely as consents come up for renewal that further conditions could be imposed as a result of increased scrutiny on the impact of climate change on local river flows, the need for sustainable water management practices to be implemented and freshwater management objectives. A review is needed on how best to integrate demand management targets (e.g. leakage reduction, per property consumption, customer metering) into Council's policies such as the District Plan and Long-Term Plan with further support via the water bylaw. By building in some achievable targets over the next 10 years this would help offset any constraints that come from the reduction in consented take volumes and allow the District's economy to continue to grow.

Conserve Water Measures

Historically Council have had to put in sustainable water measures (restrictions) due to river levels falling below the trigger levels for demand management to apply.

Restrictions are set at four levels as detailed in Table 10:

Sustainable Water Measure Detail	Levels
LEVEL 1 – PLEASE CONSERVE WATER AT ALL TIMES	LEVEL 1 CONSERVATION
LEVEL 2 – SPRINKLERS AND HOSES ON ALTERNATIVE DAYS	LEVEL 2 SPRINKLERS AND HOSES ON ALTERNATE DAYS

- Even numbered houses on even days of the month
  (i.e. if you live at number 10, you may use a sprinkler or hose on the 2nd, 4th, 6th... of the month)
- Odd numbered houses on odd days of the month
  (i.e. if you live at number 11, you may use a sprinkler or hose on the 1st, 3rd, 5th... of the month)

Watering gardens:

- Odds and evens apply (odd numbered houses on odd days of the month and even numbered houses on even days)
- Sprinklers can only be used for 1 hour, before 9am and after 5pm
- Hoses fitted with a trigger nozzle can be used before 10am and after 4pm and cannot be left running unattended
- Watering cans and buckets permitted
- Washing of vehicles and/or buildings
- Washing of vehicles and/or buildings permitted only with a hose fitted with a trigger nozzle
- Swimming pools - permitted to top up swimming pool or spa
- Hard surfaces - no hosing of hard surfaces as part of general cleaning. Spot cleaning permitted for health, safety or emergency reasons only

LEVEL 3 - WATERING GARDENS	LEVEL 3 HAND HELD HOSES ONLY ON ALTERNATE DAYS

- Odds and evens apply (odd numbered houses on odd days of the month and even numbered houses on even days)
- Sprinklers are not permitted at any time.
- Hoses fitted with a trigger nozzle can be used before 10am and after 4pm and cannot be left running unattended
- Watering cans and buckets permitted
- Washing of vehicles and/or buildings
- Washing of vehicles and/or buildings permitted only with a bucket and sponge, or at a commercial carwash

Swimming pools - permitted to top up a pool or spa using a hose fitted with a trigger-nozzle, watering can or bucket for a maximum of 15 minutes per day

Hard surfaces - no hosing of hard surfaces as part of general cleaning. Spot cleaning permitted for health, safety or emergency reasons only

LEVEL 4 - NO OUTDOOR USE, EXCEPT IN THE CASE OF AN EMERGENCY	LEVEL 4 TOTAL OUTDOOR WATER BAN

Table 10: Current Council Sustainable Water Measures

Mandating Rainwater Tanks

Currently properties in the Kairakau water supply have 1,800 L rainwater tanks installed which are supplemented by the Council water supply reticulation.

Rain water tanks will provide relief to the potable water network in times of peak demand, and allow people to continue watering their gardens when and if water restrictions are imposed. In addition, there is also a benefit from the retention of rain water in terms of reducing the amount of water entering the stormwater network during rainfall events (refer Stormwater Bylaw relating to storm water retention devices).

In terms of the benefits of rainwater tanks in the District as a means of supporting sustainable water use practices and reducing demand on the consented water sources the following comments / observations are made:

- If a secondary objective of the rainwater tanks is to provide attenuation of stormwater, rain tanks can be useful.
- In terms of compliance with Drinking Water Stands New Zealand and provision of a potable water supply, rainwater tanks should either be used for non-potable purposes (e.g. garden irrigation) and on a separate piped system, or if used for drinking water fitted with a compliant potable treatment device. For existing houses this could be cost-prohibitive, for new builds this may be reasonable.

Expansion of Water Meters

Our water is precious, and a range of tools are needed to manage its use. Meters are a valuable tool by which Council can measure how much water is being used; identify unaccountable water loss, provide information to users on how much water they are using; indicate to Council how it can plan for water use in the future.

Councils existing bylaw provides for the installation of meters to manage high users only. Council wish, to expand the ability to meter where required for other water management criteria such as demand management, information capture, loss management etc. The proposed 2021 bylaw does not mandate the installation of meters on any property at any time but provides Council with the ability to where necessary.

Resilience

Council are implementing a programme of infrastructure projects for the Waipukurau and Waipawa water supply schemes to:

- Enhance the resilience of the water supply through connecting the supplies
- Ensure the supply can reliably meet demand and levels of service
- Improve the ability to service growth

A key project to improve the resilience of Waipukurau and Waipawa, is the link project whereby the Waipawa borefield may feed a central reservoir that feeds the Waipukurau town in addition to its existing supply. This project in the first instance may in cases of emergency turn around and feed the Waipawa community. Longer term plans will be to have the supplies feeding in both directions.

Reservoir Replacement

There is a significant portion of assets that have already exceeded their theoretical useful lives. Included the two reservoirs in Waipukurau situated on Pukeora Hill, and at Pukekaihou (Hunter Park), and the two reservoirs supplying Waipawa on Abbottsford Road, Waipawa.

The reservoirs are scheduled for replacement in the following years of the 2021-2031 Long Term Plan;

Pukeora Reservoir (2023) – Year 3

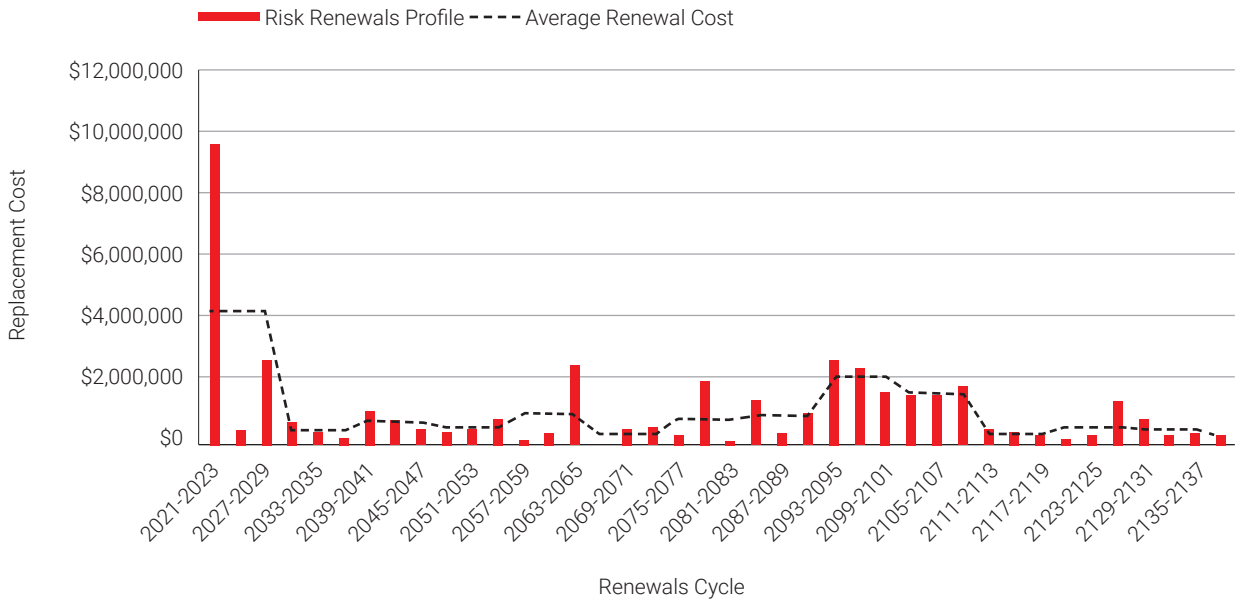
Pukekaihou (Hunter Park) Reservoir (2025) – Year 5

Abbottsford x 2 Reservoir (2024-2025) – Year 4 and 5

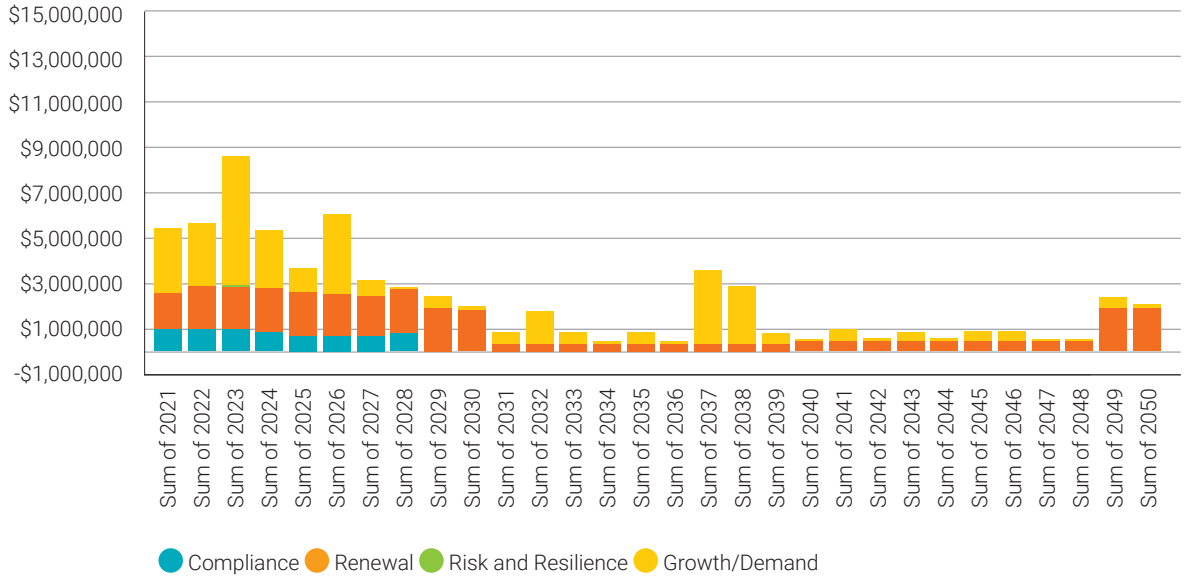
Renewals

There is a significant portion of assets that have already exceeded their theoretical useful lives and this is represented in the large spike in costs for the first period of the draft Long Term Plan 2021. Budgets are presented in three year periods. The dotted line provides the renewal budget average of three of these periods (i.e. nine years).

Renewal Budget Average



Water Supply CAPEX

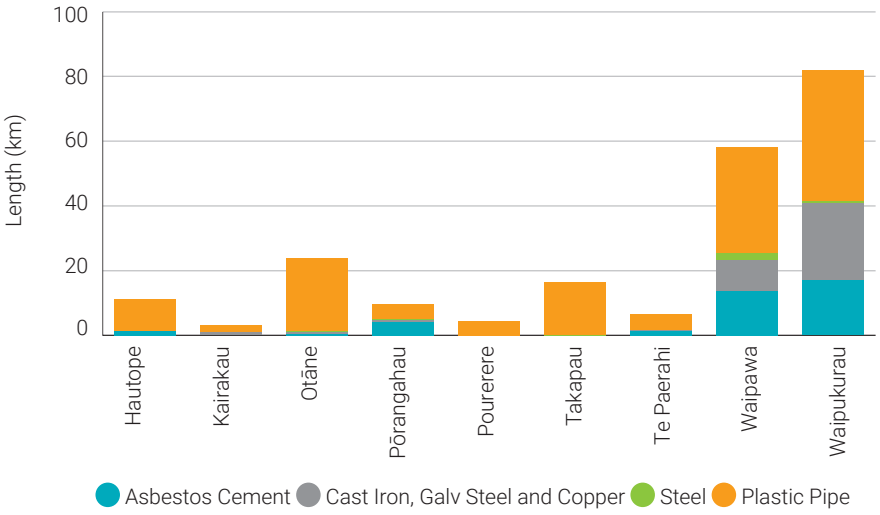


The adopted renewal budget determines the rate that pipes are renewed and therefore the time period for addressing pipes with a very high failure risk.

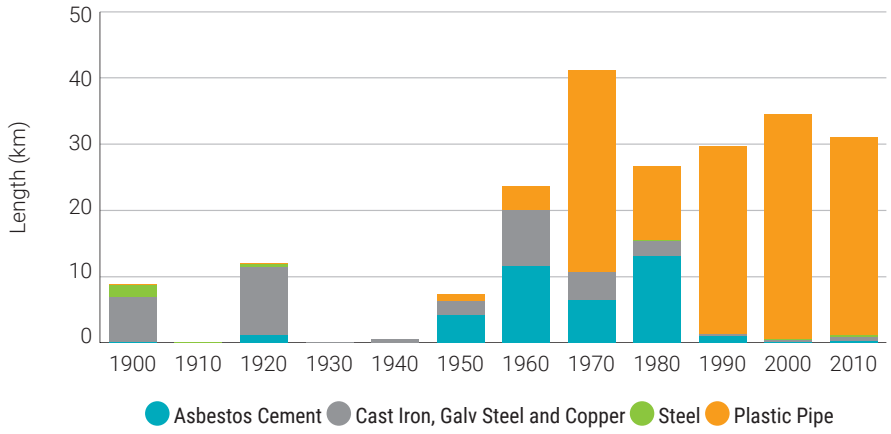
Pipes that are candidates for renewal are selected as part of the following process:

- Assign a renewal priority to each pipe in the database using risk scores
- Map the location of high and very high risk pipes across the district
- Determine discrete projects to cost effectively address the high risk pipes in each location, taking into account:
  - Opportunistic renewal of pipes in the vicinity
  - Interaction with Council's road surfacing programme
  - Interaction with growth and demand or level of service drivers

Drinking Water Reticulation Length by Community



Drinking Water Reticulation Length by Install Decade



Previous Water Management and Conservation Strategy (2012)

Council's current Water Management and Conservation Strategy (June 2012) identified CHBDC's requirement under the resource consents for Waipukurau and Waipawa water supplies to have a water management strategy.

The purpose of the 2012 Water Management and Conservation Strategy were:

- To demonstrate the financial efficiencies that could be made from conserving water through lower operating costs, reduction / deferring of capital costs and efficiencies and economies through shared water use responsibility by consumers.
- To provide linkage of the Water Activity to the social, cultural, economic and environmental community outcomes for the District, and thereby feed into the 2012-2022 LTP with the aim of supporting Council's demand management target areas.
- To recognise that there were statutory mechanisms in place, such as the Water Services Bylaw, that can enable a stronger regulatory approach to be employed by Council where necessary to manage consumer demand and water supply activities.

The 2012 Strategy also detailed Council's current approach to demand management activities:

- **Integrated Planning** – promoting water management and a more sustainable approach to water management through ensuring development is appropriately designed and engineered, and consistent standards are adopted. This included consideration of appropriate network upgrades to accommodate future pressure management.
- **Environment** – consideration of the predicted impact of future climate trends in the District. Rainwater harvesting was raised as an option for further investigation as part of the District Plan review.
- **Demand Management** – the use of restrictions to manage water use during high periods of demand, and the need for all customers to comply with the restrictions.
- **Asset Management / Reticulation Renewals** - $462,213 was budgeted for in the 2011/2012 Annual Plan for Council to continue to maintain a proactive maintenance and renewal programme, with priorities given to areas of network where evidence of high leakage is observed.
- **Targeted Growth** – at the time of writing the 2012 Strategy, Council had capped the amount of growth around the outer extents of the water supply networks due to limited capacity and low pressure. Instead growth was encouraged in the central township areas where there is more capacity. It was noted that if water management is successful in reducing demand that the cap could be reviewed in the future.
- **Zone Management** – an increase in the number of zones in the water supplies was proposed to aid Council's management of water usage, leakage and other operations and maintenance issues.
- **Leak Repairs** – an overview of Council's maintenance contract is provided with Council aiming to respond to and repair significant leaks within the CBD within six hours. Lower priority leaks have a response time of up to seven days. For leaks on private properties Council visits or contacts property owners with a request to repair the leak within seven days. It was noted that private leakage is known to be an issue particularly with lifestyle and farm properties where pipes and troughs are poorly installed and maintained. Council's bylaws enforced to ensure leaks are repaired.
- **Leak Detection Policy** - Council monitor the reticulation and stormwater drains on a regular basis to identify water leaks. Leakage detection is also undertaken with a focus on trunk main leakage, critical mains and vulnerable areas.
- **Water Metering** – extra-ordinary customers are metered (>300m³ per household per year) and charged for consumption over 300m³ per year (meters read quarterly). Meters are read monthly for consumers with trade waste accounts and larger water consumers.
- **Ordinary Water User Policy** – under this policy, Council can install a water meter and charge accordingly if a domestic property is using a volume of water that is more than what is deemed reasonable. An extra-ordinary user is any user that is not considered to be a standard domestic property using a typical volume of water, which may be subject to specific conditions and limitations.
- **Extra-ordinary Water Users** - It was noted that over the 10-year cycle of the current LTP, Council have a meter installation programme for unmetered commercial properties if the water usage is deemed to warrant a meter being fitted (e.g. consumption is > 300m³ per year). Further conditions and definitions on what are deemed an extra-ordinary water user are also in place (e.g. domestic swimming pools or spas in excess of 10m³). All new extra-ordinary connections are automatically metered.
- **Metering Tariff and Trade Waste** – standard water use and water meter tariffs are in place. It was noted that the application of trade waste charges was an important tool to encourage water use efficiencies by large users.

- **Hydrant Usage** – Council use hydrants to carry out mains flushing which is important for keeping water mains clear of debris build up. Mandatory testing of hydrants is also required by Council. Where possible these activities are programmed to avoid summer and drought periods. The NZ Fire Service are also given access to fire hydrants for training and testing purposes. Council has two dedicated and full metered water tanker filling points which are accessed via hydrants by authorised users. These dedicated filling points help to reduce excessive use and wastage of water from indiscriminate hydrant use.
- **Council Water Use** – irrigation of Council's parks and reserves requires significant water use. Council is working to put in place more efficient irrigation practices to manage the impact of irrigation during peak water usage periods and the load on treatment plants. Where practical drought resistant grasses on sports fields and plants that require minimal watering are used.
- **Water Conservation and Public Education Programme** – refer to section 'Engagement and Public Education'
- **Water Supply Bylaw** – refer to section 'Plans and Policies'.

Strategic Objectives

The Sustainable Water Management Plan will provide the means to deliver change in how we think of and value water, resulting in efficient use of water throughout community.

The SWM Plan needs to be aligned to Our Communities Strategic Outcomes, namely:

ENVIRONMENTALLY RESPONSIBLE - He Whaaro nui ki te taiao

Central Hawke's Bay is home to a unique and beautiful landscape. We celebrate and work together to enhance our local natural wonders and resources.

The management of the 3 waters systems meets growth needs to best serve the community while ensuring the effective us of the limited water resource and protecting the natural environment.

DURABLE INFRASTRUCTURE - He hanganga mauroa

We aim to provide sound and innovative facilities and services that meet the needs of our communities today. Our infrastructure is fit for purpose and future proofs our thriving district for tomorrow.

The provision of a 3 waters system in the most cost effective and sustainable way by using the latest technologies and looking for outside the square opportunities and of a quality and quantity that meets the consumers demands, while ensuring any risk to Public health is eliminated.

CONNECTED CITIZENS - He Kirirarau whau hononga

Our citizens can connect easily with each other and with those outside of our District. We all have access to everything Central Hawke's Bay has to offer and enjoy these great things together.

By delivering 3 water services outcomes in a way that protects and enhances the uniqueness of the Central Hawke's Bays identity.

PROSPEROUS DISTRICT - He rohe tonui

Our is a thriving District that is attractive to businesses. Central Hawke's Bay is enriched by the households and whanau that are actively engaged in, and contribute to our thriving District.

The provision of 3 waters to the consumer will help promote and ensure a thriving community.

Proud District - He rohe poho kererū

Central Hawke's Bay is proud of its identity and place in our region and nation. We hold our head high on the national and international stage, celebrating our unique landscape from the sea to the mountains.

By delivering 3 water services outcomes in a way that protects and enhances the uniqueness of the Central Hawke's Bays identity.

By 2025 we aim to:

- Reduce residential consumption by 10%
- Maintain less than 1.80m3 average consumption of drinking water per day per water connection
- Reduce water loss by 20% / Target ILI < 4 within 5 years
- Implement and deliver the renewals campaign as set out in the Long term Plan and Asset Management Plans
- Regular, concise and clear education programmes run regularly to promote this plan

By 2035 we aim to:

- Reduced residential consumption by 20% through universal metering and volumetric charging
- Maintain less than 1.50m3 average consumption of drinking water per day per water connection
- Reduced and maintained water loss to ILI <2 within 10 years
- Reduce water loss by 40% / Target ILI < 3 within 10 years

How do we get there?

This section describes our plans to deliver a sustainable water management plan. Many of these activities will lead towards more aspirational long-term objectives and the Plan should be updated on a cyclical basis to create a rolling three year plan that stretches us to achieve the aspirational targets.

Our approach to water efficiency can be grouped into three key areas as listed below and detailed in the follow section:

- Engaging with our customers
- Improving our assets
- Working with our stakeholders

For each key activity listed the expected outcome is defined with a priority action to determine the appropriate timing. Three categories have been assigned;

Immediate within the next 1-3 years

Investigate within 3-6 years,

Future 6+ years.

Action Plan

This section details the options that are identified as 'immediate' actions and include those actions we are already doing or will provide the greatest benefit to save large water volumes of water in the short term.

Key Area	Key Activity	Expected Outcome	Action
Engaging with our Customers	Residential education and awareness campaigns	Customers value water and are aware of the benefits of saving water through reducing their own use	Immediate
	Non-residential customer education and awareness campaigns	Work with customers to demonstrate how water can be saved through efficient practices and benefits such as financial incentives.	Immediate
	Review and update water restrictions policy to reduce irrigation / outdoor use	Seasonal policy to implement 'Sustainable Water Use Measures' which the community embraces	Immediate
	Large water consumers water efficiency review and option for savings	Target water savings within non-residential users	Investigate
	School education programme	A water-wise educational programme for schools to educate future water users about why and how to reduce our water demand	Investigate
	Working in partnership with relevant organisations (Regional Council, Water NZ) either with joint campaigns and/ or on-line promotions Finding innovative ways to engage with our customers in water efficiency	Our engagement programme will appear integrated and customers demonstrate satisfaction with the information and support they are receiving	Investigate
	Universal metering and volumetric charging - Potable water and wastewater	Informed understanding of water use behaviour to support water resource planning and meeting consenting requirements Frequent reading and billing Fair pricing scheme across the district (e.g. peak pricing, block tariff)	Investigate
	Use of rainwater tanks to substitute water demand during peak demand	Determine if rainwater tanks are beneficial to support potable water use and/or outdoor use for existing customers and new builds	Investigate
	Planting restrictions to ensure only native plants that are appropriate for the local climate are used in new developments / replacement	Water efficient landscaping policy and incentives to support new developments and replacement	Investigate

Improving our Assets	Identify 'champions' for Sustainable Water Management (SWM) within Council and define their role of promoting SWM within the community and within the Region.	Specific roles to be defined and assigned to lead and promote sustainable water management within Council and the wider community Set financial operational budget for SWM	Immediate
	Implement a bulk meter management system to ensure accuracy of measurement and reporting (Telemetry System)	Improve our understanding and analysis of demand	Immediate
	Develop a Non-Revenue Water Strategy to reduce leakage levels	Proactive leakage detection programme to reduce leakage, reduce burst frequency, and to provide continuous minimum night flow reporting	Immediate
	Establishment of District Metered Areas (DMA) or Pressure Management Areas (PMA) to provide	To monitor demand and leakage in manageable areas for informed decision making as part of the wider SWM plan	Immediate
	Data audit of existing customer metering	To account for legitimate usage and improve our understanding of water consumption by user category	Immediate
	Develop Standard Operating Procedures (SoPs) to capture fault data (breaks, complaints), flushing / repairs, etc..	To minimise and account for legitimate water usage when operating the network To capture performance data for informed decision making e.g. pipe breaks	Immediate
	Targeted renewals / rehabilitation programme to reduce leakage and burst frequency	Effective renewals programme resulting in a reduction in number of pipe breaks	Investigate
	Review water use within treatment processes and operational e.g. recycled effluent at WWTP	Demonstrate sustainable use of resources including water within water and wastewater treatment processes	Investigate
	Investigate alternative sources and provide cost benefit analysis e.g. greywater	Alternative water resources to reduce demand	Future
Working with our Stakeholders	Develop a policy to ensure sustainable water use within the Council facilities and operations e.g. Park irrigation use	Water efficient buildings and recycling of potable water in operational use	Immediate
	Use of water efficient fixtures for key stakeholders such as Education and Kāinga Ora (Homes and Communities)	A programme to implement cost-effective water saving measures in schools, public buildings, community housing etc.	Immediate
	Provide incentives for developers to adopt water efficiency measures in new and refurbished housing and be fully engaged with the community	Engaged with private developers and housing associations to identify the most practical and appropriate specification for maximising practical water efficient new housing.	Investigate
	Drive the implementation of water efficiency policy and standards in development plans including those relating to new-building specification	New build legislation to ensure new homes or businesses are designed to meet low per capita consumption	Future
	Planting restrictions to ensure only native plants that are appropriate conditions	Promote water efficient landscaping	Future

Plan Implementation

A work-stream approach has been adopted to deliver 'The Plan'.

The output will be consolidated into our Water Asset Management Plans which over time will inform the development of this document from an initial statement of strategic intent to a fully mature business approved Plan.

To implement the SWM Plan include requires making changes to our existing assets and practices; enhancing existing practices or delivering new activities. Regular reviews will monitor the success of each work-stream as presented in Figure 13 and the resulting impact on our demand assessment and predicted savings.

The individual projects identified as part of the Action Plan are presented in Figure 13 based on the proposed timing of each initiative grouped by work-stream. Council intend to review the plan on a three-yearly cycle and will assess the timing and need for individual projects based on the success of pilots, trails and the available funding to support implementation.

The options that are identified as 'immediate' actions which includes those which Council are already doing or will provide the greatest benefit to save large water volumes of water in the short term are presented in Appendix A.

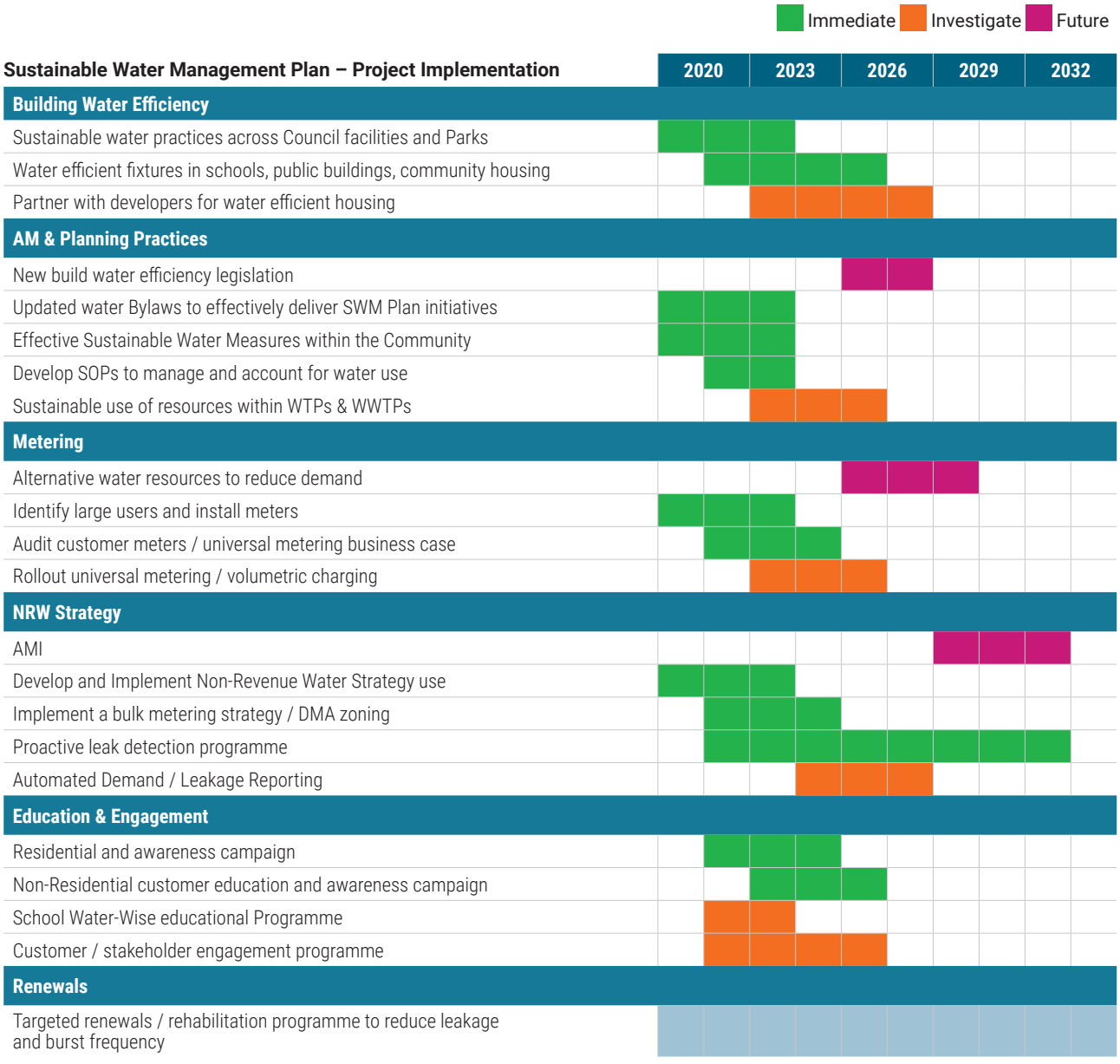


Figure 13: Sustainable Water Management Plan – Implementation Project Timeline

Ownership – Roles and Responsibilities

Ownership of the SWM Plan will need to be assigned along with champions to lead the various work-streams. Defining ownership to individuals or departments within Council will drive progress and bring success.

Roles and responsibilities are required for implementation, ongoing monitoring, analysis and reporting for individual projects / work-streams.

It is recommended that an overall team or individual is assigned responsible for Council to own and deliver the plan. This will include responsibility for proving updates Council and its stakeholders on progress, levels of success and next steps.

Measure of Success

The process of monitoring and evaluation is important and will be used to refine SWM strategies in the longer term to ensure cost-beneficial options are being implemented and savings are being achieved.

Establishing targets to measure progress will be essential with detailed assessment and pilot programmes to determine the benefits against implementation and maintenance costs. Results will support future updates to the plan and the rollout of successful practices across the district.

There is uncertainty in calculating the demand for water from customers. Key uncertainties will arise from the influence of climatic variations, economic impacts, estimates of population and the lag between implementation of water efficiency measures and when they take effect. The reporting of performance will take account of these uncertainties by inclusion of a tolerance band around targets and these will continue to be refined in future updates for inclusion in performance assessments.

Council will measure and report on the performance of options on a regular basis such as quarterly or as appropriate. For each option key performance indicators (KPIs) will be developed at the start of the project, including; water saving and cost information, with other relevant objectives. This information will support the development of the cost benefit analysis and future updates to the plan.

Plan Review

The SWM Plan is the start of a journey for Council, its stakeholders and its customers. It involves changes to behaviour, new technologies and different management practices. Councils proposes to review this plan on a three-yearly cycle in line with the Asset Management Plans and as part of Councils continuous improvement process.

The review will focus on:

- Progress of implementing sustainable water management initiatives
- Effectiveness of implemented initiatives to meet targets
- Status of pilots and investigations into other potential options
- Identifying additional options/ funding that may need to be implemented to meet future targets

The review of this Plan will enable Council to identify the water sustainable management measures that will ensure customers save water in the most cost-effective manner.

Risks and Mitigation

Several risks to the Plan have been identified but we will mitigate these risks, where at all practicable.

- Failure to engage customers with our water efficiency message and in trials/ pilots – work with the region and industry partners like Water New Zealand to help us meet customer expectations.
- Lack of legislative support/ no appetite from external stakeholders/ conflicting views on how to proceed – fully engage with external stakeholders from the start of the process.
- Changing customers' behavioural legacy – ensure we engage fully with the customer and invest in market research/ focus groups to understand the barriers to water efficiency.
- Longevity of the effects of water efficiency has not been proven – through the water efficiency trial, we will be creating a local regional case.
- Effects of reported reduced consumption not seen at water source – careful analysis of results including distribution Input data, per capita consumption monitor data and other operational activity to allow us to interpret the effects of water efficiency on Distribution Input.
- In terms of measurement of national campaign activities, these are very difficult to quantify. Other factors may also be influencing demand such as leakage improvement work in the area. By developing customer awareness, we proactively take steps to inform our customers in how they can use water sustainable which will hopefully in turn influence their water usage behaviours and will be seen, over time, a reduce in per capita consumption.
- Climate change has the potential to introduce substantial strategic risk and uncertainty. This could lead to significant capital expenditure if results are fully incorporated into schemes. However, where possible new strategic assets must be future proofed as far as is reasonably practicable.

Appendix A – Three Year Action Plan

A1: Engaging with our Customers

Activity	Expected Outcome	Building Blocks	Ownership / Year	Budget $
Review and update water restrictions policy to reduce irrigation / outdoor use	Seasonal policy to implement 'Sustainable Water Use Measures' which the community embraces	• Review current water restrictions and develop 'sustainable water measures' that can be easily adopted and understood by customers • Promote 'seasonal' sustainable water measures within the community to emphasise the importance of how we use water and the impact small changes can make • Monitor daily usage (per person) vs targets with daily updates across local news / Council website (front page) – make it engaging and interesting • Assess the effectiveness of seasonal water use measures and engage with the community of the effectiveness	Council 2020	$15,000

Residential education and awareness campaign	Customers value water and are aware of the benefits of saving water through reducing their own use
	To provide a better understanding of how customer behaviour responds to metering versus other water efficiency measures
		• Review our current water efficiency material and how we can make it more accessible to the community i.e. social media.
		• Campaign to promote simple tips on how we can all use water wisely in and around our homes and gardens to save water, save energy and money off energy bills, whilst benefiting the environment
		• Seasonal promotions to highlight the importance, Labour day, Christmas/New Year and Easter
		• Establish a water efficiency trial to understand how our customers use water and what drives them to water efficiency behaviours;
		  • Metering – How providing customers with their consumption data changes behaviour and demand
		  • Education – how education and customer information influences customer demand
		  • Devices – how the use of water efficiency devices/ appliances influence customer demand
			Council 2020-23	$15,000 per annum
				Efficiency Trial -$35,000

Non-residential customer education and awareness campaign	Work with customers to demonstrate how water can be saved through efficient practices and benefits such as financial incentives.	• Work with non-residential customers to provide water sustainable measures	Council 2020-23	$60,000

A2: Improving our Assets

Activity	Expected Outcome	Building Blocks	Ownership / Year	Budget $
Identify 'champions' for Sustainable Water Management (SWM) within Council and define their role of promoting SWM within the community and within the Region.	Specific roles to be defined and assigned to lead and promote sustainable water management within Council and the wider community	• Define role and responsibility, level of commitment to implement and manage SWM plan • Raise the profile and priority of the SWM Plan across Council departments to achieve the objectives of the plan • Promote Council as a leading example of water efficiency • Identify future opportunities for water efficiency within Council	Council / 2020-23	TBC

Implement a bulk meter management system to ensure accuracy of measurement and reporting (Telemetry System)	Improve our understanding and analysis of demand
	• Ensure there is confidence in the flow data observed at existing bulk meter locations
	• Identify where there are clear data discrepancies which may require a meter to be replaced or further investigation; and
	• Identify new locations where bulk meters should be installed to provide greater confidence in the network performance
		• Review bulk meter data and develop bulk meter improvement plan to improve meter accuracy and allow a water demand balance to be developed, this will comprise:
		  • Identifying meter location, type, condition/ age, status
		  • Review of historical flow/pressure data
		  • Develop and implement an improvement plan for the installation of new bulk meters and replacement of existing meters as part of Asset Management Plan
		  • Review telemetry system and reporting tools for suitability to integrate with other systems and provide dynamic reports i.e. daily demand /leakage summary
		  • Update / replace telemetry system and establish operational reports
		  • Develop meter specification / tender / install new bulk meters and commission
			Council & Industry Partner / 2021-23	$250,000 – estimate (subject to number of meters and communication requirements)

Develop a Non-Revenue Water Strategy to reduce leakage levels	Proactive leakage detection programme to reduce leakage, reduce burst frequency, and to provide continuous minimum night flow reporting	NRW (Water Loss) is dependent on the accuracy and availability of the source data used in the water balance calculation, therefore improving the source data is key to improving confidence, targeting and reducing leakage levels. • Establish leakage targets / base rates across water supplies / DMAs for intervention • Leakage reporting / systems to track leakage levels, natural rate of rise (NRR) • Burst frequency – unreported / unreported bursts • Establish Active leakage control process • Resources – roles / responsibilities / partners	Council & Industry Partner / 2021+	$100,000 (2021) $45,000 (2022-23) (excl repairs)
Establishment of District Metered Areas (DMA) or Pressure Management Areas (PMA) to provide	To monitor demand and leakage in manageable areas for informed decision making as part of the wider SWM plan	The focus will be on the establishment of Zones or District Metered Areas (DMA) that will allow consumption and leakage to be measured in manageable areas for informed decision making as part of the wider water resource management. • Define objectives and concept design • Proof of Concept and DMA Rollout • PRV detailed design and commissioning • DMA maintenance - Training and support • DMA System reporting - leakage monitoring and reporting (daily, monthly, annual, DIA)	Council / Industry Partners 2021-23	TBC

Data audit of existing customer metering	To account for legitimate usage and improve our understanding of water consumption by user category	• Analyse and Validate existing data / billing to determine a single source of truth whilst identifying inconsistencies • Review and align with Council stakeholders (3 Waters, Business Information Systems, Finance and Customer Services) a run list for field audit of meters. This will include all water supplies both domestic and non-domestic • Desktop and field audit of meters against a run list. This may involve auditing most connections to identify customer meter location, type, condition, status, etc... • Cleanse existing data stores with single source of truth • Produce a project completion report based on the audit of meters • Provide an installation programme for new customers (missing) / replace non-working meters – focus initially on non-residential customers, high residential users i.e. properties with swimming pools • Update asset management / finance systems	Council / Industry Partners 2021-22	$150,000
Develop Standard Operating Procedures (SoPs) to capture fault data (breaks, complaints), flushing / repairs, etc..	To minimise and account for legitimate water usage when operating the network To capture performance data for informed decision making e.g. pipe breaks	• Define a list of practices / actions that are carried out to manage the network and assess performance. Identify gaps to be updated • Review and update existing SoPs with respect to water use / efficiency • Develop new SoPs as required • Review Council systems ability to capture performance data and provide reporting	Council / Veolia / Industry Partner	$60,000

A3: Working with our Stakeholders

Activity	Expected Outcome	Building Blocks	Ownership / Year	Budget $
Develop a policy to ensure sustainable water use within the Council facilities and operations e.g. Park irrigation use	Water efficient buildings and recycling of potable water in operational use	• Data review and audit of water use within Council facilities, identify high usage and opportunities to reduce or use of re • Carry out audits to identify water re-use practices at WTPs and WWTPs • Install sub-metering during upgrades to help identify leaks or water wastage within processes • Develop KPIs for continuous monitoring for reporting	Council / Veolia 2020-1	25,000 - initial scoping/audit TBC – Audits
Use of water efficient fixtures for key stakeholders such as Education and Kāinga Ora (Homes and Communities)	A programme to implement cost-effective water saving measures in schools, public buildings, community housing etc.	• Identify and work with organisations to develop a water sustainable approach to water use • Develop an assessment tool to identify water saving opportunities for different building use • Confirm number and types of buildings to be audited • Carry out pilot study and install water saving devices • Report benefits / savings and prioritise plan for rollout across district • Present benefits and identify future opportunities for new buildings / technology partners	Council / Stakeholder Partners	TBC

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

www.chbdc.govt.nz • thrive@chbdc.govt.nz • 06 857 8060

PO Box 127 • 28 - 32 Ruataniwha Street, Waipawa 4210

CENTRAL HAWKE'S BAY
DISTRICT COUNCIL